IBM DB2 Connect
Enterprise Edition
for UNIX**

Quick Beginnings

Version 6

GC09-2829-00

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Before using this information and the product it supports, be sure to read the general information under “Appendix I. Notices” on page 243.

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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 set up of a DB2 Connect Enterprise Edition server. First, you will ensure that your host or AS/400 database is enabled for communications. Next you will install DB2 Connect and test its connection to the host or AS/400. Once you have established this connection, you will install a DB2 client and configure it to use DB2 Connect to communicate with the host or AS/400 database.

How This Book is Structured

Setting up DB2 Connect is a multi-step process. The sections in this book follow the typical sequence of tasks necessary to go from installing DB2 Connect to using client applications with your database. DB2 Connect Enterprise Edition is often installed with hundreds or thousands of clients in mind. For this reason, we advocate doing a test installation, as described below. After the test configuration has proven stable, you can use it as the template for an unattended installation of DB2 Connect and your clients across your organization.

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

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

Step 2. Verify that you have the correct hardware and software prerequisites on both your workstation and the host database server. See "Chapter 2. Planning for Installation" on page 23 for prerequisites.

Step 3. Verify that your host or AS/400 database server is configured to accept connections from DRDA Application Requesters such as DB2

Connect. See “Part 3. Preparing Host and AS/400 Databases for DB2 Connect Communications” on page 51.

Step 4. The next step is to install your DB2 Connect software. You will use this workstation to configure and verify your host and AS/400 connections. For DB2 Connect installation instructions, see “Part 2. DB2 Connect Installation” on page 21.

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

Step 6. Bind the programs and utilities provided with DB2 Connect to your host or AS/400 database. For instructions on binding programs and utilities provided with your DB2 Connect product, see “Step 6. Bind Utilities and Applications to the Database Server” on page 120.

Step 7. You will need to test the connection.

Step 8. Enable the Multisite Update feature if you wish. See “Chapter 8. Enabling Multisite Updates (Two-Phase Commit)” on page 123 for more information.

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

Step 10. Choose a representative run-time client workstation and install and configure DB2 Run-Time Client. You will use this workstation to test connectivity from DB2 run-time clients to host and AS/400 servers, as well as to test applications that use this connectivity. For instructions on installing a client, see “Part 5. Installing and Configuring Clients” on page 129.

Step 11. Install DB2 Run-Time clients on all end-user workstations that will use applications that connect to host and AS/400 database servers. For instructions on deploying DB2 Run-Time Client on a large number of workstations, refer to the *Installation and Configuration Supplement*.

Step 12. You are now ready to use DB2 Connect with all your applications. For ongoing administration of your OS/390 database servers and DB2 Connect Enterprise Edition servers, select a workstation and install the DB2 Administration Client. You can install the DB2 Administration client on a dedicated workstation, or on the same machine where DB2 Connect is running. See “Part 5. Installing and

Configuring Clients" on page 129 for instructions on installing and configuring DB2 Administration clients.

Step 13. Workstations that will be used for application development should have the DB2 Software Developer's Kit installed. See "Part 5. Installing and Configuring Clients" on page 129 for instructions on installing and configuring the DB2 Software Developer's Kit.

Step 14. If you want to use this workstation to administer DB2 for OS/390 or DB2 Universal Database for UNIX, Windows NT or OS/2 servers, install the DB2 Administration Client component of DB2 Connect. For more information on using Client tools, see "Appendix C. Using the Control Center to Administer DB2 for OS/390 and DB2 Connect Enterprise Edition servers" on page 207.

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 E. How the DB2 Library Is Structured" on page 211.

- 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, or Windows NT.
- The term *Windows 9x* refers to Windows 95 or Windows 98.
- The term *DB2 client* refers to a DB2 Run-Time Client or a DB2 Administration Client.
- The term *DB2 Universal Database* refers to DB2 Universal Database on OS/2, UNIX, and Windows 32-bit operating systems, unless otherwise stated.

Part 1. Introduction to DB2 Connect on UNIX Systems

Chapter 1. About DB2 Connect

DB2 Connect Enterprise Edition

DB2 Connect Enterprise Edition is a connectivity server that concentrates and manages connections from multiple desktop clients and web applications to DB2 database servers running on host or AS/400 systems. IBM's DB2 for AS/400, DB2 for OS/390, and DB2 for VSE & VM databases continue to be the systems of choice for managing most critical data for the world's largest organizations. While these host and AS/400 databases manage the data, there is a great demand to integrate this data with applications running on Windows, UNIX, OS/2 and Apple workstations.

DB2 Connect Enterprise Edition enables local and remote client applications to create, update, control, and manage DB2 databases and host systems using Structured Query Language (SQL), DB2 APIs (Application Programming Interfaces), ODBC (Open Database Connectivity), JDBC (Java Database Connectivity), SQLJ (Embedded SQLJ for Java), or DB2 CLI (Call Level Interface). In addition, DB2 Connect supports Microsoft Windows data interfaces such as ActiveX Data Objects (ADO), Remote Data Objects (RDO), and OLE DB.

DB2 Connect Enterprise Edition is currently available for AIX, HP-UX, Linux, OS/2, Solaris, and Windows NT operating systems. These servers provide support for applications running on Windows 3.1, Windows 9x, Windows NT, UNIX (AIX, SCO UnixWare 7, Solaris, HP-UX, Linux, Silicon Graphics IRIX, SINIX), OS/2, and Apple Macintosh workstations.

DB2 Connect Personal Edition

DB2 Connect Personal Edition provides access from a single workstation to DB2 databases residing on servers such as MVS/ESA, OS/390, OS/400, VM and VSE, as well as to DB2 Universal Database servers on Windows NT, UNIX, and OS/2. DB2 Connect Personal Edition provides the same rich set of APIs as DB2 Connect Enterprise Edition, and also features integrated SNA support on all Windows platforms.

This product is currently available for OS/2, Linux, Windows 9x, and Windows NT operating systems.

Working with DB2 Data

As well as providing a relational database to store your data, DB2 lets you issue requests to administer, query, update, insert, or delete data using local or remote client applications.

Accessing DB2 Data from Remote Clients

DB2 clients provide a run-time environment that enables client applications to access one or more remote databases. With a DB2 Administration Client, you can remotely administer DB2 or DB2 Connect servers. Local applications, and all Java applications (either local or remote), access a database through a DB2 client. All remote applications that are not Java applets must have a DB2 client installed on the client machine before they can access the remote database.

DB2 Version 6 clients are supported on:

- Windows 9x or Windows NT
- UNIX (AIX, HP-UX, Linux, SGI IRIX, and Solaris)
- OS/2

DB2 clients for the following releases and platforms are available for download from the web:

- DB2 Version 1.2 for DOS
- DB2 Version 2.1 for Macintosh
- DB2 Version 2.1 for SCO Open Server
- DB2 Version 5.2 for SCO UnixWare 7
- DB2 Version 2.1 for SINIX
- DB2 Version 5.2 for Windows 3.1

To obtain these clients, connect to the IBM DB2 clients web site at `http://www.software.ibm.com/data/db2/db2tech/clientpak.html`

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.

DB2 Connect Enterprise Edition is most appropriate for environments where:

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

Applications are provided with 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). Use of DRDA allows your applications to establish a fast connection to host and AS/400 databases without expensive host components or proprietary gateways.

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, CICS, Encina, Microsoft Transaction Server) 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:

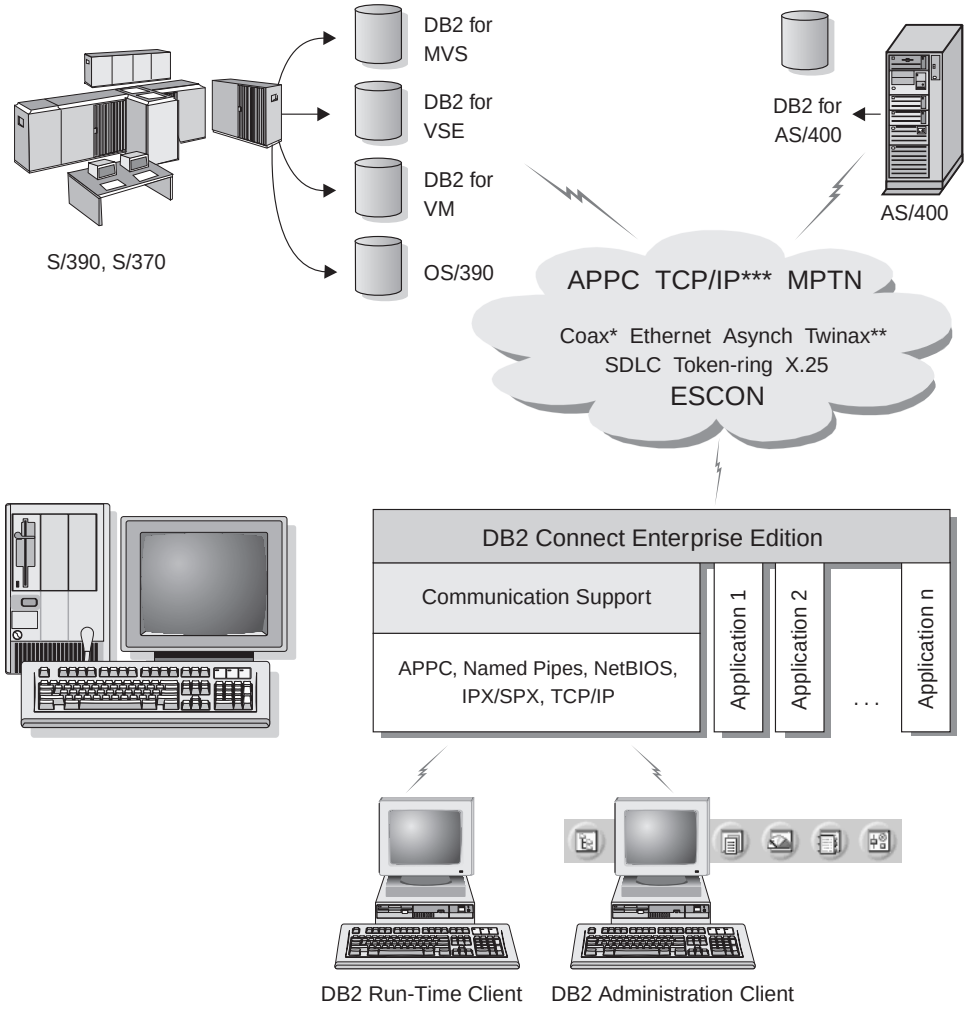
- *Spreadsheets*, such as Lotus 1-2-3 and Microsoft Excel, to analyze real-time data without having the cost and complexity of data extract and import procedures.
- *Decision support tools*, such as Business Objects, Brio and Cognos, and Crystal Reports, to provide real-time information.
- *Database 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.

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. It may also be installed on a Web server,

Transaction Processor (TP) monitor, or other 3-tier application server machines with multiple local SQL application processes and threads. In these cases, you can choose to install DB2 Connect on the same machine for simplicity, or on a separate machine to off-load CPU cycles.

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

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



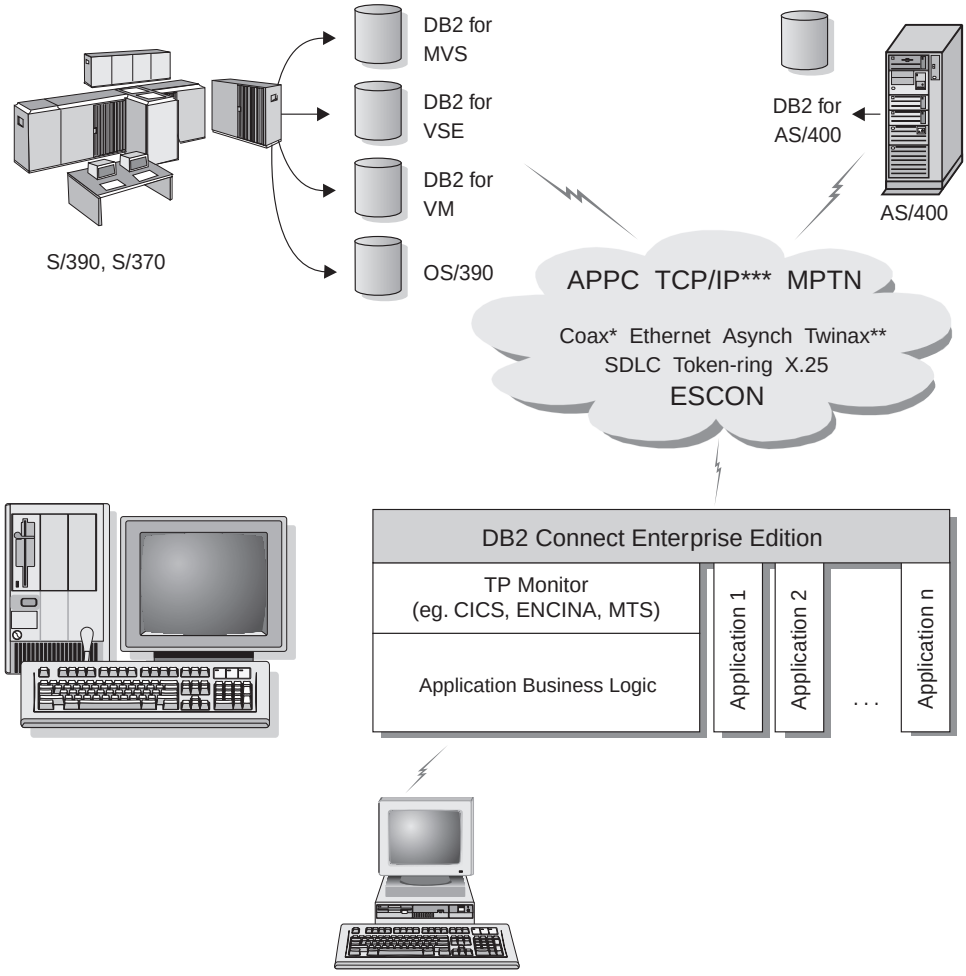
Not all protocols are supported for all platforms.

* 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. DB2 Connect Enterprise Edition



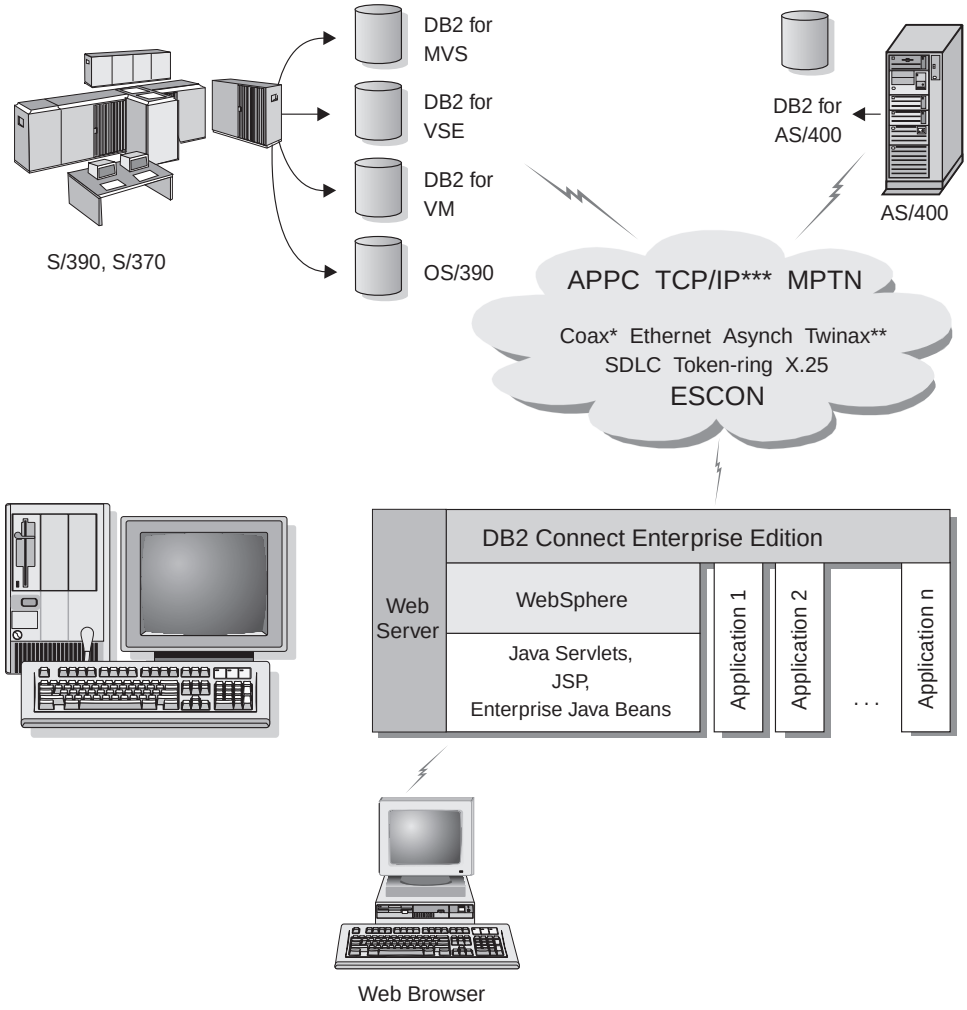
Not all protocols are supported for all platforms.

* For Host connections only

** For AS/400

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

Figure 2. Using Transaction Monitors with DB2 Connect.



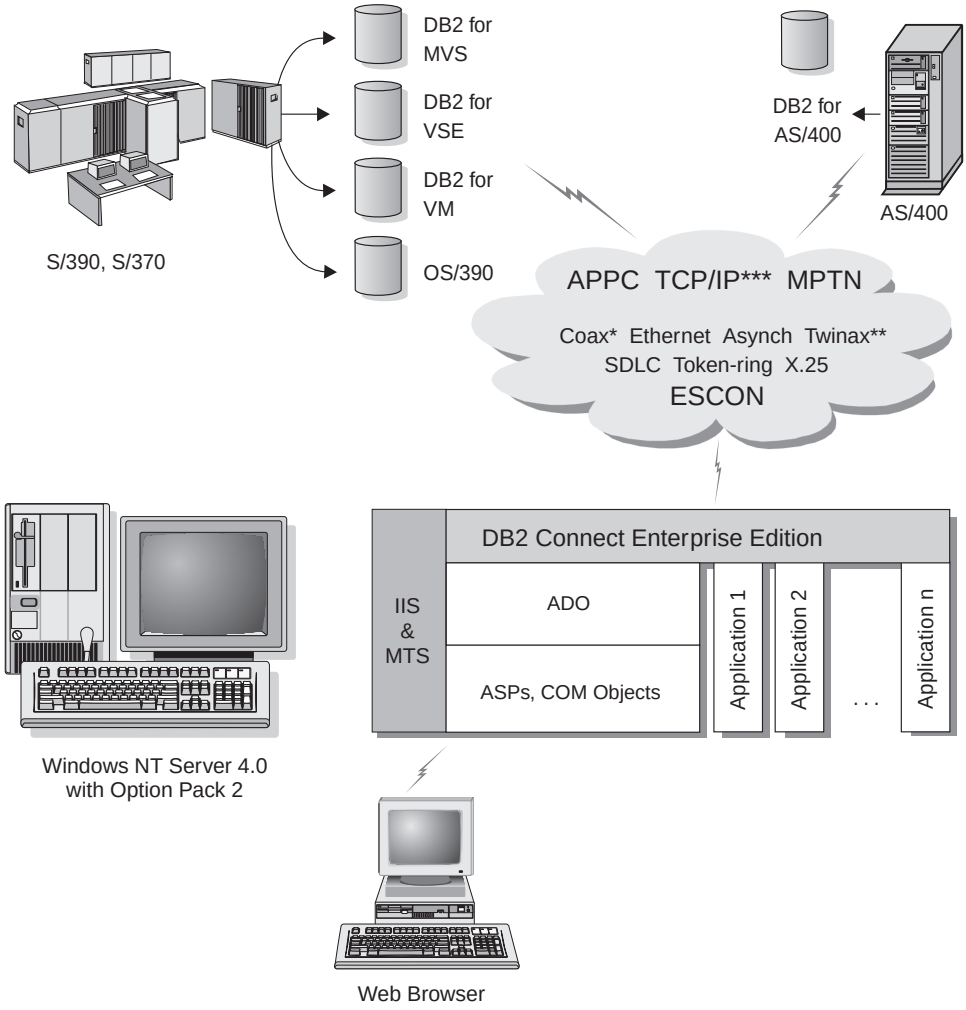
Not all protocols are supported for all platforms.

* For Host connections only

** For AS/400

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

Figure 3. Java Server Support.



Not all protocols are supported for all platforms.

* For Host connections only

** For AS/400

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

Figure 4. DB2 Connect working with Microsoft IIS.

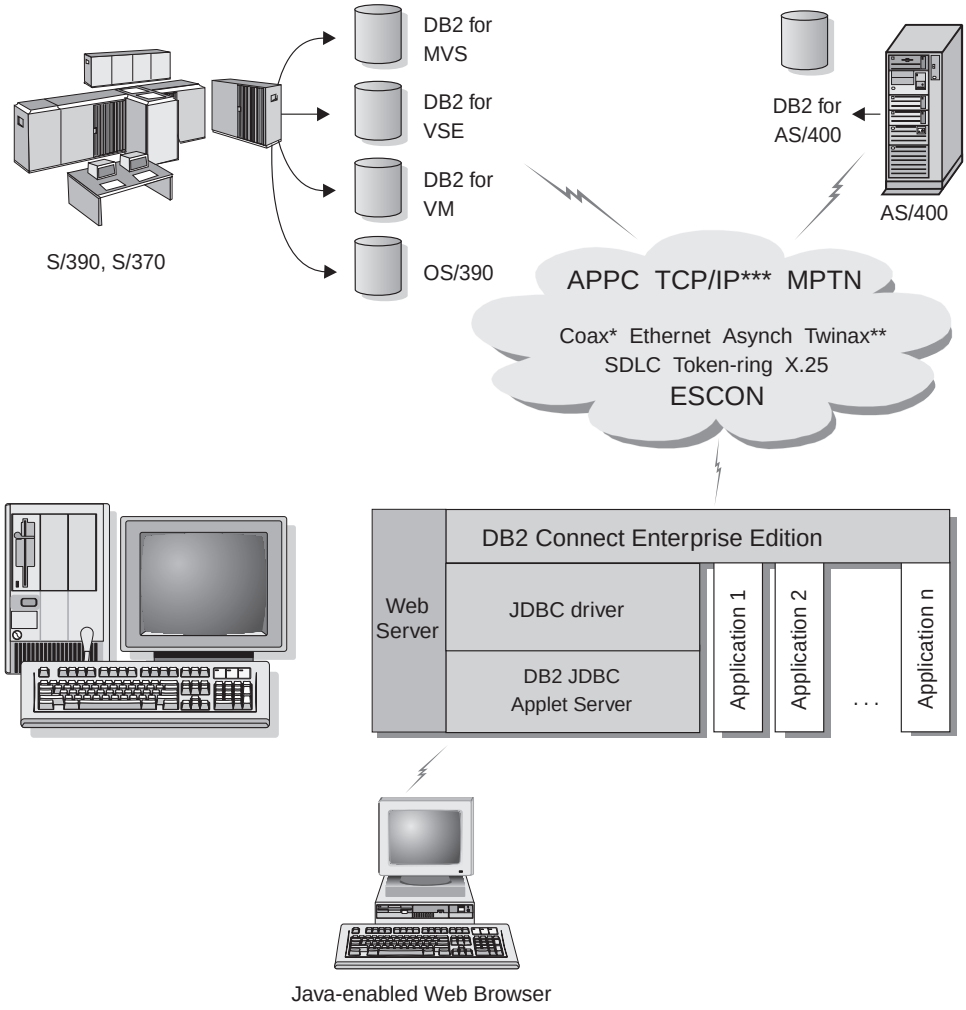
Accessing DB2 Data from the Web Using Java

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 JDBC server and the DB2 client must reside on the same machine as the Web server. The JDBC 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 JDBC server on the machine where the Web server is running.



Not all protocols are supported for all platforms.

* For Host connections only

** For AS/400

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

Figure 5. Using Java Applets.

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

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

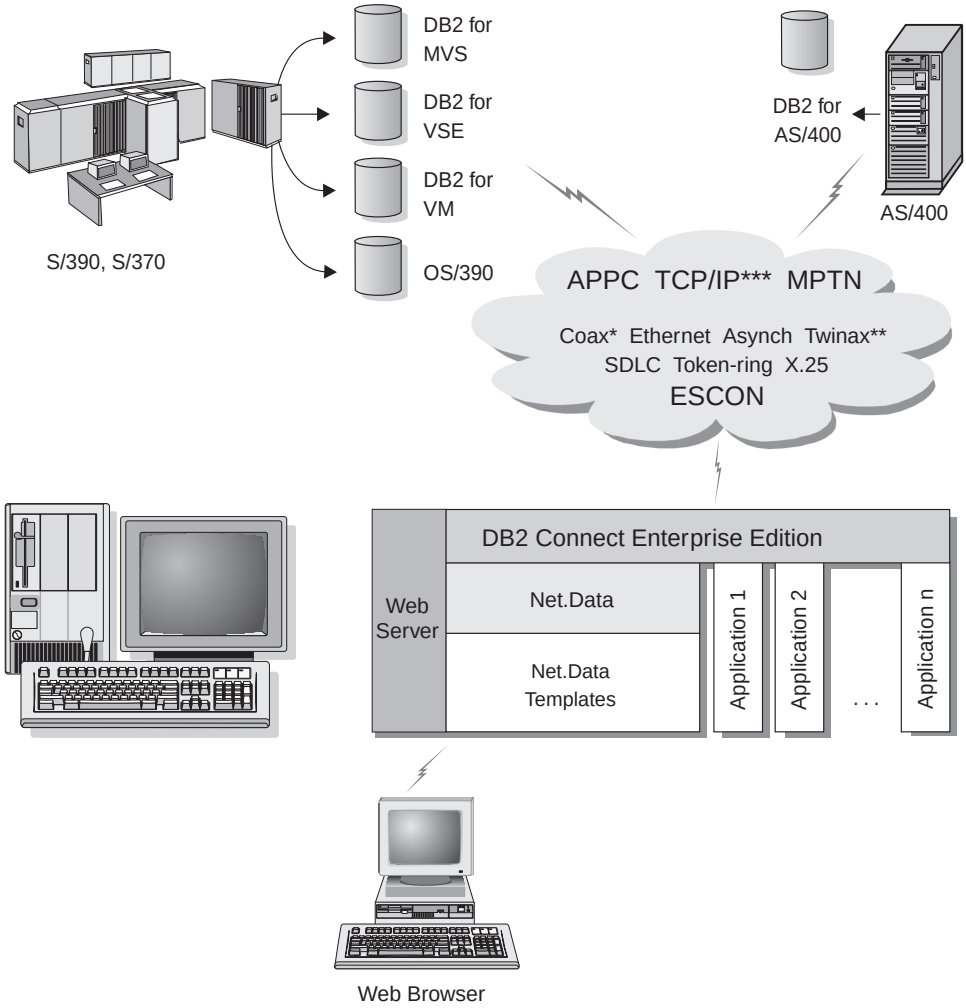
Net.Data is provided with DB2 to allow you to create applications that access data in DB2 databases from the Web.

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.Datapage at http://www.software.ibm.com/data/net.data.

Net.Data can be installed with a DB2 server to allow local access to databases. Net.Datacan be installed with a DB2 client to allow remote access to databases. In both cases, Net.Data and the Web server must be installed on the same system.



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. Net.Data with DB2 Connect.

Administering Instances and Databases with the DB2 Administration Tools

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

The Control Center for Version 6 has additional support for DB2 UDB for OS/390.

Note: This option is only available on DB2 Enterprise Edition, DB2 Enterprise - Extended Edition, DB2 Connect Personal Edition, and DB2 Connect Enterprise Edition.

If you want to access DB2 for OS/390 functions from the Control Center:

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

Managing Communications on the Server

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

- Configure communication parameters in the database manager by clicking with the right mouse button on an instance and selecting the **Configure** option from the pop-up menu.

By default, the setup program automatically detects and configures most communication protocols that it detects on your system.

- Export database information in a profile that can be used to configure clients by clicking with the right mouse button on a system and selecting the **Export** option from the pop-up menu.

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

Monitoring Databases Using DB2 Performance Monitor

With the DB2 Performance Monitor, you can:

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

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

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

You are also able to use the Windows NT Performance Monitor to monitor both database and system performance. For information on how to register DB2 resources and to use the Windows NT Performance Monitor, refer to the *Administration Guide*.

Viewing SQL Access Plans Using Visual Explain

Visual Explain helps database administrators and application developers to:

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

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

Note: You cannot use Visual Explain to administer host databases.

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. This is the preferred method to set up any OS/2, Windows 9x, or Windows NT client to communicate with a server.

You can use the command line processor to set up DB2 clients on any platform. For more information, see “Chapter 14. Configuring Client-to-Server Communications Using the Command Line Processor” on page 161.

With the Client Configuration Assistant, you can:

- Catalog databases so that they can be used by applications. Three methods are available:
  - Search the network for available databases and selecting one. Client access is automatically set up for that database.
  - Use a database access profile provided by a database administrator to automatically define your connections. Client access is automatically set up for that database.
  - Manually configure a connection to a database by entering the required connection parameters.
- Remove cataloged databases, or change the properties of a cataloged database.
- 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.

Understanding the Administration Server

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

The Administration Server must reside on every server that you want to administer and detect. The Administration Server is automatically created and started for you; its default name is `DB2DAS00`.

Developing Applications Using the DB2 Software Developer's Kit

The DB2 Software Developer's Kit 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 Software Developer's Kit is available for each of the supported operating systems and is currently available in the DB2 Universal Developer's Edition and the DB2 Personal Developer's Edition. Applications that are developed with the DB2 Software Developer's Kit will run on any platform where the equivalent DB2 client component is installed. 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 Software Developer's Kit 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 Software Developer's Kit includes:

- Precompilers for Java, C, C++, COBOL, and FORTRAN.
- Libraries, include files, and code samples to develop applications that use SQLJ and DB2 CLI.
- 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 Software Developer's Kit, 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 Software Developer's Kit 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*.

Part 2. DB2 Connect Installation

Chapter 2. Planning for Installation

If you know that your system meets all the hardware and software requirements, and you want to begin installing your DB2 product right away, go to "Chapter 4. Installing DB2 Connect on UNIX Systems" on page 39.

For information on the DB2 family of products, see "Chapter 1. About DB2 Connect" on page 3.

There are many components that you might want to use in your environment. Use the product and planning information in this section to ensure that your system meets the prerequisites and to decide which components you want to install.

Before you begin your DB2 product installation, you should determine the requirements for the system that you are planning to install and configure.

Memory Requirements

This section shows the *suggested* amount of memory that is required to run a DB2 product. The memory requirements listed here are estimates; the actual amounts required depend on the functions you are using. Use this information to plan for systems with a large number of concurrent clients or databases.

DB2 Connect Requirements

The amount of memory that you require depends on the applications you intend to run. We suggest that you have a minimum of 32 MB of memory to access host or AS/400 databases using DB2 Connect Enterprise Edition.

Complete the provided worksheet in Table 1 on page 24 and calculate the approximate values for memory that your system will require.

Table 1. Memory Requirements for DB2 Connect

Number of Clients Connecting to a Server	
___ 5 Concurrent Connections	64 MB
___ 10 Concurrent Connections	80 MB
___ 25 Concurrent Connections	96 MB
___ 50 Concurrent Connections	186 MB
___ DB2 Administration Tools	30 MB
Total Memory Requirements	__ MB

DB2 Client Requirements

The amount of memory you require to run a DB2 Run-Time Client is approximately 16 MB. If you are planning to run a DB2 Administration Client, your client workstation should have approximately 32 MB of available memory.

Disk Requirements

This section shows the *minimum* amount of disk space that is required to install your DB2 product and components. It does not include the disk requirements necessary for the operating system, application development tools, and communications products. Consult each product's documentation for these values. Estimates for disk space requirements are listed here; the actual amounts required depend on the functions you are using.

For information about space requirements for data, refer to the *Administration Guide*.

Estimating Fixed Disk Requirements

To estimate the disk requirements for a particular configuration, add the recommended minimum disk sizes for the products and components that you want to install. Include an allowance for your application data.

Server Components

Use Table 2 on page 25 to estimate the *approximate* amount of disk space you need to install DB2 and associated components on your operating system.

Table 2. Estimating Disk Requirements

	Recommended Minimum Disk (MB)
DB2 Connect Enterprise Edition for AIX	
DB2 Connect	55 MB
DB2 GUI Tools	20 MB
Online documentation in HTML format (English)	60 MB
Far-East Code Page Conversion Support	5 MB
Total Disk Space Required	__ MB
DB2 Connect Enterprise Edition for HP-UX	
DB2 Connect	77 MB
DB2 GUI Tools	20 MB
Online documentation in HTML format (English)	60 MB
Far-East Code Page Conversion Support	5 MB
Total Disk Space Required	__ MB
DB2 Connect Enterprise Edition for Linux	
DB2 Connect	31 MB
DB2 GUI Tools	20 MB
Online documentation in HTML format (English)	50 MB
Far-East Code Page Conversion Support	3.5 MB
Total Disk Space Required	__ MB
DB2 Connect Enterprise Edition for Solaris	
DB2 Connect	50 MB
DB2 GUI Tools	20 MB
Online documentation in HTML format (English)	60 MB
Far-East Code Page Conversion Support	5 MB
Total Disk Space Required	__ MB

The *online documentation in HTML format* component will install the DB2 documentation in a compressed format. You may need extra disk space temporarily for decompression. Once you have finished the installation, remove the fileset to reclaim the disk space.

Client Components

Use Table 3 on page 26 to estimate the amount of disk space you need on each of your client workstations.

If you are planning to use a DB2 client that is not listed in this table, but is supported by DB2, refer to the *Installation and Configuration Supplement* for more information.

If you are installing the Control Center or the online documentation on a Windows NT FAT or a Windows 9x FAT16 disk partition, you may require additional amounts of disk space.

Table 3. Disk Requirements for Client Components

	Recommended Minimum Disk (MB)
AIX	
DB2 Run-Time Client (Base)	25 MB
- Client Configuration Assistant	5 MB
or	
DB2 Administration Client (Base)	25 MB
- DB2 Administration Tools	40 MB
- Client Configuration Assistant	6 MB
Total Disk Space Required	__ MB
HP-UX	
DB2 Run-Time Client (Base)	25 MB
- Client Configuration Assistant	5 MB
or	
DB2 Administration Client (Base)	25 MB
- DB2 Administration Tools	40 MB
- Client Configuration Assistant	6 MB
Total Disk Space Required	__ MB
Linux	
DB2 Run-Time Client (Base)	25 MB
- Client Configuration Assistant	5 MB
or	
DB2 Administration Client (Base)	25 MB
- DB2 Administration Tools	40 MB
- Client Configuration Assistant	6 MB
Total Disk Space Required	__ MB

Table 3. Disk Requirements for Client Components (continued)

	Recommended Minimum Disk (MB)
OS/2	
DB2 Run-Time Client (Base)	11 MB
- Client Configuration Assistant	6 MB
or	
DB2 Administration Client (Base)	11 MB
- DB2 Administration Tools	68 MB
- Client Configuration Assistant	6 MB
Total Disk Space Required	__ MB
Silicon Graphics IRIX	
DB2 Run-Time Client (Base)	25 MB
- Client Configuration Assistant	6 MB
or	
DB2 Administration Client (Base)	25 MB
- DB2 Administration Tools	40 MB
- Client Configuration Assistant	6 MB
Total Disk Space Required	__ MB
Solaris	
DB2 Run-Time Client (Base)	25 MB
- Client Configuration Assistant	6 MB
or	
DB2 Administration Client (Base)	11 MB
- DB2 Administration Tools	68 MB
- Client Configuration Assistant	6 MB
Total Disk Space Required	__ MB
Windows 32-bit Operating Systems	
DB2 Run-Time Client (Base)	11 MB
- Client Configuration Assistant	6 MB
or	

Table 3. Disk Requirements for Client Components (continued)

	Recommended Minimum Disk (MB)
DB2 Administration Client (Base)	11 MB
- DB2 Administration Tools	68 MB
- Client Configuration Assistant	6 MB
Total Disk Space Required	__ MB

Software Requirements

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

For the host connectivity, software requirements will depend on:

- The protocol that you will be using, that is, SNA (APPC), TCP/IP, or MPTN (APPC over TCP/IP or vice versa)
- Whether you will be using direct connection.

Server Product Requirements

Table 4 on page 29 lists the operating system and communications software required for DB2 Connect.

Table 4. Software Requirements

Product	Hardware/Software Requirements	Communications
		AIX
• DB2 Connect Enterprise Edition	RISC System/6000 and the following: • AIX Version 4.2 or later	APPC, IPX/SPX, TCP/IP and MPTN (APPC over TCP/IP) • For TCP/IP connectivity, no additional software is required. • IPX/SPX connectivity is provided by: – AIX base operating system 4.2 or later, which supports DB2 direct addressing. – AIX base operating system 4.3 or later (contains Novell Netware Services for AIX Version 4.1), which supports DB2 direct and file server addressing. • For SNA (APPC) connectivity, one of the following communication products is required: – IBM eNetwork Communications Server for AIX V5.0.2.4 – Bull DPX/20 SNA/20 **Notes:** 1. If you want to install the DRDA Application Server function of DB2, you must install the Syncpoint Manager (SPM) and its prerequisites in order to use two-phase commit. 2. If you plan to use DCE (Distributed Computing Environment) with Version 6 of the DB2 Universal Database products, you require a DCE product that is at OSF DCE level 1.1. For DB2 Connect support, you require DB2/MVS Version 5.1 plus its prerequisite, OS/390 DCE Base Services Version 3 for DCE support. With DB2 Connect, you must install DCE Directory Services on the client and the DRDA server. You do not need DCE installed on a DB2 Connect Enterprise Edition server. 3. If you plan to use the ADSTAR Distributed Storage Manager (ADSM) facilities for backup and restore of your databases, you require the ADSM Client Version 3 or later. 4. If you plan to use the Simple Network Management Protocol (SNMP) subagent, you require DPI 2.0 provided by IBM Netfinity Agent.

Table 4. Software Requirements (continued)

Product	Hardware/Software Requirements	Communications
	HP-UX Version 10	
• DB2 Connect Enterprise Edition	HP 9000 series 700 or 800 system and the following: • HP-UX Version 10.20 or later The following patches are required: • For HP-UX Version 10.20 – PHSS_10556 – PHSS_10436 – PHSS_10053 – PHSS_10113 • For systems with the ANSI C or C++ compilers: – PHSS_10261 – PHSS_7505 – PHSS_9096 for C++	APPC and TCP/IP • For TCP/IP connectivity, no additional software is required. • For SNA (APPC) connectivity, both of the following communication products are required: – HP SNAplus2 Link Version A.10.10, and – HP SNAplus2 API Version A.10.10 **Note:** HP-UX does not provide support for inbound client APPC requests. TCP/IP is provided with the HP-UX base operating system. If you plan to use the ADSTAR Distributed Storage Manager (ADSM) facilities for backup and restore of your databases, you require the ADSM Client Version 3 or later.
	HP-UX Version 11	
• DB2 Connect Enterprise Edition	HP 9000 series 700 or 800 system and the following: • HP-UX Version 11.00 or later	APPC or TCP/IP • TCP/IP is provided with the HP-UX base operating system. • For APPC connectivity, HP-UX Version 11.00 requires the following: – SNAplus2 Link R6.11.00.00 – SNAplus2 API R.6.11.00.00 **Note:** HP-UX only supports outbound client APPC requests. It does not provide support for inbound client APPC requests. **Note:** TCP/IP is provided with the HP-UX base operating system. **Note:** If you plan to use DCE (Distributed Computing Environment) with Version 6 of the DB2 Universal Database products, you require a DCE product that is at OSF DCE level 1.1, which is provided by the HP-UX Version 11 and later operating system. With DB2 Connect, you must install DCE Directory Services on the client and the host server. You do not need DCE installed on a DB2 Connect Enterprise Edition server.
	Linux	
• DB2 Connect Enterprise Edition	• Linux kernel 2.0.35 or higher; • *glibc* Version 2.0.7 or higher; • *pdksh* package (required to run the DB2 command line processor); and • *libstdc++* Version 2.8.0 or higher. To install DB2, you will need *rpm*.	TCP/IP • For TCP/IP connectivity, no additional software is required. • APPC connectivity is not supported in this version of DB2 UDB for Linux.

Table 4. Software Requirements (continued)

Product	Hardware/Software Requirements	Communications
	Solaris	
• DB2 Connect Enterprise Edition	Solaris SPARC-based computer and the following: • Solaris Version 2.5.1 or later The following patches are required for Solaris version 2.5.1: • 101242 Rev. 11 or higher • 103566 Rev. 08 or higher • 103600 Rev. 13 or higher • 103640 Rev. 20 or higher The following patches are required for Solaris version 2.6: • 105568 Rev. 12 or higher • 105210 Rev. 13 or higher • 105181 Rev. 06 or higher	APPC, IPX/SPX, or TCP/IP • TCP/IP is provided with the Solaris base operating system. • IPX/SPX connectivity is provided with SolarNet PC Protocol Services 1.1 with IPX/SPX for the Solaris 2.x Operating Environment. • For APPC connectivity, you require SunLink SNA 9.0 or later, and the following communication products: – SunLink P2P LU6.2 9.0 or later – SunLink PU2.1 9.0 or later – SunLink P2P CPI–C 9.0 or later **Notes:** 1. DB2 Connect for Solaris requires Solaris Version 2.6 or later. 2. If you plan to use DCE (Distributed Computing Environment) with Version 6 of the DB2 Universal Database products, you require Transarc DCE Version 2.0 for Solaris 2.6 or higher. With DB2 Connect, you must install DCE Directory Services on the client and the DRDA server. You do not need DCE installed on a DB2 Connect Enterprise Edition server.

Client Product Requirements

Table 5 lists the software requirements needed for a DB2 Administration Client, DB2 Run-Time Client, or a DB2 Software Developer's Kit.

Table 5. Software Requirements for Clients

Component	Hardware/Software Requirements	Communications
• DB2 Run-Time Client for AIX • DB2 Administration Client for AIX • DB2 Software Developer's Kit for AIX	RISC System/6000 and the following: • AIX Version 4.2 or later	APPC or TCP/IP • For APPC connectivity, you require IBM eNetwork Communications Server Version 5.0.2.4 or later for AIX • The AIX base operating system provides TCP/IP connectivity, if selected during install. **Note:** If you plan to use DCE (Distributed Computing Environment), you require a DCE product that is provided by the AIX Version 5 operating system with its latest DCE PTF.

Table 5. Software Requirements for Clients (continued)

Component	Hardware/Software Requirements	Communications
• DB2 Run-Time Client for HP-UX 10.20 • DB2 Administration Client for HP-UX 10.20 • DB2 Software Developer's Kit for HP-UX	HP 9000 Series 700 or 800 system and the following: • HP-UX Version 10.20 or later The following patches are required: • For HP-UX Version 10.20 – PHSS_10556 – PHSS_10436 – PHSS_10053 – PHSS_10113 • For systems with the ANSI C or C++ compilers: – PHSS_10261 – PHSS_7505 – PHSS_9096 for C++	APPC or TCP/IP • For APPC connectivity, HP-UX Version 10.20 requires the following: – SNAplus2 and the following components: - SNAplus2 Link Version A.10.10 - SNAplus2 API Version A.10.10 **Note:** If you plan to use DCE (Distributed Computing Environment) with Version 6 of the DB2 Universal Database products, you require a DCE product that is at OSF DCE level 1.1, which is provided by the HP-UX Version 11 and later operating system. 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.
• DB2 Run-Time Client for HP-UX for 11.00 • DB2 Administration Client for HP-UX for 11.00 • DB2 Software Developer's Kit for HP-UX	HP 9000 Series 700 or 800 system and the following: • HP-UX Version 11.00 or later	APPC or TCP/IP • For APPC connectivity, you require either of the following: – SNAplus2 Link R6.11.00.00 – SNAplus2 API R6.11.00.00 **Note:** If you plan to use DCE (Distributed Computing Environment), you require a DCE product that is provided by the HP-UX Version 11 base operating system.
• DB2 Run-Time Client for Linux • DB2 Administration Client for Linux • DB2 Software Developer's Kit for Linux	• Linux kernel 2.0.35 or higher; • *glibc* Version 2.0.7 or higher; • *pdksh* package (required to run the DB2 command line processor); and • *libstdc++* Version 2.8.0 or higher. To install DB2, you will need *rpm*.	TCP/IP • The Linux base operating system provides TCP/IP connectivity, if selected during install. APPC connectivity is not provided in this release.

Table 5. Software Requirements for Clients (continued)

Component	Hardware/Software Requirements	Communications
• DB2 Run-Time Client for OS/2 • DB2 Administration Client for OS/2 • DB2 Software Developer's Kit for OS/2	• OS/2 Warp Version 3 and Version 4 • OS/2 Warp Connect Version 3 • 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 APPC connectivity, you require IBM eNetwork Communications Server for OS/2 Warp Version 5 or IBM eNetwork Personal Communications for OS/2 Warp Version 4.2. • For IPX/SPX connectivity, you require the Novell NetWare client for OS/2 Version 2.10 or later. IPX/SPX can only be used to connect to local databases. It cannot be used to connect to host or AS/400 databases. • For NetBIOS connectivity, you require IBM NTS/2 Version 1.0, IBM eNetwork Communications Server for OS/2 Warp Version 5, IBM eNetwork Personal Communications for OS/2 Warp Version 4.2, or IBM OS/2 LAN Requester. NetBIOS can only be used to connect to local databases. It cannot be used to connect to host or AS/400 databases. • For TCP/IP connectivity, you require IBM TCP/IP Version 2.0 or later. • The OS/2 base operating system provides Named Pipes (Local) connectivity. Named Pipes is supported in DOS and WIN-OS/2 sessions. **Notes:** 1. Net.Data requires OS/2 Warp Version 3 or later and a Web server such as IBM's Internet Connection Server. 2. For DCE Cell Directory Services Support (CDS) for DB2 Clients for OS/2, you must install IBM Distributed Computing Environment Cell Directory Service client, Version 2.10, on each client workstation. 3. If you are planning to use ADSM, PTF 3 for ADSTAR Distributed Storage Manager (ADSM) Version 3 is required for an OS/2 client.
• DB2 Run-Time Client for Silicon Graphics IRIX • DB2 Administration Client for Silicon Graphics IRIX • DB2 Software Developer's Kit for Silicon Graphics IRIX	• Silicon Graphics IRIX, Version 6.x, and the following filesets: – eoe.sw.oampkg – eoe.sw.svr4net The following patches are required for Versions 6.2 and 6.3: – 2791.0 – 3778.0	TCP/IP • The Silicon Graphics IRIX base operating system provides TCP/IP connectivity.

Table 5. Software Requirements for Clients (continued)

Component	Hardware/Software Requirements	Communications
• DB2 Run-Time Client for Solaris • DB2 Administration Client for Solaris • DB2 Software Developer's Kit for Solaris	Solaris SPARC-based computer and the following: • Solaris Version 2.5.1 or later The following patches are required for Solaris version 2.5.1: • 101242 Rev. 11 or higher • 103566 Rev. 08 or higher • 103600 Rev. 13 or higher • 103640 Rev. 20 or higher The following patches are required for Solaris version 2.6: • 105568 Rev. 12 or higher • 105210 Rev. 13 or higher • 105181 Rev. 06 or higher	APPC or TCP/IP • For APPC connectivity, you require SunLink SNA 9.0 or later and the following: – SunLink P2P LU6.2 9.0 or later – SunLink PU2.1 9.0 or later – SunLink P2P CPI–C 9.0 or later • The Solaris base operating system provides TCP/IP connectivity. **Note:** If you plan to use DCE (Distributed Computing Environment), you require a DCE product with Transarc DCE Version 1.1 for Solaris 2.5 and 2.5.1, patch level 18 or higher.
• DB2 Run-Time Client for Windows 9x • DB2 Administration Client for Windows 9x • DB2 Software Developer's Kit for Windows 9x	• Windows 95 4.00.950 or later • Windows 98	IPX/SPX, Named Pipes, NetBIOS, or TCP/IP • The Windows 9x base operating system provides NetBIOS, IPX/SPX, TCP/IP, and Named Pipes connectivity. **Note:** IPX/SPX connectivity is only supported to Windows NT servers. • If you plan to use LDAP (Lightweight Directory Access Protocol), you require the IBM eNetwork LDAP Directory Client Version 3.1. For more information, refer to the *Administration Guide*.

Table 5. Software Requirements for Clients (continued)

Component	Hardware/Software Requirements	Communications
• DB2 Run-Time Client for Windows NT • DB2 Administration Client for Windows NT • DB2 Software Developer's Kit for Windows NT	• Windows NT Version 4.0 with Service Pack 3 or later • Windows Terminal Server (can only run the DB2 Run-Time Client)	APPC, IPX/SPX, Named Pipes, NetBIOS, or TCP/IP • The Windows NT base operating system provides NetBIOS, IPX/SPX, TCP/IP, and Named Pipes connectivity. • For APPC connectivity, you require one of the following products: – IBM eNetwork Communications Server for Windows NT V5.01 or later. – IBM eNetwork Personal Communications for Windows NT V4.2 or later. – Microsoft SNA Server Version 4 Service Pack 2 or later – Wall Data Rumba If you plan to use DCE (Distributed Computing Environment) with Version 6 of DB2 Universal Database, you will need to ensure that if you are connecting to DB2 for OS/390 V5.1 database that it is enabled for DCE support using OS/390 DCE Base Services Version 3. • If you plan to use LDAP (Lightweight Directory Access Protocol), you require the IBM eNetwork LDAP Directory Client Version 3.1. For more information, refer to the *Administration Guide*. • If you plan to use the ADSTAR Distributed Storage Manager (ADSM) facilities for backup and restore of your databases, you require the ADSM Client Version 3 or later. • If you have the IBM Antivirus program installed on your operating system, it must be Version 3.0 or later.

Possible Client-to-Server Connectivity Scenarios

The following table shows the communication protocols that can be used when connecting a specific LAN, host or AS/400 DB2 client to a specific DB2 server or DB2 Connect server.

DB2 Workgroup, DB2 Enterprise, and DB2 Enterprise - Extended Editions can service requests from host or AS/400 clients (DRDA ARs).

Table 6. Possible Client-to-Server Connectivity Scenarios

Client	Server					
	AIX	HP-UX	Linux	OS/2	Solaris	Windows NT
AS/400 V4R1	SNA	N/A	N/A	SNA	SNA	SNA
AS/400 V4R2	SNA TCP/IP	TCP/IP	TCP/IP	SNA TCP/IP	SNA TCP/IP	SNA TCP/IP
AIX	APPC TCP/IP	TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP	APPC TCP/IP

Table 6. Possible Client-to-Server Connectivity Scenarios (continued)

Client	Server					
	AIX	**HP-UX**	**Linux**	**OS/2**	**Solaris**	**Windows NT**
HP-UX	APPC TCP/IP	TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP	APPC TCP/IP
Linux	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP
MVS	SNA	N/A	N/A	SNA	SNA	SNA
OS/2	APPC IPX/SPX(1),(2) TCP/IP	TCP/IP	TCP/IP	APPC IPX/SPX(1),(2) NetBIOS TCP/IP	APPC IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) NetBIOS TCP/IP
OS/390	SNA TCP/IP	TCP/IP	TCP/IP	SNA TCP/IP	SNA TCP/IP	SNA TCP/IP
Silicon Graphics IRIX	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP
SQL/DS	SNA	N/A	N/A	SNA	SNA	SNA
Solaris	APPC TCP/IP	TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP	APPC TCP/IP
VSE & VM V6	SNA	N/A	N/A	SNA	SNA	SNA
VSE V6	SNA	N/A	N/A	SNA	SNA	SNA
VM V6	SNA TCP/IP	TCP/IP	TCP/IP	SNA TCP/IP	SNA TCP/IP	SNA TCP/IP
Windows 9x	TCP/IP	TCP/IP	TCP/IP	NetBIOS TCP/IP	TCP/IP	IPX/SPX(1) NPIPE NetBIOS TCP/IP
Windows NT	APPC IPX/SPX(1) TCP/IP	TCP/IP	TCP/IP	APPC IPX/SPX(1) NetBIOS TCP/IP	APPC IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) NPIPE NetBIOS TCP/IP

1. Direct Addressing
2. File Server Addressing

Chapter 3. Security Requirements

Since you will be accessing data managed by other systems, you will require a user ID and password so that you can be authenticated by the system. To obtain these, contact the administrator responsible for the system where the data resides.

In addition, to access the system, you will require authorization to access data objects on the target database server; for example, tables, views, and program packages. To obtain the appropriate authorization, contact your database administrator.

An additional DB2 security mechanism called *binding* allows database administrators to limit access to specific applications. This mechanism is used to build program packages or *plans*. The database administrator then grants authority to users to execute these packages.

If you will be running an application developed using embedded SQL, a package will be supplied with your application. You must bind this package to each database that the application will access. Package files are usually supplied with the file type `.bnd`. ODBC users do not bind individual applications; instead, they must bind the ODBC driver itself to each database that will be accessed.

To bind applications or the ODBC driver, you require the following privileges on each database:

DB2 Universal Database for OS/390 or DB2 for MVS
: BINDADD privilege, plus CREATE IN COLLECTION NULLID, SYSCTRL, or SYSADM authority.

DB2 for VSE & VM
: DBA authority

DB2/400
: *CHANGE authority or higher on the NULLID collection.

If your database administrator will not grant you these privileges, another user (usually the administrator) must perform the required binds.

Chapter 4. Installing DB2 Connect on UNIX Systems

This section describes how to install DB2 Connect on UNIX-based workstations. For information on how to deploy this product using a distributed installation, refer to the *Installation and Configuration Supplement*.

We assume in these instructions that you install and configure DB2 Connect products using the DB2 Installerprogram. We also assume that you select to install the Control Center, create an instance, and create an Administration Server using the DB2 Installer program.

If you want to install your DB2 product using your UNIX operating system's native installation tools, refer to the *Installation and Configuration Supplement*.

If you need to migrate databases that were created using previous versions of DB2, you must complete certain procedures before and after installing DB2 Connect Version 6. See "Appendix B. Migrating from Previous Versions and Releases" on page 201 for further information.

Before You Begin

Before you begin installation, be sure 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 23.

__ 2. A username for the default DB2 instance. We recommend that you create a new group and use it as the primary group for the DB2 instance owner.

__ 3. A username for the Administration Server. For security reasons, we recommend that you do not use the same username that you reserved for the DB2 instance.

You can have the DB2 Installer create these usernames, or you can create them manually. Usernames should conform to both your operating system's naming rules, and those of DB2. For more information on naming rules, see "Appendix G. Naming Rules" on page 235.

When you use the DB2 Installer program, you should be aware of the following:

- The DB2 Installer's **db2setup** command only works with Bash, Bourne, and Korn shells. Other shells are not supported.
- You can generate a trace log, *db2setup.trc*, to record errors experienced during the installation. Run the **db2setup** command as follows:

  ```
  db2setup -d
  ```

  This creates a trace file, `/tmp/db2setup.trc`.

Installation Steps

To install DB2 Connect on UNIX systems, perform the following steps:

Step 1. Identify and Record Parameter Values

Table 7 will help you determine the values required to install DB2 products, set up a DB2 instance and configure the Administration Server. Before proceeding with the installation and configuration, complete the *Your Value* column in the table. If you want to choose the default value for a parameter, you do not need to provide any value in the *Your Value* column for that parameter. In Table 7, the only parameter for which a value is required is *DB2 Product Name*. All other parameters either have a default value or are optional.

Table 7. Parameter Values Required for Installation

Information Required for DB2 Installer	**Default Value**	**Your Value**
Product/Component		
DB2 Product Name[1]	DB2 Connect	
DB2 Product Messages	None	
Documentation	None	
DB2 Instance		
User Name	db2inst1	
UID	System-generated UID	
Group Name	db2iadm1	
GID	System-generated GID	
Password	ibmdb2	
TCP/IP Service Name	db2cdb2inst1	
TCP/IP Port Number	50001	

Table 7. Parameter Values Required for Installation (continued)

Information Required for DB2 Installer	Default Value	Your Value
IPX/SPX File Server Name	*	
IPX/SPX Object Name	*	
IPX/SPX Socket Number	879E	
IPX/SPX NetWare User ID	None	
IPX/SPX NetWare Password	None	
Administration Server		
User Name (DAS)	db2as	
UID (DAS)	System-generated UID	
Group Name (DAS)	db2asgrp	
GID (DAS)	System-generated GID	
Password (DAS)	ibmdb2	
TCP/IP Port Number (DAS)	523	523
IPX/SPX File Server Name (DAS)	*	
IPX/SPX Object Name (DAS)	*	
IPX/SPX Socket Number (DAS)	87A2	87A2
IPX/SPX NetWare User ID (DAS)	None	
IPX/SPX NetWare Password (DAS)	None	

Notes:

1. You can optionally select one or more filesets in this product. There is a separate fileset for each locale.

Step 2. Update Kernel Configuration Parameters

Depending on your workstation's operating system and its kernel configuration, you may need to update the kernel configuration parameters before installing DB2:

- For HP-UX kernel configuration parameters, see Table 8.
- For Solaris kernel configuration parameters, see Table 9 on page 44.

If you are installing a DB2 product on an AIX or Linux workstation, you do not need to update the kernel configuration parameters. To continue the installation on an AIX or Linux workstation, go to "Step 3. Mount the CD-ROM" on page 45.

Recommended Values for HP-UX Version 10 and Version 11

The values in Table 8 are the recommended HP-UX kernel configuration parameters.

Table 8. HP-UX Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Physical Memory		
	64MB - 128MB	128MB - 256MB	256MB+
maxuprc	256	384	512
maxfiles	256	256	256
nproc	512	768	1024
nflocks	2048	4096	8192
ninode	512	1024	2048
nfile	(4 * ninode)	(4 * ninode)	(4 * ninode)
msgseg	8192	16 384	32 768
msgmnb	65 535 (1)	65 535 (1)	65 535 (1)
msgmax	65 535 (1)	65 535 (1)	65 535 (1)
msgtql	256	512	1024
msgmap	130	258	258
msgmni	128	256	256
msgssz	16	16	16
semmni	128	256	512
semmap	130	258	514
semmns	256	512	1024
semmnu	256	512	1024
shmmax	67 108 864	134 217 728 (2)	268 435 456 (2)
shmseg	16	16	16
shmmni	300	300	300

Notes:

1. Parameters *msgmnb* and *msgmax* must be set to at least 65535.

2. Parameter *shmmax* should be set to 134217728 or 90% of the physical memory (in bytes), whichever is higher. For example, if you have 196 MB of physical memory in your system, set *shmmax* to 184 968 806 (196*0.9*1024*1024).
3. To maintain the interdependency among kernel parameters, change parameters in the same sequence in which they appear in the preceding table.

To change a value, perform the following steps:

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

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

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

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

Step 5. Click on **OK**.

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

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

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

To continue with the installation on HP-UX systems, proceed to "Step 3. Mount the CD-ROM" on page 45.

Recommended Values for Solaris

The values in Table 9 on page 44 are the recommended Solaris kernel configuration parameters.

Table 9. Solaris Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Physical Memory			
	64MB - 128MB	128MB - 256MB	256MB - 512MB	512MB+
msgsys:msginfo_msgmax	65 535(1)	65535(1)	65 535(1)	65 535(1)
msgsys:msginfo_msgmnb	65 535(1)	65 535(1)	65 535(1)	65 535(1)
msgsys:msginfo_msgmap	130	258	258	258
msgsys:msginfo_msgmni	128	256	256	256
msgsys:msginfo_msgssz	16	16	16	16
msgsys:msginfo_msgtql	256	512	1024	1024
msgsys:msginfo_msgseg	8 192	16 384	32 768	32 768
shmsys:shminfo_shmmax	67 108 864	134 217 728(2)	268 435 456(2)	536 870 912(2)
shmsys:shminfo_shmseg	16	16	16	16
shmsys:shminfo_shmmni	300	300	300	300
semsys:seminfo_semmni	128	256	512	1024
semsys:seminfo_semmap	130	258	514	1026
semsys:seminfo_semmns	256	512	1024	2048
semsys:seminfo_semmnu	256	512	1024	2048

Notes:

1. The *msgsys:msginfo_msgmnb* and *msgsys:msginfo_msgmax* parameters must be set to 65535 or larger.
2. The *shmsys:shminfo_shmmax* parameters should be set to the suggested value in the above table, or 90% of the physical memory (in bytes), whichever is higher. For example, if you have 196 MB of physical memory in your system, set the *shmsys:shminfo_shmmax* parameter to 184968806 (196*0.9*1024*1024).

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

```
set parameter_name = value
```

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

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

Sample files for updating the kernel configuration parameters are provided in the `/opt/IBMdb2/V6.1/cfg` directory. The names for these files are as follows:

kernel.param.64MB
for systems with 64MB–124MB of physical memory

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

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

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

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

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

To continue with the installation on Solaris systems, proceed to "Step 3. Mount the CD-ROM".

Step 3. Mount the CD-ROM

To install your DB2 product using the DB2 Installer program, you must first mount the CD-ROM. Once you have mounted the CD-ROM, you can start the installation.

Go to the section that describes the mounting instructions for the DB2 server that you want to install:

- "Mounting on AIX Systems"
- "Mounting on HP-UX Systems" on page 46
- "Mounting on Linux Systems" on page 47
- "Mounting on Solaris Systems" on page 47

Mounting on AIX Systems

To mount the CD-ROM on AIX, perform the following steps:

Step 1. Log in as a user with `root` authority.

Step 2. Insert the CD-ROM in the drive.

Step 3. Create a directory to mount the CD-ROM by entering the following command:

```
mkdir -p /cdrom
```

where `cdrom` represents the CD-ROM mount directory.

Step 4. Allocate a CD-ROM file system by entering the following command:

```
smitty storage
```

Step 5. Select **File Systems**.

Step 6. Select **Add / Change / Show / Delete File Systems**.

Step 7. Select **CDROM File Systems**.

Step 8. Select **Add CDROM File System**.

Step 9. Select **Device Name**.

Device names for CD-ROM file systems must be unique. If there is a duplicate device name, you may need to delete a previously-defined CD-ROM file system or use another name for your directory.

Step 10. In the pop-up window, enter the following as **mount point**:

```
/cdrom
```

Step 11. Mount the CD-ROM file system by entering the following command:

```
smit mountfs
```

Step 12. Enter a value in the **FILE SYSTEM** name field. For example, the name could be `/dev/cd0`.

Step 13. Enter a value in the **Directory over which to mount** field. For example, this value could be `/cdrom`.

Step 14. Enter a value in the **Type of Filesystem** field. For example, this value could be `cdrfs`.

Step 15. Set the **Mount as READ-ONLY system** to `Yes`.

Step 16. Click on **OK**.

Step 17. Log out.

After mounting the CD-ROM, proceed to "Step 4. Install the DB2 Products" on page 47.

Mounting on HP-UX Systems

To mount the CD-ROM on HP-UX, perform the following steps:

Step 1. Log in as a user with `root` authority.

Step 2. Insert the CD-ROM in the drive.

Step 3. Mount it by entering the following commands:

```
mkdir /cdrom
/usr/sbin/mount /dev/dsk/c0t2d0 /cdrom
```

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

Step 4. Log out.

The CD-ROM may also be mounted using the System Administration (**SAM**) tool. Consult your HP-UX documentation for more information about **SAM**.

After mounting the CD-ROM, proceed to "Step 4. Install the DB2 Products".

Mounting on Linux Systems

To mount the CD-ROM on Linux, perform the following steps:

Step 1. Log in as a user with `root` authority.

Step 2. Insert the CD-ROM in the drive and mount it with a command similar to the following:

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

where */cdrom* is the mount point of the CD-ROM.

Step 3. Log out.

After mounting the CD-ROM, proceed to "Step 4. Install the DB2 Products".

Mounting on Solaris Systems

To mount the CD-ROM on Solaris, perform the following steps:

Step 1. Log in as a user with `root` authority.

Step 2. If the Volume Manager is not running on your system, enter the following commands to mount the CD-ROM:

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

where */cdrom/unnamed_cdrom* represents the CD-ROM mount directory.

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

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

```
/cdrom/unnamed_cdrom
```

Step 3. Log out.

Step 4. Install the DB2 Products

After you mount the CD-ROM file system, use the DB2 Installer program to install DB2.

To install your DB2 product, perform the following steps:

Step 1. Log in as root.

Step 2. Insert the CD-ROM into the drive.

Step 3. Change to the directory where the CD-ROM is mounted by entering the following command:

- On AIX, HP-UX, or Linux:

  ```
  cd /cdrom
  ```

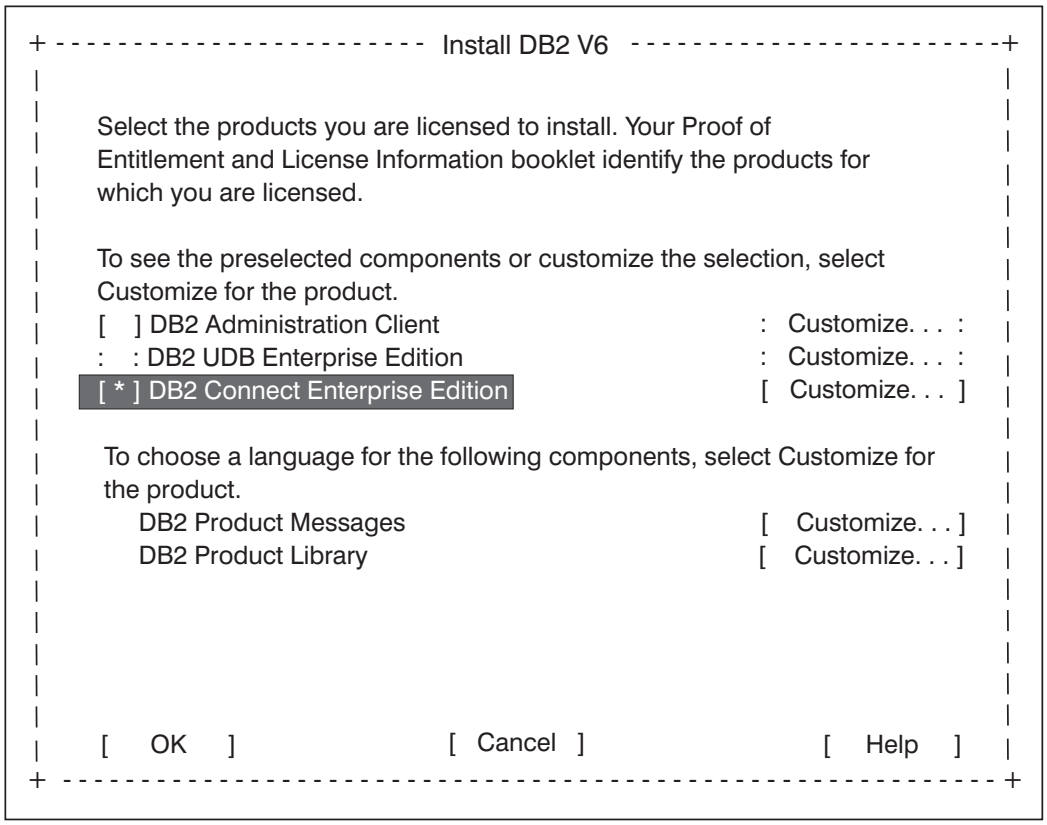
- On Solaris:

  ```
  cd /cdrom/unnamed_cdrom
  ```

  where `/cdrom` is the mount point of the CD-ROM drive on AIX, HP-UX, or Linux, and `/cdrom/unnamed_cdrom` is the mount point of the CD-ROM on Solaris.

Step 4. Enter the **./db2setup** command to start the DB2 Installerprogram. The **Install DB2 V6** window opens.

It will take some time for the DB2 Installerprogram to start up, as it is scanning your system for information.



Step 5. From the product list on the *Install DB2 V6* screen, select the products that you want to install.

Press the **Tab** key to change the highlighted option and the **Enter** key to select or deselect an option.

To display the components for a DB2 product that you want to install, select **Customize**. To go back to a previous windows at any times, select **Cancel**.

To refresh the current screen, press the **F5** key or **Ctrl+L**.

When you have finished selecting the DB2 product and its components, select **OK** to complete the installation.

For more information or assistance during the installation of any DB2 product or component, select **Help**.

When installation is complete, DB2 software is installed in the *DB2DIR* directory,

where *DB2DIR*	= /usr/lpp/db2_06_01	on AIX
	= /opt/IBMdb2/V6.1	on HP-UX, Solaris, or SGI IRIX
	= /usr/IBMdb2/V6.1	on Linux

You can use the DB2 Installer program to create an additional instance, create an Administration Server, or add additional products or components after your initial installation. To create or add a new instance, an Administration Server, or additional DB2 products and components, enter the following command:

On AIX

```
/usr/lpp/db2_06_01/install/db2setup
```

On HP-UX, Solaris, or SGI IRIX

```
/opt/IBMdb2/V6.1/install/db2setup
```

On Linux

```
/usr/IBMdb2/V6.1/install/db2setup
```

Software Registration

DB2 software registration is handled automatically if you installed your DB2 product from a CD-ROM using the DB2 Installer program. If you installed DB2 using your UNIX operating system's native installation tools, you must use the **db2licm** command to register DB2. Refer to the *Command Reference* for more information.

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 and 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.

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, LU name, and mode name.

Preparing MVS/ESA or OS/390 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 54.
- 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 61.
- DB2 host configuration steps (see “Configuring DB2 Universal Database for OS/390” on page 58, or “Configuring DB2 for MVS/ESA” on page 59).

Many details of these steps have 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 example VTAM names used throughout this book, see "Sample Network Element Names (VTAM)" on page 55. For TCP/IP names, see "Configuring TCP/IP for DB2 Universal Database for OS/390" on page 61.

If you anticipate that DB2 for OS/390 will participate in a multisite update transaction (two phase commit) then please refer to "Chapter 8. Enabling Multisite Updates (Two-Phase Commit)" on page 123. The additional steps required to set up multisite updates are not documented here.

Summary of Steps

In order 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.

Step 2. Configure VTAM - see "Configuring VTAM", or:

Step 3. Configure TCP/IP - see "Configuring TCP/IP for DB2 Universal Database for OS/390" on page 61, or:

Step 4. Configure DB2 Universal Database for OS/390 or DB2 for MVS/ESA - see "Configuring DB2 Universal Database for OS/390" on page 58, or "Configuring DB2 for MVS/ESA" on page 59.

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:

1. The VTAM APPL Definition for DB2 Universal Database for OS/390 or DB2 for MVS/ESA. (The APPL name (LU name) for the DB2 subsystem is `NYM2DB2` in these examples.)
2. 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.)
3. 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)

Figure 7 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
```

Figure 7. Network Element Names Used in the VTAM Examples

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

Sample VTAM APPL Definition for OS/390

Figure 8 on page 56 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 in order 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
```

Figure 8. Sample VTAM APPL Definition for DB2 Universal Database for OS/390 or DB2 for MVS/ESA

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, it is recommended that you 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, Figure 9 on page 57 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
```

Figure 9. Sample VTAM Switched Major Node Definition for DB2 Connect

Sample VTAM Log Mode Definition for DB2

Figure 10 on page 58 shows the sample VTAM logon mode table definition for the IBMRDB and SNASVCMG modes. Note that 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.

```
----+----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'060200000000000000122F00'    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'060200000000000000000300'    LU6.2 LU TYPE
```

Figure 10. Sample VTAM Log Mode Definition for DB2 Connect

You must define the *SNASVCMG* logon mode when using APPC.

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 in order 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 (SNA or TCP/IP):

- 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: O (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. It assumes that:

- 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 MVS Version 3.1: PTF UQ13906
- DB2 for MVS Version 4.1: PTF UQ13907
- 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` file at the DB2 Connect workstation:
  - On a UNIX system, the location of this file is usually `/etc/services`.
  - On OS/2 Warp Version 4 the location of this file is determined by the `ETC` environment variable.
  - On Windows NT, the location of this file is `<NT install directory>\system32\drivers\etc\services`.
- The location of the TCP/IP `hosts` file at the DB2 Connect workstation:
  - On a UNIX system, the location of this file is usually `/etc/hosts`.
  - On OS/2 Warp Version 4, the location of this file is usually `\mptn\etc\hosts`.
  - On Windows NT, the location of this file is usually `<NT install path>\system32\drivers\etc\hosts`.

  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 that 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 hostnames 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 10 on page 63, to plan *each* TCP/IP connection between DB2 Connect and a host database server.

Example Worksheet:

Table 10. 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	
TCP-12	LOCATION NAME	NEW_YORK3	
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	
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 the manual 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 TCP/IP address and hostname of the DB2 Universal Database for OS/390 host (items 8 and 9).
2. Fill in the values to be used for the TCP/IP address and hostname 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 that some additional planning considerations may apply, for example if you are using DCE. 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 hostname 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
   ```

Update the DB2 Connect Configuration: At a command line prompt, issue the following command to update the Database Manager Configuration:

```
db2 update dbm config using TM_DATABASE 1st_conn
```

where *TM_DATABASE* can have one of the following settings:

- *1ST_CONN*, the first database that a connection is established to will be used as the Transaction Manager database for transactions. If this option is used, then the first database connected to must be either a DB2 Universal Database Version 5 or later database, or a DB2 Universal Database for OS/390 Version 5.1 or later database. This is the recommended setting, and it is the default value for *TM_DATABASE*.
- *database_name*, the named database that is connected to will be used. If this option is used, we recommend that the named database should be either a DB2 Universal Database version 5 or later database, or a DB2 Universal Database for OS/390 Version 5.1 or later database.

Update the DB2 Connect Directories:

1. At a command line prompt, issue the following command to catalog the DB2 for MVS/ESA node:

   ```
   db2 catalog tcpip node MVSIPNOD remote MVSHOST server db2inst1c
   ```

   where:

   - *MVSIPNOD* is the local DB2 Connect node name to be used for the host.
   - *MVSHOST* is the eight-character TCP/IP host name for the DB2 Universal Database for OS/390 host. TCP/IP name lookup must resolve this name to the correct destination Internet address, either through an entry in the local `hosts` file on the DB2 Connect workstation, or via a Domain Name Server (DNS) referenced by the DB2 Connect workstation.
   - *db2inst1c* is the *port number* defined at the DB2 Connect workstation. This must resolve to the same port number as that defined for use by DB2 Connect at the DB2 for MVS/ESA host. Alternatively, you can specify the *service name* associated with that port.
2. Create entries for the Database and Data Connection Services directories, as follows (this shows the values used in the sample worksheet):

   ```
   db2 catalog dcs database NYC3 as NEW_YORK3
   db2 catalog database NYC3 as MVSIPDB1 at node MVSIPNOD authentication dcs
   ```

   where:

   - *MVSIPDB1* is user-defined and represents the DB2 Connect database alias for the host database.
   - *NYC3* is the DB2 Connect database name for the host database.
   - *MVSIPNOD* is the DB2 Connect node name for the host.
   - *NEW_YORK3* is the DB2 Universal Database for OS/390 *LOCATION NAME* for the target database.

CONNECT and BIND: Finally, connect to the target host server and bind the utilities and applications to the server using commands similar to the following in the command line processor:

```
connect to MVSIPDB1 user USERID using PASSWORD
bind path/bnd/@ddcsmvs.lst blocking all
     sqlerror continue blocking all grant public
disconnect all
```

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

These commands are described in detail in the *Command Reference*.

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. In order 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 OS/400, enter your values into the worksheet that follows:

Table 11. Configuration Parameters from OS/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.

More detailed information can also be found in the *DRDA Connectivity Guide*, and on 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`

Preparing DB2 for VSE & VM

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

More detailed information can also be found in the *DRDA Connectivity Guide*.

Part 4. Configuring Access to Host and AS/400 Databases

Chapter 6. Configuring TCP/IP Communications on the DB2 Connect Workstation

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

See "Software Requirements" on page 28 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 35 for the protocols supported for communication between your particular client and server.

To set up TCP/IP communications between your DB2 Connect workstation and a host database server, perform the following steps:

Step 1. Identify and record parameter values.

Step 2. Configure the DB2 Connect workstation:

a. Resolve the host's IP address.

b. Update the `services` file.

Step 3. Catalog the TCP/IP node.

Step 4. Catalog the database.

Step 5. Catalog the database as a Database Connection Service (DCS) database.

Step 6. Bind utilities and applications to the database server.

Step 7. Test the host connection.

Due to the characteristics of the TCP/IP protocol, TCP/IP may not be immediately notified of the failure of a partner on another host. As a result, a client application accessing a remote DB2 server using TCP/IP, or the corresponding agent at the server, may sometimes appear to be hung. DB2 uses the TCP/IP SO_KEEPALIVE socket option to detect when there has been a failure and the TCP/IP connection has been broken.

If you are experiencing problems with your TCP/IP connection, refer to the *Troubleshooting Guide* for information on how to adjust this parameter and other common TCP/IP problems.

Step 1. Identify and Record Parameter Values

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

Table 12. TCP/IP Values Required at the DB2 Connect Workstation

Parameter	Description	Sample Value	Your Value
Host Name • Hostname (*hostname*) or • IP address (*ip_address*)	Use the *hostname* or *ip_address* of the remote host. To resolve this parameter: • Contact your network administrator to obtain the *hostname*. • Contact your network administrator to obtain the *ip_address* or enter the **ping** *hostname* command.	nyx or 9.21.15.235	

Table 12. TCP/IP Values Required at the DB2 Connect Workstation (continued)

Parameter	Description	Sample Value	Your Value

Service Name
• Connection Service name (*svcename*) or
• Port number / Protocol (*port_number/tcp*)
	Values required in the `services` file.
	
	The Connection Service name is an arbitrary name that represents the Connection port number (*port_number*) on the client.
	
	The port number for the DB2 Connect workstation must be the same as the port number that the *svcename* parameter maps to in the `services` file at the host database server. (The *svcename* parameter is located in the database manager configuration file on the host.) This value must not be in use by any other applications, and must be unique within the `services` file.
	
	On UNIX platforms this value generally must be 1024 or higher.
	
	Contact your database administrator for the values used to configure the host system.
		`host1`
		
		or
		
		`3700/tcp`	

Table 12. TCP/IP Values Required at the DB2 Connect Workstation (continued)

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

Step 2. Configure the DB2 Connect Workstation

The following steps configure this protocol on the DB2 Connect Workstation. Replace the sample values with your worksheet values.

A. Resolve the Host's IP Address

If your network has a name server, or you are planning to directly specify the IP address (*ip_address*) of the server, skip this step and proceed to "B. Update the Services File" on page 75.

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

IP address (*ip_address*) of the host system in the local hosts file.

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

Table 13. Location of the Local Hosts and Services Files

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

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

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

where:

9.21.15.235
represents the *ip_address*

nyx represents the *hostname*

represents a comment describing the entry

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

B. Update the Services File

If you are planning to catalog a TCP/IP node using a port number (*port_number*), skip this step and go to "Step 3. Catalog the TCP/IP Node" on page 76.

Using a text editor, add the Connection Service name and port number to the DB2 Connect workstation's services file. This file is located in the same directory as the local hosts file that you may have edited in "A. Resolve the Host's IP Address" on page 74. For example:

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

where:

host1 represents the Connection Service name

3700 represents the Connection port number

tcp represents the communication protocol that you are using

represents a comment describing the entry

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

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

Step 3. Catalog the TCP/IP Node

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

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

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

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

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

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

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

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

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

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

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

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

If you need to change values that were set with the **catalog node** command, perform the following steps:

Step 1. Run the **uncatalog node** command in the command line processor as follows:

```
uncatalog node node_name
```

Step 2. Recatalog the node with the values that you want to use.

Step 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* is the local name of the host or AS/400 database.
- *target_dbname* is 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
```

Step 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 14. 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 node name (*node_name*) that you used to catalog the node in the previous step.	db2node	

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

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

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

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

```
catalog database database_name as database_alias at node node_name
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
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 in the command line processor as follows:

```
uncatalog database database_alias
```

Step b. Recatalog the database with the value that you want to use.

Step 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.

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

```
db2 connect to dbalias user userid using password
db2 "bind path@ddcsmvs.lst blocking all sqlerror continue
     messages mvs.msg grant public"
db2 connect reset
```

For example:

```
db2 connect to NYC3 user myuserid using mypassword
db2 "bind /sqllib/myapps@ddcsmvs.lst blocking all sqlerror continue
     messages mvs.msg grant public"
db2 connect reset
```

The *userid* and *password* specified must have the authority to bind applications against the target database.

Further information about these commands can be found in the *DB2 Connect User's Guide*.

Step 7. Test the Host or AS/400 Connection

When you have finished configuring the DB2 Connect workstation for communications, perform the following steps to test the connection:

You will need to connect to a remote database to test the connection.

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

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

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

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

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

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

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

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

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

Test the Host Connection

If the connection fails, check the following items:

At the *host*:

__ 1. The *db2comm* registry value includes the value `tcpip`.
__ 2. The `services` file was updated correctly.
__ 3. The service name (*svcename*) parameter was updated correctly in the database manager configuration file.
__ 4. The database was created and cataloged properly.
__ 5. The database manager was stopped and started again (enter the **db2stop** and **db2start** commands on the server).
__ 6. The port number specified is not being used by any other process.

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

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

At the *DB2 Connect workstation*:

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

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

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

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

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

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

Chapter 7. Configuring APPC Communications on the DB2 Connect Workstation

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

See "Software Requirements" on page 28 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 35 for the protocols supported for communication between your particular client and server.

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

Step 1. Identify and record parameter values.

Step 2. Update the APPC profiles on the DB2 Connect workstation.

Step 3. Catalog the database.

Step 4. Catalog the APPC node.

Step 5. Catalog the database as a Database Connection Service (DCS) database.

Step 6. Bind utilities and applications to the database server.

Step 7. Test the Host or AS/400 Connection.

Step 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 15 on page 84 for *each* host or AS/400 database to which you want to connect.

After you fill in the *Your Value* entries, 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.

Note: 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 15. Worksheet for Planning Host and AS/400 Server Connections

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

Table 15. 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
16	Symbolic Destination name		DB2CPIC	
17	(Remote) Transaction program (TP) name		**OS/390 or MVS:** X'07F6C4C2' or DB2DRDA **VM/VSE:** AXE for VSE, or the DB2 for VM db name for VM **AS/400:** X'07F6C4C2' or QCNTEDDM	
DB2 Directory Entries (at the DB2 Connect workstation)				
19	Node name		db2node	
19	Security		program	
20	Local database name (*local_dcsname*)		ny	

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

1. For *network ID*, determine the network name of both the host and the DB2 Connect workstations (1 , 3 , and 9). Usually these values will be the same. (For example, SPIFNET.)
2. For the *partner LU name* (2), determine the VTAM application (APPL) name for OS/390, MVS, VSE, or VM. Determine the local CP name for AS/400.
3. For *partner node name* (4), determine the System Services Control Point (SSCP) name for OS/390, MVS, VM, or VSE. Determine the local control point name for an AS/400.
4. For *database name* (5), determine the name of the host database. This is the *LOCATION NAME* for OS/390 or MVS, the *RDB_NAME* for VM or VSE, or a relational database 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**), it is recommended that you use the defaults listed in the worksheet.
13. Leave the other items blank for now (**18** to **21**).

Step 2. Update the APPC Profiles on the DB2 Connect Workstation

Use the completed worksheet in Table 15 on page 84 to configure DB2 Connect APPC communications for access to a remote host or AS/400 database server.

Go to the sections that describe how to configure APPC communications on the platforms that are present in your network:

- "Configuring IBM eNetwork Communication Server for AIX"
- "Configuring Bull SNA for AIX" on page 99
- "Configuring SNAPlus2 for HP-UX" on page 101
- "Configuring SunLink SNA for Solaris" on page 114

Configuring IBM eNetwork Communication Server for AIX

This section describes how to configure IBM eNetwork Communication Server V5.0.2.5 for AIX on your DB2 Connect workstation to connect to host or AS/400 database servers using APPC. IBM eNetwork Communication Server for AIX is the only SNA product supported for DB2 Connect running on RS/6000 machines.

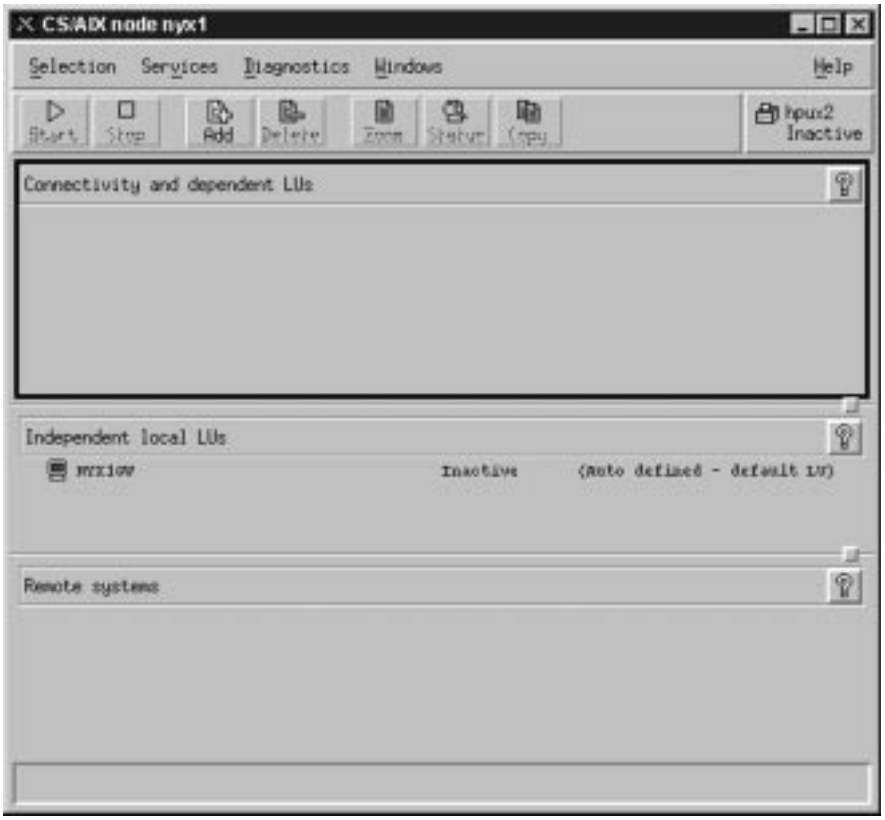
Before you begin, ensure that your workstation has IBM eNetwork Communication Server V5.0.2.5 for AIX (CS/AIX) installed. If you need further information in order to configure your SNA environment, refer to the online help provided with CS/AIX.

The following assumptions are made:

- The basic installation of the IBM eNetwork Communication Server V5 for AIX package has already been completed.
- DB2 Connect has been installed.
- The user is logged on as root.

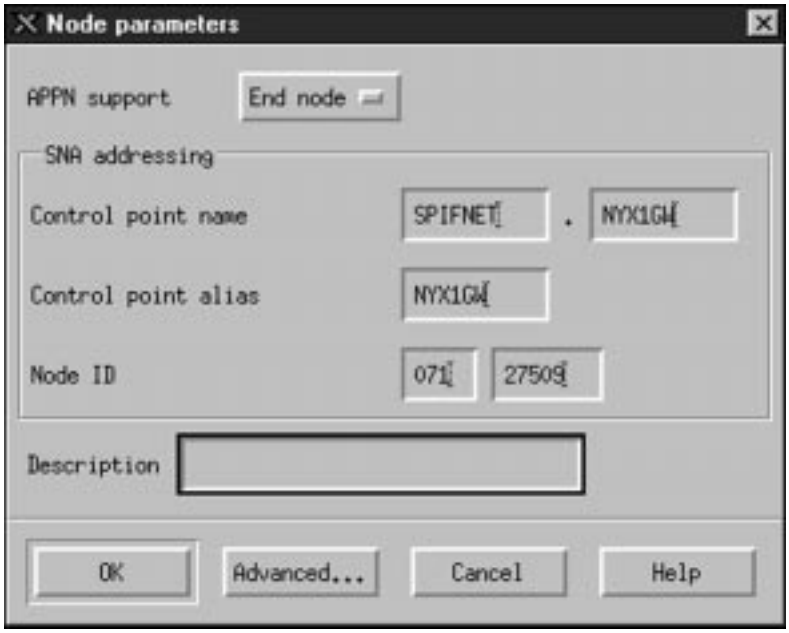
To configure CS/AIX for use by DB2 Connect, log on to the system as a user with `root` authority and use either the **/usr/bin/snaadmin** program or the **/usr/bin/X11/xsnaadmin** program. Information about these programs can be found in the system documentation. The following steps describe how to use the **xsnaadmin** program to configure CS/AIX.

Step 1. Enter the command **xsnaadmin**. The Node window for the server opens.



Step 2. Define a Node

a. Select **Services->Configure Node Parameters**. The Node Parameters window opens.



b. Select **End node** from the **APPN support** drop-down menu.

c. Enter your Network ID and the Local PU Name (**9** and **10**) in the **Control point name** fields.

d. Enter Local PU Name (**10**) in the **Control point alias** field.

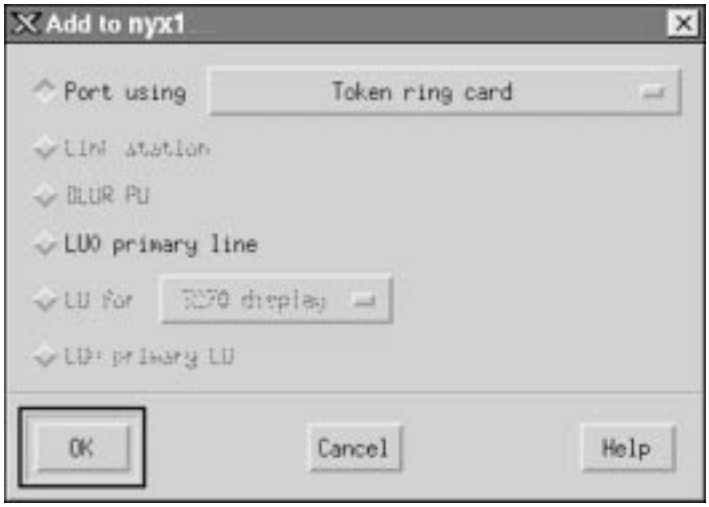
e. Enter your Node ID (**13** and **14**) in the **Node ID** fields.

f. Click on **OK**.

Step 3. Define a port

a. Select the **Connectivity and Dependent LUs** windows.

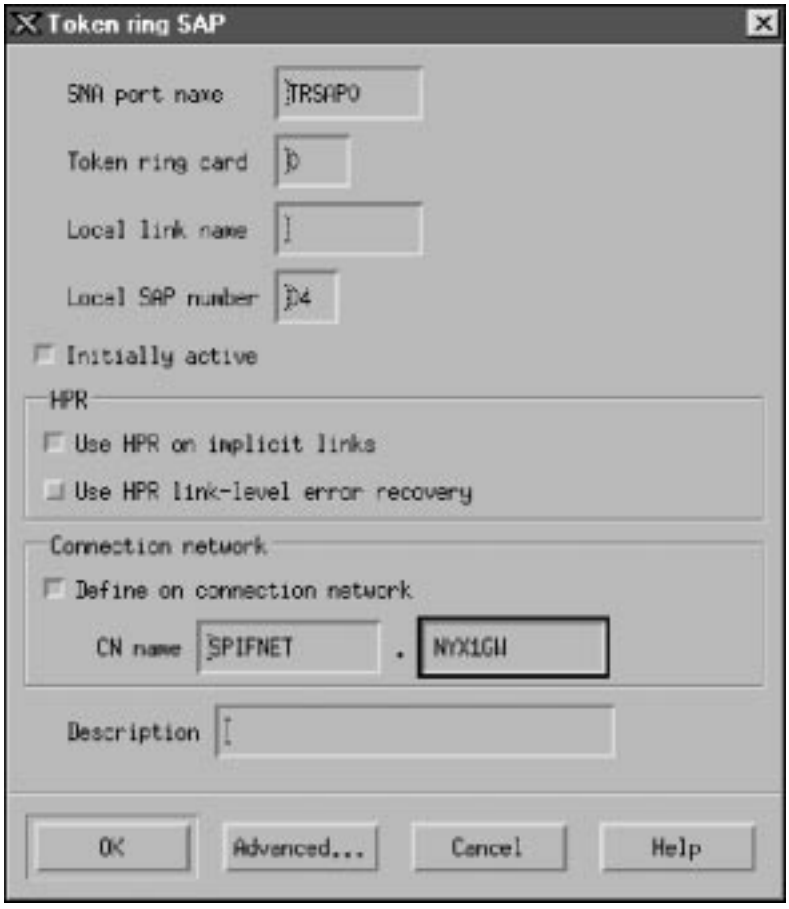
b. Click on the **Add** push button. The Add to Node window opens.



c. Select the **Port using** radio button.

d. Click on the **Port Using** drop down box and select the appropriate port type.

For our example, we will select the the **Token ring card** option.



e. Click on **OK**. The Port window for the chosen port type opens.

f. Enter a name for the port in the **SNA port name** field.

g. Select the **Initially active** check box.

h. From the **Connection network** box, select **Define on connection network** check box.

i. Enter your SNA Network Name (**9**) in the first part of the **CN name** field.

j. Enter the Local PU Name (**10**) associated with your AIX computer in the second part of the **CN name** field.

k. Click on **OK**. The **Port** window closes and a new port opens in the **Connectivity and Dependent LUs** window.

Step 4. Define a link station

a. In the **Connectivity and Dependent LUs** window, select the port that you defined in the previous step.

b. Click the **Add** push button. The Add to Node window opens.

c. Select the **Add a link station to port** radio button.

d. Click on **OK**. The Token ring link station window opens.

e. Enter a name for the link in the **Name** field.

f. Click on the **Activation** drop down box and select the **On demand** option.

g. Select the **Independent only** option in the **LU traffic** box.

h. In the **Independent LU traffic** box:

   1) Enter the Network ID (**3**) and the Partner LU Name (**2**) in the **Remote Node** fields.

   2) Click on the **Remote node type** drop down box and select the type of node that applies to your network.

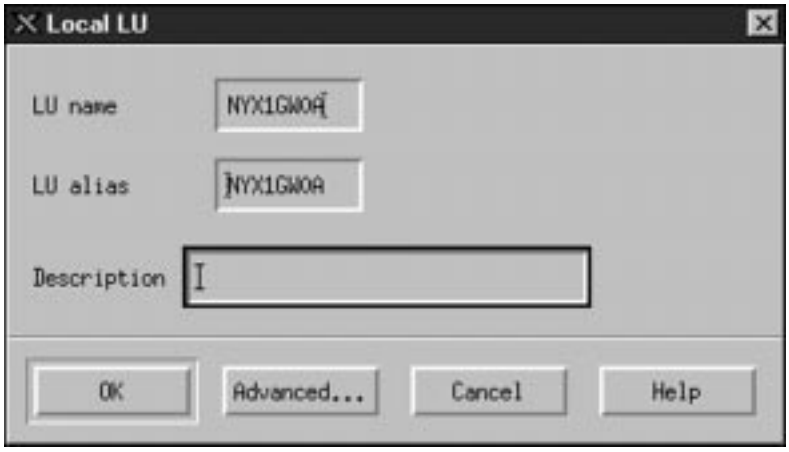
i. In the **Contact information** box, enter the SNA Destination Address (**8**) assigned for the host or AS/400 system in the **Mac address** field.

j. Click on **OK**. The Link Station window closes and a new link station appears in the **Connectivity and Dependent LUs** window.

Step 5. Define a local LU

a. Select the **Independent local LUs** window.

b. Click on the **Add** push button. The Local LU window opens.



c. Enter your independent local LU Name (**11**) in the **LU name** field.

d. Enter the same name in the **LU alias** field (**12**).

e. Click on **OK**. The new LU appears in the **Independent local LUs** window.

Step 6. Define a partner LU over the link station

a. Select **Services->APPC->New PLUs->Over link station** from the menu bar. The Partner LU on link station window opens.

b. Enter the name for the Local LU (**11**) you defined previously in the **LU name** field.

c. Enter the name for the Link station you defined previously in the **LS name** field.

d. Enter the name of the Partner LU you want to connect to (**2**) in the **Partner LU name** fields.

e. Click on **OK**. The Partner LU appears in the **Independent Local LUs** window of the Local LU that was created in the previous step.

Step 7. Define an alias for the partner LU

a. Select the **Remote Sytems** window.

b. Click on the **Add** push button. The Add to node window opens.

c. Select the **Define partner LU alias** radio button.

d. Click on **OK**. The Partner LU window opens.

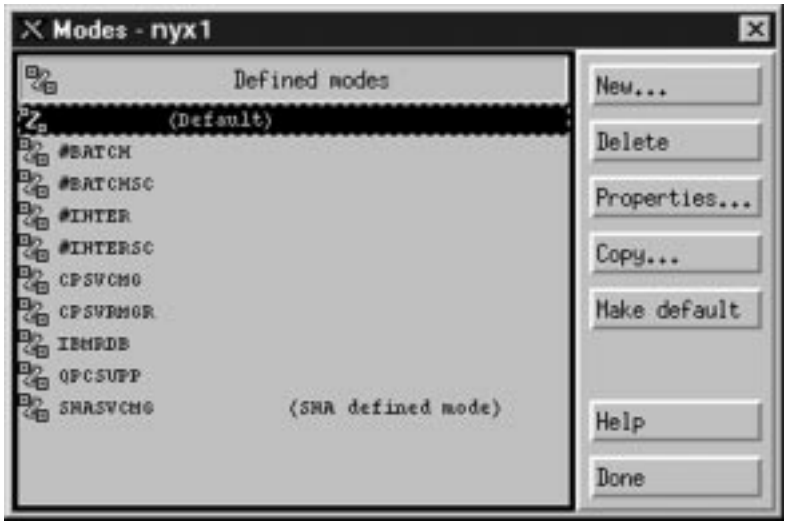
e. Enter an alias for the partner LU in the **Alias** field.

f. Enter the same value in the **Uninterpreted name** field.

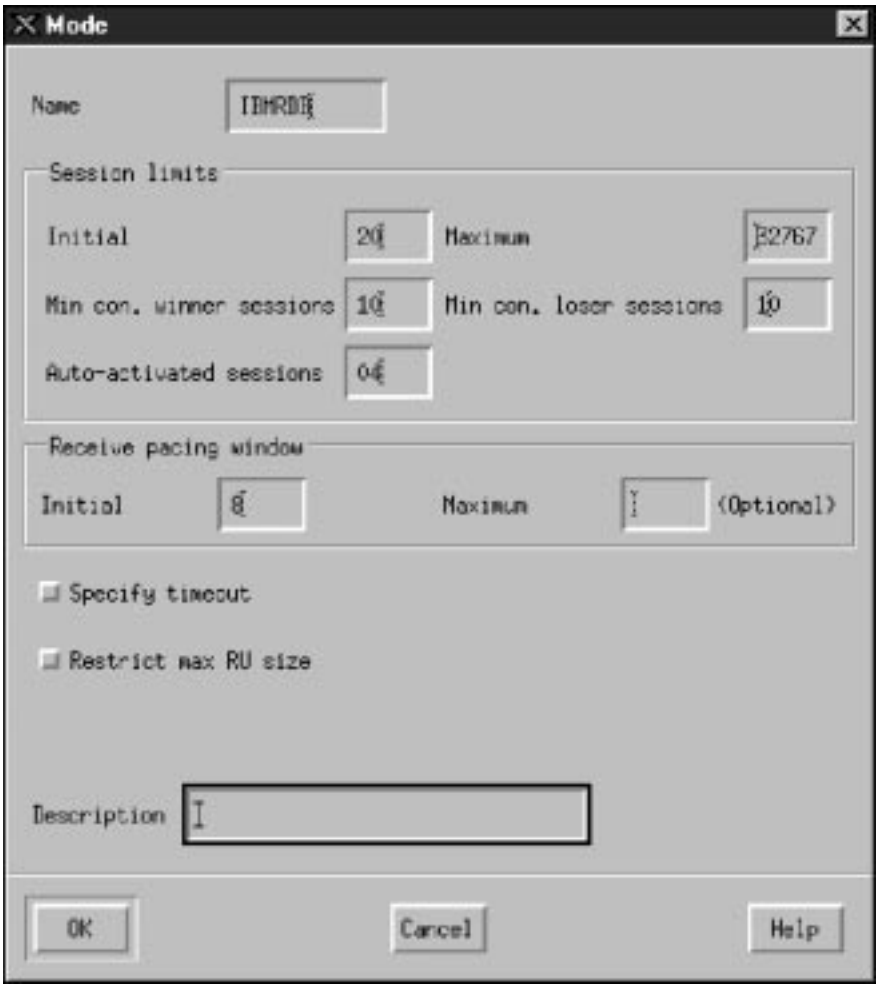
g. Click on **OK**.

Step 8. Define a mode

a. Select **Services->APPC->Modes** from the menu bar. The Modes window opens.



b. Click on the **New** push button. The Mode window opens.



c. Enter a mode name (**15**) in the **Name** field.

d. The configuration values below are suggested for the following fields:

- **Initial Session limits**: 20
- **Maximum Session limits**: 32767
- **Min con. winner sessions**: 10
- **Min con. loser sessions**: 10
- **Auto-activated session**: 4
- **Initial Receive pacing window**: 8

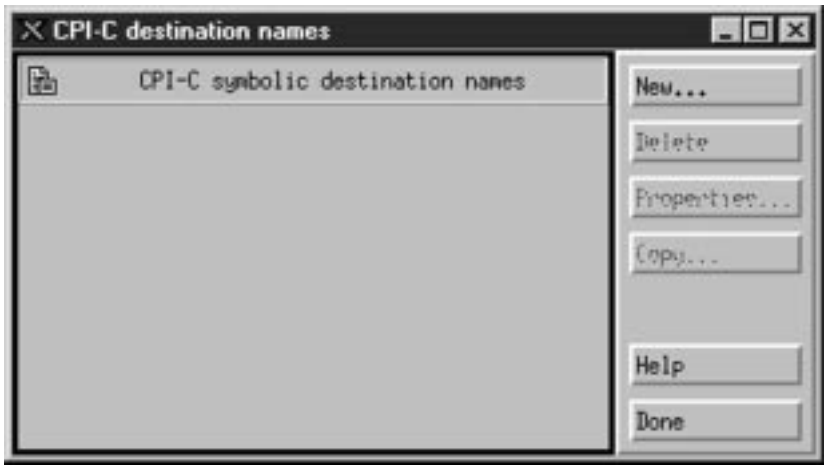
These values are suggested because they are known to work. You will need to tailor these values so that they are optimized for your particular application environment.

e. Click on **OK**. The new mode appears in the Modes window.

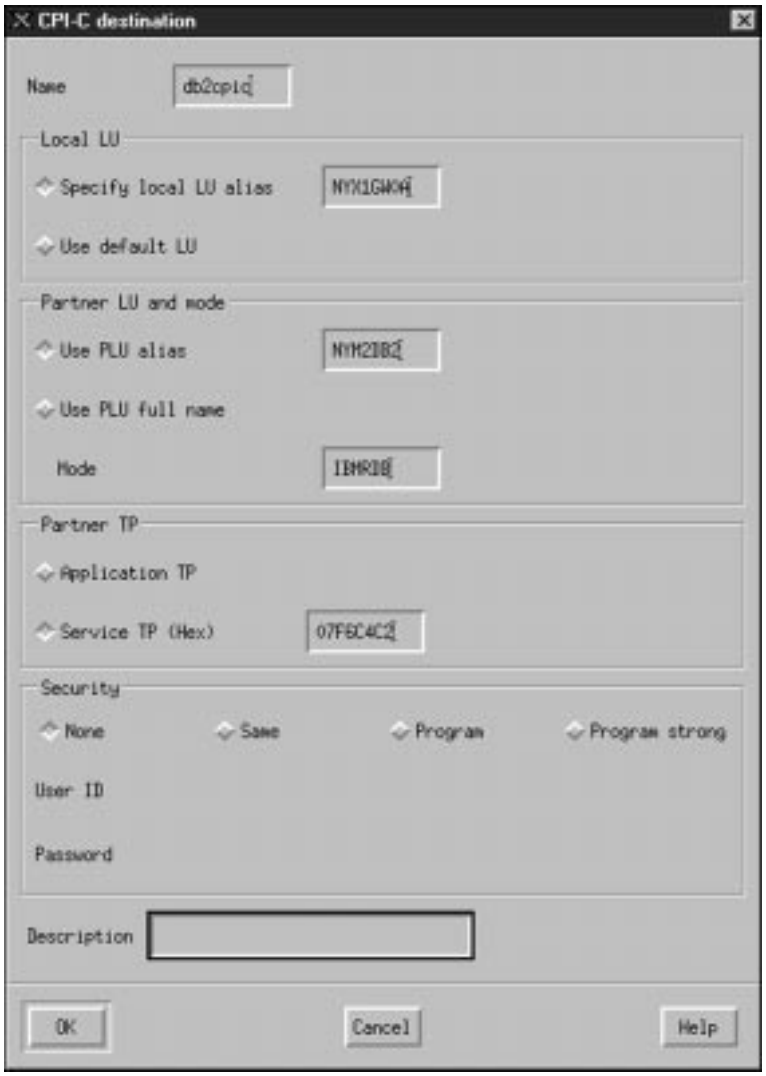
f. Click on **Done**.

Step 9. Define the CPI-C destination name

a. Select **Services->APPC->CPI-C** from the menu bar. The CPI-C destination names window opens.



b. Click on the **New** push button. The CPI-C destination window opens.



c. Enter the Symbolic Destination Name (**16**) you want to associate with the host or AS/400 server database in the **Name** field. This example uses `DB2CPIC`.

d. In the **Partner TP** box:

- For DB2 for MVS/ESA, DB2 for OS/390, and DB2 for AS/400, select the **Service TP (hex)** radio button, and enter the hexadecimal TP number (**17**). (For DB2 Universal Database for OS/390 or DB2/MVS, you can also use the default

application TP DB2DRDA. For DB2 for AS/400 you can also use the default application TP QCNTEDDM.)

- For DB2 for VM or VSE, select the **Application TP** radio button. For DB2 for VSE, enter the DB2 for VM database name. For DB2 for VSE, enter the AXE as the application TP. (**17**)

e. In the **Partner LU and mode** box:

1) Select the **Use PLU Alias** radio button, and enter the Partner LU Alias (**2**) you created in a previous step.

2) Enter the Mode name (**15**) for the mode that you created in a previous step in the **Mode** field.

f. In the **Security** box, select the radio button that corresponds to the type of security level that you want to run on your network.

g. Click on **OK**. The new destination name appears in the Destination names window.

h. Click on **Done**.

Step 10. Test the APPC connection

a. Start the SNA subsystem by entering the **/usr/bin/sna start** command. You can enter the **/usr/bin/sna stop** command to stop the SNA subsystem first, if required.

b. Start the SNA administration program. You can enter either the **/usr/bin/snaadmin** command or the **/usr/bin/X11/xsnaadmin** command.

c. Start the subsystem node. Select the appropriate node icon in the button bar, and click on the **Start** push button.

d. Start the link station. Select the link station you defined previously in the **Connectivity and Dependent LUs** window, and click on the **Start** push button.

e. Start the session. Select the LU you defined previously in the **Independent Local LUs** window, and click on the **Start** push button. A session activation window opens.

f. Select or enter the Partner LU and Mode desired.

g. Click on **OK**.

You may also need to contact your database or network administrators to have your Local LU names added to the appropriate tables in order to access the host or AS/400 server database.

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

Go to “Step 3. Catalog the APPC Node” on page 117.

Configuring Bull SNA for AIX

This section describes how to configure Bull DPX/20 SNA/20 Server on your DB2 Connect workstation to connect to host or AS/400 database servers using APPC. If Bull DPX/20 SNA/20 Server is installed prior to installing DB2 Connect, DB2 Connect uses Bull SNA. Otherwise, you need to configure DB2 Connect to work with IBM eNetwork Communications Server V5.0.2.5 for AIX. See "Configuring IBM eNetwork Communication Server for AIX" on page 86 for more information.

To determine if Bull SNA is installed on your AIX 4.1.4 (or later) system, enter the following command:

```
lslpp -l express.exsrv+dsk
```

If Bull SNA is installed, you will see output similar to the following:

```
  Fileset                      Level  State      Description
  ----------------------------------------------------------------------------
Path: /usr/lib/objrepos
  express.exsrv+dsk          2.1.3.0  COMMITTED  EXPRESS SNA Server and
                                                 Integrated Desktop
```

If you install Bull SNA after installing DB2 Connect and you want DB2 Connect to use Bull SNA instead of IBM eNetwork Communications Server for AIX, log on to the system as a user with root authority and enter the following command:

```
/usr/lpp/db2_06_01/cfg/db2cfgos
```

If you want to install the Bull DPX/20 SNA/20 Server, then you must have the following software:

__ 1. AIX V4.1.4

__ 2. Express SNA Server V2.1.3

For more information on setting up your SNA environment, refer to the Bull DPX/20 SNA/20 Server Configuration Guide.

DB2 Connect, when used with the Bull SNA server, cannot have inbound APPC connections from remote clients. The only APPC connections it can have are outbound APPC connections to the host.

To configure Bull SNA for use by DB2 Connect, enter the **express** command to configure the following SNA parameters:

```
Config         Express           Default configuration for EXPRESS
 Node          NYX1              SPIFNET.NYX1 (HOSTNAME=NYX1)
  Indep. LUs   6.2 LUs Using All Stations
    LU         NYX1              Control Point LU
  Link         tok0.00001        Link (tok0)
```

```
      Station     MVS              To MVS from NYX1
       LU         NYX1GW01         To MVS from NYX1
        LU Pair   NYM2DB2          To MVS from NYX1
         Mode     IBMRDB           IBMRDB
```

Use default values for fields not listed.

The following example illustrates the sample configuration:

```
Defining hardware:

System (hostname) = NYX1
Adapter and Port  = NYX1.tok0
  MAC Address     = 400011529778

Defining SNA node:

Name          = NYX1
Description   = SPIFNET.NYX1 (HOSTNAME=NYX1)
Network ID    = SPIFNET
Control Point = NYX1
XID Block     = 05D
XID ID        = 29778

Defining token ring link:

Name            = tok0.00001
Description     = Link (tok0)
Connection Network name
  Network ID    = SPIFNET
  Control Point = NYX

Defining token ring station:

Name               = MVS
Description        = To MVS from NYX1
Remote MAC address = 400009451902
Remote Node name
  Network ID       = SPIFNET
  Control Point    = NYX

Defining Local LU 6.2:

Name        = NYX1GW01
Description = To MVS from NYX1
Network ID  = SPIFNET
LU name     = NYX1GW01

Defining Remote LU 6.2:

Name                 = NYM2DB2
Description          = To MVS from NYX1
Network ID           = SPIFNET
LU name              = NYM2DB2
Remote Network ID    = SPIFNET
```

```
Remote Control Point = NYX
Uninterpreted Name   = NYM2DB2

Defining Mode:

Name             = IBMRDB
Description      = IBMRDB
Class of service = #CONNECT

Defining Symbolic Destination Info:

Name        = DB2CPIC
Description = To MVS from NYX1
Partner LU  = SPIFNET.NYM2DB2
Mode        = IBMRDB
Local LU    = NYX1GW01
Partner TP  = DB2DRDA
```

After you have configured these SNA parameters, you must stop and start the SNA server. To do this, perform the following steps:

Step 1. Log on to the system as a user with root authority.

Step 2. Make sure your PATH contains the $express/bin (/usr/lpp/express/bin) entry.

Step 3. Check for active users before stopping the server by entering the following command:

```
express_adm shutdown
```

Step 4. Stop all EXPRESS activity by entering the following command:

```
express_adm stop
```

Step 5. Start EXPRESS by entering the following command:

```
express_adm start
```

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

Go to "Step 3. Catalog the APPC Node" on page 117.

Configuring SNAPlus2 for HP-UX

This section describes how to configure SNAplus2 for HP-UX on your DB2 Connect workstation to connect to host or AS/400 database servers using APPC. SNAplus2 for HP-UX is the only SNA product supported for DB2 Connect running on HP-UX V10 and V11 machines.

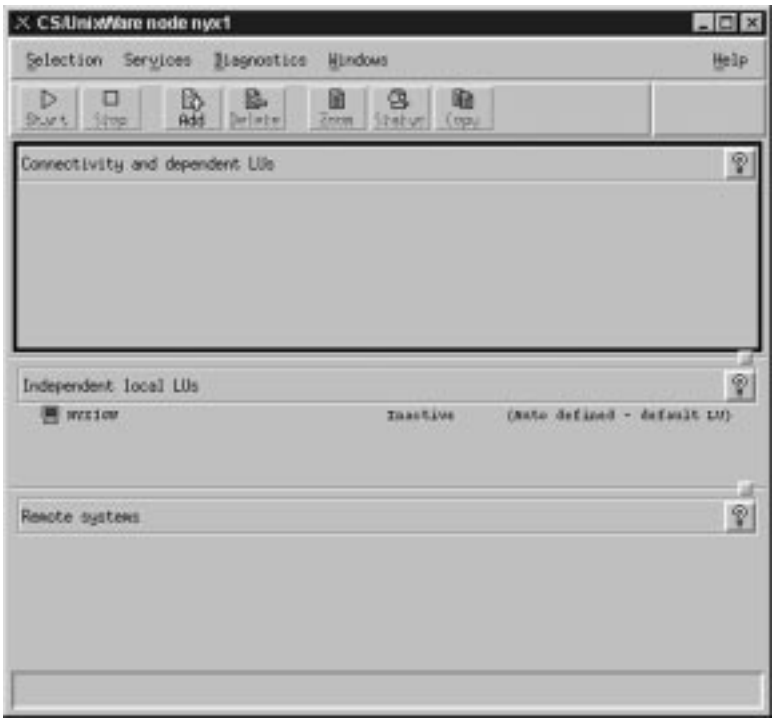
Before you begin, ensure that your workstation has HP-UX SNAplus2 installed. If you need more information in order to configure your SNA environment, refer to the online help provided with SNAplus2.

The following assumptions are made:

- The basic installation of the SNAplus2 for HP-UX package has already been completed.
- DB2 Connect has been installed.
- The user is logged on as root.

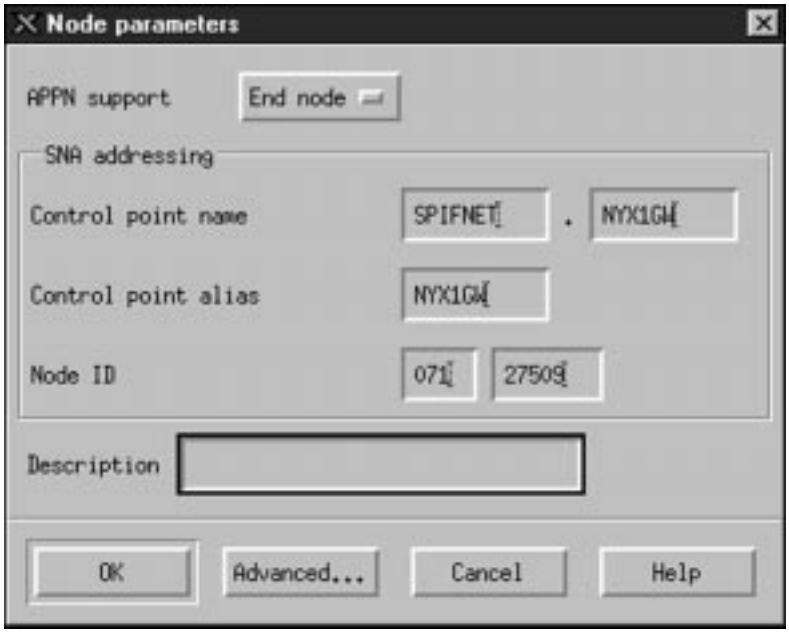
To configure SNAplus2 for DB2 Connect, log on to the system as a user with `root` authority and use either the **/opt/sna/bin/snapadmin** program or the **/opt/sna/bin/X11/xsnapadmin** program. Information about these programs can be found in the system documentation. The following steps describe how to use the **xsnapadmin** program to configure SNAplus2.

Step 1. Enter the command **xsnapadmin**. The Node window for the server opens.



Step 2. Define a Node

a. Select **Services->Configure Node Parameters**. The Node Parameters window opens.



b. Select **End node** from the **APPN support** drop-down menu.

c. Enter your Network ID and the Local PU Name (**9** and **10**) in the **Control point name** fields.

d. Enter Local PU Name (**10**) in the **Control point alias** field.

e. Enter your Node ID (**13** and **14**) in the **Node ID** fields.

f. Click on **OK**.

Step 3. Define a port

a. Select the **Connectivity and Dependent LUs** window.

b. Click on the **Add** push button. The Add to Node window opens.

c. Select the **Port using** radio button.

d. Click on the **Port Using** drop down box and select the appropriate port.

For our example, we will select the **Token ring card** option.

e. Click on **OK**. The Port window for the chosen port type opens.

f. Enter a name for the port in the **SNA port name** field.

g. Select the **Initially active** check box.

h. Select the **Define on a connection network** check box.

i. Enter your Network ID (**9**) in the first part of the **CN name** field.

j. Enter your local Control Point name (**10**) in the second part of the **CN name** field.

k. Click on **OK**. The **Port** window closes and a new port appears in the **Connectivity and Dependent LUs** window.

Step 4. Define a link station

a. In the **Connectivity and Dependent LUs** window, select the port that you defined in the previous step.

b. Click the **Add** push button. The Add to Node window opens.

c. Select the **Add a link station to port** radio button.

d. Click on **OK**. The Token ring link station window opens.

e. Enter a name for the link in the **Name** field.

f. Click on the **Activation** drop down box and select the **On demand** option.

g. Select the **Independent only** option in the **LU traffic** box.

h. In the **Independent LU traffic** box:

   1) Enter the Network ID (**3**) and the Partner LU Name (**2**) in the **Remote Node** fields.

   2) Click on the **Remote node type** drop down box and select the type of node that applies to your network.

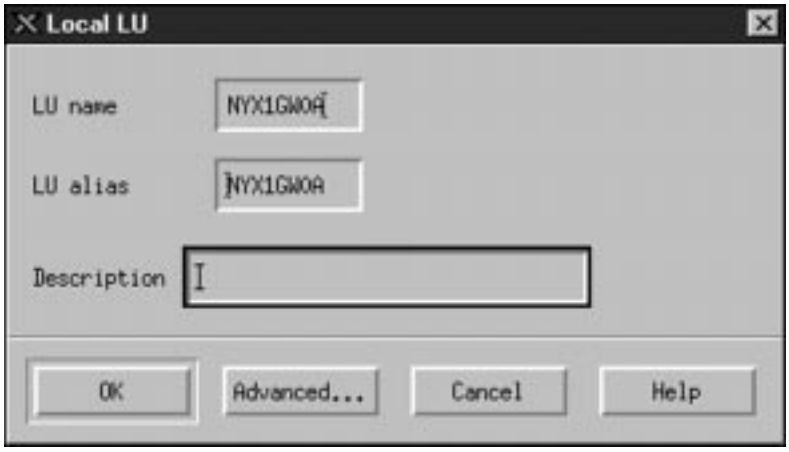
i. In the **Contact information** box, enter the SNA Destination Address (**8**) assigned for the host or AS/400 system in the **Mac address** field.

j. Click on **OK**. The Link Station window closes and a new link station appears in the **Connectivity and Dependent LUs** window.

Step 5. Define a local LU

a. Select the **Independent local LUs** window.

b. Click on the **Add** push button. The Local LU window opens.



c. Enter your independent local LU Name (**11**) in the **LU name** field.

d. Enter the same name in the **LU alias** field (**12**).

e. Click on **OK**. The new LU appears in the **Independent local LUs** window.

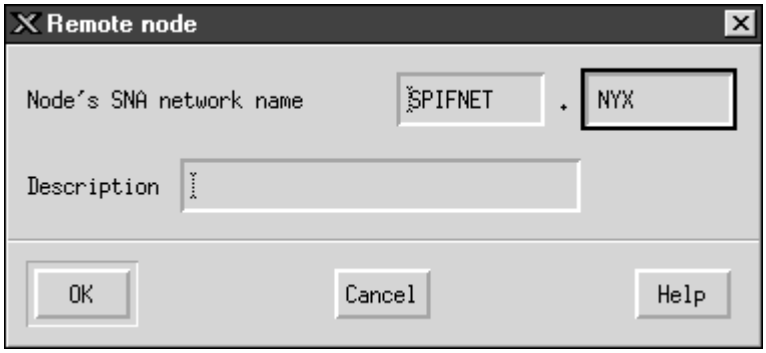
Step 6. Define a remote node

a. Select the **Remote Systems** window.

b. Click on the **Add** push button. The Add to Node window opens.

c. Select **Define remote node**.

d. Click on **OK**. The Remote Node configuration window appears.



e. Enter the Network ID (**3**) and the Partner LU Name (**2**) in the **Node's SNA network name** field.

f. Click on **OK**. The remote node appears in the **Remote Systems** window, and a default partner LU is defined for the node.

Step 7. Define a partner LU

a. In the **Remote Systems** window, double-click the default partner LU that was created when you defined a remote node in the previous step. The Partner LU window opens.

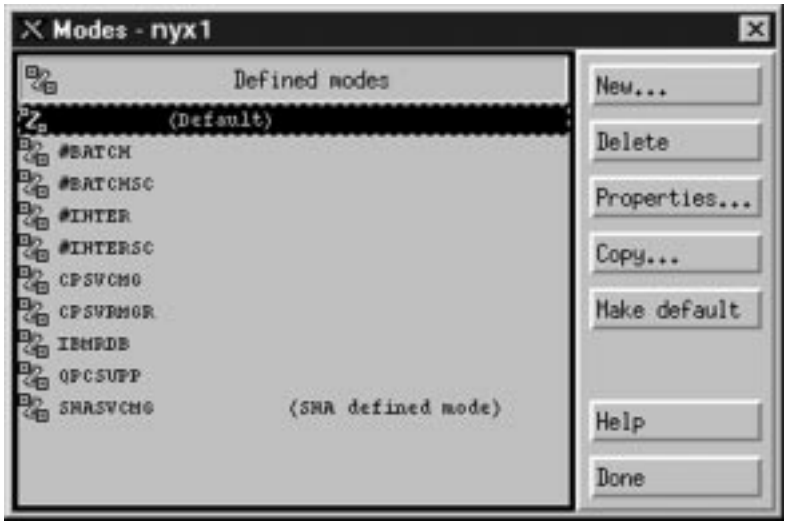
b. Enter the same Partner LU name (**2**) in the **Alias** and **Uninterpreted name** fields.

c. Select **Supports parallel sessions**.

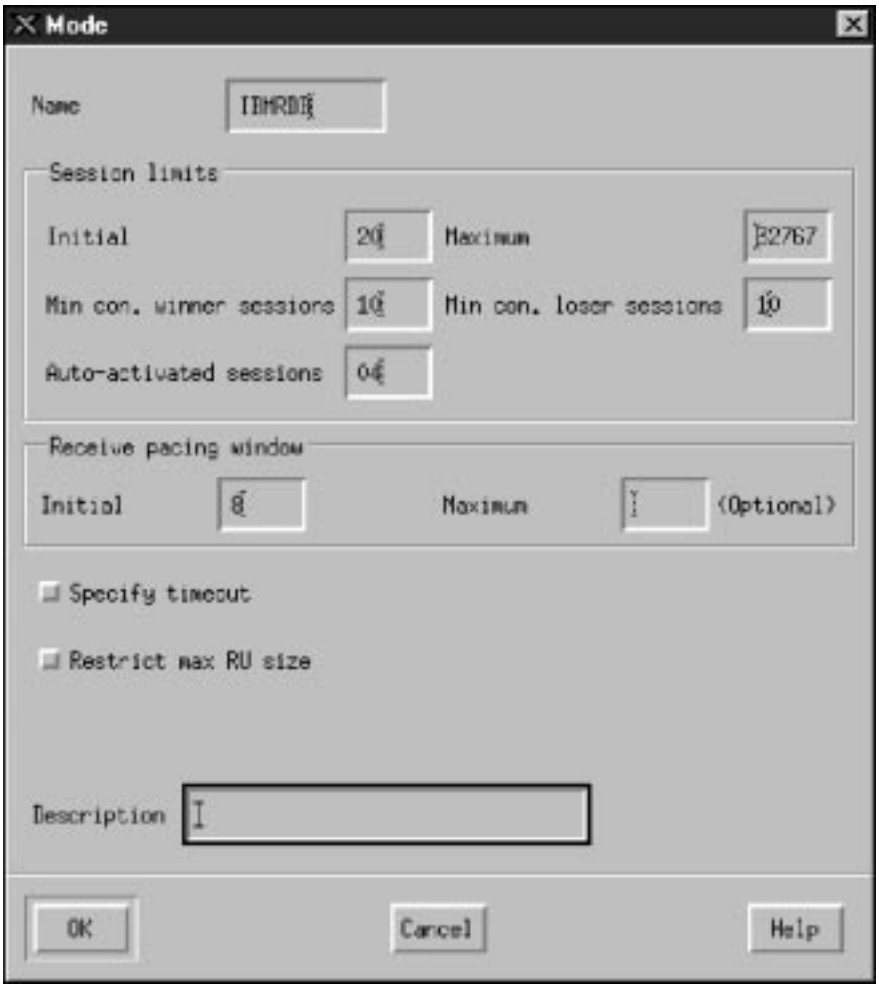
d. Click on **OK**.

Step 8. Define a mode

a. Select **Services->APPC->Modes** from the menu bar. The Modes window opens.



b. Click on the **New** push button. The Mode window opens.



c. Enter a mode name (**15**) in the **Name** field.

d. The configuration values below are suggested for the following fields:

- **Initial Session limits**: 20
- **Maximum Session limits**: 32767
- **Min con. winner sessions**: 10
- **Min con. loser sessions**: 10
- **Auto-activated session**: 4
- **Initial Receive pacing window**: 8

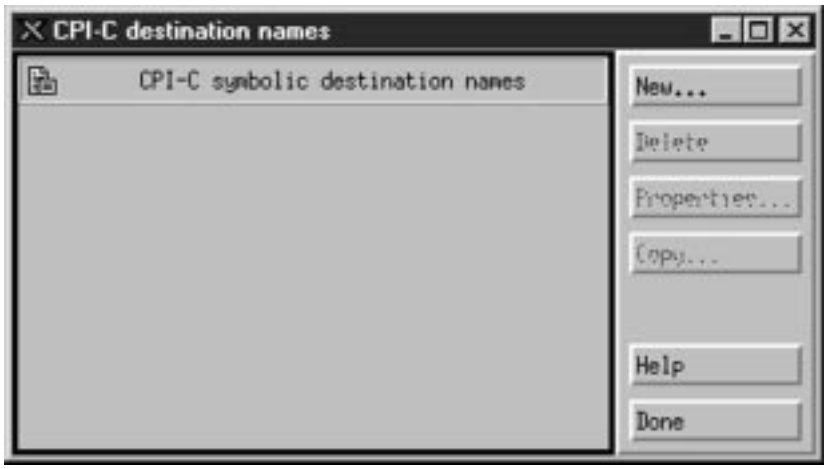
These values are suggested because they are known to work. You will need to tailor these values so that they are optimized for your particular application environment.

e. Click on **OK**. The new mode appears in the Modes window.

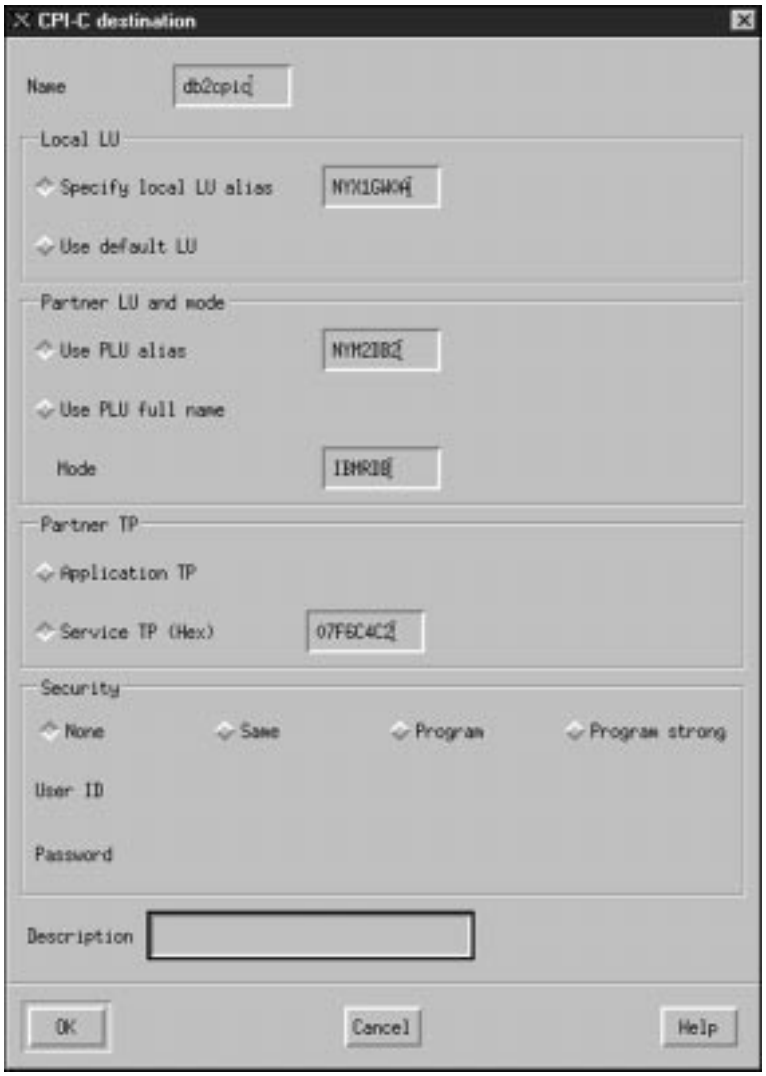
f. Click on **Done**.

Step 9. Define the CPI-C destination name

a. Select **Services->APPC->CPI-C** from the menu bar. The CPI-C destination names window opens.



b. Click on the **New** push button. The CPI-C destination window opens.



c. Enter the Symbolic Destination Name (**16**) you want to associate with the host or AS/400 server database in the **Name** field. This example uses `DB2CPIC`.

d. In the **Partner TP** box:

- For DB2 for MVS/ESA, DB2 for OS/390, and DB2 for AS/400, select the **Service TP (hex)** radio button, and enter the hexadecimal TP number (**17**). (For DB2 Universal Database for OS/390 or DB2/MVS, you can also use the default

application TP DB2DRDA. For DB2 for AS/400 you can also use the default application TP QCNTEDDM.)

- For DB2 for VM or VSE, select the **Application TP** radio button. For DB2 for VSE, enter the DB2 for VM database name. For DB2 for VSE, enter the AXE as the application TP. (**17**)

e. In the **Partner LU and mode** box:

1) Select the **Use PLU Alias** radio button, and enter the Partner LU Alias (**2**) you created in a previous step.

2) Enter the Mode name (**15**) for the mode that you created in a previous step in the **Mode** field.

f. In the **Security** box, select the radio button that corresponds to the type of security level that you want to run on your network.

g. Click on **OK**. The new destination name appears in the Destination names window.

h. Click on **Done**.

Step 10. Test the APPC connection

a. Start the SNA subsystem by entering the **/opt/sna/bin/sna start** command. You can enter the **/opt/sna/bin/sna stop** command to stop the SNA subsystem first, if required.

b. Start the SNA administration program. You can use either the **/opt/sna/bin/snaadmin** command, the **/opt/sna/bin/X11/xsnaadmin** command.

c. Start the subsystem node. Select the appropriate the node icon in the button bar, and click the **Start** push button.

d. Start the link station. Select the link station you defined previously in the **Connectivity and Dependent LUs** window, and click on the **Start** push button.

e. Start the session. Select the LU you defined previously in the **Independent Local LUs** pane, then click on the **Start** button. A session activation window opens. Select or enter the Partner LU and Mode desired.

f. Click on **OK**.

You may also need to contact your database or network administrators to have your Local LU names added to the appropriate tables in order to access the host or AS/400 server database.

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

Go to “Step 3. Catalog the APPC Node” on page 117.

Configuring SunLink SNA for Solaris

This section describes how to configure SunLink SNA PU 2.1 (SunLink SNA) for Solaris on your DB2 Connect workstation to connect to host or AS/400 database servers using APPC. SunLink SNA for Solaris is the only SNA product supported for DB2 Connect running on Solaris.

Before you begin, ensure that your workstation has SunLink SNA installed. If you need further information in order to configure your SNA environment, refer to the *SunLink PU 2.1 Server Configuration and Administrator's Manual*.

The following assumptions are made:

- The basic installation of the SunLink SNA PU 2.1 for Solaris package has already been completed.
- DB2 Connect has been installed.
- The user is logged on as root.

To configure the SunLink SNA Server for use by DB2 Connect, log on to the system as a user with `root` authority and perform the following steps:

Step 1. "Create the CPIC Side File"

Step 2. "Create the SNA Server Configuration File" on page 115

Step 3. "Define the Environment Variables Required by SunLink SNA" on page 116

Step 4. "Start the SunLink SNA Subsystem" on page 116

Note: You may also need to contact your database or network administrators to have your Local LU names added to the appropriate tables in order to access the host or AS/400 server database.

Create the CPIC Side File

You can use any plain text editor to create the CPIC side file. The file must be placed in the application's path for a standalone DB2 Connect for Solaris system. However, for remote DB2 clients to be able to access it on the DB2 Connect for Solaris system, the file should be in one of the following directories:

- `INSTHOME/sqllib/adm` or
- `INSTHOME/sqllib/bin`

Note: The name of the CPIC side file must be the same as the symbolic destination name specified in the DB2 node directory on the DB2 Connect for Solaris system.

The example below shows the CPIC side file sections required for configuring the SunLink SNA to connect to host or AS/400 database servers.

```
# CPIC Side File information
#
PTNR_LU_NAME=NYM2DB2
MODE_NAME=IBMRDB
TP_NAME=X'07F6C4C2'
SECURITY=PROGRAM
```

Create the SNA Server Configuration File

You can use any plain text editor to create the SNA server configuration file. This file is called `sunpu2.config`, and it must be placed in `/opt/SUNWpu21`, or the directory where SunLink SNA PU 2.1 Server is installed.

The following example shows the configuration file sections required for configuring the SunLink SNA to connect to host or AS/400 database servers. Other sections that are not shown are required for accepting inbound APPC connections.

```
// SunLink SunLU6.2/SunPU2.1 SNA Server Sample Configuration
// Token Ring Peer-to-Peer System A @(#)sunlu62.a.tr
//
// The physical connection is a Token Ring interface adapter.

CP      NAME=NYX1                       // Local name (8 char max)
        NQ_CP_NAME=SPIFNET.NYX1         // Network Qualified Name
        window opens

TRLINE  NAME=MAC1                       // SunLink specific name
        SOURCE_ADDRESS=x'400011527509'  // sysA_mac_addr for Sun machine
        window opens

DLC     NAME=HOSTLINK                   // User defined name (8 char max)
        LINK_NAME=MAC1                  // Line name this station is on
        LCLLSAP=x'04'                   // Local Link Service Access Point
        RMTLSAP=x'04'                   // Remove Link Service Access Point
        RMTMACADDR=x'400009451902       // sysB_mac_addr
        TERMID=x'07127509'              // XID negotiation
        window opens

LU      NAME=NYX1GW0A                   // Local name (8 char max)
        NQ_LU_NAME=SPIFNET.NYX1GW0A     // Network Qualified Name
        SESS_LMT=50                     // Max LU sessions
        LUTYPE=6.2
        window opens

PTNR_LU NAME=NYM2DB2                    // Partner LU name(8 char max)
        LOC_LU_NAME=NYX1GW0A            // Associated Local LU
        NQ_LU_NAME=SPIFNET.NYM2DB2      // Network Qualified Name
        window opens

MODE    NAME=IBMRDB                     // Mode Name (8 char max)
```

```
DLC_NAME=HOSTLINK               // Associated DLC
PTNR_LU_NAME=NYM2DB2            // Associated Partner LU
LCL_MAX_SESS_LMT=30             // Max Session Limit
MIN_CW_SESS=15                  // Min Conwinners
MIN_CL_SESS=15                  // Min Conlosers
window opens
```

Define the Environment Variables Required by SunLink SNA

In order to run any application, you must set the following environment variables:

APPC_GATEWAY
Name of the DB2 for Solaris server (usually the TCP/IP hostname).

APPC_LOCAL_LU
Name of the local LU name provided in the SNA configuration file.

For a DB2 Connect for Solaris server, export these on the DB2 Connect machine before proceeding with the next step.

Start the SunLink SNA Subsystem

To start the SunLink SNA subsystem, perform the following steps:

Step 1. Change to the SunLink installation directory, usually:

```
cd /opt/SUNWpu21
```

Step 2. Set up environment variables for *FlexLM* licensing. For example:

```
export LD_LIBRARY_PATH=/usr/openwin/lib:/usr/lib
export LM_LICENSE_FILE=/etc/opt/licenses/licenses_combined
```

Refer to the SunLink documentation for full details.

Step 3. Ensure you have created the CPIC side file.

Step 4. Ensure you have created the SNA server configuration file.

Step 5. Use the sunop utility to check the status of SunLink SNA if it is already started.

Check to see if the PU and/or DLC status is *connected*. You can also use sunop to check the status of links.

Refer to the SunLink documentation for details of the sunop utility.

Step 6. Stop SunLink if it is active. For example, enter:

```
kill -9 sunpu2.pid
kill -9 sunlu2.pid
```

Step 7. Start SunLink using the following command:

```
sunpu2.1
```

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

Go to “Step 3. Catalog the APPC Node”.

Step 3. Catalog the APPC Node

You must add an entry to the DB2 Connect workstations’s node directory to describe the remote node. This entry specifies the chosen alias (*node_name*), Symbolic destination name (*sym_dest_name*), and the APPC security type (*security_type*) that the client will use for the APPC connection.

To catalog the APPC node, perform the following steps:

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

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

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

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

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

```
catalog appc node node_name remote sym_dest_name security security_type
terminate
```

Note: The *sym_dest_name* parameter is case-sensitive and *must* exactly match the case of the Symbolic Destination Name you defined previously.

For example, to catalog a remote database server with the Symbolic Destination Name *DB2CPIC* on the node called *db2node*, using APPC Security type *program*, use:

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

Note: To connect to DB2 for MVS, it is recommended that you use security PROGRAM.

If you need to change values that were set with the **catalog node** command, perform the following steps:

Step 1. Run the **uncatalog node** command in the command line processor as follows:

```
uncatalog node node_name
```

Step 2. Recatalog the node with the values that you want to use.

Step 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* is the local name of the host or AS/400 database.
- *target_dbname* is 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
```

Step 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 16. 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 node name (*node_name*) that you used to catalog the node in the previous step.	db2node	

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

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

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

Step 4. Catalog the database by entering the following commands:

```
catalog database database_name as database_alias at node node_name
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
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.

Step 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.

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

```
db2 connect to dbalias user userid using password
db2 "bind path@ddcsmvs.lst blocking all sqlerror continue
     messages mvs.msg grant public"
db2 connect reset
```

For example:

```
db2 connect to NYC3 user myuserid using mypassword
db2 "bind /sqllib/myapps@ddcsmvs.lst blocking all sqlerror continue
     messages mvs.msg grant public"
db2 connect reset
```

The *userid* and *password* specified must have the authority to bind applications against the target database.

Further information about these commands can be found in the *DB2 Connect User's Guide*.

Step 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 *db_alias* value you defined in "Step 3. Catalog the APPC Node" on page 117:

```
connect to db_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 chapter provides an overview of the multisite update function as it applies to scenarios that involve host and AS/400 database servers. It describes 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. A good example of a multisite update is 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 that implement debit operation on one account do not get committed unless updates required to process credit 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 update. This support is available for applications developed using regular SQL as well as applications that utilize Transaction Monitor products that implement X/Open XA interface specification. Examples of such Transaction Monitor products include IBM TxSeries (CICS and Encina), Message and Queuing Series, Component Broker Series, San Francisco Project as well as Microsoft Transaction Server (MTS), BEA Tuxedo, NCR TopEnd 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 SYCNCPOINT 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, e.g. `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, SQLServer, etc. 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. At the time of this writing, the following DB2 servers provided DUOW support that enabled them to participate in distributed transactions:

- DB2 Common Server V2
- DB2 Universal Database V5 and V6
- DB2 for MVS/ESA V3.1 and 4.1
- DB2 for OS/390 V5.1
- DB2 Universal Database for OS/390 V6.1
- DB2/400 V3.1 or later (using SNA only at this time)
- DB2 Server for VM and VSE V5.1 and 6.1

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, a DB2 for OS/390 database and a DB2/400 database all within a single transaction.

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. The need for SPM is dictated by the choice of protocol (SNA vs. TCP/IP) and use of a TP monitor. See the following table for a summary of scenarios that require use of the SPM. The table 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.

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

Host and AS/400 multisite update scenarios that require SPM.				
Yes	TCP/IP	Yes	• 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
Yes	SNA	Yes	• DB2 Connect Enterprise Edition* • DB2 Universal Database Enterprise Edition* • DB2 Universal Database Enterprise-Extended Edition* **Note:** *AIX, OS/2 and Windows NT 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 • DB2/400 V3.1 or later • DB2 Server for VM or VSE V5.1 or later

Host and AS/400 multisite update scenarios that require SPM.				
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
No	SNA	Yes	• DB2 Connect Enterprise Edition* • DB2 Universal Database Enterprise Edition* • DB2 Universal Database Enterprise-Extended Edition* **Note:** *AIX, OS/2 and Windows NT 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 • DB2/400 V3.1 or later • DB2 Server for VM and VSE V5.1 or later

Note:

For more information about DUOW refer to the *DB2 Connect User's Guide*.

For additional information about DB2 Connect two-phase commit support, as well as instructions for setting up for several popular TP monitors, please see the *Administration Guide* or access the DB2 Product and Service Technical Library on the World Wide Web:

1. Set your Web browser to the following URL:

   `http://www.software.ibm.com/data/db2/library/`
2. Select ″DB2 Universal Database″.
3. Search for ″Technotes″ using the search keywords ″DDCS″, ″SPM″, ″MTS″, ″CICS″, and ″ENCINA″.

Enabling Multisite Updates Using the Control Center

As of Version 6, you can use the Control Center to provide multisite update. The procedure is very simple, and is outlined below. For more information about the multisite update configuration process, including how to configure your system manually, refer to the on-line *Connectivity Supplement*.

Starting the Multisite Update Smartguide

From the Control Center, click on the [+] sign to expand the tree view. With the right mouse button, select the instance that you wish to configure. A popup menu opens. Select **Multisite Update->Configure** from this menu.

Smartguide Steps

The Smartguide provides a notebook-type interface. Each page of the notebook 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 wish 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 Multi-Site Update** window opens.

Step 2. Select the databases you wish to test from the available databases in the left sub-window. You can use the arrow buttons in the middle to move selections to and from the **Selected Databases** sub-window.

Step 3. When you have finished your selection, press the **Test...** button at the bottom of the window. The **Multi-Site Update Test Result** window opens.

Step 4. The **Multi-Site 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. Installing and Configuring Clients

Chapter 9. Installing DB2 Clients

This section describes how to install a DB2 Administration Client, a DB2 Run-Time Client, or a DB2 Software Developer's Kit on your workstation. For information on how to deploy this product using a distributed installation, refer to the *Installation and Configuration Supplement*.

DB2 Administration Clients are available for the following platforms: AIX, HP-UX, Linux, OS/2, Silicon Graphics IRIX, Solaris, Windows 9x, and Windows NT. For more information on using Administration Client tools, see "Appendix C. Using the Control Center to Administer DB2 for OS/390 and DB2 Connect Enterprise Edition servers" on page 207.

DB2 Run-Time Clients and DB2 Software Developer's Kits are available for the following platforms: AIX, HP-UX, Linux, OS/2, Silicon Graphics IRIX, Solaris, Windows 9x, and Windows NT.

Clients that connect to a server must have the appropriate DB2 Administration Client, DB2 Run-Time Client, or DB2 Software Developer's Kit installed.

You may install a DB2 client on any number of workstations. For information about licensing, refer to your *License Information Booklet*.

Go to the section that provides installation instructions for the DB2 client that you want to install:

- "Chapter 10. Installing DB2 Clients on Windows 32-Bit Operating Systems" on page 133
- "Chapter 11. Installing DB2 Clients on OS/2 Operating Systems" on page 137
- "Chapter 12. Installing DB2 Clients on UNIX Operating Systems" on page 139

For information on how to install all other Version 6 DB2 clients or DB2 Software Developer's Kits, refer to the *Installation and Configuration Supplement*.

To download installation packages for all supported DB2 clients, which include pre-Version 6 DB2 clients such as DOS, Macintosh, SCO OpenServer, SCO Unixware, SINIX, and Windows 3.x, connect to the IBM DB2 Client Application Enabler Web site at http://www.software.ibm.com/data/db2/db2tech/clientpak.html.

Chapter 10. Installing DB2 Clients on Windows 32-Bit Operating Systems

This section contains the information you need to install a DB2 client or DB2 Software Developer's Kit on Windows 32-bit operating systems.

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 23.

__ 2. A user account to perform the installation.

Windows 9x
Any valid Windows 9x user.

Windows NT
Any user account that does not belong to the *Guests* group on the machine where the account is defined.

Installation Steps

To install a DB2 Client or Software Developer's Kit, perform the following steps:

Step 1. Log on to the system with the user account that you created to perform the installation.

Step 2. Shut down any other programs so that the setup program can update files as required.

Step 3. Insert the appropriate CD-ROM into the drive. The auto-run feature automatically starts the setup program. The setup program will determine the system language, and launch the setup program for that language. If you want to run the setup program in a different language, or the setup program failed to auto-start, see the tip that follows.

To manually invoke the setup program, perform the following steps:

a. Click on **Start** and select the **Run** option.

b. In the **Open** field, enter the following command:

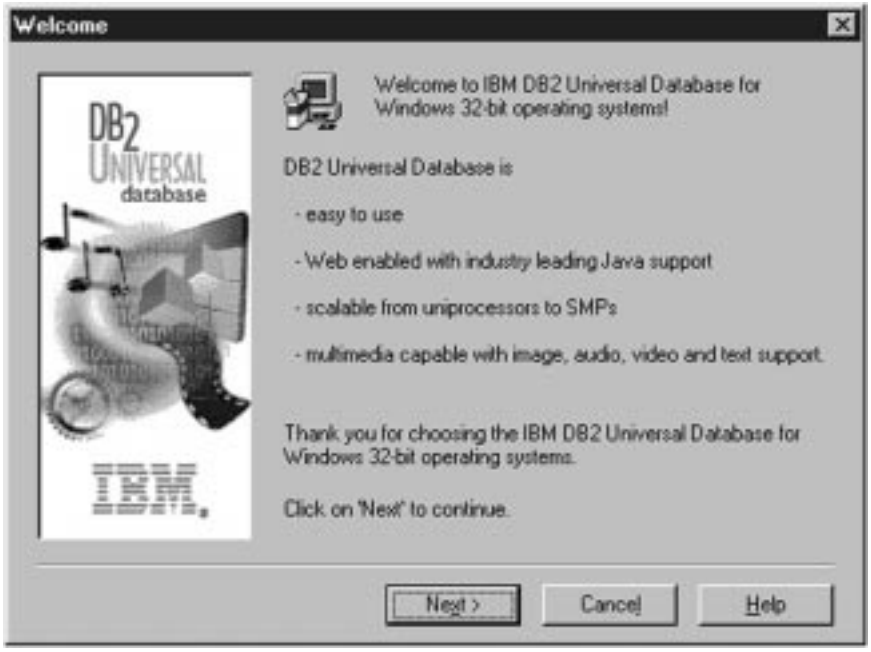
   `x:\setup /i language`

   where:

   - *x:* represents your CD-ROM drive
   - *language* represents the country code for your language (for example, EN for English). Table 23 on page 228 lists the code for each available language.

c. Click on **OK**.

Step 4. The Welcome window opens.



Step 5. Respond to the setup program's prompts. Online help is available to guide you through the remaining steps. Invoke online help by clicking on the **Help** push button, or by pressing the **F1** key at any time.

You can click on the **Cancel** push button at any time to end the installation.

For information on errors encountered during installation, see the db2.log file. The db2.log file stores general information and error messages resulting from the install and uninstall activities. By default, the db2.log file is located in the x:\db2log directory, where x: represents the drive on which your operating system is installed.

For more information, refer to the *Troubleshooting Guide*.

The setup program has:

- Created DB2 program groups and items (or shortcuts).
- Updated the Windows registry.
- Created a default client instance called DB2.

To configure your client to access remote servers, go to "Chapter 13. Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 149.

Chapter 11. Installing DB2 Clients on OS/2 Operating Systems

This section contains the information that you need to install a DB2 client or Software Developer's Kit on OS/2 operating systems. If you have a pre-Version 6 DB2 client for OS/2, the WIN-OS/2 support installed will be kept at its current level.

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 23.

__ 2. The protocol to be used for host connectivity:

   __ a. SNA

   __ b. TCP/IP

   __ c. MPTN

__ 3. A user ID to perform the installation.

   If UPM is installed, the user ID you specify must have *Administrator* or *Local Administrator* authority. Create a user ID with these characteristics if necessary.

   If UPM is not installed, DB2 will install it and set up the userid `USERID` with password `PASSWORD`.

__ 4. To verify that DB2 installed correctly, you will need to have a user account that belongs to the System Administrative (SYSADM) group, is 8 characters or less, and complies with all of DB2's naming rules.

   By default, any user that belongs to the *Local Administrators* group, on the local machine where the account is defined, has SYSADM authority on the instance. For more information, see "Working with the System Administrative Group" on page 198. For more information on valid DB2 usernames, see "Appendix G. Naming Rules" on page 235.

Installation Steps

To install a DB2 client or Software Developer's Kit for OS/2, perform the following steps:

Step 1. Insert the appropriate CD-ROM into the drive.

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

```
x:\install
```

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

Step 3. The Welcome window opens.

Step 4. Respond to the install program's prompts. Online help is available to guide you through the remaining steps. Invoke online help by clicking on the **Help** push button, or by pressing the **F1** key at any time.

For information on errors encountered during installation, see the `l1.log` and `l2.log` files. These files store general information and error messages resulting from installation and uninstall activities. By default, these files are located in the `x:\db2log` directory; where x: represents the drive on which your operating system is installed.

For more information, refer to the *Troubleshooting Guide*.

To configure your client to access remote servers, go to "Chapter 13. Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 149.

Chapter 12. Installing DB2 Clients on UNIX Operating Systems

This section contains the information that you need to install a DB2 client or Software Developer's Kit on UNIX operating systems.

Before You Begin

Before you begin installing a DB2 client or Software Developer's Kit using the DB2 Installer program, you need to gather the following 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 23.

__ 2. A username for the default DB2 instance. We recommend that you create a new group and use it as the primary group for the DB2 instance owner.

When you use the DB2 Installer program, you should be aware of the following:

- The DB2 Installer's **db2setup** command only works with Bash, Bourne, and Korn shells. Other shells are not supported.
- You can generate a trace log, *db2setup.trc*, to record errors experienced during the installation. Run the **db2setup** command as follows:

  ```
  db2setup -d
  ```

  This creates a trace file, `/tmp/db2setup.trc`.

Installation Steps

To install a DB2 client or Software Developer's Kit on AIX, HP-UX, Linux, Silicon Graphics IRIX, and Solaris systems, perform the following steps:

Step 1. Update Kernel Configuration Parameters

To run a DB2 client or Software Developer's Kit on a HP-UX, or Solaris system, you may have to update some kernel configuration parameters.

Go to the section that describes the kernel configuration parameters for the DB2 client that you want to install:

- "Recommended Values for HP-UX Version 10 and Version 11"
- "Recommended Values for Solaris" on page 141

You do *not* need to update any kernel configuration parameters to run a DB2 client or Software Developer's Kit on an AIX, Linux, or SGI IRIX workstation. If you are installing a DB2 client or Software Developer's Kit on AIX, Linux, or SGI IRIX, go to "Step 2. Mount the CD-ROM" on page 141.

Recommended Values for HP-UX Version 10 and Version 11

Table 17 lists the recommended values for HP-UX kernel configuration parameters. These values are valid for HP-UX 10 and HP-UX 11.

Table 17. HP-UX Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Recommended Value
msgseg	8192
msgmnb	65535 (1)
msgmax	65535 (1)
msgssz	16

Notes:

1. Parameters msgmnb and msgmax must be set to 65535 or higher.
2. To maintain the interdependency among kernel parameters, change parameters in the same sequence in which they appear in Table 17.

To change a value, perform the following steps:

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

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

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

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

Step 5. Click on **OK**.

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

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

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

Go to “Step 2. Mount the CD-ROM” to continue with the installation.

Recommended Values for Solaris

Table 18 lists the recommended values for Solaris kernel configuration parameters.

Table 18. Solaris Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Recommended Value
msgsys:msginfo_msgmax	65535 (1)
msgsys:msginfo_msgmnb	65535 (1)
msgsys:msginfo_msgseg	8192
msgsys:msginfo_msgssz	16

Notes:

1. Parameters msgsys:msginfo_msgmnb and msgsys:msginfo_msgmax must be set to 65535 or higher.

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

```
set parameter_name = value
```

where *parameter_name* represents the parameter you want to change.

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

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

After changing the kernel parameters, reboot the system so that the changes can take effect.

Go to “Step 2. Mount the CD-ROM” to continue with the installation.

Step 2. Mount the CD-ROM

To install your DB2 product using the DB2 Installer program, you must first mount the CD-ROM.

Go to the section that describes the mounting instructions for a DB2 client that you want to install:

- "Mounting on AIX Systems"
- "Mounting on HP-UX Systems" on page 143
- "Mounting on Linux Systems" on page 143
- "Mounting on Silicon Graphics IRIX" on page 143
- "Mounting on Solaris Systems" on page 144

Mounting on AIX Systems

To mount the CD-ROM on AIX, perform the following steps:

Step 1. Log in as a user with `root` authority.

Step 2. Insert the CD-ROM in the drive.

Step 3. Create a directory to mount the CD-ROM by entering the following command:

```
mkdir -p /cdrom
```

where `cdrom` represents the CD-ROM mount directory.

Step 4. Allocate a CD-ROM file system by entering the following command:

```
smitty storage
```

Step 5. Select **File Systems**.

Step 6. Select **Add / Change / Show / Delete File Systems**.

Step 7. Select **CDROM File Systems**.

Step 8. Select **Add CDROM File System**.

Step 9. Select **Device Name**.

Device names for CD-ROM file systems must be unique. If there is a duplicate device name, you may need to delete a previously-defined CD-ROM file system or use another name for your directory.

Step 10. In the pop-up window, enter the following as **mount point**:

```
/cdrom
```

Step 11. Mount the CD-ROM file system by entering the following command:

```
smit mountfs
```

Step 12. Enter a value in the **FILE SYSTEM** name field. For example, the name could be `/dev/cd0`.

Step 13. Enter a value in the **Directory over which to mount** field. For example, this value could be `/cdrom`.

Step 14. Enter a value in the **Type of Filesystem** field. For example, this value could be `cdrfs`.

Step 15. Set the **Mount as READ-ONLY system** to Yes.

Step 16. Click on **OK**.

Step 17. Log out.

Go to "Step 3. Perform the Installation" on page 144 to continue with the installation.

Mounting on HP-UX Systems

To mount the CD-ROM on HP-UX, perform the following steps:

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

Step 2. Insert the CD-ROM in the drive.

Step 3. Mount it by entering the following commands:

```
mkdir /cdrom
/usr/sbin/mount /dev/dsk/c0t2d0 /cdrom
```

where /cdrom represents the CD-ROM mount point.

Step 4. Log out.

The CD-ROM may also be mounted using the System Administration (**SAM**) tool. Consult your HP-UX documentation for more information about **SAM**.

Go to "Step 3. Perform the Installation" on page 144 to continue with the installation.

Mounting on Linux Systems

To mount the CD-ROM on Linux, perform the following steps:

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

Step 2. Insert the CD-ROM in the drive and mount it with a command similar to the following:

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

where */cdrom* is the mount point of the CD-ROM.

Step 3. Log out.

Go to "Step 3. Perform the Installation" on page 144 to continue with the installation.

Mounting on Silicon Graphics IRIX

Perform the following steps to mount the CD-ROM on Silicon Graphics IRIX operating systems:

1. Log in as a user with root authority.
2. Insert the appropriate CD-ROM into the drive and mount it using the **mount** command as follows:

   ```
   mount -t iso9660 device mount_point
   ```

   For example, to mount the CD-ROM as /cdrom, enter the following commands:

   ```
   mkdir /cdrom
   mount -t iso9660  /dev/scsi/sc0d7l0 /cdrom
   ```

3. Log out.

Go to “Step 3. Perform the Installation” to continue with the installation.

Mounting on Solaris Systems

To mount the CD-ROM on Solaris, perform the following steps:

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

Step 2. If the Volume Manager is not running on your system, enter the following commands to mount the CD-ROM:

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

where */cdrom/unnamed_cdrom* represents the CD-ROM mount directory.

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

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

```
/cdrom/unnamed_cdrom
```

Step 3. Log out.

Go to “Step 3. Perform the Installation” to continue with the installation.

Step 3. Perform the Installation

After you mount the CD-ROM file system, use the DB2 Installer program to install a DB2 product.

If you are installing a DB2 client from a remote server, it is better to use the **telnet** command to open a telnet session instead of using the **rlogin** command to connect to your remote server.

Step 1. Log in as user with `root` authority.

Step 2. Insert the appropriate CD-ROM into the drive.

Step 3. Change to the directory where the CD-ROM is mounted by entering the following command:

```
cd /cdrom
```

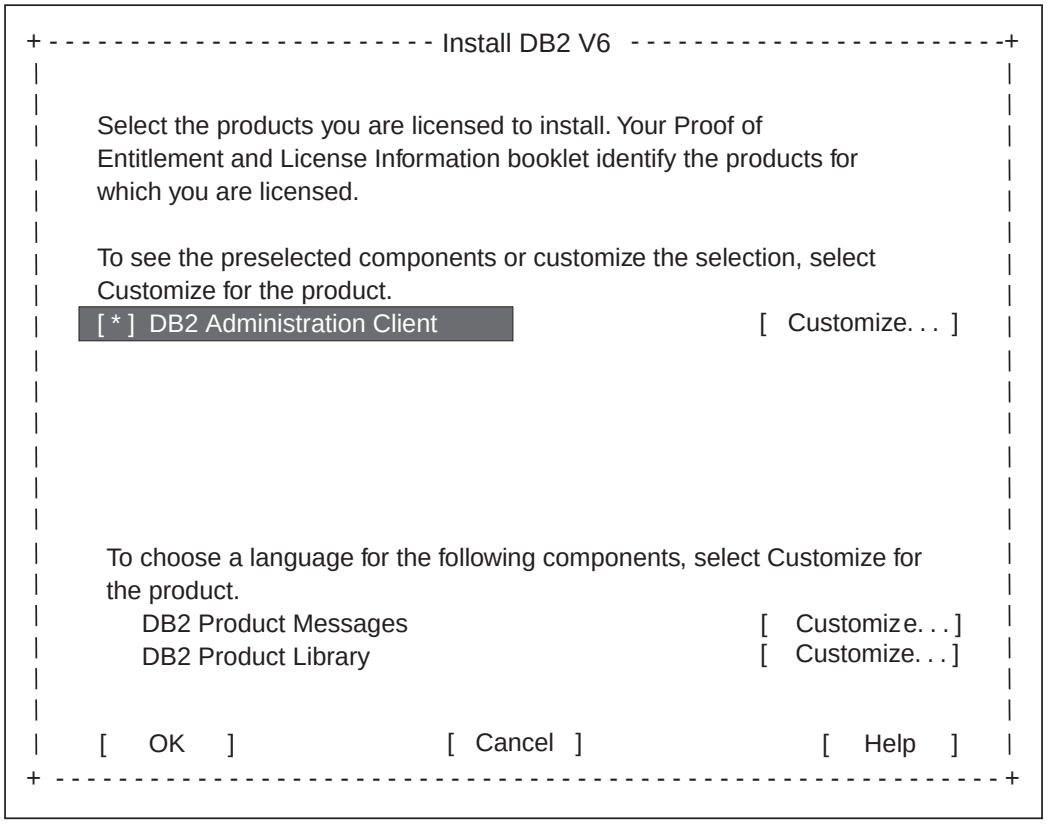
where `/cdrom` is the mount point of the CD-ROM drive.

Step 4. Change to the directory where the install image for the DB2 product that you want to install is located.

DB2 install images are available in the following directories (assuming that the mount point for the CD-ROM is `/cdrom`):

AIX	/cdrom/db2/aix
HP-UX Version 10	/cdrom/db2/hpux10
HP-UX Version 11	/cdrom/db2/hpux11
Linux	/cdrom/db2/linux
SGI	/cdrom/db2/sgi
Solaris	/cdrom/unnamed_cdrom/db2/solaris

Step 5. Enter the **./db2setup** command to start the DB2 Installer program. The Install DB2 V6 window opens.



Step 6. From the product list on the **Install DB2 V6** window, select the product that you want to install and select **OK**.

Press the Tab key to change the highlighted option and the Enter key to select or deselect the option you want.

To display the required and optional components for a product you want to install, select **Customize**. To go back to a previous window at any time, select **Cancel**. You can invoke the online help by clicking on **Help**.

To refresh the current screen, press the **F5** key or **Ctrl+L**.

This completes the installation. The DB2 software is installed in the *DB2DIR* directory,

where *DB2DIR*	= /usr/lpp/db2_06_01	on AIX
	= /opt/IBMdb2/V6.1	on HP-UX, Solaris, or SGI IRIX
	= /usr/IBMdb2/V6.1	on Linux

You can use the DB2 Installer program to create an additional instance, create an Administration Server, or add additional products or components after your initial installation. To create or add a new instance, an Administration Server, or additional DB2 products and components, enter the following command:

On AIX

```
/usr/lpp/db2_06_01/install/db2setup
```

On HP-UX, Solaris, or SGI IRIX

```
/opt/IBMdb2/V6.1/install/db2setup
```

On Linux

```
/usr/IBMdb2/V6.1/install/db2setup
```

To configure your client to access a remote DB2 Connect server, see "Chapter 14. Configuring Client-to-Server Communications Using the Command Line Processor" on page 161.

Chapter 13. Configuring Client-to-Server Communications Using the Client Configuration Assistant

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.

If you have added a new protocol to your network that is not detectable, or wish to modify any of the default settings, refer to the *Installation and Configuration Supplement*.

The information in this section describes how to use the Client Configuration Assistant (CCA) to configure your OS/2, Windows 9x, or Windows NT clients to access remote servers. 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 193.

With the CCA, you can:

- 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 enabled).
- 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 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 G. Naming Rules" on page 235.

If you are adding a database to a system that has a DB2 Connect server product installed, log on to this system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority on the instance. For more information, see "Working with the System Administrative Group" on page 198.

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 193.

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 Database** or **Add** push button to configure a connection.

Go to the section that describes the configuration method that you want to use:

- "Adding a Database Using a Profile".
- "Adding a Database Using Discovery" on page 151.
- "Adding a Database Manually" on page 154.

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 156.

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

Step 1. Select the **Use an access profile** radio button and click on the **Next** push button.

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

Step 3. Enter a local database alias name in the **Database alias** field and add a comment that describes this database in the **Comment** field. Click on the **Next** push button.

If you do not specify a database alias name, the default will be the same as the remote database alias name.

Step 4. Register this database as an ODBC data source.

If you are not planning to use ODBC, click on the **Done** push button and go to the next step.

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.

c. If you would like to create an ODBC data source file to share database access, select the **Create a file data source** check box and enter the path and filename for this file in the **File data source name** field.

d. Click on the **Optimize for application** drop down box and select the application for which you want to tune the ODBC settings.

e. Click on the **Done** push button to add the database that you selected. The Confirmation window opens.

Step 5. Click on the **Test Connection** push button to test the connection. The Connect to DB2 Database window opens.

If the database that you want to add was not added successfully, click on the **Change** push button to change any settings that you may have incorrectly specified or click on the **Help** push button for more information. For even more detailed information, refer to the *Troubleshooting Guide*.

Step 6. Enter your user ID and password and click on **OK**. If the connection is successful, a message confirming the connection appears.

Step 7. You are now able to use this database. To finish using the Add Database SmartGuide, click on the **Close** push button; you can then add more databases by clicking on the **Add** push button or 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. 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 Discovery, perform the following steps:

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

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

Step 3. Click on 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 on 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 on the **Next** push button, 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 on the **Add System** push button

b. Enter the required communication protocol parameters for the remote Administration Server and click on **OK**. A new system is added. For more information, click on the **Help** push button.

c. Select the database that you want to add and click on the **Next** push button.

Step 4. Enter a local database alias name in the **Database alias** field and add a comment that describes this database in the **Comment** field. Click on the **Next** push button.

If you do not specify a database alias name, the default will be the same as the remote database alias name.

Step 5. Register this database as an ODBC data source.

If you are not planning to use ODBC, click on the **Done** push button and go to the next step.

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.

c. If you would like to create an ODBC data source file to share database access, select the **Create a file data source** check box and enter the path and filename for this file in the **File data source name** field.

d. Click on the **Optimize for application** drop down box and select the application for which you want to tune the ODBC settings.

e. Click on the **Done** push button to add the database that you selected. The Confirmation window opens.

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

If the database that you want to add was not added successfully, click on the **Change** push button to change any settings that you may have incorrectly specified or click on the **Help** push button for more information. For even more detailed information, refer to the *Troubleshooting Guide*.

Step 7. Enter your user ID and password and click on **OK**. If the connection is successful, a message confirming the connection appears.

Step 8. You are now able to use this database. To finish using the Add Database SmartGuide, click on the **Close** push button; you can then add more databases by clicking on the **Add** push button or 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 for you.

To add a database to your system manually, perform the following steps:

Step 1. Select the **Manually configure a connection to a DB2 database** radio button and click on the **Next** push button.

If you are not using Lightweight Directory Access Protocol (LDAP), this tab will not be shown, skip this step and go to Step 3.

Step 2. 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 on the **Next** push button.
- If you would like to maintain the DB2 directories globally at an LDAP server, select the **Add database using LDAP** radio button and click on the **Next** push button.

Step 3. Select the radio button that corresponds to the protocol that you want to use from the **Protocol** list and click on the **Next** push button.

If you have installed a DB2 Connect product or the DB2 Connect Server Support feature available with DB2 Enterprise Edition or DB2 Enterprise - Extended Edition, and have selected the **TCP/IP** or **APPC** radio button, select the radio button from the **Target operating system** list that corresponds to the type of system where the database that you are trying to connect to resides.

Step 4. Enter the required communication protocol parameters and click on the **Next** push button. For more information, click on the **Help** push button.

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. Add a comment that describes this database in the **Comment** field and click on the **Next** push button.

If you are adding a database that resides on a host or AS/400 system, the **Database name** field will appear as follows:

OS/390 or MVS
Location name

AS/400
RDB name

VM or VSE
DBNAME

When a database is created on the remote server, if a database alias is not specified during database creation, the database is created with a database alias=*database_name*; otherwise, the database alias is the name that was specified when the database was created.

Step 6. Register this database as an ODBC data source.

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.

c. If you would like to create an ODBC data source file to share database access, select the **Create a file data source** check box and enter the path and filename for this file in the **File data source name** field.

d. Click on the **Optimize for application** drop down box and select the application for which you want to tune the ODBC settings.

e. Click on the **Done** push button to add the database that you selected. The Confirmation window opens.

If you are adding a database using the *manual* method, you can also select the **Node Options** tab, the **Security Options** tab, or the **Host or AS/400 Options** tab (if you are adding a host or AS/400 database) to specify more detailed catalog information. Refer to the online help in each tab for more information.

If you want to use the default settings for the node, security, and host or AS/400 (if applicable) options, click on the **Done** push button and go to the next step.

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

If the database that you want to add was not added successfully, click on the **Change** push button to change any settings that you may have incorrectly specified or click on the **Help** push button for more information. For even more detailed information, refer to the *Troubleshooting Guide*.

Step 8. Enter your user ID and password and click on **OK**. If the connection is successful, a message confirming the connection appears.

Step 9. You are now able to use this database. To finish using the Add Database SmartGuide, click on the **Close** push button; you can then add more databases by clicking on the **Add** push button or exit the CCA.

You can use the Export feature 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 feature 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. You can use either a *Server Profile* or a *Client Profile* to configure database connections on a client.

Go to the section that describes the type of profile that you want to use:

- "Server Profiles".
- "Client Profiles" on page 157.

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.

To generate a Server Profile, use the Export Server Profile function provided in the Control Center. When a profile is generated, it includes instances that have the *discover_inst* database manager configuration parameter and databases with the *discover_db* database configuration parameter set to *ENABLE*. The *discover* parameter in the Administration Server's configuration file must be set to either *SEARCH* or *KNOWN* to generate a profile for a server system.

The default settings for these configuration parameters enable you to discover all instances and databases on your network. For information on setting the *discover_inst*, *discover_db*, and *discover* configuration parameters, refer to the *Administration Guide*.

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 Control Center" on page 194.

Step 2. Select the system that you want to create a profile for and click on the right mouse button.

If the system that you want to create a profile for is not shown, select the **Systems** icon, click on the right mouse button, and select the **Add** option. Click on 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 click on the **Export** push button.

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 150.

Client Profiles

Information in a Client Profile can be used to configure clients using the Import function in the Client Configuration Assistant (CCA). These clients can import all or a subset of the configuration information in a profile.

This scenario assumes that the database connections configured on one client will be exported and used to set up one or more clients.

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, 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 193.

Step 2. Click on the **Export** push button. 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 on **OK**, and go to Step 6.
- 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 on **OK**, and go to Step 6.
- 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 on **OK**, and go to the next step.

Step 4. Select the databases to be exported from the **Available DB2 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 on 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 on the **Help** push button.

Step 6. Click on **OK**. The Export Client Profile window opens.

Step 7. Enter a path and file name for this Client Profile and click on **OK**. The DB2 Message window opens.

Step 8. Click on **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 193.

Step 2. Click on the **Import** push button. The Select Profile window opens.

Step 3. Select a Client Profile to import and click on **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 all the databases defined 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 on **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* online document.

Step 6. You are presented with a list of systems, instances, and databases. Select the database that you want to add and click on the **Next** push button.

Step 7. Enter a local database alias name in the **Database alias** field and add a comment that describes this database in the **Comment** field. Click on the **Next** push button.

If you do not specify a database alias name, the default will be the same as the remote database alias name.

Step 8. Register this database as an ODBC data source.

If you are not planning to use ODBC, click on the **Done** push button and go to the next step.

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.

c. If you would like to create an ODBC data source file to share database access, select the **Create a file data source** check box and enter the path and filename for this file in the **File data source name** field.

d. Click on the **Optimize for application** drop down box and select the application for which you want to tune the ODBC settings.

e. Click on the **Done** push button to add the database that you selected. The Confirmation window opens.

Step 9. Click on the **Test Connection** push button to test the connection. The Connect to DB2 Database window opens.

If the database that you want to add was not added successfully, click on the **Change** push button to change any settings that you may have incorrectly specified or click on the **Help** push button for more information. For even more detailed information, refer to the *Troubleshooting Guide*.

Step 10. Enter your user ID and password and click on **OK**. If the connection is successful, a message confirming the connection appears.

Step 11. You are now able to use this database. To finish using the Add Database SmartGuide, click on the **Close** push button; you can then add more databases by clicking on the **Add** push button or exit the CCA.

Chapter 14. Configuring Client-to-Server Communications Using the Command Line Processor

To configure a client to communicate with a server, the remote server must be configured to accept in-bound requests for the communication protocol that you want to use. By default, the installation program automatically detects and configures any protocols running on your server.

If you have added a new protocol to your network, or wish to change any of the default settings on the server, refer to the *Installation and Configuration Supplement*.

This section describes how to configure a client to communicate with a server using the command line processor.

If you plan to use an OS/2 or Windows 32-bit client to communicate with a server, the Client Configuration Assistant (CCA) makes it easy to automate configuration and administration tasks. If you have installed the CCA, it is recommended that you use this tool to configure your DB2 clients for communications.

See "Chapter 13. Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 149 for more information.

For instructions on entering DB2 commands, see "Entering Commands Using the Command Center" on page 195 or "Entering Commands Using the Command Line Processor" on page 196.

Go to the section that describes how to configure communications to access a remote server using the communication protocol of your choice:

- For TCP/IP, see "Configuring TCP/IP on the Client".
- For APPC, refer to the *Installation and Configuration Supplement*.

Configuring TCP/IP on the Client

This section assumes that TCP/IP is functional on the client and server workstations. See "Software Requirements" on page 28 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 35 for the supported communication protocols for your particular client and server.

To set up TCP/IP communications on a DB2 client, perform the following steps:

Step 1. Identify and record parameter values.

Step 2. Configure the client:

a. Resolve the server's host address.

b. Update the services file.

c. Catalog a TCP/IP node.

d. Catalog the database.

Step 3. Test the connection between the client and server.

Due to the characteristics of the TCP/IP protocol, TCP/IP may not be immediately notified of the failure of a partner on another host. As a result, a client application accessing a remote DB2 server using TCP/IP, or the corresponding agent at the server, may sometimes appear to be hung. DB2 uses the TCP/IP SO_KEEPALIVE socket option to detect when there has been a failure and the TCP/IP connection has been broken.

If you are experiencing problems with your TCP/IP connection, refer to the *Troubleshooting Guide* for information on how to adjust this parameter and other common TCP/IP problems.

Step 1. Identify and Record Parameter Values

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

Table 19. TCP/IP Values Required at the Client

Parameter	Description	Sample Value	Your Value
Host Name • Hostname (*hostname*) or • IP address (*ip_address*)	Use the *hostname* or *ip_address* of the remote server workstation. To resolve this parameter: • Enter the **hostname** command at the server to obtain the *hostname*. • Contact your network administrator to obtain the *ip_address* or enter the **ping** *hostname* command.	serverhost or 9.21.15.235	

Table 19. TCP/IP Values Required at the Client (continued)

Parameter	Description	Sample Value	Your Value

Service Name
• Connection Service name (*svcename*) or
• Port number / Protocol (*port_number/tcp*)
	Values required in the `services` file.
	
	The Connection Service name is an arbitrary name that represents the Connection port number (*port_number*) on the client.
	
	The port number for the client must be the same as the port number that the *svcename* parameter maps to in the `services` file at the server. (The *svcename* parameter is located in the database manager configuration file on the server.) This value must not be in use by any other applications, and must be unique within the `services` file.
	
	Contact your database administrator for the values used to configure the server.
		`server1`
		
		`3700/tcp`	

Node name (*node_name*)	A local alias, or nickname, that describes the node to which you are trying to connect. You can choose any name you want; however, all node name values within your local node directory must be unique.	`db2node`	

Step 2. Configure the Client

The following steps configure this protocol on the client. Replace the sample values with your worksheet values.

A. Resolve the Server's Host Address

If your network has a name server, or you are planning to directly specify the IP address (*ip_address*) of the server, skip this step and proceed to "Step B. Update the Services File" on page 164.

The client must know the address of the server to which it is attempting to establish communications. If a name server does not exist on your network, you may directly specify a hostname that maps to the IP address (*ip_address*) of the server in the local `hosts` file. See Table 20 on page 164 for the location of

the hosts file for your particular platform.

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

Table 20. Location of the Local Hosts and Services Files

Platform	Location
OS/2	Specified by the *etc* environment variable. Enter the **set etc** command to determine the location of your local hosts or services files.
Windows NT	Located in the winnt\system32\drivers\etc directory.
Windows 9x	Located in the windows directory.
UNIX	Located in the /etc directory.

Edit the client's hosts file and add an entry for the server's hostname. For example:

```
9.21.15.235     serverhost   # host address for serverhost
```

where:

9.21.15.235 represents the *ip_address*

serverhost represents the *hostname*

represents a comment describing the entry

If the server is not in the same domain as the client, you must provide a fully qualified domain name such as serverhost.vnet.ibm.com, where vnet.ibm.com is the domain name.

Step B. Update the Services File

If you are planning to catalog a TCP/IP node using a port number (*port_number*), skip this step and go to "Step C. Catalog a TCP/IP Node" on page 165.

Using a local text editor, add the Connection Service name and port number to the client's services file for TCP/IP support. For example:

```
server1  3700/tcp  # DB2 connection service port
```

where:

server1 represents the Connection Service name

3700 represents the Connection port number

tcp represents the communication protocol that you are using

represents a comment describing the entry

The port number used on the client must match the port number used on the server.

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

The file called services is located in the same directory as the local hosts file that you may have edited in "A. Resolve the Server's Host Address" on page 163.

See Table 20 on page 164 for the location of the services file for your particular platform.

Step C. Catalog a TCP/IP Node

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

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

Step 1. Log on to the system with a valid DB2 user ID. For more information, see "Appendix G. Naming Rules" on page 235.

If you are adding a database to a system that has a DB2 Connect server product installed, log on to this system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority on the instance. For more information, see "Working with the System Administrative Group" on page 198.

This restriction is controlled by the *catalog_noauth* database manager configuration parameter. For more information, refer to the *Administration Guide*.

Step 2. If you are using a UNIX client, set up the instance environment and invoke the DB2 command line processor. Run the start-up script as follows:

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

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

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

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

For example, to catalog the remote server *serverhost* on the node called *db2node*, using the service name *server1*, enter the following:

```
catalog tcpip node db2node remote serverhost server server1
terminate
```

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

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

If you need to change values that were set with the **catalog node** command, perform the following steps:

Step 1. Run the **uncatalog node** command in the command line processor as follows:

```
uncatalog node node_name
```

Step 2. Recatalog the node with the values that you want to use.

Step D. Catalog the Database

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

To catalog a database on the client, perform the following steps:

Step 1. Log on to the system with a valid DB2 user ID. For more information, see "Appendix G. Naming Rules" on page 235.

If you are adding a database to a system that has a DB2 Connect server product installed, log on to this system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority on the instance. For more information, see "Working with the System Administrative Group" on page 198.

This restriction is controlled by the *catalog_noauth* database manager configuration parameter. For more information, refer to the *Administration Guide*.

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

Table 21. Worksheet: Parameter Values for Cataloging Databases

Parameter	Description	Sample Value	Your Value
Database name (*database_name*)	The database alias (*database_alias*) of the *remote* database. When you create a database, it is automatically cataloged on the server with the database alias (*database_alias*) the same as the database name (*database_name*).	sample	
Database alias (*database_alias*)	An arbitrary local nickname for the remote database, on the client. If you do not provide one, the default is the same as the database name (*database_name*). This is the name that you use when connecting to a database from a client.	tor1	
Node name (node_name)	The name of the node directory entry that describes where the database resides. Use the same value for node name (*node_name*) that you used to catalog the node in the previous step.	db2node	

Step 3. If you are using a UNIX client, set up the instance environment and invoke the DB2 command line processor. Run the start-up script as follows:

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

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

Step 4. Catalog the database by entering the following commands:

```
catalog database database_name as database_alias at node node_name
terminate
```

For example, to catalog a remote database called *sample* so that it has the alias *tor1*, on the node *db2node*, enter the following commands:

```
catalog database sample as tor1 at node db2node
terminate
```

If you need to change values that were set with the **catalog** *database* command, perform the following steps:

Step a. Run the **uncatalog** *database* command as follows:

```
uncatalog database database_alias
```

Step b. Recatalog the database with the value that you want to use.

Step 3. Test the Client-to-Server Connection

When you have finished configuring the client for communications, perform the following steps to test the connection:

You will need to connect to a remote database to test the connection.

Step 1. Start the database manager by entering the **db2start** command on the server (if it was not automatically started at boot time).

Step 2. Enter the following command to connect the client to the remote database:

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

The values for *userid* and *password* must be valid for the system on which they are authenticated. By default, authentication takes place on the server for a DB2 server and on the host or AS/400 machine for a DB2 Connect server.

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

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

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

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

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

Troubleshooting the Client-to-Server Connection

If the connection fails, check the following items:

At the *server*:

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

Check the settings for the *db2comm* registry value by entering the **db2set DB2COMM** command. For more information, refer to the *Administration Guide*.

__ 2. The `services` file was updated correctly.

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

__ 4. The security service was started. Enter the **net start db2ntsecserver** command (for Windows NT servers only).

__ 5. The database was created and cataloged properly.

__ 6. The database manager was stopped and started again (enter the **db2stop** and **db2start** commands on the server).

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

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

At the *client*:

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

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

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

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

__ 5. The database was cataloged properly, using the *server's* database alias (*database_alias*) that was cataloged when the database was created on the server, as the database name (*database_name*) on the client.

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

Part 6. Using DB2 Connect

Chapter 15. Running Your Own Applications

Various types of applications can access DB2 databases:

- Applications developed using the DB2 Software Developer's Kit 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:

1. Ensure the server is configured and running.

   Be sure 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.
2. Ensure that you can connect to the database that the application uses.
3. Bind the utilities and the applications to the database. See "Binding Database Utilities" for information about binding the utilities.
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`). Each file is specific to a server.

Binding to Host Databases

To bind the utilities and applications to the DRDA server, connect to the DRDA server and use commands similar to the following:

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

where *path* corresponds to the *DB2PATH* registry value. These commands are described in detail in the *DB2 Connect User's Guide*.

Running CLI/ODBC Programs

The DB2 Call Level Interface (CLI) run-time environment and the DB2 CLI/ODBC driver are included with DB2 clients as optional components during install.

This support enables applications developed using ODBC and DB2 CLI APIs to work with any DB2 server. DB2 CLI application development support is provided by the DB2 Software Developer's Kit (DB2 SDK) 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 173 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. (Your local system is represented by **Local** icon.) If you do not have access to this program you can use the **catalog** command in the command line processor.

Step 2. On all platforms other than OS/2 the DB2 CLI/ODBC driver is an optional component during the DB2 client install. 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.

Step 3. To access the DB2 database from ODBC:

a. The ODBC Driver Manager (From Microsoft or other vendor) must already be installed (this is done by default during the installation of DB2 only on 32-bit Windows systems).

b. The DB2 databases must be registered as ODBC data sources. The ODBC driver manager does not read the DB2 catalog information; instead it references its own list of data sources.

c. If a DB2 table does not have a unique index then many ODBC applications will open it as read-only. A unique index should be created for each DB2 table that is to be updated by an ODBC application. Refer to the **CREATE INDEX** statement in the *SQL Reference*. Using the Control Center you would alter the settings of the table, then select the **Primary Key** tab and move one or more columns from the available columns list over to the primary key columns list. Any column you select as part of the primary key must be defined as NOT NULL.

Step 4. If necessary, you can set various CLI/ODBC Configuration Keywords to modify the behavior of DB2 CLI/ODBC and the applications using it.

If you followed the above steps to install ODBC support, and added DB2 databases as ODBC data sources, your ODBC applications will now be able to access them.

After the platform specific instructions there are further details on the following topics:

- "How to Bind the DB2 CLI/ODBC Driver to the Database" on page 182
- "How to Set CLI/ODBC Configuration Keywords" on page 182
- "Configuring db2cli.ini" on page 183

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 176
- "OS/2 Client Access to DB2 using CLI/ODBC" on page 178
- "UNIX Client Access to DB2 using CLI/ODBC" on page 180

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 on-line 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.

To verify that they both exist on the machine:

a. Run the Microsoft ODBC Administrator from the icon in the Control Panel, or issue the appropriate command from the command line: **odbcad32.exe.**
b. Click on the **ODBC 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 an appendix in the *Installation and Configuration Supplement* online manual.

   For information on manually editing this file (`db2cli.ini`), see "Configuring db2cli.ini" on page 183.

Step 5. If you have installed ODBC access (as described above), you can now access DB2 data using ODBC applications. Start the ODBC application and go to the Open window. Select the **ODBC databases** file type. The DB2 databases that you added as ODBC data sources will be selectable from the list. Many ODBC applications will open the table as read-only unless a unique index exists.

If you require additional information at this point you can refer to the following topics in "Detailed Configuration Information" on page 182:

- "How to Bind the DB2 CLI/ODBC Driver to the Database" on page 182
- "How to Set CLI/ODBC Configuration Keywords" on page 182
- "Configuring db2cli.ini" on page 183

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 on-line 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 an appendix in the *Installation and Configuration Supplement* manual.

      For information on manually editing this file (`db2cli.ini`), see "Configuring db2cli.ini" on page 183.

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.

If you require additional information at this point you can refer to the following topics in "Detailed Configuration Information" on page 182:

- "How to Bind the DB2 CLI/ODBC Driver to the Database" on page 182
- "How to Set CLI/ODBC Configuration Keywords" on page 182
- "Configuring db2cli.ini" on page 183

UNIX Client Access to DB2 using CLI/ODBC

Before DB2 CLI and ODBC applications can successfully access a DB2 database from a UNIX client, perform the following steps on the client system:

1. The DB2 database (and node if the database is remote) must be cataloged. To do so, use the command line processor.

   For more information see "Chapter 14. Configuring Client-to-Server Communications Using the Command Line Processor" on page 161 or the **CATALOG DATABASE** and **CATALOG NODE** commands in the *Command Reference*.

2. The DB2 CLI/ODBC driver is an optional component during the DB2 client install. Be sure it is selected at that point.

3. If you are using ODBC applications to access DB2 data, perform the following steps. (If you are using only CLI applications, skip this step and go to the next step.)

   a. When using an ODBC application you must ensure that an ODBC Driver Manager is installed and that each user that will use ODBC has access to it. DB2 does not install an ODBC Driver Manager, you must use the ODBC Driver Manager that was supplied with your ODBC client application or ODBC SDK in order to access DB2 data using that application.

   b. The Driver Manager uses two initialization files.

      odbcinst.ini ODBC Driver Manager's configuration file indicating which database drivers are installed. Each user that will use ODBC must have access to this file.

      .odbc.ini End-user's data source configuration. Each user ID has a separate copy of this file in their home directory. Note that the file starts with a dot.

      Setting up odbcinst.ini

      The settings in this file impact all of the ODBC drivers on the machine.

      Use an ASCII editor to update this file. It must have a stanza (section) called [IBM DB2 ODBC DRIVER], with a line starting with ″Driver″ indicating the full path to the DB2 ODBC driver (`db2.o`). For example, if the home directory of your end user is `/u/thisuser/` and the `sqllib` directory is installed there, then the correct entry would be:

      ```
      [IBM DB2 ODBC DRIVER]
      Driver=/u/thisuser/sqllib/lib/db2.o
      ```

      Setting up odbc.ini

The settings in this file are associated with a particular user on the machine; different users can have different odbc.ini files.

The .odbc.ini file must exist in the end user's home directory (note the dot at the start of the file name). Update this file, using an ASCII editor, to reflect the appropriate data source configuration information. To register a DB2 database as an ODBC data source there must be one stanza (section) for each DB2 database.

The .odbc.ini file must contain the following lines:

- in the [ODBC Data Source] stanza:

  ```
  SAMPLE=IBM DB2 ODBC DRIVER
  ```

  Indicates that there is a data source called SAMPLE that used the IBM DB2 ODBC DRIVER.

- in the [SAMPLE] stanza:

  ```
  [SAMPLE]
  Driver=/u/thisuser/sqllib/lib/db2.o
  Description=Sample DB2 ODBC Database
  ```

  Indicates that the SAMPLE database is part of the DB2 instance located in the directory /u/thisuser.

- in the [ODBC] stanza:

  ```
  InstallDir=/u/thisuser/sqllib/odbclib
  ```

  Indicates that /u/thisuser/sqllib/odbclib should be treated as the location where ODBC is installed.

- Ensure that the InstallDir correctly points to the ODBC Driver Manager location.

  For example, if the ODBC Driver Manager has been installed in /opt/odbc, the [ODBC] stanza would look like:

  ```
  [ODBC]
  Trace=0
  TraceFile=odbctrace.out
  InstallDir=/opt/odbc
  ```

See the sample file in the sqllib/odbclib subdirectory for an example. You can also see "How to Configure ODBC.INI" on page 183 for more detailed information.

Once the .ini files are set up you can run your ODBC application and access DB2 databases. Refer to the documentation that comes with your ODBC application for additional help and information.

4. Configure the DB2 CLI/ODBC driver (Optional).

There are various keywords and values that can be used to modify the behavior of DB2 CLI/ODBC and the applications using it. The keywords are associated with the database *alias name*, and affect all DB2 CLI/ODBC applications that access the database.

For information on manually editing this file (`db2cli.ini`), see "Configuring db2cli.ini" on page 183. For information about the specific keywords see the *CLI Guide and Reference*.

If you require additional information at this point you can refer to the following topics in "Detailed Configuration Information":

- "How to Bind the DB2 CLI/ODBC Driver to the Database"
- "How to Set CLI/ODBC Configuration Keywords"
- "Configuring db2cli.ini" on page 183

Detailed Configuration Information

The section "Platform Specific Details for CLI/ODBC Access" on page 175 should provide you with all of the information you require. The following additional information is useful where DB2 tool support is not available, and for administrators who require more detailed information.

The following topics are covered in this section:

- "How to Bind the DB2 CLI/ODBC Driver to the Database"
- "How to Set CLI/ODBC Configuration Keywords"
- "Configuring db2cli.ini" on page 183

How to Bind the DB2 CLI/ODBC Driver to the Database

The CLI/ODBC driver will autobind on the first connection to the database, provided the user has the appropriate privilege or authorization. The administrator may want to perform the first connect or explicitly bind the required files.

See "Binding Database Utilities" on page 173 for more information.

How to Set CLI/ODBC Configuration Keywords

DB2 CLI can be configured further by using either the CCA or the DB2 Client Setup administration tool, whichever is applicable for your platform, or by manually editing the `db2cli.ini` file.

This file contains various keywords and values that can be used to modify the behavior of DB2 CLI and the applications using it. The keywords are associated with the database *alias name*, and affect all DB2 CLI and ODBC applications that access the database.

By default, the location of the CLI/ODBC configuration keyword file is located in the `sqllib` directory on Intel platforms, and in the `sqllib/cfg` directory of the database instance running the CLI/ODBC applications on UNIX platforms.

The environment variable *DB2CLIINIPATH* can also be used to override the default and specify a different location for the file.

The configuration keywords enable you to:

- Configure general features such as data source name, user name, and password.
- Set options that will affect performance.
- Indicate query parameters such as wild card characters.
- Set patches or work-arounds for various ODBC applications.
- Set other, more specific features associated with the connection, such as code pages and IBM Graphic data types.

For a complete description of all the keywords and their usage, refer to the *Installation and Configuration Supplement*.

Configuring db2cli.ini: The `db2cli.ini` initialization file is an ASCII file which stores values for the DB2 CLI configuration options. A sample file is shipped to help you get started. Refer to the *CLI Guide and Reference* for information on each keyword.

See "Platform Specific Details for CLI/ODBC Access" on page 175 for more information on how to modify this file on your platform.

How to Configure ODBC.INI

Microsoft's 16-bit ODBC Driver Manager and all non-Microsoft ODBC Driver Managers use the `odbc.ini` file to record information about the available drivers and data sources. ODBC Driver Managers on UNIX platforms also uses the `odbcinst.ini` file. Although the necessary files are updated automatically by the tools on most platforms, users of ODBC on UNIX platforms will have to edit them manually. The file `odbc.ini` (and `odbcinst.ini` where required) are located:

UNIX Home directory of the user ID running the ODBC application (on UNIX the odbc.ini file name has a dot before it: .odbc.ini)

It is also possible to modify this file manually. Do not change any of the existing entries in the file. To edit this file manually perform the following steps:

Step 1. Use an ASCII editor to edit the `odbc.ini` file.

The following is an example odbc.ini file:

```
[ODBC Data Sources]
MS Access Databases=Access Data (*.mdb)

[MS Access Databases]
Driver=D:\WINDOWS\SYSTEM\simba.dll
FileType=RedISAM
SingleUser=False
UseSystemDB=False
```

The [ODBC Data Sources] section lists the name of each available data source and the description of the associated driver.

For each data source listed in the [ODBC Data Sources] section, there is a section that lists additional information about that data source. These are called the *Data Source Specification* sections.

Step 2. Under the `[ODBC DATA SOURCE]` entry, add the following line:

database_alias`=IBM DB2 ODBC DRIVER`

where *database_alias* is the alias of the database cataloged in the database directory (the database name used by the command line processor CONNECT TO statement).

Step 3. Add a new entry in the Data Source Specification section to associate the data source with the driver:

```
[database_alias]
Driver=x:\windows\system\db2cliw.dll
```

where:

- *database_alias* is the alias of the database cataloged in the database directory, and listed under the Data Source Specification section.
- *x:* is the drive where the Windows operating system is installed.

The following shows the example file with the IBM data source entries added:

```
[ODBC Data Sources]
MS Access Databases=Access Data (*.mdb)
SAMPLE=IBM DB2 ODBC DRIVER

[MS Access Databases]
Driver=D:\WINDOWS\SYSTEM\simba.dll
FileType=RedISAM
SingleUser=False
UseSystemDB=False
```

```
[SAMPLE]
Driver=D:\WINDOWS\SYSTEM\db2cliw.dll
Description=Sample DB2 Client/Server database
```

UNIX Configuration of .ini files

The section "UNIX Client Access to DB2 using CLI/ODBC" on page 180 contains detailed steps on how to update both the `odbc.ini` and `odbcinst.ini` files.

Running Java Programs

You can develop Java programs to access DB2 databases with the appropriate Java Development Kit (JDK) on AIX, HP-UX, Linux, OS/2, Silicon Graphics IRIX, Solaris, 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 Software Developer's Kit (DB2 SDK) 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 SDK 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 SDK 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 see *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 Page at:

`http://www.software.ibm.com/data/db2/java`

Configuring the Environment

To build and run DB2 Java programs, you need to install and configure the appropriate version of the Java Development Kit (JDK) on your development machine:

AIX: The Java Development Kit (JDK) Version 1.1.2 for AIX from IBM.

HP-UX:
The HP-UX Developer's Kit for Java Release 1.1.3 or later from Hewlett-Packard.

Linux: The Java Development Kit (JDK) 1.1.7, Version 1a or later for Linux from the Blackdown Organization.

OS/2: The Java Development Kit (JDK) Version 1.1.4 for OS/2 from IBM.

Silicon Graphics IRIX:
The Java Development Environment 3.1 (Sun JDK 1.1.5) and the Java Execution Environment 3.1 (Sun JRE 1.1.5) from Silicon Graphics, Inc.

Solaris:
The Java Development Kit (JDK) Version 1.1.4 for Solaris, and the Solaris Native Thread pack, from Sun Microsystems.

Windows 32-bit operating systems
The Java Development Kit (JDK) Version 1.1 for Win32 from Sun Microsystems.

For information on installing and configuring any of the above JDKs, please refer to:

`http://www.software.ibm.com/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:

```
db2 update dbm cfg using JDK11_PATH /home/smith/jdk11
```

where /home/smith/jdk11 is the path where the JDK version 1.1 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, 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.software.ibm.com/data/db2/java/v5/faq.html
```

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, Silicon Graphics IRIX, and Solaris: LD_LIBRARY_PATH includes the directory sqllib/lib; on HP-UX: SHLIB_PATH includes the directory sqllib/lib
- On Solaris 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 CAE to communicate the requests to the server and receive the results.

An SQLJ application must be bound to the database before it is run.

Java Applets

Because Java applets are delivered over the web, a web server must be installed on your DB2 machine (server or client).

To run your applet, make sure your `.html` file is properly configured. Start the JDBC applet server on the TCP/IP port specified in the `.html` file. For example, if you specified:

```
param name=port value='6789'
```

then you would enter:

```
db2jstrt 6789
```

You must ensure that your working directory is accessible to your web browser. If it is not, copy your applet's `.class` and `.html` files into a directory that is accessible. For SQLJ applets, you must also copy the profile `.class` and `.ser` files as well.

Copy the `sqllib/java/db2java.zip` file into the same directory as these other files. For SQLJ applets, also copy the `sqllib/java/runtime.zip` file into this directory. Then on your client machine start your web browser (which supports JDK 1.1) and load the `.html` file.

When your applet calls the JDBC API to connect to DB2, the JDBC driver establishes separate communications with the DB2 database through the JDBC applet server residing on the DB2 server.

An SQLJ applet must be bound to the database before it is run.

Part 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 Software Registration Tool".
- "Starting the Client Configuration Assistant".
- "Starting the Control Center" on page 194.
- "Entering Commands Using the Command Center" on page 195.
- "Entering Commands Using the Command Line Processor" on page 196.
- "Working with the System Administrative Group" on page 198.

Starting the Software Registration Tool

Start the Software Registration Tool as follows:

OS/2 Click on **OS/2 Warp** and select **DB2 for OS/2–>Registration**

Windows 9x or Windows NT
Click on **Start** and select **Programs->DB2 for Windows->Registration**

UNIX DB2 software registration is handled automatically if you installed your DB2 product from CD-ROM using the DB2 Installer program. If you installed DB2 using your UNIX operating system's native installation tools, you must enter the **db2licm** command to register DB2. See the *Command Reference* for further information.

Starting the Client Configuration Assistant

Start the Client Configuration Assistant (CCA) as follows:

OS/2 Click on **OS/2 Warp**, and select **DB2 for OS/2–>Client Configuration Assistant**

Windows 9x or Windows NT
Click on **Start** and select **Programs->DB2 for Windows->Client Configuration Assistant**

You can also start the CCA by entering the **db2cca** command at a command prompt.

Starting the Control Center

Start the Control Center in one of the following ways:

On OS/2

- Enter the **db2cc** command at a command prompt.

  or

- Click on the **OS/2 Warp** button and select **DB2 for OS/2–>Control Center**.

  Note: You must have the prerequisite Java Runtime Environment (JRE) level to launch the Control Center using this command. For more information, refer to the Control Center readme, which can be found in the `x:\sqllib\cc\prime` directory, where *x:* is drive where you installed your DB2 product.

On UNIX

- Enter the **db2cc** command at a command prompt.

  Note: You must have the prerequisite Java Runtime Environment (JRE) level to launch the Control Center using this command. For more information, refer to the Control Center README, which can be found in the *INSTHOME*`/sqllib/cc/prime` directory, where *INSTHOME* is the home directory of the instance owner.

On Windows 9x or Windows NT

- Enter the **db2cc** command at a command prompt.

  or

- Click on **Start** and select **Programs->DB2 for Windows->Control Center**.

You can also run the Control Center as an applet through a web browser. For more information, refer to the Control Center readme, which can be found in the `x:\sqllib\cc\prime` directory, where *x:* is drive where you installed your DB2 product.

Entering Commands Using the Command Center

This section describes how to enter commands using the Command Center. The Command Center provides an interactive window to:

- 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. You do this by invoking Visual Explain in the interactive window.
- 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.

Start the Command Center in one of the follows ways:

- Click on the **Command Center** icon in the Control Center.
- Enter the **db2cctr** command.

  Note: You must have the prerequisite Java Runtime Environment (JRE) level to launch the Command Center using this command.
- Launch the Command Center from the toolbar as follows:

  On Windows 9x or Windows NT

  – Click on the **Start** button and select **Programs->DB2 for Windows->Command Center**.

  On OS/2

  – Click on the **OS/2 Warp** button and select **DB2 for OS/2 –>Command Center**.

The Command Center contains a large input area in which you enter your commands. To run the commands you have entered, click on the **Execution** icon (the gears icon), or press **CTRL+Enter**.

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 then **Enter** key to start the next command on a new line. The default termination character is a semicolon (;). To specify a different termination character, click on the **Tools Settings** icon in the menu toolbar.

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 **Execution** icon (or pressed **CTRL+Enter**), the Command Center switches to the Results window which informs you how the commands are proceeding.

To recall commands that you have entered, select the **Script** Tab, click on the drop down box, and select a command.

To save commands as scripts, select **Script->Save as** from the menu bar. For more information, click on the **Help** push button or press the **F1** key.

If you want to store commonly used SQL statements or DB2 commands as scripts, click on the **Script Center** icon from the main tool bar. 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:

Command Line Mode
: 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 Command Line Mode) 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*.

Command Line Mode

To invoke a DB2 Command window, do the following:

OS/2 Click on **OS/2 Warp**, and select **DB2 for OS/2->Command Line Processor**, or open any command window.

Windows 9x or Windows NT
Click on **Start** and select **Programs->DB2 for Windows->Command Window**

You can also invoke the DB2 command window by entering the **db2cmd** command at an MS-DOS prompt.

UNIX Open any operating system command window.

If you are entering commands via the Command Window, you must include the db2 prefix. For example:

```
db2 list database directory
```

If the DB2 command contains characters that have special meaning on the operating system you are using, you will need to enter the command in quotation marks to ensure that it is run properly.

For example, the following command would retrieve all the information from the *employee* table, even if the * character has a special meaning on the operating system:

```
db2 "select * from employee"
```

If you need to enter a long command that does not fit on one line, use the line continuation character, \. When you have reached the end of the line, press the **Enter** key to continue entering the command on the next line. 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 **DB2 for OS/2–>Command Line Processor** or enter the **db2** command.

Windows 9x or Windows NT
Click on **Start**, and select **Programs->DB2 for Windows->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 an MS-DOS prompt.

UNIX Enter the **db2** command from the command line processor

In interactive input mode, the prompt looks like this:

```
db2 =>
```

In interactive input mode, you do not have to enter DB2 commands with a db2 prefix; instead, you just enter the DB2 command. For example:

```
db2 => list database directory
```

To enter operating system commands in interactive mode, precede the operating-system command with an exclamation mark (!). For example:

```
db2 => !dir
```

If you need to enter a long command that does not fit on one line, use the line continuation character, \. When you have reached the end of the line, press the **Enter** key to continue entering the command on the next line. For example:

```
db2 => select empno, function, firstname, lastname, birthdate, from \
db2 (cont.) => employee where function='service' and \
db2 (cont.) => firstname='Lily' order by empno desc
```

To end interactive input mode, enter the **quit** command.

For more information on advanced topics using the CLP, refer to the *Command Reference*.

Working with the System Administrative Group

By default, System Administrative (SYSADM) authority is granted to the following:

UNIX Any valid DB2 username that belongs to the primary group of the instance owner's user ID.

For information on how to change the default SYSADM settings and how to assign this authority to a different user or set of users, refer to the *Administration Guide.*

Appendix B. Migrating from Previous Versions and Releases

This section describes how to migrate previous versions of DB2 to the Version 6 format.

DB2 Universal Database Version 6 supports the migration of DB2 Version 2.x, Database Server Version 4x, and DB2 Version 5.x to a format usable by DB2 Version 6.

Migrating from Previous Versions of DB2

This section describes how to migrate instances, which is required if you have upgraded to DB2 Connect Enterprise Edition from an earlier version of DB2 Connect Enterprise Edition on a UNIX system.

Note: At this point, you must have DB2 Connect Version 6 installed on your system.

This section describes the steps required to migrate either a DB2 Common Server Version 2.x, a Database Server Version 4.x, or a DB2 Universal Database Version 5.x database system to a Version 6 database system.

The migration process for Database Server Version 4 is identical to that used for DB2 Common Server Version 2. Whenever Version 2 is mentioned in this section, the same information also applies to Version 4.

DB2 migration involves the following procedures:

- "Migrating Instances".

To avoid difficulties during database migration, read this entire appendix before starting the migration process.

Migrating Instances

This procedure describes how to migrate DB2 instances that were created using a previous version of DB2.

Before you can migrate an instance to use the latest version of DB2, you must install DB2 Version 6 on your system.

If there are several DB2 instances using previous versions of DB2, you do not need to migrate all of these instances at this time. Instances that are not migrated will continue to use previous versions of DB2.

Each DB2 instance must be migrated separately. To successfully migrate a DB2 instance, perform the following steps:

Step 1. Prepare the DB2 instance for migration.

Step 2. Verify that the databases can be migrated. There are also migration considerations you should take into account if you are using the Version 2 user exit program.

Step 3. Migrate the DB2 instance.

If you want to migrate several instances, you must repeat these steps for each instance.

Step 1. Prepare the DB2 Instance for Migration

Before you can migrate a DB2 instance, all applications using any databases owned by this instance must be completed. To prepare a DB2 instance for migration, perform the following steps:

Step 1. Log in as the DB2 instance owner.

Step 2. Ensure that there are no applications using any databases owned by this DB2 instance. To get a list of all applications owned by the instance, enter the **db2 list applications** command.

You can end a session by entering the **db2 terminate** command. It is not recommended to force termination of applications using the **db2 force applications all** command, since some applications may have unexpected behavior when terminated using this command. See the *Command Reference* for usage and details of this command.

Step 3. When all applications are complete, stop all database server processes owned by the DB2 instance by entering the **db2stop** command.

Step 4. Stop the DB2 license daemon by entering the **db2licm end** command.

Step 5. Stop all command line processor sessions by entering the **db2 terminate** command in each session that was running the command line processor.

Step 6. Enter the **db2_kill** command to clean up any remaining DB2 resources.

Step 7. Log off.

The DB2 instance is now ready for migration.

Step 3. Migrate the DB2 Instance

After an instance is ready for migration, use the **db2imigr** command to migrate the instance as follows:

1. Log in as user with root authority.

If the *library_path* environment variable is set to `/usr/lib` on AIX or `/opt/lib` on HP-UX, or Solaris, and there is a link in `/usr/lib` or `/opt/lib` to the Version 6 `libdb2` shared library, this can cause an error when using the **db2imigr** command. To fix the error, you should reset the *library_path* environment variable so that it does not reference the libraries in those paths by entering the following command:

```
unset library_path
```

where *library_path* represents:

- *LIBPATH* on AIX
- *SHLIB_PATH* on HP-UX
- *LD_LIBRARY_PATH* on Solaris

After migrating the DB2 instance, you should reset *LIBPATH* to its original setting.

2. Run the **db2imigr** command as follows:

```
DB2DIR/instance/db2imigr [-d] [-a AuthType] [-u fencedID] InstName
```

where *DB2DIR* = /usr/lpp/db2_06_01 on AIX
= /opt/IBMdb2/V6.1 on HP-UX, Solaris, or SGI IRIX

and where:

-d Sets the debug mode that you can use for problem determination. This parameter is optional.

-a *AuthType*
Specifies the authentication type for the instance. Valid authentication types are (SERVER), (CLIENT), and (DCS). If the *-a* parameter is not specified, the authentication type defaults to (SERVER), if a DB2 server is installed. Otherwise, the *AuthType* is set to (CLIENT). This parameter is optional.

Notes:

a. The authentication type of the instance applies to all databases owned by the instance.
b. While authentication type (DCE) is an optional parameter, it is not valid to choose (DCE) for this command.

-u *fencedID*

Is the user under which the fenced user-defined functions (UDFs) and stored procedures will execute. This parameter is optional only when a DB2 Run-Time Client is installed. It is required for all other DB2 products.

InstName

Is the login name of the instance owner.

If you are migrating a DB2 Version 2.1 or Version 5 instance, created on AIX, and the instance uses the environment variable *DB2SORT* set to a keyword *SMARTSORT*, you must set the registry value *db2sort* after the instance is migrated to Version 6. Set the *db2sort* registry value to the run time library for the sort command as follows:

```
db2set DB2SORT="/usr/lib/libsort.a"
```

Migrating the DB2 Syncpoint Manager to Version 6.0

The DB2 Syncpoint Manager Version 6 internal log formats differ from previous versions of the DB2 Syncpoint Manager. Before installing DB2 Connect Enterprise Edition Version 6 ensure there are no indoubt transactions. Refer to the *Administration Guide* for more information.

Migrating from HP-UX Version 10 to Version 11

Before you migrate databases or instances from HP-UX Version 10 to Version 11, perform the following steps:

Note: These steps must be performed before you upgrade your operating system from HP-UX Version 10 to Version 11.

Step 1. Stop all DB2 instances using the **db2stop** command.

Step 2. Stop the Administration Server using the **db2admin stop** command.

Step 3. Back up all files under the instance's `sqllib` directory and any tablespaces. Refer to the *Administration Guide* for more information.

Step 4. Back up all files under the Administration Server's `sqllib` directory, if you created an Administration Server.

Step 5. Back up the DB2 registry repository located in `/var/opt/db2/v6.1`.

Step 6. Back up or record all DB2-related entries from the `/etc/passwd`, `/etc/group`, and `/etc/services` files.

Step 7. Remove the entire DB2 product.

You can now migrate your operating system to HP-UX Version 11.

You may also want to migrate all your other non-DB2 applications at the same time. In this case, you need to perform all your pre-migration procedures at this time before the operating system is migrated. Please refer to the migration instructions that are provided with those applications for more information. DB2 pre-migration procedures should be independent of the order of your overall pre-migration plan.

After your operating system has been migrated and all your standard UNIX services are up and running, perform the following steps:

Step 1. Install DB2. For more information see "Chapter 4. Installing DB2 Connect on UNIX Systems" on page 39.

Step 2. Recreate the DB2-specific user, group and TCP services entries in the `/etc/passwd`, `/etc/group`, and `/etc/services` files.

Step 3. Restore the instance's `sqllib` directory. Refer to the *Administration Guide* for further information.

Step 4. Restore the Administration Server's `sqllib` directory. Refer to the *Administration Guide* for further information.

Step 5. Restore the DB2 registry repository to `/var/opt/db2/v6.1`. For more information refer to the *Administration Guide*.

Step 6. Update the DB2 instances that you have, one at a time. For more information refer to the *Administration Guide*.

Step 7. Update the Administration Server. For more information refer to the *Administration Guide*.

Step 8. Perform the post migration procedures.

Step 9. Start all DB2 instances and the Administration Server as required. For more information refer to the *Administration Guide*.

Appendix C. Using the Control Center to Administer DB2 for OS/390 and DB2 Connect Enterprise Edition servers

DB2 Control Center is an easy to use application provided as part of the DB2 Administration Client. The Control Center gives database administrators a powerful tool for managing DB2 Family databases. In Version 6, 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 V6.1 database servers. Version 6 of 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, 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.

Consult the *DB2 for OS/390 Program Directory* for additional information on applying service and required Function Modification Identifiers.

Using 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 catalogued on the workstation where the Control Center is running. The easiest way to accomplish this on Windows 95, 98, NT 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 click the right mouse button on the object to work with object properties or to execute actions on the object. Remember to press F1 to display help as you work.

Appendix D. db2cpic.dll - Extended SNA Security Codes on Windows NT and Windows 95

Extended SNA Security Codes were not implemented by some SNA subsystem providers. This may affect customers using one or more of the following:

- DB2 Universal Database (UDB) for Windows NT Version 5 (all editions).
- DB2 Connect Enterprise Edition for Windows NT Version 5
- DB2 Connect Personal Edition Version 5 (when running on Windows 95 or Windows NT).

A new DLL, called db2cpic2.dll has been provided in order to support Extended SNA Security Codes in these environments. The new DLL was originally packaged with FixPak 1 for DB2 Universal Database Version 5. It is identical to the original DLL db2cpic.dll, except that it includes a call to extract secondary information (cmesi()).

Table 22. Which version of db2cpic.dll to use?

If you have this SNA subsystem	On Windows NT use	On Windows 95 use
IBM Communications Server for Windows NT	db2cpic2.dll (new)	db2cpic.dll (old)
IBM Personal Communications for Windows (also Integrated SNA Support provided with DB2 Connect Personal Edition)	db2cpic2.dll	db2cpic.dll
Microsoft SNA Server	db2cpic.dll	db2cpic.dll

If DB2 fails to load db2cpic2.dll, you can do the following in the directory where it has been installed:

```
copy db2cpic2.dll db2cpic2.bak
copy db2cpic.dll db2cpic2.dll
```

This will make db2cpic2.dll the same as db2cpic.dll.

Note: If you wish to use Extended Security Support with DB2 UDB Version 5.0 on Windows 95, we recommend using IBM Personal Communications (PComm) for Windows 95 Version 4.2 (not Version 4.1). Copy db2cpic.dll to db2cpic.bak and copy db2cpic2.dll to db2cpic.dll. This will make db2cpic.dll the same as db2cpic2.dll.

Appendix E. How the DB2 Library Is Structured

The DB2 Universal Database library consists of SmartGuides, online help, books and sample programs in HTML format. This section describes the information that is provided, and how to access it.

To access product information online, you can use the Information Center. You can view task information, DB2 books, troubleshooting information, sample programs, and DB2 information on the Web. See "Accessing Information with the Information Center" on page 222 for details.

Completing Tasks with SmartGuides

SmartGuides help you complete some administration tasks by taking you through each task one step at a time. SmartGuides are available through the Control Center and the Client Configuration Assistant. The following table lists the SmartGuides.

Note: Create Database, Index, and Configure Multisite Update SmartGuide are available for the partitioned database environment.

SmartGuide	Helps You to...	How to Access...
Add Database	Catalog a database on a client workstation.	From the Client Configuration Assistant, click **Add**.
Back up Database	Determine, create, and schedule a backup plan.	From the Control Center, click with the right mouse button on the database you want to back up and select **Backup**->**Database using SmartGuide**.
Configure Multisite Update SmartGuide	Perform a multi-site update, a distributed transaction, or a two-phase commit.	From the Control Center, click with the right mouse button on the **Database** icon and select **Multisite Update**.
Create Database	Create a database, and perform some basic configuration tasks.	From the Control Center, click with the right mouse button on the **Databases** icon and select **Create**->**Database using SmartGuide**.

SmartGuide	Helps You to...	How to Access...
Create Table	Select basic data types, and create a primary key for the table.	From the Control Center, click with the right mouse button on the **Tables** icon and select **Create->Table using SmartGuide**.
Create Table Space	Create a new table space.	From the Control Center, click with the right mouse button on the **Table spaces** icon and select **Create->Table space using SmartGuide**.
Index	Advise which indexes to create and drop for all your queries.	From the Control Center, click with the right mouse button on the **Index** icon and select **Create->Index using SmartGuide**.
Performance Configuration	Tune the performance of a database by updating configuration parameters to match your business requirements.	From the Control Center, click with the right mouse button on the database you want to tune and select **Configure using SmartGuide**.
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, click with the right mouse button on the database you want to restore and select **Restore->Database using SmartGuide**.

Accessing Online Help

Online help is available with all DB2 components. The following table describes the various types of help. You can also access DB2 information through the Information Center. For information see "Accessing Information with the Information Center" on page 222.

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* is 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.

Type of Help	Contents	How to Access...
Control Center Help *Client Configuration Assistant Help* *Event Analyzer Help* *Command Center Help*	Explains the tasks you can perform in a window or notebook. The help includes prerequisite information you need to know, and 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* is 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* is the file where you want to save the message help.

SQL Help	Explains the syntax of SQL statements.	From the command line processor in interactive mode, enter: `help statement` where *statement* is 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* is a valid five-digit SQL state and *class-code* is 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.

DB2 Information – Hardcopy and Online

The table in this section lists the DB2 books. They are divided into two groups:

Cross-platform books
These books contain the common DB2 information for all platforms.

Platform-specific books
These books are for DB2 on a specific platform. For example, there are separate *Quick Beginnings* books for DB2 on OS/2, on Windows NT, and on the UNIX-based platforms.

Cross-platform sample programs in HTML
These samples are the HTML version of the sample programs that are installed with the SDK. They are for informational purposes and do not replace the actual programs.

Most books are available in HTML and PostScript format, or you can choose to order a hardcopy from IBM. The exceptions are noted in the table.

On OS/2 and Windows platforms, HTML documentation files can be installed under the doc\html subdirectory. Depending on the language of your system, some files may be in that language, and the remainder are in English.

On UNIX platforms, you can install multiple language versions of the HTML documentation files under the doc/%L/html subdirectories. Any documentation that is not available in a national language is shown in English.

You can obtain DB2 books and access information in a variety of different ways:

View	See “Viewing Online Information” on page 221.
Search	See “Searching Online Information” on page 224.
Print	See “Printing the PostScript Books” on page 224.
Order	See “Ordering the Printed Books” on page 225.

Name	Description	Form Number File Name for Online Book	HTML Directory
	Cross-Platform Books		
Administration Guide	*Administration Guide, Design and Implementation* contains information required to design, implement, and maintain a database. It also describes database access using the Control Center(whether local or in a client/server environment), auditing, database recovery, distributed database support, and high availability. *Administration Guide, Performance* contains information that focuses on the database environment, such as application performance evaluation and tuning. You can order both volumes of the *Administration Guide* in the English language in North America using the form number SBOF-8922.	Volume 1 SC09-2839 db2d1x60 Volume 2 SC09-2840 db2d2x60	db2d0
Administrative API Reference	Describes the DB2 application programming interfaces (APIs) and data structures you can use to manage your databases. Explains how to call APIs from your applications.	SC09-2841 db2b0x60	db2b0
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. This book combines the *Building Applications* books for the OS/2, Windows, and UNIX-based environments.	SC09-2842 db2axx60	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. **Note:** Available in HTML format only.	No form number db2apx60	db2ap

Name	Description	Form Number File Name for Online Book	HTML Directory
Application Development Guide	Explains how to develop applications that access DB2 databases using embedded SQL or JDBC, how to write stored procedures, user-defined types, user-defined functions, and how to use triggers. It also discusses programming techniques and performance considerations. This book was formerly known as the *Embedded SQL Programming Guide*.	SC09-2845 db2a0x60	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.	SC09-2843 db2l0x60	db2l0
Command Reference	Explains how to use the command line processor, and describes the DB2 commands you can use to manage your database.	SC09-2844 db2n0x60	db2n0
Data Movement Utilities Guide and Reference	Explains how to use the Load, Import, Export, Autoloader, and Data Propogation utilities to work with the data in the database.	SC09-2858 db2dmx60	db2dm
DB2 Connect Personal Edition Quick Beginnings	Provides planning, installing, and configuring information for DB2 Connect Personal Edition.	GC09-2830 db2c1x60	db2c1
DB2 Connect User's Guide	Provides concepts, programming and general usage information about the DB2 Connect products.	SC09-2838 db2c0x60	db2c0
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, and on how to use DRDA application servers with DB2 Connect application requesters. **Note:** Available in HTML and PostScript formats only.	No form number db2h1x60	db2h1
Glossary	Provides a comprehensive list of all DB2 terms and definitions. **Note:** Available in HTML format only.	No form number db2t0x50	db2t0

Name	Description	Form Number File Name for Online Book	HTML Directory
Installation and Configuration Supplement	Guides you through the planning, installation, and set up of platform-specific DB2 clients. This supplement contains information on binding, setting up client and server communications, DB2 GUI tools, DRDA AS, distributed installation, and the configuration of distributed requests and access methods to heterogeneous data sources.	GC09-2857 db2iyx60	db2iy
Message Reference	Lists messages and codes issued by DB2, and describes the actions you should take.	GC09-2846 db2m0x60	db2m0
Replication Guide and Reference	Provides planning, configuration, administration, and usage information for the IBM Replication tools supplied with DB2.	SC26-9642 db2e0x60	db2e0
SQL Getting Started	Introduces SQL concepts, and provides examples for many constructs and tasks.	SC09-2856 db2y0x60	db2y0
SQL Reference, Volume 1 and Volume 2	Describes SQL syntax, semantics, and the rules of the language. 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-8923.	SBOF-8923 Volume 1 db2s1x60 Volume 2 db2s2x60	db2s0
System Monitor Guide and Reference	Describes how to collect different kinds of information about databases and the database manager. Explains how to use the information to understand database activity, improve performance, and determine the cause of problems.	SC09-2849 db2f0x60	db2f0
Troubleshooting Guide	Helps you determine the source of errors, recover from problems, and use diagnostic tools in consultation with DB2 Customer Service.	S10J-8169	db2p0

Name	Description	Form Number File Name for Online Book	HTML Directory
What's New	Describes the new features, functions, and enhancements in DB2 Universal Database, Version 6.0, including information about Java-based tools.	SC09-2851 db2q0x60	db2q0
	Platform-Specific Books		
Administering Satellites Guide and Reference	Provides planning, configuration, administration, and usage information for satellites.	GC09-2821 db2dsx60	db2ds
DB2 Personal Edition Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database Personal Edition on the OS/2, Windows 95, and Windows NT operating systems.	GC09-2831 db2i1x60	db2i1
DB2 for OS/2 Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database on the OS/2 operating system. Also contains installing and setup information for many supported clients.	GC09-2834 db2i2x60	db2i2
DB2 for UNIX Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database on UNIX-based platforms. Also contains installing and setup information for many supported clients.	GC09-2836 db2ixx60	db2ix
DB2 for Windows NT Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database on the Windows NT operating system. Also contains installing and setup information for many supported clients.	GC09-2835 db2i6x60	db2i6
DB2 Enterprise - Extended Edition for UNIX Quick Beginnings	Provides planning, installation, and configuration information for DB2 Enterprise - Extended Edition for UNIX. Also contains installing and setup information for many supported clients.	GC09-2832 db2v3x60	db2v3

Name	Description	Form Number File Name for Online Book	HTML Directory
DB2 Enterprise - Extended Edition for Windows NT Quick Beginnings	Provides planning, installation, and configuration information for DB2 Enterprise - Extended Edition for Windows NT. Also contains installing and setup information for many supported clients.	GC09-2833 db2v6x60	db2v6
DB2 Connect Enterprise Edition for OS/2 and Windows NT Quick Beginnings	Provides planning, migration, installation, and configuration information for DB2 Connect Enterprise Edition on the OS/2 and Windows NT operating systems. Also contains installation and setup information for many supported clients. This book was formerly part of the *DB2 Connect Enterprise Edition Quick Beginnings*.	GC09-2828 db2c6x60	db2c6
DB2 Connect Enterprise Edition for UNIX Quick Beginnings	Provides planning, migration, installation, configuration, and usage information for DB2 Connect Enterprise Edition in UNIX-based platforms. Also contains installation and setup information for many supported clients. This book was formerly part of the *DB2 Connect Enterprise Edition Quick Beginnings*.	GC09-2829 db2cyx60	db2cy
DB2 Data Links Manager for AIX Quick Beginnings	Provides planning, installation, configuration, and task information for DB2 Data Links Manager for AIX.	GC09-2837 db2z0x60	db2z0
DB2 Data Links Manager for Windows NT Quick Beginnings	Provides planning, installation, configuration, and task information for DB2 Data Links Manager for Windows NT.	GC09-2827 db2z6x60	db2z6
DB2 Query Patroller Administration Guide	Provides administration information on DB2 Query Patrol.	SC09-2859 db2dwx60	db2dw
DB2 Query Patroller Installation Guide	Provides installation information on DB2 Query Patrol.	GC09-2860 db2iwx60	db2iw
DB2 Query Patroller User's Guide	Describes how to use the tools and functions of the DB2 Query Patrol.	SC09-2861 db2wwx60	db2ww

Name	Description	Form Number File Name for Online Book	HTML Directory
	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 for informational purposes (not all samples are available in all languages). Only available when the SDK is installed. See *Application Building Guide* for more information on the actual programs. **Note:** Available in HTML format only.	No form number	db2hs/c db2hs/cli db2hs/clp db2hs/cpp db2hs/cobol db2hs/cobol_mf db2hs/fortran db2hs/java db2hs/rexx

Notes:

1. The character in the sixth position of the file name indicates the language of a book. For example, the file name `db2d0e60` indicates that the *Administration Guide* is in English. The following letters are used in the file names to indicate the language of a book:

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. For late breaking information that could not be included in the DB2 books:
   - On UNIX-based platforms, see the `Release.Notes` file. This file is located in the `DB2DIR/Readme/%L` directory, where `%L` is the locale name and DB2DIR is:
     - `/usr/lpp/db2_06_01` on AIX
     - `/opt/IBMdb2/V6.1` on HP-UX, Solaris, SCO UnixWare 7, and Silicon Graphics IRIX
     - `/usr/IBMdb2/V6.1` on Linux.
   - On other platforms, see the `RELEASE.TXT` file. This file is located in the directory where the product is installed.
   - Under Windows `Start` menu

Viewing Online Information

The manuals 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 on all platforms other than SCO UnixWare 7:

- If you are running DB2 administration tools, use the Information Center. See "Accessing Information with the Information Center" on page 222 for details.
- Select the `Open Page` menu item of your Web browser. The page you open contains descriptions of and links to DB2 information:
  - On UNIX-based platforms, open the following page:

    `file:/`*`INSTHOME`*`/sqllib/doc/`*`%L`*`/html/index.htm`

    where *%L* is 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 on the **DB2 Online Books** icon. Depending on the system you are using, the icon is in the main product folder or the Windows Start menu.

To view online books or sample programs on the SCO UnixWare 7:

- DB2 Universal Database for SCO UnixWare 7 uses the native SCOhelp utility to search the DB2 information. You can access SCOhelp by the following methods:
  - entering the ″scohelp″ command on the command line,
  - selecting the `Help` menu in the Control Panel of the CDE desktop or
  - selecting `Help` in the Root menu of the Panorama desktop

  For more information on SCOhelp, refer to the *Installation and Configuration Supplement*.

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.

Depending on your system, you can access the Information Center from the:

- Main product folder
- Toolbar in the Control Center
- Windows Start menu
- Help menu of the Control Center

The Information Center provides the following kinds of information. Click the appropriate tab to look at the information:

Tasks	Lists tasks you can perform using DB2.
Reference	Lists DB2 reference information, such as keywords, commands, and APIs.
Books	Lists DB2 books.
Troubleshooting	Lists categories of error messages and their recovery actions.
Sample Programs	Lists sample programs that come with the DB2 Software Developer's Kit. If the Software Developer's Kit is not installed, this tab is not displayed.
Web	Lists 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 some search capabilities, so you can look for specific topics, and filter capabilities to limit the scope of your searches.

For a full text search, click the Search button of the Information Center follow the *Search DB2 Books* link in each HTML file.

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 by double-clicking its icon on the Windows or OS/2 desktop.

Refer to the release notes if you experience any other problems when searching the HTML information.

Note: Search function is not available in the Linux and Silicon Graphics environments.

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, use the following instructions:

1. Copy all files and subdirectories from \sqllib\doc\html on your local system to a Web server. Each book has its own subdirectory containing 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, see the NetQuestion Appendix in *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. Once you are able to view the book files, you should bookmark commonly viewed topics. Among those, 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 setting up a search, see the NetQuestion Appendix in *Installation and Configuration Supplement* book.

Searching Online Information

To search for information in the HTML books, you can do the following:

- Click on **Search the DB2 Books** at the bottom of any page in the HTML books. Use the search form to find a specific topic. This function is not available in the Linux or Silicon Graphics IRIX environments.
- Click on **Index** at the bottom of any page in an HTML book. Use the index to find a specific topic in the book.
- Display the table of contents or index of 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 222 for details.

Printing the PostScript Books

If you prefer to have printed copies of the manuals, you can decompress and print PostScript versions. For the file name of each book in the library, see the table in "DB2 Information – Hardcopy and Online" on page 214. Specify the full path name for the file you intend to print.

On OS/2 and Windows platforms:

1. Copy the compressed PostScript files to a hard drive on your system. The files have a file extension of `.exe` and are located in the `x:\doc\`*`language`*`\books\ps` directory, where x: is the letter representing the CD-ROM drive and *language* is the two-character country code that represents your language (for example, EN for English).
2. Decompress the file that corresponds to the book that you want. Each compressed book is a self-extracting executable file. To decompress the

book, simply run it as you would run any other executable program. The result from this step is a printable PostScript file with a file extension of .ps.

3. Ensure that your default printer is a PostScript printer capable of printing Level 1 (or equivalent) files.
4. Enter the following command from a command line:

   ```
   print filename.ps
   ```

On UNIX-based platforms:

1. Mount the CD-ROM. Refer to your *Quick Beginnings* manual for the procedures to mount the CD-ROM.
2. Change to /cdrom/doc/%L/ps directory on the CD-ROM, where */cdrom* is the mount point of the CD-ROM and *%L* is the name of the desired locale. The manuals will be installed in the previously-mentioned directory with file names ending with .ps.Z.
3. Decompress and print the manual you require using the following command:
   - For AIX:

     ```
     zcat filename | qprt -P PSPrinter_queue
     ```

   - For HP-UX, Solaris, or SCO UnixWare 7:

     ```
     zcat filename | lp -d PSPrinter_queue
     ```

   - For Linux:

     ```
     zcat filename | lpr -P PSPrinter_queue
     ```

   - For Silicon Graphics IRIX:

     ```
     zcat < filename | lp -d PSPrinter_queue
     ```

   where *filename* is the full path name and extension of the compressed PostScript file and *PSprinter_queue* is the name of the PostScript printer queue.

   For example, to print the English version of *DB2 for UNIX Quick Beginnings* on AIX, you can use the following command:

   ```
   zcat /cdrom/doc/en/ps/db2ixe60.ps.Z || qprt -P ps1
   ```

Ordering the Printed Books

You can order the printed DB2 manuals either as a set or individually. There are three sets of books available. The form number for the entire set of DB2 books is SBOF-8926-00. The form number for the books listed under the heading ″Cross-Platform Books″ is SBOF-8924-00.

Note: These form numbers only apply if you are ordering books that are printed in the English language in North America.

You can also order books individually by the form number listed in “DB2 Information – Hardcopy and Online” on page 214. To order printed versions, 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.

Appendix F. 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 unalike systems.
- How to customize your DB2 Connect workstation for your particular national language environment.
- How to customize your host Coded Character Set Identifier (CCSID) setting.

Language and Codeset Support for UNIX Operating Systems

DB2 supports many code sets and locales without translating the messages for the corresponding languages. Supporting a locale means that you can create and use a database in that locale, but you may have to view all panels and messages in a different language, if translated messages are not available in DB2. For a complete list of locales supported, refer to the *Administration Guide*.

If you want to operate in a different language environment, do the following:

1. Ensure that the appropriate message option for the desired language has been installed.
2. Set the *LANG* environment variable to the desired locale.

   For example, to use `fr_FR` messages on DB2 for AIX, you must have the `fr_FR` message option installed and must set *LANG* to `fr_FR`.

The selected message catalog filesets are placed in the following directories on the target workstation:

DB2 for AIX
`/usr/lpp/db2_06_01/msg/%L`

DB2 for HP-UX
`/opt/IBMdb2/V6.1/msg/%L`

DB2 for Linux
`/usr/IBMdb2/V6.1/msg/%L`

DB2 for Solaris
`/opt/IBMdb2/V6.1/msg/%L`

where *%L* is equal to the locale name of the message catalog.

Code Page and Language Support for OS/2 and Windows Operating Environments

During installation of DB2, the country, codepage, and regional settings are established. However, you can change these settings after installing DB2: including regional settings such as code page, country language (for monetary, date, and numeric formatting), and time zone. When a new connection to a database is made, the database manager uses these new values.

You must ensure that your regional settings are set correctly. DB2 may not produce the expected results if the country, code page, or regional settings are incorrect for the intended language.

Table 23 shows the languages into which the DB2 messages are translated.

Note: The code page values in the table that follows are also used as directory names on DB2 CD-ROMs. For example, a reference to *x*:*language*\win32\install would be *x*:\en\win32\install for English. For more detailed information on the languages and code pages support, refer to the *Administration Guide*.

Table 23. Languages and Code Pages

Country Code	Language
bg	Bulgarian
br	Brazilian Portuguese
cn	Simplified Chinese (PRC)
cz	Czech
de	German
dk	Danish
en	English
es	Spanish
fi	Finnish
fr	French
gr	Greek
hu	Hungarian
il	Hebrew
it	Italian
jp	Japanese
kr	Korean

Table 23. Languages and Code Pages (continued)

Country Code	Language
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 or DB2/MVS data, the following happens:

1. DB2 Connect sends an SQL statement and input data to OS/390 or MVS.
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 24. Workstation Code Page to Host CCSID Conversion

Host CCSIDs	Code Page	Countries
037, 273, 277, 278, 280, 284, 285, 297, 500, 871, 1140-1149	437, 819, 850, 858, 860, 863, 1004, 1051, 1252, 1275	Albania, Australia, Austria, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Latin America, Netherlands, New Zealand, Norway, Portugal, South Africa, Spain, Sweden, Switzerland, UK, USA
423, 875	737, 813, 869, 1253, 1280	Greece
870	852, 912, 1250, 1282	Croatia, Czech Republic, Hungary, Poland, Romania, Serbia / Montenegro (Latin), Slovakia, Slovenia
1025	855, 866, 915, 1251, 1283	Bulgaria, FYR Macedonia, Russia, Serbia / Montenegro (Cyrillic)
1026	857, 920, 1254, 1281	Turkey
424	862, 916, 1255	Israel - see note 3 below
420	864, 1046, 1089, 1256	Arabic countries - see note 3 below
838	874	Thailand
930, 939, 5026, 5035	932, 942, 943, 954, 5039	Japan
937	938, 948, 950, 964	Taiwan
933, 1364	949, 970, 1363	Korea
935, 1388	1381, 1383, 1386	People's Republic of China
1112, 1122	921, 922	Estonia, Latvia, Lithuania
1025	915, 1131, 1251, 1283	Belarus
1123	1124, 1125, 1251	Ukraine

Notes:

1. Code page 1004 is supported as code page 1252.

2. In general, data can be converted from a code page to a CCSID and back again to the same code page with no change. The following are the only exceptions to that rule:
   - In double-byte character set (DBCS) code pages, some data containing user-defined characters may be lost.
   - For single-byte code pages defined within mixed-byte code pages, and for some newer single-byte code pages, characters that do not exist in both the source and the target may be mapped to substitution characters and then lost when the data is converted back to the original code page.
3. For bidirectional languages, a number of special ″BiDi CCSIDS″ have been defined by IBM and are supported by DB2 Connect Version 6.

   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 Version 6 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 Page	String 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 Type	Text Type	Numerical Shape	Orientation	Shaping	Symmetrical 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 G. Naming Rules

Go to the section that describes the naming rules that you require information on:

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.

When naming a database or database alias, see "General Naming Rules" on page 235.

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 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 235.

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; and
  - column 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 235.

In addition, the name you specify:

- Can contain 1 to 8 characters
- Cannot be any of the following:
  - USERS
  - ADMINS
  - GUESTS
  - PUBLIC
  - LOCAL
- Cannot begin with:
  - IBM
  - SQL
  - SYS
- Cannot include accented characters
- In general, when naming users, groups, or instances:

  OS/2 Use uppercase names.

  UNIX Use lowercase names.

  Windows 32-bit operating systems
  Use any case.

Workstation Name (nname) Rules

A *workstation* name specifies the NetBIOS name for a database server or client that resides on the local workstation. This name is stored in the database manager configuration file. The workstation name is known as the *workstation nname*. When naming workstations, see "General Naming Rules" on page 235.

In addition, the name you specify:

- Can contain 1 to 8 characters
- Cannot include &, #, and @
- Must be unique within the network

DB2SYSTEM Naming Rules

DB2 uses the *DB2SYSTEM* name to identify a physical DB2 machine, system, or workstation within a network. On UNIX, the DB2SYSTEM name defaults to the TCP/IP hostname. On OS/2, you must specify the *DB2SYSTEM* name during install. On Windows 32-bit operating systems, you do not need to specify a *DB2SYSTEM* name; the DB2 setup program detects the NT Computer name and assigns it to *DB2SYSTEM*.

When creating a *DB2SYSTEM* name, see "General Naming Rules" on page 235.

In addition, the name you specify:

- Must be unique within a network
- Can contain a maximum of 21 characters

Password Rules

When determining passwords, consider the following rules:

OS/2 A maximum of 14 characters.

UNIX A maximum of 8 characters.

Windows 9x or Windows NT
A maximum of 14 characters.

Appendix H. 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.

Note that the Bind function in the DB2 Client Configuration Assistant chooses the correct bind files for you automatically.

Note: In the following tables, under the **Package Name** columns, each DB2 bind package is represented as follows. For example, in the file name SQLabxYz:

- SQL identifies the bind package as a DB2 utility,
- *ab* identifies the utility,
- *x* represents the last digit of the year the product became available,
- *Y* represents the platform of the client,
- *z* represents the modification level.

Users on OS/2, Windows 32-bit operating systems, and AIX systems can use the **ddcspkgn** command to determine the package name for 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

xUz Clients for Solaris

xXz Clients for SINIX

xPz Clients for Power PC

xDz Clients for OS/2

xWz Clients for Windows

xNz Clients for Windows 32-bit operating systems

xMz Clients for Macintosh

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 25. 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 25. 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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Contacting IBM

This section lists ways you can get more information from IBM.

If you have a technical problem, please take the time to review and carry out the actions suggested by the *Troubleshooting Guide* before contacting DB2 Customer Support. Depending on the nature of your problem or concern, this guide will suggest information you can gather to help us to serve you better.

For information or to order any of the DB2 Universal Database products contact an IBM representative at a local branch office or contact any authorized IBM software remarketer.

Telephone

If you live in the U.S.A., call one of the following numbers:

- 1-800-237-5511 to learn about available service options.
- 1-800-IBM-CALL (1-800-426-2255) or 1-800-3IBM-OS2 (1-800-342-6672) to order products or get general information.
- 1-800-879-2755 to order publications.

For information on how to contact IBM outside of the United States, see Appendix A of the IBM Software Support Handbook. You can access this document by accessing the following page:

`http://www.ibm.com/support/`

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The DB2 World Wide Web pages provide current DB2 information about news, product descriptions, education schedules, and more. The DB2 Product and Service Technical Library provides access to frequently asked questions, fixes, books, and up-to-date DB2 technical information. (Note that this information may be in English only.)

Anonymous FTP Sites

ftp.software.ibm.com

Log on as anonymous. In the directory /ps/products/db2, you can find demos, fixes, information, and tools concerning DB2 and many related products.

Internet Newsgroups

comp.databases.ibm-db2, bit.listserv.db2-l

These newsgroups are available for users to discuss their experiences with DB2 products.

CompuServe

GO IBMDB2 to access the IBM DB2 Family forums

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To find out about the IBM Professional Certification Program for DB2 Universal Database, go to http://www.software.ibm.com/data/db2/db2tech/db2cert.html

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