IBM® DB2® Connect™
Enterprise Edition
for UNIX®

IBM

Quick Beginnings

Version 7

IBM® DB2® Connect™
Enterprise Edition
for UNIX®

IBM

Quick Beginnings

Version 7

Before using this information and the product it supports, be sure to read the general information under "Appendix F. Notices" on page 289.

Contents

Welcome to DB2 Connect!

The DB2 Connect Quick Beginnings books provide a focused introduction to the installation and configuration of DB2 Connect products.

This *Quick Beginnings* book will guide you through the planning, installation, migration (if necessary), and setup of a DB2 Connect Enterprise Edition server. You will install DB2 Connect, you will ensure that your host or AS/400 database is enabled for communications, and test its connection to the host or AS/400. Once you have established this connection, you will install a DB2 client and configure it to use DB2 Connect to communicate with the host or AS/400 database (using the Command Line Processor or DB2 GUI tools).

DB2
Universal
Database

Conventions

This book uses the following highlighting conventions:

- **Boldface** indicates commands or graphical user interface (GUI) controls such as names of fields, folders, icons, or menu choices.
- *Italics* indicates variables that you should replace with your own value. It is also used to indicate book titles and to emphasize words.
- `Monospace` indicates file names, directory paths, and examples of text you enter exactly as shown.

This icon marks a fast path. A fast path guides you to information specific to your configuration where multiple options are available.

This icon marks a tip. It provides additional information that can help you complete a task.

For a complete description of the DB2 library, see

- If you do not follow the documented installation method with the recommended defaults, it may be necessary to refer to the *Administration Guide* and the *Command Reference* to complete the installation and configuration.
- The term *Windows 32-bit operating systems* refers to Windows 95, Windows 98, Windows NT, or Windows 2000.
- The term *Windows 9x* refers to Windows 95 or Windows 98.
- The term *DB2 client* refers to a DB2 Run-Time Client, a DB2 Administration Client, or a DB2 Application Development Client.
- In this book, the term *DB2 Universal Database* refers to DB2 Universal Database on OS/2, UNIX, and Windows 32-bit operating systems, unless otherwise stated.

Part 1. Introduction to DB2 Connect on UNIX

Chapter 1. About DB2 Connect

DB2 Connect provides connectivity to mainframe and midrange databases from Windows, OS/2, and UNIX-based platforms. You can connect to DB2 databases on AS/400, VSE, VM, MVS, and OS/390. You can also connect to non-IBM databases that comply with the Distributed Relational Database Architecture (DRDA).

The DB2 Connect Products
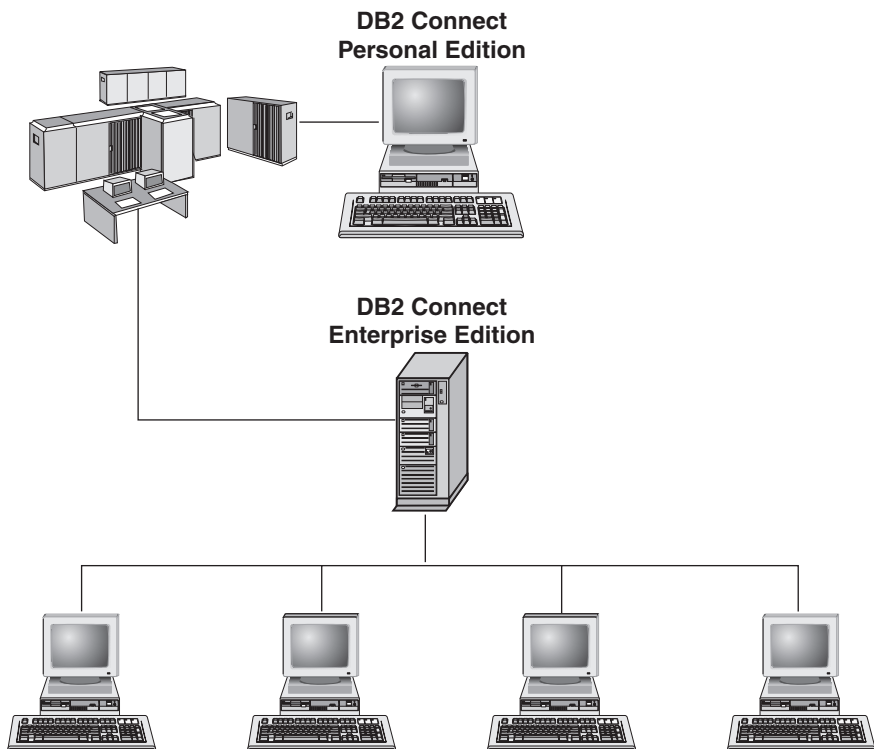
The following DB2 Connect products are available:

- Personal Edition
- Enterprise Edition
- Unlimited Edition

DB2 Connect Personal Edition provides a direct connection from one Windows, OS/2, or Linux operating system to mainframe and midrange databases. It is

designed for a two-tier environment, where each client connects directly to the host. DB2 Connect Personal Edition does not accept inbound client requests for data.

DB2 Connect Enterprise Edition, installed on a gateway server, connects an entire LAN to mainframe and midrange databases. It is designed for a three-tier environment, where clients connect to a host through a gateway server.

DB2 Connect Unlimited Edition provides an unlimited number of DB2 Connect Personal Edition and DB2 Connect Enterprise Edition licenses. You get all of these licenses for one price, based on the size of the OS/390 system that is being accessed.

Working with DB2 Data

DB2 is a relational database system rich in features, many of which can be accessed remotely. In addition to allowing you to store your data, DB2 lets you issue requests to administer, query, update, insert, or delete data using local or remote client applications.

Accessing DB2 Data from Remote Clients

DB2 clients provide a run-time environment that enables client applications to access one or more remote databases. With a DB2 Administration Client, you can remotely administer DB2 or DB2 Connect servers. All applications must access a database through a DB2 client. A Java applet can access a remote database through a Java-enabled browser.

DB2 Version 7 clients are supported on:
- OS/2
- UNIX (AIX, HP-UX, Linux, NUMA-Q, SGI IRIX, and the Solaris** Operating Environment**)
- Windows 9x, Windows NT, or Windows 2000

Accessing Host or AS/400 DB2 Data from the Desktop using DB2 Connect Enterprise Edition

A DB2 Connect server enables DB2 clients on a LAN access to data that is stored on host or AS/400 systems. DB2 Universal Database Enterprise Edition and DB2 Universal Database Enterprise - Extended Edition include the *DB2 Connect Server Support* component. All references to DB2 Connect Enterprise Edition also apply to the DB2 Connect Server Support component.

A great deal of the data in many large organizations is managed by DB2 for AS/400, DB2 for MVS/ESA, DB2 for OS/390, or DB2 for VSE & VM. Applications that run on any of the supported platforms can work with this data transparently, as if a local database server managed it. DB2 Connect

Enterprise Edition is required for supporting applications which access host or AS/400 data and exploit transaction monitors (for example, IBM TxSeries CICS and Encina Monitor, Microsoft Transaction Server, BEA Tuxedo) as well as applications that are implemented as Java applets.

In addition, you can use a wide range of off-the-shelf or custom-developed database applications with DB2 Connect and its associated tools. For example, you can use DB2 Connect products with:

- *Spreadsheets*, such as Lotus 1-2-3 and Microsoft Excel, to analyze real-time data without having the cost and complexity of data extract and import procedures.
- *Decision support tools*, such as BusinessObjects, Brio and Impromptu, and Crystal Reports, to provide real-time information.
- *Database products*, such as Lotus Approach and Microsoft Access.
- *Development tools*, such as PowerSoft PowerBuilder, Microsoft Visual Basic, and Borland Delphi, to create client/server solutions.

DB2 Connect Enterprise Edition is most appropriate for environments where:

- Host and AS/400 database servers do not support native TCP/IP connectivity and direct connectivity from desktop workstations via SNA is not desirable (see Figure 1 on page 7).
- Application is implemented using data-aware Java applets (see Figure 5 on page 12).
- Web servers are used to implement web-based applications (see Figure 4 on page 10, Figure 5 on page 12 and Figure 6 on page 14).
- Middle-tier application server is employed.
- Transaction monitors such as IBM TxSeries CICS and Encina Monitor, IBM Component Broker, IBM MQSeries, Microsoft Transaction Server (MTS), and BEA Tuxedo are used. (See Figure 2 on page 8.)

DB2 Connect provides transparent access to host or AS/400 data through a standard architecture for managing distributed data. This standard is known as Distributed Relational Database Architecture (DRDA). DRDA allows your applications to establish a fast connection to host and AS/400 databases without expensive host components or proprietary gateways.

Although DB2 Connect is often installed on an intermediate server machine to connect DB2 clients to a host or AS/400 database, it is also installed on machines where multiple local users want to access the host or AS/400 servers directly. For example, DB2 Connect may be installed on a large machine with many local users.

DB2 Connect may also be installed on a Web server, Transaction Processor (TP) monitor, or other 3-tier application server machines with multiple local

SQL application processes and threads. In these cases, you can choose to install DB2 Connect on the same machine for simplicity, or on a separate machine to off-load CPU cycles.

A DB2 Connect server enables multiple clients to connect to host or AS/400 data and can significantly reduce the effort that is required to establish and maintain access to enterprise data. Figure 1 on page 7 illustrates IBM's solution for environments in which you want to use a DB2 client making an indirect connection to a host or AS/400 database server through DB2 Connect Enterprise Edition.

In the example, you could replace the DB2 Connect server with a DB2 server that has the DB2 Connect Server Support component installed.
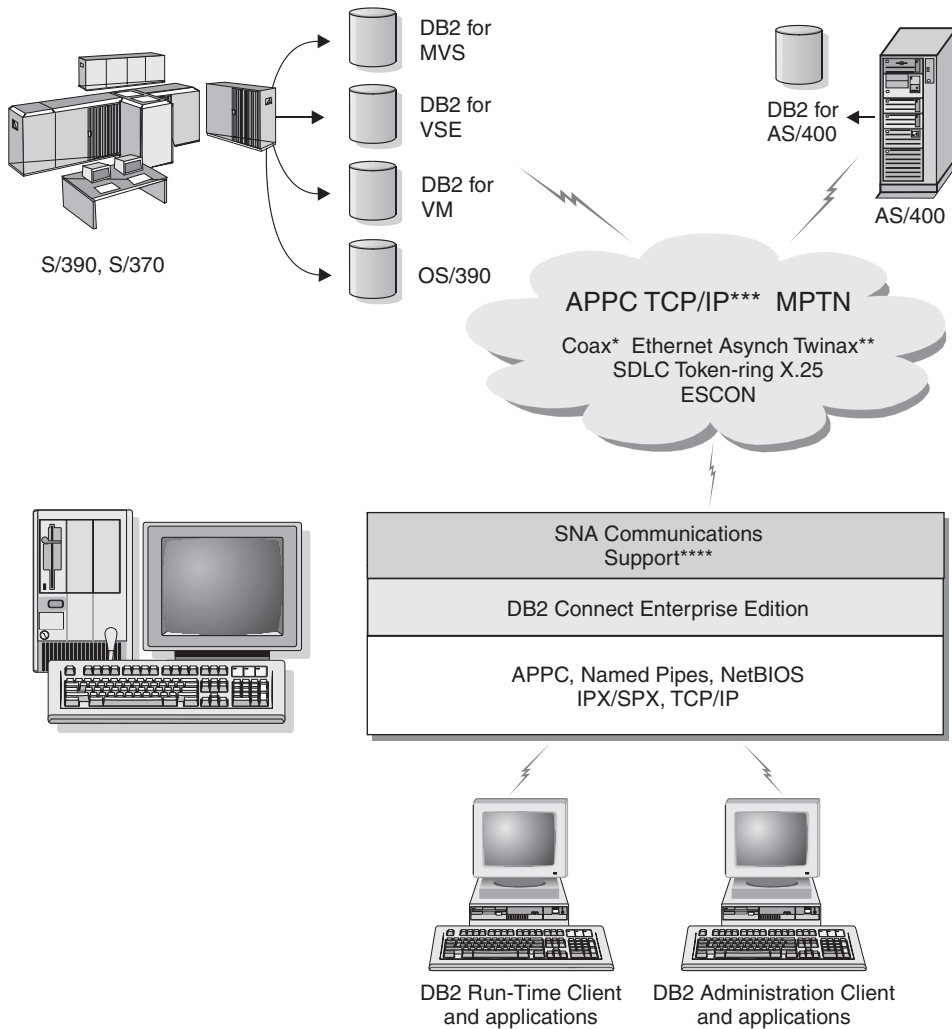
DB2 for MVS

DB2 for VSE

DB2 for VM

OS/390

S/390, S/370

DB2 for AS/400

AS/400

APPC TCP/IP*** MPTN

Coax* Ethernet Asynch Twinax**
SDLC Token-ring X.25
ESCON

SNA Communications
Support****

DB2 Connect Enterprise Edition

APPC, Named Pipes, NetBIOS
IPX/SPX, TCP/IP

DB2 Run-Time Client
and applications

DB2 Administration Client
and applications

Not all protocols are supported for all platforms.

   * For Host connections only
  ** For AS/400
 *** TCP/IP connectivity requires DB2 for OS/390 V5R1, DB2 for AS/400 V4R2,
      or DB2 for VM V6.1
**** SNA Comm Support is specific for each operating system and is required
      only in cases where native TCP/IP conectivity is not available.

Figure 1. DB2 Connect Enterprise Edition
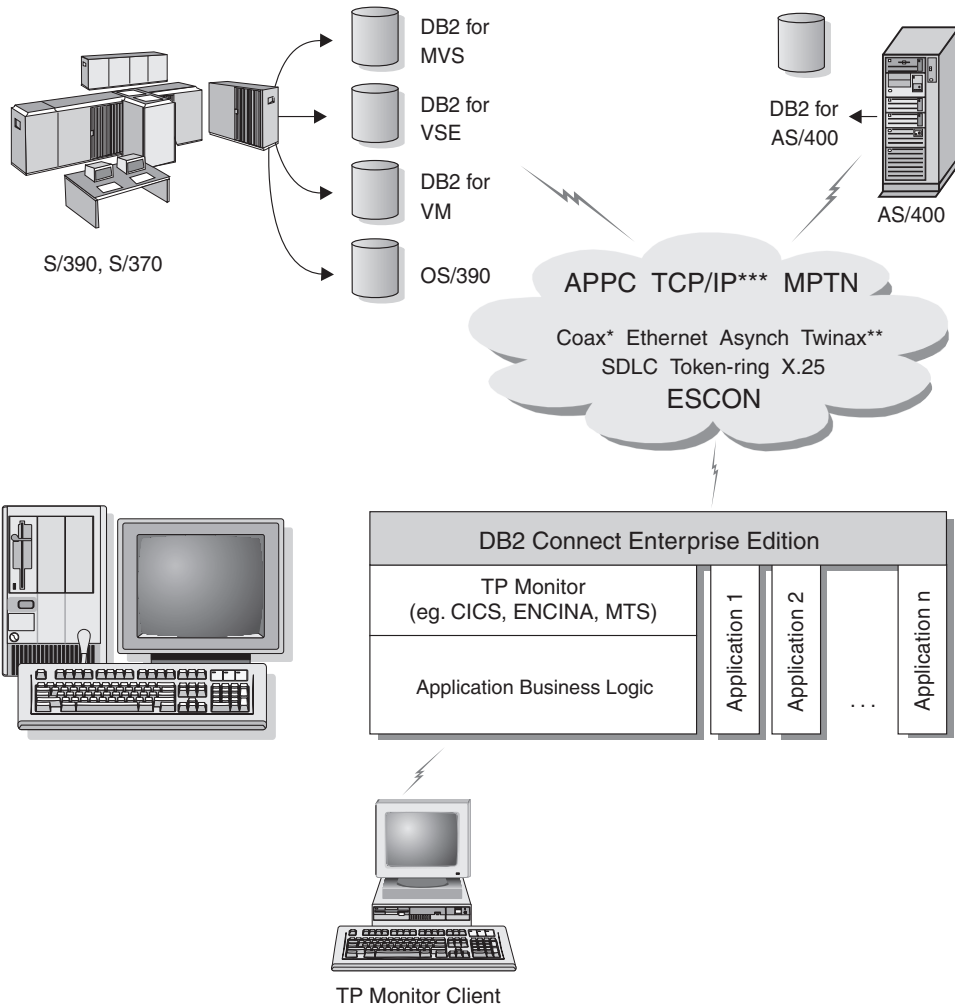
Not all protocols are supported for all platforms.

 * For Host connections only
 ** For AS/400
 *** TCP/IP connectivity requires DB2 for OS/390 V5R1, DB2 for AS/400 V4R2,
     or DB2 for VM V6.1

Figure 2. Using Transaction Monitors with DB2 Connect.
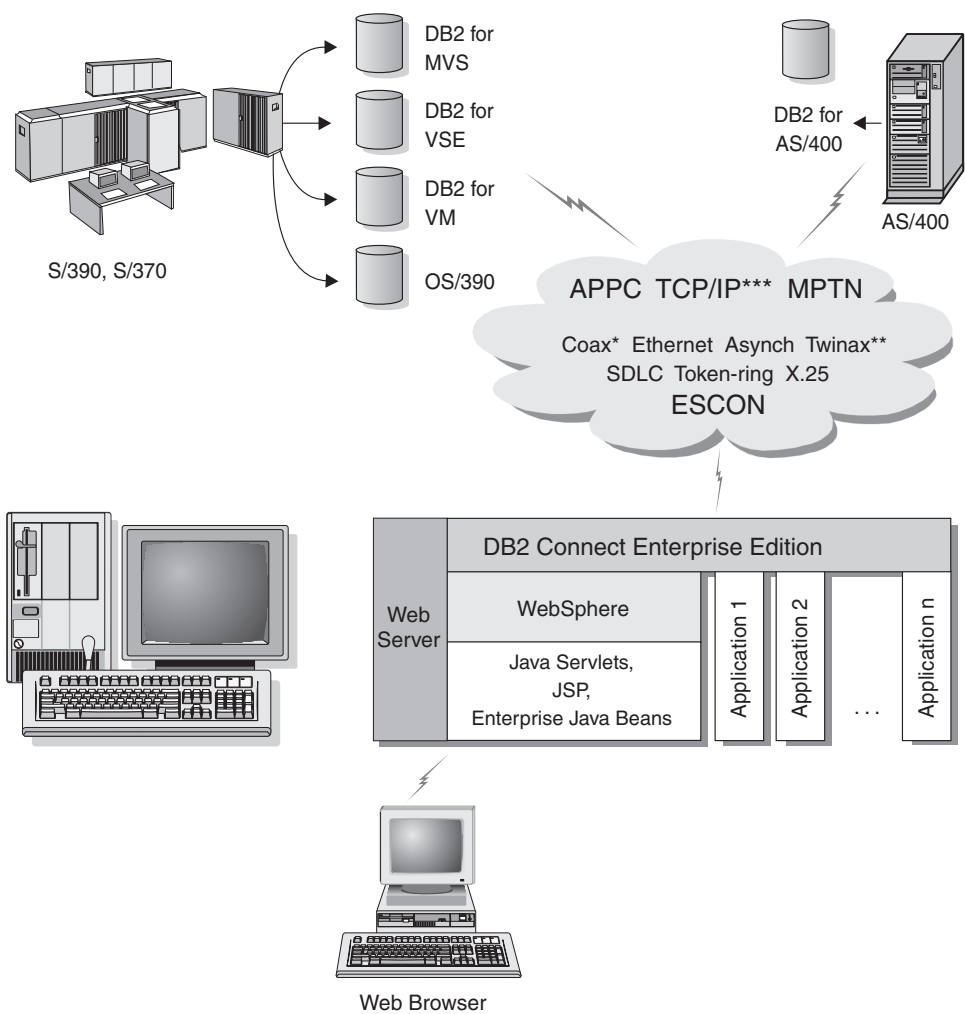
Not all protocols are supported for all platforms.

   * For Host connections only

  ** For AS/400

 *** TCP/IP connectivity requires DB2 for OS/390 V5R1or later,
    DB2 for AS/400 V4R2 or later, or DB2 for VM V6.1

Figure 3. Java Server Support.
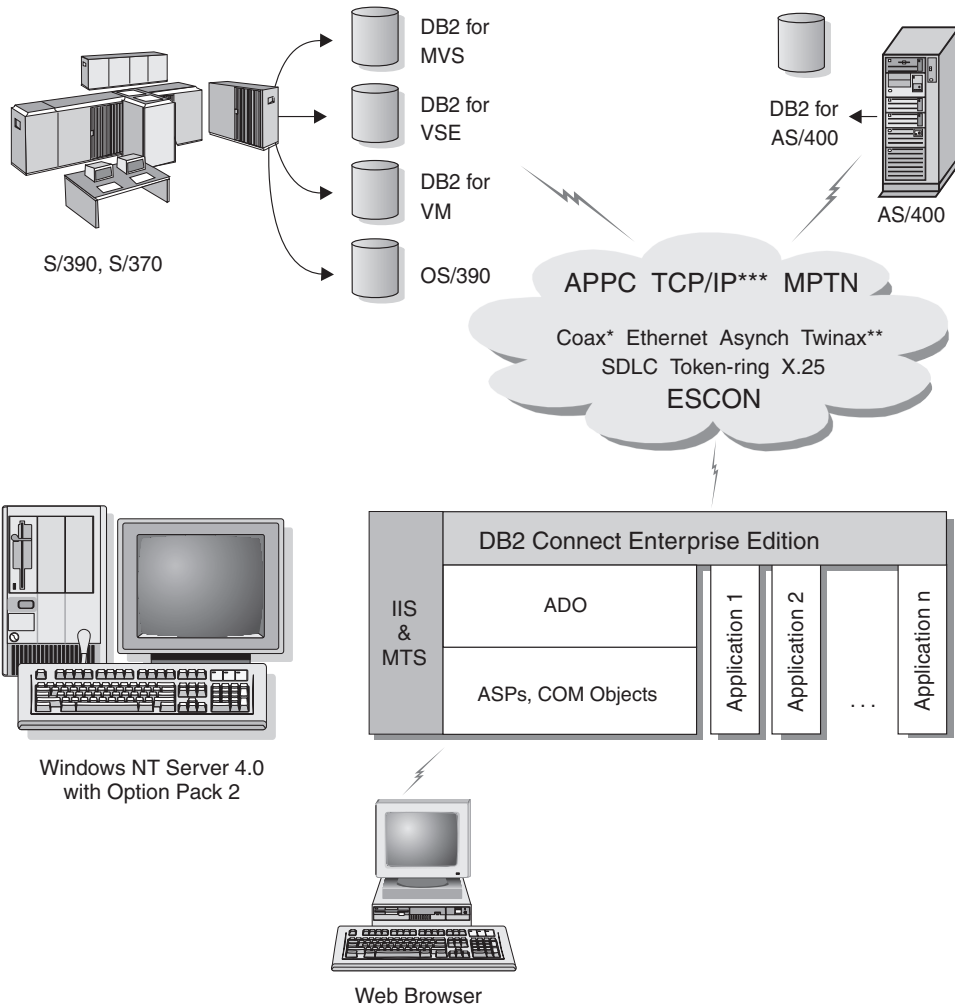
DB2 for
MVS

DB2 for
VSE

DB2 for
VM

OS/390

S/390, S/370

DB2 for
AS/400

AS/400

APPC TCP/IP*** MPTN

Coax* Ethernet Asynch Twinax**
SDLC Token-ring X.25
ESCON

DB2 Connect Enterprise Edition

IIS
&
MTS

ADO

ASPs, COM Objects

Application 1

Application 2

. . .

Application n

Windows NT Server 4.0
with Option Pack 2

Web Browser

Not all protocols are supported for all platforms.

  * For Host connections only

 ** For AS/400

*** TCP/IP connectivity requires DB2 for OS/390 V5R1, DB2 for AS/400 V4R2,
    or DB2 for VM V6.1

Figure 4. DB2 Connect working with Microsoft Internet Information Server (IIS).

Accessing DB2 Data from the Web using Java

Java Database Connectivity (JDBC) and Embedded SQL for Java (SQLJ) are provided with DB2 to allow you to create applications that access data in DB2 databases from the Web.

Programming languages containing embedded SQL are called host languages. Java differs from the traditional host languages C, COBOL, and FORTRAN, in ways that significantly affect how it embeds SQL:

- SQLJ and JDBC are open standards, enabling you to easily port SQLJ or JDBC applications from other standards-compliant database systems to DB2 Universal Database.
- All Java types representing composite data, and data of varying sizes, have a distinguished value, `null`, which can be used to represent the SQL NULL state, giving Java programs an alternative to NULL indicators that are a fixture of other host languages.
- Java is designed to support programs that, by nature, are heterogeneously portable (also called "super portable" or simply "downloadable"). Along with Java's type system of classes and interfaces, this feature enables component software. In particular, an SQLJ translator written in Java can call components that are specialized by database vendors in order to leverage existing database functions such as authorization, schema checking, type checking, transactional, and recovery capabilities, and to generate code optimized for specific databases.
- Java is designed for binary portability in heterogeneous networks, which promises to enable binary portability for database applications that use static SQL.
- You can run JDBC applets inside a web page on any system with a Java-enabled browser, regardless of the platform of your client. Your client system requires no additional software beyond this browser. The client and the server share the processing of JDBC and SQLJ applets and applications.

The DB2 JDBC Applet server and the DB2 client must reside on the same machine as the Web server. The DB2 JDBC Applet server calls the DB2 client to connect to local, remote, host, and AS/400 databases. When the applet requests a connection to a DB2 database, the JDBC client opens a TCP/IP connection to the DB2 JDBC Applet on the machine where the Web server is running.
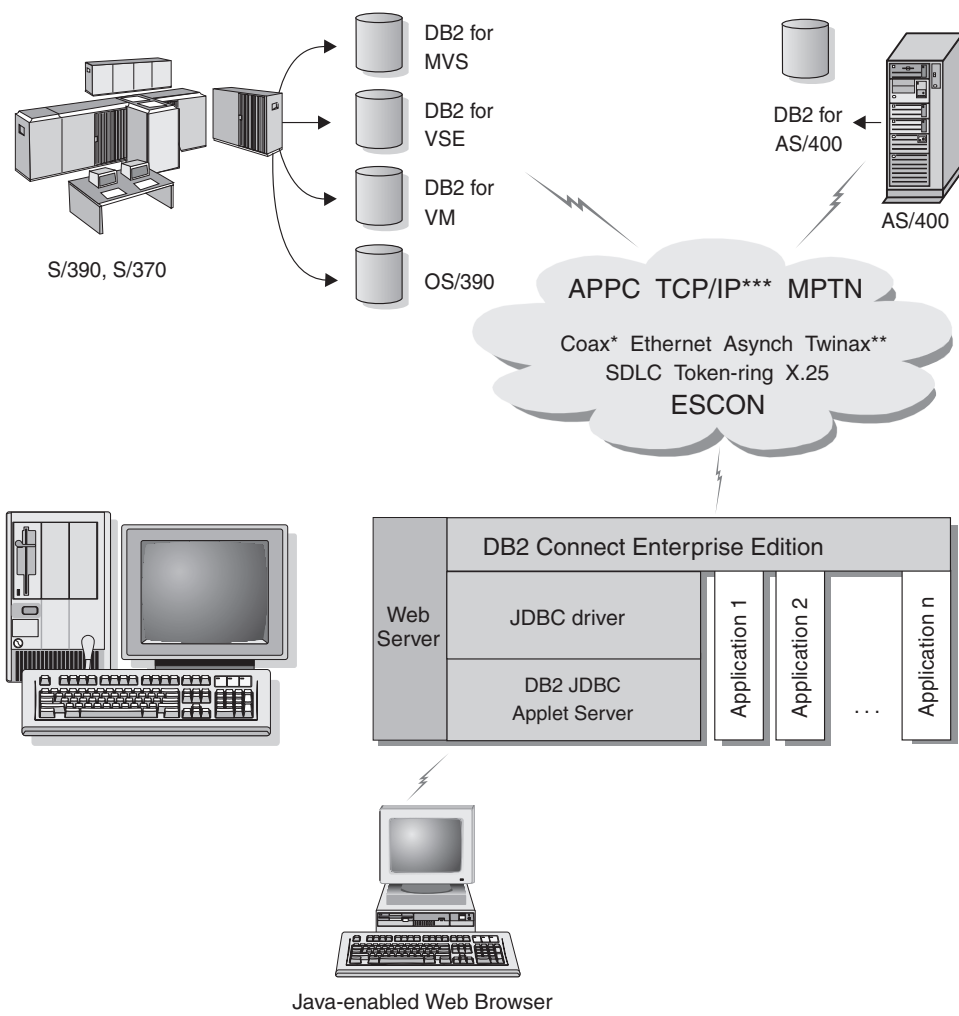
DB2 for
MVS

DB2 for
VSE

DB2 for
VM

OS/390

S/390, S/370

DB2 for
AS/400

AS/400

APPC TCP/IP*** MPTN

Coax* Ethernet Asynch Twinax**
SDLC Token-ring X.25
ESCON

DB2 Connect Enterprise Edition

Web
Server

JDBC driver

DB2 JDBC
Applet Server

Application 1

Application 2

. . .

Application n

Java-enabled Web Browser

Not all protocols are supported for all platforms.

* For Host connections only
** For AS/400
*** TCP/IP connectivity requires DB2 for OS/390 V5R1, DB2 for AS/400 V4R2,
or DB2 for VM V6.1

Figure 5. Using Java Applets.

JDBC and SQLJ applications can be run from any system that has a DB2 client
installed; a Web browser and a Web server are not required.

For more information on Java enablement, refer to the DB2 Java Enablement web page at http://www.ibm.com/software/data/db2/java/

For more information on the JDBC API, point your browser to http://splash.javasoft.com/

Accessing DB2 Data from the Web using Net.Data

Net.Data is provided with DB2 to allow you to create applications that access data in DB2 databases from the Web. You can use Net.Data to create applications that are stored on a Web server and viewable from any Web browser. While viewing these documents, users can either select automated queries or define new ones that retrieve the specified information directly from a DB2 database.

Automated queries do not require user input; they are links in an HTML document and, when selected, they trigger existing SQL queries and return the results from a DB2 database. These links can be triggered repeatedly to access current DB2 data. Customized queries require user input. Users define the search characteristics on the Web page by selecting options from a list or by entering values in fields. They submit the search by clicking on a push button. Net.Data uses the information that is supplied by the user to dynamically build a complete SQL statement, and it sends the query to the DB2 database.

A demonstration of Net.Data applications is available from the IBM Software Net.Data page at http://www.ibm.com/software/data/net.data

Net.Data can be installed with a:
- DB2 server to allow local access to databases.
- DB2 client to allow remote access to databases.

In both cases, Net.Data and the Web server must be installed on the same system.
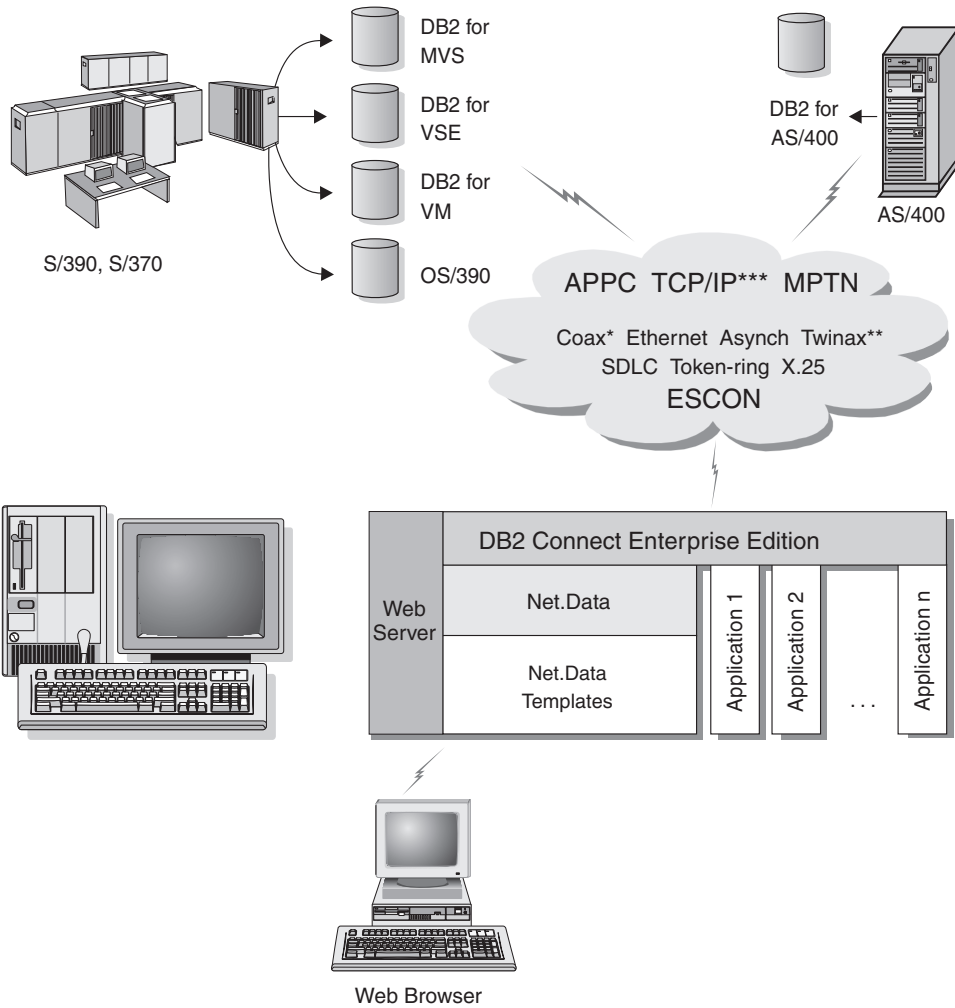
Figure 6. Net.Data with DB2 Connect.

Administering Instances and Databases with the DB2 Administration Tools

You can administer local or remote servers using the DB2 Administration Tools. Use the Control Center to perform administration tasks such as configuring DB2 instances and databases, backing up and recovering data, scheduling jobs, and managing media, all from a graphical interface.

The Control Center has additional support for DB2 UDB for OS/390. If you want to access DB2 for OS/390 functions from the Control Center:

1. Verify the following information with your systems administrator:
   a. You have a DB2 for OS/390 license (Version 5 or later).
   b. You are using one of the following: DB2 Enterprise - Extended Edition, DB2 Enterprise Edition, DB2 Connect Personal Edition, or DB2 Connect Enterprise Edition.
2. Apply a function modification identifier. Read the DB2 for OS/390 Program Directory. The program directory identifies and describes the contents of FMIDs for each tape or cartridge.
3. Apply any additional service to DB2 as described in the program directory.
4. Ensure that you enabled the stored procedures address space.

Managing Communications on the Server

The Control Center allows you to view, update, and reset server protocol settings. These functions are accessed by clicking with the right mouse button on an instance and selecting the **Setup communications** option from the pop-up menu. This tool helps database administrators to:

- Configure database manager parameters by clicking with the right mouse button on an instance and selecting the **Configure** option from the pop-up menu. By default, the setup program automatically detects and configures most communication protocols that it detects on your system.
- Export database information in a profile that can be used to configure clients by clicking with the right mouse button on a system and selecting the **Export Server Profile** option from the pop-up menu.

For information on how to configure server communications, refer to the *Installation and Configuration Supplement*.

Monitoring Databases using DB2 Performance Monitor

With the DB2 Performance Monitor, you can:

- Identify and analyze performance problems in database applications or the database manager.
- Use the early warning system to detect potential problems.
- Automate actions to correct problems that are discovered.
- Define your own statistics, in addition to the default set that is provided.

You can choose to monitor the current state of database activity or collect information when specific events occur. The Performance Monitor allows you to capture point-in-time information at specified intervals. The Event Analyzer allows you to view information about the occurrence of events such as deadlocks and transaction completions.

For additional information, refer to the *Administration Guide* or the online help. You are also able to use the Windows Performance Monitor (supported on Windows NT and Windows 2000) to monitor both database and system performance. For information on how to register DB2 resources and to use the Windows Performance Monitor, refer to the *Administration Guide*.

Viewing SQL Access Plans using Visual Explain

Note: You cannot use Visual Explain to generate access plans on host or AS/400 databases.

Visual Explain helps database administrators and application developers to:
- View the access plan chosen by the database manager's optimizer for a given SQL statement.
- Tune SQL statements for better performance.
- Design application programs and databases.
- View all the details of an access plan, including the statistics in the system catalogs.
- Decide whether or not to add an index to a table.
- Identify the source of problems by analyzing the access plan or performance of SQL statements.
- Use the portable snapshot function to view snapshots from any remote DB2 server.
- Display access plans for queries on all supported DB2 configurations.

For additional information, refer to the *Administration Guide* or the online help.

Managing Connections to Databases using the Client Configuration Assistant

The Client Configuration Assistant (CCA) helps you manage your database connections to remote servers. The CCA is available on OS/2 and Windows 32-bit operating systems and this is the preferred method to set up any OS/2, Windows 9x, Windows NT, or Windows 2000 client to communicate with a server.

You can use the command line processor to set up DB2 clients on any platform. For more information, see "Chapter 20. Configuring Client-to-Server Communications Using the Command Line Processor" on page 203.

With the CCA, 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 that database.
  - 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.
- Tune the client configuration parameters on your system. Parameters are logically grouped and suggested settings are provided on the interface as parameters are selected.
- Export client configuration information to a profile.
- Import configuration information from a profile.
- Update the server password.

Managing Warehouses using the Data Warehouse Center

DB2 Universal Database offers the Data Warehouse Center, a component that automates data warehouse processing. You can use the Data Warehouse Center to define the data to include in the warehouse. Then, you can use the Data Warehouse Center to schedule automatic refreshes of the data in the warehouse.

From the Data Warehouse Center, you can manage specific warehousing objects, including subject areas, warehouse sources, warehouse targets, agents, agent sites, steps, and processes.

You can also perform the following tasks from the Data Warehouse Center:

- Define a subject area. You use a subject area to logically group the processes that are related to a particular topic or function.
- Explore the source data and define warehouse sources.
- Create database tables and define warehouse targets.
- Define a process that specifies how to move and transform the source data into the appropriate format for the warehouse.

- Test and schedule steps.
- Define security and monitor database currency.
- Define a star schema model.

Understanding the Administration Server

The Administration Server responds to requests from the DB2 Administration Tools and the Client Configuration Assistant (CCA). The DB2 Administration Tools allow you to start, stop, and set database manager configuration parameters for servers. The Administration Server is used by the CCA to catalog databases for a client.

The Administration Server (DAS) must reside on every server that you want to administer and detect. By default the DAS is DB2AS, which is the default user ID that is created using the db2setup utility.

Developing Applications using the DB2 Application Development Client

The DB2 Application Development Client is a collection of tools that are designed to meet the needs of database application developers. It includes libraries, header files, documented APIs, and sample programs to build character-based, multimedia, or object-oriented applications.

A platform-specific version of the DB2 Application Development Client is available on each server CD-ROM. In addition the Developer Edition boxes contain the Application Development Clients for multiple supported operating systems. The Personal Developer's Edition box contains the Application Development CD-ROMs for OS/2, Windows and Linux. The Universal Developer's Edition box contains the Application Development CD-ROMs for all supported operating systems.

Through a DB2 client, these applications can access all servers and, by using the DB2 Connect product (or the DB2 Connect functionality supplied with DB2 Enterprise - Extended or DB2 Enterprise Edition), they can also access DB2 Universal Database for AS/400, DB2 Universal Database for OS/390, and DB2 for VSE & VM database servers.

The DB2 Application Development Client allows you to develop applications that use the following interfaces:
- Embedded SQL
- Call Level Interface (CLI) development environment (which is compatible with ODBC from Microsoft)
- Java Database Connectivity (JDBC)
- Embedded SQL for Java (SQLJ)

- DB2 Application Programming Interfaces (APIs) that use administrative functions to manage a DB2 database.

The DB2 Application Development Client includes:
- Precompilers for Java, C, C++, COBOL, and FORTRAN.
- Libraries, include files, and code samples to develop applications that use SQLJ and DB2 CLI.
- A single control point for metadata management through the use of templates and tokens.
- JDBC and SQLJ support to develop Java applications and applets.
- Interactive SQL, through the CLP, to prototype SQL statements and perform ad-hoc database queries.
- An API to enable other application development tools to implement precompiler support for DB2 directly with their products.
- An SQL92 and MVS Conformance Flagger to identify embedded SQL statements in applications not conforming to the ISO/ANSO SQL92 Entry Level standard, or which are not supported by DB2 for OS/390.

For complete information on the functionality of the DB2 Application Development Client, and instructions on how to use them, as well as a full list of supported compilers for your platform, refer to the *Application Building Guide*.

Running Your Own Applications

Various types of applications can access DB2 databases:
- Applications developed using a DB2 Application Development Client that include embedded SQL (including Java SQLJ applications and applets), APIs, stored procedures, user-defined functions, calls to DB2 CLI, or calls to JDBC applications and applets.
- ODBC applications such as Lotus Approach, Microsoft Visual Basic, PowerSoft PowerBuilder, Borland Delphi and thousands more.
- Net.Data macros containing HTML and SQL.

The DB2 CLI/ODBC driver is an optional component during a DB2 client install. It is required to run CLI, ODBC, JDBC, and some SQLJ applications.

For more information on running your own applications, refer to the *Installation and Configuration Supplement*.

Typical Steps Required to Install and Configure DB2 Connect

Setting up DB2 Connect is a multi-step process. DB2 Connect Enterprise Edition is often installed with hundreds or thousands of clients in mind. For this reason, we recommend a test installation, outlined below. After the test configuration has proven stable, you can use it as the template for an unattended installation of DB2 Connect and your clients across your organization.

The typical steps to installing and configuring DB2 Connect Enterprise Edition are as follows:

Step 1. Determine how you want to use DB2 Connect in your network. For the available options, see "Accessing Host or AS/400 DB2 Data from the Desktop using DB2 Connect Enterprise Edition" on page 4.

Step 2. Verify that you have the correct hardware and software prerequisites on both your workstation and the host database server. See "Chapter 2. Planning for Installation" on page 25 for prerequisites.

Step 3. Verify that your host or AS/400 database server is configured to accept connections from DB2 Connect servers. See "Part 4. Preparing Host and AS/400 Databases for DB2 Connect Communications" on page 93.

Step 4. Install your DB2 Connect software. You will use this workstation to configure and verify your host and AS/400 connections. For DB2 Connect installation instructions, see "Part 3. Installing DB2 Connect" on page 37.

Step 5. After installation, establish the connection between DB2 Connect and your host or AS/400 database system.

Step 6. Bind the programs and utilities provided with DB2 Connect to your host or AS/400 database. For instructions, see "Bind Utilities and Applications to the Database Server" on 118.

Step 7. Test the connection.

Step 8. Enable the Multisite Update feature (optional). See "Chapter 13. Enabling Multisite Updates (Two-Phase Commit)" on page 161.

Step 9. If you are planning to use Net.Data, WebSphere, transaction monitors or your own application server software, install these products or applications. For information on installing Net.Data or WebSphere consult the documentation provided with these products as part of the DB2 Connect Enterprise Edition product package. For other products consult the installation documentation provided with the product.

Step 10. Install and configure a DB2 client. Use this workstation to test connectivity from the DB2 run-time client to host and AS/400

servers, as well as to test applications that use this connectivity. For instructions, see "Part 6. Installing and Configuring DB2 Clients" on page 171.

Step 11. Use the Client Configuration Assistant to connect the client to the host or AS/400 system through DB2 Connect. For instructions, see "Chapter 19. Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 191.

Step 12. Install DB2 clients on all end-user workstations that will use applications that connect to host and AS/400 database servers. For instructions on deploying DB2 clients on a large number of workstations, refer to the *Installation and Configuration Supplement*.

Step 13. You are now ready to use DB2 Connect with all your applications. Workstations that will be used for application development should have the DB2 Application Development Client installed. For instructions, see "Part 6. Installing and Configuring DB2 Clients" on page 171.

Step 14. If you want to use this workstation to administer DB2 for OS/390 or DB2 Universal Database for UNIX, Windows NT, Windows 2000, or OS/2 servers, install the DB2 Administration Client. For more information, see "Administering DB2 for OS/390 and DB2 Connect Enterprise Edition servers with the Control Center" on page 223.

Part 2. Planning and Installation

Chapter 2. Planning for Installation

You can use many components in your environment. Use the product and planning information in this section to ensure that you decide which components you want to install. Before you install your DB2 Connect product, you should ensure that your system meets the hardware and software requirements.

If you are migrating from a previous version of DB2 Connect, there are also pre-installation migration tasks you should perform to prepare your databases.

This chapter describes the following requirements you should consider before installing DB2 Connect:

- "Memory Requirements".
- "Disk Requirements" on page 26.
- "Software Requirements" on page 27.
- "Possible Client-to-Server Connectivity Scenarios" on page 34.
- "Migrating from Previous Versions of DB2 Connect" on page 35.

Memory Requirements

The amount of random access memory (RAM) needed depends on the applications you intend to run. We suggest that you have a minimum of 64 MB of RAM to access host or AS/400 databases using DB2 Connect Enterprise Edition. This amount of memory is for a base of 5 concurrent client connections. You will need an additional 16 MB of RAM per 5 clients. Also, the DB2 administration tools require a minimum of 128 MB of RAM.

Note: The DB2 administration tools are a set of DB2 GUI tools that include the Client Configuration Assistant (not available on UNIX platforms), the Control Center, the Command Center, the Event Analyzer, and the Event Monitor.

DB2 Client Memory Requirements

To run a DB2 Run-Time Client or a DB2 Application Development Client, you need a minimum of 16 MB of memory. If you are planning to run a DB2 Administration Client, you need a minimum of 32 MB of memory.

Disk Requirements

The actual fixed disk requirements of your install may vary depending on your file system and the components you install. Ensure that you have included a disk space allowance for your operating system, application development tools, application data, and communications products. For more information about space requirements for data, refer to the *Administration Guide*.

A default install of DB2 Connect Enterprise Edition for OS/2 requires a minimum of 150 MB of disk space, which includes the documentation and the DB2 administration tools. The Java Runtime Environment (JRE) is available on the product CD-ROM.

A *typical* install of DB2 Connect Enterprise Edition for Windows requires a minimum of 205 MB of disk space, which includes the documentation, the DB2 administration tools, and the Java Runtime Environment (JRE).

A default install of DB2 Connect Enterprise Edition for UNIX ranges between 230-290 MB disk space, which includes documentation, the DB2 administration tools, but doesn't include a Java Runtime Environment (JRE).

Client Components

Use Table 1 to estimate the amount of disk space you need on each of your client workstations. You may require additional amounts of disk space depending on your file system.

Table 1. Disk Requirements for Client Components

	Recommended Minimum Disk (MB)
OS/2	
DB2 Run-Time Client	30 MB
DB2 Application Development Client (not including the JDK)	125 MB
DB2 Administration Client	95 MB
UNIX platforms	
DB2 Run-Time Client	30-40 MB (70 MB for Silicon Graphics IRIX)
DB2 Application Development Client (not including the JDK)	90-120 MB (40 MB for NUMA-Q)
DB2 Administration Client	80-110 MB

Note: PTX/NUMA-Q and Silicon Graphics IRIX operating systems do not support DB2 Administration Clients.

Table 1. Disk Requirements for Client Components (continued)

	Recommended Minimum Disk (MB)
Windows 32-bit Operating Systems	
DB2 Run-Time Client	25 MB
DB2 Application Development Client (including the JDK)	325 MB
DB2 Administration Client	125 MB

Note: All DB2 Application Development Client and DB2 Administration Client sizings include the DB2 administration tools and documentation, except for PTX/NUMA-Q.

Software Requirements

DB2 Connect Enterprise Edition products use communication software for establishing host connectivity and connectivity to DB2 Universal Database servers. In addition, DB2 Connect Enterprise Edition requires connectivity software to support connections from remote client workstations.

For the host or AS/400 connectivity, software requirements will depend on:
- The protocol that you will be using, that is, SNA (APPC), TCP/IP, or MPTN (APPC over TCP/IP or vice versa).
- Whether you will be using direct connection.

Server Product Requirements

Table 2 on page 28 lists the operating system and communications software required for DB2 Connect.

On all platforms you will need a Java Runtime Environment (JRE) Version 1.1.8 to run the DB2 tools, such as the Control Center. If you intend to run the Control Center as an applet on Windows 32-bit or OS/2 systems, you will need a Java-enabled browser. See "Chapter 21. Control Center Installation and Configuration" on page 213 for more information.

Table 2. Hardware/Software Requirements

Hardware/Software Requirements	Communications
	DB2 Connect Enterprise Edition for AIX
RISC System/6000 and AIX Version 4.2 or later.	APPC, IPX/SPX, TCP/IP and MPTN (APPC over TCP/IP)

APPC, IPX/SPX, TCP/IP and MPTN (APPC over TCP/IP)

- For TCP/IP connectivity, no additional software is required.
- IPX/SPX connectivity is provided by:
  - AIX base operating system 4.2 or later, which supports DB2 direct addressing.
  - AIX base operating system 4.3 or later (contains Novell Netware Services for AIX Version 4.1), which supports DB2 direct and file server addressing.
- For SNA (APPC) connectivity, one of the following communication products is required:
  - IBM eNetwork Communications Server for AIX V5.0.3
  - Bull DPX/20 SNA/20

Notes:

1. If you plan to use DCE (Distributed Computing Environment), you require a DCE product that is provided by your AIX operating system. For DB2 Connect support, you require DB2/MVS Version 5.1 plus its prerequisite, OS/390 DCE Base Services Version 3 for DCE support.

   With DB2 Connect, you must install DCE Directory Services on the client and the DRDA server. You do not need DCE installed on a DB2 Connect Enterprise Edition server.

2. If you plan to use the Tivoli Storage Manager facilities for backup and restore of your databases, you require the Tivoli Storage Manager Client Version 3 or later.

3. If you plan to use the Simple Network Management Protocol (SNMP) subagent, you require DPI 2.0 provided by IBM SystemView Agent.

4. For LDAP (Lightweight Directory Access Protocol) support, you require an IBM SecureWay Directory Client V3.1.1 running on AIX V4.3.1 or higher.

	DB2 Connect Enterprise Edition for HP-UX Version 11
HP 9000 series 700 or 800 system and:	APPC or TCP/IP
• HP-UX Version 11.00 or later	

APPC or TCP/IP

- TCP/IP is provided with the HP-UX base operating system.
- For APPC connectivity, HP-UX Version 11.00 requires the following:
  - SNAplus2 Link R6.11.00.00
  - SNAplus2 API R.6.11.00.00

Notes:

1. HP-UX only supports outbound client APPC requests. It does not provide support for inbound client APPC requests.

2. If you plan to use the Tivoli Storage Manager facilities for backup and restore of your databases, you require the Tivoli Storage Manager Client Version 3 or later.

3. If you plan to use DCE (Distributed Computing Environment), you require a DCE product that is provided by the HP-UX Version 11 operating system.

   With DB2 Connect, you must install DCE Directory Services on the client and the host server. You do not need DCE installed on a DB2 Connect Enterprise Edition server.

Table 2. Hardware/Software Requirements (continued)

Hardware/Software Requirements	Communications
DB2 Connect Enterprise Edition for Linux	
• Linux kernel 2.2.12 or higher; • *glibc* Version 2.1.2 or higher; • *pdksh* package (required to run the DB2 command line processor); and • *libstdc++* Version 2.9.0. To install DB2, you will need *rpm*.	TCP/IP • For TCP/IP connectivity, no additional software is required.
DB2 Connect Enterprise Edition for NUMA-Q	
NUMA-Q system running PTX Version 4.5 or later and ptx/EFS v1.4.0 with templog	TCP/IP • For TCP/IP connectivity, no additional software is required.
DB2 Connect Enterprise Edition for the Solaris** Operating Environment	

Solaris SPARC-based computer and:
• Solaris Version 2.6 or later
 	
The following patches are required for Solaris version 2.6:
• 105181-17 or higher
• 105210-25 or higher
• 105568-12 or higher
	APPC, IPX/SPX, or TCP/IP
	• TCP/IP is provided with the Solaris base operating system.
	• IPX/SPX connectivity is provided with SolarNet PC Protocol Services 1.1 with IPX/SPX for the Solaris 2.x Operating Environment.
	• For APPC connectivity, you require SunLink SNA 9.1 or later, and the following communication products:
	  – SunLink P2P LU6.2 9.0 or later
	  – SunLink PU2.1 9.0 or later
	  – SunLink P2P CPI–C 9.0 or later
	
	Notes:
	1. If you plan to use DCE (Distributed Computing Environment), you require Transarc DCE Version 2.0 for Solaris 2.6 or higher.
	   With DB2 Connect, you must install DCE Directory Services on the client and the DRDA server. You do not need DCE installed on a DB2 Connect Enterprise Edition server.
	2. If you plan to use the Tivoli Storage Manager facilities for backup and restore of your databases, you require the Tivoli Storage Manager Client Version 3 or later.

Client Product Requirements

Table 3 on page 30 lists the software requirements needed for a DB2 Administration Client, DB2 Run-Time Client, or an DB2 Application Development Client.

On all platforms you will need a Java Runtime Environment (JRE) Version 1.1.8 to run the DB2 tools, such as the Control Center. If you intend to run the Control Center as an applet on Windows 32-bit or OS/2 systems, you will need a Java-enabled browser. See "Chapter 21. Control Center Installation and Configuration" on page 213 for more information.

Table 3. Software Requirements for Clients

Component	Hardware/Software Requirements	Communications
• DB2 Run-Time Client for AIX • DB2 Administration Client for AIX • DB2 Application Development Client for AIX	RISC System/6000 and: • AIX Version 4.2 or later **Note:** When the DB2 Application Development Client is installed, the JDK 1.1.8 is only installed if no other version of the JDK is detected.	APPC or TCP/IP • For APPC connectivity, you require IBM eNetwork Communications Server Version 5.0.3 or later for AIX • The AIX base operating system provides TCP/IP connectivity, if selected during install. **Notes:** 1. If you plan to use DCE (Distributed Computing Environment), you require a DCE product that is provided with the AIX operating system. 2. For LDAP (Lightweight Directory Access Protocol) support, you require an IBM SecureWay Directory Client V3.1.1 running on AIX V4.3.1 or higher. **Note:**

• DB2 Run-Time Client for HP-UX
• DB2 Administration Client for HP-UX
• DB2 Application Development Client for HP-UX
	HP 9000 Series 700 or 800 system and:
	• HP-UX Version 11.00 or later
	
	Note: When the DB2 Application Development Client is installed, the JDK is not installed. Contact your operating system vendor for the latest version of the JDK.
		APPC or TCP/IP
		
		• The base HP-UX operating system provides TCP/IP connectivity.
		• For APPC connectivity, you require either of the following:
		  – SNAplus2 Link R6.11.00.00
		  – SNAplus2 API R6.11.00.00
		
		Note: If you plan to use DCE (Distributed Computing Environment), you require a DCE product that is provided by the HP-UX Version 11 operating system.

• DB2 Run-Time Client for Linux • DB2 Administration Client for Linux • DB2 Application Development Client for Linux	• Linux kernel 2.2.12 or higher; • *glibc* Version 2.1.2 or higher; • *pdksh* package (required to run the DB2 command line processor); and • *libstdc++* Version 2.9.0 or higher. To install DB2, you will need *rpm*. **Note:** When the DB2 Application Development Client is installed, the JDK is not installed. Contact your operating system vendor for the latest version of the JDK.	TCP/IP • The Linux base operating system provides TCP/IP connectivity, if selected during install.

Table 3. Software Requirements for Clients (continued)

Component	Hardware/Software Requirements	Communications
• DB2 Run-Time Client for OS/2 • DB2 Administration Client for OS/2 • DB2 Application Development Client for OS/2	• OS/2 Warp Version 4 • OS/2 Warp Server Version 4 • OS/2 Warp Server Advanced V4 • OS/2 Warp Server Advanced V4 with SMP Feature • OS/2 Warp Server for e-business **Note:** When the DB2 Application Development Client is installed, the JDK is not installed. You can install the latest version of the JDK from your product CD-ROM.	APPC, IPX/SPX, NetBIOS, or TCP/IP • For APPC connectivity, you require IBM eNetwork Communications Server for OS/2 Warp Version 5 or IBM eNetwork Personal Communications for OS/2 Warp Version 4.2. • For IPX/SPX connectivity, you require the Novell NetWare client for OS/2 Version 2.10 or later. IPX/SPX can only be used to connect to local databases. It cannot be used to connect to host or AS/400 databases. • The OS/2 base operating system provides NetBIOS and TCP/IP connectivity, if selected during installation. NetBIOS can only be used to connect to local databases. It cannot be used to connect to host or AS/400 databases. • The OS/2 base operating system provides Named Pipes (Local) connectivity. Named Pipes is supported in DOS and WIN-OS/2 sessions. **Notes:** 1. Net.Data requires a Web server such as WebSphere. 2. For DCE Cell Directory Services Support (CDS) for DB2 Clients for OS/2, you must install an IBM Distributed Computing Environment Cell Directory Service client on each client workstation. 3. If you are planning to use Tivoli Storage Manager, PTF 3 for Tivoli Storage Manager Version 3 is required for an OS/2 client.
• DB2 Run-Time Client for NUMA-Q • DB2 Application Development Client for NUMA-Q	NUMA-Q/2000 system running PTX Version 4.5 or later and ptx/EFS v1.4.0 with templog. **Note:** When the DB2 Application Development Client is installed, the JDK is not installed. Contact your operating system vendor for the latest version of the JDK.	TCP/IP • For TCP/IP connectivity, no additional software is required.

Table 3. Software Requirements for Clients (continued)

Component	Hardware/Software Requirements	Communications
• DB2 Run-Time Client for Silicon Graphics IRIX • DB2 Application Development Client for Silicon Graphics IRIX	• Silicon Graphics IRIX, Version 6.x, and the following filesets: – eoe.sw.oampkg – eoe.sw.svr4net The following patches are required for Versions 6.2 and 6.3: – 2791.0 – 3778.0 **Note:** When the DB2 Application Development Client is installed, the JDK is not installed. Contact your operating system vendor for the latest version of the JDK.	TCP/IP • The Silicon Graphics IRIX base operating system provides TCP/IP connectivity.
• DB2 Run-Time Client for Solaris • DB2 Administration Client for Solaris • DB2 Application Development Client for Solaris	Solaris SPARC-based computer and: • Solaris Version 2.6 or later The following patches are required for Solaris version 2.6: • 105181-17 or higher • 105210-25 or higher • 105568-12 or higher **Note:** When the DB2 Application Development Client is installed, the JDK is not installed. Contact your operating system vendor for the latest version of the JDK.	APPC or TCP/IP • For APPC connectivity, you require SunLink SNA 9.1 or later and the following: – SunLink P2P LU6.2 9.0 or later – SunLink PU2.1 9.0 or later – SunLink P2P CPI–C 9.0 or later • The Solaris base operating system provides TCP/IP connectivity. **Note:** If you plan to use DCE (Distributed Computing Environment), you require Transarc DCE Version 2.0 or later.

Table 3. Software Requirements for Clients (continued)

Component	Hardware/Software Requirements	Communications
• DB2 Run-Time Client for Windows 9x • DB2 Administration Client for Windows 9x • DB2 Application Development Client for Windows 9x	• Windows 95 4.00.950 or later • Windows 98 **Note:** When the DB2 Application Development Client is installed, the JDK 1.1.8 is installed.	IPX/SPX, Named Pipes, NetBIOS, or TCP/IP • The Windows 9x base operating system provides NetBIOS, IPX/SPX, TCP/IP, and Named Pipes connectivity. **Note:** IPX/SPX connectivity is only supported to Windows NT and Windows 2000 servers. • If you plan to use LDAP (Lightweight Directory Access Protocol), you require either the Microsoft LDAP client or the IBM SecureWay Directory Client Version 3.1.1. For more information, refer to the *Administration Guide*. • If you plan to use the Tivoli Storage Manager facilities for backup and restore of your databases, you require the Tivoli Storage Manager Client Version 3 or later. • If you have the IBM Antivirus program installed on your operating system, it must be disabled or uninstalled to complete a DB2 installation.

Table 3. Software Requirements for Clients (continued)

Component	Hardware/Software Requirements	Communications

• DB2 Run-Time Client for Windows NT and Windows 2000
 	
• DB2 Administration Client for Windows NT and Windows 2000
 	
• DB2 Application Development Client for Windows NT and Windows 2000
	• Windows NT Version 4.0 with Service Pack 3 or later
	
	• Windows Terminal Server (can only run the DB2 Run-Time Client)
	
	• Windows 2000
	
	Note: When the DB2 Application Development Client is installed, the JDK 1.1.8 is installed.
		APPC, IPX/SPX, Named Pipes, NetBIOS, or TCP/IP
		
		• The Windows NT and Windows 2000 base operating systems provides NetBIOS, IPX/SPX, TCP/IP, and Named Pipes connectivity.
		
		• For APPC connectivity, you require one of the following products:
		  – Windows NT:
		    - IBM eNetwork Communications Server V5.01 or later.
		    - IBM eNetwork Personal Communications for Windows NT V4.2 or later.
		  – Windows 2000:
		    - IBM eNetwork Communications Server V6.1 or later.
		    - IBM eNetwork Personal Communications for Windows NT V4.3 CSD2 or later.
		  – Microsoft SNA Server Version 3 Service Pack 3 or later
		  – Wall Data Rumba
		
		• If you plan to use DCE (Distributed Computing Environment), you will need to ensure that if you are connecting to DB2 for OS/390 V5.1 database that it is enabled for DCE support using OS/390 DCE Base Services Version 3.
		
		• If you plan to use LDAP (Lightweight Directory Access Protocol), you require either the Microsoft LDAP client or the IBM SecureWay Directory Client Version 3.1.1. For more information, refer to the *Administration Guide*.
		
		• If you plan to use the Tivoli Storage Manager facilities for backup and restore of your databases, you require the Tivoli Storage Manager Client Version 3 or later.
		
		• If you have the IBM Antivirus program installed on your operating system, it must be disabled or uninstalled to complete a DB2 installation.

Possible Client-to-Server Connectivity Scenarios

The following table shows the communication protocols that can be used when connecting a specific DB2 client to a specific DB2 server.

Table 4. Possible Client-to-Server Connectivity Scenarios

Client	Server						
	AIX	HP-UX	Linux	OS/2	PTX/NUMA-Q	Solaris	Windows NT/ Windows 2000
AS/400 V4R1	APPC	N/A	N/A	APPC	N/A	APPC	APPC

Table 4. Possible Client-to-Server Connectivity Scenarios (continued)

Client	Server						
	AIX	HP-UX	Linux	OS/2	PTX/NUMA-Q	Solaris	Windows NT/ Windows 2000
AS/400 V4R2	APPC TCP/IP	TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP
AIX	APPC TCP/IP	TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP
HP-UX	APPC TCP/IP	TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP
Linux	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP
MVS	APPC	N/A	N/A	APPC	N/A	APPC	APPC
OS/2	APPC IPX/SPX(1),(2) TCP/IP	TCP/IP	TCP/IP	APPC IPX/SPX(1),(2) NetBIOS TCP/IP	TCP/IP	APPC IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) NetBIOS TCP/IP
OS/390	APPC TCP/IP	TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP
PTX/NUMA-Q	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP
Silicon Graphics IRIX	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP
SQL/DS	APPC	N/A	N/A	APPC	N/A	APPC	APPC
Solaris	APPC TCP/IP	TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP
VSE & VM V5	APPC	N/A	N/A	APPC	N/A	APPC	APPC
VSE V6	APPC	N/A	N/A	APPC	N/A	APPC	APPC
VM V6	APPC TCP/IP	TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP
Windows 9x	TCP/IP	TCP/IP	TCP/IP	NetBIOS TCP/IP	TCP/IP	TCP/IP	IPX/SPX(1) NPIPE NetBIOS TCP/IP
Windows NT/ Windows 2000	APPC IPX/SPX(1) TCP/IP	TCP/IP	TCP/IP	APPC IPX/SPX(1) NetBIOS TCP/IP	TCP/IP	APPC IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) NPIPE NetBIOS TCP/IP
1. Direct Addressing							
2. File Server Addressing							

Migrating from Previous Versions of DB2 Connect

DB2 Connect Version 7 supports the migration of DB2 databases and instances created with DB2 Connect Version 5.x and Version 6. If you are migrating from one of these versions to DB2 Connect Version 7, you should prepare your databases and instances before installing DB2.

Note: The only databases that may exist within a DB2 Connect Enterprise Edition server instance is a DB2 transaction manager database. This database is used by DB2 to store transaction state information for DB2 coordinated transactions. For more information on transaction managers, refer to the *DB2 Connect User's Guide*.

Preparing Databases and Instances for Migration

This section describes how to prepare existing DB2 Version 5.x databases and instances for migration to a format usable by DB2 Version 7. If you want to migrate more than one instance, you must repeat these steps for each instance.

You must be logged in as the instance owner to complete these steps.

To prepare your databases for migration:

1. Ensure that there are no applications using any databases owned by the DB2 instance you are preparing to migrate. To get a list of all applications owned by the instance, enter the **db2 list applications** command. If all applications are disconnected, this command will return the following message:

   ```
   SQL1611W No data was returned by the Database System Monitor.
   SQLSTATE=00000
   ```

   You can end a session by entering the **db2 terminate** command.

2. Ensure that all databases are cataloged. To view a list of all the cataloged databases in the current instance, enter the following command:

   ```
   db2 list database directory
   ```

3. Make a backup copy of all Version 5.x databases. You do not have to back up Version 6 databases. Refer to the *Administration Guide* for your DB2 product for information on making a backup copy of a database and to the *Command Reference* for the syntax of the backup command.

4. When all applications are complete and you have backed up your databases, stop all database server processes owned by the DB2 instance by entering the **db2stop** command.

5. Stop the DB2 license daemon by entering the **db2licd -end** command.

6. Stop all command line processor sessions by entering the **db2 terminate** command in each session that was running the command line processor.

7. Ensure that the **db2profile** (bash, Bourne, or Korn shells) or **db2cshrc** (C shell) instance environment setup script, under the instance's INSTHOME/sqllib/ directory, is of the proper shell syntax.

   If necessary, ensure that each export statement is separated into different lines. For example:

   ```
   DB2INSTANCE=db2inst1        //bash, Bourne, or Korn shells
   export DB2INSTANCE

   set DB2INSTANCE=db2inst1   //C shell
   ```

Your Next Step

After you have determined that your system meets all hardware and software requirements, and after you have prepared any existing databases and instances for migration, you can now install DB2 Connect Version 7.

Part 3. Installing DB2 Connect

If you want to install a DB2 Administration Client, Run-Time Client, or Application Development Client see "Chapter 18. Installing DB2 Clients on UNIX Operating Systems" on page 185. For information on how to deploy this product using a distributed installation, refer to the *Installation and Configuration Supplement*.

This section describes how to install DB2 Connect on UNIX-based system using either the db2setup utility or your operating system's native administration tools. For information on how to deploy this product using a distributed installation, refer to the *Installation and Configuration Supplement*.

Before You Begin

Please read the following information before installing your DB2 product.

System requirements

> Ensure that your system meets all of the memory, hardware, and software requirements to install your DB2 product. For more information, see "Chapter 2. Planning for Installation" on page 25.

Product licensing

> Your product CD-ROM contains several DB2 products. *Your Proof of Entitlement* and the *License Information* booklet identify the products for which you are licensed.

Migrating from previous versions of DB2

> DB2 for UNIX Version 7 products can co-exist on the same machine with previous versions of DB2. However, if you want to migrate databases and instances that were created using DB2 Version 5.0 or Version 5.2, you must complete certain tasks before *and* after installing DB2. For pre-installation migration tasks, see "Chapter 2. Planning for Installation" on page 25.

NIS and NIS+ environments
> If you are running Network Information Services (NIS) or NIS+, you must create group and user IDs on the master server *before* installing DB2. You also need to set up the user and group names in such a way that the primary group of the Administration Server must be in the secondary group list of all the instances, and the secondary group list of the Administration Server must contain the primary group of all

the instances. If NIS or NIS+ is not running on the system, secondary group lists are modified automatically.

Installation parameters

You should identify and record the parameter values required to install your DB2 product. Table 5 will help you determine these values and provides space in the *Your Value* column to record your own parameter values. The only parameter for which you must provide a value is *DB2 Product Name*. All other parameters either have a default value or are optional.

We recommend that you create the following unique usernames and groups:
- A new username and group for the DB2 instance owner.
- A second new username and group for the Administration server.

Usernames for the default DB2 instance and Administration Server should conform to both your operating system's naming rules and those of DB2. For more information on DB2 naming rules, see "Appendix D. Naming Rules" on page 281.

Table 5. Parameter Values Required for Installation

Information Required for Installation	Default Value	Your Value
Product/Component		
DB2 Product Name[1]	DB2 Connect	
DB2 Product Messages	None	
Documentation	None	
DB2 Instance		
User Name	db2inst1	
UID	System-generated UID	
Group Name	db2iadm1	
GID	System-generated GID	
Home Directory	/home/db2inst1	
Fenced User Defined Functions (UDFs)	db2fenc1	
Password	ibmdb2	
TCP/IP Service Name	db2cdb2inst1	
TCP/IP Port Number	50000	
IPX/SPX File Server Name	*	
IPX/SPX Object Name	*	

Table 5. Parameter Values Required for Installation (continued)

Information Required for Installation	Default Value	Your Value
IPX/SPX Socket Number	879E	
IPX/SPX NetWare User ID	None	
IPX/SPX NetWare Password	None	
Administration Server		
User Name (DAS)	db2as	
UID (DAS)	System-generated UID	
Group Name (DAS)	db2asgrp	
GID (DAS)	System-generated GID	
Home Directory	/home/db2as	
Password (DAS)	ibmdb2	
TCP/IP Port Number (DAS)	523	523
IPX/SPX File Server Name (DAS)	*	
IPX/SPX Object Name (DAS)	*	
IPX/SPX Socket Number (DAS)	87A2	87A2
IPX/SPX NetWare User ID (DAS)	None	
IPX/SPX NetWare Password (DAS)	None	
Note: You can optionally select one or more filesets in this product. There is a separate fileset for each locale.		

About the db2setup utility

We recommend that you use the db2setup utility to install DB2 products on UNIX-based systems. This utility leads you through the installation process using a simple text-based interface that includes online help. Default values are provided for all required installation parameters, but you can also enter your own values.

The db2setup utility can:
- Create or assign groups and user IDs. If you are running NIS or NIS+, you will need to do perform these tasks manually.
- Create a DB2 instance and configure it for communications.
- Create the Administration Server and configure it for communications.

- Install a license key.
- Install additional products, product messages, and documentation.
- Create links for DB2 files.

If you choose to install DB2 using another method, such as using your operating system's native administration tools, you will have to perform these tasks manually.

The db2setup utility can also generate a trace log to record errors during installation. To generate a trace log, enter the **./db2setup -d** command. This generates a log in /tmp/db2setup.trc.

The db2setup utility works with bash, Bourne, and Korn shells. Other shells are not supported.

Your next step

To install DB2, go to the appropriate chapter:

"Chapter 3. Installing DB2 Connect for AIX" on page 41.

"Chapter 4. Installing DB2 Connect for HP-UX" on page 47.

"Chapter 5. Installing DB2 Connect for Linux" on page 57.

"Chapter 6. Installing DB2 Connect for NUMA-Q" on page 65.

"Chapter 7. Installing DB2 Connect for Solaris" on page 73.

Chapter 3. Installing DB2 Connect for AIX

The following sections describe how to install DB2 Connect for AIX using the db2setup utility and the System Management Interface Tool (SMIT).

The following instructions assume that you have read "Part 3. Installing DB2 Connect" on page 37.

Installing DB2 Connect for AIX Using the db2setup Utility

The db2setup utility is the recommended method for installing DB2 Connect for AIX. This utility can perform all of the tasks required to install DB2 Connect. If you prefer not to use the db2setup utility, see "Manually Installing DB2 Connect for AIX" on page 42.

To install DB2 Connect for AIX using the db2setup utility:

1. Log in as a user with root authority.
2. Insert and mount your DB2 Connect product CD-ROM. For information on how to mount a CD-ROM, see "Mounting CD-ROMs on UNIX Operating Systems" on page 252.
3. Change to the directory where the CD-ROM is mounted by entering the **cd /cdrom** command where **cdrom** is the mount point of your product CD-ROM.
4. Enter the **./db2setup** command. The DB2 Setup Utility window opens.
5. Select **Install** and press Enter. The Install DB2 V7 window opens.
6. Select the products you want and are licensed to install. Press **Tab** to move between available options and fields. Press **Enter** to select or deselect an option. Selected options are denoted by an asterisk.

   When you select to install a DB2 Connect product, you can choose the product's **Customize** option to view and change the optional components that will be installed.

When installation is complete your DB2 Connect software will be installed in the /usr/lpp/db2_07_01 directory.

You can use the db2setup utility at any time to set up an existing instance, create another instance, create an Administration Server, or install additional DB2 products or components. Log in as a user with root authority and run the **./db2setup** command from your DB2 product CD-ROM.

If you are installing DB2 Enterprise Edition for AIX, and want to use your database server as a DB2 control server, you must select and install the Control Server component as part of the installation. This component is not selected by default. After installing DB2, you must create the DB2CTLSV instance, and the SATCTLDB database. For the memory, disk, and software requirements for the Control Server component, and for information about creating the DB2CTLSV instance and the SATCTLDB database, refer to the *Administering Satellites Guide and Reference*.

Manually Installing DB2 Connect for AIX

We recommend that you use the db2setup utility to install DB2 Connect for AIX. If you prefer not to use this utility, you can install DB2 Connect manually using AIX's System Management Interface Tool (SMIT).

With SMIT, you can install a software bundle or you can install subset of DB2 products and filesets. Installing DB2 Connect using the software bundle feature is easier than installing individual filesets because selecting a single bundle eliminates the need to select all of the required filesets from a long list.

To install DB2 Connect using the SMIT software bundle feature:
1. Log in as a user with root authority.
2. Insert and mount the appropriate CD-ROM.
3. Enter the **smit** command.
4. Select **Software Installation and Maintenance —> Install and Update Software —> Install Software Bundle (Easy Install)**.
5. Specify the input device or directory for the installation media, or click List to display all input devices or directories.
6. Select the CD-ROM drive you mounted, then press Enter.
7. Select the bundle you want to install and press Enter. The Install Software Bundle window opens.
8. Review the bundle installation parameters. In particular, make sure that **COMMIT software updates** and **AUTOMATICALLY install requisite software** are set to **yes**. Click **OK** again to begin installation.
9. If you did not install the DB2 Media-Defined software bundle on this system, use the following procedure to install it:
   a. In the **Bundle to Install** menu, select the **Media-Defined** option, then press Enter.
   b. In the **Install Bundle Contents** menu, press Enter to continue with the installation. Messages may appear to indicate the status of the installation. Press Enter to continue.
   c. Press F3 to return to the **Install Bundle Contents** menu.

d. Press F4 to re-display the list of software bundles. Select the bundle you want to install and press Enter to begin the installation process. DB2 will be installed in `/usr/lpp/db2_07_01/`.

Repeat the steps in this section if you want to install software bundles on other machines.

Note: When you install DB2 Connect using the software bundle feature, the DB2 Product Library (HTML) filesets are not automatically installed. Also, the DB2 Product Messages, other than in English, are not installed. You must install these filesets separately using the following method.

To install a subset of DB2 products or filesets using SMIT:

1. Log in as user with root authority.
2. Insert and mount the appropriate CD-ROM.
3. Enter the **smit install_latest** command.
4. Specify the INPUT `device/directory` for DB2 and press Enter.

   For example, if `/cdrom` is the CD-ROM mount directory, enter `/cdrom/db2` as the INPUT device.
5. Press F4 to display a list of software to install.
6. Press F7 to mark one or more filesets for installation. If you are installing a non-English DB2 Product Library (HTML) fileset, the English DB2 Product Documentation (HTML) fileset will also be installed automatically.
7. Press Enter to install the selected filesets. DB2 will be installed in `/usr/lpp/db2_07_01/`.
8. Press F10 to exit when the command displays **OK**.

Repeat the steps in this section if you want to install subsets of DB2 products or filesets on other machines.

If you installed a DB2 Product Library (HTML) fileset, you must run the **/usr/lpp/db2_07_01/doc/db2insthtml** *locale* command to uncompress and untar the HTML documentation, where *locale* represents the language identifier of the installed fileset. If you installed any non-English DB2 Product Library filesets, run this command for the English fileset first, then re-run this command for every installed non-English fileset locale. To recover disk space, you may want to remove the compressed tar files and product library filesets after installation. You will still be able to view the HTML books after the compressed tar files and filesets have been removed.

DB2 Connect for AIX Post-installation Tasks

After manually installing your DB2 product, you should create a group and user IDs for the instance owner, Administration Server, and fenced user

defined functions (UDFs) and stored procedures. Once you set up these IDs you can create an instance, create the Administration Server, install the license key, and create links for your DB2 files.

Note: You do not have to perform these tasks if you used the db2setup utility to install DB2.

Creating group and user IDs for the instance owner, Administration Server, and UDFs

You should create group and user IDs for the instance owner, Administration Server, and UDFs and stored procedures. If you want to use existing user or group IDs, you can skip this section and proceed to creating an instance.

In addition to the rules imposed by the operating system for user names and groups, you must also adhere to the rules described in "Appendix D. Naming Rules" on page 281.

To create a group and user ID for the instance owner:
1. Log in as a user with root authority.
2. Enter the following command to make a new group:
   ```
   mkgroup id=999 dbadmin1
   ```

   where 999 represents the group ID and dbadmin1 represents the group name. This new group is the SYSADM group for the instance.
3. Enter the following command to make a new user:
   ```
   mkuser id=1004 pgrp=dbadmin1 groups=dbadmin1 home=/home/db2inst1 db2inst1
    passwd db2inst1
   ```

   where 1004 represents the user ID, dbadmin1 represents the group you created in the previous step, /home/db2inst1 represents the user's home directory, and db2inst1 represents the username and instance name.

You should use a unique user ID for each instance you create. This allows for easier error recovery if a system error occurs.

To create group and user IDs for the Administration Server follow the same steps you used to create IDs for the instance owner. You must use different user IDs for the Administration Server and instance owner. For security reasons, we recommend you use a different group ID for the Administration Server and instance owner.

To create group and user IDs for UDFs and stored procedures, follow the same steps you used to create IDs for the instance owner. For security reasons,

we recommend that you use different user IDs for UDFs and the instance owner. You will be asked to supply a UDF user ID when you create a DB2 instance.

Creating an instance

A DB2 instance is an environment in which you store data and run applications. Use the **db2icrt** command to create an instance. You must have root authority to enter this command. For more information about database instances, refer to the *Administration Guide*.

The **db2icrt** command is run with the following parameters:

```
DB2DIR/instance/db2icrt -a AuthType -u FencedID InstName
```

where:

- `DB2DIR` represents your DB2 installation directory

  where DB2DIR = /usr/lpp/db2_07_01 on AIX
                = /opt/IBMdb2/V7.1 HP-UX, PTX, SGI IRIX, or Solaris
                = /usr/IBMdb2/V7.1 on Linux

- `-a AuthType` represents the authentication type for the instance. `AuthType` can be one of `SERVER`, `CLIENT`, `DCS`, `DCE`, `SERVER_ENCRYPT`, `DCS_ENCRYPT`, or `DCE_SERVER_ENCRYPT`.
- `-u FencedID` represents the name of the user under which fenced user defined functions (UDFs) and fenced stored procedures will run. This flag is not required if you are creating an instance on a DB2 client.
- `InstName` represents the name of instance.

Creating the Administration Server

The Administration Server provides services to support tools that automate the configuration of connections to DB2 databases. The Administration Server also supports tools that administer DB2 from your server system or a remote client using the Control Center. For more information on the Administration Server, refer to the *Administration Guide*.

To create the Administration Server use the **DB2DIR/instance/dasicrt ASName** command

  where DB2DIR = /usr/lpp/db2_07_01 on AIX
                = /opt/IBMdb2/V7.1 HP-UX, PTX, SGI IRIX, or Solaris
                = /usr/IBMdb2/V7.1 on Linux

and **ASName** represents the name of the Administration Server you want to create.

Updating the License Key

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

To update your DB2 product license key:
1. Log in as a user with root authority.
2. Update your DB2 product license with the following command:

   ```
   /usr/lpp/db2_07_01/adm/db2licm -a filename
   ```

   where `filename` is the full pathname and filename for the license file that corresponds to the product you have purchased.

   The DB2 product license key is added to the `/var/ifor/nodelock` file.

   The names of the license files for these products are:

   db2conee.lic
   > DB2 Connect Enterprise Edition

   db2udbwm.lic
   > DB2 Warehouse Manager

   db2relc.lic
   > DB2 Relational Connect

   For example, if the CD-ROM is mounted in the `/cdrom` directory and the name of the license file is `db2dlm.lic`, the command should be as follows:

   ```
   /usr/lpp/db2_07_01/adm/db2licm -a /cdrom/db2/license/db2dlm.lic
   ```

Creating links for DB2 Connect files

You can create links for the DB2 files to the `/usr/lib` directory, and for the include files to the `/usr/include` directory for a particular version and release level of the product.

You may want to create these links if you are developing or running applications and want to avoid having to specify the full path to the product libraries and include files.

To create links for DB2 files, log in as a user with root authority and run the **/usr/lpp/db2_07_01/cfg/db2ln** command. If there are existing links to the `/usr/lib` and `/usr/include` directories from previous versions of DB2, they will automatically be removed by entering the **db2ln** command to create links for this version of DB2. If you want to re-establish the links to the libraries of previous versions, then you must execute the **db2rmln** command from your previous version of DB2 before you execute the **db2ln** command from the previous versions of DB2. Links can be established for only one version of DB2 on a given system.

Chapter 4. Installing DB2 Connect for HP-UX

The following sections describe how to install DB2 Connect for HP-UX using the **db2setup** utility and HP-UX's native **swinstall** program.

The following instructions assume that you have read "Part 3. Installing DB2 Connect" on page 37.

Updating HP-UX Kernel Configuration Parameters

Before installing your DB2 Connect for HP-UX product using **db2setup** or **swinstall**, you may need to update your system's kernel configuration parameters. The values in Table 6 on page 48 are the recommended HP-UX kernel configuration parameters.

Note: You must reboot your machine after updating any kernel configuration parameters.

Table 6. HP-UX Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Physical Memory		
	64MB - 128MB	**128MB - 256MB**	**256MB+**
maxuprc	256	384	512
maxfiles	256	256	256
nproc	512	768	1024
nflocks	2048	4096	8192
ninode	512	1024	2048
nfile	(4 * ninode)	(4 * ninode)	(4 * ninode)
msgseg	8192	16384	32767(1)
msgmnb	65535 (2)	65535 (2)	65535 (2)
msgmax	65535 (2)	65535 (2)	65535 (2)
msgtql	256	512	1024
msgmap	130	258	258
msgmni	128	256	256
msgssz	16	16	16
semmni	128	256	512
semmap	130	258	514
semmns	256	512	1024
semmnu	256	512	1024
shmmax	67108864	134217728 (3)	268435456 (3)
shmseg	16	16	16
shmmni	300	300	300

Notes:

1. The msgsem parameter must be set no higher than 32767.
2. The msgmnb and *msgmax* parameters must be set to at least 65 535.
3. The shmmax parameter should be set to 134 217 728 or 90% of the physical memory (in bytes), whichever is higher. For example, if you have 196 MB of physical memory in your system, set *shmmax* to 184968806 (196*1024*1024*0.9).
4. To maintain the interdependency among kernel parameters, change parameters in the same sequence in which they appear in the preceding table.

To change a value, perform the following steps:

Step 1. Enter the **SAM** command to start the System Administration Manager (SAM) program.

Step 2. Double-click on the **Kernel Configuration** icon.

Step 3. Double-click on the **Configurable Parameters** icon.

Step 4. Double-click on the parameter that you want to change and enter the new value in the **Formula/Value** field.

Step 5. Click on **OK**.

Step 6. Repeat these steps for all of the kernel configuration parameters that you want to change.

Step 7. When you are finished setting all of the kernel configuration parameters, select **Action —> Process New Kernel** from the action menu bar.

The HP-UX operating system automatically reboots after you change the values for the kernel configuration parameters.

Installing DB2 Connect for HP-UX Using the db2setup Utility

After updating your HP-UX kernel configuration parameters, you can begin installing DB2 Connect for HP-UX. The **db2setup** utility is the recommended method for installing DB2 for HP-UX. This utility can perform all of the tasks required to install DB2 Connect. If you prefer not to use the **db2setup** utility, see "Manually Installing DB2 Connect for HP-UX" on page 50.

To install DB2 Connect for HP-UX using the **db2setup** utility:

1. Log in as a user with root authority.
2. Insert and mount your DB2 product CD-ROM. For information on how to mount a CD-ROM, see "Mounting CD-ROMs on UNIX Operating Systems" on page 252.
3. Change to the directory where the CD-ROM is mounted by entering the **cd /cdrom** command where `cdrom` is the mount point of your product CD-ROM.
4. Enter the **./db2setup** command. The DB2 Setup Utility window opens.
5. Select **Install** and press Enter. The Install DB2 V7 window opens.
6. Select the products you want and are licensed to install. Press **Tab** to move between available options and fields. Press **Enter** to select or deselect an option. Selected options are denoted by an asterisk.

   When you select to install a DB2 product, you can choose the product's **Customize** option to view and change the components that will be installed.

   Select **OK** to continue the installation process or **Cancel** to go back to a previous window. Select **Help** for more information or assistance during the installation of any DB2 product.

When installation is complete you DB2 Connect software will be installed in the /opt/IBMdb2/V7.1/ directory.

You can use the **db2setup** utility at any time to create an another instance, create an Administration Server, or install additional DB2 products or

components. Log in as a user with root authority and run the **./db2setup** command from your DB2 product CD-ROM.

Manually Installing DB2 Connect for HP-UX

We recommend that you use the **db2setup** utility to install DB2 Connect for HP-UX. If you prefer not to use this utility, you can install DB2 Connect manually using your HP-UX's **swinstall** command.

Before you install DB2 Connect you should update your system's kernel configuration parameters. For more information see "Updating HP-UX Kernel Configuration Parameters" on page 47.

To install your DB2 Connect for HP-UX product using the **swinstall** command:

1. Log in as a user with root authority.
2. Insert and mount the appropriate CD-ROM.
3. Run the **swinstall** program using the following command:

   ```
   swinstall -x autoselect_dependencies=true
   ```

   This command opens the Software Selection window and the Specify Source window. If necessary, change the **Source Host Name** in the Specify Source window.
4. In the **Source Depot Path** field enter /cdrom/db2/hpux11 where /cdrom represents the CD-ROM mount directory.
5. Click **OK** to return to the Software Selection window.
6. The Software Selection window contains a list of available software to install. Select the products you are licensed to install. *Your Proof of Entitlement* and *License Information* booklet identify the products for which you are licensed.

   DB2V7CAE
   >   DB2 Universal Database Run-Time Client for HP-UX

   DB2V7CONN
   >   DB2 Connect Enterprise Edition for HP-UX

   DB2V7SDK
   >   DB2 Application Development Client

   DB2V7HTML
   >   DB2 Universal Database Product Library in HTML (all locales).
   >
   >   The DB2V7HTML product includes filesets for all the DB2 product documentation. A separate fileset exists for each language. For example, the fileset name for the DB2 product library in English is DB2V7HTML.en_US. Whenever you install a

non-English DB2V7HTML fileset the English version is also installed. For a complete list of filesets in the DB2V7HTML product, see "Chapter 8. Contents of the DB2 Products for UNIX platforms" on page 83.

After installing a DB2V7HTML fileset you must uncompress and untar it before you can view the HTML files. See "DBV7HTML fileset post-installation tasks" for instructions.

DB2V7MSG

DB2 Universal Database Product Messages (all locales).

The DB2V7MSG product includes a separate fileset for every locale in which DB2 Product Messages are available. There is no fileset for the English (en_US.iso88591 or en_US.roman8) locale since these messages are always installed with the base product. For example, to install the DB2 Product messages in the fr_FR.iso88591 locale, you need to install the fileset DB2V7MSG.fr_FR. For a complete list of filesets in the DB2V7MSG product, see "Chapter 8. Contents of the DB2 Products for UNIX platforms" on page 83.

7. Select **Mark for Install** from the **Actions** menu to choose the product to be installed.

8. Select **OK** when the following message appears:

   ```
   In addition to the software you just marked, other software was
   automatically marked to resolve dependencies.  This message will
   not appear again.
   ```

9. Select **Install (analysis)** from the **Actions** menu to begin product installation and to open the Install Analysis window.

10. Select **OK** in the Install Analysis window when the **Status** field displays a Ready message.

11. Select **Yes** in the Confirmation window windows to confirm that you want to install the software.

    View the Install window to read processing data while the software is being installed, until the **Status** field indicates Ready and the Note window opens. The **swinstall** program loads the fileset, and runs the control scripts for the fileset.

12. Select **Exit** from the **File** menu to exit from **swinstall**.

DBV7HTML fileset post-installation tasks

After installing any DB2V7HTML fileset you must uncompress and untar it before you can view the HTML files. To uncompress and untar a DB2V7HTML fileset, run the **/opt/IBMdb2/V7.1/doc/db2insthtml `locale`** command where **`locale`** represents the language of the fileset you installed. To recover disk space, you may want to remove the compressed tar files and

product library filesets after installation. You will still be able to view the HTML books after the compressed tar files and filesets have been removed.

Note: The English DB2V7HTML fileset is *always* installed whenever a non-English fileset is installed. If you installed a non-English DB2V7HTML fileset, run the **db2insthtml** command against the en_US locale first, then re-run the command against all installed non-English DB2V7HTML filesets.

DB2 Connect for HP-UX Post-installation tasks

After manually installing your DB2 product, you should create a group and user IDs for the instance owner, Administration Server, and fenced user defined functions (UDFs) and stored procedures. Once you set up these IDs you can create an instance, create the Administration Server, install the license key, and create links for your DB2 files.

You do not have to perform these tasks if you used the **db2setup** utility to install DB2.

Creating group and user IDs for the instance owner, Administration Server, and UDFs

You should create group and user IDs for the instance owner, Administration Server, and UDFs and stored procedures. If you want to use existing user or group IDs, you can skip this section and proceed to creating an instance.

In addition to the rules imposed by the operating system for user names and groups, you must also adhere to the rules described in "Appendix D. Naming Rules" on page 281.

To create a group and user ID for the instance owner:
1. Log in as a user with root authority.
2. Enter the following command to make a new group:
   ```
   groupadd id=999 dbadmin1
   ```

   where 999 represents the group ID and dbadmin1 represents the group name. This new group is the SYSADM group for the instance.
3. Enter the following command to make a new user:
   ```
   useradd -g dbadmin1 -d /home/db2inst1 -m db2inst1 passwd db2inst1
   ```

   where dbadmin1 represents the group you created in the previous step, /home/db2inst1 represents the user's home directory, and db2inst1 represents the username and instance name.

You should use a unique user ID for each instance you create. This allows for easier error recovery if a system error occurs.

To create group and user IDs for the Administration Server follow the same steps you used to create IDs for the instance owner. You must use different user IDs for the Administration Server and instance owner. For security reasons, we recommend you use a different group ID for the Administration Server and instance owner.

To create group and user IDs for UDFs and stored procedures, follow the same steps you used to create IDs for the instance owner. For security reasons, we recommend that you use different user IDs for UDFs and the instance owner. You will be asked to supply a UDF user ID when you create a DB2 instance.

Creating an instance

A DB2 instance is an environment in which you store data and run applications. Use the **db2icrt** command to create an instance. You must have root authority to enter this command. For more information about database instances, refer to the *Administration Guide*.

The **db2icrt** command is run with the following parameters:

```
DB2DIR/instance/db2icrt -a AuthType -u FencedID InstName
```

where:

- `DB2DIR` represents your DB2 installation directory

      where DB2DIR   = /usr/lpp/db2_07_01 on AIX
                     = /opt/IBMdb2/V7.1 HP-UX, PTX, SGI IRIX, or Solaris
                     = /usr/IBMdb2/V7.1 on Linux

- `-a AuthType` represents the authentication type for the instance. AuthType can be one of `SERVER`, `CLIENT`, `DCS`, `DCE`, `SERVER_ENCRYPT`, `DCS_ENCRYPT`, or `DCE_SERVER_ENCRYPT`.
- `-u FencedID` represents the name of the user under which fenced user defined functions (UDFs) and fenced stored procedures will run. This flag is not required if you are creating an instance on a DB2 client.
- `InstName` represents the name of instance.

Creating the Administration Server

The Administration Server provides services to support tools that automate the configuration of connections to DB2 databases. The Administration Server also supports tools that administer DB2 from your server system or a remote client using the Control Center. For more information on the Administration Server, refer to the *Administration Guide*.

To create the Administration Server use the **DB2DIR/instance/dasicrt ASName** command

where DB2DIR   = /usr/lpp/db2_07_01 on AIX
                     = /opt/IBMdb2/V7.1 HP-UX, PTX, SGI IRIX, or Solaris
                     = /usr/IBMdb2/V7.1 on Linux

and **ASName** represents the name of the Administration Server you want to create.

Updating the License Key
Your Proof of Entitlement and the *License Information* booklet identify the products for which you are licensed.

To update your DB2 product license key:

1. Log in as a user with root authority.
2. Update your DB2 product license with the following command:

   ```
   /opt/IBMdb2/V7.1/adm/db2licm -a filename
   ```

   where `filename` represents the full pathname and filename for the license file that corresponds to the product you have purchased.

   The DB2 product license key is added to the `/var/ifor/nodelock` file.

   The names of the license files for these products are:

   db2conee.lic
   > DB2 Connect Enterprise Edition

   For example, if the CD-ROM is mounted in the `/cdrom` directory and the name of the license file is `db2udbee.lic`, the command should be as follows:

   ```
   /opt/IBMdb2/V7.1/adm/db2licm -a /cdrom/db2/license/db2udbee.lic
   ```

Creating links for DB2 Connect files

You can create links for the DB2 files to the `/usr/lib` directory, and for the include files to the `/usr/include` directory for a particular version and release level of the product.

You may want to create these links if you are developing or running applications and want to avoid having to specify the full path to the product libraries and include files.

To create links for DB2 files, log in as a user with root authority and run the **/opt/IBMdb2/V7.1/cfg/db2ln** command. If there are existing links to the `/usr/lib` and `/usr/include` directories from previous versions of DB2, they will automatically be removed by entering the **db2ln** command to create links for this version of DB2. If you want to re-establish the links to the libraries of previous versions, then you must execute the **db2rmln** command from your

previous version of DB2 before you execute the **db2ln** command from the previous versions of DB2. Links can be established for only one version of DB2 on a given system.

Chapter 5. Installing DB2 Connect for Linux

The following sections describe how to install DB2 Connect for Linux using the db2setup utility or the **rpm** command.

The following instructions assume that you have read "Part 3. Installing DB2 Connect" on page 37.

Enabling Your Linux Workstation for a DB2 Connect Installation

The Linux distribution that you want to install your DB2 product on may not be 'DB2-ready' out of the box and therefore may not have some of the packages that DB2 requires to run. This section discusses the 'out-of-the-box' preparation work that you need to do with your particular Linux distribution to enable it for DB2 Version 7.

Installing DB2 Connect on Red Hat Linux

The only preparation work that you need to do to install your DB2 product on a workstation that is running Red Hat Linux Version 6.0 or later is to add the required pdksh package that is not part of a Red Hat default installation. This package, called pdksh-5.2.xx-x, where *xx-x* represents a point release level, is available in the /RedHat/RPMS directory on the Red Hat CD-ROM. Refer to your Linux documentation for information on how to install this package using the **rpm** command.

Installing DB2 Connect on Caldera Open Linux

Caldera Open Linux (Caldera) Version 2.3 is missing the required pdksh package from a default installation. This pdksh package is on the Caldera Version 2.3 CD-ROM, however it is not compatible with DB2. As relationships strengthen between IBM and Caldera, you should expect this problem to be fixed, in the meantime, you can use a Red Hat pdksh package.

To enable your Caldera workstation for a DB2 installation using a Red Hat pdksh package, download the *pdksh-5.2.13-3.i386* package or a later version from a local Red Hat mirror site. You can find the latest list of mirror sites at http://www.redhat.com/download/mirror.html. Because this is a Red Hat package, you would receive a dependency error on the *glibc* package) if you try to install it. The *glibc* package is automatically installed with Caldera Version 2.3. You can therefore ignore this error because it is a result of different naming conventions between distribution vendors. To bypass the error, you will have to install this package using the no dependencies option. For example, you could use the **rpm -i --nodeps** command to install this

package without dependencies. Refer to your Linux documentation for information on how to install this package using the **rpm** command.

Installing DB2 Connect on Turbo Linux

To enable your Turbo Linux Version 3.6 or later workstation for DB2, you need to add the pdksh package. This is the only prerequisite that is missing from a default installation. This package is available on the Turbo Linux CD-ROM and is located in the /TurboLinux/RPMS directory. Refer to your Linux documentation for information on how to install this package using the **rpm** command.

Installing DB2 Connect on SuSE Linux

The SuSE Version 6.3 default installation is simple to enable for DB2. DB2 requires glibc Version 2.1.2 or higher to run. SuSE Version 6.3 comes with this package, but the distribution refers to this package by a different name. SuSE calls this package shlibs. This causes problems because the db2setup utility fails to recognize the existence of the required glibc package, and ultimately fails. To address this problem, a dummyglibc package is included on the DB2 CD-ROM. If you install this package, the installation will run smoothly. The package is called glibc-2.2.1-2.i386.rpm and is located in the /db2/install/dummyrpm directory on the DB2 CD-ROM. Refer to your Linux documentation for information on how to install this package using the **rpm** command.

Installing DB2 Connect for Linux Using the db2setup Utility

The db2setup utility is the recommended method for installing DB2 Connect for Linux. This utility can perform all of the tasks required to install DB2 Connect. If you prefer not to use the db2setup utility, see "Manually Installing DB2 Connect for Linux" on page 59.

Sometimes display problems can occur when running the db2setup utility. To refresh the current screen at any time, press Ctrl+L. To avoid most potential display problems, install DB2 through a virtual console session which is a terminal window outside of the graphical interface that most Linux distributions are installed with. To change to a virtual console session, press Ctrl+Alt+F1. To change back to the graphical interface, press Ctrl+Alt+F7. Your particular Linux distribution may differ. Rrefer to your Linux documentation for more information.

To install this product using the db2setup utility:
1. Log in as a user with root authority.
2. Insert and mount your DB2 Connect product CD-ROM. For information on how to mount a CD-ROM, see "Mounting CD-ROMs on UNIX Operating Systems" on page 252.

3. Change to the directory where the CD-ROM is mounted by entering the **cd /cdrom** command where **cdrom** is the mount point of your product CD-ROM.
4. Enter the **./db2setup** command. The DB2 Setup Utility window opens.
5. Select **Install** and press Enter. The Install DB2 V7 window opens.
6. Select the products you want and are licensed to install. Press Tab to move between available options and fields. Press Enter to select or deselect an option. Selected options are denoted by an asterisk.

    When you select to install a DB2 Connect product, you can choose the product's **Customize** option to view and change the optional components that will be installed.

When installation is complete your DB2 Connect software will be installed in the /usr/IBMdb2/V7.1 directory.

Manually Installing DB2 Connect for Linux

We recommend that you use the db2setup utility to install DB2 Connect for Linux. If you prefer not to use this utility, you can install DB2 Connect manually using the **db_install** or **rpm** commands. Your DB2 Connect product is made up of different functions and components that are referred to as packages in the Linux environment. When you install your DB2 Connect product using the **rpm** command, you must select to install each package that you require and each associated package for the optional functions that you want to use. For example, if you want to install the Control Center on your Linux workstation, you would need to install the db2wcc71–7.1.0–0.i386.rpm package by entering the following command:

```
rpm -ivh db2wcc71–7.1.0–0.i386.rpm
```

Some packages are required and some are optional. For information on the packages that are required to install a DB2 Connect product, see "Products and Selectable Components" on page 85. For a detailed list of all the package names, see "Chapter 8. Contents of the DB2 Products for UNIX platforms" on page 83.

Using the **rpm** command to install a DB2 product is prone to errors because you could easily skip over a required package. We recommend that you use the **db2_install** script to install a DB2 product if you do not want to use the db2setup utility. The **db2_install** script will install both the required and optional packages for a DB2 product using the **rpm** command.

To install DB2 Connect using the **db2_install** script:
1. Log in as a user with root authority.

2. Ensure that your Linux workstation has been enabled for DB2 Connect, for more information, see "Enabling Your Linux Workstation for a DB2 Connect Installation" on page 57.

3. Insert and mount the appropriate CD-ROM. For more information on mounting a CD-ROM, see "Mounting CD-ROMs on UNIX Operating Systems" on page 252.

4. Enter the **./db2_install** command. The script will return a list of the products that are available for installation from your CD-ROM, for example:

```
Specify one or more of the following keywords,
separated by spaces, to install DB2 products.

DB2.WGRP - DB2 Workgroup Edition
DB2.SDK  - DB2 Application Development Client
DB2.CAE  - DB2 Administration Client
Enter "help" to redisplay the product names, enter "quit" to exit.
********************************************************************
```

5. Enter the name of the DB2 product that you want to install and press Enter. For example, to install DB2 Workgroup Edition, respond to the **db2_install** script's prompt by entering DB2.WGRP. The **db2_install** script will begin installing all the rpms associated with the product that you selected for installation.

When installation is complete your DB2 Connect software will be installed in the /usr/IBMdb2/V7.1 directory.

DB2 Connect Post-Installation Tasks

After manually installing your product, you should create a group and user IDs for the instance owner, Administration Server, and fenced user defined functions (UDFs) and stored procedures. Once you set up these IDs you can create an instance, create the Administration Server, install the license key, and create links for your DB2 files.

You do not have to perform these tasks if you used the db2setup utility to install DB2.

Creating Group and User IDs for the Instance Owner, Administration Server, and UDFs

You should create group and user IDs for the instance owner, Administration Server, and UDFs and stored procedures. If you want to use existing user or group IDs, you can skip this section and proceed to creating an instance.

In addition to the rules imposed by the operating system for user names and groups, you must also adhere to the rules described in "Appendix D. Naming Rules" on page 281.

To create a group and user ID for the instance owner:

1. Log in as a user with root authority.
2. Enter the following command to make a new group:

   ```
   mkgroup -g 999 dbadmin1
   ```

   where 999 represents the group ID and `dbadmin1` represents the group name. This new group is the SYSADM group for the instance.
3. Enter the following command to make a new user:

   ```
   mkuser -u 1004 -g db2admin1 -G dbadmin1 -m -d /home/db2inst1
       db2inst1 -p db2inst1
   ```

   where 1004 represents the user ID, `dbadmin1` represents the group you created in the previous step, `/home/db2inst1` represents the user's home directory, and `db2inst1` represents the username and instance name.

You should use a unique user ID for each instance you create. This allows for easier error recovery if a system error occurs.

To create group and user IDs for the Administration Server follow the same steps you used to create IDs for the instance owner. You must use different user IDs for the Administration Server and instance owner. For security reasons, we recommend you use a different group ID for the Administration Server and instance owner.

To create group and user IDs for UDFs and stored procedures, follow the same steps you used to create IDs for the instance owner. For security reasons, we recommend that you use different user IDs for UDFs and the instance owner. You will be asked to supply a UDF user ID when you create a DB2 instance.

Creating an Instance
A DB2 instance is an environment in which you store data and run applications. Use the **db2icrt** command to create an instance. You must have root authority to enter this command. For more information about database instances, refer to the *Administration Guide*.

The **db2icrt** command is run with the following parameters:

```
DB2DIR/instance/db2icrt -a AuthType -u FencedID InstName
```

where:
- `DB2DIR` represents your DB2 installation directory

     where DB2DIR   = /usr/lpp/db2_07_01 on AIX
                    = /opt/IBMdb2/V7.1 HP-UX, PTX, SGI IRIX, or Solaris
                    = /usr/IBMdb2/V7.1 on Linux

- **-a** AuthType represents the authentication type for the instance. AuthType can be one of SERVER, CLIENT, DCS, DCE, SERVER_ENCRYPT, DCS_ENCRYPT, or DCE_SERVER_ENCRYPT.
- **-u** FencedID represents the name of the user under which fenced user defined functions (UDFs) and fenced stored procedures will run. This flag is not required if you are creating an instance on a DB2 client.
- InstName represents the name of instance.

Creating the Administration Server

The Administration Server provides services to support tools that automate the configuration of connections to DB2 databases. The Administration Server also supports tools that administer DB2 from your server system or a remote client using the Control Center. For more information on the Administration Server, refer to the *Administration Guide*.

To create the Administration Server use the **DB2DIR/instance/dasicrt ASName** command

        where DB2DIR = /usr/lpp/db2_07_01 on AIX
                               = /opt/IBMdb2/V7.1 HP-UX, PTX, SGI IRIX, or Solaris
                               = /usr/IBMdb2/V7.1 on Linux

and **ASName** represents the name of the Administration Server you want to create.

Updating the License Key

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

To update your DB2 product license key:
1. Log in as a user with root authority.
2. Update your DB2 product license with the following command:

   ```
   /usr/IBMdb2/V7.1/adm/db2licm -a filename
   ```

   where filename is the full pathname and filename for the license file that corresponds to the product you have purchased. The names of the license files for these products are:

   db2conee.lic
         DB2 Connect Enterprise Edition

   For example, if the CD-ROM is mounted on /cdrom and the name of the license file is db2udbee.lic, the command should be as follows:

   ```
   /usr/IBMdb2/V7.1/adm/db2licm -a /cdrom/db2/license/db2udbee.lic
   ```

Creating Links for DB2 Files

You can create links for the DB2 files to the /usr/lib directory, and for the include files to the /usr/include directory for a particular version and release level of the product.

You may want to create these links if you are developing or running applications and want to avoid having to specify the full path to the product libraries and include files.

To create links for DB2 files, log in as a user with root authority and run the **/usr/IBMdb2/V7.1/cfg/db2ln** command. If there are existing links to the /usr/lib and /usr/include directories from previous versions of DB2, they will automatically be removed by entering the **db2ln** command to create links for this version of DB2. If you want to re-establish the links to the libraries of previous versions, then you must execute the **db2rmln** command from your previous version of DB2 before you execute the **db2ln** command from the previous versions of DB2. Links can be established for only one version of DB2 on a given system.

Chapter 6. Installing DB2 Connect for NUMA-Q

The following sections describe how to install DB2 Connect for NUMA-Q using the db2setup utility and the **pkgadd** command.

The following instructions assume that you have read "Part 3. Installing DB2 Connect" on page 37.

Updating NUMA-Q/PTX Kernel Configuration Parameters

Before installing DB2 Connect for NUMA-Q product using the db2setup utility, you may need to update your system's kernel configuration parameters. The values in Table 7 are the recommended PTX kernel configuration parameters.

Note: You must reboot your machine after updating any kernel configuration parameters.

Table 7. PTX Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Physical Memory
	512MB+
msgmap	514
msgmax(1)	65535
msgmnb(1)	65535
msgmni	512
msgssz	64
msgtql	1024
msgseg(2)	32767
semmni	1024
semmap	514
semmnu	2048
semmns	2048
semume	80
shmmax(3)	2147483647
shmseg	16
shmmni	300
shm_lock_ok	1
shm_lock_uid	−1

Notes:

1. The msgmax and msgmnb must be set to 65535 or larger.
2. The msgsem parameter must be set no higher than 32767.
3. The shmmax must be set to 2147483647 or larger.

To modify your PTX kernel configuration parameters, perform the following steps:

Step 1. Log on as a user with root authority.

Step 2. Enter the menu command.

Step 3. Press A to select the **System Administration** option.

Step 4. Press C to select the **Kernel Configuration** option.

Step 5. Press Ctrl+F in the **Change Kernel Configuration Disk** form. If you want to build the new kernel in a disk other than the root disk, enter the disk and press Ctrl+F.

Step 6. In the Compile, Configure, or Remove a Kernel window, select the kernel configuration type with which your current kernel is built and press K.

Step 7. In the **Configure a kernel with site specific parameters** form, go down one page (press Ctrl+D), press A for **All** in the **Visibility level for parameter changes** and then press Ctrl+F.

Step 8. In the Configure Files With Adjustable Parameters window select ALL (press Ctrl+T) and press Ctrl+F.

Step 9. In the Tunable Parameters window, use arrow keys to navigate. Press Ctrl+T to select the parameter you want to change and press Ctrl+F.

Step 10. In the Detail of Parameter Expression(s) window, press s to set the new value.

Step 11. In the **Add site specific 'set' parameter** form, enter the new value and press Ctrl+F.

Step 12. Repeat steps 9 through 11 to change the values of all other parameters that you want to change.

Step 13. Once you are done changing all the parameters, press Ctrl+E from the Tunable Parameters window.

Step 14. Compile the kernel.

Step 15. Press Ctrl+X to exit the menu.

Step 16. Reboot the system so that the changes can take effect.

Installing DB2 Connect for NUMA-Q Using the db2setup Utility

After updating your PTX kernel configuration parameters, you can begin installing DB2 Connect. The db2setup utility is the recommended method for installing DB2 Connect for NUMA-Q. This utility can perform all of the tasks required to install DB2. If you prefer not to use the db2setup utility, see "Manually Installing DB2 Connect for NUMA-Q" on page 67.

To install DB2 Connect for NUMA-Q using the db2setup utility:

1. Log in as a user with root authority.

2. Insert and mount your DB2 Connect product CD-ROM. For information on how to mount a CD-ROM, see "Mounting CD-ROMs on UNIX Operating Systems" on page 252.

3. Change to the directory where the CD-ROM is mounted by entering the **cd /cdrom** command where **cdrom** is the mount point of your product CD-ROM.

4. Enter the **./db2setup** command. The DB2 Setup Utility window opens.

5. Select **Install** and press Enter. The Install DB2 V7 window opens.

6. Select the products you want and are licensed to install. Press Tab to move between available options and fields. Press Enter to select or deselect an option. Selected options are denoted by an asterisk.

   When you select to install a DB2 product, you can choose the product's **Customize** option to view and change the components that will be installed.

   Select **OK** to continue the installation process or **Cancel** to go back to a previous window. Select **Help** for more information or assistance during the installation of any DB2 product.

When installation is complete, the DB2 Connect software will be installed in the /opt/IBMdb2/V7.1/ directory.

You can use the db2setup utility at any time to create an another instance, create an Administration Server, or install additional DB2 products or components. Log in as a user with root authority and run the **./db2setup** command from your DB2 product CD-ROM.

Manually Installing DB2 Connect for NUMA-Q

We recommend that you use the db2setup utility to install DB2 Connect for NUMA-Q. If you prefer not to use this utility, you can install DB2 products and filesets manually using the **db2_install** and **pkgadd** commands.

Before you install DB2 Connect you should update your system's kernel configuration parameters. For more information see "Updating NUMA-Q/PTX Kernel Configuration Parameters" on page 65.

To install your DB2 Connect for NUMA-Q product using the **db2_install** command:

1. Log in as a user with root authority.

2. Insert and mount the appropriate CD-ROM.

3. Run the **db2_install** command as follows:

       /cdrom/unnamed_cdrom/db2_install

The **db2_install** command prompts for one or more of the following to be installed, and for the base directory where the product files are to be installed. The products are listed by keyword and product description:

DB2.CENT
DB2 Connect Enterprise Edition for NUMA-Q

DB2.RCAE
DB2 Universal Database Run-Time Client NUMA-Q

DB2.SDK
DB2 Application Development Client NUMA-Q

The command displays the following prompt: Specify one or more of the keywords separated by spaces.

4. Type the keyword of the products to be installed when prompted.
5. Type the name of the base directory when prompted. The default base directory is /opt.

   If the default base directory is used, all files will be installed in the /opt/IBMdb2/V7.1 directory.
6. Enter Yes to start the DB2 Connect product installation.

Installing DB2 Connect for NUMA-Q Product Messages

A separate package exists for every locale in which DB2 Product Messages are translated. Packages for DB2 Product Messages are given names such as db2ms%L71, where %L represents two letters for the language name. For example, the package name for the DB2 Product Messages in the de (German) locale is db2msde71. For a complete list of DB2 Product Messages, see "Chapter 8. Contents of the DB2 Products for UNIX platforms" on page 83.

To install DB2 Product Message packages using the **pkgadd** command:

1. Log in as a user with root authority.
2. Insert and mount the appropriate CD-ROM.
3. Run the **pkgadd** command as follows:

       pkgadd -d *cdrom-dir*/db2 *pkgname*

   where *cdrom-dir* represents the CD-ROM mount directory and *pkgname* is the package name.

   For example, to install the DB2 Product Messages in the de (German) locale, enter the following command:

       pkgadd -d /cdrom/unnamed_cdrom/db2 db2msde71

DB2 Connect for NUMA-Q Post-installation tasks

After manually installing your DB2 Connect product, you should create a group and user IDs for the instance owner, Administration Server, and fenced

user defined functions (UDFs) and stored procedures. Once you set up these IDs you can create an instance, create the Administration Server, install the license key, and create links for your DB2 files.

You do not have to perform these tasks if you used the db2setup utility to install DB2.

Creating group and user IDs for the instance owner, Administration Server, and UDFs

You should create group and user IDs for the instance owner, Administration Server, and UDFs and stored procedures. If you want to use existing user or group IDs, you can skip this section and proceed to creating an instance.

In addition to the rules imposed by the operating system for user names and groups, you must also adhere to the rules described in "Appendix D. Naming Rules" on page 281.

To create a group and user ID for the instance owner:
1. Log in as a user with root authority.
2. Enter the following command to make a new group:

    ```
    groupadd -g 999 dbadmin1
    ```

    where 999 represents the group ID and dbadmin1 represents the group name. This new group is the SYSADM group for the instance.
3. Enter the following command to make a new user:

    ```
    useradd -g dbadmin1 -u 1004 -d /export/home/db2inst1 -m db2inst1
      passwd db2inst1
    ```

    where dbadmin1 represents the group you created in the previous step, 1004 represents the user ID, /export/home/db2inst1 represents the user's home directory, and db2inst1 represents the username and instance name.

You should use a unique user ID for each instance you create. This allows for easier error recovery if a system error occurs.

To create group and user IDs for the Administration Server follow the same steps you used to create IDs for the instance owner. You must use different user IDs for the Administration Server and instance owner. For security reasons, we recommend you use a different group ID for the Administration Server and instance owner.

To create group and user IDs for UDFs and stored procedures, follow the same steps you used to create IDs for the instance owner. For security reasons,

we recommend that you use different user IDs for UDFs and the instance owner. You will be asked to supply a UDF user ID when you create a DB2 instance.

Creating an instance

A DB2 instance is an environment in which you store data and run applications. Use the **db2icrt** command to create an instance. You must have root authority to enter this command. For more information about database instances, refer to the *Administration Guide*.

The **db2icrt** command is run with the following parameters:

```
DB2DIR/instance/db2icrt -a AuthType -u FencedID InstName
```

where:

- DB2DIR represents your DB2 installation directory

    where DB2DIR   = /usr/lpp/db2_07_01 on AIX
                   = /opt/IBMdb2/V7.1 HP-UX, PTX, SGI IRIX, or Solaris
                   = /usr/IBMdb2/V7.1 on Linux

- -a AuthType represents the authentication type for the instance. AuthType can be one of SERVER, CLIENT, DCS, DCE, SERVER_ENCRYPT, DCS_ENCRYPT, or DCE_SERVER_ENCRYPT.
- -u FencedID represents the name of the user under which fenced user defined functions (UDFs) and fenced stored procedures will run. This flag is not required if you are creating an instance on a DB2 client.
- InstName represents the name of instance.

Creating the Administration Server

The Administration Server provides services to support tools that automate the configuration of connections to DB2 databases. The Administration Server also supports tools that administer DB2 from your server system or a remote client using the Control Center. For more information on the Administration Server, refer to the *Administration Guide*.

To create the Administration Server use the **DB2DIR/instance/dasicrt ASName** command

    where DB2DIR   = /usr/lpp/db2_07_01 on AIX
                   = /opt/IBMdb2/V7.1 HP-UX, PTX, SGI IRIX, or Solaris
                   = /usr/IBMdb2/V7.1 on Linux

and **ASName** represents the name of the Administration Server you want to create.

Updating the License Key

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

To update your DB2 product license key:

1. Log in as a user with root authority.
2. Update your DB2 product license with the following command:

       /opt/IBMdb2/V7.1/adm/db2licm -a filename

   where `filename` represents the full pathname and filename for the license file that corresponds to the product you have purchased.

   The DB2 Connect product license key is added to the `/var/ifor/nodelock` file.

   The names of the license files for these products are:

   db2conee.lic
          DB2 Connect Enterprise Edition

   db2relc.lic
          DB2 Relational Connect

   For example, if the CD-ROM is mounted in the `/cdrom` directory and the name of the license file is `db2udbee.lic`, the command should be as follows:

       /opt/IBMdb2/V7.1/adm/db2licm -a /unnamed_cdrom/db2/license/db2udbee.lic

Creating links for DB2 Connect files

You can create links for the DB2 files to the `/usr/lib` directory, and for the include files to the `/usr/include` directory for a particular version and release level of the product.

You may want to create these links if you are developing or running applications and want to avoid having to specify the full path to the product libraries and include files.

To create links for DB2 Connect files, log in as a user with root authority and run the **/opt/IBMdb2/V7.1/cfg/db2ln** command. If there are existing links to the `/usr/lib` and `/usr/include` directories from previous versions of DB2, they will automatically be removed by entering the **db2ln** command to create links for this version of DB2. If you want to re-establish the links to the libraries of previous versions, then you must execute the **db2rmln** command from your previous version of DB2 before you execute the **db2ln** command from the previous versions of DB2. Links can be established for only one version of DB2 on a given system.

Chapter 7. Installing DB2 Connect for Solaris

The following sections describe how to install DB2 Connect for the Solaris**
Operating Environment using the db2setup utility or the **db2_install** and
pkgadd commands.

The following instructions assume that you have read "Part 3. Installing DB2
Connect" on page 37.

Updating Solaris kernel configuration parameters

Before installing your DB2 Connect for Solaris product using the db2setup
utility or the **db2_install** and **pkgadd** commands, you may need to update
your system's kernel configuration parameters. The values in Table 8 are the
recommended Solaris kernel configuration parameters.

Note: You must reboot your machine after updating any kernel configuration
parameters.

Table 8. Solaris Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Physical Memory			
	64MB - 128MB	128MB - 256MB	256MB - 512MB	512MB+
msgsys:msginfo_msgmax	65535(1)	65535(1)	65535(1)	65535(1)
msgsys:msginfo_msgmnb	65535(1)	65535(1)	65535(1)	65535(1)
msgsys:msginfo_msgmap	130	258	258	258
msgsys:msginfo_msgmni	128	256	256	256
msgsys:msginfo_msgssz	16	16	16	16
msgsys:msginfo_msgtql	256	512	1024	1024
msgsys:msginfo_msgseg	8192	16384	32767(2)	32767(2)
shmsys:shminfo_shmmax	67108864	134217728(2)	268435456(3)	536870912(3)
shmsys:shminfo_shmseg	50	50	50	50
shmsys:shminfo_shmmni	300	300	300	300
semsys:seminfo_semmni	128	256	512	1024
semsys:seminfo_semmap	130	258	514	1026
semsys:seminfo_semmns	256	512	1024	2048
semsys:seminfo_semmnu	256	512	1024	2048
semsys:seminfo_semume	50	50	50	50

Notes:

1. The `msgsys:msginfo_msgmnb` and `msgsys:msginfo_msgmax` parameters must be set to 65535 or larger.
2. The `msgsys:msgsem` parameter must be set no higher than 32767.
3. The `shmsys:shminfo_shmmax` parameters should be set to the suggested value in the above table, or 90% of the physical memory (in bytes), whichever is higher. For example, if you have 196 MB of physical memory in your system, set the `shmsys:shminfo_shmmax` parameter to 184968806 (196*1024*1024*0.9).

To set a kernel parameter, add a line at the end of the /etc/system file as follows:

```
set parameter_name = value
```

For example, to set the value of the *msgsys:msginfo_msgmax* parameter, add the following line to the end of the /etc/system file:

```
set msgsys:msginfo_msgmax = 65535
```

Sample files for updating the kernel configuration parameters are provided in the /opt/IBMdb2/V7.1/cfg directory, or on your DB2 product CD-ROM in the /db2/install/samples directory. The names for these files are as follows:

kernel.param.64MB
> for systems with 64MB–128MB of physical memory

kernel.param.128MB
> for systems with 128MB–256MB of physical memory

kernel.param.256MB
> for systems with 256MB–512MB of physical memory

kernel.param.512MB
> for systems with 512MB–1GB of physical memory

Depending upon the amount of physical memory in your system, append the appropriate kernel configuration parameter file to the /etc/system file. If necessary, change the value of the *shmsys:shminfo_shmmax* parameter as described in Note 2 above.

After updating the /etc/system file, reboot the system.

Installing DB2 Connect for Solaris using the db2setup utility

After updating your Solaris kernel configuration parameters, you can begin installing DB2 Connect. The db2setup utility is the recommended method for installing DB2 Connect for Solaris. This utility can perform all of the tasks required to install DB2 Connect. If you prefer not to use the db2setup utility, see "Manually installing DB2 Connect for Solaris".

To install DB2 Connect for Solaris using the db2setup utility:

1. Log in as a user with root authority.
2. Insert and mount your DB2 product CD-ROM. For information on how to mount a CD-ROM, see "Mounting CD-ROMs on UNIX Operating Systems" on page 252.
3. Change to the directory where the CD-ROM is mounted by entering the **cd /cdrom** command where **cdrom** is the mount point of your product CD-ROM.
4. Enter the **./db2setup** command. The DB2 Setup Utility window opens.
5. Select **Install** and press Enter. The Install DB2 V7 window opens.
6. Select the products you want and are licensed to install. Press Tab to move between available options and fields. Press Enter to select or deselect an option. Selected options are denoted by an asterisk.

   When you select to install a DB2 product, you can choose the product's **Customize** option to view and change the components that will be installed.

   Select **OK** to continue the installation process or **Cancel** to go back to a previous window. Select **Help** for more information or assistance during the installation of any DB2 product.

When installation is complete, the DB2 Connect software will be installed in the `/opt/IBMdb2/V7.1/` directory.

You can use the db2setup utility at any time to create an another instance, create an Administration Server, or install additional DB2 Connect products or components. Log in as a user with root authority and run the **./db2setup** command from your DB2 product CD-ROM.

Manually installing DB2 Connect for Solaris

We recommend that you use the db2setup utility to install DB2 Connect for Solaris. If you prefer not to use this utility, you can install DB2 Connect products and filesets manually using the **db2_install** and **pkgadd** commands.

Before you install DB2 Connect you should update your system's kernel configuration parameters. For more information see "Updating Solaris kernel configuration parameters" on page 73.

To install your DB2 Connect for Solaris product using the **db2_install** command:

1. Log in as a user with root authority.
2. Insert and mount the appropriate CD-ROM.
3. If the Volume Manager is *not* running on your system, enter the following commands to mount the CD-ROM:

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

   where */cdrom/unnamed_cdrom* represents the CD-ROM mount directory and /dev/dsk/c0t6d0s2 represents the CD-ROM drive device.

   Note: If you are mounting the CD-ROM drive from a remote system using NFS, the CD-ROM file system on the remote machine must be exported with root access. You must also mount that file system with root access on the local machine.

   If the Volume Manager (vold) *is* running on your system, the CD-ROM is automatically mounted as:

   ```
   /cdrom/unnamed_cdrom
   ```

4. Run the **db2_install** command as follows:

   ```
   /cdrom/unnamed_cdrom/db2_install
   ```

   The **db2_install** command prompts for one or more of the following to be installed, and for the base directory where the product files are to be installed. The products are listed by keyword and product description.

   DB2.CENT
         DB2 Connect Enterprise Edition for Solaris

   DB2.CAE
         DB2 Universal Database Administration Client

   DB2.RCAE
         DB2 Universal Database Run-Time Client

   DB2.SDK
         DB2 Application Development Client

   DB2.DQP
         DB2 Universal Database Query Patroller

   NETQ IBM NetQuestion HTML Search System

The command displays the following prompt: `Specify one or more of the keywords separated by spaces.`

5. Type the keyword of the products to be installed when prompted.
6. Type the name of the base directory when prompted. The default base directory is `/opt`.

   If the default base directory is used, all files will be installed in the `/opt/IBMdb2/V7.1` directory.

7. Enter `Yes` to start the DB2 product installation.

Installing the DB2 for Solaris Product Library

To view DB2 product documents online, HTML versions of these documents are provided for installation. These documents are translated into several languages. However, not every manual in the DB2 product library is translated into multiple languages. The English version of every manual is available in HTML format. When you select a non-English HTML fileset without selecting the English version, the English HTML fileset is also installed.

A separate package exists for every language in which DB2 documents are translated. Packages for DB2 documentation are given names such as `db2ht%L71`, where `%L` represents two letters for the language and locale identifier.

For example, the package name for the DB2 Product Library in English is `db2hten71`. For a complete list of packages for the DB2 Product Library, see "Chapter 8. Contents of the DB2 Products for UNIX platforms" on page 83.

To install the DB2 Product Library (HTML) package, do the following:

1. Log in as a user with root authority.
2. Insert and mount the appropriate CD-ROM.
3. Run the **pkgadd** command:

       pkgadd -d *cdrom-dir*/db2 *pkgname*

   where *cdrom-dir* is the CD-ROM mount directory and *pkgname* is the package name. For example, to install DB2 documentation in English, you can enter the following command:

       pkgadd -d /cdrom/unnamed_cdrom/db2 db2hten71

   This command installs the compressed-tar files for the DB2 documents in the `/opt/IBMdb2/V7.1/doc/`*locale*`/html` directory, where *locale* is the language language identifier.

4. Run the following command to uncompress and untar the HTML files:

       /opt/IBMdb2/V7.1/doc/db2insthtml *locale*

where *lang* represents the locale identifier. For example, the locale for English is en_US.

To recover disk space, you may want to remove the compressed tar files and product library filesets after installation. You will still be able to view the HTML books after the compressed tar files and filesets have been removed.

Installing DB2 for Solaris Product Messages

A separate package exists for every locale in which DB2 Product Messages are translated. Packages for DB2 Product Messages are given names such as db2ms%L71, where %L represents two letters for the language name. For example, the package name for the DB2 Product Messages in the de (German) locale is db2msde71. For a complete list of DB2 Product Messages, see "Chapter 8. Contents of the DB2 Products for UNIX platforms" on page 83.

To install DB2 Product Message packages using the **pkgadd** command:

1. Log in as a user with root authority.
2. Insert and mount the appropriate CD-ROM.
3. Run the **pkgadd** command as follows:

       pkgadd -d *cdrom-dir*/db2 *pkgname*

   where *cdrom-dir* represents the CD-ROM mount directory and *pkgname* is the package name.

   For example, to install the DB2 Product Messages in the de (German) locale, enter the following command:

       pkgadd -d /cdrom/unnamed_cdrom/db2 db2msde71

DB2 for Solaris post-installation tasks

After manually installing your DB2 Connect product, you should create a group and user IDs for the instance owner, Administration Server, and fenced user defined functions (UDFs) and stored procedures. Once you set up these IDs you can create an instance, create the Administration Server, install the license key, and create links for your DB2 Connect files.

You do not have to perform these tasks if you used the db2setup utility to install DB2 Connect.

Creating group and user IDs for the instance owner, Administration Server, and UDFs

You should create group and user IDs for the instance owner, Administration Server, and UDFs and stored procedures. If you want to use existing user or group IDs, you can skip this section and proceed to creating an instance.

In addition to the rules imposed by the operating system for user names and groups, you must also adhere to the rules described in "Appendix D. Naming Rules" on page 281.

To create a group and user ID for the instance owner:

1. Log in as a user with root authority.
2. Enter the following command to make a new group:

   ```
   groupadd -g 999 dbadmin1
   ```

   where 999 represents the group ID and `dbadmin1` represents the group name. This new group is the SYSADM group for the instance.
3. Enter the following command to make a new user:

   ```
   useradd -g dbadmin1 -u 1004 -d /export/home/db2inst1 -m db2inst1
     passwd db2inst1
   ```

   where `dbadmin1` represents the group you created in the previous step, 1004 represents the user ID, `/export/home/db2inst1` represents the user's home directory, and `db2inst1` represents the username and instance name.

You should use a unique user ID for each instance you create. This allows for easier error recovery if a system error occurs.

To create group and user IDs for the Administration Server follow the same steps you used to create IDs for the instance owner. You must use different user IDs for the Administration Server and instance owner. For security reasons, we recommend you use a different group ID for the Administration Server and instance owner.

To create group and user IDs for UDFs and stored procedures, follow the same steps you used to create IDs for the instance owner. For security reasons, we recommend that you use different user IDs for UDFs and the instance owner. You will be asked to supply a UDF user ID when you create a DB2 instance.

Creating an instance

A DB2 instance is an environment in which you store data and run applications. Use the **db2icrt** command to create an instance. You must have root authority to enter this command. For more information about database instances, refer to the *Administration Guide*.

The **db2icrt** command is run with the following parameters:

```
DB2DIR/instance/db2icrt -a AuthType -u FencedID InstName
```

where:

- `DB2DIR` represents your DB2 installation directory

      where DB2DIR = /usr/lpp/db2_07_01 on AIX
                    = /opt/IBMdb2/V7.1 HP-UX, PTX, SGI IRIX, or Solaris
                    = /usr/IBMdb2/V7.1 on Linux

- `-a AuthType` represents the authentication type for the instance. `AuthType` can be one of `SERVER, CLIENT, DCS, DCE, SERVER_ENCRYPT, DCS_ENCRYPT,` or `DCE_SERVER_ENCRYPT`.
- `-u FencedID` represents the name of the user under which fenced user defined functions (UDFs) and fenced stored procedures will run. This flag is not required if you are creating an instance on a DB2 client.
- `InstName` represents the name of instance.

Creating the Administration Server

The Administration Server provides services to support tools that automate the configuration of connections to DB2 databases. The Administration Server also supports tools that administer DB2 from your server system or a remote client using the Control Center. For more information on the Administration Server, refer to the *Administration Guide*.

To create the Administration Server use the **DB2DIR/instance/dasicrt ASName** command

      where DB2DIR = /usr/lpp/db2_07_01 on AIX
                    = /opt/IBMdb2/V7.1 HP-UX, PTX, SGI IRIX, or Solaris
                    = /usr/IBMdb2/V7.1 on Linux

and **ASName** represents the name of the Administration Server you want to create.

Updating the License Key

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

To update your DB2 Connect product license key:
1. Log in as a user with root authority.
2. Update your DB2 Connect product license with the following command:

       /opt/IBMdb2/V7.1/adm/db2licm -a filename

   where `filename` represents the full pathname and filename for the license file that corresponds to the product you have purchased.

   The DB2 Connect product license key is added to the `/var/ifor/nodelock` file.

The names of the license files for these products are:

db2conee.lic
> DB2 Connect Enterprise Edition

For example, if the CD-ROM is mounted in the /cdrom directory and the name of the license file is db2udbee.lic, the command should be as follows:

```
/opt/IBMdb2/V7.1/adm/db2licm -a /unnamed_cdrom/db2/license/db2udbee.lic
```

Creating links for DB2 Connect files

You can create links for the DB2 files to the /usr/lib directory, and for the include files to the /usr/include directory for a particular version and release level of the product.

You may want to create these links if you are developing or running applications and want to avoid having to specify the full path to the product libraries and include files.

To create links for DB2 Connect files, log in as a user with root authority and run the **/opt/IBMdb2/V7.1/cfg/db2ln** command. If there are existing links to the /usr/lib and /usr/include directories from previous versions of DB2, they will automatically be removed by entering the **db2ln** command to create links for this version of DB2. If you want to re-establish the links to the libraries of previous versions, then you must execute the **db2rmln** command from your previous version of DB2 before you execute the **db2ln** command from the previous versions of DB2. Links can be established for only one version of DB2 on a given system.

Chapter 8. Contents of the DB2 Products for UNIX platforms

This chapter lists the contents of various DB2 Universal Database products available for UNIX platforms.

Packaging

The following DB2 Universal Database components, packages, or filesets are available for installation:

Table 9. DB2 Components, Packages or Filesets

Description	Fileset Name		
	DB2 for AIX	**DB2 for HP-UX**	**DB2 for NUMA-Q, Solaris, and Linux** [3]
DB2 Client	db2_07_01.client	DB2V7CAE.client	db2cliv71
Java Support (JDBC)	db2_07_01.jdbc	DB2V7CAE.jdbc	db2jdbc71
DB2 Control Center	db2_07_01.wcc	DB2V7WCC.wcc	db2wcc71
Administration Server	db2_07_01.das	DB2V7WGRP.das	db2das71
DB2 Control Server	db2_07_01.ctsr	n/a	n/a
DB2 Run-time Environment	db2_07_01.db2.rte	DB2V7WGRP.db2rte	db2rte71
DB2 Sample Database Source	db2_07_01.db2.samples	DB2V7WGRP.dbsmpl	db2smpl71
DB2 Engine	db2_07_01.db2.engn	DB2V7WGRP.db2engn	db2engn71
DB2 Replication	db2_07_01.repl	DB2V7WGRP.repl	db2repl71
DB2 Connect	db2_07_01.conn	DB2V7CONN.conn	db2conn71
DB2 Communication Support - TCP/IP	db2_07_01.cs.rte	DB2V7WGRP.csrte	db2crte71
DB2 Communication Support - SNA	db2_07_01.cs.sna	DB2V7WGRP.cssna	db2csna71 [4]
DB2 Communication Support - DRDA Application Server	db2_07_01.cs.drda	DB2V7WGRP.csdrda	db2cdrd71 [5]
DB2 Communication Support - IPX	db2_07_01.cs.ipx	n/a	db2cipx71 [4]
DB2 Query Patroller Agent	db2_07_01.dqp.agt	n/a	db2dqpa71 [4]
DB2 Query Patroller Server	db2_07_01.dqp.srv	n/a	db2dqps71 [4]
DB2 Enterprise - Extended Edition Extentions	db2_07_01.pext	DB2V7EEE.pext	db2pext71 [4]

Table 9. DB2 Components, Packages or Filesets (continued)

Description	Fileset Name		
	DB2 for AIX	DB2 for HP-UX	DB2 for NUMA-Q, Solaris, and Linux [3]
LDAP support	db2_07_01.ldap	n/a	db2ldap7 [4]
Local Warehouse Control Database	db2_07_01.cdb	DB2V7WGRP.cdb	db2cdb71
Common Jar Files	db2_07_01.jar	DB2V7CAE.cj	db2cj71
Getting Started	db2_07_01.gs	DB2V7WGRP.gs	db2gs71 [4]
Distributed Join for DB2 Data Sources	db2_07_01.dj	DB2WGRP.dj	db2dj71
Information Catalog for the Web	db2_07_01.icw	n/a	db2icw71 [4]
ISV Toolkit	db2_07_01.isv	n/a	db2isv71 [4]
Stored Procedure Builder	db2_07_01.spb	n/a	db2spb71 [4]
Data Links DFS Client Enabler	db2_07_01.dfsc	n/a	n/a
License Support of DB2 Enterprise - Extended Edition	db2_07_01.xlic	DB2V7EEE.xlic	db2xlic71 [4]
License Support of DB2 Enterprise Edition	db2_07_01.elic	DB2V7ENTP.elic	db2elic71
License Support of DB2 Connect Enterprise Edition	db2_07_01.clic	DB2V7CONN.clic	db2clic71
License Support of DB2 Workgroup Edition	db2_07_01.wlic	DB2V7WGRP.wlic	db2wlic71
License Support of DB2 Personal Edition	n/a	n/a	db2pelic71 [5]
License Support of DB2 Connect Personal Edition	n/a	n/a	db2cplic71 [5]
Application Development Tools	db2_07_01.adt.rte	DB2V7SDK1.adtrte	db2adt71
DB2 ADT Sample Programs	db2_07_01.adt.samples	DB2V7SDK.adtsamp	db2adts71
Code Page Conversion Tables - Uni Code Support	db2_07_01.cnvucs	DB2V7CAE.convucs	db2cucs71
Code Page Conversion Tables - Japanese	db2_07_01.conv.jp	DB2V7WGRP.convjp	db2cnvj71
Code Page Conversion Tables - Korean	db2_07_01.conv.kr	DB2V7WGRP.convkr	db2cnvk71
Code Page Conversion Tables - Simplified Chinese	db2_07_01.conv.sch	DB2V7WGRP.convsch	db2cnvc71

Table 9. DB2 Components, Packages or Filesets (continued)

Description	Fileset Name		
	DB2 for AIX	DB2 for HP-UX	DB2 for NUMA-Q, Solaris, and Linux [3]
Code Page Conversion Tables - Traditional Chinese	db2_07_01.conv.tch	DB2V7WGRP.convtch	db2cnvt71
DB2 Product Messages - %L [1, 2]	db2_07_01.msg.%L	DB2V7MSG.%L	db2ms%L71
DB2 Product Document (HTML) - %L [1]	db2_07_01.html.%L	DB2V7HTML.%L	db2ht%L71

Notes:

1. %L in the fileset name represents the locale name. There is a separate fileset for each locale. While DB2 Product Messages and Documentation are translated in several locales, not every message catalog or book is translated in every locale. For a complete list of DB2-supported locales, refer to the *Administration Guide*.

2. English messages are always installed.

3. All Linux component, package, and fileset names are the same as Solaris but have the extension `-7.1.0-0.i386.rpm`. For example, the Linux DB2 Client component name is `db2cliv71-7.1.0-0.i386.rpm`.

4. Not available on DB2 for Linux or DB2 for NUMA-Q.

5. Not available on DB2 for Linux.

6. Only available on DB2 for Linux.

Products and Selectable Components

Table 10 lists the DB2 Universal Database products and selectable components that you can install.

Table 10. Components for DB2 Products

Product / Component Description	DB2 client	DB2 Universal Database Workgroup Edition	DB2 Universal Database Enterprise Edition	DB2 Enterprise - Extended Edition	DB2 Connect
DB2 client	✔✔	✔✔	✔✔	✔✔	✔✔
Java Support (JDBC)	✔	✔	✔	✔	✔
DB2 Control Center support	..	✔	✔	✔	✔
Administration Server	n/a	✔✔	✔✔	✔✔	✔✔
DB2 Run-time Environment	n/a	✔✔	✔✔	✔✔	✔✔

Table 10. Components for DB2 Products (continued)

Product / Component Description	DB2 client	DB2 Universal Database Workgroup Edition	DB2 Universal Database Enterprise Edition	DB2 Enterprise - Extended Edition	DB2 Connect
DB2 Sample Database Source	n/a	✔✔	✔✔	✔✔	n/a
DB2 Engine	n/a	✔✔	✔✔	✔✔	n/a
DB2 Connect	n/a	n/a	✔✔	✔✔	✔✔
LDAP support	✔	✔	✔	✔	✔
Local Warehouse Control Database	n/a	✔	✔	✔	n/a
Common Jar Files	✔✔✔	✔✔✔	✔✔✔	✔✔✔	✔✔✔
Getting Starting	n/a	✔	✔	✔	n/a
Distributed Join for DB2 Data Sources	n/a	✔	✔	✔	n/a
Information Catalog for the Web	o	o	o	o	o
ISV Toolkit	n/a	n/a	n/a	n/a	n/a
Stored Procedure Builder	n/a	n/a	n/a	n/a	n/a
Data Links DFS Client Enabler (AIX only)	o	o	o	o	o
DB2 Enterprise - Extended Edition Extensions	n/a	n/a	n/a	✔	n/a
Communication Support for TCP/IP	n/a	✔✔	✔✔	✔✔	✔✔
Communication Support for IPX/SPX	n/a	✔✔	✔✔	✔✔	✔✔
Communication Support for SNA	n/a	✔✔	✔✔	✔✔	✔✔
Communication Support for DRDA Application Server	n/a	✔✔	✔✔	✔✔	✔✔
Code Page Conversion Tables - Japanese	n/a	✔	✔	✔	✔
Code Page Conversion Tables - Korean	n/a	✔	✔	✔	✔
Code Page Conversion Tables - Simplified Chinese	n/a	✔	✔	✔	✔
Code Page Conversion Tables - Traditional Chinese	n/a	✔	✔	✔	✔

Table 10. Components for DB2 Products (continued)

Product / Component Description	DB2 client	DB2 Universal Database Workgroup Edition	DB2 Universal Database Enterprise Edition	DB2 Enterprise - Extended Edition	DB2 Connect
DB2 Replication	n/a	✔	✔	✔	✔
DB2 Product Messages (non-English)[1]	n/a	o	o	o	o
DB2 Product Library (HTML)[1]	n/a	o	o	o	o

✔✔✔	This is a required component which will be installed only if the Control Center, Stored Procedure Builder, Getting Started, or Query Patrol is selected.
✔✔	This is a required component that must be installed.
✔	This is a recommended component that is installed by default. You can choose not to install this component.
o	This is an optional component that is not installed by default. If you want to install it, you must select it.
..	This component is available with the DB2 Administration Client only.
n/a	This component is not available for installation.

Note: There is a separate component of the DB2 Product Messages and the DB2 Product Library for each locale.

Chapter 9. Removing DB2 Products

This chapter describes how to remove DB2 products on UNIX-based systems.

For information on removing DB2 products on OS/2 and Windows systems, refer to the *Quick Beginnings* manuals for these platforms.

Stop the Administration Server

You must stop the Administration Server before you remove DB2 products.

To stop the Administration Server:
1. Log in as the Administration Server owner.
2. Run the start up script:
   ```
   . INSTHOME/ sqllib/db2profile        (bash, Bourne, or Korn shells)
   source INSTHOME/sqllib/db2cshrc      (C shell)
   ```

   where *INSTHOME* is the home directory of the instance.
3. Stop the Administration Server by entering the **db2admin stop** command.

Stop all DB2 instances

You must stop all DB2 instances before you remove DB2.

To stop a DB2 instance:
1. Log in as a user with root authority.
2. To obtain a list of the names of all DB2 instances on your system, enter the **DB2DIR/bin/db2ilist** command

where *DB2DIR*	= /usr/lpp/db2_07_01	on AIX
	= /opt/IBMdb2/V7.1	on HP-UX, PTX, SGI IRIX, or Solaris
	= /usr/IBMdb2/V7.1	on Linux

3. Log out.
4. Stop the instance.

   To stop a database instance:
   a. Log in as the instance owner.
   b. Run the start up script:
      ```
      . INSTHOME/ sqllib/db2profile        (bash, Bourne, or Korn shells)
      source INSTHOME/sqllib/db2cshrc      (C shell)
      ```

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

   c. Back up files in the `INSTHOME/sqllib` directory, if needed, where
      `INSTHOME` is the home directory of the instance owner.

      You might want to save the database manager configuration file,
      `db2systm`, the `db2nodes.cfg` file, or user defined function or fenced
      stored procedure applications in `INSTHOME/sqllib/function`.

   d. Stop all database applications by entering the **db2 force application all**
      command.

   e. Stop the DB2 database manager by entering the **db2stop** command.

   f. Confirm that the instance is stopped by entering the **db2 terminate**
      command.

5. Repeat these steps for each instance.

Remove the Administration Server

You must remove the Administration Server before you remove DB2.

To remove the Administration Server:

1. Log in as the Administration Server owner.

2. Run the start up script:

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

   where *INSTHOME* is the home directory of the user who owns the
   Administration Server.

3. Back up the files in the `ASHOME/sqllib` directory, if needed, where `ASHOME`
   is the home directory of the user who owns the Administration Server.

4. Log off.

5. Log in as *root* and remove the Administration Server by entering the
   following command:

   > **DB2DIR/instance/dasidrop** *ASName*

   where

   ```
   where DB2DIR  = /usr/lpp/db2_07_01 on AIX
                 = /opt/IBMdb2/V7.1 HP-UX, PTX, SGI IRIX, or Solaris
                 = /usr/IBMdb2/V7.1 on Linux
   ```

   and *ASName* represents the name of the administration instance being
   removed.

The **dasidrop** command removes the `/sqllib` directory under the home
directory of the Administration Server.

Remove DB2 instances (Optional)

You can remove some or all of the DB2 Version 7 instances on your system. Once an instance is removed, all the DB2 databases owned by the instance, if any, will not be usable. Remove DB2 instances only if you are not planning to use DB2 Version 7 products, or if you do not want to migrate existing instances to a later version of DB2.

On UNIX Systems:

To remove an instance:

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

   ```
   DB2DIR/instance/db2idrop InstName
   ```

   where

   where DB2DIR = /usr/lpp/db2_07_01 on AIX
                        = /opt/IBMdb2/V7.1 HP-UX, PTX, SGI IRIX, or Solaris
                        = /usr/IBMdb2/V7.1 on Linux

   The **db2idrop** command removes the instance entry from the list of instances and removes the INSTHOME/sqllib directory, where *INSTHOME* is the home directory of the instance and where *InstName* is the login name of the instance.

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

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

Remove DB2 Products

You must stop all outstanding DB2 processes before removing DB2 products.

To remove DB2 Products on AIX Systems

You can remove DB2 on AIX using the System Management Interface Tool (SMIT) or the **installp** command.

To remove DB2 products on AIX systems using SMIT:

1. Log in as user with root authority.
2. Type **smit install_remove** to proceed directly to the Remove Software Products screen.

3. Press F4 to display a list of the software to remove. Press F7 at some or all of the entries that have a prefix of db2_07_01.
4. Press Enter to start removing DB2 products.

To remove *all* DB2 Version 7 products, enter the **installp -u db2_07_01** command.

To remove DB2 Products on HP-UX Systems

1. Log in as user with root authority.
2. Use **swremove** to remove some or all DB2 Version 7 products.

To remove DB2 Products on Linux, PTX, SGI IRIX, and Solaris Systems

1. Log in as user with root authority.
2. Enter the **db2_deinstall -n** command. This command is found in the root directory of your DB2 Version 7 product CD.

> **Note:** The **db2_deinstall -n** command will remove *all* DB2 products from your system.

Part 4. Preparing Host and AS/400 Databases for DB2 Connect Communications

Chapter 10. Configuring Host and AS/400 Databases for DB2 Connect

This section describes the steps required to configure host and AS/400 database servers to accept connections from DB2 Connect workstations. These steps must be performed by users who have the necessary system privileges and special expertise, such as your network or system administrator, or your DB2 administrator.

For more information on configuring host and AS/400 database servers, refer to the following publications:

- The *DB2 for OS/390 Installation Guide* (GC26-8970) contains the most complete and up-to-date information for DB2 Universal Database for OS/390.
- The online *Connectivity Supplement* provided with DB2 Connect contains selected information on setting up a host or AS/400 database server communications.
- *Distributed Relational Database Cross Platform Connectivity and Applications* (SG24-4311) contains useful post-configuration information.
- *AS/400 Distributed Database Programming V4* (SC41-5702).

The sample values used in this section match those used elsewhere in this book. When you follow the instructions provided you *must* substitute your own values for elements such as network name, Logical Unit (LU) name, and mode name.

Preparing OS/390 (or MVS/ESA) for DB2 Connect

Your VTAM administrator and your host system administrator must configure VTAM and OS/390 (or MVS/ESA) to prepare DB2 Universal Database for OS/390 (or DB2 for MVS/ESA) to receive inbound connection requests from your DB2 Connect workstation.

This section provides:

- Examples of VTAM definitions required at your DB2 Universal Database for OS/390 host for use with DB2 Connect SNA connections. These should be compared with current definitions. See "Configuring VTAM" on page 96.
- Instructions for establishing TCP/IP network connections between DB2 Connect and DB2 Universal Database for OS/390. See "Configuring TCP/IP for DB2 Universal Database for OS/390" on page 102.

- DB2 host configuration steps (see "Configuring DB2 Universal Database for OS/390" on page 100, or "Configuring DB2 for MVS/ESA" on page 101). Many details of these steps changed with the introduction of DB2 Universal Database for OS/390 Version 5.1. Most of these steps apply to SNA users, but some also apply to users who will connect to DB2 Universal Database for OS/390 via TCP/IP.

For a summary of the sample VTAM names used throughout this book, see "Sample Network Element Names (VTAM)" on page 97. For TCP/IP names, see "Configuring TCP/IP for DB2 Universal Database for OS/390" on page 102.

> If you anticipate that DB2 for OS/390 will participate in a multisite update transaction (two-phase commit) then please refer to "Chapter 13. Enabling Multisite Updates (Two-Phase Commit)" on page 161. The additional steps required to set up multisite updates are not documented here.
>
> SNA and two-phase commit with DRDA are not supported on PTX.

Summary of Steps

To prepare DB2 Universal Database for OS/390 or DB2 for MVS/ESA to receive connection requests from DB2 Connect, you must complete the following steps at your DB2 Universal Database for OS/390 host:

Step 1. Verify that the following PTFs for OS/390 are installed:

- PTF UQ06843 for APAR PQ05771
- PTF UQ09146 for APAR PQ07537.

   Note: If you are using DB2 for OS/390 6.l, the fix for APAR PQ34536 is required regardless of whether APPC or TCP/IP is used. This applies to both DB2 Connect 7.1 PE and EE on all platforms.

Step 2. Configure your protocol:

- To configure VTAM, see "Configuring VTAM".
- To configure DB2 Universal Database for OS/390 or DB2 for MVS/ESA, see "Configuring DB2 Universal Database for OS/390" on page 100, or "Configuring DB2 for MVS/ESA" on page 101.
- To configure TCP/IP, see "Configuring TCP/IP for DB2 Universal Database for OS/390" on page 102.

Configuring VTAM

To configure VTAM, your VTAM Administrator needs to determine the names and options to be used on your system. The following definitions must be provided to enable the DB2 Connect workstation to connect to the host:

- The VTAM APPL definition for DB2 Universal Database for OS/390 or DB2 for MVS/ESA. (The APPL name, or LU name, for the DB2 subsystem is NYM2DB2 in these examples.)
- The VTAM PU and LU definitions for DB2 Connect. (The PU and LU definitions for the DB2 Connect workstation are NYX1 and NYX1GW01 respectively in these examples.)
- The VTAM log mode definition for DB2. (The log mode entry to be used for the connection is IBMRDB in these examples.)

The sample VTAM definitions are provided in the sections that follow. These samples use parameters that match the parameters used elsewhere in this book.

Sample Network Element Names (VTAM)
The following example shows the sample VTAM definitions used to configure a host database server.

```
DB2 Connect Server:
        - Network ID              : SPIFNET
        - Local Node Name         : NYX1        (PU name)
        - Local Node ID           : 05D27509

        - LU Name                 : SPIFNET.NYX1GW01 (the same LU is used
                                                for DB2 Connect,
                                                for DB2 Universal Database,
                                                and for the SPM)
        - LU Alias                : NYX1GW01

HOST:
        - Network ID              : SPIFNET
        - Node Name               : NYX

        - LU Name                 : SPIFNET.NYM2DB2
        - LU Alias                : NYM2DB2
        - LAN Destination Address : 400009451902 (NCP TIC address)

MODE DEFINITION:
        - Mode Name               : IBMRDB

DB2 for MVS/ESA:
        - Location                : NEW_YORK3

SECURITY:
        - Security Type           : Program
        - Authentication Type     : DCS
```

In this scenario, both userID and password are checked only at the host. If you use Authentication SERVER, which is the default, then authentication will also take place at the DB2 Connect server.

Sample VTAM APPL Definition for OS/390

The following example shows the sample VTAM application major node definitions. In most cases, such a definition will already exist with a different LU name. Otherwise, this application major node must be defined, and DB2 Universal Database for OS/390 must be customized to use the LU name defined. This name is the Partner LU name required by DB2 Connect.

```
----+----1----+----2----+----3----+----4----+----5----+----6----+----7--

DB2APPLS VBUILD TYPE=APPL

NYM2DB2  APPL  APPC=YES,                                              X
               AUTH=(ACQ),                                           X
               AUTOSES=1,                                            X
               DLOGMOD=IBMRDB,                                       X
               DMINWNL=512,                                          X
               DMINWNR=512,                                          X
               DSESSLIM=2048,                                        X
               EAS=6000,                                             X
               MODETAB=RDBMODES,                                     X
               PARSESS=YES,                                          X
               PRTCT=SFLU,                                           X
               MODETAB=RDBMODES,                                     X
               SECACPT=ALREADYV,                                     X
               SRBEXIT=YES,                                          X
               VERIFY=NONE,                                          X
               VPACING=8
```

Note: Continuations must begin in column 16, with continuation marks in column 72.

Sample VTAM PU and LU Definitions for DB2 Connect

If your security policies allow it, enable DYNPU and DYNLU in VTAM to allow any PU and LU access through VTAM. Contact your VTAM administrator for more information.

To enable a specific LU or PU, see the following example which shows the sample VTAM switched major node definitions.

If you already use SNA applications on the DB2 Connect workstation, then a PU definition already exists. However, an independent LU definition might not. The independent LU definition required for DB2 Connect must have LOCADDR=0 specified.

```
----+----1----+----2----+----3----+----4----+----5----+----6----+----7--

        SWITCHED MAJOR NODE DEFINITION FOR PU NYX1 and
        INDEPENDENT LU NYX1GW01

LOC300    VBUILD TYPE=LOCAL

NYX1          ADDR=01,IDBLK=071,IDNUM=27509,ANS=CONT,DISCNT=NO,       X
              IRETRY=YES,ISTATUS=ACTIVE,MAXDATA=4302,MAXOUT=7,        X
              MAXPATH=1,PUTYPE=2,SECNET=NO,MODETAB=RDBMODES           X
              SSCPFM=USSSCS,PACING=0,VPACING=2

NYX1GW01  LOCADDR=000,MODETAB=RDBMODES,DLOGMODE=IBMRDB

OTHERLU   LOCADDR=002
```

Sample VTAM Log Mode Definition for DB2

The following example shows the sample VTAM logon mode table definition for the IBMRDB and SNASVCMG modes. This example specifies a 4K *RUSIZE*, which may not be suitable for your environment. For example, if you are using Ethernet, which has a maximum Frame Size of 1536 bytes. Your VTAM administrator should check these values and advise you which mode table entry name and *RUSIZE* to specify for DB2 Connect. You must define the *SNASVCMG* logon mode when using APPC.

```
----+----1----+----2----+----3----+----4----+----5----+----6----+----7---

RDBMODES  MODTAB

IBMRDB    MODEENT LOGMODE=IBMRDB,   DRDA DEFAULT MODE                    *
                  TYPE=0,           NEGOTIABLE BIND                      *
                  PSNDPAC=X'01',    PRIMARY SEND PACING COUNT            *
                  SSNDPAC=X'01',    SECONDARY SEND PACING COUNT          *
                  SRCVPAC=X'00',    SECONDARY RECEIVE PACING COUNT       *
                  RUSIZES=X'8989',  RUSIZES IN-4K    OUT-4K              *
                  FMPROF=X'13',     LU6.2 FM PROFILE                     *
                  TSPROF=X'07',     LU6.2 TS PROFILE                     *
                  PRIPROT=X'B0',    LU6.2 PRIMARY PROTOCOLS              *
                  SECPROT=X'B0',    LU6.2 SECONDARY PROTOCOLS            *
                  COMPROT=X'D0B1',  LU6.2 COMMON PROTOCOLS               *
                  PSERVIC=X'0602000000000000000122F00'   LU6.2 LU TYPE

SNASVCMG  MODEENT LOGMODE=SNASVCMG, DRDA DEFAULT MODE                    *
                  PSNDPAC=X'00',    PRIMARY SEND PACING COUNT            *
                  SSNDPAC=X'02',    SECONDARY SEND PACING COUNT          *
                  SRCVPAC=X'00',    SECONDARY RECEIVE PACING COUNT       *
                  RUSIZES=X'8585',  RUSIZES IN-1K    OUT-1K              *
                  FMPROF=X'13',     LU6.2 FM PROFILE                     *
                  TSPROF=X'07',     LU6.2 TS PROFILE                     *
                  PRIPROT=X'B0',    LU6.2 PRIMARY PROTOCOLS              *
                  SECPROT=X'B0',    LU6.2 SECONDARY PROTOCOLS            *
                  COMPROT=X'D0B1',  LU6.2 COMMON PROTOCOLS               *
                  PSERVIC=X'0602000000000000000000300'   LU6.2 LU TYPE
```

Configuring DB2 Universal Database for OS/390

Before you can use DB2 Connect, your DB2 Universal Database for OS/390
Administrator must configure DB2 Universal Database for OS/390 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 Universal Database for OS/390 database server. For
more detailed examples, refer to the *Connectivity Supplement* and the *DB2 for
OS/390 Installation Reference*.

The following tables need to be updated, depending on the type of
connections you are using:

- SYSIBM.LUNAMES for SNA connections
- SYSIBM.IPNAMES for TCP/IP connections

The sections that follow contain examples of commands to update these tables
for DB2 Universal Database for OS/390. Work with your DB2 administrator to
determine the updates required for your DB2 Universal Database for OS/390
system. For more information on the DB2 Universal Database for OS/390
communications database tables, refer to the *DB2 Universal Database for OS/390
SQL Reference*.

Updating SYSIBM.LUNAMES

To permit database connection requests to be accepted from any incoming DB2 Connect LU, just insert a blank row. Use an SQL similar to the following:

```
INSERT INTO SYSIBM.LUNAMES (LUNAME) VALUES ('        ')
```

Alternatively, if you want to restrict access by LU name, you can use an SQL command similar to the following to update this table:

```
INSERT INTO SYSIBM.LUNAMES (LUNAME,
                            SECURITY_OUT,
                            ENCRYPTPSWDS,
                            USERNAMES)
                    VALUES('NYX1GW01','P','N','O');
```

Result:

```
COLUMN                EXAMPLE            REMARK
======                =======            ======
LUNAME                NYX1GW01           Name of the DB2 Connect LU
SECURITY_OUT          P
ENCRYPTPSWDS          N
USERNAMES             O
```

Updating SYSIBM.IPNAMES

If you want to permit inbound database connection requests for TCP/IP nodes, you can use an SQL command such as the following to update this table:

```
INSERT INTO SYSIBM.IPNAMES (LINKNAME) VALUES('        ')
```

Configuring DB2 for MVS/ESA

Before you can use the DB2 Connect connection, your DB2 for MVS/ESA administrator must configure DB2 for MVS/ESA to permit connections from the DB2 Connect workstation. To configure DB2 for MVS/ESA, the following tables need to be updated:

- SYSIBM.SYSUSERNAMES
- SYSIBM.SYSLUNAMES
- SYSIBM.SYSLUMODES

The sections that follow contain examples of commands to update these tables. Work with your DB2 administrator to determine the options required for your DB2 for MVS/ESA system.

Updating SYSIBM.SYSUSERNAMES

If you want to use secondary authorization IDs, you can use the following SQL command to update this table:

```
INSERT INTO SYSIBM.SYSUSERNAMES VALUES('I','ADBUSER','NYX1GW01',' ',' ');
```

Result:

```
COLUMN              EXAMPLE           REMARK
======              =======           ======
Type                I
Authid              ADBUSER
LU Name             NYX1GW01          Name of the DB2 Connect LU
NewAuthID           (blank)
Password            (blank)
```

USERNAME types are: 0 (outbound translation), I (inbound translation), B (both inbound and outbound), and blank (no authorization IDs are translated, and no passwords are sent to the server).

Updating SYSIBM.SYSLUNAMES
If you want to restrict access by LU name, you can use an SQL command similar to the following to update this table:

```
INSERT INTO SYSIBM.SYSLUNAMES VALUES('NYX1GW01','IBMRDB','A','N',' ','I');
```

Result:

```
COLUMN              EXAMPLE           REMARK
======              =======           ======
LUNAME              NYX1GW01          Name of the DB2 Connect LU
SYSMODENAME         IBMRDB
USERSECURITY        A
ENCRYPTPSWDS        N
MODESELECT
USERNAMES           I
```

Alternatively, just insert a blank row, and this will allow any incoming DB2 Connect LUs to be accepted.

Updating SYSIBM.SYSLUMODES
You can use an SQL command such as the following to update this table:

```
INSERT INTO SYSIBM.SYSLUMODES VALUES ('NYX1    ', 'IBMRDB', 150, 'Y');
```

where:
- *NYX1* represents the PU name of server involved
- *IBMRDB* represents the name of VTAM logon mode
- *150* represents the maximum number of conversations
- *Y* represents the number of sessions preallocated at startup. This can also be left as N, or blank (the default) for deferred at startup.

Configuring TCP/IP for DB2 Universal Database for OS/390

This section describes how to configure TCP/IP communications between your DB2 Connect workstation and DB2 Universal Database for OS/390 Version 5.1 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 may be different.
- The target database resides on DB2 Universal Database for OS/390 Version 5.1 or later.
- All the necessary software prerequisites are installed.
- DB2 clients have been set up as required.

Prerequisite OS/390 Software for TCP/IP Support
OS/390 R3+ is the minimum operating system level required for TCP/IP support. OS/390 V2R5+ is the recommended operating system level, and the best performer.

The following informational APARS for DB2 for OS/390 are regularly updated with information about PTFs to install for various OS/390 components, particularly TCP/IP for OS/390. If you use TCP/IP connectivity with DB2 for OS/390, it is extremely important that you review and apply PTFs and APAR fixes described in the following DB2 for OS/390 information APARs:
- II11164
- II11263
- II10962

The following fixes are recommended for DB2 for OS/390:
- DB2 for OS/390 Version 5.1: PTF UQ13908, PTF UQ17755

Collecting Information
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 workstation. 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
        Usually /etc/

    On OS/2
        Determined by the ETC environment variable, which can be checked by entering the **set etc** command.

    On Windows NT and Windows 2000
        Usually *x:*\system32\drivers\etc\, where *x:* represents the install path directory.

On Windows 9x

> Usually *x:*\windows\, where *x:* represents the Windows 9x install path directory.

You may use a *domain name server* to avoid maintaining this file on multiple systems.

- The locations of the equivalent files at the target DB2 Universal Database for OS/390 host.
- The TCP/IP *port number* defined to DB2 Universal Database for OS/390.

  Note: The associated *service name* information is not exchanged between the DB2 Connect workstation and DB2 Universal Database for OS/390.
  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 OS/390 database server
- The user ID and password to be used when issuing CONNECT requests for the database at the host.

Refer to your local network administrator and your DB2 for OS/390 administrator for help getting this information. Use one copy of the example work sheet, Table 11, to plan *each* TCP/IP connection between DB2 Connect and a host database server.

Example Worksheet:

Table 11. Example Worksheet for Planning TCP/IP Connections to DB2 Universal Database for OS/390

Ref.	Description	Sample Value	Your Value
User Information			
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
Network Elements at the Host			
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	

Table 11. Example Worksheet for Planning TCP/IP Connections to DB2 Universal Database for OS/390 (continued)

Ref.	Description	Sample Value	Your Value
TCP-13	User ID		
TCP-14	Password		
Network Elements at the DB2 Connect Workstation			
TCP-18	Host name	mcook02	
TCP-19	IP address	9.21.27.179	
TCP-20	Service name	db2inst1c	
TCP-21	Port number	446	446
DB2 Directory Entries at the DB2 Connect Workstation)			
TCP-30	Node name	MVSIPNOD	
TCP-31	Database name	nyc3	
TCP-32	Database alias	mvsipdb1	
TCP-33	DCS database name	nyc3	

Notes:

1. To obtain the host's IP address TCP-9 , enter at the host:

    TSO NETSTAT HOME

2. To obtain the port number TCP-11 , look for DSNL004I in the DB2 master address space or system log.

Configuring the TCP/IP Connection

Use these steps in this section to complete the configuration and make the connection.

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

1. Fill in the values to be used for the host name and IP address of the DB2 Universal Database for OS/390 host (items 8 and 9).
2. Fill in the values to be used for the host name and IP address of the DB2 Connect workstation (items 18 and 19).
3. Determine the port number or service name to be used for the connection (items 10 and 11, or 20 and 21).
4. Determine the LOCATION NAME of the DB2 for OS/390 database server to which you wish to connect.
5. Determine the values to be used for user ID and PASSWORD when connecting to the host database.

Note: Additional planning considerations may apply, for example if you are using DCE. For more information, see the *DB2 Connect User's Guide*.

Update the DB2 Universal Database for OS/390 Host: At your OS/390 host:

1. Verify the host address or the host name.
2. Verify the port number or the service name.
3. Update the services file with the correct port number and service name if necessary.
4. Update the hosts file (or the Domain Name Server used by the DB2 Universal Database for OS/390 system) with the host name and IP address of the DB2 Connect workstation if necessary.
5. Ensure the new definitions are active before attempting to test the connection. Refer to your host network administrator or change control staff if necessary.
6. Check with the DB2 Universal Database for OS/390 administrator that you have a valid user ID, password, and database *LOCATION NAME*.
7. PING the DB2 Connect workstation, 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*

Preparing DB2 Universal Database for AS/400 for DB2 Connect

DB2 Connect gives applications on remote systems access to data in your DB2 Universal Database for AS/400 system. To set up the connection, the person installing DB2 Connect needs the following information:

__ 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 `WRKLIND (*trlan)`.

__ 3. The mode name. You can get a list of mode names by entering `WRKMODD`. If the mode IBMRDB has been defined on your AS/400 system, you should use it.

__ 4. The local control point name. You can get this information by entering `DSPNETA`.

__ 5. The remote transaction program name. The default is X'07'6DB (X'07F6C4C2'). The default is always used by DB2 Universal Database for AS/400. If entering a hexadecimal number is not convenient, an alias is QCNTEDDM.

__ 6. 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 screen:

```
                    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 AS/400, enter your values
into the worksheet that follows:

Table 12. Configuration Parameters from AS/400

Item	Parameter	Example	Your value
A-1	Local network name	SPIFNET	
A-2	Local adapter address	400009451902	
A-3	Mode name	IBMRDB	
A-4	Local control point name	SYD2101A	
A-5	Remote transaction program	X'07F6C4C2'(default)	
A-6	Relational database name	NEW_YORK3	

For further information about how to set up DB2 Universal Database for
AS/400 as an application server, refer to the online *Connectivity Supplement*
provided with your DB2 Connect product.

For more information, refer to the *DRDA Connectivity Guide* and the World
Wide Web at the V4R4 AS/400 Information Center. The Information Center
can be found at the following URL: http://as400bks.rochester.ibm.com or
http://www.as400.ibm.com/db2/db2main.htm.

Preparing DB2 for VSE & VM

For information about how to set up DB2 for VSE & VM as an application
server, refer to the online *Connectivity Supplement* and the *DRDA Connectivity
Guide*.

Part 5. Configuring Access to Host and AS/400 Databases

Chapter 11. Manually Configuring TCP/IP Communications on the DB2 Connect Workstation

This section describes the manual configuration instructions for TCP/IP communications on a DB2 Connect workstation.

This section assumes that TCP/IP is functional on the DB2 Connect and host systems.

The following steps provide an overview on how to set up TCP/IP communications between your DB2 Connect workstation and a host database server:

> Due to the characteristics of the TCP/IP protocol, TCP/IP may not be immediately notified of the failure of a partner on another host. As a result, a client application accessing a remote DB2 server using TCP/IP, or the corresponding agent at the server, may sometimes appear to be hung. DB2 uses the TCP/IP SO_KEEPALIVE socket option to detect when there has been a failure and the TCP/IP connection has been broken.
>
> If you are experiencing problems with your TCP/IP connection, refer to the *Troubleshooting Guide* for information on how to adjust this parameter and other common TCP/IP problems.

1. Identify and Record Parameter Values

As you proceed through the configuration steps, complete the *Your Value* column in the following table. You can fill in some of the values before you start configuring this protocol.

Table 13. TCP/IP Values Required at the DB2 Connect Workstation

Parameter	Description	Sample Value	Your Value
Host name • Hostname (*hostname*) or • IP address (*ip_address*)	Use the *hostname* or *ip_address* of the remote host. To resolve this parameter: • Contact your network administrator to obtain the *hostname*. • Contact your network administrator to obtain the *ip_address* or enter the **ping** *hostname* command.	nyx or 9.21.15.235	
Service Name • Connection Service name (*svcename*) or • Port number/Protocol (*port_number/tcp*)	Values required in the `services` file. The Connection Service name is an arbitrary name that represents the Connection port number (*port_number*) on the client. The port number for the DB2 Connect workstation must be the same as the port number that the *svcename* parameter maps to in the services file at the host database server. (The *svcename* parameter is located in the database manager configuration file on the host.) This value must not be in use by any other applications, and must be unique within the services file. On UNIX platforms, this value generally must be 1024 or higher. Contact your database administrator for the values used to configure the host system.	host1 or 3700/tcp	

Table 13. TCP/IP Values Required at the DB2 Connect Workstation (continued)

Parameter	Description	Sample Value	Your Value
Target database name (*target_dbname*)	The database name as it is known on the host or AS/400 system. • If you are connecting to a DB2 for OS/390 system, use the location name. • If you are connecting to a DB2 for AS/400 system, use the local RDB name. • If you are connecting to a DB2 for VM or DB2 for VSE system, use the dbname.	newyork	
Local database name (*local_dcsname*)	An arbitrary local nickname for use by DB2 Connect that represents the remote host or AS/400 database.	ny	
Node name (*node_name*)	A local alias, or nickname, that describes the node to which you are trying to connect. You can choose any name you want; however, all node name values within your local node directory must be unique.	db2node	

2. Configure the DB2 Connect Workstation

The steps in this section configure TCP/IP on the DB2 Connect Workstation. Replace the sample values with your worksheet values.

A. Resolve the Host's IP Address

If your network has a name server, or you are planning to directly specify the IP address (*ip_address*) of the server, skip this step and proceed to "B. Update the Services File" on page 114.

The DB2 Connect workstation must know the address of the host system to which it is attempting to establish communications. If a name server does not exist on your network, you may directly specify a hostname that maps to the IP address (*ip_address*) of the host system in the local hosts file.

If you are planning on supporting a UNIX client that is using Network Information Services (NIS), and you are not using a domain name server on your network, you must update the hosts file located on your NIS master server.

Table 14. Location of the Local Hosts and Services Files

Platform	Location
Windows 9x	`windows` directory
Windows NT and Windows 2000	`winnt\system32\drivers\etc` directory
UNIX	`/etc` directory
OS/2	Specified by the *etc* environment variable. Enter the **set etc** command to determine the location of your local hosts or services files. **Note:** For DOS and WIN-OS2 sessions, you might need to update the hosts and services files located in the `tcpip_product\dos\etc` directory.

Using a text editor, add an entry to the DB2 Connect workstation's hosts file for the host system's hostname. For example:

```
9.21.15.235     nyx   # host address for nyx
```

where:

9.21.15.235
　　　　represents the *ip_address*

nyx　　represents the *hostname*

#　　represents a comment describing the entry

If the host system is not in the same domain as the DB2 Connect Workstation, you must provide a fully qualified domain name such as `nyx.spifnet.ibm.com`, where `spifnet.ibm.com` is the domain name.

B. Update the Services File

> If you are planning to catalog a TCP/IP node using a port number (*port_number*), skip this step and go to "3. Catalog the TCP/IP Node" on page 115.

Using a text editor, add the Connection Service name and port number to the DB2 Connect workstation's services file. This file is located in the same directory as the local hosts file that you may have edited in "A. Resolve the Host's IP Address" on page 113. For example:

```
host1  3700/tcp  # DB2 connection service port
```

where:

host1　　represents the Connection Service name

3700　　represents the Connection port number

tcp   represents the communication protocol that you are using

\#   represents a comment describing the entry

The port number used on the DB2 Connect workstation must match the port number used on the host system. Also, ensure that you did not specify a port number that is being used by any other process.

If you are planning on supporting a UNIX client that uses Network Information Services (NIS), you must update the services file located on your NIS master server.

3. Catalog the TCP/IP Node

You must add an entry to the DB2 Connect workstation's node directory to describe the remote node. This entry specifies the chosen alias (*node_name*), the *hostname* (or *ip_address*), and the *svcename* (or *port_number*) that the client will use to access the remote host.

To catalog a TCP/IP node, perform the following steps:

Step 1. Log on to the system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority.

Step 2. Set up the instance environment and invoke the DB2 command line processor. Run the start-up script as follows:

```
. INSTHOME/sqllib/db2profile   (for Bourne or Korn shell)
source INSTHOME/sqllib/db2cshrc (for C shell)
```

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

Step 3. Catalog the node by entering the following commands:

```
catalog tcpip node node_name remote [hostname|ip_address]
 server [svcename|port_number]
 terminate
```

For example, to catalog the remote host *nyx* on the node called *db2node*, using the service name *host1*, enter the following:

```
catalog tcpip node db2node remote nyx server host1
terminate
```

To catalog a remote server with the IP address *9.21.15.235* on the node called *db2node*, using the port number *3700*, enter the following:

```
catalog tcpip node db2node remote 9.21.15.235 server 3700
terminate
```

> If you need to change values that were set with the **catalog node** command, perform the following steps:
>
> Step 1. Run the **uncatalog node** command in the command line processor as follows:
>
> ```
> db2 uncatalog node node_name
> ```
>
> Step 2. Recatalog the node with the values that you want to use.

4. Catalog the Database as a Database Connection Service (DCS) Database

To catalog the remote database as a Data Connection Services (DCS) database, perform the following steps:

Step 1. Log on to the system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority.

Step 2. Enter the following commands:

```
catalog dcs db local_dcsname as target_dbname
terminate
```

where:

- *local_dcsname* represents the local name of the host or AS/400 database.
- *target_dbname* represents the name of database on the host or AS/400 database system.

For example, to make ny the local database name for DB2 Connect, for the remote host or AS/400 database called newyork, enter the following commands:

```
catalog dcs db ny as newyork
terminate
```

5. Catalog the Database

Before a client application can access a remote database, the database must be cataloged on the host system node and on any DB2 Connect workstation nodes that will connect to it. When you create a database, it is automatically cataloged on the host with the database alias (*database_alias*) the same as the database name (*database_name*). The information in the database directory, along with the information in the node directory, is used on the DB2 Connect workstation to establish a connection to the remote database.

To catalog a database on the DB2 Connect Workstation, perform the following steps.

Step 1. Log on to the system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority.

Step 2. Fill in the Your Value column in the following worksheet.

Table 15. Worksheet: Parameter Values for Cataloging Databases

Parameter	Description	Sample Value	Your Value
Database name (*database_name*)	The local DCS database name (*local_dcsname*) of the *remote* database, you specified this when you catalogued the DCS database directory, for example, ny.	ny	
Database alias (*database_alias*)	An arbitrary local nickname for the remote database. If you do not provide one, the default is the same as the database name (*database_name*). This is the name that you use when connecting to the database from a client.	localny	
Node name (node_name)	The name of the node directory entry that describes where the database resides. Use the same value for the node name (*node_name*) that you used to catalog the node in the previous step.	db2node	

Step 3. Set up the instance environment and invoke the DB2 command line processor. Run the start-up script as follows:

```
. INSTHOME/sqllib/db2profile    (for Bourne or Korn shell)
source INSTHOME/sqllib/db2cshrc (for C shell)
```

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

Step 4. Catalog the database by entering the following commands in the command line processor:

```
catalog database database_name as database_alias at node node_name
authentication auth_value
```

For example, to catalog the DCS known database *ny* so that it has the local database alias *localny*, on the node *db2node*, enter the following commands:

```
catalog database ny as localny at node db2node
authentication dcs
```

> If you need to change values that were set with the **catalog** *database* command, perform the following steps:
>
> Step a. Run the **uncatalog** *database* command in the command line processor as follows:
>
> ```
> uncatalog database database_alias
> ```
>
> Step b. Recatalog the database with the value that you want to use.

6. Bind Utilities and Applications to the Database Server

The steps you have just completed set up the DB2 Connect workstation to communicate with the host or AS/400 system. You must now bind the utilities and applications to the host or AS/400 database server. You need BINDADD authority to bind.

To bind the utilities and applications to the host or AS/400 database server, enter the following commands:

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

For example:

```
connect to NYC3 user myuserid using mypassword
bind path/bnd/@ddcsmvs.lst blocking all sqlerror continue
      messages mvs.msg grant public
connect reset
```

For more information about these commands, refer to the *DB2 Connect User's Guide*.

7. Test the Host or AS/400 Connection

When you have finished configuring the DB2 Connect workstation for communications, perform the following steps to test the connection on a remote database. You will need to connect to a remote database to test the connection.

Step 1. Start the database manager by entering the **db2start** command on the host database server (if it was not already started).

Step 2. Enter the following command in the DB2 Connect workstation's Command Center or command line processor to connect to the remote database:

```
connect to database_alias user userid using password
```

The values for *userid* and *password* must be valid for the system on which they are authenticated. By default, authentication takes place on the host or AS/400 database server.

Authentication for connecting to host databases is set while configuring DB2 Connect. For more information, refer to the *DB2 Connect User's Guide*.

If the connection is successful, you will get a message showing the name of the database to which you have connected. You are now able to retrieve data from that database. For example, to retrieve a list of all the table names listed in the system catalog table, enter the following SQL command:

```
db2 "select tabname from syscat.tables"
```

When you are finished using the database connection, enter the **db2 connect reset** command to end the database connection.

You are now ready to start using DB2. For more advanced topics, refer to the *Administration Guide* and the *Installation and Configuration Supplement*.

Test the Host Connection

If the connection fails, check the following items:

At the host:

__ 1. The *db2comm* registry value includes the value `tcpip`.

__ 2. The services file was updated correctly.

__ 3. The service name (*svcename*) parameter was updated correctly in the database manager configuration file.

__ 4. The database was created and cataloged properly.

__ 5. The database manager was stopped and started again (enter the **db2stop** and **db2start** commands on the server).

__ 6. The port number specified is not being used by any other process.

If there are problems starting a protocol's connection managers, a warning message appears and the error messages are logged in the `db2diag.log` file.

For more information on the `db2diag.log` file, refer to the *Troubleshooting Guide*.

At the DB2 Connect workstation:

__ 1. If used, the services and hosts files were updated correctly.

__ 2. The node was cataloged with the correct hostname (*hostname*) or IP address (*ip_address*).

__ 3. The port number must match, or the service name must map to, the port number used on the host.

__ 4. The node name (*node_name*) that was specified in the database directory points to the correct entry in the node directory.

__ 5. The database was cataloged properly, using the hosts's database alias (*database_alias*). This database alias was cataloged when the database was created on the host, as the database name (*database_name*) on the DB2 Connect workstation.

If the connection still fails after you verify these items, refer to the *Troubleshooting Guide*.

Chapter 12. Manually Configuring APPC Communications on the DB2 Connect Workstation

This section describes how to manually configure a DB2 Connect workstation to communicate with a host or AS/400 database server using the APPC communication protocol. The instructions in this section assume that APPC is supported on the DB2 Connect and host or AS/400 machines.

For more information about the communications requirements of your platform, see "Software Requirements" on page 27. See "Possible Client-to-Server Connectivity Scenarios" on page 34 for the protocols supported for communication between your particular client and server.

The following steps are required to set up a DB2 Connect workstation to use APPC communications with a host or AS/400 database server:

- "1. Identify and Record Parameter Values".
- "2. Update the APPC Profiles on the DB2 Connect Workstation" on page 124.
- "3. Catalog the APPC Node" on page 156.
- "4. Catalog the Database as a Database Connection Service (DCS) Database" on page 157.
- "5. Catalog the Database" on page 157.
- "6. Bind Utilities and Applications to the Database Server" on page 159.
- "7. Test the Host or AS/400 Connection" on page 159.

1. Identify and Record Parameter Values

Before you configure the DB2 Connect workstation, have your host-side administrator and LAN administrator fill in copies of the worksheet in Table 16 on page 122 for *each* host or AS/400 database to which you want to connect.

After you fill in the entries in the *Your Value* column, you can use the worksheet to configure APPC communications for DB2 Connect. During the configuration process, replace the sample values that appear in the configuration instructions with your values from the worksheet, using the boxed numbers (for example, **1**) to relate the configuration instructions to the worksheet values.

The worksheet and configuration instructions supply suggested or sample values for required configuration parameters. For other parameters, use the

communications program's default values. If your network configuration is different from that used in the instructions, consult your Network Administrator for values that are appropriate to your network.

In the configuration instructions, the ✱ symbol denotes entries that need to be changed but do not have a representation on the worksheet.

Table 16. Worksheet for Planning Host and AS/400 Server Connections

Ref.	Name at the DB2 Connect Workstation	Network or VTAM Name	Sample Value	Your Value
Network Elements at the Host				
1	Host name	Local network name	SPIFNET	
2	Partner LU name	Application name	NYM2DB2	
3	Network ID		SPIFNET	
4	Partner node name	Local CP or SSCP name	NYX	
5	Target database name (*target_dbname*)	**OS/390 or MVS:** LOCATION NAME **VM/VSE:** DBNAME **AS/400:** RDB name	NEWYORK	
6	Link name or mode name		IBMRDB	
7	Connection name (link name)		LINKHOST	
8	Remote network or LAN address	Local adapter or destination address	400009451902	
Network Elements at the DB2 Connect Workstation				
9	Network or LAN ID		SPIFNET	
10	Local control point name		NYX1GW	
11	Local LU name		NYX1GW0A	
12	Local LU alias		NYX1GW0A	
13	Local node or node ID	ID BLK	071	
14		ID NUM	27509	
15	Mode name		IBMRDB	
16	Symbolic destination name		DB2CPIC	

Table 16. Worksheet for Planning Host and AS/400 Server Connections (continued)

Ref.	Name at the DB2 Connect Workstation	Network or VTAM Name	Sample Value	Your Value
17	Remote Transaction program (TP) name		**OS/390 or MVS:** X'07'6DB ('07F6C4C2') or DB2DRDA **VM/VSE:** AXE for VSE. The DB2 for VM db name, or X'07'6DB ('07F6C4C2') for VM **AS/400:** X'07'6DB ('07F6C4C2') or QCNTEDDM	
DB2 Directory Entries at the DB2 Connect Workstation				
19	Node name		db2node	
19	Security		program	
20	Local database name (*local_dcsname*)		ny	

For each server that you are connecting to, fill in a copy of the worksheet as follows:

1. For *network ID*, determine the network name of both the host and the DB2 Connect workstations (**1** , **3** , and **9**). Usually these values will be the same. For example, SPIFNET.

2. For the *partner LU name* (**2**), determine the VTAM application (APPL) name for OS/390, MVS, VSE, or VM. Determine the local CP name for AS/400.

3. For *partner node name* (**4**), determine the System Services Control Point (SSCP) name for OS/390, MVS, VM, or VSE. Determine the local control point name for an AS/400.

4. For *database name* (**5**), determine the name of the host database. This is the *LOCATION NAME* for OS/390 or MVS, the *DBNAME* for VM or VSE, or a relational database (RDB) name for AS/400.

5. For *mode name* (**6** and **15**), usually the default IBMDRB is sufficient.

6. For *remote network address* (**8**), determine the controller address or local adapter address of the target host or AS/400 system.

7. Determine the *local control point name* (**10**) of the DB2 Connect workstation. This is usually the same as the PU name for the system.

8. Determine the *local LU name* to be used by DB2 Connect (**11**). If you use a Syncpoint Manager to manage multisite updates (two-phase commit), the local LU should be the LU used for the SPM. In this case, that LU cannot also be the control point LU.

9. For *local LU alias* (**12**), you usually use the same value as for the local LU name (**11**).

10. For *local node* or *node ID* (**13** plus **14**), determine the IDBLK and IDNUM of the DB2 Connect workstation. The default value should be correct.

11. For *symbolic destination name* (**16**), choose a suitable value.

12. For (remote) *transaction program (TP) name* (**17**), use the defaults listed in the worksheet.

13. Leave the other items blank for now (**18** to **21**).

2. Update the APPC Profiles on the DB2 Connect Workstation

Use the completed worksheet in Table 16 on page 122 to configure DB2 Connect APPC communications for access to a remote host or AS/400 database server.

Go to the sections that describe how to configure APPC communications on the platforms that are present in your network:

- "Configuring IBM eNetwork Communication Server for AIX"
- "Configuring Bull SNA for AIX" on page 133
- "Configuring SNAPlus2 for HP-UX" on page 135
- "Configuring SNAP-IX Version 6.0.1 for SPARC Solaris" on page 145
- "Configuring SunLink 9.1 for Solaris" on page 153

Configuring IBM eNetwork Communication Server for AIX

This section describes how to configure IBM eNetwork Communication Server V5.0.3 for AIX on your DB2 Connect workstation to connect to host or AS/400 database servers using APPC. IBM eNetwork Communication Server for AIX is the only SNA product supported for DB2 Connect running on RS/6000 machines.

Before you begin, ensure that your workstation has IBM eNetwork Communication Server V5.0.3 for AIX (CS/AIX) installed. If you need further information in order to configure your SNA environment, refer to the online help provided with CS/AIX.

The following assumptions are made:

- The basic installation of the IBM eNetwork Communication Server V5 for AIX package has already been completed and PTF 5.0.3 has been applied.
- DB2 Connect has been installed.

To configure CS/AIX for use by DB2 Connect, log on to the system as a user with root authority and use either the **/usr/bin/snaadmin** program or the **/usr/bin/X11/xsnaadmin** program. Information about these programs can be found in the system documentation. The following steps describe how to use the **xsnaadmin** program to configure CS/AIX.

Step 1. Enter the command **xsnaadmin**. The Node window for the server opens.

Step 2. Define a node.

a. Select **Services —> Configure Node Parameters**. The Node Parameters window opens.

b. Select **End node** from the **APPN support** drop-down menu.

c. Enter your network ID and the local PU name (**9** and **10**) in the **Control point name** fields.

d. Enter the local PU name (**10**) in the **Control point alias** field.

e. Enter your Node ID (**13** and **14**) in the **Node ID** fields.

f. Click **OK**.

Step 3. Define a port.

a. Select the Connectivity and Dependent LUs window.

b. Click the **Add** push button. The Add to Node window opens.

c. Select the **Port using** radio button.

d. Click the **Port Using** drop down box and select the appropriate port type. For the purpose of our example, we will select the **Token ring card** option.
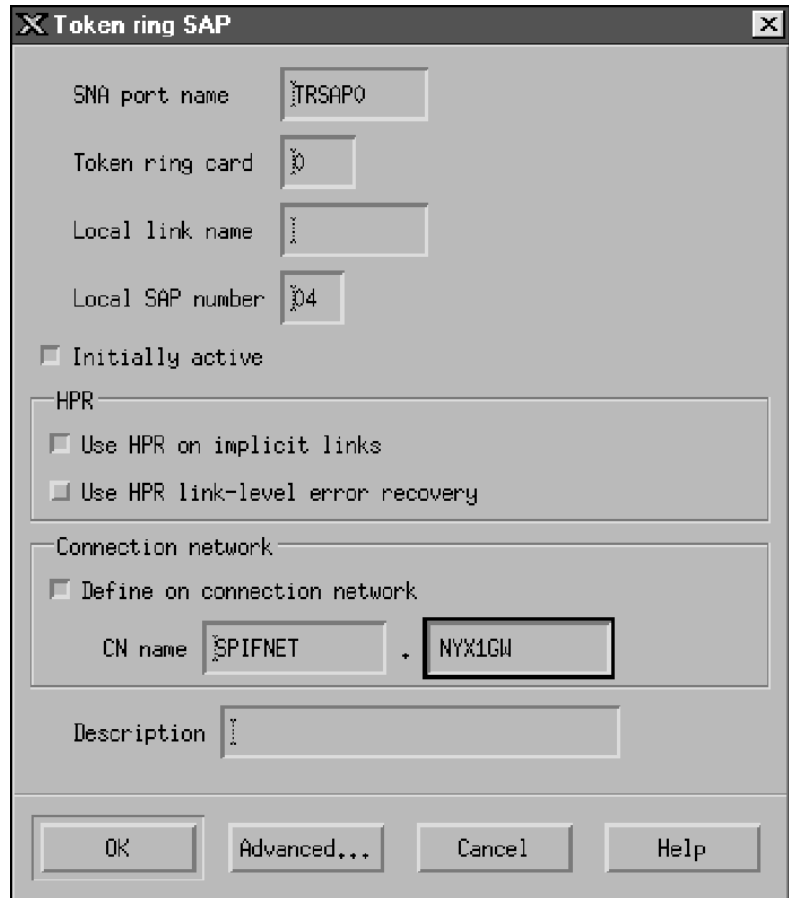
e. Click **OK**. The Port window for the chosen port type opens.

f. Enter a name for the port in the **SNA port name** field.

g. Select the **Initially active** check box.

h. From the **Connection network** box, select **Define on connection network** check box.

i. Enter your SNA Network Name (**9**) in the first part of the **CN name** field.

j. Enter the Local PU Name (**10**) associated with your AIX computer in the second part of the **CN name** field.

k. Click **OK**. The Port window closes and a new port opens in the Connectivity and Dependent LUs window.
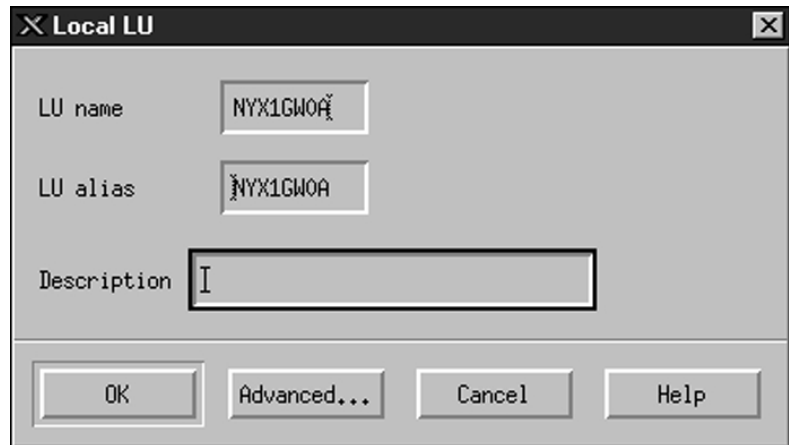
Step 4. Define a link station.

   a. In the Connectivity and Dependent LUs window, select the port that you defined in the previous step.

   b. Click the **Add** push button. The Add to Node window opens.

   c. Select the **Add a link station to port** radio button.

   d. Click **OK**. The Token ring link station window opens.

   e. Enter a name for the link in the **Name** field.

   f. Click the **Activation** drop-down box and select the **On demand** option.

   g. Select the **Independent only** option in the **LU traffic** box.

   h. In the **Independent LU traffic** box:

      1) Enter the network ID (**3**) and the partner LU name (**2**) in the **Remote node** fields.

> 2) Click the **Remote node type** drop-down box and select the type of node that applies to your network.

> i. In the **Contact information** box, enter the SNA destination address (**8**) assigned for the host or AS/400 system in the **Mac address** field.

> j. Click **OK**. The Link Station window closes and a new link station appears in the Connectivity and Dependent LUs window.

Step 5. Define a local LU.

> a. Select the **Independent local LUs** window.

> b. Click the **Add** push button. The Local LU window opens.

> c. Enter your independent local LU Name (**11**) in the **LU name** field.

> d. Enter the same name in the **LU alias** field (**12**).

> e. Click **OK**. The new LU appears in the Independent Local LUs window.

Step 6. Define a partner LU over the link station.

> a. Select **Services —> APPC —> New PLUs —>Over Link Station** from the menu bar. The Partner LU on link station window

opens.
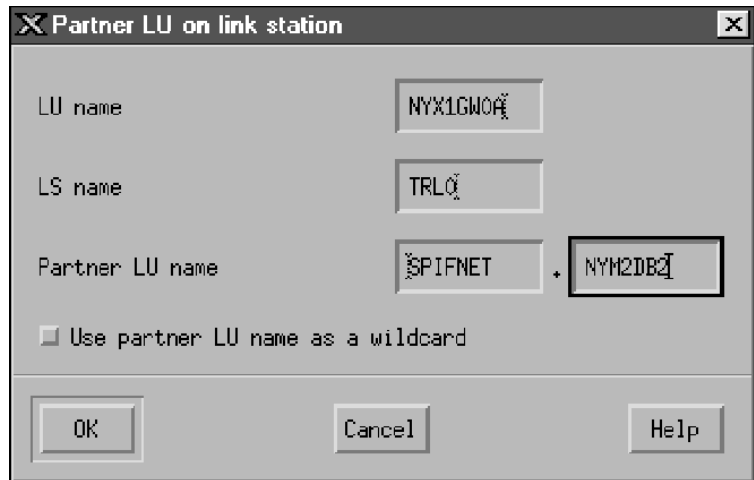
b. Enter the name for the local LU (**11**) you defined previously in the **LU name** field.

c. Enter the name for the link station you defined previously in the **LS name** field.

d. Enter the name of the partner LU you want to connect to (**2**) in the **Partner LU name** field.

e. Click **OK**. The Partner LU appears in the Independent Local LUs window of the Local LU that was created in the previous step.

Step 7. Define an alias for the partner LU.

a. Select the Remote Systems window.

b. Click the **Add** push button. The Add to Node window opens.

c. Select the **Define partner LU alias** radio button.

d. Click **OK**. The Partner LU window opens.

e. Enter an alias for the partner LU in the **Alias** field.

f. Enter the same value in the **Uninterpreted name** field.

g. Click **OK**.

Step 8. Define a mode.

a. Select **Services —> APPC—> Modes** from the menu bar. The Modes window opens.

b. Click the **New** push button. The Mode window opens.

c. Enter a mode name (**15**) in the **Name** field.
d. The configuration values below are suggested for the following
   fields:
   - **Initial session limits**: 20
   - **Maximum session limits**: 32767
   - **Min con. winner sessions**: 10
   - **Min con. loser sessions**: 10
   - **Auto-activated sessions**: 4
   - **Initial receive pacing window**: 8

   These values are suggested because they are known to work. You
   will need to tailor these values so that they are optimized for
   your particular application environment.
e. Click **OK**. The new mode appears in the Modes window.

f. Click **Done**.

Step 9. Define the CPI-C destination name.

a. Select **Services —> APPC—> CPI-C** from the menu bar. The CPI-C destination names window opens.

b. Click the **New** push button. The CPI-C destination window opens.

c. In the **Name** field, enter the Symbolic Destination Name (**16**) you want to associate with the host or AS/400 server database. This example uses db2cpic.

d. In the **Partner TP** box:

- For DB2 for MVS/ESA, DB2 for OS/390, and DB2 for AS/400, select the **Service TP (hex)** radio button, and enter the hexadecimal TP number (**17**). (For DB2 Universal Database for OS/390 or DB2/MVS, you can also use the default application TP DB2DRDA. For DB2 for AS/400 you can also use the default application TP QCNTEDDM.)
- For DB2 for VM or VSE, select the **Application TP** radio button. For DB2 for VM, enter the DB2 for VM database name. For DB2 for VSE, enter the AXE as the application TP (**17**).

e. In the **Partner LU and mode** box:

1) Select the **Use PLU alias** radio button, and enter the partner LU alias (**2**) you created in a previous step.

2) In the **Mode** field, enter the mode name (**15**) for the mode that you created in a previous step.

f. In the **Security** box, select the radio button that corresponds to the type of security level that you want to run on your network.

g. Click **OK**. The new destination name appears in the Destination Names window.

h. Click **Done**.

Step 10. Test the APPC connection.

a. Start the SNA subsystem by entering the **/usr/bin/sna start** command. You can enter the **/usr/bin/sna stop** command to stop the SNA subsystem first, if required.

b. Start the SNA administration program. You can enter either the **/usr/bin/snaadmin** command or the **/usr/bin/X11/xsnaadmin** command.

c. Start the subsystem node. Select the appropriate node icon in the button bar, and click the **Start** push button.

d. Start the link station. Select the link station you defined previously in the Connectivity and Dependent LUs window, and click the **Start** push button.

e. Start the session. Select the LU you defined previously in the Independent Local LUs window, and click the **Start** push button. A session activation window opens.

f. Select or enter a partner LU and mode.

g. Click **OK**.

> You may also need to contact your database or network administrators to have your local LU names added to the appropriate tables in order to access the host or AS/400 server database.

You now need to update the DB2 directories, bind utilities and applications to the server, and test the connection.

Go to "3. Catalog the APPC Node" on page 156.

Configuring Bull SNA for AIX

This section describes how to configure Bull DPX/20 SNA/20 Server on your DB2 Connect workstation to connect to host or AS/400 database servers using APPC. If Bull DPX/20 SNA/20 Server is installed prior to installing DB2 Connect, DB2 Connect uses Bull SNA. Otherwise, you need to configure DB2 Connect to work with IBM eNetwork Communications Server V5.0.3 for AIX. See "Configuring IBM eNetwork Communication Server for AIX" on page 124 for more information.

To determine if Bull SNA is installed on your AIX 4.2 (or later) system, enter the following command:

```
lslpp -l express.exsrv+dsk
```

If Bull SNA is installed, you will see output similar to the following:

```
   Fileset                   Level  State      Description
   ----------------------------------------------------------------------
 Path: /usr/lib/objrepos
   express.exsrv+dsk         2.1.3.0  COMMITTED  EXPRESS SNA Server and
                                                 Integrated Desktop
```

If you install Bull SNA after installing DB2 Connect and you want DB2 Connect to use Bull SNA instead of IBM eNetwork Communications Server for AIX, log on to the system as a user with root authority and enter the following command:

```
/usr/lpp/db2_06_01/cfg/db2cfgos
```

If you want to install the Bull DPX/20 SNA/20 Server, then you must have the following software:

__ 1. AIX V4.1.4

__ 2. Express SNA Server V2.1.3

For more information on setting up your SNA environment, refer to the Bull DPX/20 SNA/20 Server Configuration Guide.

DB2 Connect, when used with the Bull SNA server, cannot have inbound APPC connections from remote clients. The only APPC connections it can have are outbound APPC connections to the host.

To configure Bull SNA for use by DB2 Connect, enter the **express** command to configure the following SNA parameters:

```
Config        Express            Default configuration for EXPRESS
 Node         NYX1               SPIFNET.NYX1 (HOSTNAME=NYX1)
  Indep. LUs  6.2 LUs Using All Stations
    LU        NYX1               Control Point LU
  Link        tok0.00001         Link (tok0)
   Station    MVS                To MVS from NYX1
     LU       NYX1GW01           To MVS from NYX1
      LU Pair NYM2DB2            To MVS from NYX1
        Mode  IBMRDB             IBMRDB
```

Use default values for fields not listed.

The following example illustrates the sample configuration:

```
Defining hardware:

System (hostname) = NYX1
Adapter and Port  = NYX1.tok0
  MAC Address     = 400011529778

Defining SNA node:

Name          = NYX1
Description   = SPIFNET.NYX1 (HOSTNAME=NYX1)
Network ID    = SPIFNET
Control Point = NYX1
XID Block     = 05D
XID ID        = 29778

Defining token ring link:

Name          = tok0.00001
Description   = Link (tok0)
Connection Network name
  Network ID    = SPIFNET
  Control Point = NYX

Defining token ring station:

Name              = MVS
Description       = To MVS from NYX1
Remote MAC address = 400009451902
Remote Node name
  Network ID    = SPIFNET
  Control Point = NYX

Defining Local LU 6.2:

Name        = NYX1GW01
Description = To MVS from NYX1
Network ID  = SPIFNET
LU name     = NYX1GW01

Defining Remote LU 6.2:
```

```
Name               = NYM2DB2
Description        = To MVS from NYX1
Network ID         = SPIFNET
LU name            = NYM2DB2
Remote Network ID  = SPIFNET
Remote Control Point = NYX
Uninterpreted Name = NYM2DB2

Defining Mode:

Name            = IBMRDB
Description     = IBMRDB
Class of service = #CONNECT

Defining Symbolic Destination Info:

Name        = DB2CPIC
Description = To MVS from NYX1
Partner LU  = SPIFNET.NYM2DB2
Mode        = IBMRDB
Local LU    = NYX1GW01
Partner TP  = DB2DRDA
```

After you have configured these SNA parameters, you must stop and start the SNA server. To do this, perform the following steps:

Step 1. Log on to the system as a user with root authority.

Step 2. Make sure your PATH contains the $express/bin (/usr/lpp/express/bin)entry.

Step 3. Check for active users before stopping the server by entering the following command:

```
express_adm shutdown
```

Step 4. Stop all EXPRESS activity by entering the following command:

```
express_adm stop
```

Step 5. Start EXPRESS by entering the following command:

```
express_adm start
```

You now need to update the DB2 directories, bind utilities and applications to the server, and test the connection.

Configuring SNAPlus2 for HP-UX

This section describes how to configure SNAplus2 for HP-UX on your DB2 Connect workstation to connect to host or AS/400 database servers using APPC. SNAplus2 for HP-UX is the only SNA product supported for DB2 Connect running on HP-UX V10 and V11 machines.
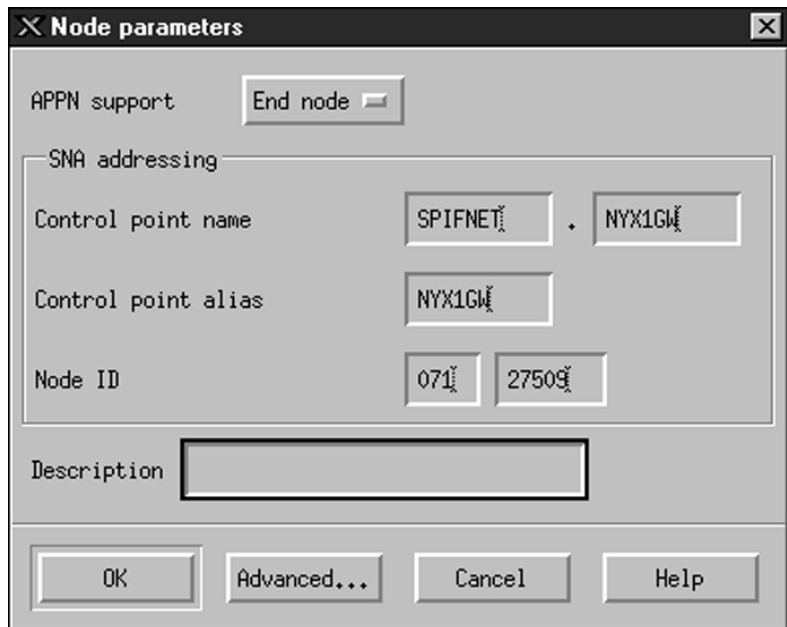
Before you begin, ensure that your workstation has HP-UX SNAplus2 installed. If you need more information in order to configure your SNA environment, refer to the online help provided with SNAplus2.

The following assumptions are made:
- The basic installation of the SNAplus2 for HP-UX package has already been completed.
- DB2 Connect has been installed.

To configure SNAplus2 for DB2 Connect, log on to the system as a user with root authority and use either the **/opt/sna/bin/snapadmin** program or the **/opt/sna/bin/X11/xsnapadmin** program. Information about these programs can be found in the system documentation. The following steps describe how to use the **xsnapadmin** program to configure SNAplus2.

Step 1. Enter the command **xsnapadmin**. The Node window for the server opens.

Step 2. Define a node.

a. Select **Services —> Configure Node Parameters**. The Node Parameters window opens.

b. Select **End node** from the **APPN support** drop-down menu.

c. Enter your network ID and the local PU name (**9** and **10**) in the **Control point name** fields.

d. Enter the local PU name (**10**) in the **Control point alias** field.

e. Enter your Node ID (**13** and **14**) in the **Node ID** fields.

f. Click **OK**.

Step 3. Define a port.

    a. Select the Connectivity and Dependent LUs window.

    b. Click the **Add** push button. The Add to Node window opens.

    c. Select the **Port using** radio button.

    d. Click the **Port Using** drop down box and select the appropriate port. For the purpose of our example, we will select the **Token ring card** option.

    e. Click **OK**. The Port window for the chosen port type opens.

    f. Enter a name for the port in the **SNA port name** field.

    g. Select the **Initially active** check box.

    h. Select the **Define on a connection network** check box.

    i. Enter your network ID (**9**) in the first part of the **CN name** field.

    j. Enter your local control point name (**10**) in the second part of the **CN name** field.

    k. Click **OK**. The Port window closes and a new port appears in the Connectivity and Dependent LUs window.
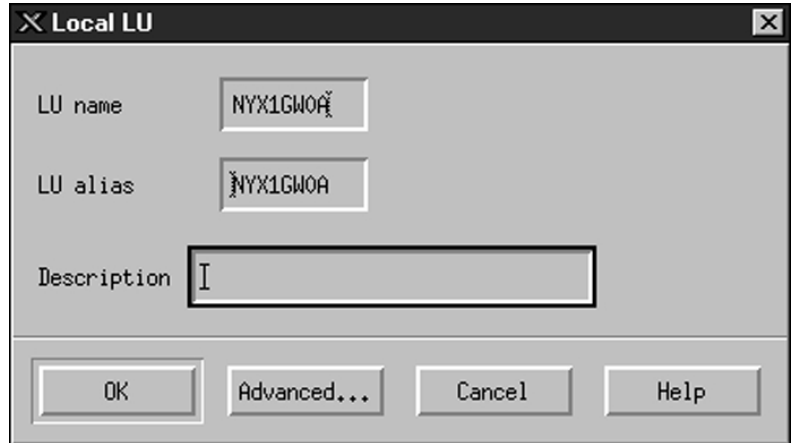
Step 4. Define a link station.

a. In the Connectivity and Dependent LUs window, select the port that you defined in the previous step.

b. Click the **Add** push button. The Add to Node window opens.

c. Select the **Add a link station to port** radio button.

d. Click **OK**. The Token ring link station window opens.

Token ring link station	
Name	TRL0
SNA port name...	TRSAP0
Activation	On demand

LU traffic
◇ Any   ◆ Independent only   ◇ Dependent only

Independent LU traffic
Remote node...   SPIFNET . NYX
Remote node type   End or LEN node

Contact information
MAC address   400009451902   Flip
SAP number   04

Description

| OK | Advanced... | Cancel | Help |

e. Enter a name for the link in the **Name** field.

f. Click the **Activation** drop-down box and select the **On demand** option.

g. Select the **Independent only** option in the **LU traffic** box.

h. In the **Independent LU traffic** box:

   1) Enter the network ID (**3**) and the partner LU name (**2**) in the **Remote node** fields.

   2) Click the **Remote node type** drop-down box and select the type of node that applies to your network.

i. In the **Contact information** box, enter the SNA destination address (**8**) assigned for the host or AS/400 system in the **Mac address** field.

j. Click **OK**. The Link Station window closes and a new link station appears in the Connectivity and Dependent LUs window.

Step 5. Define a local LU.

a. Select the **Independent local LUs** window.

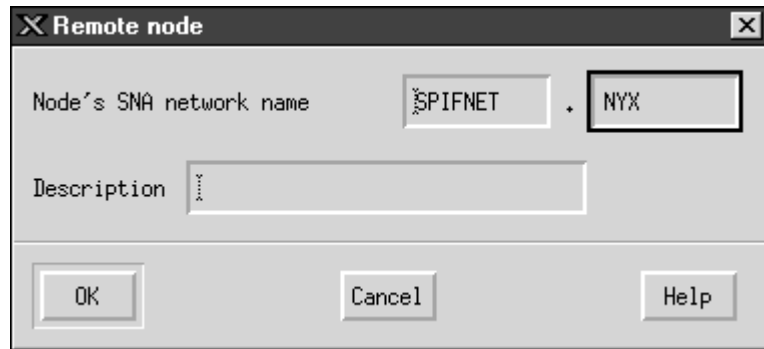b. Click the **Add** push button. The Local LU window opens.

c. Enter your independent local LU Name (**11**) in the **LU name** field.

d. Enter the same name in the **LU alias** field (**12**).

e. Click **OK**. The new LU appears in the Independent Local LUs window.

Step 6. Define a remote node.

a. Select the **Remote Systems** window.

b. Click the **Add** push button. The Add to Node window opens.

c. Select **Define remote node**.

d. Click **OK**. The Remote Node configuration window opens.

e. Enter the network ID (**3**) and the partner LU name (**2**) in the **Node's SNA network name** field.

f. Click **OK**. The remote node appears in the Remote Systems window, and a default partner LU is defined for the node.

Step 7. Define a partner LU.

a. In the Remote Systems window, double-click the default partner LU that was created when you defined a remote node in the previous step. The Partner LU window opens.

b. Enter the same partner LU name (**2**) in the **Alias** and **Uninterpreted name** fields.

c. Select **Supports parallel sessions**.

d. Click **OK**.

Step 8. Define a mode.

a. Select **Services —> APPC—> Modes** from the menu bar. The Modes window opens.

b. Click the **New** push button. The Mode window opens.

c. Enter a mode name (**15**) in the **Name** field.

d. The configuration values below are suggested for the following fields:

- **Initial session limits**: 20
- **Maximum session limits**: 32767
- **Min con. winner sessions**: 10

- **Min con. loser sessions**: 10
- **Auto-activated sessions**: 4
- **Initial receive pacing window**: 8

These values are suggested because they are known to work. You will need to tailor these values so that they are optimized for your particular application environment.

  e. Click **OK**. The new mode appears in the Modes window.

  f. Click **Done**.

Step 9. Define the CPI-C destination name.

  a. Select **Services —> APPC—> CPI-C** from the menu bar. The CPI-C destination names window opens.

b. Click the **New** push button. The CPI-C destination window opens.

```
┌─────────────────────────────────────────────────────────────────┐
│ ☓ CPI-C destination                                           ⊠ │
├─────────────────────────────────────────────────────────────────┤
│                                                                   │
│  Name          db2cpic                                            │
│  ┌─Local LU──────────────────────────────────────────────────┐   │
│  │  ◇ Specify local LU alias     NYX1GWOA                     │   │
│  │                                                            │   │
│  │  ◇ Use default LU                                          │   │
│  └────────────────────────────────────────────────────────────┘   │
│  ┌─Partner LU and mode───────────────────────────────────────┐   │
│  │  ◇ Use PLU alias              NYM2DB2                      │   │
│  │                                                            │   │
│  │  ◇ Use PLU full name                                       │   │
│  │                                                            │   │
│  │     Mode                      IBMRDB                       │   │
│  └────────────────────────────────────────────────────────────┘   │
│  ┌─Partner TP────────────────────────────────────────────────┐   │
│  │  ◇ Application TP                                          │   │
│  │                                                            │   │
│  │  ◇ Service TP (Hex)           07F6C4C2                     │   │
│  │  ┌─Security─────────────────────────────────────────────┐ │   │
│  │  │ ◇ None      ◇ Same      ◇ Program    ◇ Program strong │ │   │
│  │  │ User ID                                               │ │   │
│  │  │ Password                                              │ │   │
│  │  └───────────────────────────────────────────────────────┘ │   │
│  └────────────────────────────────────────────────────────────┘   │
│  Description  [                                      ]            │
│  ┌──────┐              ┌────────┐            ┌──────┐             │
│  │  OK  │              │ Cancel │            │ Help │             │
│  └──────┘              └────────┘            └──────┘             │
└─────────────────────────────────────────────────────────────────┘
```

c. In the **Name** field, enter the Symbolic Destination Name (**16**) you want to associate with the host or AS/400 server database. This example uses db2cpic.

d. In the **Partner TP** box:
   - For DB2 for MVS/ESA, DB2 for OS/390, and DB2 for AS/400, select the **Service TP (hex)** radio button, and enter the hexadecimal TP number (**17**). (For DB2 Universal Database for OS/390 or DB2/MVS, you can also use the default

application TP DB2DRDA. For DB2 for AS/400 you can also use the default application TP QCNTEDDM.)

- For DB2 for VM or VSE, select the **Application TP** radio button. For DB2 for VM, enter the DB2 for VM database name. For DB2 for VSE, enter the AXE as the application TP (**17**).

e. In the **Partner LU and mode** box:

1) Select the **Use PLU alias** radio button, and enter the partner LU alias (**2**) you created in a previous step.

2) In the **Mode** field, enter the mode name (**15**) for the mode that you created in a previous step.

f. In the **Security** box, select the radio button that corresponds to the type of security level that you want to run on your network.

g. Click **OK**. The new destination name appears in the Destination Names window.

h. Click **Done**.

Step 10. Test the APPC connection.

a. Start the SNA subsystem by entering the **/opt/sna/bin/sna start** command. You may need to enter the **/opt/sna/bin/sna stop** command to stop the SNA subsystem first.

b. Start the SNA administration program. You can use either the **/opt/sna/bin/snaadmin** command or the **/opt/sna/bin/X11/xsnaadmin** command.

c. Start the subsystem node. Select the appropriate node icon in the button bar, and click the **Start** push button.

d. Start the link station. Select the link station you defined previously in the Connectivity and Dependent LUs window, and click the **Start** push button.

e. Start the session. Select the LU you defined previously in the Independent Local LUs pane, then click the **Start** button. A session activation window opens. Select or enter a partner LU and mode.

f. Click **OK**.

> You may also need to contact your database or network administrators to have your Local LU names added to the appropriate tables in order to access the host or AS/400 server database.

You now need to update the DB2 directories, bind utilities and applications to the server, and test the connection.

Configuring SNAP-IX Version 6.0.1 for SPARC Solaris

This section describes how to configure DCL SNAP-IX V6.0.6 for SPARC Solaris on your DB2 Connect workstation to connect to host or AS/400 database servers using APPC.

Before you begin, ensure that your workstation has DCL SNAP-IX V6.1.0 for SPARC Solaris installed. For more information on configuring your SNA environment, refer to the online help provided with DCL SNAP-IX V6.1.0 for SPARC Solaris.

The following assumptions have been made:
- You have completed the basic installation of the DCL SNAP-IX V6.1.0 for SPARC Solaris package.
- You have installed DB2 Connect.

To configure DCL SNAP-IX V6.1.0 for SPARC Solaris for DB2 Connect, log on to the system as a user with root authority and use either the **/opt/sna/bin/snaadmin** or the **/opt/sna/bin/X11/xsnaadmin** program. For more information about these programs, refer to the system documentation.

To configure DCL SNAP-IX V6.1.0 for SPARC Solaris using the **xsnaadmin** program, perform the following steps:

Step 1. Enter the **xsnaadmin** command. The Node window for the server opens.

Step 2. Define a node.

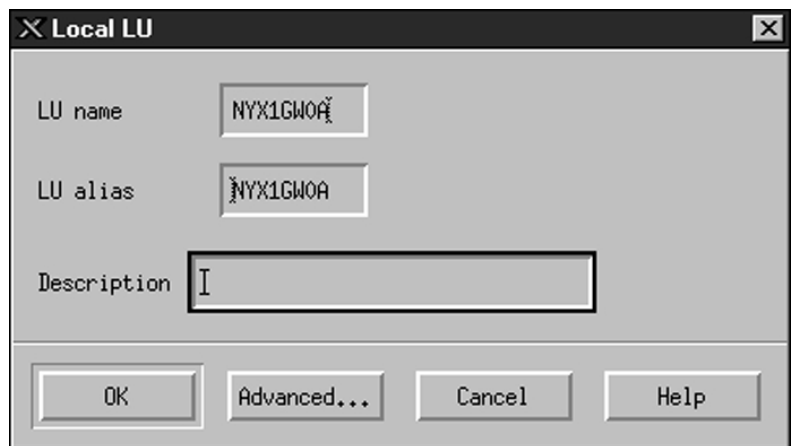a. Select **Services —> Configure Node Parameters**. The Node Parameters window opens.
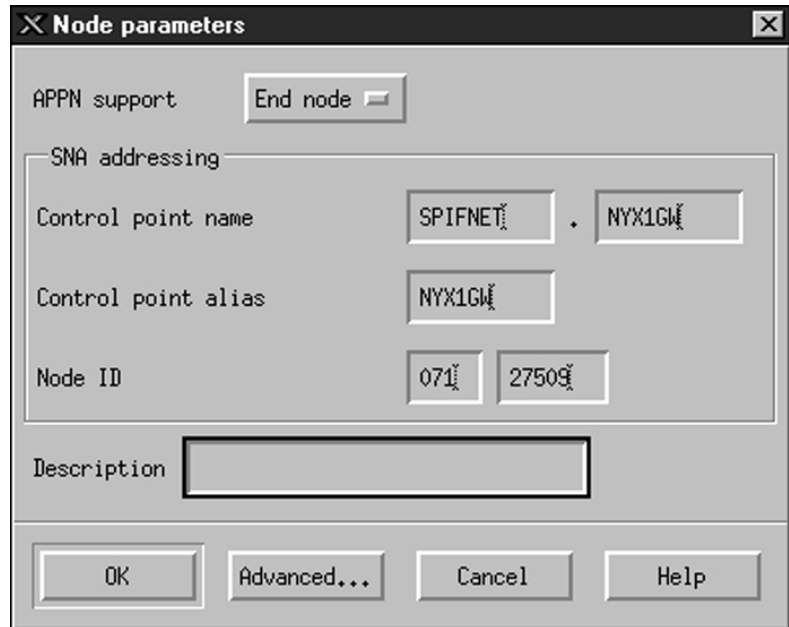
b. Select **End node** from the **APPN support** drop-down menu.
c. Enter your network ID and the local PU name (**9** and **10**) in the **Control point name** fields.
d. Enter the local PU name (**10**) in the **Control point alias** field.
e. Enter your Node ID (**13** and **14**) in the **Node ID** fields.
f. Click **OK**.

Step 3. Define a port.
   a. Select the Connectivity and Dependent LUs window.
   b. Click **Add**. The Add to Node window opens.
   c. Select the **Port using** radio button.
   d. Click on the **Port Using** drop down box and select the appropriate port. For the purpose of our example, we will select the **SunTRI/P Adapter** option.
   e. Click **OK**. The Port window for the chosen port type opens.
   f. Enter a name for the port in the **SNA port name** field.
   g. Select the **Initially active** check box.
   h. Click **OK**. The Port window closes, and a new port appears in the Connectivity and Dependent LUs window.

Step 4. Define a link station.

a. In the Connectivity and Dependent LUs window, select the port that you defined in the previous step.

b. Click **Add**. The Add to Node window opens.

c. Select the **Add a Link Station to Port** radio button.

d. Click **OK**. The Token Ring Link Station window opens.

e. Enter a name for the link in the **Name** field.

f. Select the **Independent Only** option in the LU traffic box.

g. In the Independent LU traffic box:

   1) Enter the Network ID (**3**) and the Partner PU Name (**2**) in the Remote Node fields.

   2) Click on the **Remote node type** drop down box and select the type of node that applies to your network.

h. In the Contact information box, enter the SNA Destination Address (**8**) assigned for the host or AS/400 system in the Mac address field.

i. Click **OK**. The Link Station window closes, and a new link station appears in the Connectivity and Dependent LUs pane.

Step 5. Define a local LU.

a. Select the **Independent local LUs** window.

b. Click the **Add** push button. The Local LU window opens.

c. Enter your independent local LU Name (**11**) in the **LU name** field.

d. Enter the same name in the **LU alias** field (**12**).

e. Click **OK**. The new LU appears in the Independent Local LUs window.

Step 6. Define a remote node.

a. Select the **Remote Systems** window.

b. Click the **Add** push button. The Add to Node window opens.

c. Select **Define remote node**.

d. Click **OK**. The Remote Node configuration window opens.

e. Enter the network ID (**3**) and the partner LU name (**2**) in the **Node's SNA network name** field.

f. Click **OK**. The remote node appears in the Remote Systems window, and a default partner LU is defined for the node.

Step 7. Define a partner LU.

a. Select **Services —> APPC —> New partner LUs —> Partner LU on Remote Node** from the menu bar. The Partner LU window opens.

b. Enter the Partner LU name in the **Partner LU Name** fields.

c. Enter the same Partner LU name (**2**) in the **Alias and Uninterpreted Name** fields.

d. Select **Supports Parallel Sessions**.

e. Enter the Partner PU name in the **Location** fields.

f. Click **OK**.

Step 8. Define a mode.

a. Select **Services —> APPC—> Modes** from the menu bar. The Modes window opens.

b. Click the **New** push button. The Mode window opens.

c. Enter a mode name (**15**) in the **Name** field.
d. The configuration values below are suggested for the following fields:

- **Initial session limits**: 20
- **Maximum session limits**: 32767
- **Min con. winner sessions**: 10
- **Min con. loser sessions**: 10
- **Auto-activated sessions**: 4
- **Initial receive pacing window**: 8

These values are suggested because they are known to work. You will need to tailor these values so that they are optimized for your particular application environment.

e. Click **OK**. The new mode appears in the Modes window.

f. Click **Done**.

Step 9. Define the CPI-C destination name.

a. Select **Services —> APPC —>CPI-C** from the menu bar. The CPI-C Destination Names window opens.

b. Click **New**. The CPI-C Destination window opens.

c. Enter the Symbolic Destination Name (**16**) you want to associate with the host or AS/400 server database in the **Name** field. This example uses DB2CPIC.

d. In the **Local LU** box:
   • Select the specific Local LU alias radio button and enter the Local LU alias you created previously.

e. In the **Partner LU and mode** box:
   1) Select the **Use PLU Alias** radio button, and enter the Partner LU Alias (**2**) you created in a previous step.

2) Enter the Mode name (**15**) for the mode that you created in a previous step in the **Mode** field.

f. In the Partner TP Box:

1) For DB2 for MVS/ESA, DB2 for OS/390, and DB2 for AS/400, select the **Service TP (hex)** radio button.

2) Enter the hexadecimal TP number (**17**). (For DB2 Universal Database for OS/390 or DB2/MVS, you can also use the default application TP DB2DRDA. For DB2 for AS/400 you can also use the default application TP QCNTEDDM.)

3) For DB2 for VM or VSE, select the **Application TP** radio button. For DB2 for VM, enter the DB2 for VM database name. For DB2 for VSE, enter the AXE as the application TP. (**17**)

g. In the **Security** box, select the radio button that corresponds to the type of security level that you want to run on your network.

h. Click **OK**. The new destination name appears in the Destination Names window.

i. Click **Done**.

j. Test the APPC connection.

1) Start the SNA subsystem by entering the **/opt/sna/bin/sna start** command. You can enter the **/opt/sna/bin/sna stop** command to stop the SNA subsystem first, if required.

2) Start the SNA administration program. You can use either the **/opt/sna/bin/snaadmin** or the **/opt/sna/bin/X11/xsnaadmin** command.

3) Start the subsystem node. Select the node icon in the button bar, and click the **Start** push button.

4) Start the link station. Select the link station that you previously defined in the Connectivity and Dependent LUs window. Click **Start**.

5) Start the session. Select the LU you defined previously in the Independent Local LUs window, then click **Start**. A session activation window opens. Select or enter the Partner LU and Mode desired.

6) Click **OK**.

You now need to update the DB2 directories, bind utilities and applications to the server, and test the connection.

Step 10. Test the APPC connection.

   a. Start the SNA subsystem by entering the **/opt/sna/bin/sna start** command. You can enter the **/opt/sna/bin/sna stop** command to stop the SNA subsystem first, if required.

   b. Start the SNA administration program. You can use either the **/opt/sna/bin/snaadmin** or the **/opt/sna/bin/X11/xsnaadmin** command.

   c. Start the subsystem node. Select the node icon in the button bar, and click the **Start** push button.

   d. Start the link station. Select the link station that you previously defined in the Connectivity and Dependent LUs window. Click **Start**.

   e. Start the session. Select the LU you defined previously in the Independent Local LUs window, then click **Start**. A session activation window opens. Select or enter the Partner LU and Mode desired.

   f. Click **OK**.

> You may also need to contact your database or network administrators to have your Local LU names added to the appropriate tables in order to access the host or AS/400 server database.

Configuring SunLink 9.1 for Solaris

This section describes how to configure SunLink 9.1 (SunLink SNA) for Solaris on your DB2 Connect workstation to connect to host or AS/400 database servers using APPC. SunLink SNA for Solaris is the only SNA product supported for DB2 Connect running on Solaris.

Before you begin, ensure that your workstation has SunLink SNA 9.1 installed. The following assumptions have been made:

- The basic installation of the SunLink SNA PU 2.1 for Solaris package has already been completed.
- DB2 Connect has been installed.

To configure the SunLink SNA Server for use by DB2 Connect, log on to the system as a user with `root` authority and perform the following steps:

Step 1. "Start the Configuration Program" on page 154

Step 2. "Configuring for a Link Station" on page 154

Step 3. "Configuring for a Session" on page 155

> You may also need to contact your database or network administrators to have your local LU names added to the appropriate tables in order to access the host or AS/400 server database.

Start the Configuration Program

The Sunlink Version 9.1 configuration tool uses a graphical user interface accessible through X Windows. To begin the configuration, do the following:

1. Log on as root.
2. To initialize the daemons:
   a. Start the **sunsetup** program by entering:

      ```
      /opt/SUNWgman/sunsetup
      ```

   b. Select option 4, and then 5 (Start GMAN/PU21 Software).
3. To start the graphical interface for configuring Sunlink:
   a. Export your display (for example, export DISPLAY=hostname:0)
   b. Start the **sungmi** program by entering:

      ```
      /opt/SUNWgmi/sungmi
      ```

Configuring for a Link Station

In SNA networking you must have a working link station before you can establish a session. To establish a link station with Sunlink 9.1, complete the following steps:

1. Double click on the **config1** folder in the left-hand pane of the configuration window. A hierarchical tree of icons representing resources will open. Each of the configuration actions you will perform can be launched by right-clicking on the appropriate icon in this window.
2. Begin by configuring **Systems**. Select the **Systems** icon, and right-click.
   a. From the menu that appears, select **New —> System**
   b. Set HOST = Solaris3. All other information can be left to defaults.
3. Next, you will need to configure **PU2.1 Servers**. Select the **PU2.1 Servers** icon, and right-click.
   a. From the menu that appears, select **New PU2.1 Servers> PU2.1 Server**.
   b. If you are using Solaris3, enter the following:

      ```
      Name: OMXUF5
      CP Name: CAIBMOML.OMXUF5
      Command Options: -t -1
      sunop service:  brxadmin_pu2
      lu6.2 service:  brxlu62_serv
      ```

   All other options can be left as default values.
4. The next step is to configure your LAN connections. Select the **LAN Connections** icon, and right-click.

a. From the menu that appears, **select New 'Lan Connections' LAN Connection**.

b. If you are using Solaris3, enter the following:

```
Line Name:  MAC
Local Mac:  08002082611F
```

c. Click on **Advanced**. Ensure that the following is set:

```
Lan Speed: 16Mbs
```

5. The last item is your DLC settings. Select **MAC** icon, and right-click.

a. From the menu that appears, select **New —> DLC (PU2)**.

b. For example, If you are using Solaris3, enter the following:

```
DLC Name:  Jetsons
Remote Mac:  400011529798
Remote CP: CAIBMOML.OMXR88
```

Stop the SNA daemons and start them again. You should now see an active Link Station connection. Ensure that this works before continuing.

Configuring for a Session

To configure an SNA session for database communications, double click on the **config1** folder in the left-hand pane of the configuration window. A hierarchical tree of icons representing resources will open. Each of the configuration actions you will perform can be launched by right-clicking on the appropriate icon in this window.

To configure for a session:

1. Start by configuring the independent LU. Select the **Independent LU** icon, and right-click.

a. From the menu that appears, select **New —> Independent LU**.

b. If you are using Solaris3, enter the following:

```
Name:  OMXUF50A
```

c. Click on **Advanced**. Set the session limit as follows:

```
Session Limit:  16
Sync level : No
```

Note: Two-Phase commit is currently not supported by DB2 with SUNLINK.

2. Next, set the partner LU. Select the **Partner LU's** icon, and right-click.

a. From the menu that appears, select **New —> Partner LU**.

b. If you are using Solaris3, enter the following:

```
Name:  OMXR880A
Local LU: OMXUF50A
```

3. Finally, set the mode. Select the **OMXR880A** icon found under the **Partner LU** icon, and right-click.

a. From the menu that appears, select **New —> Mode**.

b. For example, If you are using Solaris3, enter the following:

```
Mode Name:  IBMRDB
DLC Name: Jetsons
```

To activate the session, you must stop and then restart the SNA daemons.

3. Catalog the APPC Node

You must add an entry to the DB2 Connect workstation's node directory to describe the remote node. This entry specifies the chosen alias (*node_name*), symbolic destination name (*sym_dest_name*), and the APPC security type (*security_type*) that the client will use for the APPC connection.

To catalog the APPC node, perform the following steps:

Step 1. Log on to the system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority.

Step 2. Set up the instance environment and invoke the DB2 command line processor. Run the start-up script as follows:

```
. INSTHOME/sqllib/db2profile    (for Bourne or Korn shell)
source INSTHOME/sqllib/db2cshrc (for C shell)
```

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

Step 3. Catalog the node by entering the following commands:

```
catalog appc node node_name remote sym_dest_name security security_type
terminate
```

The *sym_dest_name* parameter is case-sensitive and *must* exactly match the case of the symbolic destination name you defined previously. For example, to catalog a remote database server with the symbolic destination name DB2CPIC on the node called db2node, using APPC Security type *program*, use:

```
catalog appc node db2node remote DB2CPIC security program
terminate
```

Note: To connect to DB2 for MVS, it is recommended that you use security PROGRAM.

If you need to change values that were set with the **catalog node** command, perform the following steps:

Step 1. Run the **uncatalog node** command in the command line processor as follows:

```
db2 uncatalog node node_name
```

Step 2. Recatalog the node with the values that you want to use.

---

4. Catalog the Database as a Database Connection Service (DCS) Database

To catalog the remote database as a Data Connection Services (DCS) database, perform the following steps:

Step 1. Log on to the system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority.

Step 2. Enter the following commands:

```
catalog dcs db local_dcsname as target_dbname
terminate
```

where:
- *local_dcsname* represents the local name of the host or AS/400 database.
- *target_dbname* represents the name of database on the host or AS/400 database system.

For example, to make ny the local database name for DB2 Connect, for the remote host or AS/400 database called newyork, enter the following commands:

```
catalog dcs db ny as newyork
terminate
```

5. Catalog the Database

Before a client application can access a remote database, the database must be cataloged on the host system node and on any DB2 Connect workstation nodes that will connect to it. When you create a database, it is automatically cataloged on the host with the database alias (*database_alias*) the same as the database name (*database_name*). The information in the database directory, along with the information in the node directory, is used on the DB2 Connect workstation to establish a connection to the remote database.

To catalog a database on the DB2 Connect Workstation, perform the following steps.

Step 1. Log on to the system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority.

Step 2. Fill in the Your Value column in the following worksheet.

Table 17. Worksheet: Parameter Values for Cataloging Databases

Parameter	Description	Sample Value	Your Value
Database name (*database_name*)	The local DCS database name (*local_dcsname*) of the *remote* database, you specified this when you catalogued the DCS database directory, for example, ny.	ny	
Database alias (*database_alias*)	An arbitrary local nickname for the remote database. If you do not provide one, the default is the same as the database name (*database_name*). This is the name that you use when connecting to the database from a client.	localny	
Node name (node_name)	The name of the node directory entry that describes where the database resides. Use the same value for the node name (*node_name*) that you used to catalog the node in the previous step.	db2node	

Step 3. Set up the instance environment and invoke the DB2 command line processor. Run the start-up script as follows:

```
. INSTHOME/sqllib/db2profile    (for Bourne or Korn shell)
source INSTHOME/sqllib/db2cshrc (for C shell)
```

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

Step 4. Catalog the database by entering the following commands:

```
catalog database database_name as database_alias at
   node node_name authentication auth_type
terminate
```

For example, to catalog the DCS known database *ny* so that it has the local database alias *localny*, on the node *db2node*, enter the following commands:

```
catalog database ny as localny at node db2node
   authentication dcs
terminate
```

> If you need to change values that were set with the **catalog** *database* command, perform the following steps:
>
> Step a. Run the **uncatalog** *database* command:
>
> ```
> uncatalog database database_alias
> ```
>
> Step b. Recatalog the database with the value that you want to use.

6. Bind Utilities and Applications to the Database Server

The steps you have just completed set up the DB2 Connect workstation to communicate with the host or AS/400 system. You must now bind the utilities and applications to the host or AS/400 database server. You need BINDADD authority to bind.

To bind the utilities and applications to the host or AS/400 database server, enter the following commands:

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

For example:

```
connect to NYC3 user myuserid using mypassword
bind path/bnd/@ddcsmvs.lst blocking all sqlerror continue
      messages mvs.msg grant public
connect reset
```

For more information about these commands, refer to the *DB2 Connect User's Guide*.

7. Test the Host or AS/400 Connection

When you have finished configuring the DB2 Connect workstation for communications, you need to test the connection to the remote database.

Enter the following command at the DB2 Connect workstation, remembering to substitute the **database_alias** value you defined in "4. Catalog the Database as a Database Connection Service (DCS) Database" on page 157:

```
connect to database_alias user userid using password
```

For example, enter the following command:

```
connect to nyc3 user userid using password
```

The *userid* and *password* values required are those defined at the host or AS/400 system, and must be provided to you by your DB2 Administrator. For more information, refer to the *DB2 Connect User's Guide*.

If the connection is successful, you will get a message showing the name of the database to which you have connected. You are now able to retrieve data from that database. For example, to retrieve a list of all the table names listed in the system catalog table, enter the following command:

```
"select tabname from syscat.tables"
```

When you are finished using the database connection, enter the **connect reset** command to end the database connection.

If the connection fails, check the following items at the DB2 Connect workstation:

__ 1. The node was cataloged with the correct symbolic destination name (*sym_dest_name*).
__ 2. The node name (*node_name*) that was specified in the database directory points to the correct entry in the node directory.
__ 3. The database was cataloged properly, using the correct *real_host_dbname* for the database on the host or AS/400 server.

If the connection still fails after you verify these items, refer to the *Troubleshooting Guide*.

Chapter 13. Enabling Multisite Updates (Two-Phase Commit)

This section provides an overview of the multisite update function as it applies to scenarios that involve host and AS/400 database servers. It describes the products and components needed to implement PC, UNIX, and Web applications that update multiple DB2 databases in the same transaction.

Multisite update, also known as distributed unit of work (DUOW) and two-phase commit, is a function that enables your applications to update data in multiple remote database servers with guaranteed integrity. For example, a banking transaction that involves the transfer of money from one account to another in a different database server.

In such a transaction, it is critical that updates which implement debit operations on one account do not get committed unless updates required to process credits to the other account are committed as well. The multisite update considerations apply when data representing these accounts is managed by two different database servers.

DB2 products provide comprehensive support for multisite updates. This support is available for applications developed using regular SQL as well as applications that use transaction monitor (TP monitor) products that implement the X/Open XA interface specification. Examples of such TP monitors products include IBM TxSeries (CICS and Encina), IBM Message and Queuing Series, IBM Component Broker Series, IBM San Francisco Project as well as Microsoft Transaction Server (MTS), BEA Tuxedo and several others. There are different setup requirements depending on whether native SQL multisite update or TP monitor multisite update is used.

Both the native SQL and TP monitor multisite update programs must be precompiled with the `CONNECT 2 SYNCPOINT TWOPHASE` options. Both can use the SQL Connect statement to indicate which database they want to be used for the SQL statements that follow. If there is no TP monitor to tell DB2 it is going to coordinate the transaction (as indicated by DB2 receiving the `xa_open` calls from the TP monitor to establish a database connection), then the DB2 software will be used to coordinate the transaction.

When using TP monitor multisite update, the application must request commit or rollback by using the TP monitor's API, for example `CICS SYNCPOINT`, `Encina Abort()`, `MTS SetAbort()`.

When using native SQL multisite update, the normal SQL COMMIT and ROLLBACK must be used.

TP monitor multisite update can coordinate a transaction that accesses both DB2 and non-DB2 resource managers such as Oracle, Informix or SQLServer. Native SQL multisite update is used with DB2 servers only.

For a multisite update transaction to work, each of the databases participating in a distributed transaction must be capable of supporting distributed unit of work. Currently, the following DB2 servers provided DUOW support that enabled them to participate in distributed transactions:

- DB2 UDB for UNIX, OS/2, and Windows V5 or later
- DB2 for MVS/ESA V3.1 and 4.1
- DB2 for OS/390 V5.1
- DB2 Universal Database for OS/390 V6.1 or later
- DB2/400 V3.1 or later (SNA only)
- DB2 Server for VM and VSE V5.1 or later (SNA only)
- Database Server 4

A distributed transaction can update any mix of supported database servers. For example, your application can update several tables in DB2 Universal Database on Windows NT or Windows 2000, a DB2 for OS/390 database, and a DB2/400 database, all within a single transaction.

Host and AS/400 Multisite Update Scenarios that Require SPM

Host and AS/400 database servers require DB2 Connect to participate in a distributed transaction originating from PC, UNIX, and Web applications. In addition, many of the multisite update scenarios that involve host and AS/400 database servers require that the Syncpoint Manager (SPM) component be configured. When a DB2 instance is created, the DB2 SPM is automatically configured with default settings.

The need for SPM is dictated by the choice of protocol (SNA or TCP/IP) and use of a TP monitor. The following table provides a summary of scenarios that require the use of SPM. The table also shows that DB2 Connect is required for any access to the host or AS/400 from Intel or UNIX machines. In addition, for multisite updates, the SPM component of DB2 Connect is required if the access is via SNA or uses a TP monitor.

Table 18. Host and AS/400 multisite update scenarios that require SPM

TP Monitor Used?	Protocol	SPM Needed?	Product Required (choose One)	Host and AS/400 Database Supported
Yes	TCP/IP	Yes	• DB2 Connect Enterprise Edition • DB2 Universal Database Enterprise Edition • DB2 Universal Database Enterprise - gExtended Edition	• DB2 for OS/390 V5.1 • DB2 Universal Database for OS/390 V6.1 or later
Yes	SNA	Yes	• DB2 Connect Enterprise Edition* • DB2 Universal Database Enterprise Edition* • DB2 Universal Database Enterprise - Extended Edition* **Note:** *AIX, OS/2, Windows NT and Windows 2000 platforms only.	• DB2 for MVS/ESA V3.1 and 4.1 • DB2 for OS/390 V5.1 • DB2 Universal Database for OS/390 V6.1 or later • DB2/400 V3.1 or later • DB2 Server for VM or VSE V5.1 or later

Table 18. Host and AS/400 multisite update scenarios that require SPM (continued)

TP Monitor Used?	Protocol	SPM Needed?	Product Required (choose One)	Host and AS/400 Database Supported
No	TCP/IP	No	- DB2 Connect Personal Edition - DB2 Connect Enterprise Edition - DB2 Universal Database Enterprise Edition - DB2 Universal Database Enterprise - Extended Edition	- DB2 for OS/390 V5.1 - DB2 Universal Database for OS/390 V6.1 or later
No	SNA	Yes	- DB2 Connect Enterprise Edition* - DB2 Universal Database Enterprise Edition* - DB2 Universal Database Enterprise - Extended Edition* **Note:** *AIX, OS/2, Windows NT and Windows 2000 platforms only.	- DB2 for MVS/ESA V3.1 and 4.1 - DB2 for OS/390 V5.1 - DB2 Universal Database for OS/390 V6.1 or later - DB2/400 V3.1 or later - DB2 Server for VM and VSE V5.1 or later

Note: A distributed transaction can update any mix of supported database servers. For example, your application can update several tables in DB2

UDB on Windows NT, a DB2 for OS/390 database and a DB2/400 database all within a single transaction.

For more information about two-phase commit, as well as instructions for setting up for several popular TP monitors, refer to the *Administration Guide*.

You can also access the DB2 Product and Service Technical Library on the World Wide Web:

1. Go to the following Web page:
   http://www.ibm.com/software/data/db2/library/
2. Select the **DB2 Universal Database** link.
3. Search for "Technotes" using the search keywords "DDCS", "SPM", "MTS", "CICS", and "ENCINA".

Using the Control Center to Enable Multisite Updates

You can use the Control Center to provide multisite updates. The procedure is simple, and is outlined below. For more information about the multisite update configuration process, including how to configure your system manually, refer to the online *Connectivity Supplement*.

Starting the Multisite Update Wizard

From the Control Center, click the [+] sign to expand the tree view. With the right mouse button, select the instance that you wish to configure. A pop-up menu opens. Select **Multisite Update —> Configure** menu item.

Wizard Steps

The Wizard provides a notebook-type interface. Each page of the wizard will prompt you for certain information about your configuration. The pages are shown below in the order in which you will encounter them.

Step 1. Specify a Transaction Processor (TP) monitor.

This field will show the defaults for the TP monitor you have enabled. If you do not want to use a TP monitor, select **Do Not Use a TP Monitor**.

Step 2. Specify the communications protocols you will use.

Step 3. Specify a Transaction Manager database.

This panel defaults to the first database you connect to (1ST_CONN). You can leave this default or select another catalogued database.

Step 4. Specify the types of database servers involved in the update, and also whether or not TCP/IP is to be used exclusively.

Step 5. Specify the Syncpoint Manager settings.

This page will only appear if the settings on the previous page indicate that you need to use DB2's Syncpoint Manager in a multisite update scenario.

Testing the Multisite Update Feature

Step 1. Select the instance with the right mouse button and choose the **Multisite Update —> Test** menu option from the pop-up menu. The Test Multisite Update window opens.

Step 2. Select the databases you want to test from the available databases in the **Available databases** list box. You can use the arrow buttons in the middle to move selections to and from the **Selected databases** list box. You can also change the selected userid and password by directly editing them in the **Selected databases** list box.

Step 3. When you have finished your selection, click **OK** at the bottom of the window. The Multisite Update Test Result window opens.

Step 4. The Multisite Update Test Result window shows which of the databases you selected succeeded or failed the update test. The window will show SQL codes and error messages for those that failed.

Chapter 14. DB2 Connect SYSPLEX Support

SYSPLEX permits DB2 Connect to seamlessly transfer an incoming connection from one remote database server to a designated backup server in the event that the first server fails. DB2 Connect support for SYSPLEX is enabled by default, however each DCS database catalog entry must be configured to enable SYSPLEX support.

Note: If the DB2 Connect concentrator is not active, then *active* connections are **not** transferred between hosts in the event of server failure; if a server fails all existing connections to that server are lost. If the concentrator is active, then only connections with inflight transactions to the particular SYSPLEX member that goes down will be lost. Other connections will be maintained and the next transaction will be sent to a remaining member.

How DB2 SYSPLEX Exploitation Works

In a typical scenario, the DB2 Connect Enterprise Edition server machine A would be in conversation with a SYSPLEX containing two DB2 for OS/390 hosts, say machines B and C:

SYSPLEX machine B	SYSPLEX machine C
LOCATION_NAME_B	LOCATION_NAME_C
LU Address=NETB.LUB	LU Address=NETC.LUC

Suppose that in this scenario an application now issues:

```
db2 connect to aliasb user xxxxxxx using xxxxxxxx
```

The connection to database `LOCATION_NAME_B` is established, and because SYSPLEX exploitation is enabled both for the DB2 Connect server and the DCS directory entry, DB2 for OS/390 identifies to DB2 Connect the network addresses for each SYSPLEX participant (NETB.LUB and NETC.LUC. DRDA4 protocols and message flows are used to return this information). Once an initial connection has been made, the returned list of addresses is cached at the DB2 Connect server. The list is either a list of SNA LU names (as in this example), or a list of IP addresses, but the list cannot contain a mixture of these address types, so that if the initial `CONNECT` is issued for an APPC node, only SNA addresses are returned, and if the initial `CONNECT` is issued for a TCP/IP node, then only IP addresses are returned.

Priority Information Used for Load Balancing and Fault Tolerance

The list of addresses provided by DB2 for OS/390 also includes priority information, including the number of connections for each network address, and the list is refreshed whenever a new connection is made by DB2 Connect. This additional information is used for load balancing purposes, as well as for fault tolerance.

How DB2 Connect Uses the Cached Address List

If subsequently, the database connection to ALIASB fails, then an error message SQL30081N is issued, and the connection will be dropped. If a further connection request is received for ALIASB, DB2 Connect does the following:

1. It tries the best choice from the cached list of addresses based on the priority information that was returned by DB2 for OS/390. This strategy is always used by DB2 Connect, and it is by this means that load balancing is achieved.

2. If this connection attempt fails, then the other addresses in the list are tried, in descending order of priority, as returned by DB2 for OS/390. This is how DB2 Connect exploits the SYSPLEX information to achieve fault tolerance.

3. If all other attempts to connect fail, then DB2 Connect will retry the connection to ALIASB using the address contained in the cataloged node directory.

Configuration Requirements for SYSPLEX

1. On a DB2 Connect Enterprise Edition server, SYSPLEX exploitation is enabled by default, but it can be turned off by setting the DB2SYSPLEX_SERVER profile variable to the value zero.

2. SYSPLEX exploitation will not be used for a given database unless the DCS directory entry for that database contains SYSPLEX (not case-sensitive) in the 6th positional parameter.

3. For APPC connections, these additional considerations apply:

   a. A Partner LU definition must exist for each LU that is a DB2 for OS/390 participant in the SYSPLEX.

   b. Matching CPIC symbolic destination name profiles must be defined for each participant, each having the same name as the related LU.

   Therefore, in this scenario, the SNA subsystem that the DB2 Connect server uses, must contain a Partner LU profile for NETB.LUB and NETC.LUC, referenced from a CPIC symbolic destination profile called LUB and LUC respectively.

4. For the scenario described below, only the primary DB2 for OS/390 database (LOCATION_NAME_B) need be defined in the catalog on the DB2 Connect server, as follows:

```
db2 catalog  appc node nodeb remote lub security program
db2 catalog dcs database dbb as location_name_b parms ',,,,,sysplex'
db2 catalog database dbb as aliasb at node nodeb authentication dcs
```

No DB2 directory entries need be defined in the catalog on the DB2 Connect server to reach the database LOCATION_NAME_C, since it is a secondary participant in the SYSPLEX . However, the symbolic destination name luc must reference the Partner LU definition for NETB.LUC since an APPC connection is being used.

Considerations for System/390 SYSPLEX Exploitation

DB2 Connect Enterprise Edition servers now provide load balancing and fault-tolerance when routing connections to multiple SYSPLEXes. When connected to DB2 for OS/390 running in a data sharing environment, DB2 Connect will spread the workload amongst the different DB2 subsystems comprising the data sharing group, based on the system load information provided by the Workload Manager (WLM). This support requires DB2 for OS/390 Version 5.1 or later.

Each SYSPLEX returns weighted priority information for each connection address, and this information is cached by DB2 Connect at the server, where it is used to balance connections by distributing them among the returned addresses, based on the returned priorities.

DB2 Connect Enterprise Edition servers also provide fault-tolerance by trying alternate addresses in the event of a connection failure. An error will only be returned to the application if all known connections have failed. Since for SNA addresses there is no equivalent to Domain Name Server (DNS) lookup, to ensure that a connection can be made the first time after a **db2start**, DB2 Connect writes the addresses returned for SNA to the file db2con.ini, and this file is read on **db2start**. This provides a means to recover if the catalogued node is down.

In the event of failure to connect to a particular SNA address, the following message is written to the db2diag.log:

```
DIA4805E A connection cannot be established to the DRDA application server
  at SNA address "%1" due to unknown symbolic destination name "%2".
```

A new profile (or registry) variable DB2SYSPLEX_SERVER has been created to enable this feature. If DB2SYSPLEX_SERVER is not present or is set to a non-zero value, then SYSPLEX exploitation is enabled. If DB2SYSPLEX_SERVER is set to zero then SYSPLEX exploitation is disabled. Setting DB2SYSPLEX_SERVER to a

value of zero disables the SYSPLEX exploitation for the server regardless of how the DCS database catalog entry has been specified.

The db2 registry variable DB2CONNECT_IN_APP_PROCESS can be used to allow clients running on the same machine as the DB2 Connect Enterprise Edition server to exploit the SYSPLEX support. For more information, refer to the *DB2 Connect User's Guide*.

With the addition of the concentrator, DB2 Connect now has the ability to balance the workload at transaction boundaries. The DB2 Connect concentrator must be enabled for this to work. Depending on the version of DB2 on the host, different granularity of load balancing will be achieved. If running against DB2 for OS/390 V6.1 of later, then on each transaction DB2 Connect will receive updated status from the WLM.

However, if the host is DB2 for OS/390 V5.1, then WLM status will still only be returned on a connect request. Because of this, long running connections are not recommended in conjunction with OS/390 V5.1 and SYSPLEX support. However long running connections can be used with OS/390 V6.1 and SYSPLEX support.

Part 6. Installing and Configuring DB2 Clients

Chapter 15. Installing DB2 Clients

This section describes the different DB2 clients, and provides information on distributed installation, and thin client configuration.

Note: DB2 clients can connect to DB2 servers *two* releases later or *one* release earlier than the client's release level, as well as to servers at the same release level. For example, a DB2 Version 5.2 client can connect to DB2 Version 5.0, 5.2, 6.1, and 7.1 servers, while a DB2 Version 7.1 client can connect to DB2 Version 6.1 and 7.1 servers.

You may install a DB2 client on any number of workstations. For information about licensing, refer to your *License Information Booklet*.

You cannot create a database on a DB2 client, only connect to databases that reside on a DB2 server.

To go to the section that provides client installation instructions:
- "Chapter 16. Installing DB2 Clients on Windows 32-Bit Operating Systems" on page 177
- "Chapter 17. Installing DB2 Clients on OS/2 Operating Systems" on page 181
- "Chapter 18. Installing DB2 Clients on UNIX Operating Systems" on page 185

For information on how to install Version 7 DB2 clients on other platforms, refer to the *Installation and Configuration Supplement*.

To download installation packages for DB2 clients supported on other platforms, and pre-Version 7 clients, connect to the IBM DB2 Client Application Enabler Web site at http://www.ibm.com/software/data/db2/db2tech/clientpak.html

DB2 Run-Time Client

A DB2 Run-Time Client provides the ability for workstations from a variety of platforms to access DB2 databases.

DB2 Run-Time Clients are available for the following platforms: AIX, HP-UX, Linux, OS/2, NUMA-Q, Silicon Graphics IRIX, the Solaris Operating Environment, and Windows 32-bit operating systems.

DB2 Administration Client

A DB2 Administration Client provides the ability for workstations from a variety of platforms to access and administer DB2 databases. The DB2 Administration Client has all the features of the DB2 Run-Time Client and also includes all the DB2 Administration tools, documentation, and support for Thin Clients.

The DB2 Administration Client also includes the client components for DB2 Query Patroller, a sophisticated query management and workload distribution tool. In order to use Query Patroller, you must have a Query Patroller server installed. For more information refer to the *DB2 Query Patroller Installation Guide*.

DB2 Administration Clients are available for the following platforms: AIX, HP-UX, Linux, OS/2, Solaris, Windows 32-bit operating systems. For more information on using Administration Client tools, see "Administering DB2 for OS/390 and DB2 Connect Enterprise Edition servers with the Control Center" on page 223.

DB2 Application Development Client

The DB2 Application Development Client was known as the DB2 Software Development Kit (DB2 SDK) in previous versions of DB2. DB2 Application Development Client provides the tools and environment you need to develop applications that access DB2 servers and application servers that implement Distributed Relational Database Architecture (DRDA). You can build and run DB2 applications with a DB2 Application Development Client installed. You can also run DB2 applications on a DB2 Administration Client and a DB2 Run-Time Client.

DB2 Application Development Clients are available for the following platforms: AIX, HP-UX, Linux, OS/2, NUMA-Q, Silicon Graphics IRIX, the Solaris Operating Environment, and Windows 32-bit operating systems.

The applicable DB2 Application Development Client can be found on the server product CD-ROM. The DB2 Application Development Client for all platforms can be found on the set of DB2 Application Development Client CD-ROMs.

Distributed Installation

If you are planning to install DB2 products across your network, you may consider using a distributed installation. With a network-based installation, you can roll out multiple identical copies of DB2 products. For more information on performing a distributed installation, refer to the *Installation and Configuration Supplement*.

DB2 Thin Client

You can install a DB2 client for Windows 9x, Windows NT, or Windows 2000 on a code server, and have Thin Client workstations access the code across a LAN connection. Thin Client workstations function like any other DB2 client. In the setup, the main difference is that the DB2 client code is installed on a code server, and not individually on each workstation. Thin Client workstations need only a minimal configuration to set parameters and establish links to a code server. For more information on installing DB2 Thin Clients, refer to the *Installation and Configuration Supplement*.

Chapter 16. Installing DB2 Clients on Windows 32-Bit Operating Systems

This section contains the information you need to install a DB2 client on Windows 32-bit operating systems.

Before You Begin Installing

1. Ensure that your system meets all of the memory, hardware, and software requirements to install your DB2 client. For more information, see "Chapter 2. Planning for Installation" on page 25.

2. You require a user account to perform the installation.

   Windows 9x
   > Any valid Windows 9x user.

   Windows NT or Windows 2000
   > A user account that belongs to a group with more authority than the Guests group. For example, the Users group or the Power Users group. For information about installing on Windows NT or Windows 2000 without administrator authority, see "Installing Without Administrator Authority".

Installing Without Administrator Authority

When installing a DB2 client without administrator authority on Windows NT and Windows 2000, you will not be able to install these components:

- Control Center
- NetQuestion
- Integrated SNA Support

The following are some specific installation scenarios:

- *A user has installed a DB2 product without having administrator authority, and then an administrator installs a DB2 product on the same machine.* In this scenario, the installation performed by the administrator will remove the previous installation performed by the user without administrator authority, resulting in a clean installation of the DB2 product. The installation performed by the administrator will overwrite all of the user's services, shortcuts, and environment variables from the previous installation of DB2.

- *A user without administrator authority has installed a DB2 product, and then a second user without administrator authority attempts to install a DB2 product on*

the same machine. In this scenario, the installation by the second user will fail, and return an error message that the user must be an administrator to install the product.

- *An administrator has installed a DB2 product, and then a user without administrator authority attempts to install a DB2 single-user product on the same machine.* In this scenario, the installation being attempted by the user without administrator authority will fail, and return an error message saying that the user must be an administrator to install the product.

Installation Steps

To install a DB2 client, perform the following steps:

Step 1. Log on to the system with the user account that you want to use to perform the installation.

Step 2. Shut down any other programs so that the setup program can update files as required.

Step 3. Insert the appropriate CD-ROM into the drive. The auto-run feature automatically starts the setup program. The setup program 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 start, see the following tip:

> To manually invoke the setup program, perform the following steps:
> a. Click **Start** and select the **Run** option.
> b. In the **Open** field, enter the following command:
>
>   *x:*\setup /i *language*
>
>   where:
>   - *x:* represents your CD-ROM drive
>   - *language* represents the country code for your language (for example, EN for English). Table 29 on page 276 lists the code for each available language.
> c. Click **OK**.

Step 4. The DB2 Launchpad opens. It looks similar to the following:
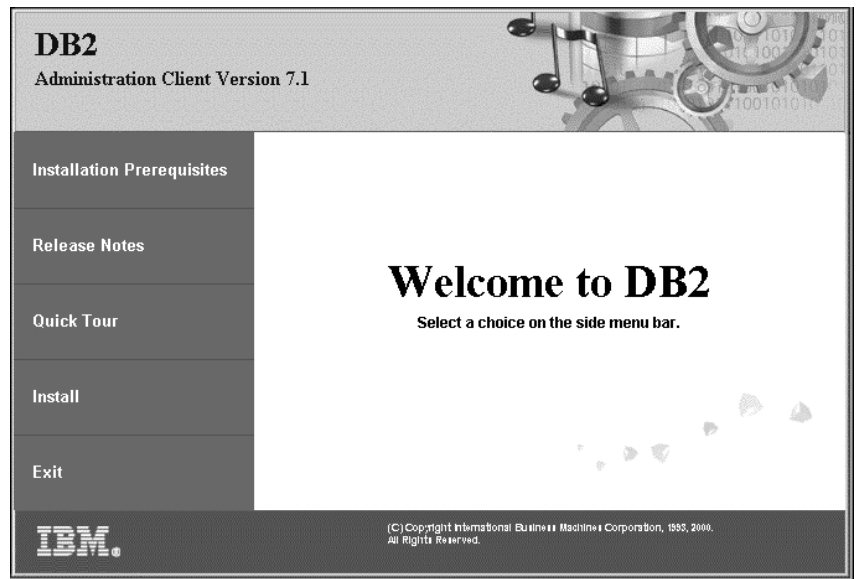
Step 5. From this window, you can view the Installation Prerequisites and the Release Notes, you can take a Quick Tour to explore the features, capabilities, and benefits of DB2 Universal Database Version 7, or you can proceed directly to the installation.

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. Invoke the online help by clicking **Help**, or by pressing **F1** at any time. You can click **Cancel** at any time to end the installation.

> For information on errors encountered during installation, see the db2.log file. The db2.log file stores general information and error messages resulting from the install and uninstall activities. By default, the db2.log file is located in the x:\db2log directory, where x: represents the drive on which your operating system is installed.
>
> For more information, refer to the *Troubleshooting Guide*.

The setup program performs the following actions:
- Create DB2 program groups and items (or shortcuts).
- Update the Windows registry.
- Create a default client instance called DB2.

To configure your client to access remote servers, go to "Chapter 19. Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 191.

Chapter 17. Installing DB2 Clients on OS/2 Operating Systems

This section contains the information that you need to install a DB2 client on OS/2 operating systems. If you have a pre-Version 7 DB2 client for OS/2, the WIN-OS/2 support installed will be kept at its current level.

If you want to run Windows 3.x applications on your OS/2 system, you must also install the DB2 Client Application Enabler for Windows 3.x on your system. For more information, connect to the IBM DB2 Client Application Enabler Web site at http://www.ibm.com/software/data/db2/db2tech/clientpak.html

Before You Begin Installing

Before you begin the installation, be sure that you have the following items and information:

1. Ensure that your system meets all of the memory, hardware, and software requirements to install your DB2 product. For more information, see "Chapter 2. Planning for Installation" on page 25.

2. The protocol to be used for host connectivity:

   __ a. Direct connection via SNA using Integrated SNA support or a third part SNA product.

   __ b. Direct connection via TCP/IP

   __ c. MPTN

3. A user ID to perform the installation.

   If UPM is installed, the user ID you specify must have *Administrator* or *Local Administrator* authority. Create a user ID with these characteristics if necessary.

   If UPM is not installed, DB2 will install it and set up the user ID USERID with password PASSWORD.

4. To verify that DB2 installed correctly, you will need to have a user account that belongs to the DB2 System Administrative (SYSADM) group, is 8 characters or less, and complies with all of DB2's naming rules.

   By default, any user that belongs to the *Local Administrators* group, on the local machine where the account is defined, has SYSADM authority on the instance. For more information, see "Working with the System Administrative Group" on page 251. For more information on valid DB2 usernames, see "Appendix D. Naming Rules" on page 281.

Installation Steps

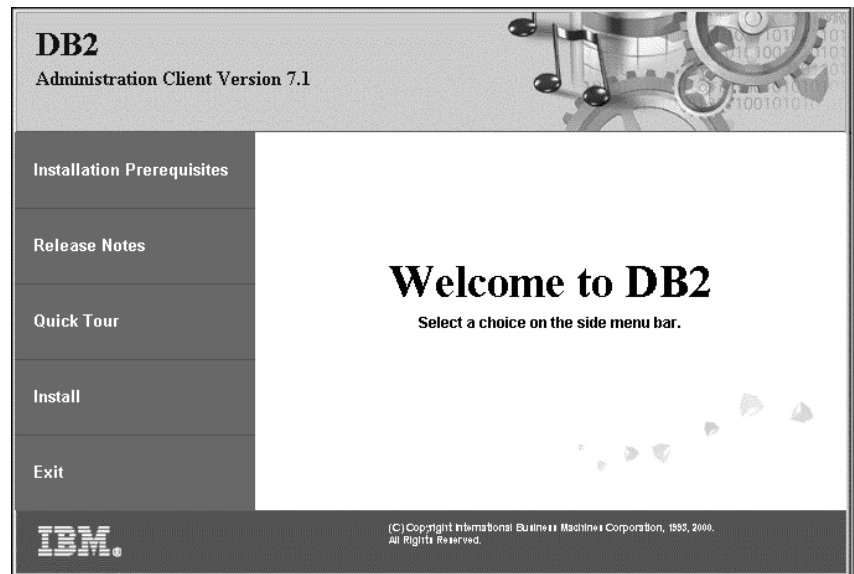To install a DB2 client for OS/2, perform the following steps:

Step 1. Insert the appropriate CD-ROM into the drive.

Step 2. Open an OS/2 command window, set the directory to your CD-ROM drive, and enter the following command:

```
x:\install
```

where *x* represents your CD-ROM drive.

Step 3. The DB2 Launchpad opens. It looks similar to the following:

Step 4. From this window, you can view the installation prerequisites and the release notes, you can take a Quick Tour to explore the features, capabilities, and benefits of DB2 Universal Database Version 7, or you can proceed directly to the installation.

Once you have initiated the installation, proceed by following the install program's prompts. Online help is available to guide you through the remaining steps. To invoke the online help, click **Help**, or press **F1**.

> For information on errors encountered during installation, see the `l1.log` and `l2.log` files. These files store general information and error messages resulting from installation and uninstall activities. By default, these files are located in the `x:\db2log` directory; where `x:` represents the drive on which your operating system is installed.
>
> For more information, refer to the *Troubleshooting Guide*.

To configure your client to access remote servers, go to "Chapter 19. Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 191.

If you want to use ODBC applications with OS/2, you must ensure that the \sqllib\dll\odbc.dll file appears as the first odbc.dll in the LIBPATH parameter of the config.sys file. The Install program does not automatically position the dynamic link library (dll) as of Version 7. If odbc.dll is not the first ODBC dll listed, you may have problems connecting to DB2 through ODBC applications.

Chapter 18. Installing DB2 Clients on UNIX Operating Systems

This section contains the information that you will need to install a DB2 client on a UNIX-based workstation.

Before You Begin

Before you begin installing a DB2 client using the db2setup utility, you need to ensure that your system meets all of the memory, hardware, and software requirements to install your DB2 product. For more information, see "Chapter 2. Planning for Installation" on page 25.

About the db2setup utility

We recommend that you use the db2setup utility to install DB2 products on UNIX-based systems. This utility leads you through the installation process using a simple interface that includes online help. Default values are provided for all required installation parameters, but you can also enter your own values.

The db2setup utility can:
- Create or assign groups and user IDs.
- Create a DB2 instance.
- Install product messages.

> **Note:** Documentation is available in HTML format on the product CD-ROM.

If you choose to install DB2 using another method, such as using your operating system's native administration tools, you will have to perform these tasks manually. For more information on installing DB2 manually, see your server platform's installation chapter.

The db2setup utility can generate a trace log to record errors during installation. To generate a trace log, run the **./db2setup -d** command. This generates a log in /tmp/db2setup.trc.

The db2setup utility works with Bash, Bourne, and Korn shells. Other shells are not supported.

Updating Kernel Configuration Parameters

This section applies only to DB2 clients running on HP-UX and NUMA-Q/PTX systems, and the Solaris** Operating Environment.

If you are installing a DB2 client on AIX, Linux, or SGI IRIX systems, go to "Installing Your DB2 Client" on page 189.

Before installing your DB2 client on a HP-UX, PTX or Solaris system, you may need to update your system's kernel configuration parameters. We recommend that you set your system's kernel configuration parameters to the values in the following sections:

- "HP-UX Kernel Configuration Parameters"
- "NUMA-Q/PTX Kernel Configuration Parameters" on page 187
- "Solaris Kernel Configuration Parameters" on page 188

HP-UX Kernel Configuration Parameters

Table 19 lists the recommended values for HP-UX kernel configuration parameters. These values are valid for DB2 clients running on HP-UX Version 11.

Note: You must reboot your machine after updating any kernel configuration parameters.

Table 19. HP-UX Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Recommended Value
msgseg	8192
msgmnb	65535 (1)
msgmax	65535 (1)
msgssz	16

Notes:

1. Parameters msgmnb and msgmax must be set to 65535 or higher.
2. To maintain the interdependency among kernel parameters, change parameters in the same sequence in which they appear in Table 19.

To change a value, perform the following steps:

Step 1. Enter the **SAM** command to start the System Administration Manager (SAM) program.

Step 2. Double-click on the **Kernel Configuration** icon.

Step 3. Double-click on the **Configurable Parameters** icon.

Step 4. Double-click on the parameter that you want to change and enter the new value in the **Formula/Value** field.

Step 5. Click on **OK**.

Step 6. Repeat these steps for all of the kernel configuration parameters that you want to change.

Step 7. When you are finished setting all of the kernel configuration parameters, select **Action —> Process New Kernel** from the action menu bar.

The HP-UX operating system automatically reboots after you change the values for the kernel configuration parameters.

After you have updated your kernel parameters, go to "Installing Your DB2 Client" on page 189 to continue with the installation.

NUMA-Q/PTX Kernel Configuration Parameters

Table 20 lists the recommended values for NUMA-Q/PTX kernel configuration parameters for DB2 clients.

Note: You must reboot your machine after updating any kernel configuration parameters.

Table 20. NUMA-Q/PTX Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Recommended Value
msgmax	65535
msgmnb	65535
msgseg	8192
msgssz	16

To modify your PTX kernel configuration parameters, perform the following steps:

Step 1. Log on as a user with root authority.

Step 2. Enter the menu command.

Step 3. Press A to select the **System Administration** option.

Step 4. Press C to select the **Kernel Configuration** option.

Step 5. Press Ctrl+F in the **Change Kernel Configuration Disk** form. If you want to build the new kernel in a disk other than the root disk, enter the disk and press Ctrl+F.

Step 6. In the Compile, Configure, or Remove a Kernel window, select the kernel configuration type with which your current kernel is built and press K.

Step 7. In the **Configure a kernel with site specific parameters** form, go down one page (press Ctrl+D), press A for **All** in the **Visibility level for parameter changes** and then press Ctrl+F.

Step 8. In the Configure Files With Adjustable Parameters window select ALL (press Ctrl+T) and press Ctrl+F.

Step 9. In the Tunable Parameters window, use arrow keys to navigate. Press `Ctrl+T` to select the parameter you want to change and press `Ctrl+F`.

Step 10. In the Detail of Parameter Expression(s) window, press `s` to set the new value.

Step 11. In the **Add site specific 'set' parameter** form, enter the new value and press `Ctrl+F`.

Step 12. Repeat steps 9 through 11 on page 66 to change the values of all other parameters that you want to change.

Step 13. Once you are done changing all the parameters, press `Ctrl+E` from the Tunable Parameters window.

Step 14. Compile the kernel.

Step 15. Press `Ctrl+X` to exit the menu.

Step 16. Reboot the system so that the changes can take effect.

Notes:

1. The `msgmax` and `msgmnb` must be set to 65535 or larger.

2. The `msgsem` parameter must be set no higher than 32767.

3. The `shmmax` must be set to 2147483647 or larger.

After you have updated your kernel parameters, go to "Installing Your DB2 Client" on page 189 to continue with the installation.

Solaris Kernel Configuration Parameters

Table 21 lists the recommended values for Solaris kernel configuration parameters.

Note: You must reboot your machine after updating any kernel configuration parameters.

Table 21. Solaris Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Recommended Value

`msgsys:msginfo_msgmax`
`msgsys:msginfo_msgmnb`
`msgsys:msginfo_msgseg`
`msgsys:msginfo_msgssz`
	65535 (1)
	65535 (1)
	8192
	16

Notes:

1. Parameters `msgsys:msginfo_msgmnb` and `msgsys:msginfo_msgmax` must be set to 65535 or higher.

To set a kernel parameter, add a line at the end of the /etc/system file as follows:

```
set parameter_name = value
```

where *parameter_name* represents the parameter you want to change.

For example, to set the value of parameter *msgsys:msginfo_msgmax*, add the following line to the end of the /etc/system file:

```
set msgsys:msginfo_msgmax = 65535
```

After you have updated your kernel parameters, go to "Installing Your DB2 Client" to continue with the installation.

Installing Your DB2 Client

After updating your kernel configuration parameters and rebooting your system (if necessary), you can install your DB2 client.

If you are installing a DB2 client from a remote server, it is better to use the **telnet** command to open a telnet session instead of using the **rlogin** command to connect to your remote server.

To install a DB2 client:
1. Log in as user with root authority.
2. Insert and mount the appropriate CD-ROM. For information on mounting CD-ROMs, see "Mounting CD-ROMs on UNIX Operating Systems" on page 252.
3. Change to the directory where the CD-ROM is mounted by entering the **cd /cdrom** command where **/cdrom** is the CD-ROM mount point.
4. Change to one of the following directories:

   AIX   /cdrom/db2/aix

   HP-UX Version 11   /cdrom/db2/hpux11

   Linux   /cdrom/db2/linux

   NUMA-Q/PTX   /cdrom/db2/numaq

   SGI/IRIX   /cdrom/db2/sgi

   Solaris   /cdrom/unnamed_cdrom/db2/solaris
5. Enter the **./db2setup** command. After a few moments the Install DB2 V7 window opens.
6. Select the product that you want to install and select **OK**.

   Press **Tab** to move between available options and fields. Press **Enter** to select or deselect an option. Selected options are denoted by an asterisk.

   When you select to install a DB2 product, you can choose the product's **Customize** option to view and change the components that will be installed.

Select **OK** to continue the installation process or **Cancel** to go back to a previous window. Select **Help** for more information or assistance during the installation of any DB2 product.

When installation is complete DB2 software will be installed in the *DB2DIR* directory,

where *DB2DIR*   = /usr/lpp/db2_07_01 on AIX
                          = /opt/IBMdb2/V7.1   on HP-UX, NUMA-Q/PTX, SGI IRIX, or Solaris
                          = /usr/IBMdb2/V7.1   on Linux

You can use the **db2setup** program add additional products or components after your initial installation. To create or add additional DB2 products and components, enter the following command:

On AIX

```
/usr/lpp/db2_07_01/install/db2setup
```

On HP-UX, PTX, SGI IRIX, or Solaris

```
/opt/IBMdb2/V7.1/install/db2setup
```

On Linux

```
/usr/IBMdb2/V7.1/install/db2setup
```

Your next step

After installing your DB2 client, you should configure it to access a remote DB2 Connect server. For more information see "Chapter 20. Configuring Client-to-Server Communications Using the Command Line Processor" on page 203.

Chapter 19. Configuring Client-to-Server Communications Using the Client Configuration Assistant

This chapter describes how to configure client-to-server communications using the Client Configuration Assistant (CCA). In an LDAP-enabled environment, you may not need to perform the tasks described in this chapter.

Notes:

1. The CCA is available for DB2 clients running on OS/2 and Windows 32–bit systems.
2. LDAP support is available for Windows, AIX, and the Solaris operating environment.

LDAP Directory Support Considerations

In an LDAP-enabled environment, the directory information about DB2 servers and databases is kept in the LDAP directory. When a new database is created, the database is automatically registered in the LDAP directory. During a database connection, the DB2 client goes to the LDAP directory to retrieve the required database and protocol information and uses this information to connect to the database. There is no need to run the CCA to configure LDAP protocol information.

You may still want to use the CCA in the LDAP environment to:
- Manually catalog a database in the LDAP directory
- Register a database as an ODBC data source
- Configure CLI/ODBC information
- Remove a database cataloged in the LDAP directory

For more information about the LDAP Directory Support, refer to the *Installation and Configuration Supplement*.

Before You Begin

When you add a database using this configuration method, the CCA will generate a default node name for the server where the database resides.

To complete the steps in this section, you should be familiar with how to start the CCA. For more information, see "Starting the Client Configuration Assistant" on page 247.

Note: To configure communications from a DB2 client to a server, the remote server must be configured to accept inbound client requests. By default, the server installation program automatically detects and configures most protocols on the server for inbound client connections. It is recommended that you install and configure the communications protocols desired on the server before installing DB2.

If you have added a new protocol to your network that is not detectable, or want to modify any of the default settings, refer to the *Installation and Configuration Supplement*.

Note: The Client Configuration Assistant (CCA) no longer supports DDCS Version 2.4 configuration profiles. Configuration profiles exported using DDCS Version 2.4 cannot be imported by CCA Version 7.

Configuration Steps

To configure your workstation to access a database on a remote server, perform the following steps:

Step 1. Log on to the system with a valid DB2 user ID. For more information, see "Appendix D. Naming Rules" on page 281.

> If you are adding a database to a system that has a DB2 Connect server product installed, log on to this system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority on the instance. For more information, see "Working with the System Administrative Group" on page 251.
>
> This restriction is controlled by the *catalog_noauth* database manager configuration parameter. For more information, refer to the *Administration Guide*.

Step 2. Start the CCA. For more information, see "Starting the Client Configuration Assistant" on page 247.

The Welcome window opens each time you start the CCA, until you add at least one database to your client.

Step 3. Click on the **Add** push button to configure a connection.

You can use one of the following configuration methods:
- "Adding a Database Using a Profile" on page 193.
- "Adding a Database Using Discovery" on page 194.
- "Adding a Database Manually" on page 196.

Adding a Database Using a Profile

A server profile contains information about server instances on a system, and databases within each server instance. For information on profiles, see "Creating and Using Profiles" on page 198.

If your administrator provided you with a profile, perform the following steps:

Step 1. Select the **Use a profile** radio button and click the **Next** push button.

Step 2. Click the **...** push button and select a profile. Select a remote database from the object tree that is displayed from the profile, and if the database selected is a gateway connection, select a connection route to the database. Click the **Next** push button.

Step 3. Enter a local database alias name in the **Database alias** field and optionally enter a comment that describes this database in the **Comment** field. Click **Next**.

Step 4. If you are planning to use ODBC, register this database as an ODBC data source.

> **Note:** ODBC must be installed to perform this operation.

   a. Ensure that the **Register this database for ODBC** check box is selected.

   b. Select the radio button that describes how you would like to register this database:

   - If you would like all users on your system to have access to this data source, select the **As a system data source** radio button.
   - If you would like only the current user to have access to this data source, select the **As a user data source** radio button.
   - If you would like to create an ODBC data source file to share database access, select the **As a file data source** radio button and enter the path and file name for this file in the **File data source name** field.

   c. Click the **Optimize for application** drop down box and select the application for which you want to tune the ODBC settings.

   d. Click **Finish** to add the database that you selected. The Confirmation window opens.

Step 5. Click the **Test Connection** push button to test the connection. The Connect to DB2 Database window opens.

Step 6. In the Connect To DB2 Database window, enter a valid user ID and password for the remote database and click **OK**. If the connection is successful, a message confirming the connection appears.

If the connection test failed, you will receive a help message. To change any settings you may have incorrectly specified, click the **Change** push button in the Confirmation window to return to the Add Database Wizard. If problems persist, refer to the *Troubleshooting Guide* for more information.

Step 7. You are now able to use this database. Click **Add** to add more databases, or click **Close** to exit the Add Database Wizard. Click **Close** again to exit the CCA.

Adding a Database Using Discovery

> This option cannot return information about DB2 systems earlier than Version 5 or any systems where an Administration Server is not running. For more information, refer to the *Administration Guide*.

You can use the Discovery feature to search a network for databases. To add a database to your system using Discovery, perform the following steps:

Step 1. Select the **Search the network** radio button and click the **Next** push button.

Step 2. Click the [+] sign beside the **Known Systems** icon to list all the systems known to your client.

Step 3. Click the [+] sign beside a system to get a list of the instances and databases on it. Select the database that you want to add, click the **Next** push button, and proceed to Step 4.

If the system that contains the database that you want to add is not listed, perform the following steps:

  a. Click on the [+] sign beside the **Other Systems (Search the network)** icon to search the network for additional systems.

  b. Click on the [+] sign beside a system to get a list of the instances and databases on it.

  c. Select the database that you want to add, click **Next**, and proceed to Step 4.

The Client Configuration Assistant may be unable to detect a remote system if:

- The Administration Server is not running on the remote system.
- The Discovery function times out. By default, the Discovery function will search the network for 40 seconds; this may 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 Discovery request is running on is configured so that the Discovery request does not reach the remote system desired.
- You are using NetBIOS as the Discovery protocol. You may need to set the *DB2NBDISCOVERRCVBUFS* registry variable to a larger value to enable the client to receive more concurrent Discovery replies.

For more information, refer to the *Administration Guide*.

If the system that you want to add is still not listed, it can be added to the list of systems by performing the following steps:

a. Click **Add System**. The Add System window opens.

b. Enter the required communication protocol parameters for the remote Administration Server and click **OK**. A new system is added. For more information, click **Help**.

c. Select the database that you want to add and click **Next**.

Step 4. Enter a local database alias name in the **Database alias** field and optionally enter a comment that describes this database in the **Comment** field. Click **Next**.

Step 5. If you are planning to use ODBC, register this database as an ODBC data source.

Note: ODBC must be installed to perform this operation.

a. Ensure that the **Register this database for ODBC** check box is selected.

b. Select the radio button that describes how you would like to register this database:

- If you would like all users on your system to have access to this data source, select the **As a system data source** radio button.
- If you would like only the current user to have access to this data source, select the **As a user data source** radio button.

- If you would like to create an ODBC data source file to share database access, select the **As a file data source** radio button and enter the path and file name for this file in the **File data source name** field.

   c. Click the **Optimize for application** drop down box and select the application for which you want to tune the ODBC settings.

   d. Click **Finish** to add the database that you selected. The Confirmation window opens.

Step 6. Click the **Test Connection** push button to test the connection. The Connect to DB2 Database window opens.

Step 7. In the Connect To DB2 Database window, enter a valid user ID and password for the remote database and click **OK**. If the connection is successful, a message confirming the connection appears.

If the connection test failed, you will receive a help message. To change any settings you may have incorrectly specified, click the **Change** push button in the Confirmation window to return to the Add Database Wizard. If problems persist, refer to the *Troubleshooting Guide* for more information.

Step 8. You are now able to use this database. Click **Add** to add more databases, or click **Close** to exit the Add Database Wizard. Click **Close** again to exit the CCA.

Adding a Database Manually

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 via the command line processor, however, the parameters are presented graphically for you.

To add a database to your system manually, perform the following steps:

Step 1. Select the **Manually configure a connection to a database** radio button and click **Next**.

Step 2. If you are using Lightweight Directory Access Protocol (LDAP), select the radio button that corresponds to the location where you would like your DB2 directories to be maintained:

- If you would like to maintain the DB2 directories locally, select the **Add database to your local machine** radio button and click **Next**.
- If you would like to maintain the DB2 directories globally at an LDAP server, select the **Add database using LDAP** radio button and click **Next**.

Step 3. Select the radio button that corresponds to the protocol that you want to use from the **Protocol** list.

If DB2 Connect (or the DB2 Connect Support Feature) is installed on your machine and you select TCP/IP or APPC, you can select **The database physically resides on a host or AS/400 system**. If you select this check box, you will have the option of selecting the type of connection that you want to make to the host or AS/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**.

Step 4. Enter the required communication protocol parameters and click **Next**. For more information, click **Help**.

Step 5. Enter 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 this is a host or AS/400 database, type the Location name for an OS/390 database, the RDB name for an AS/400 database, or the DBNAME for a VSE or VM database in the **Database name** field, and optionally add a comment that describes this database in the **Comment** field.

Click **Next**.

Step 6. Register this database as an ODBC data source.

Note: ODBC must be installed to perform this operation.

a. Ensure that the **Register this database for ODBC** check box is selected.

b. Select the radio button that describes how you would like to register this database:

- If you would like all users on your system to have access to this data source, select the **As a system data source** radio button.
- If you would like only the current user to have access to this data source, select the **As a user data source** radio button.
- If you would like to create an ODBC data source file to share database access, select the **As a file data source** radio button and enter the path and file name for this file in the **File data source name** field.

c. Click the **Optimize for application** drop down box and select the application for which you want to tune the ODBC settings.

d. Click **Finish** to add the database that you selected. The Confirmation window opens.

Step 7. Click the **Test Connection** push button to test the connection. The Connect to DB2 Database window opens.

Step 8. In the Connect To DB2 Database window, enter a valid user ID and password for the remote database and click **OK**. If the connection is successful, a message confirming the connection appears.

If the connection test failed, you will receive a help message. To change any settings you may have incorrectly specified, click the **Change** push button in the Confirmation window to return to the Add Database Wizard. If problems persist, refer to the *Troubleshooting Guide* for more information.

Step 9. You are now able to use this database. Click **Add** to add more databases, or click **Close** to exit the Add Database Wizard. Click **Close** again to exit the CCA.

You can use the Export function of the CCA to create a client profile for an existing client configuration and use it to create identical target clients across your network. A client profile contains database connection, ODBC/CLI, and configuration information for an existing client. Use the CCA Import function to set up multiple clients across your network. Each target client will have the same configuration and settings as the existing client. For more information on creating and using client profiles, see "Creating and Using Profiles".

> You have now completed all the tasks that are involved in Quick Beginnings and are ready to start using DB2 Connect.
>
> If you want to deploy this product using a distributed installation, refer to the *Installation and Configuration Supplement*.

Creating and Using Profiles

The information in this section describes how to create and use profiles to set up connections between DB2 clients and servers. To configure database connections on a DB2 client, you can use either a server profile or client profile.

Server Profiles

A server profile contains information about instances on a server system, and databases within each instance. The information for each instance includes the protocol information required to set up a client to connect to databases in that instance.

> We recommend that you create a server profile only after you have created the DB2 databases that you want your remote clients to access.

To create a server profile, perform the following steps:

Step 1. Start the Control Center. For more information, refer to "Starting the DB2 Control Center" on page 247.

Step 2. Select the system that you want to create a profile for and right click.

If the system that you want to create a profile for is not shown, select the **Systems** icon, click the right mouse button, and select the **Add** option. Click the **Help** push button and follow the online help.

Step 3. Select the **Export Server Profile** option.

Step 4. Enter a path and filename for this profile and select **OK**.

> You are ready to use this profile on your system. For more information on how to add a database to your system using a server profile, go to "Configuration Steps" on page 192.

Client Profiles

Information in a client profile can be used to configure clients using the Import function in the Client Configuration Assistant (CCA). Clients can import all or a subset of the configuration information in a profile. The following scenario assumes that the database connections configured on one client will be exported and used to set up one or more clients.

Note: Configuration profiles can also be imported using the **db2cfimp** command. Refer to the *Command Reference* for more information.

A client profile is generated from a client using the Export function of the CCA. The information contained in a client profile is determined during the export process. Depending on the settings chosen, it can contain the existing client's:

- Database connection information (including CLI or ODBC settings).
- Client settings (including database manager configuration parameters and DB2 registry variables).
- CLI or ODBC common parameters.
- Configuration data for the local APPC or NetBIOS communications subsystem.

To create a client profile, perform the following steps:

Step 1. Start the CCA. For more information, see "Starting the Client Configuration Assistant" on page 247.

Step 2. Click **Export**. The Select Export Option window opens.

Step 3. Select one of the following export options:

- If you want to create a profile that contains all of the databases cataloged on your system, and all of the configuration information for this client, select the **All** radio button, click **OK**, and go to Step 8.
- If you want to create a profile that contains all of the databases cataloged on your system *without* any of the configuration information for this client, select the **Database connection information** radio button, click **OK**, and go to Step 8.
- If you want to select a subset of the databases that are cataloged on your system, or a subset of the configuration information for this client, select the **Customize** radio button, click **OK**, and go to the next step.

Step 4. Select the databases to be exported from the **Available databases** box and add them to the **Selected databases** box by clicking on the push button.

> To add all of the available databases to the **Databases to be exported** box, click the **>>** button.

Step 5. Select the check boxes from the **Select custom export option** box that correspond to the options that you want to set up for the target client.

To customize settings, click on the appropriate **Customize** push button. The settings that you customize will only affect the profile to be exported, no changes will be made to your workstation. For more information, click **Help**.

Step 6. Click **OK**. The Export Client Profile window opens.

Step 7. Enter a path and file name for this client profile and click **OK**. The DB2 Message window appears.

Step 8. Click **OK**.

To import a client profile, perform the following steps:

Step 1. Start the CCA. For more information, see "Starting the Client Configuration Assistant" on page 247.

Step 2. Click **Import**. The Select Profile window opens.

Step 3. Select a client profile to import and click **OK**. The Import Profile window opens.

Step 4. You can select to import all or a subset of the information in a Client Profile. Select one of the following import options:

- To import everything in a client profile, select the **All** radio button.

- To import a specific database, or settings, that are defined in a Client Profile, select the **Customize** radio button. Select the check boxes that correspond to the options that you want to customize.

Step 5. Click **OK**.

> If you selected the **All** radio button, you are now ready to start using your DB2 product. For more advanced topics, refer to the *Administration Guide* and the *Installation and Configuration Supplement*.

Step 6. You are presented with a list of systems, instances, and databases. Select the database that you want to add and click **Next**.

Step 7. Enter a local database alias name in the **Database alias** field and optionally enter a comment that describes this database in the **Comment** field. Click **Next**.

Step 8. If you are planning to use ODBC, register this database as an ODBC data source.

  Note: ODBC must be installed to perform this operation.

  a. Ensure that the **Register this database for ODBC** check box is selected.

  b. Select the radio button that describes how you would like to register this database:
    - If you would like all users on your system to have access to this data source, select the **As a system data source** radio button.
    - If you would like only the current user to have access to this data source, select the **As a user data source** radio button.
    - If you would like to create an ODBC data source file to share database access, select the **As a file data source** radio button and enter the path and file name for this file in the **File data source name** field.

  c. Click the **Optimize for application** drop down box and select the application for which you want to tune the ODBC settings.

  d. Click **Finish** to add the database that you selected. The Confirmation window opens.

Step 9. Click the **Test Connection** push button to test the connection. The Connect to DB2 Database window opens.

Step 10. In the Connect To DB2 Database window, enter a valid user ID and password for the remote database and click **OK**. If the connection is successful, a message confirming the connection appears.

If the connection test failed, you will receive a help message. To change any settings you may have incorrectly specified, click the **Change** push button in the Confirmation window to return to the

Add Database Wizard. If problems persist, refer to the *Troubleshooting Guide* for more information.

Step 11. You are now able to use this database. Click **Add** to add more databases, or click **Close** to exit the Add Database Wizard. Click **Close** again to exit the CCA.

Chapter 20. Configuring Client-to-Server Communications Using the Command Line Processor

This section describes how to configure a client to communicate with a server using the command line processor (CLP).

If you plan to use an OS/2 or Windows 32-bit client to communicate with a server, the Client Configuration Assistant (CCA) makes it easy to automate configuration and administration tasks. If you have installed the CCA, it is recommended that you use this tool to configure your OS/2 or Windows 32-bit client for communications. For more information see "Chapter 19. Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 191.

To configure a client to communicate with a server, the remote server must be configured to accept in-bound requests for the communications protocols that you want to use. By default, the installation program automatically detects and configures most protocols running on your server.

If you have added a new protocol to your network, or want to change any of the default settings on the server, refer to the *Installation and Configuration Supplement*.

For instructions on entering DB2 commands, see "Entering Commands Using the Command Center" on page 248 or "Entering Commands Using the Command Line Processor" on page 249.

Go to the section that describes how to configure communications to access a remote server using the communication protocol of your choice:

- For TCP/IP, see "Configuring TCP/IP on the Client".
- For APPC, refer to the *Installation and Configuration Supplement*.

Configuring TCP/IP on the Client

This section assumes that TCP/IP is functional on the client and server workstations. See "Software Requirements" on page 27 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 34 for the supported communication protocols for your particular client and server.

To set up TCP/IP communications on a DB2 client, perform the following steps:

Step 1. Identify and record parameter values.

Step 2. Configure the client:

    a. Resolve the server's host address.

    b. Update the services file.

    c. Catalog a TCP/IP node.

    d. Catalog the database.

Step 3. Test the connection between the client and server.

> Due to the characteristics of the TCP/IP protocol, TCP/IP may not be immediately notified of the failure of a partner on another host. As a result, a client application accessing a remote DB2 server using TCP/IP, or the corresponding agent at the server, may sometimes appear to be hung. DB2 uses the TCP/IP SO_KEEPALIVE socket option to detect when there has been a failure and the TCP/IP connection has been broken.
>
> If you are experiencing problems with your TCP/IP connection, refer to the *Troubleshooting Guide* for information on how to adjust this parameter and other common TCP/IP problems.

Step 1. Identify and Record Parameter Values

As you proceed through the configuration steps, complete the *Your Value* column in the following table. You can fill in some of the values before you start configuring this protocol.

Table 22. TCP/IP Values Required at the Client

Parameter	Description	Sample Value	Your Value

Host Name
• Hostname (*hostname*)
  or
• IP address (*ip_address*)
	Use the *hostname* or *ip_address* of the remote server workstation.
	
	To resolve this parameter:
	• Enter the **hostname** command at the server to obtain the *hostname*.
	• Contact your network administrator to obtain the *ip_address* or enter the **ping** *hostname* command.
	• On UNIX systems, you can also use the *DB2*/**bin/hostlookup** *hostname* command.
	  where *DB2* is the directory where DB2 is installed.
		serverhost
		
		or
		
		9.21.15.235	

Table 22. TCP/IP Values Required at the Client (continued)

Parameter	Description	Sample Value	Your Value
Service Name • Connection Service name (*svcename*) or • Port number/Protocol (*port_number/tcp*)	Values required in the `services` file. The Connection Service name is an arbitrary local name that represents the connection port number (*port_number*) on the server. The port number must be the same as the port number that the *svcename* parameter maps to in the `services` file at the server. (The *svcename* parameter is located in the database manager configuration file on the server.) This value must not be in use by any other applications, and must be unique within the `services` file. Contact your database administrator for the values used to configure the server.	server1 3700/tcp	
Node name (*node_name*)	A local alias, or nickname, that describes the node to which you are trying to connect. You can choose any name you want; however, all node name values within your local node directory must be unique.	db2node	

Step 2. Configure the Client

The following steps configure the client to communicate with the server using TCP/IP. Replace the sample values with your worksheet values.

A. Resolve the Server's Host Address

> If your network has a name server, or you are planning to directly specify the IP address (*ip_address*) of the server, skip this step and proceed to "Step B. Update the Services File" on page 206.

The client must know the IP address of the server to which it is attempting to establish communications. If a name server does not exist on your network, you may directly specify a hostname that maps to the IP address (*ip_address*)

of the server in the local hosts file. See Table 23 for the location of the hosts file for your particular platform.

If you are planning on supporting a UNIX client that is using Network Information Services (NIS), and you are not using a name server on your network, you must update the hosts file located on your NIS master server.

Table 23. Location of the Local Hosts and Services Files

Platform	Location
OS/2	Specified by the *etc* environment variable. Enter the **set etc** command to determine the location of your local hosts or services files.
Windows NT or Windows 2000	Located in the winnt\system32\drivers\etc directory.
Windows 9x	Located in the windows directory.
UNIX	Located in the /etc directory.

Edit the client's hosts file and add an entry for the server's hostname. For example:

```
9.21.15.235     serverhost   # host address for serverhost
```

where:

9.21.15.235   represents the *ip_address*

serverhost   represents the *hostname*

represents a comment describing the entry

If the server is not in the same domain as the client, you must provide a fully qualified domain name such as serverhost.vnet.ibm.com, where vnet.ibm.com is the domain name.

Step B. Update the Services File

> If you are planning to catalog a TCP/IP node using a port number (*port_number*), skip this step and go to "Step C. Catalog a TCP/IP Node" on page 207.

Using a local text editor, add the Connection Service name and port number to the client's services file for TCP/IP support. For example:

```
server1  3700/tcp  # DB2 connection service port
```

where:

server1 represents the Connection Service name

3700   represents the connection port number. The port number specified on the client must match the port number used on the server.

tcp   represents the communication protocol that you are using

represents a comment describing the entry

If you are planning on supporting a UNIX client that uses Network Information Services (NIS), you must update the `services` file located on your NIS master server.

The `services` file is located in the same directory as the local `hosts` file that you may have edited in "A. Resolve the Server's Host Address" on page 205.

See Table 23 on page 206 for the location of the services file for your particular platform.

Step C. Catalog a TCP/IP Node

You must add an entry to the client's node directory to describe the remote node. This entry specifies the chosen alias (*node_name*), the *hostname* (or *ip_address*), and the *svcename* (or *port_number*) that the client will use to access the remote server.

To catalog a TCP/IP node, perform the following steps:

Step 1.   Log on to the system with a valid DB2 user ID. For more information, see "Appendix D. Naming Rules" on page 281.

> If you are adding a database to a system that has a DB2 Connect server product installed, log on to this system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority on the instance. For more information, see "Working with the System Administrative Group" on page 251.
>
> This restriction is controlled by the *catalog_noauth* database manager configuration parameter. For more information, refer to the *Administration Guide*.

Step 2.   If you are using a UNIX client, run the start-up script as follows:

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

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

Step 3.   Catalog the node by entering the following commands:

```
db2 "catalog tcpip node node_name remote [hostname|ip_address]
  server [svcename|port_number]"
db2 terminate
```

For example, to catalog the remote server *serverhost* on the node called *db2node*, using the service name *server1*, enter the following:

```
db2 catalog tcpip node db2node remote serverhost server server1
db2 terminate
```

To catalog a remote server with the IP address *9.21.15.235* on the node called *db2node*, using the port number *3700*, enter the following:

```
db2 catalog tcpip node db2node remote 9.21.15.235 server 3700
db2 terminate
```

🔍	If you need to change values that were set with the **catalog node** command, perform the following steps: Step 1. Run the **uncatalog node** command in the command line processor as follows: `db2 uncatalog node node_name` Step 2. Recatalog the node with the values that you want to use.

Step D. Catalog the Database

Before a client application can access a remote database, the database must be cataloged on the server node and on any client nodes that will connect to it. By default, when you create a database, it is automatically cataloged on the server with the database alias (*database_alias*) the same as the database name (*database_name*). The information in the database directory, along with the information in the node directory, is used on the client to establish a connection to the remote database.

To catalog a database on the client, perform the following steps:

Step 1. Log on to the system with a valid DB2 user ID. For more information, see "Appendix D. Naming Rules" on page 281.

🔍	If you are adding a database to a system that has a DB2 Connect server product installed, log on to this system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority on the instance. For more information, see "Working with the System Administrative Group" on page 251. This restriction is controlled by the *catalog_noauth* database manager configuration parameter. For more information, refer to the *Administration Guide*.

Step 2. Fill in the *Your Value* column in the following worksheet.

Table 24. Worksheet: Parameter Values for Cataloging Databases

Parameter	Description	Sample Value	Your Value
Database name (*database_name*)	The database alias (*database_alias*) of the *remote* database. When you create a database, it is automatically cataloged on the server with the database alias (*database_alias*) the same as the database name (*database_name*), unless specified otherwise.	sample	
Database alias (*database_alias*)	An arbitrary local nickname for the remote database, on the client. If you do not provide one, the default is the same as the database name (*database_name*). The database alias is the name that you use when connecting to the host or AS/400 database server from the DB2 Connect server.	tor1	
Authentication (*auth_value*)	The value of the authentication required by your enterprise. Please refer to the *DB2 Connect User's Guide* for more information on this parameter.	DCS This means that the userid and password supplied are validated at the host or AS/400 only.	
Node name (*node_name*)	The name of the node directory entry that describes where the database resides. Use the same value for node name (*node_name*) that you used to catalog the node in the previous step.	db2node	

Step 3. If you are using a UNIX client, run the start-up script as follows:

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

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

Step 4. Catalog the database by entering the following commands:

```
catalog database database_name as database_alias at node node_name
    authentication auth_type
terminate
```

For example, to catalog a remote database called *sample* so that it has the alias *tor1*, on the node *db2node*, enter the following commands:

```
catalog database sample as tor1 at node db2node
    authentication dcs
terminate
```

> If you need to change values that were set with the **catalog** *database* command, perform the following steps:
>
> Step a. Run the **uncatalog database** command as follows:
>
> > db2 uncatalog database *database_alias*
>
> Step b. Recatalog the database with the value that you want to use.

Step 3. Test the Client-to-Server Connection

After configuring the client for communications, you will need to connect to a remote database to test the connection.

Step 1. Start the database manager by entering the **db2start** command on the server (if it was not automatically started at boot time).

Step 2. If you are using a UNIX client, run the start-up script as follows:

```
. INSTHOME/sqllib/db2profile    (for Bash, Bourne or Korn shell)
source INSTHOME/sqllib/db2cshrc (for C shell)
```

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

Step 3. Enter the following command on the client to connect the client to the remote database:

```
db2 connect to database_alias user userid using password
```

The values for userid and password must be valid for the system on which they are authenticated. By default, authentication takes place on the server for a DB2 server and on the host or AS/400 machine for a DB2 Connect server.

If the connection is successful, you will get a message showing the name of the database to which you have connected. You are now able to retrieve data from that database. For example, to retrieve a list of all the table names listed in the system catalog table, enter the following SQL command in the Command Center or CLP:

```
"select tabname from syscat.tables"
```

When you are finished using the database connection, enter the **command reset** command to end the database connection.

> You are now ready to start using DB2. For more advanced topics, refer to the *Administration Guide* and the *Installation and Configuration Supplement*.

Troubleshooting the Client-to-Server Connection

If the connection fails, check the following items:

At the *server*:

1. The *db2comm* registry value includes the value `tcpip`.

> Check the settings for the *db2comm* registry value by entering the **db2set DB2COMM** command. For more information, refer to the *Administration Guide*.

2. The services file was updated correctly.
3. The service name (*svcename*) parameter was updated correctly in the database manager configuration file.
4. The security service was started. Enter the **net start db2ntsecserver** command (for Windows NT and Windows 2000 servers only).
5. The database was created and cataloged properly.
6. The database manager was stopped and started again (enter the **db2stop** and **db2start** commands on the server).

> For more information on the `db2diag.log` file, refer to the *Troubleshooting Guide*.

At the *client*:

1. If used, the `services` and `hosts` files were updated correctly.
2. The node was cataloged with the correct hostname (*hostname*) or IP address (*ip_address)*.
3. The port number matches, or the sevices name maps to, the port number used on the server.
4. The node name (*node_name*) that was specified in the database directory points to the correct entry in the node directory.
5. The database was cataloged properly, using the *server's* database alias (the *database_alias* that was cataloged when the database was created on the server), as the database name (*database_name*) on the client.

If the connection still fails after you verify these items, refer to the *Troubleshooting Guide*.

Chapter 21. Control Center Installation and Configuration

This chapter describes how to install and configure the DB2 Control Center.

The Control Center is the main DB2 graphical tool for administering your database. It is available on Windows 32-bit, OS/2, and UNIX operating systems.

The Control Center provides a clear overview of all the systems and database objects being managed. You can also access other administration tools from the Control Center by selecting icons on the Control Center toolbar or from the Tools pop-up menu.

Application versus Applet

You can run the Control Center either as a Java application or as a Java applet through a web server. In both cases you need a supported Java Virtual Machine (JVM) installed on your machine to run the Control Center. A JVM can be a Java Runtime Environment (JRE) for running applications, or a Java-enabled browser for running applets.

- Java *applications* run just like other applications on your machine, provided you have the correct JRE installed.

  On Windows 32-bit operating systems, the correct JRE level was installed or upgraded for you during DB2 installation.

  On AIX systems, the correct JRE was installed for you during DB2 installation only if another JRE was not detected on your system. If another JRE was detected on your AIX system during DB2 installation, the JRE that comes with DB2 was not installed. In this case, you must install the correct JRE level before running the Control Center.

  On all other operating systems you must install the correct JRE level before running the Control Center. See Table 26 on page 215 for a list of correct JRE levels.

  Note: Some operating systems, including OS/2 Warp Server for e-business and AIX 4.3, have built-in Java support. For more information, check with your administrator.

- Java *applets* are programs that run within Java-enabled browsers. The Control Center applet code can reside on a remote machine and is served to the client's browser through a web server. This type of client is often called a *thin client* because a minimal amount of resources (a Java-enabled browser) is required to run the Java applet.

You must use a supported Java-enabled browser to run the Control Center as a Java applet. See Table 26 on page 215 for a list of supported browsers.

Machine Configurations

You can set up your Control Center in a number of different ways. The following table identifies four scenarios, each showing a different way of installing the required components. These scenarios are referenced throughout the Control Center Services Setup (Applet Mode only) section that follows the table.

Table 25. Control Center Machine Configuration Scenarios

Scenario	Machine A	Machine B	Machine C
1 - Stand-alone, Application	JRE Control Center application DB2 server		
2 - Two Tier, Application	JRE Control Center application DB2 client		DB2 server
3 - Two Tier, Browser	Supported Browser (Windows and OS/2 only) Control Center applet	Web server JDBC Applet Server DB2 server	
4 - Three Tier, Browser	Supported Browser (Windows and OS/2 only) Control Center applet	JDBC Applet Server DB2 client	DB2 server

Figure 7 on page 215 summarizes the four basic Control Center machine configurations:
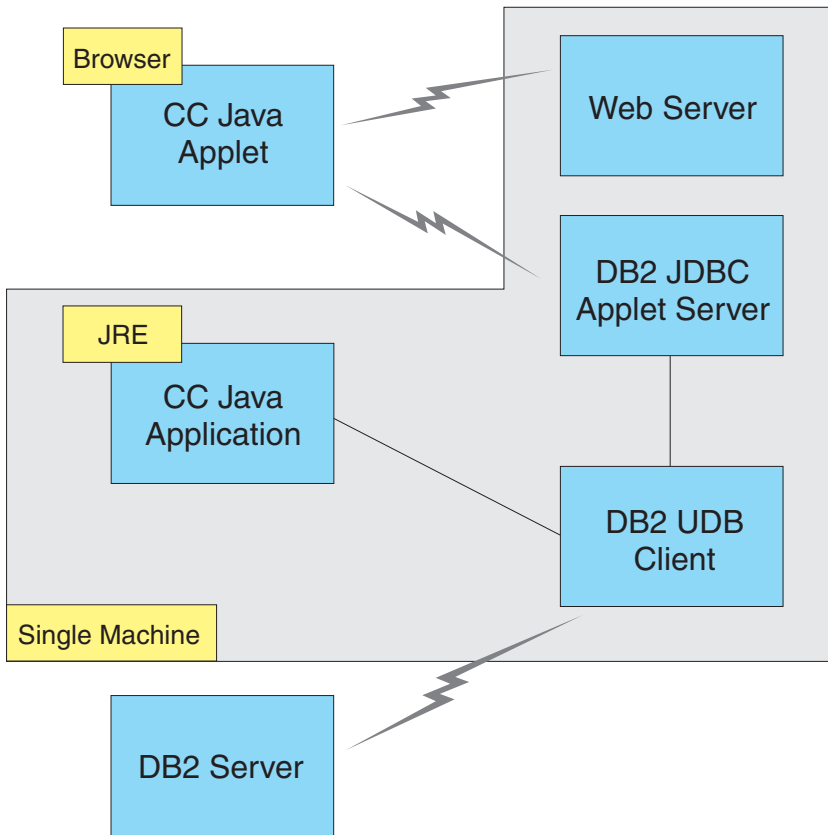
Figure 7. DB2 Control Center machine configurations

Supported Java Virtual Machines for the Control Center

The following table lists supported Java Virtual Machines (JREs and browsers) required to run the Control Center as an application or applet:

Table 26. Supported Java Virtual Machines (JVMs) for the Control Center

Operating System	Correct Java Runtime Environments	Supported Browsers
Windows 32-bit	JRE 1.1.8 (automatically installed or updated by DB2, if necessary)	Netscape 4.5 or higher (shipped), or IE 4.0 Service Pack 1 or higher
AIX	JRE 1.1.8.4 (automatically installed if no other JREs detected)	None
OS/2	JRE 1.1.8	Netscape 4.6 (shipped)
Linux	JRE 1.1.8	None

Table 26. Supported Java Virtual Machines (JVMs) for the Control Center (continued)

Operating System	Correct Java Runtime Environments	Supported Browsers
Solaris	JRE 1.1.8	None
HP-UX 11	JRE 1.1.8	None
IRIX	JRE 1.1.8 (3.1.1 SGI) + Cosmo code 2.3.1	None
PTX	JRE 1.1.8	None

For the latest information on supported JREs and browsers, go to http://www.ibm.com/software/data/db2/udb/db2cc

Setting Up and Working with the Control Center

This section describes how to set up and customize the Control Center for your environment.

Control Center Services Setup (Applet Mode only)

If you will run the Control Center as an application, skip this section and go to "Running the Control Center as a Java Application" on page 218.

To set up the Control Center to run as an applet:

1. Start the Control Center JDBC Applet Server.
2. On Windows NT or Windows 2000, start the security server.

1. Start the Control Center JDBC Applet Server
To start the Control Center JDBC Applet Server, enter the **db2jstrt** *6790* command, where *6790* represents any 4-digit port number that is not already in use.

We recommend that you start the Control Center JDBC Applet Server with a user account that has SYSADM authority.

The first time you start the Control Center JDBC Applet Server, it will create several node directory entries, together with various files for administration purposes. In Scenarios 1 and 3 in "Machine Configurations" on page 214, all of these administration files and directory entries will be created in the current DB2 instance.

Most DB2 resources are accessed over **database connect** or **instance attach**. In both cases the user must supply valid user ID and password combinations to gain access. However, some resources are accessed directly by the Control Center JDBC Applet Server, including the database and node directories (catalogs), and the Command Line Processor. Access to these resources is

performed by the Control Center JDBC Applet Server on behalf of the logged in Control Center user. Both the user and the server are required to have the proper authorization before access will be granted. For example, to update the database directory, a minimum of SYSCTRL authority is required.

It is possible to run an instance of the Control Center JDBC Applet Server with any level of security, but you will be unable to update certain resources such as database and node directories. In particular, you may encounter a **SQL1092N** message informing you of the lack of authorization for a request. The user specified in the message can be either the user signed into Control Center, or the user account running the Control Center JDBC Applet Server.

On Windows NT, you can start the Control Center JDBC Applet Server by clicking **Start** and selecting **Settings —> Control Panel —> Services**. Select the **DB2 JDBC Applet Server - Control Center** service and click **Start**.

On Windows 2000, you can start the Control Center JDBC Applet Server by clicking **Start** and selecting **Settings —> Control Panel —> Administrative Tools —> Services**. Select the **DB2 JDBC Applet Server - Control Center** service, click the **Action** menu and then select **Start**.

On any system, you can start the Control Center JDBC Applet Server by entering:

```
net start DB2ControlCenterServer
```

This step is not required if your Control Center JDBC Applet Server is autostarted.

If you start the Control Center JDBC Applet Server as a Windows NT or Windows 2000 service, you must configure the startup in the services dialog to change the account information.

2. Start the Windows NT or Windows 2000 Security Server
To work with the Control Center on Windows NT or Windows 2000, the security server must be running. During DB2 installs, the Security Server is usually set up to autostart.

You can check if the Security Server is running on Windows NT by clicking **Start** and selecting **Settings —> Control Panel —> Services**.

On Windows 2000, click **Start** and select **Settings —> Control Panel —> Administrative Tools —> Services**.

If the **DB2 Security Server** is not started on Windows NT, select it and click **Start**. On Windows 2000, select the **Action** menu and click **Start**.

After you have started the Control Center JDBC Applet Server and started the Windows NT or Windows 2000 security server (if necessary), go to "Running the Control Center as a Java Applet".

Working with the Control Center

You can run the Control Center as a Java application or as a Java applet. If your environment is configured similar to Scenarios 1 or 2 in Table 25 on page 214, you must run the Control Center as an application. If your environment is configured like Scenarios 3 or 4, you must run it as an applet.

Running the Control Center as a Java Application

To run the Control Center as a Java application, you must have the correct Java Runtime Environment (JRE) installed. See Table 26 on page 215 for the correct JRE level for your operating system.

1. To start the Control Center as an application:

   On Windows 32-bit operating systems:
   Click **Start** and select **Programs —> IBM DB2 —> Control Center**.

   On OS/2:
   Open the **IBM DB2** folder and double-click on the **Control Center** icon.

   On all supported platforms:
   Start the Control Center from a command prompt by entering the **db2cc** command.

2. The DB2 Control Center window opens.

3. You can start working with the Control Center without an existing database by creating a sample database. Enter the **db2sampl** command on the DB2 Universal Database server. On UNIX operating systems, ensure that you are logged in to the DB2 instance before you enter the **db2sampl** command.

Running the Control Center as a Java Applet

To run the Control Center as a Java applet, you must have a Web server set up on the machine that contains the Control Center applet code and the Control Center JDBC Applet Server. The Web server must allow access to the sqllib directory.

If you choose to use a virtual directory, substitute this directory for the home directory. For example, if you map sqllib to a virtual directory called temp on a server named yourserver, a client would use the URL: http://yourserver/temp

If you do not have the DB2 documentation installed and you would like to configure your web server to work with DB2's online documentation, refer to the *Installation and Configuration Supplement*.

To run Control Center as an applet on Windows 32-bit or OS/2 operating systems, you must run **db2classes.exe** on the machine where the DB2 JDBC Applet Server resides to unzip the required Java class files. On UNIX-based systems, you must uncompress and untar **db2classes.tar.Z** to make the required Java class files available.

To load the Control Center HTML page, perform the following steps:

1. Start the **Control Center Launch** page through your web server. In your browser, select **File –> Open Page**. The **Open Page** dialog box appears. Enter the URL of your Web server and the main Control Center page and click on the **Open** push button. For example, if your server is named yourserver, you would open http://yourserver/cc/prime/db2cc.htm

2. In the **Server port** field, enter a value for the Control Center JDBC Applet Server port. The default server port value is 6790.

3. Click on the **Start Control Center** push button.

4. The Control Center Sign On window opens. Enter your user ID and password. This user ID must have an account on the machine that is running the Control Center JDBC Applet Server. Your initial logon will be used for all database connections. It can be changed from the Control Center pull-down menu. A unique user profile will be assigned to each user ID. Click **OK**.

5. The DB2 Control Center window opens.

6. You can start working with the Control Center without an existing database by creating a sample database. Enter the **db2sampl** command on the DB2 Universal Database server. On UNIX operating systems, ensure that you are logged in to the DB2 instance before you enter the **db2sampl** command.

Customizing Your Control Center HTML File
To automatically start the Control Center the next time you open db2cc.htm, perform the following steps:

- For Scenarios 1 or 2, modify the autoStartCC parameter tag in db2cc.htm from

  ```
  param name="autoStartCC" value="false"
  ```

  to

  ```
  param name="autoStartCC" value="true"
  ```

- For Scenarios 3 or 4, modify the autoStartCC, hostNameText, and portNumberText parameter tags in db2cc.htm to

  ```
  param name="autoStartCC" value="true"
  param name="hostNameText" value="yourserver"
  param name="portNumberText" value="6790"
  ```

where yourserver represents the Server name or IP address and 6790 represents the server port value of the machine to which you want to connect.

Configuring Your Web Server to Work with the Control Center
For general web server configuration information, consult the setup documentation that came with your web server.

For more information on serving DB2 online documentation through a web server, refer to the *Installation and Configuration Supplement*.

Functional Considerations

If you are using the Control Center over the Internet, be aware that there is no encryption of the data flow between the Control Center JDBC Applet Server and the browser.

To use the color options of Visual Explain on Netscape, you must set your operating system to support more than 256 colors.

On OS/2 systems, you must install the Control Center on an HPFS-formatted drive. DB2 does not support the installation of the Control Center on an OS/2 FAT drive, because an OS/2 FAT drive does not support long filenames required by Java.

Every activity will be associated with an explicit DB2 connection or attachment. For security purposes, every DB2 activity will be validated.

When you are using the Control Center under Scenarios 3 or 4, the local system is Machine B. The local system is the system name as it appears in the DB2 Control Center window.

Installation Tips for Control Center Help on UNIX Operating Systems

When installing the Control Center online help on UNIX operating systems you should keep the following in mind:

- You should install the Control Center help and the product documentation at the same time. If you install the Control Center help and the DB2 online product documentation separately, you can expect the second installation to take some time. This is true regardless of which package is installed first.
- You must select the Control Center help for any non-English language explicitly. Installing the product messages for a particular language does not mean that the Control Center help for that language is automatically installed. However, if you install the Control Center help for a particular language, the product messages for that language are installed automatically.

- If you manually install the Control Center on UNIX-based workstations rather than using the db2setup utility, you must run the **db2insthtml** command to install the online documentation. For more information, refer to the *DB2 for UNIX Quick Beginnings*.

Configuring TCP/IP on OS/2

To run the Control Center on OS/2 Warp 4 while disconnected from a LAN, you will need to configure TCP/IP to enable local loopback and localhost. If you are running OS/2 Warp Server for e-business, local loopback is enabled by default.

Enabling Local Loopback

To enable local loopback on your system:
1. Open the **System Setup** folder.
2. Open the **TCP/IP Configuration** notebook.
3. View the **Network** page.
4. In the **Interface to Configure** list box, highlight **loopback interface**.
5. If the **Enable interface** check box is not selected, select it now.
6. Verify that the **IP address** is 127.0.0.1 and **Subnet Mask** is empty.

Enabling Localhost

To enable localhost on your system:
1. To check if localhost is enabled, enter the **ping localhost** command.
   - If data is returned and localhost is enabled, you can skip steps 2 and 3 below and go directly to step 4.
   - If localhost unknown is returned, or if the command hangs, localhost is not enabled. Go to step 2.
2. If you are on a network, make sure that loopback is enabled. To enable local loopback see "Enabling Local Loopback".
3. If you are *not* on a network, enable localhost by performing these steps:
   a. Add the following line after other ifconfig lines in the MPTN\BIN\SETUP.CMD command file:

      ifconfig lo 127.0.0.1

   b. In the TCP/IP configuration folder, perform the following steps:
      1) Go to the **Configure Name Resolution Services** page.
      2) In the **Hostname configuration without a Nameserver** table, add an entry with *IP Address* set to 127.0.0.1 and *Hostname* set to localhost.

      Note: If you have a hostname for your machine on the **Configure LAN Name Resolution Services** page, you must add this name as an alias when you set the *IP Address 127.0.0.1* to localhost.

c. Select the **Look through HOSTS list before going to the nameserver** list box. This step tells your OS/2 system that when it is looking for a host, such as `localhost`, it should use the host address found on your machine rather than checking the nameserver. If the host is not defined on your machine, OS/2 continues looking for the host by using the nameserver you configured.

d. Close **TCP/IP Configuration** and reboot the system.

e. You should be able to ping `localhost` without being connected to any network.

4. Verify that your hostname is correct. On an OS/2 command line, enter the **hostname** command. The hostname returned should match the one listed in the **TCP/IP Configuration** notebook on the **Hostnames** page and it must be less than 32 characters. If the hostname deviates from these conditions, correct it on the **Hostnames** page.

5. Verify that your hostname is set properly in CONFIG.SYS. You should see a line similar to the following:

```
SET HOSTNAME=<correct_name>
```

where *<correct_name>* represents the value returned by the **hostname** command. If this is not the case, make the necessary changes and reboot your system when you are finished.

Verifying TCP/IP Configuration on OS/2

If you are having trouble running the Control Center on OS/2 while disconnected from a LAN, try running the **sniffle /P** command to diagnose the problem.

Troubleshooting Information

For the latest service information on the Control Center, point your browser to http://www.ibm.com/software/data/db2/udb/db2cc

If you are having problems running the Control Center, check the following:

- Ensure the Control Center JDBC Applet Server (db2jd) is running.
- Verify that the server port number is correct.
- Check that the Control Center JDBC Applet Server is running under a user account that has SYSADM authority.
- Ensure that the Database Administration Server (DAS) is running on any DB2 Universal Database systems you are trying to administer by entering the **db2admin start** command. On UNIX-based systems, ensure that you are logged in as the DAS instance owner when you issue this command.

If you are having problems running the Control Center as an *application*, also check the following:

- Verify that the correct JRE is installed. See Table 26 on page 215 for more information.

If you are having problems running the Control Center as an *applet*, also check the following:
- Verify that you are running a supported browser. See Table 26 on page 215 for more information.
- Check your browser's Java console window for diagnostic and trace information for the Control Center.
- Make sure that the client browser does not have CLASSPATH set. To make sure CLASSPATH is not set, open a command window and enter **SET CLASSPATH=** then start your client browser from this command window. Also, note that if CLASSPATH is not set in a Windows NT or Windows 2000 environment, it may still get picked up from autoexec.bat from a Windows 9x installation on the same machine.
- Ensure that you are using the db2cc.htm file from the machine running the Control Center JDBC Applet Server.
- Remember that the Control Center works within the DB2 client's locale, and that the DB2 client is located at the Control Center JDBC Applet Server's location.

Administering DB2 for OS/390 and DB2 Connect Enterprise Edition servers with the Control Center

The Control Center has been greatly enhanced to deliver new management functions to database administrators who need to manage DB2 for OS/390 V5.1 and later database servers.

The Control Center has also been enhanced to manage operational and performance characteristics of DB2 Connect Enterprise Edition connectivity servers. The combination of DB2 for OS/390 server management and new DB2 Connect monitoring support provide complete end-to-end administration and monitoring for desktop and web applications that work with DB2 for OS/390 servers.

The DB2 Control Center uses the familiar "explorer" interface to allow database administrators to easily navigate between different database servers and the database objects they manage. Context sensitive right-mouse activated menus provide administrators with the ability to change attributes of database objects and to launch commands and utilities.

Database objects are presented in a consistent fashion for all DB2 family servers. This greatly reduces the amount of learning that is required for administrators who need to manage both DB2 for OS/390 and DB2 Universal Databases on Windows NT, Windows 2000, UNIX and OS/2 servers. While

the Control Center preserves consistency across servers it does not hide capabilities that are unique to each DB2 server. This gives database administrators the power to perform all aspects of their tasks.

The ability to manage DB2 Connect connectivity servers is delivered through management of user connections and by keeping vital statistics on various performance aspects of the connectivity server. For example, database administrators can easily view all of the users connected through a particular DB2 Connect server, and their connection characteristics.

Administrators can also collect load and performance information such as the number of SQL statements and transactions executed, number of bytes sent and received, statement and transaction execution times and much more. Collected data can be displayed using easy to understand live graphs.

Preparing DB2 for OS/390 Servers for the Control Center

The DB2 Control Center uses stored procedures to deliver many of its management functions. Therefore, for the Control Center to function properly each DB2 for OS/390 server that will be managed from the Control Center needs to have stored procedures enabled and the proper stored procedures installed on that server.

For more information on applying service and required Function Modification Identifiers, refer to the *DB2 for OS/390 Program Directory*.

Working with the Control Center

Before you can work with a server and its databases you will need to catalog information about the server on the Control Center workstation. The DB2 Control Center only works with servers and databases that are cataloged on the workstation where the Control Center is running. The easiest way to accomplish this on Windows and OS/2 workstations is to use the DB2 Client Configuration Assistant (CCA).

Once the Control Center is running, start by clicking on the plus sign next to the server you want to administer. Select the database or connectivity server objects that you want to administer and right click on the object to work with object properties or to execute actions on the object. You can invoke the online help by clicking **Help**, or by pressing **F1** at any time.

Other Sources of Information

For more information about using the Control Center to administer DB2 for OS/390, refer to the following online resource: http://www.ibm.com/software/data/db2/os390/v6facts/db2cc.html

For complete information about DB2 for OS/390 Version 6, refer to the online library: http://www.ibm.com/software/data/db2/os390/v6books.html

For more information about stored procedures and the Control Center for OS/390, go to: http://www.ibm.com/software/data/db2/os390/cc390/

Part 7. Using DB2 Connect

Chapter 22. Running Your Own Applications

Various types of applications can access DB2 databases:

- Applications developed using the DB2 Application Development Client that include embedded SQL, APIs, stored procedures, user-defined functions or calls to the DB2 CLI.
- ODBC applications such as Lotus Approach.
- JDBC applications and applets.
- Net.Data macros containing HTML and SQL.

An application on a DB2 client can access a remote database without knowing its physical location. The DB2 client determines the location of the database, manages the transmission of the requests to the database server, and returns the results.

In general, to run a database client application, use the following steps:

Step 1. Ensure the server is configured and running.

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.

Step 2. Ensure that you can connect to the database that the application uses.

Step 3. Bind the utilities and the applications to the database. See "Binding Database Utilities" for more information.

Step 4. Run the application program.

Binding Database Utilities

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 OS/2, and Windows 32-bit operating systems). Each file is specific to a server.

Binding to Host Databases

To bind the utilities and applications to the DRDA server, connect to the DRDA server and use commands similar to the following:

```
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. These commands are described in detail in the *DB2 Connect User's Guide*.

Running CLI/ODBC Programs

The DB2 Call Level Interface (CLI) run-time environment and the DB2 CLI/ODBC driver are included with DB2 clients as optional components during install.

This support enables applications developed using ODBC and DB2 CLI APIs to work with any DB2 server. DB2 CLI application development support is provided by the DB2 Application Development Client which is packaged with your DB2 server.

Before DB2 CLI or ODBC applications can access DB2, the DB2 CLI packages must be bound on the server. Although this will occur automatically on the first connection if the user has the required authority to bind the packages, it is recommended that the administrator do this first with each version of the client on each platform that will access the server. See "Binding Database Utilities" on page 229 for specific details.

The following general steps are required on the client system to give DB2 CLI and ODBC applications access to DB2 databases. These instructions assume that you have successfully connected to DB2 using a valid user ID and password. Depending on the platform many of these steps are automatic. For complete details, see the section that deals specifically with your platform.

Step 1. Use the Client Configuration Assistant (CCA) to add the database (if you have separate client and server machines) so that its instances and databases can be made known to the Control Center, then add the instances and databases for that system. If you do not have access to this program you can use the **catalog** command in the command line processor.

Step 2. The DB2 CLI/ODBC driver is an optional component during the DB2 client install on Windows platforms. Be sure it is selected at that

point. On OS/2 you must use the **Install ODBC Driver** icon to install both the DB2 CLI/ODBC driver and the ODBC driver manager. On UNIX platforms the DB2 CLI/ODBC driver is automatically installed with the client.

Step 3. To access the DB2 database from ODBC:

    a. The ODBC Driver Manager (From Microsoft or other vendor) must already be installed (this is done by default during the installation of DB2 only on 32-bit Windows systems).

    b. The DB2 databases must be registered as ODBC data sources. The ODBC driver manager does not read the DB2 catalog information; instead it references its own list of data sources.

    c. If a DB2 table does not have a unique index then many ODBC applications will open it as read-only. A unique index should be created for each DB2 table that is to be updated by an ODBC application. Refer to the **CREATE INDEX** statement in the *SQL Reference*. Using the Control Center you would alter the settings of the table, then select the **Primary Key** tab and move one or more columns from the available columns list over to the primary key columns list. Any column you select as part of the primary key must be defined as NOT NULL.

Step 4. If necessary, you can set various CLI/ODBC Configuration Keywords to modify the behavior of DB2 CLI/ODBC and the applications using it.

If you followed the above steps to install ODBC support, and added DB2 databases as ODBC data sources, your ODBC applications will now be able to access them.

After the platform specific instructions there are further details on the following topics:

- "How to Bind the DB2 CLI/ODBC Driver to the Database" on page 238
- "How to Set CLI/ODBC Configuration Keywords" on page 238
- "Configuring db2cli.ini" on page 239

Platform Specific Details for CLI/ODBC Access

The platform specific details on how to give DB2 CLI and ODBC applications access to DB2 are divided into the following categories:

- "Windows 32-bit operating systems Client Access to DB2 using CLI/ODBC" on page 232
- "OS/2 Client Access to DB2 using CLI/ODBC" on page 234
- "UNIX Client Access to DB2 using CLI/ODBC" on page 235

Windows 32-bit operating systems Client Access to DB2 using CLI/ODBC

Before DB2 CLI and ODBC applications can successfully access a DB2 database from a Windows client, perform the following steps on the client system:

Step 1. The DB2 database (and node if the database is remote) must be cataloged. To do so, use the CCA (or the command line processor).

For more information refer to the online help in the CCA (or the **CATALOG DATABASE** and **CATALOG NODE** commands in the *Command Reference*).

Step 2. Verify that the Microsoft ODBC Driver Manager and the DB2 CLI/ODBC driver are installed. On Windows 32-bit operating systems they are both installed with DB2 unless the ODBC component is manually unselected during the install. DB2 will not overwite a newer version of the Microsoft ODBC Driver Manager if one is found.

To verify that they both exist on the machine:

a. Start the Microsoft ODBC Data Sources icon in the Control Panel, or run the **odbcad32.exe** command from the command line.

b. Click on the **Drivers** tab.

c. Verify that "IBM DB2 ODBC DRIVER" is shown in the list.

If either the Microsoft ODBC Driver Manager or the IBM DB2 CLI/ODBC driver is not installed, then rerun the DB2 install and select the ODBC component on Windows 32-bit operating systems.

Step 3. Register the DB2 database with the ODBC driver manager as a *data source*. On Windows 32-bit operating systems you can make the data source available to all users of the system (a system data source), or only the current user (a user data source). Use either of these methods to add the data source:

- Using the CCA:

  a. Select the DB2 database alias that you want to add as a data source.

  b. Click on the **Properties** push button. The Database Properties window opens.

  c. Select the **Register this database for ODBC** check box.

  d. On Windows 32-bit operating systems you can use the radio buttons to add the data source as either a user or system data source.

- Using the **Microsoft 32-bit ODBC Administration tool**, which you can access from the icon in the Control Panel or by running **odbcad32.exe** from the command line:

  a. On Windows 32-bit operating systems the list of user data sources appears by default. If you want to add a system data

source click on the **System DSN** button, or the **System DSN** tab (depending on the platform).

  b. Click on the **Add** push button.

  c. Double-click on the IBM DB2 ODBC Driver in the list.

  d. Select the DB2 database to add and click on **OK**.

- On Windows 32-bit operating systems there is a command that can be issued in the command line processor to register the DB2 database with the ODBC driver manager as a data source. An administrator could create a command line processor script to register the required databases. This script could then be run on all of the machines that require access to the DB2 databases through ODBC.

  The *Command Reference* contains more information on the CATALOG command:

  ```
  CATALOG [ user | system ] ODBC DATA SOURCE
  ```

Step 4. Configure the DB2 CLI/ODBC driver using the CCA: (Optional)

  a. Select the DB2 database alias you want to configure.

  b. Click on the **Properties** push button. The Database Properties window opens.

  c. Click on the **Settings** push button. The CLI/ODBC Settings window opens.

  d. Click on the **Advanced** push button. You can set the configuration keywords in the window that opens. These keywords are associated with the database *alias name*, and affect all DB2 CLI/ODBC applications that access the database. The online help explains all of the keywords, as does and the *Installation and Configuration Supplement* online manual.

  For information on manually editing this file (db2cli.ini), see "Configuring db2cli.ini" on page 239.

Step 5. If you have installed ODBC access (as described above), you can now access DB2 data using ODBC applications. Start the ODBC application and go to the Open window. Select the **ODBC databases** file type. The DB2 databases that you added as ODBC data sources will be selectable from the list. Many ODBC applications will open the table as read-only unless a unique index exists.

If you require additional information at this point you can refer to the following topics in "Detailed Configuration Information" on page 238:

- "How to Bind the DB2 CLI/ODBC Driver to the Database" on page 238
- "How to Set CLI/ODBC Configuration Keywords" on page 238
- "Configuring db2cli.ini" on page 239

OS/2 Client Access to DB2 using CLI/ODBC

Before DB2 CLI and ODBC applications can successfully access a DB2 database from an OS/2 client, perform the following steps on the client system:

1. The DB2 database (and node if the database is remote) must be cataloged. To do so, use the CCA (or the command line processor).

   For more information, see the online help in the CCA.

2. If you are using ODBC applications to access DB2 data, perform the following steps. (If you are using only CLI applications, skip this step and go to the next step.)

   a. Check that there is an ODBC Driver Manager installed. The ODBC Driver Manager is not installed with DB2; we suggest you use the Driver Manager that was shipped with your ODBC application. Also ensure that the DB2 CLI/ODBC driver is installed:

      1) Run the ODBC Administration tool as described in its documentation. This is usually done in one of two ways:

         - Double-click on the **ODBC** Folder in OS/2, and double-click on the **ODBC Administrator** icon.
         - Run **odbcadm.exe** from the command line.

         The Data Sources window opens.

      2) Click on the **Drivers** push button. The Drivers window opens.

      3) Verify that "IBM DB2 ODBC DRIVER" is shown in the list.

      If the ODBC Driver Manager is not installed then follow the installation instructions that came with your ODBC application. If the IBM DB2 CLI/ODBC driver is not installed then double-click on the **Install ODBC Driver** icon in the DB2 folder to install the DB2 CLI/ODBC driver.

   b. Register the DB2 database with the ODBC driver manager as a *data source* using either of these methods:

      - Using the CCA:

         1) Select the DB2 database alias that you want to add as a data source.

         2) Click on the **Properties** push button.

         3) Select the **Register this database for ODBC** check box.

      - Using the ODBC Driver Manager:

         1) Run the ODBC Driver Manager, as described in its documentation. This is usually done in one of two ways:

            – Double-click on the **ODBC** Folder in OS/2, and double-click on the **ODBC Administrator** icon.

            – Run **odbcadm.exe** from the command line.

2) Click on the **Add** push button from the Data Sources window. The Add Data Source Window opens.

3) Double-click on the IBM DB2 ODBC DRIVER in the list.

4) Select the DB2 database to add and click on **OK**.

3. Configure the DB2 CLI/ODBC driver using the CCA: (Optional)

   a. Select the DB2 database alias you want to configure.

   b. Click on the **Properties** push button. The Database Properties window opens.

   c. Click on the **Settings** push button. The CLI/ODBC Settings window opens.

   d. Click on the **Advanced** push button. You can set the configuration keywords in the window that appears. These keywords are associated with the database *alias name*, and affect all DB2 CLI/ODBC applications that access the database. The online help explains all of the keywords, as does and the *Installation and Configuration Supplement* manual.

   For information on manually editing this file (db2cli.ini), see "Configuring db2cli.ini" on page 239.

4. If you have installed ODBC access (as described above), you can now access DB2 data using ODBC applications. Start the ODBC application and go to the Open window. Select the **ODBC databases** file type. The DB2 databases that you added as ODBC data sources will be selectable from the list. Many ODBC applications will open the table as read-only unless a unique index exists.

UNIX Client Access to DB2 using CLI/ODBC

Before DB2 CLI and ODBC applications can successfully access a DB2 database from a UNIX client, perform the following steps on the client system:

1. The DB2 database (and node if the database is remote) must be cataloged. To do so, use the command line processor.

   For more information see "Chapter 20. Configuring Client-to-Server Communications Using the Command Line Processor" on page 203 or the **CATALOG DATABASE** and **CATALOG NODE** commands in the *Command Reference*.

2. The DB2 CLI/ODBC driver is installed during the DB2 client install. Be sure it is selected at that point.

3. If you are using ODBC applications to access DB2 data, perform the following steps. (If you are using only CLI applications, skip this step and go to the next step.)

   a. When using an ODBC application you must ensure that an ODBC Driver Manager is installed and that each user that will use ODBC has access to it. DB2 does not install an ODBC Driver Manager, you must

use the ODBC Driver Manager that was supplied with your ODBC client application or ODBC SDK in order to access DB2 data using that application.

b. The Driver Manager uses two initialization files.

odbcinst.ini   ODBC Driver Manager's configuration file indicating which database drivers are installed. Each user that will use ODBC must have access to this file.

.odbc.ini   End-user's data source configuration. Each user ID has a separate copy of this file in their home directory. Note that the file starts with a dot.

Setting up odbcinst.ini

The settings in this file impact all of the ODBC drivers on the machine.

Use an ASCII editor to update this file. It must have a stanza (section) called [IBM DB2 ODBC DRIVER], with a line starting with "Driver" indicating the full path to the DB2 ODBC driver, called db2.o on AIX, and libdb2 on other UNIX platforms (the file extension depends on the platform; libdb2.so on Solaris Operating Environment, and so on). For example, on AIX, if the home directory of your end user is /u/thisuser/ and the sqllib directory is installed there, then the correct entry would be:

```
[IBM DB2 ODBC DRIVER]
Driver=/u/thisuser/sqllib/lib/db2.o
```

Setting up .odbc.ini

The settings in this file are associated with a particular user on the machine; different users can have different .odbc.ini files.

The .odbc.ini file must exist in the end user's home directory (note the dot at the start of the file name). Update this file, using an ASCII editor, to reflect the appropriate data source configuration information. To register a DB2 database as an ODBC data source there must be one stanza (section) for each DB2 database.

The .odbc.ini file must contain the following lines:

- in the [ODBC Data Source] stanza:

```
SAMPLE=IBM DB2 ODBC DRIVER
```

  Indicates that there is a data source called SAMPLE that used the IBM DB2 ODBC DRIVER.

- in the [SAMPLE] stanza (on AIX, for example):

```
[SAMPLE]
Driver=/u/thisuser/sqllib/lib/libdb2.a
Description=Sample DB2 ODBC Database
```

Indicates that the SAMPLE database is part of the DB2 instance located in the directory /u/thisuser.

- in the [ODBC] stanza:

```
InstallDir=/u/thisuser/sqllib/odbclib
```

Indicates that /u/thisuser/sqllib/odbclib should be treated as the location where ODBC is installed.

- Ensure that the InstallDir correctly points to the ODBC Driver Manager location.

  For example, if the ODBC Driver Manager has been installed in /opt/odbc, the [ODBC] stanza would look like:

```
[ODBC]
Trace=0
TraceFile=odbctrace.out
InstallDir=/opt/odbc
```

See "How to Configure ODBC.INI" on page 239 for more detailed information.

Once the .ini files are set up you can run your ODBC application and access DB2 databases. Refer to the documentation that comes with your ODBC application for additional help and information.

4. Configure the DB2 CLI/ODBC driver (Optional).

   There are various keywords and values that can be used to modify the behavior of DB2 CLI/ODBC and the applications using it. The keywords are associated with the database *alias name*, and affect all DB2 CLI/ODBC applications that access the database.

   For information on manually editing this file (db2cli.ini), see "Configuring db2cli.ini" on page 239. For information about the specific keywords see the *CLI Guide and Reference*.

If you require additional information at this point you can refer to the following topics in "Detailed Configuration Information" on page 238:

- "How to Bind the DB2 CLI/ODBC Driver to the Database" on page 238
- "How to Set CLI/ODBC Configuration Keywords" on page 238
- "Configuring db2cli.ini" on page 239

Detailed Configuration Information

The section "Platform Specific Details for CLI/ODBC Access" on page 231 should provide you with all of the information you require. The following additional information is useful where DB2 tool support is not available, and for administrators who require more detailed information.

The following topics are covered in this section:
- "How to Bind the DB2 CLI/ODBC Driver to the Database"
- "How to Set CLI/ODBC Configuration Keywords"
- "Configuring db2cli.ini" on page 239

How to Bind the DB2 CLI/ODBC Driver to the Database
The CLI/ODBC driver will autobind on the first connection to the database, provided the user has the appropriate privilege or authorization. The administrator may want to perform the first connect or explicitly bind the required files.

See "Binding Database Utilities" on page 229 for more information.

How to Set CLI/ODBC Configuration Keywords
DB2 CLI can be configured further by using either the CCA or the DB2 Client Setup administration tool, whichever is applicable for your platform, or by manually editing the db2cli.ini file.

This file contains various keywords and values that can be used to modify the behavior of DB2 CLI and the applications using it. The keywords are associated with the database *alias name*, and affect all DB2 CLI and ODBC applications that access the database.

By default, the location of the CLI/ODBC configuration keyword file is located in the sqllib directory on Intel platforms, and in the sqllib/cfg directory of the database instance running the CLI/ODBC applications on UNIX platforms.

The environment variable *DB2CLIINIPATH* can also be used to override the default and specify a different location for the file.

The configuration keywords enable you to:
- Configure general features such as data source name, user name, and password.
- Set options that will affect performance.
- Indicate query parameters such as wild card characters.
- Set patches or work-arounds for various ODBC applications.

- Set other, more specific features associated with the connection, such as code pages and IBM Graphic data types.

For a complete description of all the keywords and their usage, refer to the *Installation and Configuration Supplement*.

Configuring db2cli.ini: The db2cli.ini initialization file is an ASCII file which stores values for the DB2 CLI configuration options. A sample file is shipped to help you get started. Refer to the *CLI Guide and Reference* for information on each keyword.

See "Platform Specific Details for CLI/ODBC Access" on page 231 for more information on how to modify this file on your platform.

How to Configure ODBC.INI

Microsoft's 16-bit ODBC Driver Manager and all non-Microsoft ODBC Driver Managers use the odbc.ini file to record information about the available drivers and data sources. ODBC Driver Managers on UNIX platforms also uses the odbcinst.ini file. Although the necessary files are updated automatically by the tools on most platforms, users of ODBC on UNIX platforms will have to edit them manually. The file odbc.ini (and odbcinst.ini where required) are located:

UNIX   Home directory of the user ID running the ODBC application (on UNIX the odbc.ini file name has a dot before it: .odbc.ini)

It is also possible to modify this file manually. Do not change any of the existing entries in the file. To edit this file manually perform the following steps:

Step 1. Use an ASCII editor to edit the odbc.ini file.

The following is an example odbc.ini file:

```
[ODBC Data Sources]
MS Access Databases=Access Data (*.mdb)

[MS Access Databases]
Driver=D:\WINDOWS\SYSTEM\simba.dll
FileType=RedISAM
SingleUser=False
UseSystemDB=False
```

The [ODBC Data Sources] section lists the name of each available data source and the description of the associated driver.

For each data source listed in the [ODBC Data Sources] section, there is a section that lists additional information about that data source. These are called the *Data Source Specification* sections.

Step 2. Under the [ODBC DATA SOURCE] entry, add the following line:

```
database_alias=IBM DB2 ODBC DRIVER
```

where *database_alias* is the alias of the database cataloged in the
database directory (the database name used by the command line
processor CONNECT TO statement).

Step 3. Add a new entry in the Data Source Specification section to associate
the data source with the driver:

```
[database_alias]
Driver=x:\windows\system\db2cliw.dll
```

where:

- *database_alias* is the alias of the database cataloged in the database
  directory, and listed under the Data Source Specification section.
- *x:* is the drive where the Windows operating system is installed.

The following shows the example file with the IBM data source entries added:

```
[ODBC Data Sources]
MS Access Databases=Access Data (*.mdb)
SAMPLE=IBM DB2 ODBC DRIVER

[MS Access Databases]
Driver=D:\WINDOWS\SYSTEM\simba.dll
FileType=RedISAM
SingleUser=False
UseSystemDB=False

[SAMPLE]
Driver=D:\WINDOWS\SYSTEM\db2cliw.dll
Description=Sample DB2 Client/Server database
```

UNIX Configuration of .ini files

The section "UNIX Client Access to DB2 using CLI/ODBC" on page 235
contains detailed steps on how to update both the odbc.ini and odbcinst.ini
files.

Running Java Programs

You can develop Java programs to access DB2 databases with the appropriate
Java Development Kit (JDK) on AIX, HP-UX, Linux, OS/2, PTX, Silicon
Graphics IRIX, Solaris Operating Environment, or Windows 32-bit operating
systems. The JDK includes Java Database Connectivity (JDBC), a dynamic
SQL API for Java.

For DB2 JDBC support, you must include the DB2 Java Enablement
component when you install the DB2 client. With DB2 JDBC support you can

build and run JDBC applications and applets. These contain dynamic SQL only, and use a Java call interface to pass SQL statements to DB2.

The DB2 Application Development Client provides support for Java embedded SQL (SQLJ). With DB2 SQLJ support and DB2 JDBC support you can build and run SQLJ applications and applets. These contain static SQL and use embedded SQL statements that are bound to the DB2 database.

Java can also be used on the server to create JDBC and SQLJ stored procedures and user-defined functions (UDFs).

Building and running different types of Java programs requires support from different components of DB2:

- To build JDBC applications, you must install a DB2 client with the DB2 Java Enablement component. To run JDBC applications, your DB2 client with the DB2 Java Enablement component must connect to a DB2 server.
- To build SQLJ applications, you must install the DB2 Application Development Client and a DB2 Administrative Client with the DB2 Java Enablement component. To run SQLJ applications, your DB2 client with the DB2 Java Enablement component must connect to a DB2 server.
- To build JDBC applets, you must install a DB2 client with the DB2 Java Enablement component. To run JDBC applets, the client machine does not require any DB2 components.
- To build SQLJ applets, you must install the DB2 Application Development Client and a DB2 Administrative Client with the DB2 Java Enablement component. To run SQLJ applets, the client machine does not require any DB2 components.

For detailed information on building and running JDBC and SQLJ programs refer to the *Application Building Guide*. For more information on DB2 programming in Java, refer to the *Application Development Guide*. This covers creating and running JDBC and SQLJ applications, applets, stored procedures and UDFs.

For the latest, updated DB2 Java information, visit the Web site at: http://www.ibm.com/software/data/db2/java

Configuring the Environment

To build DB2 Java programs, you need to install and configure the appropriate version of a Java Development Kit (JDK) on your development machine. To run DB2 Java applications, you must install and configure the appropriate version of either a Java Runtime Environment (JRE) or JDK on your development machine. The following table lists the version of the JDK that is appropriate for your development machine:

AIX   The IBM AIX Developer Kit, Java Technology Edition, Version 1.1.8.

On AIX systems that do not have a JDK installed, this JDK is automatically installed with the DB2 Application Development Client.

HP-UX
> The HP-UX Developer's Kit for Java, Release 1.1.8, from Hewlett-Packard.

Linux The IBM Developer Kit for Linux, Java Technology Edition, Version 1.1.8.

OS/2 The IBM Java Development Kit for OS/2, version 1.1.8, which is available on the product CD-ROM.

PTX The ptx/JSE, Version 1.2.1, from IBM.

SGI IRIX
> The Java 2 Software Development Kit for SGI IRIX, version 1.2.1, from SGI.

Solaris Operating Environment
> The Java Development Kit for Solaris, version 1.1.8, from Sun Microsystems.

Windows 32-bit operating systems
> The IBM Developer Kit for Windows 32-bit operating systems, Java Technology Edition, Version 1.1.8. When you install the DB2 Application Development Client, this JDK is automatically installed in the `sqllib\java\jdk` directory.

For information on installing and configuring any of the above JDKs, please refer to: http://www.ibm.com/software/data/db2/java

For all supported platforms, you must also install and configure a DB2 client with the DB2 Java Enablement component. To bind SQLJ programs to a database, you must install and configure a DB2 Administrative Client with the DB2 Java Enablement component.

To run DB2 Java stored procedures or UDFs, you also need to update the DB2 database manager configuration to include the path where the JDK version 1.1 is installed on your development machine. You can do this by entering the following on the command line:

On UNIX platforms:
```
db2 update dbm cfg using JDK11_PATH /usr/jdk
```

where `/usr/jdk` represents the path where the JDK is installed.

On Windows and OS/2 platforms:
```
db2 update dbm cfg using JDK11_PATH C:\sqllib\java\jdk
```

where `C:\sqllib\java\jdk` represents the path where the JDK is installed.

You can check the DB2 database manager configuration to verify the correct value for the JDK11_PATH field by entering the following command:

```
db2 get dbm cfg
```

You may want to pipe the output to a file for easier viewing. The JDK11_PATH field appears near the beginning of the output. For more information on these commands, refer to the *Command Reference*.

On Solaris Operating Environment, some Java Virtual Machine implementations do not work well in programs that run in a "setuid" environment. The shared library that contains the Java interpreter, `libjava.so`, may fail to load. As a workaround, you can create symbolic links for all needed JVM shared libraries in `/usr/lib`, with a command similar to the following (depending on where Java is installed on your machine):

```
ln -s /opt/jdk1.1.3/lib/sparc/native_threads/*.so /usr/lib
```

For more information on this and other workarounds available, please visit: http://www.ibm.com/software/data/db2/java

To run Java programs, the following environment variables are automatically updated during DB2 installation on OS/2 and the Windows Operating System, and during instance creation on UNIX platforms.

On UNIX platforms:
- CLASSPATH includes "." and the file `sqllib/java/db2java.zip`
- On AIX, Linux, PTX, Silicon Graphics IRIX, and Solaris Operating Environment: LD_LIBRARY_PATH includes the directory `sqllib/lib`
- On HP-UX: SHLIB_PATH includes the directory `sqllib/lib`
- On Solaris Operating Environment only: THREADS_FLAG is set to "native"

On Windows and OS/2 platforms:
- CLASSPATH includes "." and the file `%DB2PATH%\java\db2java.zip`

In order to build and run SQLJ programs, CLASSPATH is also automatically updated to include these files:

On UNIX platforms:
- `sqllib/java/sqlj.zip` (required to build SQLJ programs)
- `sqllib/java/runtime.zip` (required to run SQLJ programs)

On Windows and OS/2 platforms:

- `%DB2PATH%\java\sqlj.zip` (required to build SQLJ programs)
- `%DB2PATH%\java\runtime.zip` (required to run SQLJ programs)

Java Applications

Start your application from the desktop or command line by running the Java interpreter on the executable program with this command:

```
java prog_name
```

where `prog_name` is the name of the program.

The DB2 JDBC driver handles the JDBC API calls from your application and uses the DB2 client to communicate the requests to the server and receive the results. An SQLJ application must be bound to the database before it is run.

Java Applets

Because Java applets are delivered over the web, a web server must be installed on your DB2 machine (server or client).

To run your applet, make sure your `.html` file is properly configured. Start the JDBC applet server on the TCP/IP port specified in the `.html` file. For example, if you specified:

```
param name=port value='6789'
```

then you would enter:

```
db2jstrt 6789
```

You must ensure that your working directory is accessible to your web browser. If it is not, copy your applet's `.class` and `.html` files into a directory that is accessible. For SQLJ applets, you must also copy the profile `.class` and `.ser` files as well.

Copy the `sqllib/java/db2java.zip` file into the same directory as these other files. For SQLJ applets, also copy the `sqllib/java/runtime.zip` file into this directory. Then on your client machine start your web browser (which supports JDK 1.1) and load the `.html` file.

When your applet calls the JDBC API to connect to DB2, the JDBC driver establishes separate communications with the DB2 database through the JDBC applet server residing on the DB2 server. An SQLJ applet must be bound to the database before it is run.

Part 8. Appendixes

Appendix A. Basic Task Knowledge

This section describes the basic tasks that you will need to know to use this product effectively.

Go to the task that you want to perform:
- "Starting the Client Configuration Assistant".
- "Starting the DB2 Control Center".
- "Entering Commands Using the Command Center" on page 248.
- "Entering Commands Using the Command Line Processor" on page 249.
- "Working with the System Administrative Group" on page 251.
- "Granting Advanced User Rights on Windows" on page 252.
- "Mounting CD-ROMs on UNIX Operating Systems" on page 252.
- "Upgrading DB2 from Try and Buy Mode" on page 255.

Starting the Client Configuration Assistant

Start the Client Configuration Assistant (CCA) as follows:

OS/2
Click on **OS/2 Warp**, and select **IBM DB2 —> Client Configuration Assistant**

Windows 32-bit operating systems
Click on **Start** and select **Programs—>IBM DB2—>Client Configuration Assistant**

You can also start the CCA by entering the **db2cca** command at a command prompt.

Starting the DB2 Control Center

You can run the DB2 Control Center as a Java *application* or as a Java *applet*.

To run the Control Center as an application
Enter the **db2cc** command. Your system must have the correct Java Runtime Environment installed in order to run the Control Center as an application.

On Windows 32-bit and OS/2 systems, you can also start the Control Center as an application by invoking the **Control Center** icon in your **IBM DB2** program group.

To run the Control Center as an applet

You must have a Java-enabled browser and you must perform some additional configuration steps to run the Control Center as an applet. For detailed instructions on running the Control Center as an applet or application, see "Chapter 21. Control Center Installation and Configuration" on page 213.

Entering Commands Using the Command Center

This section describes how to enter commands using the Command Center. There are two versions of the Command Center. This section documents the Command Center that is accessible from the DB2 Control Center.

Note: If you do not have the Control Center installed, a Command Center with limited functionality is available through the IBM DB2 program group, or by entering the **db2cctr** command.

From the Command Center you can:

- Run SQL statements, DB2 commands, and operating system commands.
- See the execution result of SQL statements and DB2 commands in a results window. You can scroll through the results and save the output to a file.
- Save a sequence of SQL statements and DB2 commands to a script file. You can then schedule the script to run as a job. When a saved script is modified, all jobs dependent on the saved script inherit the new modified behavior.
- Recall and run a script file.
- See the execution plan and statistics associated with a SQL statement before execution.
- Get quick access to database administrative tools from the main tool bar.
- Display all the command scripts known to the system through the Script Center, with summary information listed for each.
- Use the SQLAssist tool to build complex queries.
- Display results in an table you can edit.

To start the Command Center, click on the **Command Center** icon in the Control Center.

The Command Center contains a large input area for entering commands. To run the commands you have entered, click on the **Execute** icon (the gears icon).

> In the Command Center, you do not have to enter a command with the db2 prefix; instead you just enter the DB2 command. For example:
>
>   list database directory
>
> To enter operating system commands, precede the operating-system command with an exclamation mark (!). For example:
>
>   !dir

If you want to enter multiple commands, you must end each command with the termination character, then press **Enter** to start the next command on a new line. The default termination character is a semicolon (;).

For example, you could connect to a database called SAMPLE and list all the system tables by entering the following command:

    connect to sample;
    list tables for system

After you have clicked on the **Execute** icon, the results are displayed.

To recall commands that you have entered during your session, select the **Command history** drop down box, and select a command.

To save commands, select **Interactive —> Save Command As** from the menu bar. For more information, click on the **Help** push button or press the **F1** key.

> You can use the **Append to Script** button and the Script page of the Command Center to store commonly used SQL statements or DB2 commands as scripts. For more information, click on the **Help** push button or press the **F1** key.

Entering Commands Using the Command Line Processor

You can use the command line processor to enter DB2 commands, SQL statements, and operating system commands. It operates in the following modes:

DB2 Command Window

  The DB2 command line processor behaves like a command window from your operating system. You can enter operating system commands, DB2 commands, or SQL statements and view their output.

Interactive Input Mode

  The db2 prefix that you use for DB2 commands (in the DB2 Command Window) is pre-entered for you. You can enter operating systems commands, DB2 commands, or SQL statements and view their output.

File Input Mode
> Processes commands that are stored in a file. For information on the file input mode, refer to the *Command Reference*.

DB2 Command Window

To invoke a DB2 Command Window, do the following:

OS/2   Open any OS/2 command window.

Windows 32-bit operating systems
> Click on **Start** and select **Programs —> IBM DB2 —> Command Window**

> You can also invoke the DB2 command window by entering the **db2cmd** command at your operating system's prompt.

UNIX   Open any operating system command window.

If you are entering commands via the Command Window, you must include the db2 prefix. For example:

```
db2 list database directory
```

If the DB2 command contains characters that have special meaning on the operating system you are using, you will need to enter the command in quotation marks to ensure that it is run properly.

For example, the following command would retrieve all the information from the *employee* table, even if the * character has a special meaning on the operating system:

```
db2 "select * from employee"
```

To enter a long command that does not fit on a single line, you must use a space followed by the line continuation character ″\″ at the end of one line, then press the **Enter** key to continue the command on to the next. For example:

```
db2 select empno, function, firstname, lastname, birthdate, from \
db2 (cont.) => employee where function='service' and \
db2 (cont.) => firstname='Lily' order by empno desc
```

Interactive Input Mode

To invoke the command line processor in interactive input mode, do the following:

OS/2   Click on **OS/2 Warp** and select **IBM DB2 —> Command Line Processor** or enter the **db2** command.

Windows 32-bit operating systems
> Click on **Start** and select **Programs —> IBM DB2 —> Command Line Processor**.

You can also invoke the command line processor in interactive input mode by entering the **db2cmd** command followed by the **db2** command at your operating system's prompt.

UNIX   Enter the **db2** command from the command line processor

In interactive input mode, the prompt looks like this:

```
db2 =>
```

In interactive input mode, you do not have to enter DB2 commands with a db2 prefix; instead, you just enter the DB2 command. For example:

```
db2 => list database directory
```

To enter operating-system commands in interactive mode, precede the operating system command with an exclamation mark (!). For example:

```
db2 => !dir
```

To enter a long command that does not fit on a single line, you must use a space followed by the line continuation character ″\″ at the end of one line, then press the **Enter** key to continue the command on to the next. For example:

```
db2 select empno, function, firstname, lastname, birthdate, from \
db2 (cont.) => employee where function='service' and \
db2 (cont.) => firstname='Lily' order by empno desc
```

To end interactive input mode, enter the **quit** command.

For more information on advanced topics using the CLP, refer to the *Command Reference*.

Working with the System Administrative Group

By default, System Administrative (SYSADM) authority is granted to the following:

UNIX   Any valid DB2 user name that belongs to the primary group of the instance owner's user ID.

For information on how to change the default SYSADM settings and how to assign this authority to a different user or set of users, refer to the *Administration Guide*.

Granting Advanced User Rights on Windows

Windows NT

To grant advanced user rights on Windows NT you must be logged on as a Local Administrator. Perform the following steps to grant user rights:

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

Windows 2000

To grant advanced user rights on Windows 2000 you must be logged on as a Local Administrator. Perform the following steps to grant user rights:

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

Mounting CD-ROMs on UNIX Operating Systems

The following sections describe how to mount your DB2 product CD-ROM on UNIX-based operating systems.

Mounting the CD-ROM on AIX

To mount the CD-ROM on AIX using the System Management Interface Tool (SMIT), perform the following steps:

1. Log in as a user with root authority.
2. Insert the CD-ROM in the drive.
3. Create a CD-ROM mount point by entering the `mkdir -p /cdrom` command, where `cdrom` represents the CD-ROM mount point directory.

4. Allocate a CD-ROM file system using SMIT by entering the **smit storage** command.

5. After SMIT starts, select **File Systems —> Add / Change / Show / Delete File Systems —> CDROM File Systems —> Add CDROM File System**.

6. In the Add a File System window:
   - Enter a device name for your CD-ROM file system in the **DEVICE Name** field. Device names for CD-ROM file systems must be unique. If there is a duplicate device name, you may need to delete a previously-defined CD-ROM file system or use another name for your directory. In our example, we will use /dev/cd0 as the device name.
   - Enter the CD-ROM mount point directory in the **MOUNT POINT** window. In our example, the mount point directory is /cdrom.
   - In the **Mount AUTOMATICALLY at system restart** field, select yes to enable automatic mounting of the file system.
   - Click **OK** to close the window, then click **Cancel** three times to exit SMIT.

7. Next, mount the CD-ROM file system by entering the **smit mountfs** command.

8. In the Mount a File System window:
   - Enter the device name for this CD-ROM file system in the **FILE SYSTEM name** field. In our example, the device name is /dev/cd0.
   - Enter the CD-ROM mount point in the **Directory over which to mount** field. In our example, the mount point is /cdrom.
   - Enter cdrfs in the **Type of Filesystem** field. To view the other kinds of file systems you can mount, click **List**.
   - In the **Mount as READ-ONLY system** field, select to yes.
   - Accept the remaining default values and click OK to close the window.

Your CD-ROM file system is now mounted. To view the contents of the CD-ROM, place the disk in the drive and enter the **cd /cdrom** command where **cdrom** is the CD-ROM mount point directory.

Mounting the CD-ROM on HP-UX

Because DB2 Version 7.1 for HP-UX contains several files with long file names, the mount command may fail. The following steps will enable you to mount successfully your DB2 for HP-UX product CD-ROM:

1. Log in as a user with root authority.

2. In the /etc directory, add the following line to the pfs_fstab file:

    ```
    /dev/dsk/c0t2d0 mount_point pfs-rrip ro,hard
    ```

    where *mount_point* represents the mount point of the CD-ROM.

3. Start the *pfs* daemon by entering the following commands (if they are not already running):

```
/usr/sbin/pfs_mountd &
/usr/sbin/pfsd 4 &
```

4. Insert the CD-ROM in the drive and enter the following commands:

```
 mkdir /cdrom
 /usr/sbin/pfs_mount /cdrom
```

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

5. Log out.

Mounting the CD-ROM on Linux

To mount the CD-ROM on Linux:

1. Log in as a user with root authority.
2. Insert the CD-ROM 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-ROM.

3. Log out.

Note that some window managers may automatically mount your CD-ROM for you. Consult your system documentation for more information.

Mounting the CD-ROM on PTX

To mount the CD-ROM on PTX:

1. Log in as a user with root authority.
2. Insert the CD-ROM in the drive and enter the following commands:

```
mkdir /cdrom
mount -r -F cdfs /dev/dsk/cd0 /cdrom
```

where */cdrom* is the mount point of the CD-ROM.

3. Log out.

Mounting the CD-ROM on Solaris

To mount the CD-ROM on Solaris:

1. Log in as a user with root authority.
2. Insert the CD-ROM into the drive.
3. If the Volume Manager is *not* running on your system, enter the following commands to mount the CD-ROM:

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

where */cdrom/unnamed_cdrom* represents the CD-ROM mount directory and /dev/dsk/c0t6d0s2 represents the CD-ROM drive device.

Note: If you are mounting the CD-ROM drive from a remote system using NFS, the CD-ROM file system on the remote machine must be exported with root access. You must also mount that file system with root access on the local machine.

If the Volume Manager (vold) *is* running on your system, the CD-ROM is automatically mounted as:

```
/cdrom/unnamed_cdrom
```

4. Log out.

Upgrading DB2 from Try and Buy Mode

You can upgrade a DB2 product from the Try and Buy mode to a licensed version in two ways. You can use the command line utility called **db2licm** or use the License Center. The License Center is a built-in feature of the Control Center.

On UNIX Operating Systems

To add a license using the command line:

1. Log in as a user with root authority.
2. The **db2licm** utility can be found in the following locations:
   - For AIX, `/usr/lpp/db2_07_01/adm/`
   - For LINUX, `/usr/IBMdb2/V7.1/adm/`
   - For HP-UX, PTX, Solaris, PTX, `/opt/IBMdb2/V7.1/adm/`
3. Issue the following command:

   ```
   db2licm filename.lic
   ```

   where *filename.lic* represents the name of the licensing file. For more information about the **db2licm** command, refer to the *Command Reference*.

On OS/2 and Windows 32-bit Operating Systems

To add a license using the command line:

1. Go to the `<install directory>\bin` directory, where `<install directory>` represents the directory where you installed the product.
2. To add a license, issue the following command:

   ```
   db2licm path/filename.lic
   ```

   License files are contained in the `db2/license` directory of the installation CD.

   For more information about the **db2licm** command, refer to the *Command Reference*.

Adding a license using the License Center

To add a license using the License Center:

1. Launch the Control Center.
2. Select **License Center** from the **Tools** menu list.
3. Refer to the online help for the License Center available from the Control Center.

Appendix B. Using the DB2 Library

The DB2 Universal Database library consists of online help, books (PDF and HTML), and sample programs in HTML format. This section describes the information that is provided, and how you can access it.

To access product information online, you can use the Information Center. For more information, see "Accessing Information with the Information Center" on page 271. You can view task information, DB2 books, troubleshooting information, sample programs, and DB2 information on the Web.

DB2 PDF Files and Printed Books

DB2 Information

The following table divides the DB2 books into four categories:

DB2 Guide and Reference Information
These books contain the common DB2 information for all platforms.

DB2 Installation and Configuration Information
These books are for DB2 on a specific platform. For example, there are separate *Quick Beginnings* books for DB2 on OS/2, Windows, and UNIX-based platforms.

Cross-platform sample programs in HTML
These samples are the HTML version of the sample programs that are installed with the Application Development Client. The samples are for informational purposes and do not replace the actual programs.

Release notes
These files contain late-breaking information that could not be included in the DB2 books.

The installation manuals, release notes, and tutorials are viewable in HTML directly from the product CD-ROM. Most books are available in HTML on the product CD-ROM for viewing and in Adobe Acrobat (PDF) format on the DB2 publications CD-ROM for viewing and printing. You can also order a printed copy from IBM; see "Ordering the Printed Books" on page 267. The following table lists books that can be ordered.

On OS/2 and Windows platforms, you can install the HTML files under the `sqllib\doc\html` directory. DB2 information is translated into different

languages; however, all the information is not translated into every language. Whenever information is not available in a specific language, the English information is provided

On UNIX platforms, you can install multiple language versions of the HTML files under the doc/%L/html directories, where *%L* represents the locale. For more information, refer to the appropriate *Quick Beginnings* book.

You can obtain DB2 books and access information in a variety of ways:

Table 27. DB2 Information

Name	Description	Form Number PDF File Name	HTML Directory
DB2 Guide and Reference Information			
Administration Guide	*Administration Guide: Planning* provides an overview of database concepts, information about design issues (such as logical and physical database design), and a discussion of high availability.	SC09-2946 db2d1x70	db2d0
	Administration Guide: Implementation provides information on implementation issues such as implementing your design, accessing databases, auditing, backup and recovery.	SC09-2944 db2d2x70	
	Administration Guide: Performance provides information on database environment and application performance evaluation and tuning.	SC09-2945 db2d3x70	
	You can order the three volumes of the *Administration Guide* in the English language in North America using the form number SBOF-8934.		
Administrative API Reference	Describes the DB2 application programming interfaces (APIs) and data structures that you can use to manage your databases. This book also explains how to call APIs from your applications.	SC09-2947 db2b0x70	db2b0

Table 27. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
Application Building Guide	Provides environment setup information and step-by-step instructions about how to compile, link, and run DB2 applications on Windows, OS/2, and UNIX-based platforms.	SC09-2948 db2axx70	db2ax
APPC, CPI-C, and SNA Sense Codes	Provides general information about APPC, CPI-C, and SNA sense codes that you may encounter when using DB2 Universal Database products. Available in HTML format only.	No form number db2apx70	db2ap
Application Development Guide	Explains how to develop applications that access DB2 databases using embedded SQL or Java (JDBC and SQLJ). Discussion topics include writing stored procedures, writing user-defined functions, creating user-defined types, using triggers, and developing applications in partitioned environments or with federated systems.	SC09-2949 db2a0x70	db2a0
CLI Guide and Reference	Explains how to develop applications that access DB2 databases using the DB2 Call Level Interface, a callable SQL interface that is compatible with the Microsoft ODBC specification.	SC09-2950 db2l0x70	db2l0
Command Reference	Explains how to use the Command Line Processor and describes the DB2 commands that you can use to manage your database.	SC09-2951 db2n0x70	db2n0
Connectivity Supplement	Provides setup and reference information on how to use DB2 for AS/400, DB2 for OS/390, DB2 for MVS, or DB2 for VM as DRDA application requesters with DB2 Universal Database servers. This book also details how to use DRDA application servers with DB2 Connect application requesters. Available in HTML and PDF only.	No form number db2h1x70	db2h1

Table 27. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
Data Movement Utilities Guide and Reference	Explains how to use DB2 utilities, such as import, export, load, AutoLoader, and DPROP, that facilitate the movement of data.	SC09-2955 db2dmx70	db2dm
Data Warehouse Center Administration Guide	Provides information on how to build and maintain a data warehouse using the Data Warehouse Center.	SC26-9993 db2ddx70	db2dd
Data Warehouse Center Application Integration Guide	Provides information to help programmers integrate applications with the Data Warehouse Center and with the Information Catalog Manager.	SC26-9994 db2adx70	db2ad
DB2 Connect User's Guide	Provides concepts, programming, and general usage information for the DB2 Connect products.	SC09-2954 db2c0x70	db2c0
DB2 Query Patroller Administration Guide	Provides an operational overview of the DB2 Query Patroller system, specific operational and administrative information, and task information for the administrative graphical user interface utilities.	SC09-2958 db2dwx70	db2dw
DB2 Query Patroller User's Guide	Describes how to use the tools and functions of the DB2 Query Patroller.	SC09-2960 db2wwx70	db2ww
Glossary	Provides definitions for terms used in DB2 and its components. Available in HTML format and in the *SQL Reference*.	No form number db2t0x70	db2t0
Image, Audio, and Video Extenders Administration and Programming	Provides general information about DB2 extenders, and information on the administration and configuration of the image, audio, and video (IAV) extenders and on programming using the IAV extenders. It includes reference information, diagnostic information (with messages), and samples.	SC26-9929 dmbu7x70	dmbu7
Information Catalog Manager Administration Guide	Provides guidance on managing information catalogs.	SC26-9995 db2dix70	db2di

Table 27. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
Information Catalog Manager Programming Guide and Reference	Provides definitions for the architected interfaces for the Information Catalog Manager.	SC26-9997 db2bix70	db2bi
Information Catalog Manager User's Guide	Provides information on using the Information Catalog Manager user interface.	SC26-9996 db2aix70	db2ai
Installation and Configuration Supplement	Guides you through the planning, installation, and setup of platform-specific DB2 clients. This supplement also contains information on binding, setting up client and server communications, DB2 GUI tools, DRDA AS, distributed installation, the configuration of distributed requests, and accessing heterogeneous data sources.	GC09-2957 db2iyx70	db2iy
Message Reference	Lists messages and codes issued by DB2, the Information Catalog Manager, and the Data Warehouse Center, and describes the actions you should take. You can order both volumes of the Message Reference in the English language in North America with the form number SBOF-8932.	Volume 1 GC09-2978 db2m1x70 Volume 2 GC09-2979 db2m2x70	db2m0
OLAP Integration Server Administration Guide	Explains how to use the Administration Manager component of the OLAP Integration Server.	SC27-0787 db2dpx70	n/a
OLAP Integration Server Metaoutline User's Guide	Explains how to create and populate OLAP metaoutlines using the standard OLAP Metaoutline interface (not by using the Metaoutline Assistant).	SC27-0784 db2upx70	n/a
OLAP Integration Server Model User's Guide	Explains how to create OLAP models using the standard OLAP Model Interface (not by using the Model Assistant).	SC27-0783 db2lpx70	n/a
OLAP Setup and User's Guide	Provides configuration and setup information for the OLAP Starter Kit.	SC27-0702 db2ipx70	db2ip
OLAP Spreadsheet Add-in User's Guide for Excel	Describes how to use the Excel spreadsheet program to analyze OLAP data.	SC27-0786 db2epx70	db2ep

Table 27. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
OLAP Spreadsheet Add-in User's Guide for Lotus 1-2-3	Describes how to use the Lotus 1-2-3 spreadsheet program to analyze OLAP data.	SC27-0785 db2tpx70	db2tp
Replication Guide and Reference	Provides planning, configuration, administration, and usage information for the IBM Replication tools supplied with DB2.	SC26-9920 db2e0x70	db2e0
Spatial Extender User's Guide and Reference	Provides information about installing, configuring, administering, programming, and troubleshooting the Spatial Extender. Also provides significant descriptions of spatial data concepts and provides reference information (messages and SQL) specific to the Spatial Extender.	SC27-0701 db2sbx70	db2sb
SQL Getting Started	Introduces SQL concepts and provides examples for many constructs and tasks.	SC09-2973 db2y0x70	db2y0
SQL Reference, Volume 1 and Volume 2	Describes SQL syntax, semantics, and the rules of the language. This book also includes information about release-to-release incompatibilities, product limits, and catalog views. You can order both volumes of the *SQL Reference* in the English language in North America with the form number SBOF-8933.	Volume 1 SC09-2974 db2s1x70 Volume 2 SC09-2975 db2s2x70	db2s0
System Monitor Guide and Reference	Describes how to collect different kinds of information about databases and the database manager. This book explains how to use the information to understand database activity, improve performance, and determine the cause of problems.	SC09-2956 db2f0x70	db2f0
Text Extender Administration and Programming	Provides general information about DB2 extenders and information on the administration and configuring of the text extender and on programming using the text extenders. It includes reference information, diagnostic information (with messages) and samples.	SC26-9930 desu9x70	desu9

Table 27. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
Troubleshooting Guide	Helps you determine the source of errors, recover from problems, and use diagnostic tools in consultation with DB2 Customer Service.	GC09-2850 db2p0x70	db2p0
What's New	Describes the new features, functions, and enhancements in DB2 Universal Database, Version 7.	SC09-2976 db2q0x70	db2q0
DB2 Installation and Configuration Information			
DB2 Connect Enterprise Edition for OS/2 and Windows Quick Beginnings	Provides planning, migration, installation, and configuration information for DB2 Connect Enterprise Edition on the OS/2 and Windows 32-bit operating systems. This book also contains installation and setup information for many supported clients.	GC09-2953 db2c6x70	db2c6
DB2 Connect Enterprise Edition for UNIX Quick Beginnings	Provides planning, migration, installation, configuration, and task information for DB2 Connect Enterprise Edition on UNIX-based platforms. This book also contains installation and setup information for many supported clients.	GC09-2952 db2cyx70	db2cy
DB2 Connect Personal Edition Quick Beginnings	Provides planning, migration, installation, configuration, and task information for DB2 Connect Personal Edition on the OS/2 and Windows 32-bit operating systems. This book also contains installation and setup information for all supported clients.	GC09-2967 db2c1x70	db2c1
DB2 Connect Personal Edition Quick Beginnings for Linux	Provides planning, installation, migration, and configuration information for DB2 Connect Personal Edition on all supported Linux distributions.	GC09-2962 db2c4x70	db2c4
DB2 Data Links Manager Quick Beginnings	Provides planning, installation, configuration, and task information for DB2 Data Links Manager for AIX and Windows 32-bit operating systems.	GC09-2966 db2z6x70	db2z6

Table 27. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
DB2 Enterprise - Extended Edition for UNIX Quick Beginnings	Provides planning, installation, and configuration information for DB2 Enterprise - Extended Edition on UNIX-based platforms. This book also contains installation and setup information for many supported clients.	GC09-2964 db2v3x70	db2v3
DB2 Enterprise - Extended Edition for Windows Quick Beginnings	Provides planning, installation, and configuration information for DB2 Enterprise - Extended Edition for Windows 32-bit operating systems. This book also contains installation and setup information for many supported clients.	GC09-2963 db2v6x70	db2v6
DB2 for OS/2 Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database on the OS/2 operating system. This book also contains installation and setup information for many supported clients.	GC09-2968 db2i2x70	db2i2
DB2 for UNIX Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database on UNIX-based platforms. This book also contains installation and setup information for many supported clients.	GC09-2970 db2ixx70	db2ix
DB2 for Windows Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database on Windows 32-bit operating systems. This book also contains installation and setup information for many supported clients.	GC09-2971 db2i6x70	db2i6
DB2 Personal Edition Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database Personal Edition on the OS/2 and Windows 32-bit operating systems.	GC09-2969 db2i1x70	db2i1
DB2 Personal Edition Quick Beginnings for Linux	Provides planning, installation, migration, and configuration information for DB2 Universal Database Personal Edition on all supported Linux distributions.	GC09-2972 db2i4x70	db2i4

Table 27. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
DB2 Query Patroller Installation Guide	Provides installation information about DB2 Query Patroller.	GC09-2959 db2iwx70	db2iw
DB2 Warehouse Manager Installation Guide	Provides installation information for warehouse agents, warehouse transformers, and the Information Catalog Manager.	GC26-9998 db2idx70	db2id
Cross-Platform Sample Programs in HTML			
Sample programs in HTML	Provides the sample programs in HTML format for the programming languages on all platforms supported by DB2. The sample programs are provided for informational purposes only. Not all samples are available in all programming languages. The HTML samples are only available when the DB2 Application Development Client is installed. For more information on the programs, refer to the *Application Building Guide*.	No form number	db2hs
Release Notes			
DB2 Connect Release Notes	Provides late-breaking information that could not be included in the DB2 Connect books.	See note #2.	db2cr
DB2 Installation Notes	Provides late-breaking installation-specific information that could not be included in the DB2 books.	Available on product CD-ROM only.	
DB2 Release Notes	Provides late-breaking information about all DB2 products and features that could not be included in the DB2 books.	See note #2.	db2ir

Notes:

1. The character *x* in the sixth position of the file name indicates the language version of a book. For example, the file name db2d0e70 identifies the English version of the *Administration Guide* and the file name db2d0f70 identifies the French version of the same book. The following letters are used in the sixth position of the file name to indicate the language version:

Language	Identifier
Brazilian Portuguese	b

Bulgarian	u
Czech	x
Danish	d
Dutch	q
English	e
Finnish	y
French	f
German	g
Greek	a
Hungarian	h
Italian	i
Japanese	j
Korean	k
Norwegian	n
Polish	p
Portuguese	v
Russian	r
Simp. Chinese	c
Slovenian	l
Spanish	z
Swedish	s
Trad. Chinese	t
Turkish	m

2. Late breaking information that could not be included in the DB2 books is available in the Release Notes in HTML format and as an ASCII file. The HTML version is available from the Information Center and on the product CD-ROMs. To view the ASCII file:

- On UNIX-based platforms, see the `Release.Notes` file. This file is located in the `DB2DIR/Readme/%L` directory, where `%L` represents the locale name and `DB2DIR` represents:
  - `/usr/lpp/db2_07_01` on AIX
  - `/opt/IBMdb2/V7.1` on HP-UX, PTX, Solaris, and Silicon Graphics IRIX
  - `/usr/IBMdb2/V7.1` on Linux.
- On other platforms, see the `RELEASE.TXT` file. This file is located in the directory where the product is installed. On OS/2 platforms, you can also double-click the **IBM DB2** folder and then double-click the **Release Notes** icon.

Printing the PDF Books

If you prefer to have printed copies of the books, you can print the PDF files found on the DB2 publications CD-ROM. Using the Adobe Acrobat Reader, you can print either the entire book or a specific range of pages. For the file name of each book in the library, see Table 27 on page 258.

You can obtain the latest version of the Adobe Acrobat Reader from the Adobe Web site at http://www.adobe.com.

The PDF files are included on the DB2 publications CD-ROM with a file extension of PDF. To access the PDF files:

1. Insert the DB2 publications CD-ROM. On UNIX-based platforms, mount the DB2 publications CD-ROM. Refer to your *Quick Beginnings* book for the mounting procedures.
2. Start the Acrobat Reader.
3. Open the desired PDF file from one of the following locations:
   - On OS/2 and Windows platforms:

     `x:\doc\`*language* directory, where *x* represents the CD-ROM drive and *language* represent the two-character country code that represents your language (for example, EN for English).
   - On UNIX-based platforms:

     /cdrom`/doc/%L` directory on the CD-ROM, where */cdrom* represents the mount point of the CD-ROM and *%L* represents the name of the desired locale.

You can also copy the PDF files from the CD-ROM to a local or network drive and read them from there.

Ordering the Printed Books

You can order the printed DB2 books either individually or as a set (in North America only) by using a sold bill of forms (SBOF) number. To order books, contact your IBM authorized dealer or marketing representative, or phone 1-800-879-2755 in the United States or 1-800-IBM-4YOU in Canada. You can also order the books from the Publications Web page at http://www.elink.ibmlink.ibm.com/pbl/pbl.

Two sets of books are available. SBOF-8935 provides reference and usage information for the DB2 Warehouse Manager. SBOF-8931 provides reference and usage information for all other DB2 Universal Database products and features. The contents of each SBOF are listed in the following table:

Table 28. Ordering the printed books

SBOF Number	Books Included	
SBOF-8931	• Administration Guide: Planning • Administration Guide: Implementation • Administration Guide: Performance • Administrative API Reference • Application Building Guide • Application Development Guide • CLI Guide and Reference • Command Reference • Data Movement Utilities Guide and Reference • Data Warehouse Center Administration Guide • Data Warehouse Center Application Integration Guide • DB2 Connect User's Guide • Installation and Configuration Supplement • Image, Audio, and Video Extenders Administration and Programming • Message Reference, Volumes 1 and 2	• OLAP Integration Server Administration Guide • OLAP Integration Server Metaoutline User's Guide • OLAP Integration Server Model User's Guide • OLAP Integration Server User's Guide • OLAP Setup and User's Guide • OLAP Spreadsheet Add-in User's Guide for Excel • OLAP Spreadsheet Add-in User's Guide for Lotus 1-2-3 • Replication Guide and Reference • Spatial Extender Administration and Programming Guide • SQL Getting Started • SQL Reference, Volumes 1 and 2 • System Monitor Guide and Reference • Text Extender Administration and Programming • Troubleshooting Guide • What's New
SBOF-8935	• Information Catalog Manager Administration Guide • Information Catalog Manager User's Guide • Information Catalog Manager Programming Guide and Reference	• Query Patroller Administration Guide • Query Patroller User's Guide

DB2 Online Documentation

Accessing Online Help

Online help is available with all DB2 components. The following table describes the various types of help.

Type of Help	Contents	How to Access...
Command Help	Explains the syntax of commands in the command line processor.	From the command line processor in interactive mode, enter: `? command` where *command* represents a keyword or the entire command. For example, `? catalog` displays help for all the CATALOG commands, while `? catalog database` displays help for the CATALOG DATABASE command.
Client Configuration Assistant Help *Command Center Help* *Control Center Help* *Data Warehouse Center Help* *Event Analyzer Help* *Information Catalog Manager Help* *Satellite Administration Center Help* *Script Center Help*	Explains the tasks you can perform in a window or notebook. The help includes overview and prerequisite information you need to know, and it describes how to use the window or notebook controls.	From a window or notebook, click the **Help** push button or press the **F1** key.
Message Help	Describes the cause of a message and any action you should take.	From the command line processor in interactive mode, enter: `? XXXnnnnn` where *XXXnnnnn* represents a valid message identifier. For example, `? SQL30081` displays help about the SQL30081 message. To view message help one screen at a time, enter: `? XXXnnnnn	more`  To save message help in a file, enter:  `? XXXnnnnn > filename.ext` where *filename.ext* represents the file where you want to save the message help.

Type of Help	Contents	How to Access...
SQL Help	Explains the syntax of SQL statements.	From the command line processor in interactive mode, enter: `help statement` where *statement* represents an SQL statement. For example, `help SELECT` displays help about the SELECT statement. **Note:** SQL help is not available on UNIX-based platforms.
SQLSTATE Help	Explains SQL states and class codes.	From the command line processor in interactive mode, 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, while `? 08` displays help for the 08 class code.

Viewing Information Online

The books included with this product are in Hypertext Markup Language (HTML) softcopy format. Softcopy format enables you to search or browse the information and provides hypertext links to related information. It also makes it easier to share the library across your site.

You can view the online books or sample programs with any browser that conforms to HTML Version 3.2 specifications.

To view online books or sample programs:
- If you are running DB2 administration tools, use the Information Center.
- From a browser, click **File —>Open Page**. The page you open contains descriptions of and links to DB2 information:
  - On UNIX-based platforms, open the following page:
    ```
    INSTHOME/sqllib/doc/%L/html/index.htm
    ```

    where `%L` represents the locale name.
  - On other platforms, open the following page:
    ```
    sqllib\doc\html\index.htm
    ```

    The path is located on the drive where DB2 is installed.

If you have not installed the Information Center, you can open the page by double-clicking the **DB2 Information** icon. Depending on the system you are using, the icon is in the main product folder or the Windows Start menu.

Installing the Netscape Browser

If you do not already have a Web browser installed, you can install Netscape from the Netscape CD-ROM found in the product boxes. For detailed instructions on how to install it, perform the following:

1. Insert the Netscape CD-ROM.
2. On UNIX-based platforms only, mount the CD-ROM. Refer to your *Quick Beginnings* book for the mounting procedures.
3. For installation instructions, refer to the CDNAV*nn*.txt file, where *nn* represents your two character language identifier. The file is located at the root directory of the CD-ROM.

Accessing Information with the Information Center

The Information Center provides quick access to DB2 product information. The Information Center is available on all platforms on which the DB2 administration tools are available.

You can open the Information Center by double-clicking the Information Center icon. Depending on the system you are using, the icon is in the Information folder in the main product folder or the Windows **Start** menu.

You can also access the Information Center by using the toolbar and the **Help** menu on the DB2 Windows platform.

The Information Center provides six types of information. Click the appropriate tab to look at the topics provided for that type.

Tasks   Key tasks you can perform using DB2.

Reference   DB2 reference information, such as keywords, commands, and APIs.

Books   DB2 books.

Troubleshooting
      Categories of error messages and their recovery actions.

Sample Programs
      Sample programs that come with the DB2 Application Development Client. If you did not install the DB2 Application Development Client, this tab is not displayed.

Web   DB2 information on the World Wide Web. To access this information, you must have a connection to the Web from your system.

When you select an item in one of the lists, the Information Center launches a viewer to display the information. The viewer might be the system help viewer, an editor, or a Web browser, depending on the kind of information you select.

The Information Center provides a find feature, so you can look for a specific topic without browsing the lists.

For a full text search, follow the hypertext link in the Information Center to the **Search DB2 Online Information** search form.

The HTML search server is usually started automatically. If a search in the HTML information does not work, you may have to start the search server using one of the following methods:

On Windows
> Click **Start** and select **Programs —> IBM DB2 —> Information —> Start HTML Search Server**.

On OS/2
> Double-click the **DB2 for OS/2** folder, and then double-click the **Start HTML Search Server** icon.

Refer to the release notes if you experience any other problems when searching the HTML information.

Note: The Search function is not available in the Linux, PTX, and Silicon Graphics IRIX environments.

Using DB2 Wizards

Wizards help you complete specific administration tasks by taking you through each task one step at a time. Wizards are available through the Control Center and the Client Configuration Assistant. The following table lists the wizards and describes their purpose.

Note: The Create Database, Create Index, Configure Multisite Update, and Performance Configuration wizards are available for the partitioned database environment.

Wizard	Helps You to...	How to Access...
Add Database	Catalog a database on a client workstation.	From the Client Configuration Assistant, click **Add**.
Backup Database	Determine, create, and schedule a backup plan.	From the Control Center, right-click the database you want to back up and select **Backup —> Database Using Wizard**.

Wizard	Helps You to...	How to Access...
Configure Multisite Update	Configure a multisite update, a distributed transaction, or a two-phase commit.	From the Control Center, right-click the **Databases** folder and select **Multisite Update**.
Create Database	Create a database, and perform some basic configuration tasks.	From the Control Center, right-click the **Databases** folder and select **Create —> Database Using Wizard**.
Create Table	Select basic data types, and create a primary key for the table.	From the Control Center, right-click the **Tables** icon and select **Create —> Table Using Wizard**.
Create Table Space	Create a new table space.	From the Control Center, right-click the **Table Spaces** icon and select **Create —> Table Space Using Wizard**.
Create Index	Advise which indexes to create and drop for all your queries.	From the Control Center, right-click the **Index** icon and select **Create —> Index Using Wizard**.
Performance Configuration	Tune the performance of a database by updating configuration parameters to match your business requirements.	From the Control Center, right-click the database you want to tune and select **Configure Performance Using Wizard**. For the partitioned database environment, from the Database Partitions view, right-click the first database partition you want to tune and select **Configure Performance Using Wizard**.
Restore Database	Recover a database after a failure. It helps you understand which backup to use, and which logs to replay.	From the Control Center, right-click the database you want to restore and select **Restore —> Database Using Wizard**.

Setting Up a Document Server

By default, the DB2 information is installed on your local system. This means that each person who needs access to the DB2 information must install the same files. To have the DB2 information stored in a single location, perform the following steps:

1. Copy all files and subdirectories from \sqllib\doc\html on your local system to a Web server. Each book has its own subdirectory that contains all the necessary HTML and GIF files that make up the book. Ensure that the directory structure remains the same.

2. Configure the Web server to look for the files in the new location. For information, refer to the NetQuestion Appendix in the *Installation and Configuration Supplement*.

3. If you are using the Java version of the Information Center, you can specify a base URL for all HTML files. You should use the URL for the list of books.

4. When you are able to view the book files, you can bookmark commonly viewed topics. You will probably want to bookmark the following pages:
   - List of books
   - Tables of contents of frequently used books
   - Frequently referenced articles, such as the ALTER TABLE topic
   - The Search form

For information about how you can serve the DB2 Universal Database online documentation files from a central machine, refer to the NetQuestion Appendix in the *Installation and Configuration Supplement*.

Searching Information Online

To find information in the HTML files, use one of the following methods:

- Click **Search** in the top frame. Use the search form to find a specific topic. This function is not available in the Linux, PTX, or Silicon Graphics IRIX environments.
- Click **Index** in the top frame. Use the index to find a specific topic in the book.
- Display the table of contents or index of the help or the HTML book, and then use the find function of the Web browser to find a specific topic in the book.
- Use the bookmark function of the Web browser to quickly return to a specific topic.
- Use the search function of the Information Center to find specific topics. See "Accessing Information with the Information Center" on page 271 for details.

Appendix C. National Language Support (NLS)

This section contains information about configuring national language support for the DB2 Connect product, and includes information on:

- Which languages are supported by DB2 Connect Enterprise Edition and DB2 Connect Personal Edition.
- How DB2 Connect handles the conversion of data between different systems.
- How to customize your DB2 Connect workstation for your particular national language environment.
- How to customize your host Coded Character Set Identifier (CCSID) setting.

Language and Codeset Support for UNIX Operating Systems

DB2 supports many code sets and locales without translating the messages for the corresponding languages. Supporting a locale means that you can create and use a database in that locale, but you may have to view all panels and messages in a different language, if translated messages are not available in DB2. For a complete list of locales supported, refer to the *Administration Guide*.

If you want to operate in a different language environment, perform the following steps:

Step 1. Ensure that the appropriate message option for the desired language has been installed.

Step 2. Set the *LANG* environment variable to the desired locale.

For example, to use `fr_FR` messages on DB2 for AIX, you must have the `fr_FR` message option installed and must set *LANG* to `fr_FR`.

The selected message catalog filesets are placed in the following directories on the target workstation:

DB2 for AIX
  `/usr/lpp/db2_07_01/msg/%L`

DB2 for HP-UX, PTX, and Solaris
  `/opt/IBMdb2/V7.1/msg/%L`

DB2 for Linux
  `/usr/IBMdb2/V7.1/msg/%L`

where *%L* is equal to the locale name of the message catalog.

Code Page and Language Support for OS/2 and Windows Operating Environments

During installation of DB2, the country, codepage, and regional settings are established. However, you can change these settings after installing DB2: including regional settings such as code page, country language (for monetary, date, and numeric formatting), and time zone. When a new connection to a database is made, the database manager uses these new values.

You must ensure that your regional settings are set correctly. DB2 may not produce the expected results if the country, code page, or regional settings are incorrect for the intended language. Table 29 shows the languages into which the DB2 messages are translated. If the setup is run on a machine that is set up using a non-supported language, then English is the default unless the user has specified otherwise.

Table 29. Languages and Code Pages

Country Code	Language
bg	Bulgarian
br	Brazilian Portuguese
cn	Simplified Chinese (PRC)
cz	Czech
de	German
dk	Danish
en	English
es	Spanish
fi	Finnish
fr	French
gr	Greek
hu	Hungarian
il	Hebrew
it	Italian
jp	Japanese
kr	Korean
nl	Dutch
no	Norwegian
pl	Polish
pt	Portuguese
ru	Russian

Table 29. Languages and Code Pages (continued)

Country Code	Language
se	Swedish
si	Slovenian
tr	Turkish
tw	Traditional Chinese (Taiwan)

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 the DB2 Connect workstation and a host or AS/400 database server, it is usually converted from a workstation 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 (for example, data from a column declared with the FOR BIT DATA clause) is not converted. 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 DB2 Universal Database for OS/390 data, the following happens:

1. DB2 Connect sends an SQL statement and input data to OS/390.
2. DB2 Universal Database for OS/390 converts the data to an EBCDIC CCSID and processes it.
3. DB2 Universal Database for OS/390 sends the result back to the DB2 Connect workstation.
4. DB2 Connect converts the result to an ASCII or ISO code page and returns it to the user.

The table that follows shows the conversions that are supported between code pages (on the workstation) and CCSIDs (on the host). For more detailed information about supported code page conversions, refer to the *Administration Guide*.

Table 30. Workstation Code Page to Host CCSID Conversion

Host CCSIDs	Code Page	Countries
037, 273, 277, 278, 280, 284, 285, 297, 500, 871, 1140-1149	437, 819, 850, 858, 860, 863, 1004, 1051, 1252, 1275	Albania, Australia, Austria, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Latin America, Netherlands, New Zealand, Norway, Portugal, South Africa, Spain, Sweden, Switzerland, UK, USA
423, 875	737, 813, 869, 1253, 1280	Greece
870	852, 912, 1250, 1282	Croatia, Czech Republic, Hungary, Poland, Romania, Serbia/Montenegro (Latin), Slovakia, Slovenia
1025	855, 866, 915, 1251, 1283	Bulgaria, FYR Macedonia, Russia, Serbia/Montenegro (Cyrillic)
1026	857, 920, 1254, 1281	Turkey
424	862, 916, 1255	Israel - see note 3 below
420	864, 1046, 1089, 1256	Arabic countries - see note 3 below
838	874	Thailand
930, 939, 5026, 5035	932, 942, 943, 954, 5039	Japan
937	938, 948, 950, 964	Taiwan
933, 1364	949, 970, 1363	Korea
935, 1388	1381, 1383, 1386	People's Republic of China
1112, 1122	921, 922	Estonia, Latvia, Lithuania
1025	915, 1131, 1251, 1283	Belarus
1123	1124, 1125, 1251	Ukraine

Notes:

1. Code page 1004 is supported as code page 1252.
2. In general, data can be converted from a code page to a CCSID and back again to the same code page with no change. The following are the only exceptions to that rule:
   - In double-byte character set (DBCS) code pages, some data containing user-defined characters may be lost.

- For single-byte code pages defined within mixed-byte code pages, and for some newer single-byte code pages, characters that do not exist in both the source and the target may be mapped to substitution characters and then lost when the data is converted back to the original code page.

3. 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 *Administration Guide* for details of these special CCSIDs. Refer to the Release Notes for DB2 Connect for detailed information about how to set them up for DRDA host connections.

Bidirectional CCSID Support

The following BiDi attributes are required for correct handling of Bidirectional data on different platforms:

```
- Text type (LOGICAL vs VISUAL)
- Shaping (SHAPED vs UNSHAPED)
- Orientation (RIGHT-TO-LEFT vs LEFT-TO-RIGHT)
- Numeral shape (ARABIC vs HINDI)
- Symmetric swapping (YES or NO)
```

Since defaults on different platforms are not the same, problems appear when DB2 data is sent from one platform to another. For example, Windows platforms use LOGICAL UNSHAPED data, while data on OS/390 is usually in SHAPED VISUAL format. Therefore, without any support for these attributes data sent from DB2 Universal Database for OS/390 to DB2 UDB on a Windows 32-bit operating systems workstation displays incorrectly.

Bidirectional-specific CCSIDs

The following bidirectional Coded Character Set Identifiers (CCSID) have been defined and are implemented with DB2 UDB:

```
CCSID -  Code  - String
      -  Page  -  Type
-------+--------+----------
 00420    420      4
 00424    424      4
 08612    420      5
 08616    424      6
 12708    420      7
X'3F00'   856      4
X'3F01'   862      4
X'3F02'   916      4
X'3F03'   424      5
X'3F04'   856      5
X'3F05'   862      5
```

```
X'3F06'    916    5
X'3F07'   1255    5
X'3F08'   1046    5
X'3F09'    864    5
X'3F0A'   1089    5
X'3F0B'   1256    5
X'3F0C'    856    6
X'3F0D'    862    6
X'3F0E'    916    6
X'3F0F'   1255    6
X'3F10'    420    6
X'3F11'    864    6
X'3F12'   1046    6
X'3F13'   1089    6
X'3F14'   1256    6
X'3F15'    424    8
X'3F16'    856    8
X'3F17'    862    8
X'3F18'    916    8
X'3F19'    420    8
X'3F1A'    420    9
X'3F1B'    424   10
X'3F1C'    856   10
X'3F1D'    862   10
X'3F1E'    916   10
X'3F1F'   1255   10
X'3F20'    424   11
X'3F21'    856   11
X'3F22'    862   11
X'3F23'    916   11
X'3F24'   1255   11
```

Where CDRA String Types are defined:

```
 String -  Text - Numerical - Orientation - Shaping  - Symmetrical
  Type  -  Type -   Shape   -      -            -     -  Swapping
---------+-------+------------+-------------+-----------+-------------
    4      Visual   Arabic        LTR          Shaped        OFF
    5     Implicit  Arabic        LTR         Unshaped        ON
    6     Implicit  Arabic        RTL         Unshaped        ON
   7(*)    Visual   Arabic     Contextual(*)  Unshaped-Lig   OFF
    8      Visual   Arabic        RTL          Shaped        OFF
    9      Visual  Passthru       RTL          Shaped         ON
   10     Implicit             Contextual-L                   ON
   11     Implicit             Contextual-R                   ON
```

Note: Field orientation is left-to-right (LTR) when the first alphabetic character is a Latin one, and right-to-left (RTL) when it is a bidirectional (RTL) character. Characters are unshaped, but LamAlef ligatures are kept, and not broken into constituents.

Appendix D. Naming Rules

Go to the section that describes the naming rules that you require information on:

- "General Naming Rules"
- "Database, Database Alias, and Catalog Node Name Rules"
- "Object Name Rules" on page 282
- "Username, User ID, Group Name, and Instance Name Rules" on page 283
- "Workstation Name (nname) Rules" on page 284
- "DB2SYSTEM Naming Rules" on page 284
- "Password Rules" on page 284

General Naming Rules

Unless otherwise specified, all names can include the following characters:

- A through Z. When used in most names, characters A through Z are converted from lowercase to uppercase.
- 0 through 9
- @, #, $, and _ (underscore)

Unless otherwise specified, all names must begin with one of the following characters:

- A through Z
- @, #, and $

Do not use SQL reserved words to name tables, views, columns, indexes, or authorization IDs. For a list of SQL reserved words, refer to *SQL Reference*.

Database, Database Alias, and Catalog Node Name Rules

Database names are the identifying names assigned to databases in the database manager. *Database alias names* are synonyms given to remote databases. Database aliases must be unique within the System Database Directory in which all aliases are stored. *Catalog node names* are the identifying names that are assigned to entries in the node directory. Each entry in the node directory is an alias name for a computer on your network. To avoid confusions that could arise from multiple names for the same server, we recommend that you use the same catalog node name as the network name for the server.

When naming a database, database alias, or catalog node name, see "General Naming Rules" on page 281. In addition, the name you specify can *only* contain 1 to 8 characters.

> To avoid potential problems, do not use the special characters @, #, and $ in a database name if you intend to have a client remotely connect to a host database. Also, because these characters are not common to all keyboards, do not use them if you plan to use the database in another country.
>
> On Windows NT and Windows 2000 systems, ensure that no instance name is the same as a service name.

Object Name Rules

Database objects include:
- Tables
- Views
- Columns
- Indexes
- User-defined functions (UDFs)
- User-defined types (UDTs)
- Triggers
- Aliases
- Table spaces
- Schemas

When naming database objects, see "General Naming Rules" on page 281.

In addition, the name you specify:
- Can contain 1 to 18 characters *except* for the following:
  - Table names (including view names, summary table names, alias names, and correlation names), which can contain up to 128 characters
  - column names, which can contain up to 30 characters
  - schema names, which can contain up to 30 characters
- Cannot be any of the SQL reserved words that are listed in the *SQL Reference*.

Using delimited identifiers, it is possible to create an object that violates these naming rules; however, subsequent use of the object could result in errors.

For example, if you create a column with a + or – sign included in the name and you subsequently use that column in an index, you will experience problems when you attempt to reorganize the table. To avoid potential problems with the use and operation of your database, *do not* violate these rules.

Username, User ID, Group Name, and Instance Name Rules

Usernames or *User IDs* are the identifiers assigned to individual users. When naming users, groups, or instances, see "General Naming Rules" on page 281.

In addition to the general naming rules:

- User IDs on OS/2 can contain 1 to 8 characters. They cannot start with a numeric digit or end with $.
- Usernames on UNIX can contain 1 to 8 characters.
- Usernames on Windows can contain 1 to 30 characters. The Windows NT and Windows 2000 operating systems currently have a limit of 20 characters.
- Group and instance names can contain 1 to 8 characters.
- Names cannot be any of the following:
  - USERS
  - ADMINS
  - GUESTS
  - PUBLIC
  - LOCAL
- Names cannot begin with:
  - IBM
  - SQL
  - SYS
- Names cannot include accented characters.
- In general, when naming users, groups, or instances:

  OS/2   Use uppercase names.

  UNIX   Use lowercase names.

  Windows 32-bit operating systems
        Use any case.

Workstation Name (nname) Rules

A *workstation* name specifies the NetBIOS name for a database server or client that resides on the local workstation. This name is stored in the database manager configuration file. The workstation name is known as the *workstation nname*. When naming workstations, see "General Naming Rules" on page 281.

In addition, the name you specify:
- Can contain 1 to 8 characters
- Cannot include &, #, and @
- Must be unique within the network

DB2SYSTEM Naming Rules

DB2 uses the *DB2SYSTEM* name to identify a physical DB2 machine, system, or workstation within a network. On UNIX, the DB2SYSTEM name defaults to the TCP/IP hostname. On OS/2, you must specify the *DB2SYSTEM* name during install. On Windows 32-bit operating systems, you do not need to specify a *DB2SYSTEM* name; the DB2 setup program detects the Windows Computer name and assigns it to *DB2SYSTEM*.

When creating a *DB2SYSTEM* name, see "General Naming Rules" on page 281.

In addition, the name you specify:
- Must be unique within a network
- Can contain a maximum of 21 characters

Password Rules

When determining passwords, consider the following rules:

OS/2   A maximum of 14 characters.

UNIX   A maximum of 8 characters.

Windows 32-bit operating systems
                A maximum of 14 characters.

Appendix E. List Files, Bind Files, and Packages

This appendix lists the bind files contained in different `.lst` files shipped with the product. Although the contents of these lists are similar for each platform, the bind packages are generated specifically for each platform. Each package name can be mapped back to the client platform.

The Bind function in the DB2 Client Configuration Assistant chooses the correct bind files for you automatically.

Users on OS/2, Windows 32-bit operating systems, and AIX systems can use the **ddcspkgn** command to determine the package name for individual bind files or list (.lst) files. This command is found in the `bin` directory under the DB2 installation directory. For example, on an AIX system, enter the following command with the bind file in the local directory:

```
/sqllib/bin/ddcspkgn db2ajgrt.bnd
```

The following list maps *Y* values to platforms:

xAz   Clients for AIX

xHz   Clients for HP-UX

xLz   Clients for Linux

xDz   Clients for OS/2

xTz   Clients for PTX

xUz   Clients for Solaris

xXz   Clients for SINIX

xWz   Clients for Windows

xNz   Clients for Windows 32-bit operating systems

xGz   Clients for Silicon Graphics

List Files Associated with DRDA Servers

The following table lists which bind files are included in the `.lst` file associated with a particular DRDA host. The package associated with each bind file is also listed:

DRDA Server	List File
OS/390 and MVS	ddcsmvs.lst

DRDA Server	List File
VSE	ddcsvse.lst
VM	ddcsvm.lst
OS/400	ddcs400.lst

Table 31. DRDA Bind Files and Packages

Component	Bind File Name	Package Name	MVS	VM/VSE	OS/400
DB2 Call Level Interface					
Isolation level CS	db2clics.bnd	sqll1*xyz*	yes	yes	yes
Isolation level RR	db2clirr.bnd	sqll2*xyz*	yes	yes	yes
Isolation level UR	db2cliur.bnd	sqll3*xyz*	yes	no	yes
Isolation level RS	db2clirs.bnd	sqll4*xyz*	no	no	yes
Isolation level NC	db2clinc.bnd	sqll5*xyz*	no	no	yes
Using MVS table names	db2clims.bnd	sqll7*xyz*	yes	no	no
Using OS/400 table names (OS/400 3.1 or later)	db2clias.bnd	sqlla*xyz*	no	no	yes
Using VSE/VM table names	db2clivm.bnd	sqll8*xyz*	no	yes	no
Command Line Processor					
Isolation level CS	db2clpcs.bnd	sqlc2*xyz*	yes	yes	yes
Isolation level RR	db2clprr.bnd	sqlc3*xyz*	yes	yes	yes
Isolation level UR	db2clpur.bnd	sqlc4*xyz*	yes	yes	yes
Isolation level RS	db2clprs.bnd	sqlc5*xyz*	no	no	yes
Isolation level NC	db2clpnc.bnd	sqlc6*xyz*	no	no	yes
REXX					
Isolation level CS	db2arxcs.bnd	sqla1*xyz*	yes	yes	yes
Isolation level RR	db2arxrr.bnd	sqla2*xyz*	yes	yes	yes
Isolation level UR	db2arxur.bnd	sqla3*xyz*	yes	yes	yes
Isolation level RS	db2arxrs.bnd	sqla4*xyz*	yes	yes	yes
Isolation level NC	db2arxnc.bnd	sqla5*xyz*	no	no	yes
Utilities					
Export	db2uexpm.bnd	sqlub*xyz*	yes	yes	yes
Import	db2uimpm.bnd	sqluf*xyz*	yes	yes	yes

Table 31. DRDA Bind Files and Packages (continued)

Component	Bind File Name	Package Name	MVS	VM/VSE	OS/400
Import	db2uimtb.bnd	db2uk*xyz*	yes	yes	yes

Note: If your DB2 for MVS/ESA system has APAR PN60988 installed (or if it is a later release than Version 3 Release 1), you can add the bind files for isolation level NC to the ddcsmvs.lst file.

Appendix F. Notices

IBM may not offer the products, services, or features discussed in this document in all countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

IBM World Trade Asia Corporation
Licensing
2-31 Roppongi 3-chome, Minato-ku
Tokyo 106, Japan

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make

improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Canada Limited
Office of the Lab Director
1150 Eglinton Ave. East
North York, Ontario
M3C 1H7
CANADA

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this information and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement, or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

This information may contain examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

COPYRIGHT LICENSE:

This information may contain sample application programs in source language, which illustrates programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs.

Each copy or any portion of these sample programs or any derivative work must include a copyright notice as follows:

© (your company name) (year). Portions of this code are derived from IBM Corp. Sample Programs. © Copyright IBM Corp. _enter the year or years_. All rights reserved.

Trademarks

The following terms, which may be denoted by an asterisk(*), are trademarks of International Business Machines Corporation in the United States, other countries, or both.

ACF/VTAM	IBM
AISPO	IMS
AIX	IMS/ESA
AIX/6000	LAN DistanceMVS
AIXwindows	MVS/ESA
AnyNet	MVS/XA
APPN	Net.Data
AS/400	OS/2
BookManager	OS/390
CICS	OS/400
C Set++	PowerPC
C/370	QBIC
DATABASE 2	QMF
DataHub	RACF
DataJoiner	RISC System/6000
DataPropagator	RS/6000
DataRefresher	S/370
DB2	SP
DB2 Connect	SQL/DS
DB2 Extenders	SQL/400
DB2 OLAP Server	System/370
DB2 Universal Database	System/390
Distributed Relational	SystemView
Database Architecture	VisualAge
DRDA	VM/ESA
eNetwork	VSE/ESA
Extended Services	VTAM
FFST	WebExplorer
First Failure Support Technology	WIN-OS/2

The following terms are trademarks or registered trademarks of other companies:

Microsoft, Windows, and Windows NT are trademarks or registered trademarks of Microsoft Corporation.

Java or all Java-based trademarks and logos, and Solaris are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Tivoli and NetView are trademarks of Tivoli Systems Inc. in the United States, other countries, or both.

UNIX is a registered trademark in the United States, other countries or both and is licensed exclusively through X/Open Company Limited.

Other company, product, or service names, which may be denoted by a double asterisk(**) may be trademarks or service marks of others.

Index

Special Characters

.INI file
    db2cli.ini 239
    ODBC 239

A

access profiles
    adding databases 193
    client 198
    creating 198
    server 198
    using 198
accessing data
    using DB2 Connect 5
    using Net.Data or JDBC 11
accessing DB2 servers
    TCP/IP 111, 203
accessing host servers
    configuring communications
        IBM eNetwork
            Communication Server V5
            for AIX 124
        SNAP-IX for Sparc
            Solaris 145
        SNAplus2 for HP-UX 135
        SunLink SNA Version 9.1 for
            Solaris 153
accessing multiple servers 203
accessing servers
    overview 203
add database wizard 272, 273
adding databases
    manually 196
    using access profiles 193
    using Discovery 194
Administration Server
    creating on AIX 45
    creating on HP-UX 53
    creating on Linux 62
    creating on NUMA-Q 70
    creating on Solaris 80
    overview 18
AIX
    creating an instance 45
    creating fenced UDF and stored
      procedure IDs 44
    creating group IDs 44
    creating user IDs 44

AIX *(continued)*
    installing additional products and
      components using
      db2setup 41
    installing using db2setup 41
    installing using SMIT 42
    license file names 46
    mounting CD-ROM 252
    software requirements 28
    updating the license key 46
APPC
    Bull SNA 133
    Communications Manager for
      OS/2 31
    manually configuring 121
    on OS/2 31
    on Windows 2000 34
    on Windows 9x 33
    on Windows NT 34
    SNAplusLink 124, 135, 153
    software requirements 27
    SunLink SNA 32
    supported platforms 27
APPL 123
application development
    using Net.Data or JDBC 11
    using ODBC 230
AS/400
    configuring DB2 Universal
      Database for AS/400 for DB2
      Connect 106
    configuring for DB2
      Connect 106
    DSPNETA 106
    DSPRDBDIRE 107
    WRKLIND 106

B

backup database wizard 272
bidirectional CCSID support 279
bidirectional language support 279
bind files and package names 285
binding
    utilities 230
books 257, 267

C

cached address list
    using 168

catalog node name
    naming rules 281
cataloging
    APPC node 156
    databases 116, 157, 208
    TCP/IP node 115, 207, 208
CCSID 275, 279
client profiles
    creating 199
    definition 199
    importing 200
    using 199
clients
    configuring 203
    installing 173
code page
    conversion exceptions 279
    conversions 275
coded character set identifier
  (CCSID) 275
Command Center
    entering DB2 commands 248
    entering SQL statements 248
    overview 15
commands
    dasicrt 45, 53, 62, 70, 80
    db2_install 75
    db2 list applications 36
    db2 terminate 36
    db2cc 218
    db2icrt 45, 53, 61, 62, 70, 79, 80
    db2jstrt 216
    db2licm 46, 54, 62, 71, 80
    db2rmln 46, 55, 63, 71, 81
    db2sampl 218
    db2setup 41, 49, 58, 66, 75, 185,
      189
        −d option 40
        description 39
        generating trace log using 40
        supported UNIX shells 40
    db2stop 36
    pkgadd 75
    rlogin 189
    sniffle 222
communication protocols
    APPC 121
    by platform 27
    configuring 111, 203

298   DB2 Connect Quick Beginnings for UNIX**

Contacting IBM

If you have a technical problem, please review and carry out the actions suggested by the *Troubleshooting Guide* before contacting DB2 Customer Support. This guide suggests information that you can gather to help DB2 Customer Support to serve you better.

For information or to order any of the DB2 Universal Database products contact an IBM representative at a local branch office or contact any authorized IBM software remarketer.

If you live in the U.S.A., then you can call one of the following numbers:
- 1-800-237-5511 for customer support
- 1-888-426-4343 to learn about available service options

Product Information

If you live in the U.S.A., then you can call one of the following numbers:
- 1-800-IBM-CALL (1-800-426-2255) or 1-800-3IBM-OS2 (1-800-342-6672) to order products or get general information.
- 1-800-879-2755 to order publications.

http://www.ibm.com/software/data/
> The DB2 World Wide Web pages provide current DB2 information about news, product descriptions, education schedules, and more.

http://www.ibm.com/software/data/db2/library/
> The DB2 Product and Service Technical Library provides access to frequently asked questions, fixes, books, and up-to-date DB2 technical information.
>
> **Note:** This information may be in English only.

http://www.elink.ibmlink.ibm.com/pbl/pbl/
> The International Publications ordering Web site provides information on how to order books.

http://www.ibm.com/education/certify/
> The Professional Certification Program from the IBM Web site provides certification test information for a variety of IBM products, including DB2.

ftp.software.ibm.com

Log on as anonymous. In the directory `/ps/products/db2`, you can find demos, fixes, information, and tools relating to DB2 and many other products.

comp.databases.ibm-db2, bit.listserv.db2-l

These Internet newsgroups are available for users to discuss their experiences with DB2 products.

On Compuserve: GO IBMDB2

Enter this command to access the IBM DB2 Family forums. All DB2 products are supported through these forums.

For information on how to contact IBM outside of the United States, refer to Appendix A of the *IBM Software Support Handbook*. To access this document, go to the following Web page: http://www.ibm.com/support/, and then select the IBM Software Support Handbook link near the bottom of the page.

Note: In some countries, IBM-authorized dealers should contact their dealer support structure instead of the IBM Support Center.

IBM ®

Part Number: CT7XZNA

CT7XZNA