IBM® DB2® Connect™
Personal Edition

IBM

DB2 Connect Quick Beginnings

Version 7

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Personal Edition

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Version 7

Before using this information and the product it supports, be sure to read the general information under "Appendix F. Notices" on page 187.

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 Personal Edition workstation. Once the DB2 Connect Personal Edition workstation has been installed and configured, you will configure a connection from the workstation to a DB2 server on a host or AS/400 system (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 "Appendix B. Using the DB2 Library" on page 155.

- 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. An Introduction to DB2 Connect

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

DB2 Connect
Personal Edition

DB2 Connect
Enterprise Edition
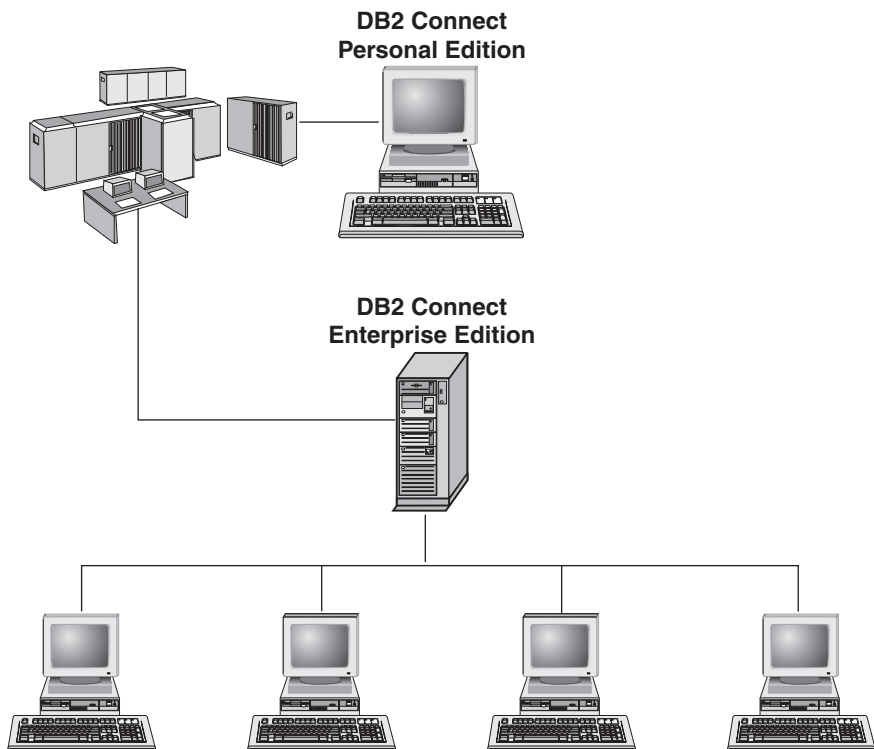
The following DB2 Connect products are available:

- 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 Host or AS/400 DB2 Data using DB2 Connect Personal Edition

A Direct connection without intermediate servers is a very convenient and desirable configuration. This is especially true for situations where the host or the AS/400 database server supports TCP/IP connectivity (for example, DB2 for OS/390 V5.1, or DB2 for AS/400 V4R2, or DB2 for VM 6.1). In such a configuration, each DB2 Connect workstation establishes a direct TCP/IP connection to DB2 for OS/390 or, for platforms with integrated SNA Support, connects via APPC to DB2 for MVS and other host and AS/400 databases.

TCP/IP connectivity requires that the host or AS/400 database support TCP/IP. DB2 for OS/390 V5.1, DB2/400 V4R2, and DB2 for VM V6.1 support native TCP/IP connections. An alternative to native TCP/IP is MPTN connectivity. MPTN connections require that IBM AnyNet products be installed on the target database system, but do not require the host or AS/400 database to provide native TCP/IP support.

Figure 1 on page 5 shows a workstation, with DB2 Connect Personal Edition installed, directly connected to a host or AS/400 database server.
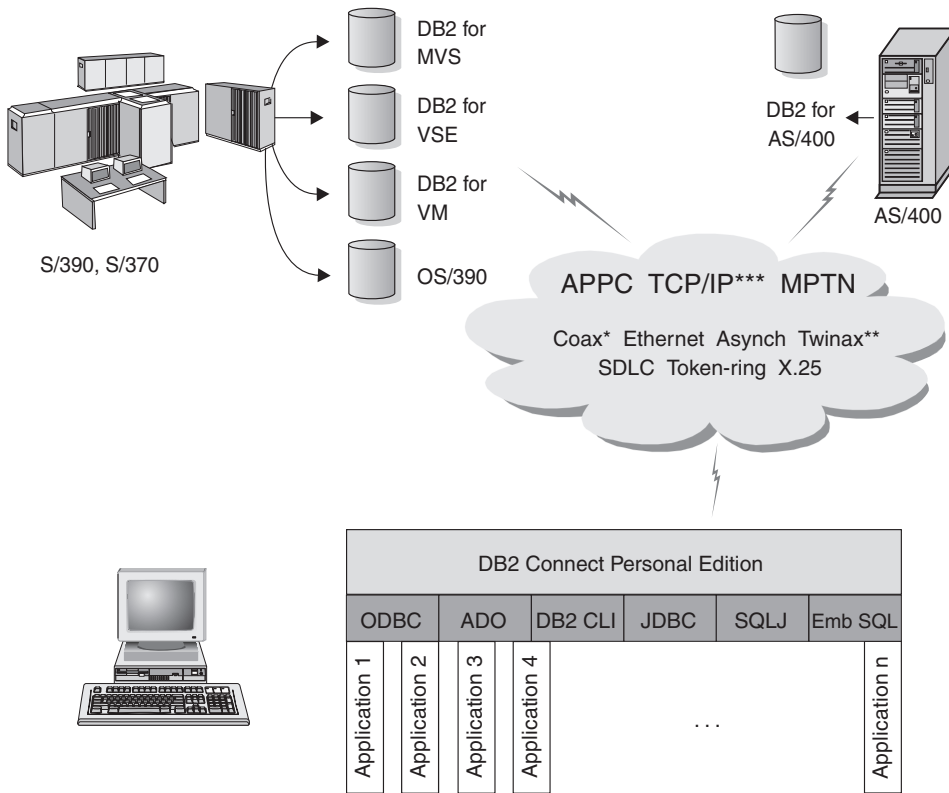
Not all protocols are supported for all platforms.

    * 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 1. Direct Connection Between DB2 Connect and a host or AS/400 database server

In this environment, if you are using Windows 32-bit operating systems you can use the DB2 Connect Personal Edition Integrated SNA Support to connect directly to the host or AS/400 servers. DB2 Connect Integrated SNA Support permits connections over a variety of local and wide area networks, such as Token-Ring, Ethernet, SDLC, Twinax, Coax and Asynchronous dial-up.

The DB2 Connect Integrated SNA Support implements both APPC and MPTN connections over networks using hosts and AS/400 systems that have IBM AnyNet products installed. Users of OS/2 workstations can use IBM Personal Communications for OS/2, or IBM Communications Server for OS/2 to achieve direct APPC and MPTN connectivity.

Connections via Communications Gateway

Some organizations prefer to concentrate access to SNA networks through dedicated **SNA Gateways**, such as IBM eNetwork Communications Server, Microsoft SNA Server, or Novell Netware for SAA. DB2 Connect products support connections through gateways, so this can be a good choice if you need terminal emulation and other SNA services not provided by DB2 Connect. Figure 2 on page 7 illustrates such a situation.

S/390, S/370

DB2 for
MVS

DB2 for
VSE

DB2 for
VM

OS/390

DB2 for
AS/400

AS/400

APPC TCP/IP*** MPTN

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

SNA Gateway
(eg. IBM eNetwork Communications
Server, Microsoft SNA Server)

IPX/SPX, NetBIOS TCP/IP

DB2 Connect Personal Edition
with SNA Gateway client software

DB2 Connect Personal Edition
with SNA Gateway client software

DB2 Connect Personal Edition
with SNA Gateway client software

  * 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. Indirect Connection to host or AS/400 database server via SNA Communications Gateway

If you have many workstations that require access to your DB2 host or
AS/400-based data sources, then you may want to use DB2 Connect EE with
DB2 Clients, instead of DB2 Connect PE on every machine. DB2 Connect

Enterprise Edition can be installed on the same machine as IBM eNetwork Communications Server or Microsoft SNA Server, and in many cases it can provide a less expensive and better-performing solution.

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 3 on page 10).
- Application is implemented using data-aware Java applets (see Figure 7 on page 15).
- Web servers are used to implement web-based applications (see Figure 6 on page 13, Figure 7 on page 15 and Figure 8 on page 17).
- 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 4 on page 11.)

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 3 on page 10 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.
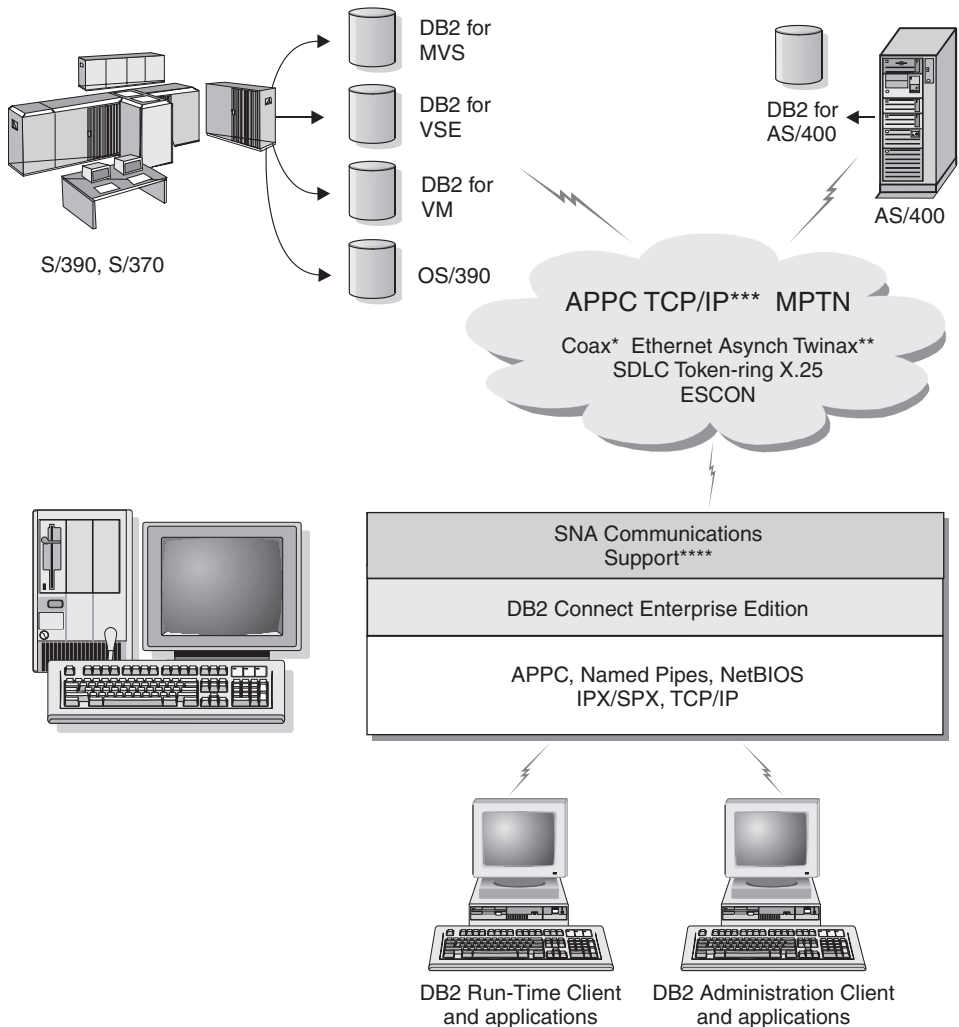
DB2 for
MVS

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 3. DB2 Connect Enterprise Edition
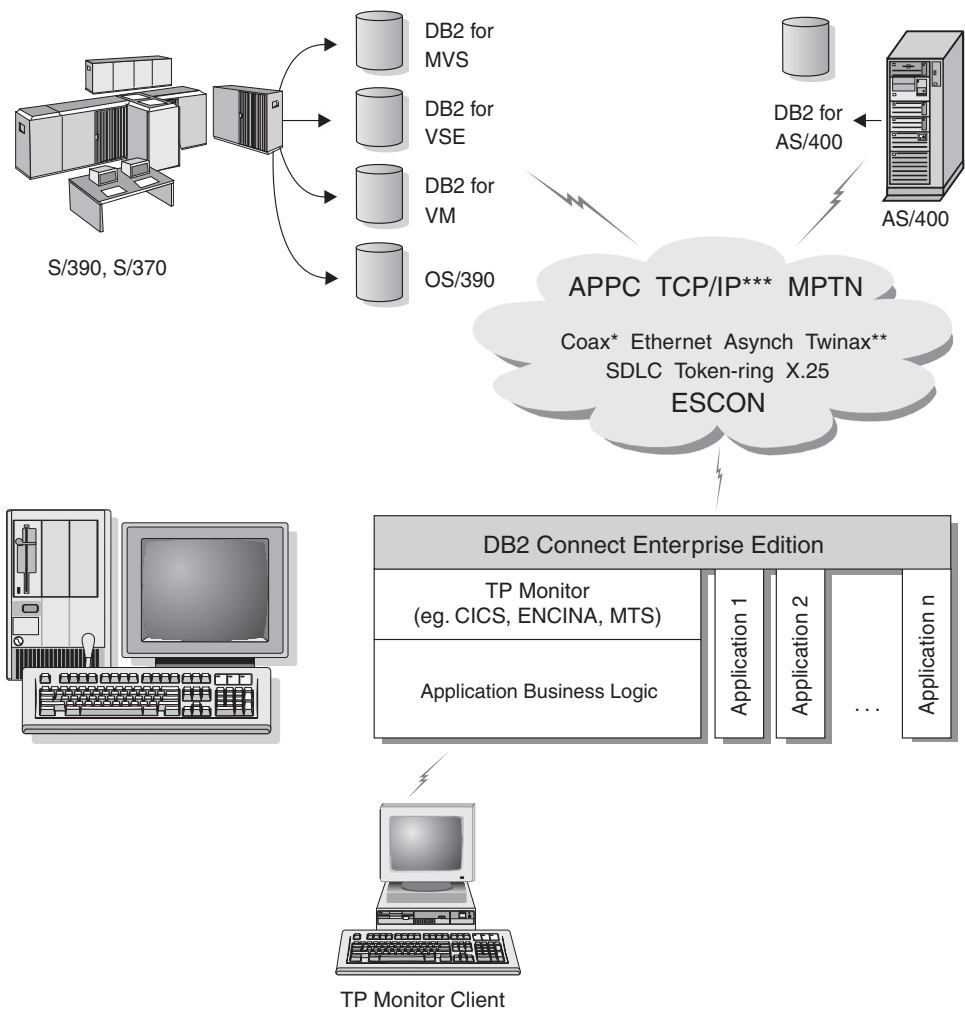
DB2 for
MVS

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

TP Monitor
(eg. CICS, ENCINA, MTS)

Application Business Logic

Application 1

Application 2

. . .

Application n

TP Monitor Client

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. Using Transaction Monitors with DB2 Connect.

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

WebSphere

Java Servlets,
JSP,
Enterprise Java Beans

Application 1

Application 2

. . .

Application n

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 V5R1or later,
DB2 for AS/400 V4R2 or later, or DB2 for VM V6.1

Figure 5. 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 6. 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.
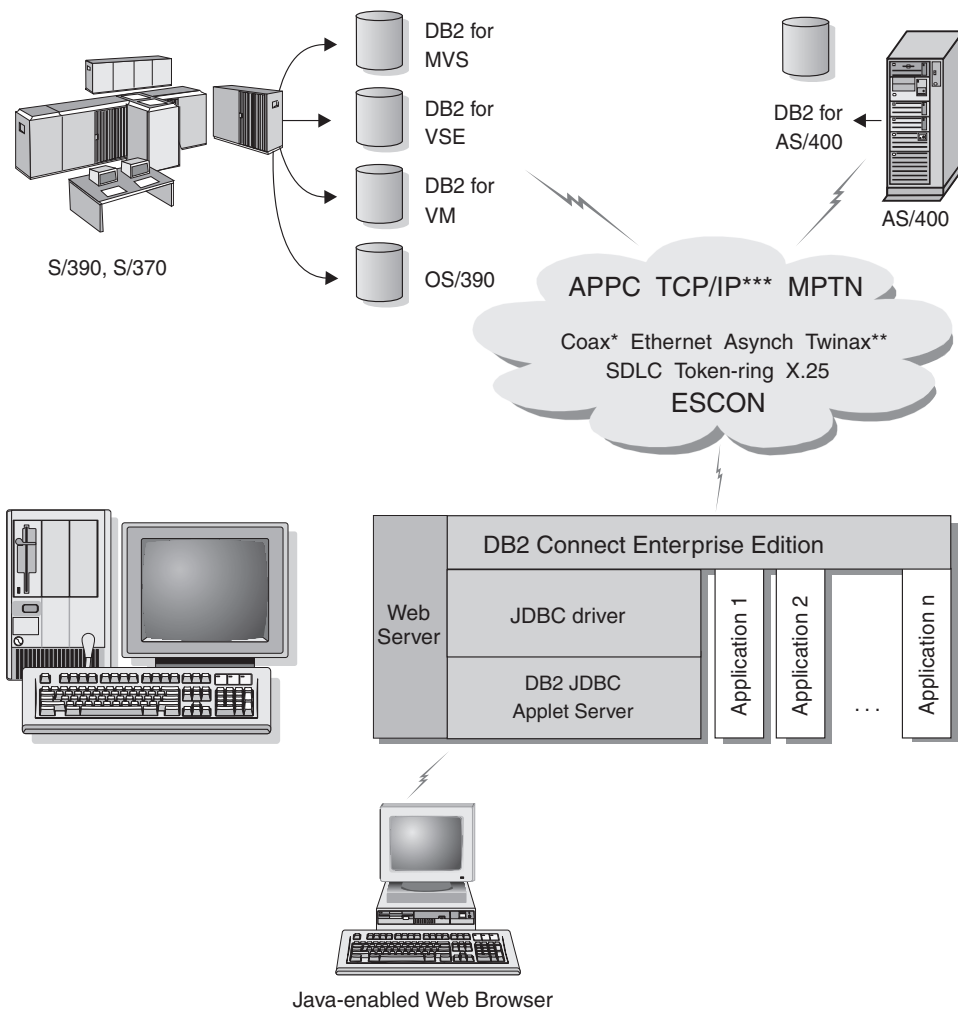
DB2 for
MVS

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 7. 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.
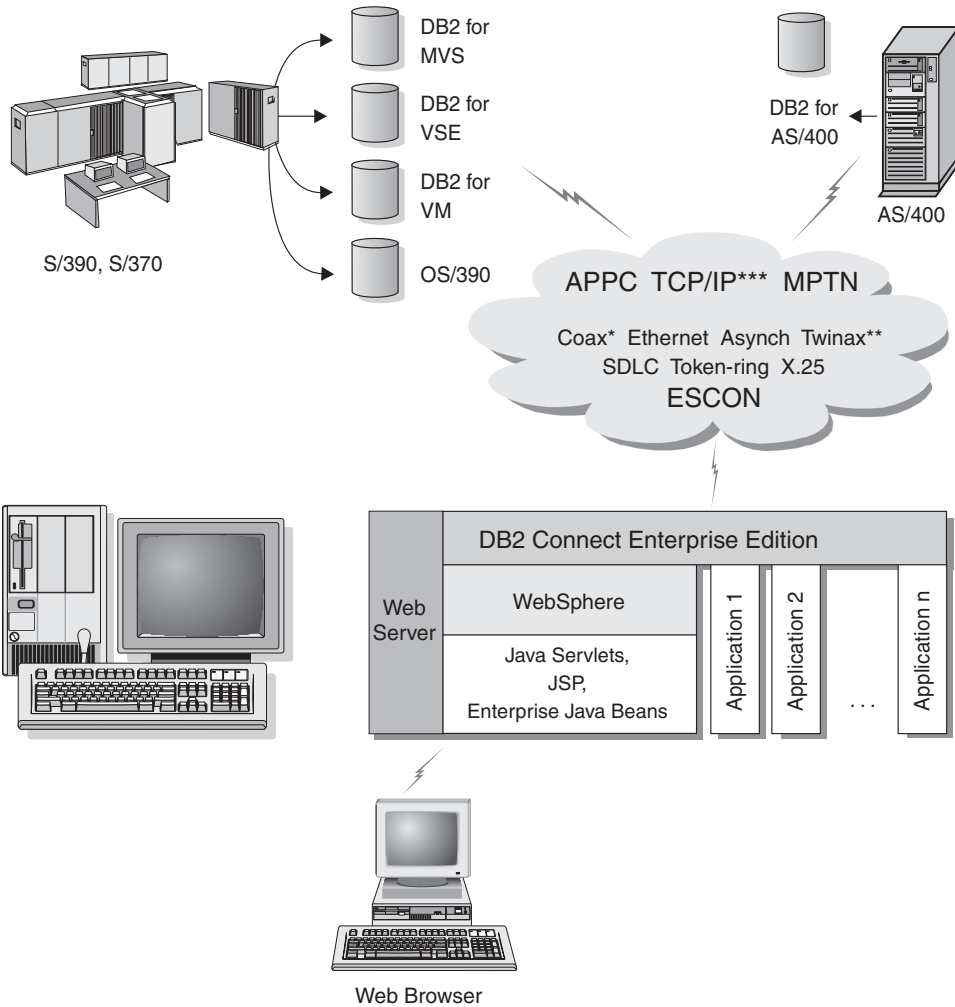
Automated queries do not require user input; they are links in an HTML document and, when selected, they trigger existing SQL queries and return the results from a DB2 database. These links can be triggered repeatedly to access current DB2 data. Customized queries require user input. Users define the 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.
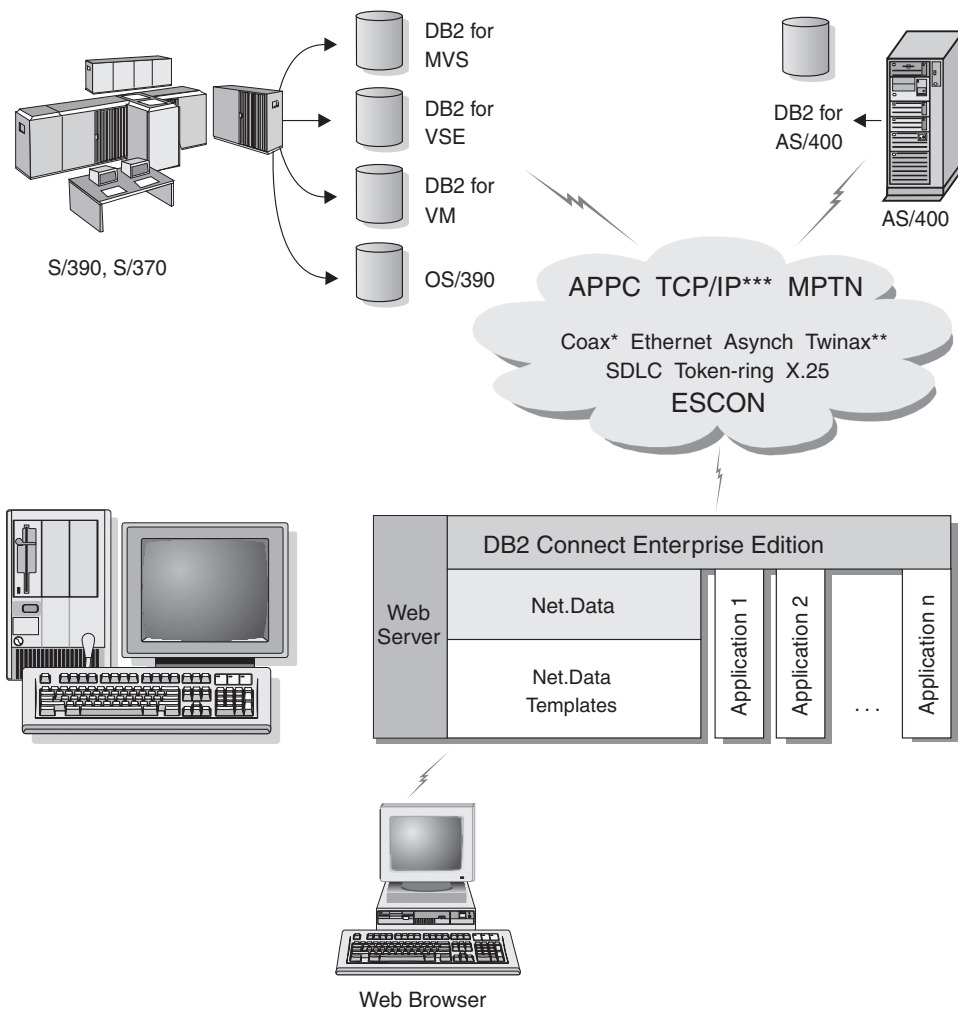
DB2 for MVS

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

Net.Data

Net.Data Templates

Application 1

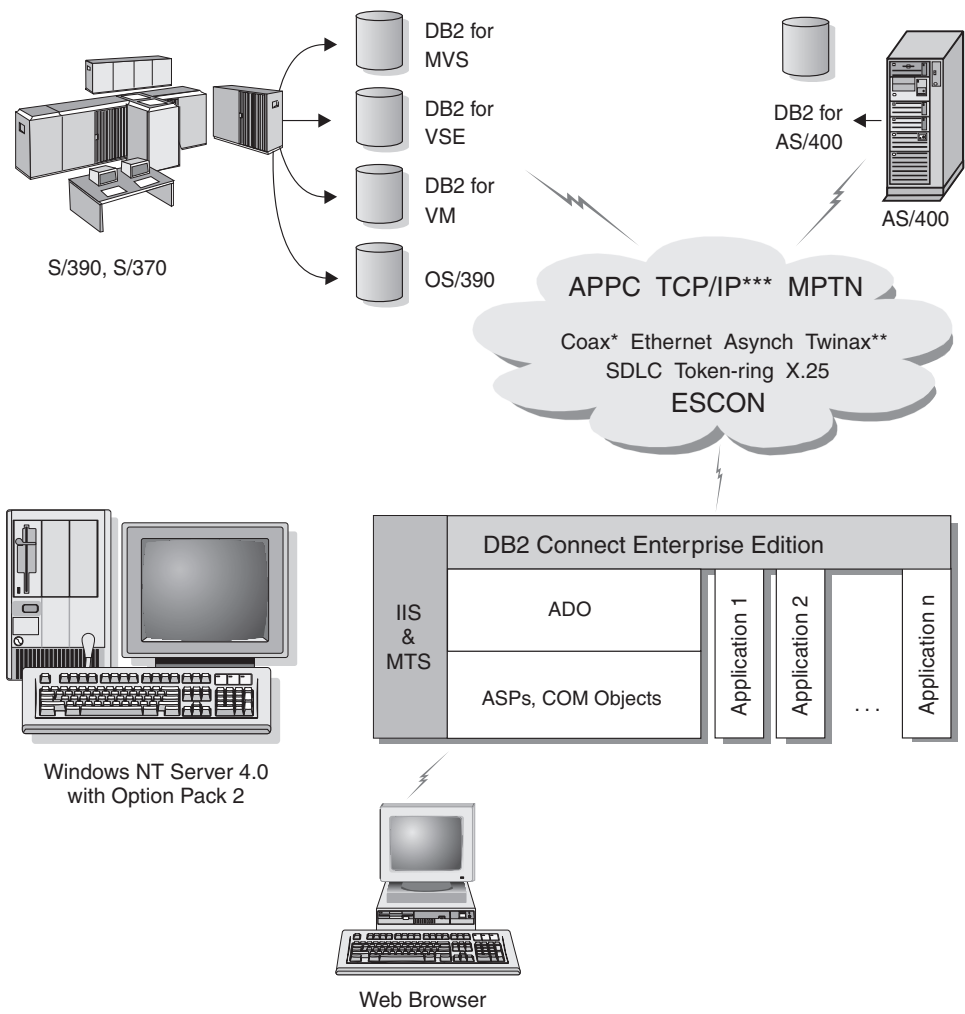Application 2

. . .

Application n

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 8. Net.Data with DB2 Connect.

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, refer to the *Installation and Configuration Supplement*.

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. DB2 Connect Personal Edition is limited in that it cannot search for Host or AS/400 databases, except through a DB2 Connect Enterprise Edition server.
  - 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.

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.

The typical steps to installing and configuring DB2 Connect Personal 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 using DB2 Connect Personal 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 3. Preparing Host and AS/400 Databases for DB2 Connect Communications" on page 39.

Step 4. Install your DB2 Connect software. You will use this workstation to configure and verify your host and AS/400 connections. For installation instructions, see "Chapter 4. Installing DB2 Connect on Windows" on page 33 or "Chapter 3. Installing DB2 Connect on OS/2" on page 29.

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

DB2 Connect can locate and configure all TCP/IP and most SNA connections for you. You can use the Client Configuration Assistant (CCA) to find the host database. See "Chapter 6. Configuring DB2 Connect to Host or AS/400 Communications Using the CCA" on page 57 for information on using the CCA. If you are using a supported SNA product that DB2 Connect does not automatically configure, you can use the instructions in "Part 4. Configuring DB2 Connect to Communicate with Host and AS/400 Databases" on page 55 that correspond to your SNA product to complete the configuration.

DB2 Connect Personal Edition ships with integrated SNA support. If you need to manually configure the integrated SNA product, refer to the *Installation and Configuration Supplement*.

Step 6. Bind the programs and utilities provided with DB2 Connect to your host or AS/400 database. For instructions, see "Binding DB2 Utilities and Applications" on page 64.

Step 7. Test the connection. See "Chapter 6. Configuring DB2 Connect to Host or AS/400 Communications Using the CCA" on page 57 for more instruction.

Step 8. 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 5. Configuring DB2 Clients to Use DB2 Connect" on page 103.

Step 9. 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 127.

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.

This chapter describes the following requirements you should consider before installing DB2 Connect:
- "Memory Requirements".
- "Disk Requirements".
- "Software Requirements" on page 26.

Memory Requirements

The amount of random access memory (RAM) that you require depends on the applications you intend to run. We recommend a minimum of 32 MB of RAM to access host or AS/400 databases using DB2 Connect Personal Edition.

Disk Requirements

The actual fixed disk requirements of your install may vary depending on your file system and the components you install, which you can select using the custom install option. 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 Personal Edition for OS/2 requires a minimum of 125 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 Personal Edition for Windows requires a minimum of 150 MB of disk space, which includes the documentation, the DB2 administration tools, and the Java Runtime Environment (JRE).

Software Requirements

DB2 Connect Personal Edition relies on network software to provide connectivity to host and AS/400 databases as well as to DB2 Universal Database servers. Therefore, it is important to establish which network software you will use before proceeding with the installation.

DB2 Connect Personal Edition uses communication software for establishing host or AS/400 connectivity and connectivity to DB2 Universal Database servers. For the host or AS/400 connectivity, your software requirements will depend on two conditions:

- The protocol that you will be using (APPC, TCP/IP, or MPTN)
- Whether you will be using a direct connection (see "Accessing Host or AS/400 DB2 Data using DB2 Connect Personal Edition" on page 4), or connections via an SNA gateway (see "Connections via Communications Gateway" on page 6).

Product Requirements

Table 1 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 10. Control Center Installation and Configuration" on page 117 for more information.

Table 1. Hardware/Software Requirements

Hardware/Software Requirements	Communications
DB2 Connect Personal Edition 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	APPC, IPX/SPX, NetBIOS, or TCP/IP • For local IPX/SPX connectivity, you require Novell NetWare Requester, Version 2.10 or later. • The OS/2 base operating system provides NetBIOS and TCP/IP connectivity, if selected during installation. • For SNA (APPC) connectivity, one of the following communications products is required: – IBM eNetwork Communications Server for OS/2 Warp Version 5 – IBM eNetwork Personal Communications for OS/2 Warp Version 4.2 – IBM Communication Server for OS/2 Version 4 **Note:** The DB2 SNMP Subagent requires DPI 1.1 support provided by TCP/IP Version 2.0 or later, or DPI 2.0 support provided by IBM SystemView Agent.

Table 1. Hardware/Software Requirements (continued)

Hardware/Software Requirements	Communications
DB2 Connect Personal Edition for Windows 32-bit operating systems	

• Windows 95 Version 4.00.950 or later
 	
• Windows 98
 	
• Windows NT Version 4.0 with Service Pack 3, or later
 	
• Windows 2000
	APPC, TCP/IP, and MPTN (APPC over TCP/IP)
	
	• The Windows NT and Windows 2000 base operating systems provides NetBIOS, IPX/SPX, Named Pipes, and TCP/IP connectivity.
	
	For SNA (APPC) connectivity, one of the following communication products is required:
	
	• Windows NT:
	– IBM Communications Server Version 5.01 or later.
	– IBM Personal Communications Version 4.2 or later.
	• Windows 2000:
	– IBM Communications Server Version 6.1 or later.
	– IBM Personal Communications Version 4.3 CSD2 or later.
	• Microsoft SNA Server Version 3 Service Pack 3 or later.
	
	Notes:
	
	1. If you plan to use DCE (Distributed Computing Environment), you will need:
	  • A DCE product that is at OSF DCE level 1.1 with IBM DCE for Windows NT Version 2.0.
	  • 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.
	
	  In addition, DB2 also supports Gradient PC-DCE for Windows 32-bit operating systems Version 2.0 Runtime Media Kit. For DB2 Connect support, you require DB2/MVS Version 5.1 plus its prerequisite, OS/390 DCE Base Services version 3 for DCE support.
	  Note: 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 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*.
	
	3. 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.
	
	4. If you have the IBM Antivirus program installed on your operating system, it must be disabled or uninstalled to complete a DB2 installation.
	
	5. If you plan to use the Simple Network Management Protocol (SNMP) subagent, you require DPI 2.0 provided by IBM SystemView Agent.

Chapter 3. Installing DB2 Connect on OS/2

This section describes how to install DB2 Connect Personal Edition on an OS/2 workstation. For information on how to deploy this product using a distributed installation, refer to the *Installation and Configuration Supplement*.

Before You Begin

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 type of host connectivity that you want to use (a direct connection using DB2 Connect Personal Edition or a connection that uses an SNA gateway).

3. 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

4. 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.

5. A user ID for the Administration Server.

   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 the user ID specified for the Administration Server will be created.

Performing the Installation

To install your DB2 product, 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. Insert the CD-ROM in the drive.

Step 3. Open an OS/2 command window and set the directory to your CD-ROM drive by entering the following command:

```
x:
```

where *x:* represents your CD-ROM drive.

Step 4. Enter the following command:

```
x:\install
```

where *x:* represents your CD-ROM drive.

> To invoke the installation program, enter the following command:
>
> ```
> x:\install /i language
> ```
>
> where:
> - *x:* represents your CD-ROM drive
> - *language* represents the country code for your language (for example, EN for English). Table 12 on page 173 lists the code for each available language.

Step 5. The DB2 Launchpad opens. It looks similar to the following:
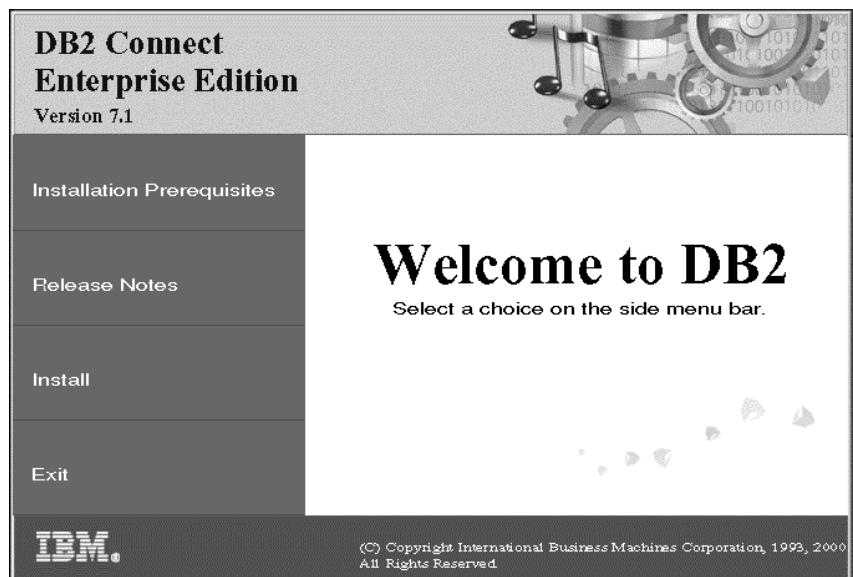
From this window, you can view the installation prerequisites and the release notes, or you can proceed directly to the installation.

Step 6. Once you have initiated the installation, proceed by following the setup program's prompts. Online help is available to guide you through the remaining steps. To invoke the online help, click **Help** or press **F1**. You can click **Cancel** at any time to end the installation.

> 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 set up connections to host or AS/400 database servers, you must first prepare host and AS/400 databases for DB2 Connect communications, see "Chapter 5. Configuring Host and AS/400 Databases for DB2 Connect" on page 41. If your host of AS/400 system is already enabled for DB2 Connect communications, go to one of the following sections:
> - If Microsoft SNA Server is being used, go to "Chapter 7. Manually Configuring APPC Communications on the DB2 Connect Workstation" on page 67 and then go to "Chapter 6. Configuring DB2 Connect to Host or AS/400 Communications Using the CCA" on page 57.
> - If IBM SNA products are being used, go to "Chapter 6. Configuring DB2 Connect to Host or AS/400 Communications Using the CCA" on page 57.

Chapter 4. Installing DB2 Connect on Windows

This section describes how to install DB2 Connect Personal Edition on Windows 32-bit operating systems. For information on how to deploy this product using a distributed installation or set up a Thin Connect workstation, refer to the *Installation and Configuration Supplement*.

Before You Begin

Before you begin the installation, ensure 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 type of host connectivity you will be using:

   - Direct connection via TCP/IP

   - Direct connection via SNA using Integrated SNA Support or a third party SNA product

   - Connection via SNA Gateway. If using the SNA gateway make sure that:

     – SNA Gateway software is installed and configured on the gateway server machine and connectivity can be established from the gateway machine to the host or AS/400. For instructions on configuring IBM eNetwork Communication Server see "Configuring IBM eNetwork Communications Server for Windows" on page 71. For instructions on configuring Microsoft SNA Server see "Configuring Microsoft SNA Server for Windows" on page 79. If you are using another gateway consult the documentation provided with your SNA Gateway product.

     – Client software for your SNA Gateway software is installed and configured on the workstation where DB2 Connect Personal Edition is installed. For instructions on configuring client software for IBM eNetwork Communications Server, see "Configuring IBM eNetwork Communications Server for Windows NT SNA API Client" on page 76. For instructions on configuring client software for Microsoft SNA Server see "Configuring Microsoft SNA Client" on page 88.

3. A user account that will be used to perform the installation. There are two methods to install: an Adminstrator's install and a non-Administrator's install (available only on Windows NT and Windows 2000 Professional).

   For an administrator's install, the account you are logged in as must:

   - Be defined locally

- Belong to the Local Administrator's group
- Have the following advanced user rights:
  - *Act as part of the operating system*
  - *Create token object*
  - *Increase quotas*
  - *Replace a process level token*

> You can perform the installation without these advanced user rights, but the setup program will be unable to validate accounts. We recommend that any user account used to install this product have these advanced user rights.

For a non-Administrator's install, which is only available on Windows NT and Windows 2000 Professional, the account you are logged in as must belong to a group with more authority than the Guests group. For example, the Users group or the Power Users group.

Note: The non-Administrator's install does have some limitations:

- The Control Center is unavailable.
- Net Question and Personal Communications require administrative authority. Therefore, both Net Question and integrated SNA support is unavailable. If the system already has an integrated SNA stack, SNA support will then be available.

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

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

The following are some specific install scenarios:

- *A user has installed DB2 Connect using the non-Administrator install method, and then an administrator installs any DB2 product on the same machine.* In this scenario, the administrator install will remove any non-Administrator installs that exist on the system, resulting in a clean install of the administrator product. The administrator install will

overwrite all of the user's services, shortcuts, and environment variables from the previous installation of DB2 Connect.

- *A user has installed DB2 Connect using the non-Administrator install method, and then a second user installs any DB2 product on the same machine.* In this scenario, the second user install will fail, and return an error message that the user must be an administrator to install the product.
- *An administrator has installed DB2 Connect, and then a user attempts to install any DB2 single-user product on the same machine.* In this scenario, the single user install will fail, and return an error message that the user must be an administrator to install the product.

4. During installation, you will provide a user account that will be used by the DB2 Administration Server to log on to the system. The account you specify must be defined locally and belong to the Local Administrator's group.

   By default, the setup program will create a user account using the username db2admin and the password that you specify. You can accept the default user account, create your own user account by modifying the default values, or provide your own. If you create or provide your own user account, ensure that it conforms to DB2's naming rules. For more information, see "Appendix D. Naming Rules" on page 179.

5. During the installation, you may also be prompted for user names and passwords for the products and services that you install.

6. If you want to use LDAP with Windows 2000, you must extend the directory schema to contain DB2 object classes and attribute definitions. You must do this once, before you install any DB2 product.

   To extend the directory schema, execute the **db2schex.exe** program from the installation CD with Schema Admins authority. You can execute this program with Schema Admins authority, without logging off and logging on again, as follows:

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

   where x: represents the CD-ROM letter.

   When **db2schex.exe** completes, you can continue with the installation.

Performing the Installation

To install your DB2 product, 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 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 auto-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 12 on page 173 lists the code for each available language.
>
> c. Click **OK**.

Step 4. The DB2 Launchpad opens. It looks similar to the following:

DB2 Connect Enterprise Edition
Version 7.1

Installation Prerequisites

Release Notes

Install

Exit

Welcome to DB2
Select a choice on the side menu bar.

IBM.

(C) Copyright International Business Machines Corporation, 1993, 2000
All Rights Reserved
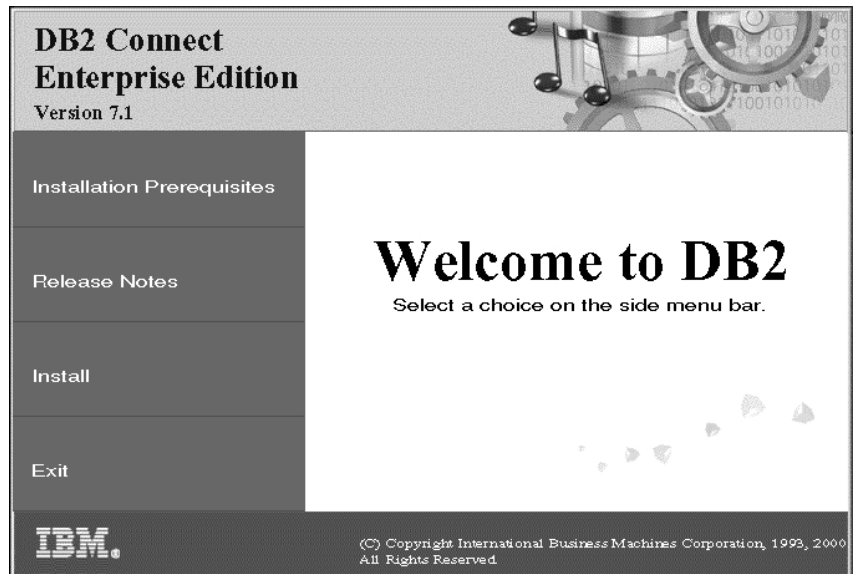
Step 5. From this window, you can view the installation prerequisites and the release notes, or you can proceed directly to the installation.

Step 6. Once you have initiated the installation, proceed by following the setup program's prompts. Online help is available to guide you through the remaining steps. To invoke the online help, click **Help** or press **F1**. 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*.

Based on your component selections, the installation program has:

- Created DB2 program groups and items (or shortcuts).
- Created the following services on Windows NT and Windows 2000: DB2 JDBC Applet Server, DB2 Security Server, License Service, Control Center Server Service, Visual Warehouse Agent Daemon, Visual Warehouse Logger, Visual Warehouse Server, Essbase Service, OLAP Integration Service.
- Updated the Windows registry (Windows NT and Windows 2000 only).

To set up connections to host or AS/400 database servers, you must first prepare host and AS/400 databases for DB2 Connect communications, see "Chapter 5. Configuring Host and AS/400 Databases for DB2 Connect" on page 41. If your host of AS/400 system is already enabled for DB2 Connect communications, go to one of the following sections:

- If Microsoft SNA Server is being used, go to "Chapter 7. Manually Configuring APPC Communications on the DB2 Connect Workstation" on page 67 and then go to "Chapter 6. Configuring DB2 Connect to Host or AS/400 Communications Using the CCA" on page 57.
- If IBM SNA products are being used, go to "Chapter 6. Configuring DB2 Connect to Host or AS/400 Communications Using the CCA" on page 57.

Part 3. Preparing Host and AS/400 Databases for DB2 Connect Communications

Chapter 5. 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 42.
- 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 48.

- DB2 host configuration steps (see "Configuring DB2 Universal Database for OS/390" on page 46, or "Configuring DB2 for MVS/ESA" on page 47). 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 43. For TCP/IP names, see "Configuring TCP/IP for DB2 Universal Database for OS/390" on page 48.

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 46, or "Configuring DB2 for MVS/ESA" on page 47.
- To configure TCP/IP, see "Configuring TCP/IP for DB2 Universal Database for OS/390" on page 48.

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
```

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 2, to plan *each* TCP/IP connection between DB2 Connect and a host database server.

Example Worksheet:

Table 2. 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 2. 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 3. 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 4. Configuring DB2 Connect to Communicate with Host and AS/400 Databases

Chapter 6. Configuring DB2 Connect to Host or AS/400 Communications Using the CCA

This section describes how to use the Client Configuration Assistant (CCA) to configure your DB2 Connect workstation to access host or AS/400 DB2 databases. The configuration steps described in this section apply if you are connecting to the host or AS/400 system using TCP/IP or SNA (APPC).

If you have already established a connection with the database with DB2 Connect and you want to connect to the host through a DB2 client, see instead "Chapter 9. Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 105.

> The CCA cannot auto-detect or configure the following SNA (APPC) subsystems:
> - Communications Server for Windows NT SNA API Client
> - Microsoft SNA Server for Windows NT

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 147.

To configure communications to a non-host or AS/400 based DB2 database, go to "Chapter 9. Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 105.

To configure communications to a host or AS/400 DB2 database using the command line processor, or if an SNA product cannot be configured by the CCA, go to the section that describes the communications protocol that you want to configure:
- TCP/IP - refer to the *Installation and Configuration Supplement*.
- APPC - see "Chapter 7. Manually Configuring APPC Communications on the DB2 Connect Workstation" on page 67.

Using the CCA

With the CCA, you can perform any of the following actions:
- Configure database connections that applications can use.
- Update or delete existing configured database connections.
- Display the information for existing configured connections.
- Test a connection to a database.

- Enable or disable databases to be configured as CLI or ODBC data sources.
- Export client profiles, or import client and server profiles which contain information for the setup of a client.
- Update client configuration settings.
- Discover remote databases (if the remote database has been previously catalogued on a DB2 Connect server).
- Bind user applications and utilities to databases.
- Change your server password.

The CCA provides three methods to set up a database connection to a server:
- Using a profile.
- Searching the network for databases.
- Manually entering database and communication protocol information for a server. When you add a database using this configuration method, the Client Configuration Assistant will generate a default node name for the server where the database resides.

Configuration Steps

To configure your workstation to access a host or AS/400 database, 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 179.

> If you are adding a database to a system that has a DB2 Connect server product installed, log on to this system as authority.
>
> This restriction is controlled by the *catalog_noauth* database manager configuration parameter. For more information, refer to the *Administration Guide*.

Step 2. The Welcome window opens each time you start the CCA, until you add at least one database to your client.

Step 3. Click **Add Database** or **Add** to configure a connection.

You can use one of the following configuration methods:
- "Adding a Database Using a Profile".
- "Adding a Database Using Discovery" on page 60.
- "Adding a Database Manually" on page 62.

Adding a Database Using a Profile

A profile contains information about instances and databases on a system, and databases within each instance. For information on profiles, see "Creating and Using Profiles" on page 112.

If your administrator provided you with a profile, perform the following steps:

Step 1. Select the **Use a profile** radio button and click **Next**.

Step 2. Click on the **...** push button and select a profile.

Step 3. A list, with the system, the instances, and the databases, is displayed. Select the database that you want to add to your system.

Step 4. Select the type of connection that you want to make to the host or AS/400 database. Before you do this, you must select a host or AS/400 database from the list of databases in the profile.

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

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

Step 5. Click **Next**.

Step 6. 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 7. 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 8. Click the **Test Connection** push button to test the connection. The Connect to DB2 Database window opens.

Step 9. 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 10. 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 pre-Version 5 DB2 systems or any systems where an Administration Server is not running. It also cannot return information about host or AS/400 databases, unless they are already cataloged on a DB2 Connect EE server. For more information, refer to the *Administration Guide*.

You can use the Discovery feature to search the network for databases. To add a database to your system using the Discovery feature, perform the following steps:

Step   1. Select the **Search the network** radio button and click **Next**.

Step   2. Click on the **[+]** sign beside the **Known Systems** icon to list all the systems known to your systems.

Step   3. Click on the **[+]** sign beside a system to get a list of the instances and databases on it.

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. Select the type of connection that you want to make to the host or AS/400 database. Before you do this, you must select a host or AS/400 database from the list of databases in the profile.

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

Step 5. Click **Next**.

Step 6. 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 7. 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 8. Click the **Test Connection** push button to test the connection. The Connect to DB2 Database window opens.

Step 9. 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 10. 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 protocol information for the server that you want to connect to, 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.

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. You will also have the option of selecting the type of connection that you want to make to the host or AS/400 database. Select the **The database physically resides on a host or AS/400 system** check box, then select either of the following radio buttons:

- 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.

Binding DB2 Utilities and Applications

When you have finished adding the host or AS/400 database to your system, we recommend that you bind any DB2 utilities or applications to the database you just added. To do so, perform the following steps:

Step 1. Log on to the system with a user ID that has System Administrative (SYSADM), Database Administrative (DBADM), or Bind Add (BINDADD) authority on the database.

Step 2. Start the CCA.

Step 3. Select the database against which you want to bind the utilities and packages.

Step 4. Click **Bind**.

Step 5. Select the type of bind that you want to perform:

- Select the **Bind DB2 utilities** radio button if you want to bind utilities against the database.
- Select the **Bind user applications** radio button if you want to bind applications against the database.

Step 6. Click **Continue**.

Step 7. Enter a user ID and password to connect to the database and click **OK**.

Step 8. Select the utilities or applications that you want to bind and click **OK**.

> Now that you have configured host connections, go to "Chapter 8.
> Enabling Multisite Updates (Two-Phase Commit)" on page 97 if you
> want to enable the multisite updates feature.

Chapter 7. 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.

You will only need to refer to the instructions in this section if you wish to manually configure your APPC connection to a host or AS/400 database. APPC can often be configured automatically using the Client Configuration Assistant (CCA). The following table lists the products that can be configured using the CCA:

Table 4. Products Configured Using the CCA

Products	Platform	Configured by the CCA?
IBM Personal Communications V4.2 and later	Windows 32-bit operating systems	Yes
IBM Communications Server (Server)	Windows NT and Windows 2000	Yes
IBM Communications Server (Client)	Windows 32-bit operating systems	No
IBM Communications Server	OS/2	Yes
RUMBA	Windows 32-bit operating systems	Yes
Microsoft SNA (Server)	Windows NT and Windows 2000	No
Microsoft SNA (Client)	Windows 32-bit operating systems	No

For more information about the communications requirements of your platform, see "Software Requirements" on page 26.

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" on page 68.
- "2. Update the APPC Profiles on the DB2 Connect Workstation" on page 71.

- "3. Catalog the APPC or APPN Node" on page 91.
- "4. Catalog the Database as a Database Connection Service (DCS) Database" on page 92.
- "5. Catalog the Database" on page 93.
- "6. Bind Utilities and Applications to the Database Server" on page 94.
- "7. Test the Host or AS/400 Connection" on page 94.

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 5 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 5. 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	

Table 5. 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
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	
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	

Table 5. 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
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 5 on page 68 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 Communications Server for Windows"
- "Configuring IBM eNetwork Communications Server for Windows NT SNA API Client" on page 76
- "Configuring Microsoft SNA Server for Windows" on page 79
- "Configuring Microsoft SNA Client" on page 88

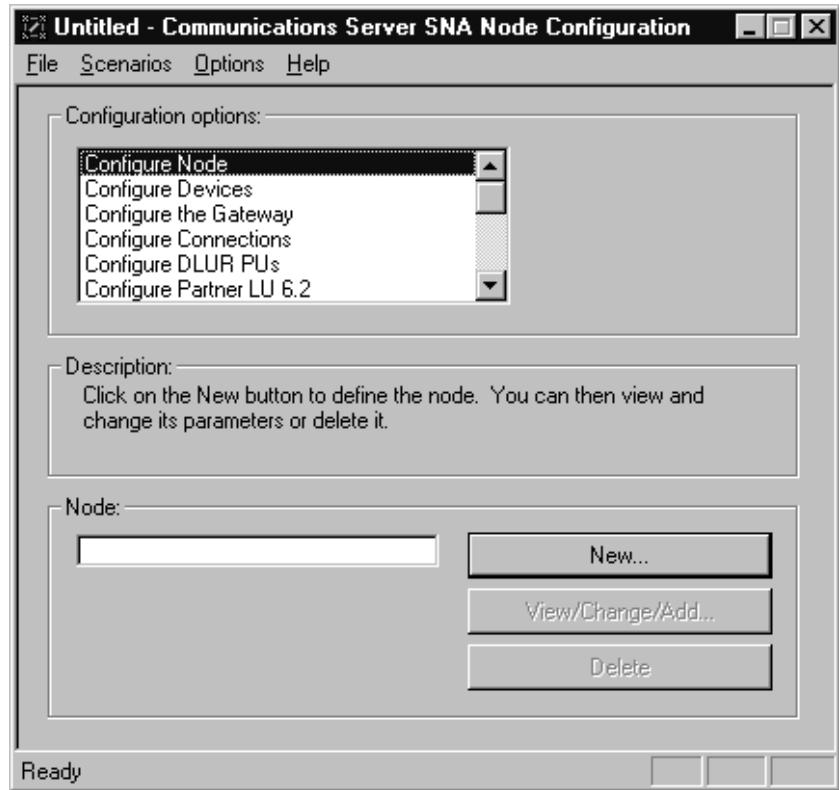## Configuring IBM eNetwork Communications Server for Windows

Before you begin, ensure that the IBM eNetwork Communications Server for Windows (supported on Windows NT and Windows 2000) you installed meets the following requirements:

__ 1. It is Version 5.0 or higher if you are planning to update multiple databases within the same transaction; if you are planning to use 2-phase commit then Version 5.01 of Communications Server for Windows is required

__ 2. The IBM Communications Server IEEE 802.2 LAN interface was installed (this is an installation option for Communications Server)

__ 3. The JR11529 and JR11170 APAR fixes have been applied. These fixes are required to enable cancelling of queries in progress by using Ctrl-BREAK or issuing the SQLCancel ODBC/CLI call.

__ 4. The LLC2 driver was installed from the Communications Server for Windows installation directory. During the installation, Communications Server for Windows asks if you want to install LLC2. If you are not sure whether LLC2 was installed with your copy of Communications Server for Windows, you can find out as follows:

   a. Click **Start** and select **Settings —> Control Panel**.

   b. Double-click on the **Network** icon.

   c. On the Network window, click on the **Protocols** tab. **IBM LLC2 Protocol** must be one of the protocols listed. If it is not, you need to install this protocol from your IBM Communications Server for Windows software. For more information, refer to documentation supplied with Communications Server for Windows.

To start IBM eNetwork Personal Server, perform the following steps:

Step 1. Click on **Start** and select **Programs —>IBM Communications Server —> SNA Node Configuration**. The IBM Communications Server SNA Node Configuration window opens.

Step 2. Select **File —> New —> Advanced** from the menu bar. The
Configuration options window opens. Subsequent steps will begin
from this window.

To configure IBM eNetwork Personal Server for APPC communications,
complete the perform the following steps:

Step 1. Configure Node

   a. In the **Configuration options** field, select **Configure Node**, then
      click on the **New** push button. The Define the Node window
      opens.

   b. In the **Fully qualified CP name** fields, type in the network name
      (**9**) and the local control point name (**10**) (SPIFNET.NYX1).

   c. Optionally, in the **CP alias** field, type in a CP alias. If you leave
      this blank the local control point name (**10**) will be used (NYX1).

   d. In the **Local Node ID** fields, type in the block ID (**13**) and the
      physical unit ID (**14**) (05D.27509).

   e. Select the appropriate node type. The default is to select the **End
      Node** radio button.

  f. Click on **OK**.

Step 2. Configure Devices

  a. In the **Configuration options** field, select **Configure devices**.

  b. Ensure that in the **DLCs** field, the appropriate DLC is highlighted. For example, **LAN**.

  c. Click on the **New** push button. The appropriate window opens with default values displayed. For example, the Define a LAN device window.

  d. Click on **OK** to accept the default values.

Step 3. Configure the Gateway

  a. In the **Configuration options** field, select **Configure the Gateway**, then click on the **New** push button. The Define Gateway window opens.

  b. Click the **SNA Clients** tab.

  c. Ensure that there is a check mark in the **Enable SNA API Client Services** check box.

  d. Click **OK** to accept the default values.

Step 4. Configure Connections

  a. In the **Configuration options** field, select **Configure connections**.

  b. Ensure that **LAN** is highlighted in the **DLCs** field.

  c. Click on the **New** push button. The Define a LAN Connection window opens.

  d. On the **Basic** tab panel:

   1) In the **Link station name** field, type in the name (**7**) from the worksheet (`LINKHOST`).

   2) In the **Destination address** field, type in the address (**8**) from the worksheet (`400009451902`).

  e. On the **Security** tab panel:

   1) In the **Adjacent CP name** fields, type in the network ID (**3**) and the Control Point name (**4**) (`SPIFNET.NYX`).

   2) In the **Adjacent CP type** field, select the appropriate CP type (for example, **Back-level LEN**).

   3) Ensure that **TG number** is set to `0` (the default).

   4) Click **OK**.

Step 5. Configure Partner LU 6.2

  a. In the **Configuration options** field, select **Configure partner LU**, then click on the **New** button. The Define a Partner LU 6.2 window opens.

  b. In the **Partner LU name** fields, type in the network ID (**3**) and the Partner LU name (**2**) (`SPIFNET.NYM2DB2`).

c. In the **Partner LU alias** field, type in the Partner LU name (**2**) from the worksheet (NYM2DB2).

d. If you are configuring Communications Server for SNA Clients, in the **Fully-qualified CP name** fields, type in the Network ID (**3**) and the adjacent control point SSCP name (**4**) (SPIFNET.NYX).

e. Leave the other fields blank. and click on **OK**.

Step 6. Configure Modes

a. In the **Configuration options** field, select **Configure modes**, then click on the **New** button. The Define a Mode window opens.

b. In the **Mode name** field (**6**), type in the mode name (IBMRDB).

c. Click on the **Advanced** tab and ensure that the **Class of Service Name** is set to **#CONNECT**.

d. Accept the defaults for the other fields and click on **OK**.

Step 7. Configure Local LU 6.2

a. In the **Configuration options** field, select **Configure local LU 6.2**, then click on the **New** button. The Define a Local LU 6.2 window opens.

b. In the **Local LU name** field, type in the name (**11**) from the worksheet (NYX1GW01).

c. Enter a value for the **LU session limit** field. The default, 0, specifies the maximum allowed value.

d. Accept the defaults for the other fields and click on **OK**.

Step 8. Configure CPI-C Side Information

a. In the **Configuration options** field, select **Configure CPI-C Side Information**, then click on the **New** button. The Define CPI-C Side Information window opens.

b. In the **Symbolic destination name** field, type in the name (**16**) from the worksheet (DB2CPIC).

c. In the **Mode name** field, enter in the name (**15**) from the worksheet (IBMRDB).

d. Click on the radio button beside **Use Partner LU alias** and select a Partner LU alias.

e. Specify the TP name. In the **TP name** field:

- To specify a non-service TP, in the **TP name** field, enter the name of the non-service TP, for example DB2DRDA, and ensure that there is *no* check mark in the **Service TP** check box.

- To specify a service TP, in the **TP name** field, enter the name of the service TP, for example 076DB, and ensure that there *is* a check mark in the **Service TP** check box.

f. Accept the defaults for the other fields and click on **OK**.

Step 9. Save the Configuration

   a. Select **File —> Save as** from the menu bar. The Save As window
       opens.

   b. Enter a file name, for example ny3.acg

   c. Click on **OK**.

   d. In the window that opens you are asked if you want this
       configuration to be the default. Click on the **Yes** push button.

Step 10. Update the Environment

   IBM Personal Communications uses an environment variable called
   appcllu to set the default APPC Local LU. You may set this variable
   on a per-session basis by opening a command window and typing
   set appcllu=*local_lu_name*, however you will probably find it more
   convenient to permanently set the variable. In order to permanently
   set the variable in Windows NT, complete the following steps:

   Step a. Click on **Start** and select **Settings —> Control Panel**.
            Double-click on the **System** icon. When the **System
            Properties** window opens, select the **Environment** tab.

   Step b. Enter appcllu in the **Variable** field, and enter your Local
            LU name (**11**) in the **Value** field.

   Step c. Click **Set** to accept the changes then click **OK** to exit the
            System Properties window.

   The environment variable will now remain set for future sessions.

Step 11. Start SNA Node Operations

   To start SNA node operations on your machine, complete the
   following steps:

   Step a. Click on **Start** and select **Programs —> IBM
            Communications Server —> SNA Node Operations**. The
            SNA Node Operations window opens.

   Step b. From the menu bar, click on **Operations** and select **Start
            Node**. In the dialog box that opens, select the configuration
            file you saved at the end of Step 2 (in our example,
            ny3.acg). Click **OK**.

   SNA node operations will now begin running.

Step 12. Registering Communications Server as a Windows Service

   To automatically start Communications Server when the machine is
   booted, you can register it as a Windows service.

   To register Communications Server as a Windows service execute
   one of the following commands:

       csstart -a

to register Communications Server with the default configuration, or:

```
csstart -a c:\ibmcs\private\your.acg
```

where `c:\ibmcs\private\your.acg` represents the fully qualified name of the non-default Communications Server configuration file you want to use.

Whenever your machine is booted in the future, Communications Server will be started automatically with the required configuration file.

You now need to update the DB2 directories, bind utilities and applications to the server, and test the connection.

The easiest way to do this is to use the Client Configuration Assistant (CCA). For more information on using the CCA, go to "Chapter 6. Configuring DB2 Connect to Host or AS/400 Communications Using the CCA" on page 57. However, you can also perform these steps manually, as described in "3. Catalog the APPC or APPN Node" on page 91 and the sections that follow.

Configuring IBM eNetwork Communications Server for Windows NT SNA API Client

Read this section if you have a Windows NT workstation that has IBM eNetwork Communications Server for Windows NT SNA API Client Version 5.0 or higher installed and you want to connect to an IBM eNetwork Communications Server for Windows NT Server.

The Communications Server for Windows NT Server and its SNA API client act as a split client. This configuration requires that you have an APPC-enabled application (such as DB2 Connect) running on the SNA API client workstation.

> The instructions in this section use a Windows NT client. The instructions for other supported operating systems are similar; refer to your Communications Server for Windows NT documentation for more information.

To configure the Windows NT SNA API client for APPC communications, complete the following steps:

Step 1. Create a user account for the SNA API client on the Communications Server for Windows NT Server

   a. Click **Start** and select **Programs —> Administrative Tools (Common) —> User Manager**. The User Manager window opens.

b. Select **Users —> New User** from the menu bar. The New User window opens.

c. Fill in the fields for the new SNA client user accout. For more information, refer to the Windows NT online help.

d. Ensure that this user account is a member of the *Administrators, IBMCSADMIN,* and *IBMCSAPI* groups:

   1) Click **Groups**.

   2) Select a group from the **Not member of** box and click **<- Add**. Repeat this step for each group that your user account must belong to.

e. Click **OK**.

f. Click **Add**.

Step 2. Start the configuration GUI for the IBM eNetwork CS/NT SNA API Client. Click **Start** and select **Programs —> IBM Communications Server SNA Client —> Configuration**. The CS/NT SNA Client Configuration window opens.
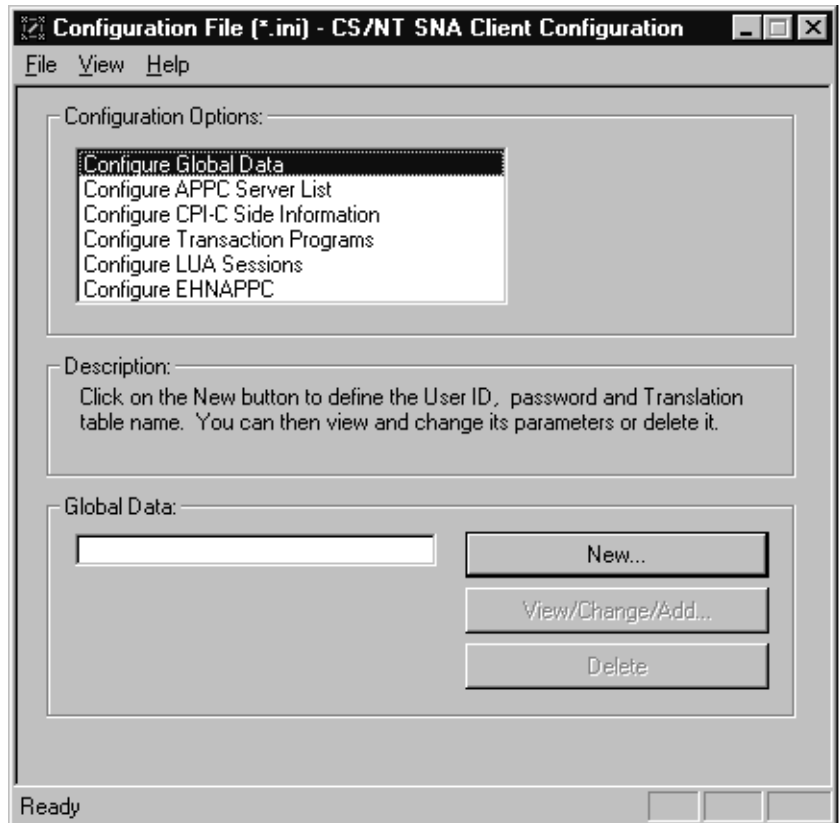
Step 3. Configure Global Data

a. In the **Configuration options** box, select the **Configure Global Data** option and click on the **New** push button. The Define Global Data window opens.

b. Enter the user name for the SNA API client in the **User name** field. This is the user name that was defined in Step 1.

c. Enter the password for the user account in the **Password** and **Confirm Password** fields.

d. Click **OK**.

Step 4. Configure APPC Server List

a. In the **Configuration options** box, select the **Configure APPC Server List** option. Click on the **New** push button. The Define APPC Server List window opens.

b. Type in the IP address of the server (for example, 123.123.123.123).

c. Click **OK**.

Step 5. Configure CPI-C Side Information

a. In the **Configuration options** box, select the **Configure CPI-C side information** option and click **New**. The Define CPI-C side information window opens.

b. Enter the symbolic destination name (**16**) in the **Symbolic destination name** field.

c. Enter your Local LU alias (**12**) in the **Local LU alias** field.

d. Enter the mode name (**15**) in the **Mode name** field.

e. Enter the transaction program name (**17**) in the **TP name** field.

f. Select the **For SNA API Client use** check box for this transaction program.

g. Enter the network ID (**3**) and partner LU name (**2**) in the **Partner LU name** field.

h. Click **OK**.

Step 6. Save the Configuration

a. Select **File —> Save As** from the menu bar. The Save As window opens.

b. Enter a file name, and click **Save**.

You now need to update the DB2 directories, bind utilities and applications to the server, and test the connection.

The easiest way to do this is to use the Client Configuration Assistant (CCA). For more information on using the CCA, go to "Chapter 6. Configuring DB2 Connect to Host or AS/400 Communications Using the CCA" on page 57. However, you can also perform these steps manually, as described in "3. Catalog the APPC or APPN Node" on page 91 and the sections that follow.

Configuring Microsoft SNA Server for Windows

This section describes how to configure Microsoft SNA Server Version 4.0 for Windows NT on your DB2 Connect workstation to connect to host or AS/400 database servers using APPC. Although Microsoft SNA Server will run on Windows NT 4.0 Workstation, Windows NT 4.0 Server is recommended.

If you wish to use DB2's Multisite Update feature with this product, your minimum requirement is Microsoft SNA Server Version 4 Service Pack 3. For more information, refer to "Chapter 8. Enabling Multisite Updates (Two-Phase Commit)" on page 97.

You can define the properties of your SNA connections in the Microsoft SNA Server Manager (Server Manager). The Server Manager uses an interface similar to that of the Windows NT Explorer. The following illustration shows the interface. There are two panes in the main window of the Server Manager. All the configuration options we will be using can be accessed by right-clicking on objects in the left-hand pane of the window. Every object has a *context menu* that you can access by right-clicking on the object.

To configure APPC communications for use by DB2 Connect using Microsoft SNA Server Manager, perform the following steps:

Step 1. To start the Server Manager, click **Start** and select **Programs —> Microsoft SNA Server —> Manager**. The Microsoft SNA Server

Manager window opens.
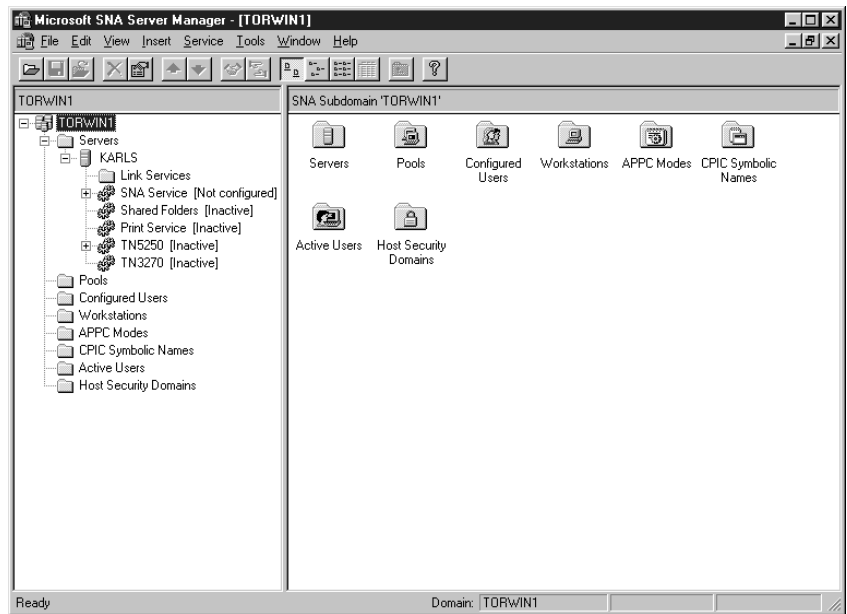
Step 2. Define the control point name

a. Click on the [+] sign beside the **Servers** folder.

b. Right-click on **SNA Service** folder and select the **Properties** option. The Properties window opens.

c. Enter the correct **NETID** (**9**) and **Control Point Name** (**10**) in the corresponding fields.

d. Click **OK**.
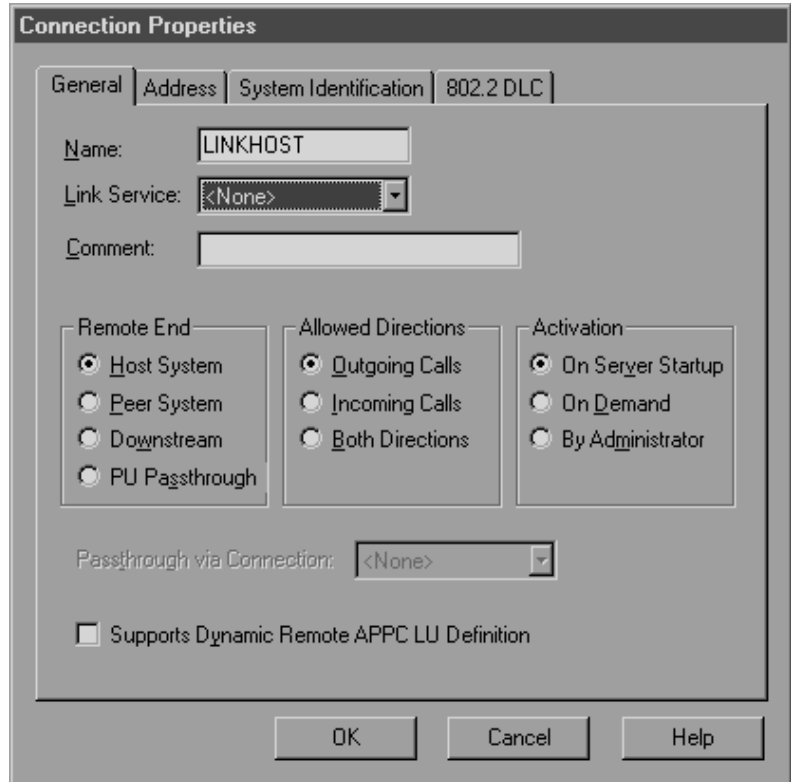
Step 3. Define the link service (802.2)

a. Right-click on the **SNA Service** icon and select the **Insert —>
   Link Service** option. The Insert Link Service window opens.
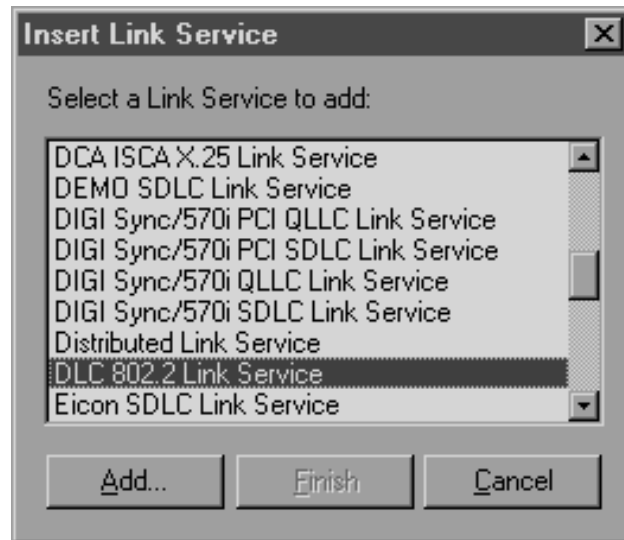
b. Select DLC 802.2 Link Service.
c. Click **Add**.
d. Click **Finish**.

Step 4. Define the connection properties

a. Right-click on **SNA Service** and select the **Insert —> Connection —> 802.2** option. The Connection Properties window opens.

Connection Properties

General | Address | System Identification | 802.2 DLC |

Name: LINKHOST

Link Service: <None>

Comment:

Remote End
- ⦿ Host System
- ○ Peer System
- ○ Downstream
- ○ PU Passthrough

Allowed Directions
- ⦿ Outgoing Calls
- ○ Incoming Calls
- ○ Both Directions

Activation
- ⦿ On Server Startup
- ○ On Demand
- ○ By Administrator

Passthrough via Connection: <None>

☐ Supports Dynamic Remote APPC LU Definition

OK | Cancel | Help

b. Enter a connection name (**7**) in the **Name** field.
c. Click on the **Link Service** drop-down box and select the **SnaDlc1** option.
d. Select the **Remote End** radio button from the **Host System** box.
e. Select the **Both Directions** radio button from the **Allowed Directions** box.
f. Select the **On Server Startup** radio button from the **Activation** box.

g. Select the **Address** tab.
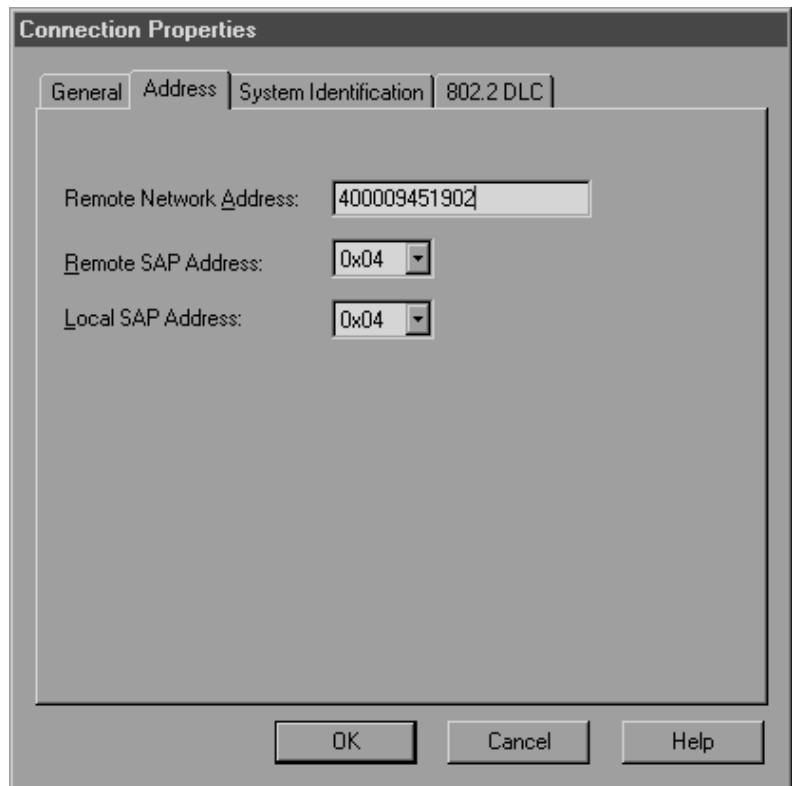
h. Fill in the **Remote Network Address** field (**8**). Accept the default numbers in the other fields.

i. Select the **System Identification** tab.

j. Enter the following information:

   1) For the **Local Node Name**, add the **Network ID** (**9**), the **Local PU Name** (**10**), and the **Local Node ID** (**1** plus **14**). Accept the **XID Type** default.

   2) For the **Remote Node Name**, add the **NETID** (**1**) and the **Control Point Name** (**4**).

k. Accept the other defaults and click **OK**.

Step 5. Define a local LU

   a. Right-click on the **SNA Service** icon and select the **Insert —> APPC —> Local LU** option. The Local APPC LU Properties

window opens.
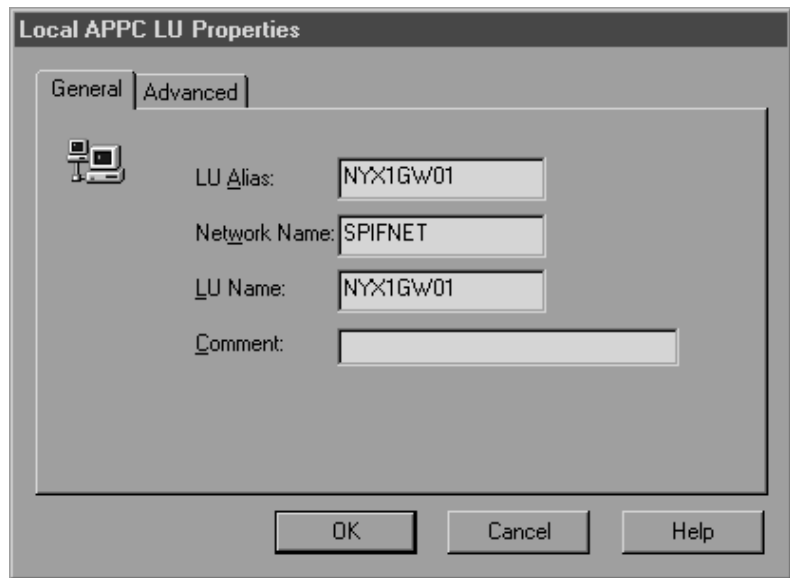
b. Enter the following information:
   - The **LU Alias** (**12**).
   - The **NETID** (**9**).
   - The **LU Name** (**11**).
c. Select the **Advanced** tab. If you are planning to use a DB2's multisite update support, ensure that you have:
   1) Installed Microsoft SNA Server V4 Service Pack 3
   2) De-selected the **Member of Default Outgoing Local APPC LU Pool** option. DB2 requires exclusive use of this LU for multisite update.
   3) From the **SyncPoint Support** field:
      - Select Enable.
      - Enter the SNA Server name in the **Client** field.

   Syncpoint support must be enabled on this server. It is not supported on SNA clients. Therefore, the **Client** field must contain the name of the local SNA Server. Multisite update is typically required if you use Transaction Processing (TP) Monitors such as Microsoft Transaction Server, IBM TxSeries, or BEA Tuxedo.

   An additional LU should be defined without Syncpoint support enabled, or if multisite update is not required. For this

LU, you should ensure that **Member of Default Outgoing Local APPC LU Pool** option is selected

    d. Accept the other defaults and click **OK**.

Step 6. Define a remote LU

    a. Right-click on **SNA Services** icon and select the **Insert —> APPC —> Remote LU** option. The Remote APPC LU Properties window opens.

    b. Click on the **Connection** drop down box and select the appropriate connection name (**7**).

    c. Enter the partner LU name (**2**) in the **LU Alias** field.

    d. Enter the Network ID (**1**) in the **Network Name** field.

> The other fields will be filled in by the program. If your LU alias is not the same as your LU Name, make sure you specify the LU Name in the appropriate field. The program will fill it in automatically, but it will be incorrect if the alias and the name are not the same.
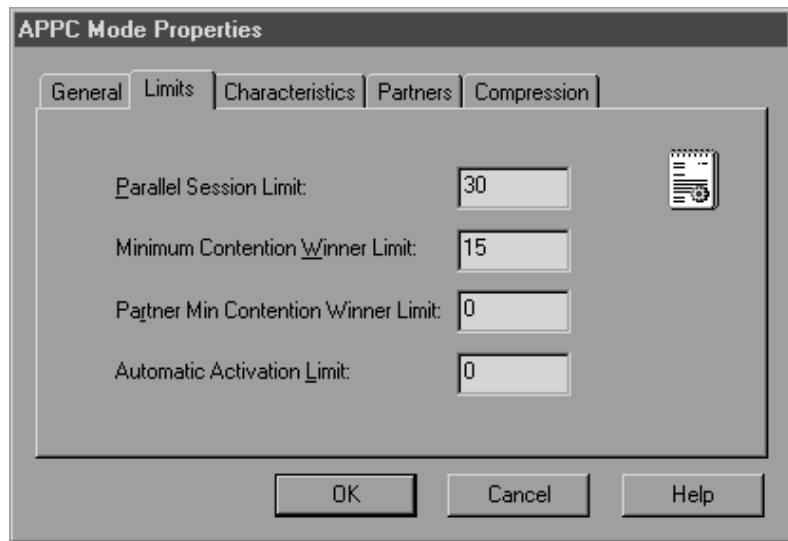
    e. Click **OK**.

Step 7. Define a mode

    a. Right-click on **APPC Modes** folder and select the **Insert —> APPC —> Mode Definition** option. The APPC Mode Properties window opens.

    b. Enter the Mode Name **6** in the **Mode Name** field.

c. Select the **Limits** tab.

d. Enter appropriate numbers for the **Parallel Session Limit** and **Minimum Contention Winner Limit** fields. Your Host-Side or LAN administrator should be able to supply you with the numbers if you do not know the limits you should place here.

e. Accept the other defaults, and click **OK**.

Step 8. Define the CPIC name properties

a. Right-click on **CPIC Symbolic Name** folder icon and select the **Insert —> APPC —> CPIC Symbolic Name** option. The CPIC

Name Properties window opens.

CPIC Name Properties

General | Partner Information

Name: DB2CPIC

Comment:

Conversation Security
- ⊙ None
- ○ Same
- ○ Program   User ID...

Mode Name:
IBMRDB

OK   Cancel   Help

b. Enter the Symbolic Destination Name (**16**) in the **Name** field.
c. Click on the **Mode Name** drop down box and select a mode name, for example, **IBMRDB**.
d. Select the **Partner Information** tab.

CPIC Name Properties

General | Partner Information

Partner TP Name
- ○ Application TP
- ⊙ SNA Service TP [in hex]

Partner LU Name
- ○ Alias
- ⊙ Fully Qualified   SPIFNET   NYM2DB2

OK   Cancel   Help

e. In **Partner TP Name** box, select the **SNA Service TP (in hex)** radio button and enter the Service TP name (**17**), or select the **Application TP** radio button and enter the Application TP name (**17**).

f. In the **Partner LU Name** box, select the **Fully Qualified** radio
　　　button.

　　g. Enter the fully-qualified Partner LU Name (**1** and **2**) or alias.

　　h. Click **OK**.

　　i. Save the configuration

　　　1) Select **File —> Save** from the menu bar of the Server Manager
　　　　window. The Save File window opens.

　　　2) Enter a unique name for your configuration into the **File Name**
　　　　field.

　　　3) Click **Save**.

You now need to update the DB2 directories, bind utilities and applications to the
server, and test the connection.

The easiest way to do this is to use the Client Configuration Assistant (CCA). For more
information on using the CCA, go to "Chapter 6. Configuring DB2 Connect to Host or
AS/400 Communications Using the CCA" on page 57. However, you can also perform
these steps manually, as described in "3. Catalog the APPC or APPN Node" on page 91
and the sections that follow.

Configuring Microsoft SNA Client

Read this section if you have a Windows NT workstation that has DB2
Connect installed. This section provides step-by-step instructions for setting
up the communications between your DB2 Connect workstation and a
Windows NT workstation that has Microsoft SNA Server V4.0 (or later)
installed.

For instructions on how to configure Microsoft SNA Server Version 4.0 for Windows
NT, go to "Configuring Microsoft SNA Server for Windows" on page 79.

Figure 9 on page 89 illustrates the example DB2 Connect Server scenario.
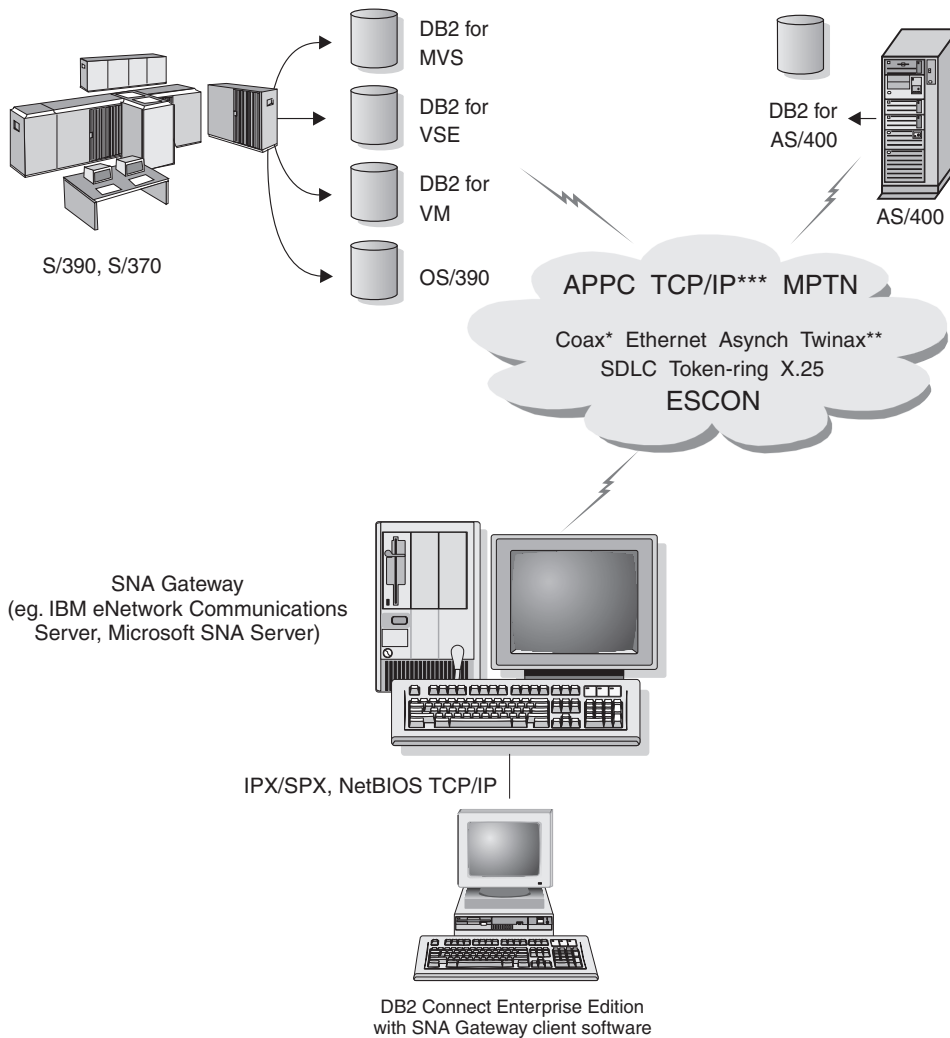
Figure 9. Indirect Connection to host or AS/400 database server via SNA Communications Gateway

The rest of this section assumes:

1. The Microsoft SNA Server has already been configured for APPC communications with the host, and is enabled for ODBC and DRDA. Refer to the Microsoft SNA Server documentation for further information.

2. Microsoft SNA Client Version 2.11 is not already installed on your DB2 Connect workstation.

To configure the Microsoft SNA client, perform the following steps:

Step 1. Obtain Required Information

For your Microsoft SNA client software to function properly you must have access to a properly configured Microsoft SNA Server. Request that your SNA Server administrator:

1. Obtain the proper license for you to use Microsoft SNA Client on your workstation.
2. Define a user ID and password for you on the SNA Server domain.
3. Define connections to the host and AS/400 databases that you need to access, as described in "Configuring Microsoft SNA Server for Windows" on page 79.
4. Provide you with the symbolic destination name (**16**), database name (**5**), and user account to use for each database connection defined in the previous step.

   If you plan to change host passwords, the SNA administrator will also need to provide you with symbolic destination names for password management tasks on each host.
5. Provide you with the Microsoft SNA Server domain name and the protocol used for communicating with the SNA server (TCP/IP, NetBEUI, IPX/SPX).

Step 2. Install the Microsoft SNA Client on the DB2 Connect Workstation

1. Obtain the Microsoft SNA Client software, and follow its instructions to start the installation program.
2. Follow the instructions on the screen to complete the installation. Choose your SNA Server domain name and communication protocol according to the instructions provided by your SNA Server administrator.
3. When you reach the Optional Components window, *deselect* Install ODBC/DRDA driver so that it will not be installed.
4. Complete the installation.

Step 3. Install DB2 Connect for Windows

1. Install DB2 Connect.
2. Open the DB2 Folder, and click on the **Client Configuration Assistant** to start the configuration dialog.
3. Click on **Start** and select **Programs —> DB2 for Windows NT —> Client Configuration Assistant**.
4. You need to provide the following information:

a. The Symbolic destination name (**16**) defined at the Microsoft SNA Server for the Partner LU (**2**) of the target host or AS/400 database server.

b. The real database name (**5**).

You now need to update the DB2 directories, bind utilities and applications to the server, and test the connection.

The easiest way to do this is to use the Client Configuration Assistant (CCA). For more information on using the CCA, go to "Chapter 6. Configuring DB2 Connect to Host or AS/400 Communications Using the CCA" on page 57. However, you can also perform these steps manually, as described in "3. Catalog the APPC or APPN Node" and the sections that follow.

---

3. Catalog the APPC or APPN Node

You must add an entry to the DB2 Connect workstations's node directory to describe the remote node. In most cases, you will add an APPC node entry to the node directory. For OS/2 and Windows 32-bit operating systems, you can alternatively add an APPN node entry if your local SNA node has been set up as an APPN node.

To catalog the node, perform the following steps:

Step 1. Log on to the system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority. You can also log on to the system without these authority levels if you have the `catalog_noauth` option set to `ON`.

Step 2. To catalog an APPC node, specify 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. Enter 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 must 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*, enter the following commands:

```
catalog appc node db2node remote DB2CPIC security program
terminate
```

Step 3. To catalog an APPN node, specify the chosen alias (*node_name*), the network ID (**9**), the remote partner LU (**4**), the transaction program name (**17**), the mode (**15**), and the security type. Enter the following commands substituting your values from the worksheet in Table 5 on page 68:

```
catalog "appn node db2node network SPIFNET remote NYM2DB2
         tpname QCNTEDDM mode IBMRDB 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 6. 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.   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 92:

```
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 8. 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 7. 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 7. 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.

Part 5. Configuring DB2 Clients to Use DB2 Connect

Chapter 9. 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 147.

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*.

If you are adding a host or AS/400 database, go to "Chapter 6. Configuring DB2 Connect to Host or AS/400 Communications Using the CCA" on page 57.

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 179.

> If you are adding a database to a system that has a DB2 Connect server product installed, log on to this system as authority.
>
> 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 147.

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 107.
- "Adding a Database Using Discovery" on page 108.
- "Adding a Database Manually" on page 110.

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 112.

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 147.

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 106.

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 147.

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 147.

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 10. 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 9 on page 119 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 9 on page 119 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 8. 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 10 on page 119 summarizes the four basic Control Center machine configurations:
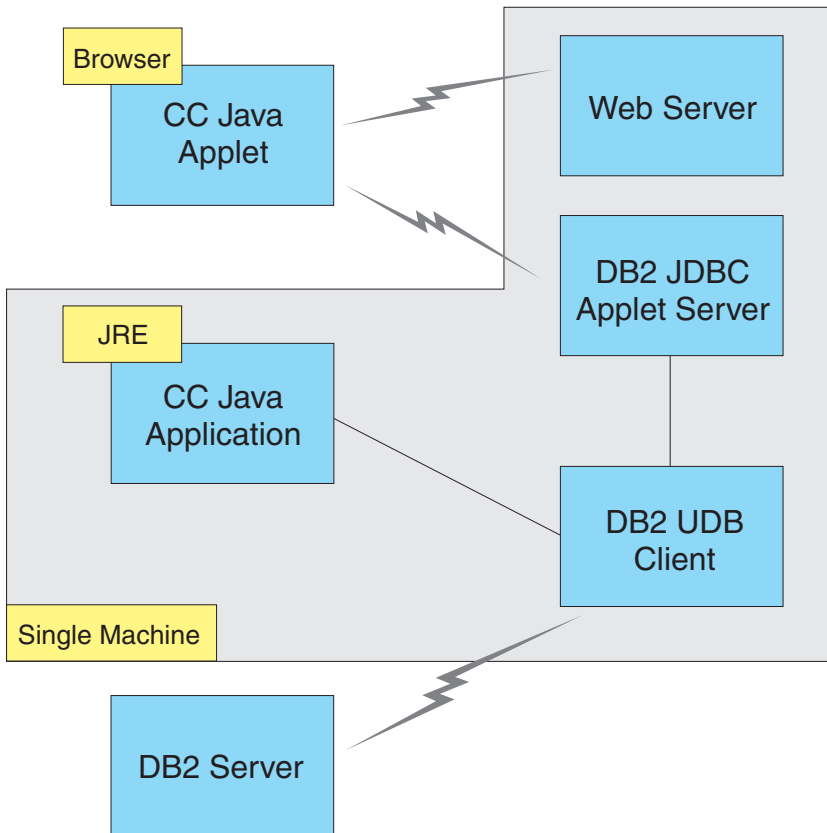
Figure 10. DB2 Control Center machine configurations

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 9. 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 9. 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 122.

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 118, 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 8 on page 118, 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 9 on page 119 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.

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 9 on page 119 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 9 on page 119 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 6. Using DB2 Connect

Chapter 11. 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*.

Binding to DB2 Universal Databases

How you bind the database utilities to a database depends on your workstation's operating system:

- On OS/2 and Windows 32-bit operating systems, you can use the Client Configuration Assistant by performing the following steps:

  Step 1. Start the Client Configuration Assistant (CCA).

  Step 2. Select the database to which you want to bind the utilities.

  Step 3. Click **Bind**.

  Step 4. Select the **Bind DB2 Utilities** radio button.

  Step 5. Click **Continue**.

  Step 6. Enter a user ID and password to connect to the database. The user ID must have the authority to bind new packages against the database. Select the utilities you want to bind and click **OK**.

- On all operating systems, you can use the command line processor by performing the following steps:

  Step 1. Change to the bnd directory, which is x:\sqllib\bnd, where x: represents the drive where you installed DB2.

  Step 2. To connect to the database, enter the following commands in the Command Center or the Command Line Processor:

  ```
  connect to database_alias
  ```

  where *database_alias* represents the name of the database to which you want to connect.

  Step 3. Enter the following commands in the Command Center or the Command Line Processor:

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

In this example, `bind.msg` and `clibind.msg` are the output message files, and EXECUTE and BINDADD privileges are granted to *public*.

Step 4. Reset the connection to the database by entering the following command:

```
connect reset
```

For more information on the **bind** command, refer to the *Command Reference*.

Notes:

1. The `db2ubind.lst` file contains the list of bind (.bnd) files required to create the packages for the database utilities. The `db2cli.lst` file contains the list of bind (.bnd) files required to create packages for the DB2 CLI and the DB2 ODBC driver.

2. Binding may take a few minutes to complete.

3. If you have BINDADD authority, the first time you use the DB2 CLI or ODBC driver, the DB2 CLI packages will be bound automatically.

> If the applications that you are using require binding to the database, you can use the Client Configuration Assistant's Bind facility, or the command line processor, to perform the bind action.

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 133 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.

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 137
- "OS/2 Client Access to DB2 using CLI/ODBC" on page 138

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 overwrite 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.

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.

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.

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.

Detailed Configuration Information

The section "Platform Specific Details for CLI/ODBC Access" on page 136 should provide you with all of the information you require. *Installation and Configuration Supplement* includes additional information on setting up and using DB2 CLI and ODBC applications. (The online *Installation and Configuration Supplement* manual is located in the directory *x:*`\doc\en\html`, where *x:* is the letter that designates your CD-ROM and en is the two-character country code that represents your language, for example en for English.) This information is useful where DB2 tool support is not available, and for administrators who require more detailed information.

The following topics are covered in the *Installation and Configuration Supplement* online manual:

- How to Bind the DB2 CLI/ODBC Driver to the Database
- How to Set CLI/ODBC Configuration Keywords
- Configuring db2cli.ini

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 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.

Part 7. 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 148.
- "Entering Commands Using the Command Line Processor" on page 149.
- "Working with the System Administrative Group" on page 151.
- "Granting Advanced User Rights on Windows" on page 152.
- "Upgrading DB2 from Try and Buy Mode" on page 152.
- "Uninstalling DB2 Connect" on page 153.

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 10. Control Center Installation and Configuration" on page 117.

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.

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.

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:

OS/2   Any valid DB2 user ID which belongs to the Administrator or Local Administrator group.

Windows 9x Any Windows 9x user.

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**.

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 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.

Uninstalling DB2 Connect

You can uninstall DB2 Connect as follows:

1. Drop all databases.
2. Do one of the following:
   - Windows: go to the Add/Remove Products window, and select DB2 Connect.
   - OS/2: launch the Installation Utility in the IBM DB2 folder, select the product, and then select **Action —> Delete**.
   - Go to the sqllib\bin directory, and invoke the **db2unins** command.

If you cannot run the uninstall program, for example because the installation was unsuccessful, you can remove DB2 as follows:

1. Remove any partially installed files. For example, delete the files in the c:\sqllib directory.
2. Under Windows, clean up the registry, using a registry editor such as **regedt32**. Delete the following entries:

```
HKEY_LOCAL_MACHINE\SOFTWARE\IBM\DB2
HKEY_CURRENT_USER\SOFTWARE\IBM\DB2
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\name
```

where *name* is one of the following:

- The instance name
- The instance name followed by **-N**
- **DB2REMOTECMD**
- **DB2DAS00**
- **DB2GOVERNOR**

- **DB2NTSECSERVER**
- **DB2JDS**
- **DB2_NT_Performance**
- **DB2LICD**
- **DB2ControlCenterServer**
- **vwd**
- **vwkernel**
- **vwlogger**
- **EssbaseService**
- **OLAPIntegrationService**
- **DlfmService**

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 169. 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 165. 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:
- "Viewing Information Online" on page 168
- "Searching Information Online" on page 172
- "Ordering the Printed Books" on page 165
- "Printing the PDF Books" on page 164

Table 10. 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 10. 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 10. 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 10. 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 10. 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 10. 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 10. 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 10. 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 10 on page 156.

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 11. 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 169 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.

Code Page and Language Support

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 12 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 12. 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

Table 12. Languages and Code Pages (continued)

Country Code	Language
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
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 13. 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

Table 13. Workstation Code Page to Host CCSID Conversion (continued)

Host CCSIDs	Code Page	Countries
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 180
- "Username, User ID, Group Name, and Instance Name Rules" on page 181
- "Workstation Name (nname) Rules" on page 181
- "DB2SYSTEM Naming Rules" on page 182
- "Password Rules" on page 182

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 179. 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 179.

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 179.

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.

  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 179.

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 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 179.

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.

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 and in the DB2 Data Sources Setup (included in DB2 Connect Personal Edition) choose 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
VSE	ddcsvse.lst
VM	ddcsvm.lst
OS/400	ddcs400.lst

Table 14. 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

Table 14. DRDA Bind Files and Packages (continued)

Component	Bind File Name	Package Name	MVS	VM/VSE	OS/400
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
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.

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    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.

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On Compuserve: GO IBMDB2

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