IBM DB2 Connect
Enterprise Edition

IBM

Quick Beginnings

Version 5.2

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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 561.

Contents

Welcome to DB2 Connect

This book provides you with an *easy start* to installing and using the basic functions of DB2 Connect.

Part 1 gives an overview of DB2 and DB2 Connect products.

Part 2 provides information on planning for and install ing DB2 Connect on any supported operating system.

Part 3 provides information on using the Client Configuration Assistant to configure communications between DB2 Connect and host systems and between DB2 Connect and its clients.

Part 4 describes how to configure SNA software manually.

Part 5 describes how to install and configure DB2 Clients.

Part 6 describes how to use DB2 Universal Database.

Part 7 describes the unattended installation of DB2 Connect. It also describes alternative methods of installing DB2 Connect Enterprise Edition on UNIX systems, and techniques for administrators to set up clients to connect to DB2 Connect servers or DB2 Servers.

Part 8 describes configuring DRDA hosts to accept connections from DB2 Connect.

Part 9 contains reference information and describes viewing, printing, and ordering the manuals that are provided in online format.

Conventions

This book uses these highlighting conventions:

- **Boldface type** 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 a 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 is a fast path icon. It tells you if you can skip sections to get to the "how to" information. It is shown to indicate where you should go next.

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

Road Map to DB2 Connect Information

Use the following table to quickly find the information you need.

If you want to...	Refer to...	Required Reading?
Understand the different options for deploying DB2 Connect in your network,	Chapter 1, "About DB2 Connect" on page 3.	Optional.
Confirm that your system meets the DB2 Connect software and hardware prerequisites,	"Software Requirements" on page 30 and "Disk Requirements" on page 27.	Recommended.
Install DB2 Connect,	the installation chapter for your environment and your workstation's operating system: • For OS/2: – Chapter 5, "Installing DB2 Connect on OS/2 Systems" on page 45 – Chapter 43, "Unattended DB2 Installation on OS/2 Operating Systems" on page 419 • For Windows NT: – Chapter 6, "Installing DB2 Connect on Windows NT Systems" on page 51 – Chapter 44, "Unattended DB2 Installation on Windows 32-bit Operating Systems" on page 429 • For UNIX systems: – Chapter 7, "Installing DB2 Connect on UNIX Systems" on page 57	Required.

If you want to...	Refer to...	Required Reading?

Create SNA connections to DRDA databases,	the chapter that applies to your workstation's operating system and SNA communications subsystem:
	
	• For OS/2:
	  – Chapter 10, "Configuring Host and AS/400 Connections on OS/2 or Windows NT Workstations" on page 87
	  – Chapter 12, "Configuring Communications Server for OS/2 for DB2 Connect for OS/2" on page 95
	• For Windows NT:
	  – Chapter 10, "Configuring Host and AS/400 Connections on OS/2 or Windows NT Workstations" on page 87
	  – Chapter 13, "Configuring IBM Communications Server for Windows NT" on page 111
	  – Chapter 15, "Configuring IBM Communications Server for Windows NT SNA Client" on page 135
	  – Chapter 16, "Configuring Microsoft SNA Server Version 4.0 for Windows NT" on page 143
	  – Chapter 17, "Configuring Microsoft SNA Client" on page 151
	• For UNIX systems:
	  – Chapter 18, "Configuring SNA Server for DB2 Connect on AIX" on page 157
	  – Chapter 19, "Configuring Bull SNA for DB2 Connect on AIX" on page 173
	  – Chapter 21, "Configuring SNAPlus for DB2 Connect on HP-UX" on page 195
	  – Chapter 22, "Configuring SunLink SNA for DB2 Connect for Solaris" on page 209
		Required.

Modify how DB2 Connect Enterprise Edition communicates with DB2 clients,	Chapter 25, "Using the Control Center to Configure Server Communications" on page 247 or Chapter 26, "Using the Command Line Processor to Configure the DB2 Connect Server to Accept Clients" on page 251.	Required.
Install and configure DB2 clients,	Chapter 27, "Installing DB2 Clients" on page 273.	Required.
Use the DB2 components,	Chapter 36, "Getting Started with DB2 Universal Database" on page 343.	Recommended.
Control access, authentication, passwords, and user ID or username management,	"Working with the System Administrative Group" on page 345.	Recommended.

If you want to...	Refer to...	Required Reading?
Use clients,	Chapter 39, "Running Your Own Applications" on page 369.	Recommended.
Bind applications and utilities to DB2 for MVS/OS390, DB2 for AS/400, or DB2 for VM & VSE to give applications access to host data,	"Binding Database Utilities" on page 369.	Required by you or your database administrator.
Set up a DB2 Call Level Interface or ODBC environment to enable ODBC applications such as Lotus Approach to access DB2 data,	"Running CLI/ODBC Programs" on page 370.	Recommended if you will use this function.
Use the DB2 Command Center or the DB2 command line processor to enter SQL statements or DB2 commands interactively,	Chapter 40, "Entering DB2 Commands and SQL Statements" on page 389.	Recommended.
Prepare DRDA hosts to accept connections from DB2 Connect,	Chapter 49, "Configuring DRDA Hosts for DB2 Connect" on page 493.	Recommended for your DRDA and network administrators.
Configure TCP/IP connections to DB2 for OS/390 databases,	"Configuring TCP/IP for DB2 for OS/390" on page 502	
Print or view online documentation,	"Printing the PostScript Books" on page 521 or "Viewing Online Books" on page 520.	Recommended.
Learn about last-minute changes to the product,	The Installation Notes that are on the CD-ROM or the Release Notes that are installed with the products.	Recommended.

Part 1. Introduction to DB2 Connect

Chapter 1. About DB2 Connect

DB2 is a *relational* database management system that is web-enabled with Java support; scalable from single processors to clusters of symmetric multiprocessors; and multimedia capable with image, audio, video, and text support.

IBM's DB2 for OS/390, DB2 for AS/400, 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 PCs, UNIX workstations, and Apple Macintosh workstations.

The DB2 Connect Enterprise Edition product is a host data access server that provides managed connectivity from desktop and web applications to databases stored on the following systems:

- DRDA servers: DB2 for MVS/ESA, DB2 for AS/400, DB2 for OS/390, DB2 for VSE & VM systems
- DB2 Universal Database servers, which are available for OS/2, Windows NT, and several UNIX systems.

DB2 Connect provides access to those databases in a cost-effective way by using a standard architecture for managing distributed data, 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. DB2 Connect products provide a DRDA Application Requester that can access DRDA Application Servers running on MVS, AS/400, OS/390, VM, and VSE systems.

DB2 Connect products provide a run-time environment for database applications that are written in C, C++, Java, COBOL, FORTRAN, SmallTalk, REXX, and other programming languages. Programmers can use the latest tools, such as Microsoft Visual Studio, Borland Delphi, and many others, to develop database applications using the following Application Programming Interfaces (APIs):

- Microsoft ODBC
- DB2 Embedded SQL (both static and dynamic)
- DB2 Call Level Interface
- Java Support(JDBC)
- Embedded SQL for Java (SQLJ)

This allows you to use a wide range of off-the-shelf or custom-developed database applications, and provides application programmers with a broad selection of tools and functions. 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, Intersolv Q+E Database Editor, and Crystal Reports, to provide real-time information.
- *Database products*, such as Lotus Approach and Microsoft Access.
- *Development tools*, such as PowerSoft PowerBuilder, Microsoft VisualBasic, and Borland Delphi, to create client/server solutions.

In addition, you get the DB2 Client Application Enablers CD-ROM, which contains all the latest DB2 Client Application Enablers. With DB2 Client Application Enabler, clients from a variety of platforms can connect to host databases through the DB2 Connect Enterprise Edition server.

DB2 Connect Enterprise Edition is a member of the DB2 family of products, which includes relational database systems, middleware, and application development tools. The following is a list of other DB2 family products that are available separately:

DB2 Universal Database Workgroup Edition
A relational database management system that enables local and remote client applications to create, update, control, and manage relational databases using Structured Query Language (SQL), ODBC, JDBC, or CLI.

This product is available for OS/2, Windows NT, and SCO UnixWare 7 only.

DB2 Universal Database Enterprise Edition
A relational database management system that enables local and remote client applications to create, update, control, and manage relational databases using Structured Query Language (SQL), ODBC, JDBC, or CLI. This product also includes support for host and AS/400 connectivity. This product provides its users with access to DB2 databases that reside on host systems such as MVS/ESA, OS/390, AS/400, VM, and VSE. This product is available for AIX, HP-UX, OS/2, SCO UnixWare 7, Solaris and Windows NT.

DB2 Application Developer's Kit
Contains a collection of DB2 Universal Database products, clients, DB2 Connect products, DB2 Software Developer's Kits, and application development tools for all supported operating systems.

The Application Developer's Kit gives you all the tools that you need to create multimedia database applications that can run on a variety of platforms and can connect to any DB2 server, including mainframe and AS/400 databases.

DB2 Universal Database Personal Edition
Allows you to create and use local databases. DB2 Personal Edition can also act as client to access remote DB2 servers. This product is available for the OS/2 and Windows 32-bit operating systems only.

DB2 Connect Personal Edition
Provides access from a single workstation to DB2 databases residing on host systems such as MVS/ESA, OS/390, OS/400, VM, and VSE, as well as access to DB2 databases. DB2 Connect Personal Edition is available for the OS/2, Windows 3.x, and Windows 32-bit operating systems. This product was formerly known as DDCS Single-User.

DB2 Connect Enterprise Edition

DB2 for
MVS

DB2 for
VSE

DB2 for
VM

DB2 for
OS/390

DB2 for
OS/400

APPC

AS/400

S/390, S/370, AS/400

TCP/IP

APPC

APPC

MPTN

TCP/IP   **APPC**

DB2 Connect Enterprise Edition

Communication Support

APPC, NetBIOS, IPX/SPX,
TCP/IP

Application 1

Application 2

. . .

Application n

Win NT, OS/2, UNIX

DB2 CAE
for OS/2

DB2 CAE
for Windows-based
platforms

DB2 CAE
for DOS

DB2 CAE
for Macintosh

DB2 CAE
for UNIX-based
platforms
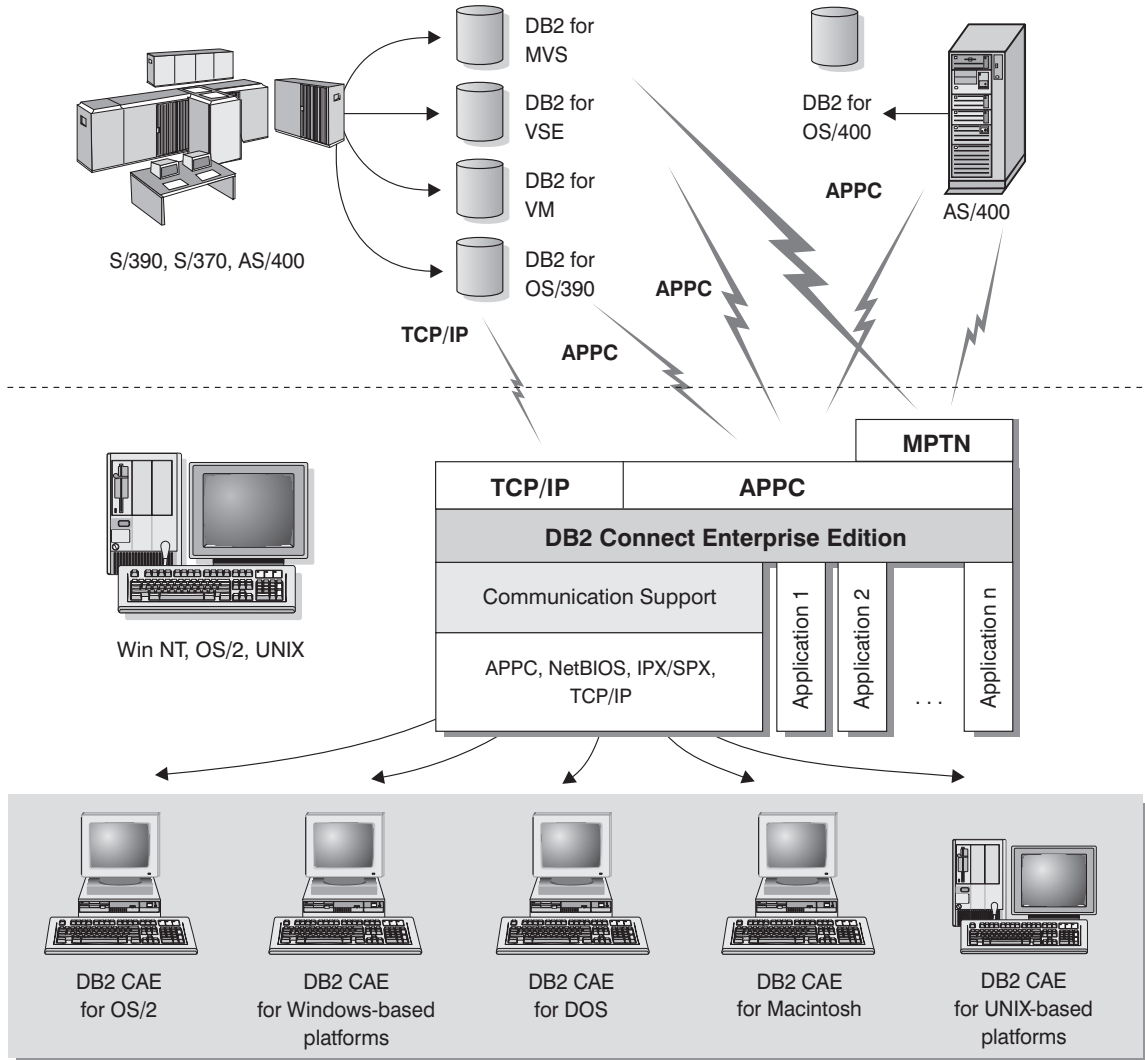
NOTE: CAE is Client Application Enabler. Not all protocols are supported for all the clients.

Figure 1. DB2 Connect Enterprise Edition

DB2 Connect servers and DB2 Universal Database servers are commonly
referred to as DB2 servers throughout this book.

Managing Connections to Databases Using the Client Configuration Assistant

The Client Configuration Assistant helps you manage your database connections to remote DB2 servers. The Client Configuration Assistant is available on OS/2 and Windows 32-bit operating systems. Use the command line processor to set up DB2 clients on UNIX platforms.

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 a few 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.

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.

You can install the DB2 Software Developer's Kit on a DB2 server or on a remote workstation.

There is a platform-specific version of the DB2 Software Developer's Kit available for each of the supported operating systems and it is available in the Application Development Kit. Applications that are developed with the DB2 Software Developer's

Kit will run on any platform where the equivalent DB2 Client Application Enabler component is installed. Through a DB2 Client Application Enabler, these applications can access all DB2 servers and, by using DB2 Connect, they can also access DB2 for AS/400, DB2 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 Support (JDBC)
- Embedded SQL for Java (SQLJ)
- Application programming interfaces to access database utilities.

The DB2 Software Developer's Kit supports several programming languages (which include COBOL, C, and C++) for application development, and provides precompilers for the supported languages. Refer to the *Building Applications for UNIX Environments* or the *Building Applications for Windows and OS/2 Environments* manuals for complete information on using the DB2 Software Developer's Kit, and for a list of the supported compilers.

Accessing DB2 Data from the Web

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

Use *Java Support* to create applications or applets that access data in DB2 databases. You can run JDBC applets inside Hypertext Markup Language (HTML) web pages 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 applets and applications.

The JDBC server and the DB2 Client Application Enabler must reside on the same machine as the Web server. The JDBC server calls the DB2 Client Application Enabler to connect to local, remote, or host databases. When the applet requests a connection to a DB2 database, the JDBC client opens a TCP/IP socket to the JDBC server on the machine where the Web server is running. See Figure 2 on page 8 for an example of Java-enabled browsers accessing data from remote DB2 databases.

Accessing DB2 Data Using JDBC
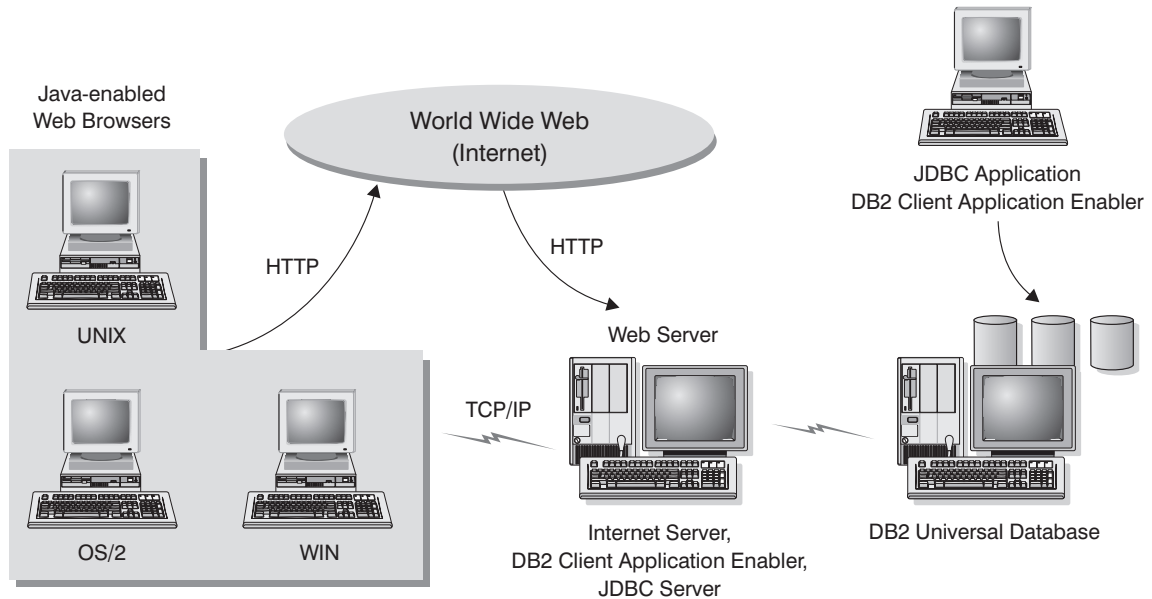
Figure 2. Accessing Internet Data Stored on DB2 Using JDBC

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

For more information on Java enablement, refer to the Java Enablement web page (http://www.software.ibm.com/data/db2/java/). For more information on the JDBC API, refer to the URL http://splash.javasoft.com/.

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 the 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 the entry 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 database.

A demonstration of Net.Data applications is available from the IBM Software Page
(http://www.software.ibm.com/) under the Data Management link. Access the Data
Management Link from the option on the Products drop-down window.

Net.Data can be installed with a DB2 server to allow local access to databases.
Net.Data can be installed with a DB2 Client Application Enabler to allow remote access
to databases. In both cases, Net.Data and a Web server must be installed on the same
system. See Figure 3 for an example of Net.Data that is being used to access data
from remote DB2 databases.
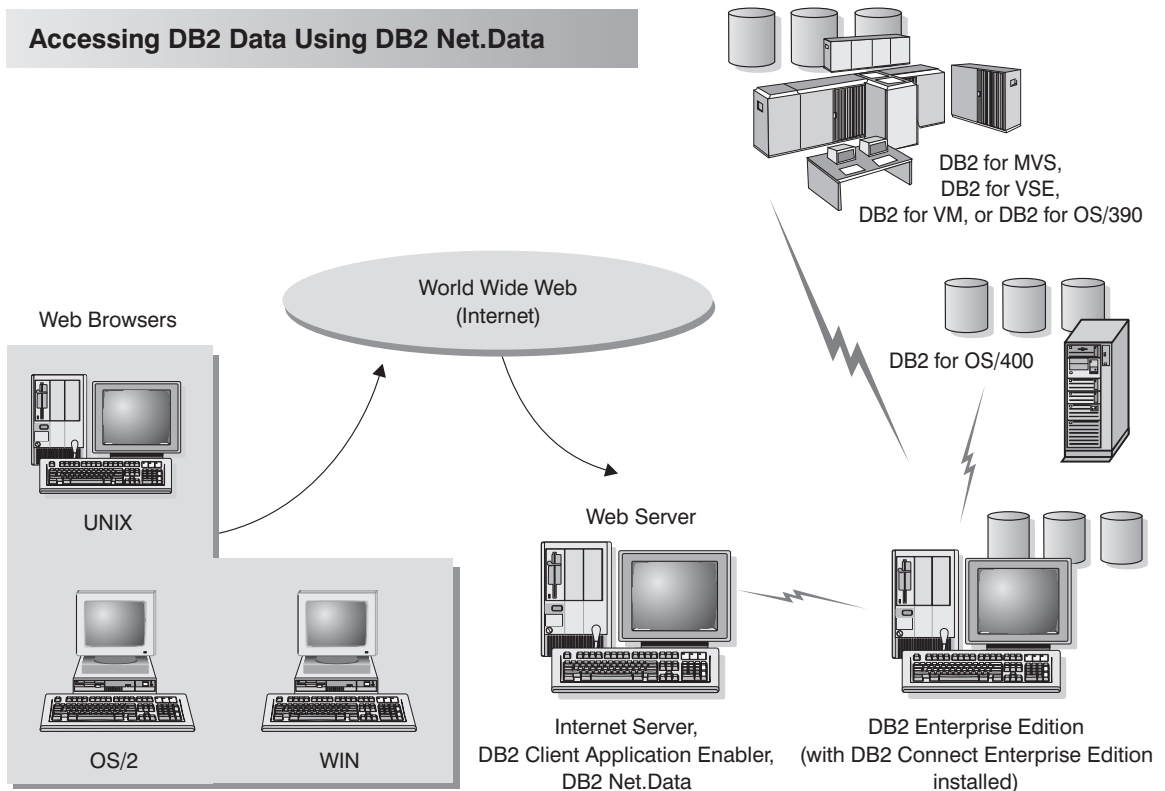
Figure 3. Accessing Internet Data Stored on DB2 Using Net.Data

Chapter 2. What's New in DB2 Connect Version 5.2?

DB2 Connect Version Version 5.2 includes the following enhancements for the host and AS/400 DRDA functions:

- DCE Cell Directory support

  Users working with host and AS/400 databases servers now have additional options for providing database location information when using DCE Cell Directory support for implementations from IBM and Gradient. Refer to the *Administration Guide* for additional information.

- Enhanced password management

  DB2 Connect now permits users to change their passwords without having to log on to their database server. Users can now change their passwords in any one of four ways: by using the SQL CONNECT statement from the DB2 Command Line Processor, by requesting a password change from within the ODBC login dialog, by using the password change option of the Client Configuration Assistant, or by using the ATTACH command.

  In addition, application programmers can now take advantage of DB2 Connect enhanced password management to deliver more robust security mechanisms for their applications. The ability to change user passwords is provided for Embedded SQL, ODBC, and DB2 CLI, as well as for Java using both JDBC and SQLJ.

  For example, with this support, a user connected to a DB2 for OS/390 database server no longer has to sign on to TSO in order to change his or her password when it expires. Through DRDA, DB2 for OS/390 can change the password for you. The old password along with the new password and the verify password must be supplied by the user.

  If the security specified at the DB2 Connect EE gateway is DCS then a request to change the password is sent to the DRDA server. If the authentication specified is SERVER then the password on the gateway machine is changed.

  An additional benefit is that, with TCP/IP connections to the host, a separate LU definition is no longer required, as was the case with DB2 Connect Version 5.0. Refer to the DB2 Connect Enterprise Edition *Quick Beginnings* manual for additional information.

- Enhanced security failure notification

  Users connecting to host and AS/400 databases can now get additional information on the cause of security failures when they occur, for example as the result of an expired password. Refer to the DB2 Connect *Quick Beginnings* manuals for further information.

In addition, password change support is now supported through DRDA (see *Enhanced password management above).*

- Enhanced System/390 SYSPLEX exploitation

  DB2 Connect Enterprise Edition (EE), and the DB2 Connect component that is included in both DB2 UDB EE and DB2 UDB Extended - Enterprise Edition (EEE), can now provide enhanced load balancing and fault tolerance by routing connections to different nodes on a System/390 SYSPLEX. Some additional configuration considerations apply, and these are documented in the DB2 Connect Enterprise Edition *Quick Beginnings* manual.

- Optimized Catalog Access for ODBC and JDBC Applications

  A new tool db2ocat is provided on Windows 32-bit operating systems in order to assist customers to optimize system catalog searches for ODBC applications.

  DB2 Connect now offers a way to dramatically improve the performance of ODBC and JDBC applications that make extensive use of the system catalog. This improvement is provided using the CLISCHEMA parameter in the DB2CLI.INI file, which allows applications to use an ODBC-optimized catalog instead of the regular system catalog tables. In addition, a point-and-click utility that greatly simplifies the creation and maintenance of ODBC-optimized catalogs can be obtained by downloading db2ocat.zip from:

      ftp://ftp.software.ibm.com/ps/products/db2/tools.

- Microsoft Transaction Server support

  DB2 family databases including host and AS/400 databases can now fully participate in distributed transactions managed by the Microsoft Transaction Server (MTS). Refer to the DB2 Connect Enterprise Edition *Quick Beginnings* manual for additional information.

- New BIND options (DYNAMICRULES)

  There are two new enumerated values for the DYNAMICRULES option of the BIND command. These two values: DEFINE, and INVOKE, are defined to specify the authorization identity to be used for the execution of a dynamic SQL statement in a user defined function (UDF) or in a stored procedure:

  DEFINE   Indicates that the authorization identifier used for the execution of dynamic SQL is the definer of the UDF or stored procedure.

  INVOKE   Indicates that the authorization identifier used for the execution of dynamic SQL is the invoker of the UDF or stored procedure.

  Refer to the *Command Reference* for further information.

- Set Client Information API enhancements

  A new Set Client Information API allows three-tier client/server or TP monitor applications to pass more specific information about the application end user to DB2 for OS/390.

  The new information includes the end user name supplied by server application, the workstation name, the application name, and the accounting string. This

information can now be reported by the DB2 for OS/390 DISPLAY THREAD command and it is available in DB2 for OS/390 accounting records. Previously, in three-tier environments, DB2 for OS/390 could only provide information about the server application and the individual authentication user ID , and not about the numerous end users who multiplex SQL queries on long-running connections.

For additional information refer to the *API Reference*.

- SQLDescribeParam support for DB2 Connect

  With this enhancement, an application is now able to issue the *SQLDescribeParam* API call to retrieve parameter descriptions from a DB2 for OS/390 data source. For further information refer to *What's New*.

- Support for Bidirectional Languages

  DB2 Connect now provides support for bidirectional languages such as Arabic and Hebrew. Refer to the *Administration Guide* for more information about the nature of this support.

  For information on configuring DB2 Connect Version 5.2 for bidirectional languages please refer to the Release Notes for DB2 Connect Version 5.2.

- System Monitor enhancements

  The following System Monitor enhancements for DB2 Connect are provided in Version 5.2:

  1. Enhancements to the `sqlmonss` API call and the LIST DCS APPLICATIONS command provide for the listing of seven new data elements: DCS application status, client login ID, client platform, client protocol, host CCSID, process ID of client application, and status change time.

  2. New GET SNAPSHOT support for DB2 Connect at the database manager and application levels, where the application level reporting includes statement and transaction levels.

  3. New SNAPSHOT support for DB2 Connect at the database level.

  Further information is provided in the *DB2 Connect User's Guide* .

  Information about detailed updates to the *System Monitor Guide and Reference* is contained in *What's New*.

- Two-phase commit support enhancements

  – In DB2 Connect Enterprise Edition Version 5.0, two-phase commit support over SNA connections using the DB2 Syncpoint Manager (SPM) was only available on AIX and OS/2. With DB2 Connect Enterprise Edition Version 5.2, this support is now extended to Windows NT. This support requires IBM eNetwork Communications Server for Windows NT Version 5.01 or higher.

  – Two-phase commit for XA applications was previously only supported over SNA connections, using the SPM. It is now also supported over TCP/IP connections using the SPM.

    Applications executed by Transaction Processing Monitors such as IBM TXSeries, CICS for Open Systems, Encina Monitor, and Microsoft Transaction

Server previously had to access host systems such as DB2 for OS/390 using SNA. With DB2 Connect Version 5.2, TCP/IP can now be used by these same applications. The DB2 Syncpoint Manager must be used to enable this new feature.

For further information refer to your DB2 Connect *Quick Beginnings* manual.

- Simplified DB2 Syncpoint Manager Configuration

  DB2 Syncpoint Manager configuration has been simplified. Many steps are now automated or eliminated compared to previous releases. Please refer to your DB2 Connect *Quick Beginnings* manual.

- Support for the SCO** operating system

  DB2 Connect Enterprise Edition Version 5.2 is available for the SCO operating system.

- Support for Big Integer, Large Object, Row ID, and User Defined Distinct data types.

  DB2 Connect Version 5.2 now provides support for Big Integer, Large Object, Row ID, and User Defined Distinct data types. Refer to the *SQL Reference* for more details.

- Enhancements to the Client Configuration Assistant:

  – In V5.2 you can use the Client Configuration Assistant (CCA) to configure TCP/IP connections to DB2 for VM and DB2 for AS/400 database servers.

  – You can also use the CCA to configure IBM Communications Server for NT (CS/NT) and IBM Personal Communications (PComm) SNA stacks if you are using an SNA network.

DB2 Connect Version 5

- New easier to purchase packaging:

  – A single DB2 Connect Personal Edition package that contains OS/2, Windows 3.1, Windows 95, Windows 98 and Windows NT versions of the product. This package contains everything that is needed to get started, including a complimentary copy of Lotus Approach.

  – A single DB2 Connect Enterprise Edition package that contains OS/2, Windows NT, and all UNIX versions.

- Capability:

  – New Level 3 ODBC driver with many improvements

  – Updated JDBC driver for better Java support

- Support for stored procedures that return multi-row result sets and multiple result sets (requires DB2 for OS/390 Version 5.1 or higher)

  - Built-in replication support

  - Generic bind option: you can specify any bind option supported by the host database.

  - SYSPLEX exploitation (DB2 Connect Enterprise Edition only; requires DB2 for OS/390 Version 5.1 or higher)

- Usability:

  - New installation method

  - TCP/IP database connections are much easier to configure (requires DB2 for OS/390 Version 5.1 or higher, or DB2 for AS/400 Version 4.2)

  - Integrated SNA support with point-and click configuration (DB2 Connect Personal Edition only)

  - New point and click configuration utility for configuring host connections.

  - Much easier process for connecting desktop client systems to DB2 Connect Enterprise Edition servers. Clients can discover DB2 Connect servers and all of the databases that are defined on each server

  - Improved ODBC traces with detailed information for performance analysis

  - Control Center and other GUI tools that simplify several DBA tasks

- Security:

  - DCE security (requires DB2 for OS/390 Version 5.1 or higher)

  - Ability to run ODBC applications without having to authorize each user to base tables. Users can now bind their ODBC driver in such a way as to allow applications to run under the authority of the person that bound the ODBC driver.

- Performance:

  - Faster access to the DB2 catalog for ODBC applications

  - Reduced network traffic:

    - Early close for cursors

    - Deferred prepare

    - Reduced byte count on Compound SQL

    - Several other network flow enhancements

    - Support for ASCII storage on the host (requires DB2 for OS/390 Version 5.1 or higher)

- Connectivity:

  - Support for DRDA over TCP/IP connections to other IBM DRDA Application Servers, as they introduce support for TCP/IP.

- SNA over TCP/IP via integrated MPTN support (requires AnyNet on the host).
- Support for additional SNA connectivity options:
  - IBM Communication Server for Windows NT
  - IBM Personal Communications
- Other:
  - Ability to initiate 2-phase commit transactions over TCP/IP (requires DB2 for OS/390 Version 5.1 or higher)
  - Ability for desktop applications to participate in a 2-phase commit transactions without the need for a gateway (TCP/IP only, requires DB2 for OS/390 V5.1 or higher)
  - Ability to use DB2 for OS/390 for added reliability of transaction coordination (requires DB2 for OS/390 Version 5.1 or higher, and TCP/IP)
  - Numerous other enhancements and fixes affecting all aspects of system performance, reliability, and usability.

Chapter 3. How to Use DB2 Connect in Your Network

Go directly to Chapter 5, "Installing DB2 Connect on OS/2 Systems" on page 45, Chapter 6, "Installing DB2 Connect on Windows NT Systems" on page 51, or Chapter 7, "Installing DB2 Connect on UNIX Systems" on page 57 if you want to start installing the product immediately.

Your network is a complex combination of hardware and software components, set up to best fit the needs of your organization. DB2 Connect products provide several ways of connecting to S/370, S/390, and AS/400 database servers to enable you to choose the best way to connect your workstations to your host databases. This chapter describes the following network configurations:

- Direct SNA connection from DB2 Connect to a DRDA host, such as DB2 for MVS/ESA, using DB2 Connect Personal Edition.

- Indirect connection from DB2 Connect to a DRDA host via a communications gateway, such as IBM Communications Server or Microsoft SNA Server.

- Server-based connection from DB2 clients to DRDA hosts via a DB2 Connect Enterprise Edition server.

In addition to access to mainframe and AS/400 databases, DB2 Connect products can provide access to DB2 Universal Database servers. This chapter provides a brief description of such a configuration.

Note: If is important that you decide which of the network configurations applies to your environment. This is a required step in setting up connectivity to your database servers.

Direct Connection to a Host or AS/400 Server

Direct connection without intermediate gateways and servers is a very convenient and desirable configuration. This is especially true for situations where the host or the AS/400 database supports TCP/IP connectivity (for example, DB2 for OS/390 V5.1 or later, or OS/400 V4 Release 2). In such a configuration, each DB2 Connect workstation establishes a direct TCP/IP connection to DB2 for OS/390 or, using the Integrated SNA Support, connects via APPC to DB2 for MVS and other host and AS/400 databases.

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

Figure 4 shows workstations directly connected to a DRDA host. Each workstation has DB2 Connect Personal Edition installed.
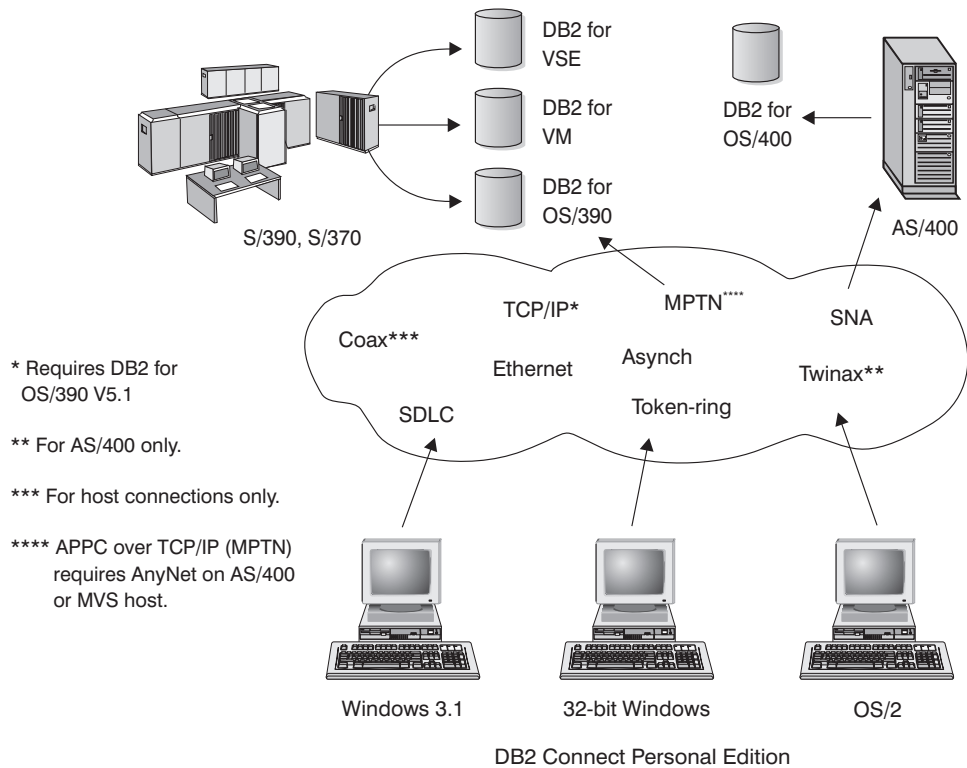
Figure 4. Direct Connection Between DB2 Connect and a DRDA Host

In this environment, if you are using Windows 32-bit operating systems, you can use the DB2 Connect Personal Edition Integrated SNA Support to connect directly to the host servers. DB2 Connect Integrated SNA Support permits connections over a variety of local and wide area networks, such as Token-Ring, Ethernet, SDLC, Twinax, Coax and Asynchronous dial-up. The DB2 Connect Integrated SNA Support implements both APPC and MPTN connections over networks using hosts and AS/400 systems that have IBM AnyNet products installed. Users of OS/2 workstations can use IBM Personal Communications for OS/2. IBM Communications Manager V1.11. or IBM Communications Server for OS/2 to achieve direct APPC and MPTN connectivity.

Connections via Communications Gateway

Some organizations prefer to concentrate access to SNA networks through dedicated **SNA Gateways**, such as IBM Communications Server, Microsoft SNA Server, or Novell Netware for SAA. DB2 Connect products support connections through gateways, so this can be a good choice if you need terminal emulation and other SNA services not provided by DB2 Connect. Figure 5 on page 19 illustrates such a situation.
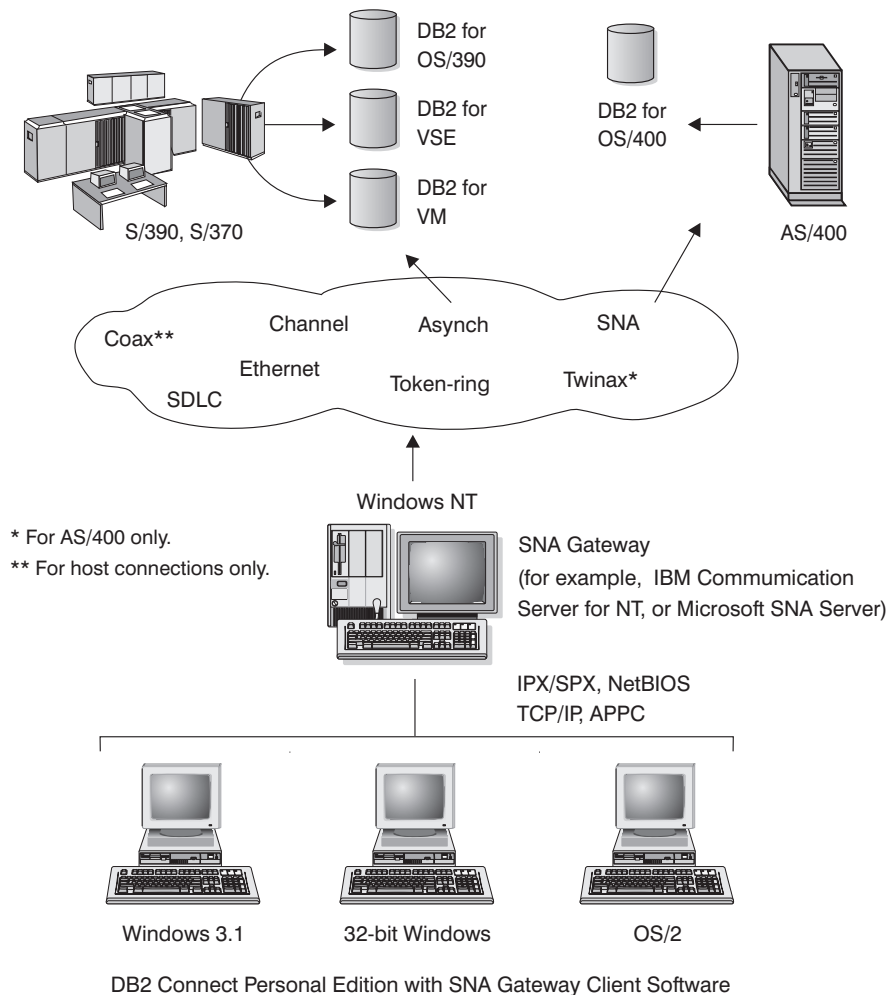
Figure 5. Indirect Connection to DRDA Host via SNA Communications Gateway

Although you can use DB2 Connect Personal Edition with SNA gateways, you may find DB2 Connect Enterprise Edition a better choice if you want to use many DB2 Clients.

DB2 Connect Enterprise Edition can be installed on the same machine as IBM Communications Server or Microsoft SNA Server, and in many cases it can provide a less expensive and better-performing solution. Figure 6 on page 21 provides an overview of the DB2 Connect Enterprise Edition gateway scenario.

Connections via a DB2 Connect Enterprise Edition Server

Figure 6 on page 21 illustrates IBM's solution for environments in which you want to use a DB2 Client Application Enabler making an indirect connection to a DRDA host through DB2 Connect Enterprise Edition server.

All DB2 and DB2 Connect products include a Client Application Enabler component. In addition, Client Application Enablers for AIX, DOS, HP-UX, Macintosh, OS/2, SCO Unix Ware, Silicon Graphics, SINIX, Solaris, and Windows 32-bit operating systems are provided on separate CD-ROMs with all DB2 products except the Personal Edition versions.

This type of connectivity is most appropriate for environments where large numbers of workstations need well-managed, secure access to host and AS/400 databases. It allows database administrators to concentrate all access to host data through one or more DB2 Connect servers.

This type of a configuration is required for supporting applications that exploit transaction monitors (e.g. CICS, Encina, Tuxedo) as well as applications that are implemented as Java applets. This configuration is also the right choice for multi-tier applications for both traditional client-server as well as web application server environments.

Although the DB2 Connect EE Server is often installed in an intermediate server machine to connect the DB2 CAE clients to the host, it is also installed in machines where multiple local users want to access the host or AS/400 servers directly. For example, the DB2 Connect EE may be installed in a large UNIX machine with many local users. It may also be installed in a large NT or UNIX Web server, TP monitor, or other 3-tier application server machine with multiple local SQL applicaton processes/threads. In these cases, you can choose to install DB2 Connect EE in the same machine for simplicity, or in a separate machine to off-load the CPU cycle.

DB2 for
OS/390

DB2 for
VSE

DB2 for
VM

DB2 for
OS/400

S/390, S/370

AS/400

TCP/IP*

Coax***

Asynch

SNA

Twinax**

Ethernet

SDLC

Token-ring

X.25

* Requires DB2 for OS/390 V5.1.

** For AS/400 only.

*** For host connections only.

OS/2
Windows NT
UNIX

DB2 Connect Enterprise Edition
(Available for OS/2, Windows NT,
and several UNIX workstations.)

APPC, IPX/SPX, NetBIOS, TCP/IP

DB2 CAE
for OS/2

DB2 CAE
for Windows-based
platforms

DB2 CAE
for DOS

DB2 CAE
for Macintosh

DB2 CAE
for UNIX-based
platforms

Actual connectivity options depend on the platform chosen.

Figure 6. Indirect Connection to DRDA Host via DB2 Connect Enterprise Edition

Connections to DB2 Universal Database Servers

Figure 7 illustrates a direct connection between a DB2 Universal Database server and the DB2 Client Application Enabler software that is included in DB2 Connect Personal Edition. You can use these connections concurrently with connections to DRDA hosts.

DB2 Universal Database servers are available for AIX, HP-UX, OS/2, Solaris, and Windows NT.
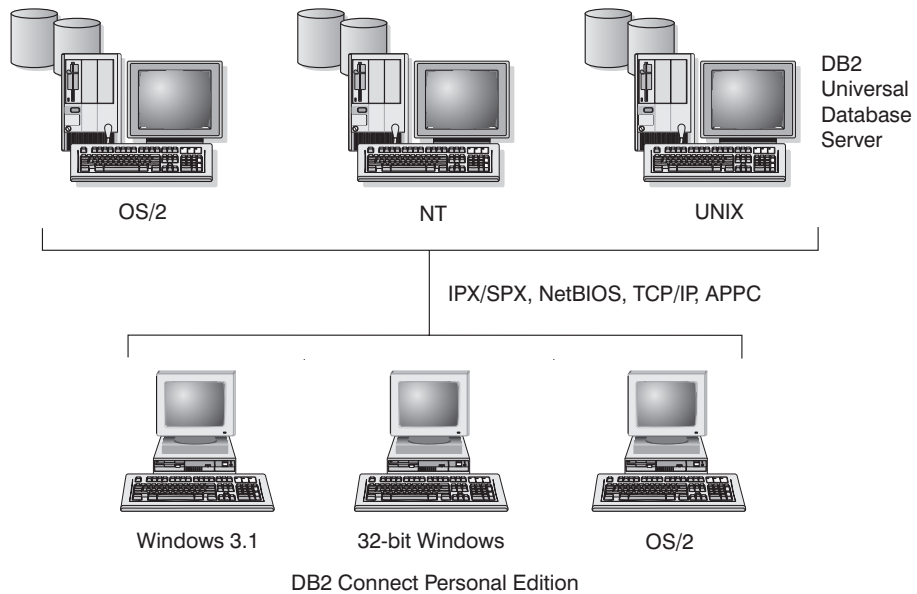
Figure 7. Connection between DB2 Connect Personal Edition and a DB2 Server

Part 2. DB2 Connect: Planning and Installation

Chapter 4. Planning for Installation

> If you know that your system meets DB2 Connect's hardware and software requirements, and you want to start installing DB2 Connect right away, go directly to either Chapter 5, "Installing DB2 Connect on OS/2 Systems" on page 45, Chapter 6, "Installing DB2 Connect on Windows NT Systems" on page 51, or Chapter 7, "Installing DB2 Connect on UNIX Systems" on page 57.

DB2 Connect provides many components that you might want to use in your environment. Use the product and planning information in this section to confirm that your system has the prerequisites, and to decide which components you want to install.

Memory Requirements

If you want to access databases on host systems such as OS/390, MVS, OS/400, VM, or VSE, use the configuration shown in Figure 8. You will need to install DB2 Connect Enterprise Edition.

Connect clients to DB2 Connect Enterprise Edition for OS/2 or Windows NT using one of the supported protocols: APPC, IPX/SPX, Named Pipes (Windows NT only), NetBIOS, or TCP/IP. Connect clients to DB2 Connect Enterprise Edition for AIX or Solaris using one of the supported protocols: APPC, IPX/SPX, or TCP/IP. DB2 Connect then connects to the appropriate host database management system using DRDA over APPC or TCP/IP. (TCP/IP is supported on DB2 for OS/390 Version 5.1 or later.)

DB2 Connect Enterprise Edition - Memory Requirements

OS/2
Win NT
Win 95

24MB

Administration Client
(CAE with Graphical Tools)

DB2 for MVS,
DB2 for VSE,
or DB2 for VM

CAE for
UNIX-based
platforms

LAN with various clients

DB2 for OS/400

CAE for OS/2

CAE for
Windows-based
platforms

5 Concurrent Clients

64MB

Amount of memory required depends
on application.

DB2 Connect Enterprise Edition
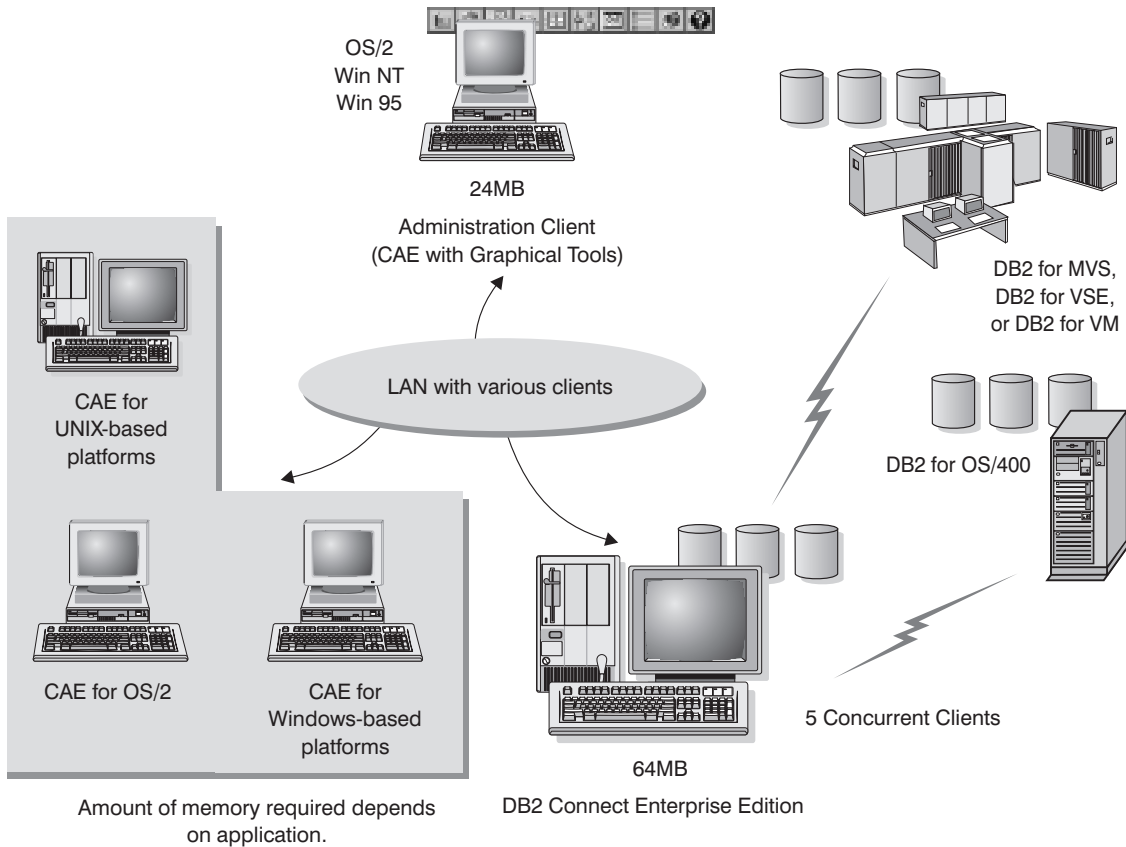
Figure 8. Configuration for Accessing Host Data

The amount of memory you need on your system depends on the number of concurrent clients you intend to connect. For the OS/2 or Windows NT DB2 Connect server, it is recommended that a minimum of 32 MB of memory be installed to accommodate five concurrent clients. We suggest that you have a minimum of 48 MB of memory to accommodate 25 concurrent clients and 64 MB of memory for 50 concurrent clients.

For the UNIX DB2 Connect server, it is recommended that a minimum of 64 MB of memory be installed to accommodate five concurrent clients. The diagram shows a scenario with five concurrent clients connected to a UNIX DB2 Connect server. We suggest that you have a minimum of 96 MB of memory to accommodate 25 concurrent clients and 128 MB of memory for 50 concurrent clients. Use these guidelines to determine the amount of memory necessary in your environment.

An administration client is shown in the diagram. This client can be on an OS/2 or Windows 32-bit operating systems and can be used to manage the DB2 servers on your network. Typically, 30 MB of memory is required to run all the graphical tools you will need for an administration client.

For the DB2 clients in your environment, the amount of memory required depends on the database applications you are running.

Disk Requirements

This section shows the *minimum* amount of disk space that is required to install DB2 products 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. Use this information to plan for systems with a large number of concurrent clients or databases. 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 1 on page 28 to estimate the amount of disk space you need to install DB2 and associated components on your operating system.

Table 1. Estimating Disk Requirements

DB2 Connect Enterprise Edition for OS/2	
DB2 Connect — this amount includes the following components:	100 MB
• Client Configuration Assistant	5 MB
• Graphical Tools	5 MB
• Control Center	30 MB
• Performance Monitor	10 MB
• Visual Explain	5 MB
• Windows Support	10 MB
• LU 6.2 Syncpoint Manager	15 MB
• East Asian Conversion Support	5 MB
Online documentation in HTML format	30 MB
DB2 Connect Enterprise Edition for Windows NT	
DB2 Connect — this amount includes the following components:	70 MB
• Graphical Tools (Client Configuration Assistant, Control Center, Performance Monitor, and Visual Explain)	35 MB
• East Asian Conversion Support	5 MB
Online documentation in HTML format	30 MB
DB2 Connect Enterprise Edition for AIX	
DB2 Connect	55 MB
• Online documentation in HTML format	40 MB
• Far-East Conversion Support	5 MB
DB2 Connect Enterprise Edition for HP-UX	
DB2 Connect	86 MB
• Online documentation in HTML format	40 MB
• Far-East Conversion Support	5 MB
DB2 Connect Enterprise Edition for Solaris	
DB2 Connect	50 MB
• Online documentation in HTML format	40 MB
• Far-East Conversion Support	5 MB

Note: The disk amounts listed are approximations.

Client Components

Use Table 2 on page 29 to estimate the amount of disk space you need on each of your client workstations.

Table 2 (Page 1 of 2). Estimating Disk Requirements for Client Components

	Recommended Minimum Disk (MB)
DB2 Client Application Enabler for AIX	
DB2 Client Application Enabler for AIX	22 MB
• Online documentation in HTML format	25 MB
DB2 Client Application Enabler for HP-UX	
DB2 Client Application Enabler for HP-UX	18 MB
• Online documentation in HTML format	25 MB
DB2 Client Application Enabler for Macintosh	
DB2 Client Application Enabler for Macintosh	8 MB
• Online documentation in HTML format	7 MB
DB2 Client Application Enabler for OS/2	
DB2 Client Application Enabler for OS/2 — this amount includes the following components: • Client Configuration Assistant • Graphical Tools • Control Center • Performance Monitor • Visual Explain	70 MB 2 MB 10 MB 24 MB 8 MB 4 MB
• Online documentation in HTML format	25 MB
DB2 Client Application Enabler for SCO OpenServer Version 2	
DB2 Client Application Enabler for SCO OpenServer Version 2	16 MB
• Online documentation in HTML format	25 MB
DB2 Client Application Enabler for SCO UnixWare 7	
DB2 Client Application Enabler for SCO UnixWare 7	16 MB
• Online documentation in HTML format	25 MB
DB2 Client Application Enabler for Silicon Graphics IRIX	
DB2 Client Application Enabler for Silicon Graphics IRIX	14 MB
• Online documentation in HTML format	19 MB
DB2 Client Application Enabler for SINIX Version 2	
DB2 Client Application Enabler for SINIX	16 MB
• Online documentation in HTML format	21 MB
DB2 Client Application Enabler for Solaris	
DB2 Client Application Enabler for Solaris	16 MB
• Online documentation in HTML format	25 MB
DB2 Client Application Enabler for Windows 3.x	
DB2 Client Application Enabler for Windows 3.x	10 MB

Table 2 (Page 2 of 2). Estimating Disk Requirements for Client Components

	Recommended Minimum Disk (MB)
• Online documentation in HTML format	10 MB
DB2 Client Application Enablers for Windows 32-bit Operating Systems	
DB2 Client Application Enablers for Windows 32-bit operating systems — this amount includes the following components:	94 MB
• Client Configuration Assistant	2 MB
• Control Center	18 MB
• Performance Monitor	6 MB
• Visual Explain	3 MB
• Online documentation in HTML format	30 MB

Software Requirements

The following sections outline the software that is required to run DB2 Connect Enterprise Edition or DB2 Connect Personal Edition on each of the supported operating systems.

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)

- Whether you will be using direct connection (see "Direct Connection to a Host or AS/400 Server" on page 17 or "Connections via Communications Gateway" on page 19).

Software Requirements for OS/2 Users

DB2 Connect Enterprise Edition can be used on machines running one of the following levels of the OS/2 operating system:

- 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 with SMP Feature.

Because of DB2 Connect's requirement for communications, versions of OS/2 with built-in communications capabilities such as OS/2 Warp Connect, Warp Server, Warp Server Advanced, and OS/2 Warp Version 4 are recommended.

Notes:

1. If you plan to install DB2 Connect using TME 10 SystemView, you must have TME 10 SystemView LAN Client provided by the OS/2 Warp Server.

2. The DB2 SNMP subagent requires DPI 2.0 support provided by the OS/2 Warp Server installed. If you plan to use DB2 SNMP subagent for system management, you will have to use OS/2 Warp Server.

Host Communications

DB2 Connect products running on OS/2 support communications with host and AS/400 databases using SNA (APPC), TCP/IP[1], and MPTN (APPC over TCP/IP)[2] protocols. DB2 Connect products can support all of these protocols at the same time.

For direct connection to host and AS/400 databases via SNA (APPC), one of the following communication products is required:

- IBM Communication Manager for OS/2 V1.11
- IBM Communication Server Version 4
- IBM Personal Communications for OS/2 V4.1

For direct connections to host databases via TCP/IP, no additional software is required for network-enabled versions of OS/2. Users of OS/2 Warp Version 3 require IBM TCP/IP for OS/2 Version 3.0 or later.

For connections via communications gateway, see "Connections via Communications Gateway" on page 19 and the documentation for your SNA gateway product that describes the enablement of OS/2 clients for APPC (LU6.2) communications.

Notes:

1. If you plan to support two-phase commit capability, that is, if you will be running applications that update multiple databases within the same transaction and you have an SNA (APPC) connection to your host or AS/400 database, you must install Syncpoint Manager (SPM) component. You must also use IBM Communication Server V4.1 of later for OS/2.

2. If you plan to use DCE (Distributed Computing Environment) Security for

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| [1] Requires a version of the host or AS/400 operating system that provides native TCP/IP support (e.g. DB2 for OS/390 V5.1 or
| OS/400 V4R2)

[2] Requires AnyNet to be installed on the host or the AS/400

authenticating users that connect to host databases, you do not have to install DCE products on your DB2 Connect workstation. However, you will have to:

- Ensure that you are connecting to DB2 for OS/390 V5.1 database that is enabled for DCE support using OS/390 DCE Base Services Version 3.
- Ensure that client workstations, using DCE security, have appropriate DCE software installed. DCE software must be at OSF DCE level 1.1

Support for Remote Clients

DB2 servers running on OS/2 support communications with remote clients via TCP/IP, NetBIOS, IPX/SPX, and SNA (APPC) protocols. DB2 servers can support all of these protocols at the same time.

If you are using a version of OS/2 with built-in communications capabilities such as OS/2 Warp Connect, Warp Server, Warp Server Advanced, or OS/2 Warp Version 4, no additional software is required for supporting remote clients using TCP/IP, NetBIOS, and IPX/SPX protocols.

If you are using a version of OS/2 without built-in communication support or if you need to support clients connecting via APPC one of the following communication products is required:

- NetBIOS
    - IBM LAN Requester
    - IBM NTS/2 V1.0 or later
    - IBM Communication Manager V1.x
- TCP/IP
    - IBM TCP/IP Version 3.0 or later
- IPX/SPX
    - Novell NetWare Requester, Version 2.10 or later
- APPC
    - IBM Communication Manager for OS/2 V1.11
    - IBM Communication Server Version 4.1 (required for 2-phase commit)
    - IBM Personal Communications for OS/2 V4.1

Software Requirements for Windows NT Users

DB2 Connect can be used on machines running one of the following levels of the Windows NT operating system:

- Windows NT Workstation Version 4.0
- Windows NT Server Version 4.0
- Windows NT Workstation Version 3.51

- Windows NT Server Version 3.51

Host Communications

DB2 Connect products running on Windows NT support communications with host and AS/400 databases using SNA (APPC), TCP/IP [1], and MPTN (APPC over TCP/IP)[2] protocols. DB2 Connect products can support all of these protocols at the same time.

For direct connection to host and AS/400 databases via SNA (APPC), one of the following communication products is required:

- IBM Communication Server for Windows NT V5 or later
- IBM Personal Communications for Windows NT V4.2 or later
- Microsoft SNA Server V2.11 or later

For direct connections to host databases via TCP/IP, no additional software is required.

For connections via SNA gateway, see "Connections via Communications Gateway" on page 19 and the documentation for your SNA gateway product that describes the enablement of Windows NT clients for APPC (LU6.2) communications.

Note: If you plan to use DCE (Distributed Computing Environment) Security for authenticating users that connect to host databases, you do not have to install DCE products on your DB2 Connect workstation. However, you will need to:

- Ensure that you are connecting to DB2 for OS/390 V5.1 database that is enabled for DCE support using OS/390 DCE Base Services Version 3.
- Ensure that client workstations, using DCE security, have appropriate DCE software installed. DCE software must be at OSF DCE level 1.1

If you plan to support two-phase commit on NT, you must configure the DB2 Syncpoint Manager and install IBM eNetwork Communications Server for NT V5.01.

Support for Remote Clients

DB2 servers running on Windows NT support communications with remote clients via TCP/IP, NetBIOS, IPX/SPX, Named Pipes, and SNA (APPC) protocols. DB2 servers can support all of these protocols at the same time.

Windows NT supplies all the communication support required to establish TCP/IP, NetBIOS, IPX/SPX, and Named Pipes connections. Therefore, no additional software is required for supporting remote clients or connecting to DB2 Universal Database and DB2 Connect servers.

Software Requirements for AIX Users

DB2 Connect can be used on IBM RISC System/6000 and Bull workstations running AIX Version 4.1 4 or later.

Host Communications

DB2 Connect products running on AIX support communications with host and AS/400 databases using SNA (APPC), TCP/IP[1], and MPTN (APPC over TCP/IP)[2] protocols. DB2 Connect products can support all of these protocols at the same time.

For direct connection to host and AS/400 databases via SNA (APPC), one of the following communication products is required:

- IBM SNA Server for AIX Version 3 or later
- IBM Communication Server for AIX Version 4 or later
- Bull DPX/20 SNA/20

For direct connections to host databases via TCP/IP, no additional software is required.

Note: If you plan to use DCE (Distributed Computing Environment) Security for authenticating users that connect to host databases, you do not have to install DCE products on your DB2 Connect workstation. However, you will need to:

- Ensure that you are connecting to DB2 for OS/390 V5.1 database that is enabled for DCE support using OS/390 DCE Base Services Version 3.
- Ensure that client workstations, using DCE security, have appropriate DCE software installed. DCE software must be at OSF DCE level 1.1

Support for Remote Clients

DB2 servers running on AIX support communications with remote clients via TCP/IP, NetBIOS, IPX/SPX, and SNA (APPC) protocols. DB2 servers can support all of these protocols at the same time.

AIX supplies all the communication support required to establish TCP/IP connections. Therefore, no additional software is required for supporting remote clients or connecting to DB2 Universal Database servers.

If you need to support clients connecting via NetBIOS, IPX/SPX, or APPC, one of the following communication products is required:

- NetBIOS
  - IBM NetBIOS and IPX/SPX for AIX Version 2.1
- IPX/SPX
  - IBM NetBIOS and IPX/SPX for AIX Version 2.1

- IBM NetWare for AIX, Version 3.11B
- | AIX Connections feature of AIX 4.1.4
- | AIX base operating system 4.1.4 or later

- APPC
    - IBM Communication Server for AIX Version 4
    - IBM SNA Server for AIX Version 3

Software Requirements for HP-UX Users

DB2 Connect can be used on HP 9000 series 700 and 800 workstations running HP-UX Version 10.10 or later.

Host Communications

DB2 Connect products running on HP-UX support communications with host and AS/400 databases using SNA (APPC), and TCP/IP[1] protocols. DB2 Connect products can support all of these protocols at the same time.

For direct connection to host and AS/400 databases via SNA (APPC), both of the following communication products are required:

- | HP SNAplusLink Release 4 Version A.10.10, or system network
- | architectureplus2Link Release 6 Version 11.00.000, and
- | HP SNAplusAPI Release 4 Version A.10.10 or system network
- | architectureplus2API Release 6 Version 11.00.000

For direct connections to host databases via TCP/IP, no additional software is required.

Notes:

1. If you plan to use DCE (Distributed Computing Environment) Security for authenticating users that connect to host databases, you do not have to install DCE products on your DB2 Connect workstation. However, you will need to:

    - Ensure that you are connecting to DB2 for OS/390 V5.1 database that is enabled for DCE support using OS/390 DCE Base Services Version 3.
    - Ensure that client workstations, be using DCE security, have appropriate DCE software installed. DCE software must be at OSF DCE level 1.1

Support for Remote Clients

DB2 servers running on HP-UX support communications with remote clients via TCP/IP, and IPX/SPX protocols. DB2 servers can support all of these protocols at the same time.

HP-UX supplies all the communication support required to establish TCP/IP connections. Therefore, no additional software is required for supporting remote clients or connecting to DB2 Universal Database servers.

If you need to support clients connecting via IPX/SPX, you must have NetWare Version 3.12 for HP 9000 installed and configured.

Software Requirements for Solaris Users

DB2 Connect can be used on SUN workstations running Solaris Version 2.5.1 or later.

Host Communications

DB2 Connect products running on Solaris support communications with host and AS/400 databases using SNA (APPC), and TCP/IP[1] protocols. DB2 Connect products can support all of these protocols at the same time.

For direct connection to host and AS/400 databases via SNA (APPC), you must purchase SunLink SNA 9.0 and install and configure the following components of this product:

- SunLink P2P LU6.2 9.0
- SunLink PU2.1 9.0
- SunLink P2P CPI-C 9.0

For direct connections to host databases via TCP/IP, no additional software is required.

Note: If you plan to use DCE (Distributed Computing Environment) Security for authenticating users that connect to host databases, you do not have to install DCE products on your DB2 Connect workstation. However, you will need to:

- Ensure that you are connecting to DB2 for OS/390 V5.1 database that is enabled for DCE support using OS/390 DCE Base Services Version 3.
- Ensure that client workstations that will be using DCE security have appropriate DCE software installed. DCE software must be at OSF DCE level 1.1

Support for Remote Clients

DB2 servers running on Solaris support communications with remote clients via TCP/IP, and IPX/SPX protocols, as well as incoming clients via APPC. DB2 servers can support all of these protocols at the same time.

Solaris supplies all the communication support required to establish TCP/IP connections. Therefore, no additional software is required for supporting remote clients or connecting to DB2 Universal Database servers.

If you need to support clients connecting via IPX/SPX, you must install and configure SolarNet PC Protocol Services 1.1 with IPX/SPX for the Solaris 2.x Operating Environment.

Software Requirements for SCO UnixWare 7 Users

DB2 Connect can be used on Intel-based workstations supported by SCO UnixWare 7.

Host Communications

DB2 Connect products running on SCO UnixWare 7 support communications with host and AS/400 databases using SNA (APPC), and TCP/IP[1] protocols. DB2 Connect products can support all of these protocols at the same time.

For direct connection to host and AS/400 databases via SNA (APPC), you require IBM eNetwork Communication Server for SCO UnixWare 7, Version 5.

For direct connections to host databases via TCP/IP, no additional software is required.

Support for Remote Clients

SCO UnixWare 7 supplies all the communication support required to establish TCP/IP or IPX/SPX connections. Therefore, no additional software is required for supporting remote clients or connecting to DB2 Universal Database servers.

Client Product Requirements

Table 3 lists the software requirements needed for the DB2 client products.

Table 3 (Page 1 of 5). Software Requirements for Clients

Component	Operating System	Communications
• DB2 Client Application Enabler for AIX	RISC System/6000 and the following: • AIX Version 4.1.4 or later	APPC or TCP/IP • For APPC connectivity, you require IBM Communications Server Version 4.1.4 or later for AIX • The AIX base operating system provides TCP/IP connectivity, if selected during install. **Notes:** 1. If you want to use DCE (Distributed Computing Environment), you require a DCE product that is provided by the AIX Version 4.1.4 operating system with its latest DCE PTF. 2. DB2 for AIX also has a server IPX communications manager.

Table 3 (Page 2 of 5). Software Requirements for Clients

Component	Operating System	Communications
• DB2 Client Application Enabler for HP-UX Version 10.10 or later	HP 9000 Series 700 or 800 system and the following: • HP-UX Version 10.10 or later The following patches are required: • For HP-UX Version 10.20 – PHSS_10556 – PHSS_10436 – PHSS_10053 – PHSS_10113 • For HP-UX Version 10.10 – PHSS_10437 – 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 10.10 and 10.20 require one of the following: – SNAplus and the following components: - SNAplusLink Version A.10.10 - SNAplusAPI Version A.10.10 OR – SNAplus2 and the following components: - SNAplus2Link Version A.10.10 - SNAplus2API Version A.10.10 • The HP-UX base operating system provides TCP/IP connectivity. **Notes:** 1. DB2 for HP-UX has a server IPX communications manager 2. If you want to use DCE (Distributed Computing Environment), you require a DCE product that is provided by the HP-UX Version 10 or later base operating system.
• DB2 Client Application Enabler for HP-UX Version 11	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 • The HP-UX base operating system provides TCP/IP connectivity. **Notes:** 1. DB2 for HP-UX has a server IPX communications manager 2. If you want to use DCE (Distributed Computing Environment), you require a DCE product that is provided by the HP-UX Version 11 or later base operating system.
• DB2 Client Application Enabler for Macintosh	• System 7.5 or later	TCP/IP • For TCP/IP connectivity, you require MacTCP Version 2.0.6. **Note:** If you are running in a 68K environment, you need to install Apple Shared Library Manager (ASLM) Version 2.0 or later.

Table 3 (Page 3 of 5). Software Requirements for Clients

Component	Operating System	Communications
• DB2 Client Application Enabler for OS/2	• OS/2 Warp Version 3 or 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	APPC, IPX/SPX, Named Pipes (Local), NetBIOS, or TCP/IP • For APPC connectivity, you require IBM Communications Manager Version 1.x or later. • For NetBIOS connectivity, you require IBM NTS/2 Version 1.0, IBM Communications Manager Version 1.1, or IBM OS/2 LAN Requester. • For IPX/SPX connectivity, you require the Novell NetWare client for OS/2 Version 2.10 or later. • 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. OS/2 Warp Server provides the Netfinity LAN client that Netfinity LAN needs for installing clients and servers. 2. Net.Data requires OS/2 Warp Version 3 or later and a Web server such as IBM's Internet Connection Server. 3. For DCE Cell Directory Services Support (CDS) for DB2 Client Application Enabler for OS/2, you must install IBM Distributed Computing Environment Cell Directory Service client, Version 2.10, on each client workstation.
• DB2 Client Application Enabler for SCO OpenServer	• SCO OpenServer Version 5.0.2 or later	APPC, IPX/SPX, or TCP/IP • For APPC connectivity, you require Interface Systems CLEO SNA Version 4.1.1. • The SCO OpenServer base operating system provides IPX/SPX and TCP/IP connectivity.
• DB2 Client Application Enabler for SCO UnixWare 7	• SCO UnixWare 7	APPC, IPX/SPX, or TCP/IP • For APPC connectivity, you require: – IBM eNetwork Communications Server Version 5 • The SCO UnixWare 7 base operating system provides IPX/SPX and TCP/IP connectivity.

• DB2 Client Application Enabler for Silicon Graphics IRIX	• Silicon Graphics IRIX, Version 6.x, and the following filesets:
	  – eoe.sw.oampkg
	  – eoe.sw.svr4net
		TCP/IP
		
		Note: The Silicon Graphics IRIX base operating system provides TCP/IP connectivity.

• DB2 Client Application Enabler for SINIX	Siemens Nixdorf RM200 or RM400 or RM600 system and the following:
	
	• SINIX-N or SINIX-Y Version 5.42 or later,
	• Reliant UNIX
		APPC or TCP/IP
		
		• For APPC connectivity, you require the following:
		  – SINIX TRANSIT-SERVER V3.3, SNA Communication Server
		  – SINIX TRANSIT-CLIENT V3.3 SNA Communication Server / Local Function
		  – SINIX TRANSIT-CPIC V3.3 SNA LU6.2 Communication and CPI-C.
		• The SINIX base operating system provides TCP/IP connectivity.

Table 3 (Page 4 of 5). Software Requirements for Clients

Component	Operating System	Communications
• DB2 Client Application Enabler for Solaris	Solaris SPARC-based computer and the following: • Solaris Version 2.5.1 or later The following patches are required with Version 2.5.1: • 101242 Rev.11 or higher • 103566 Rev.08 or higher • 103600 Rev.13 or higher • 103640 Rev.20 or higher	APPC or TCP/IP • For APPC connectivity, you require SunLink SNA 9.0 and the following: – SunLink P2P LU6.2 9.0 – SunLink PU2.1 9.0 – SunLink P2P CPI–C 9.0 • The Solaris base operating system provides TCP/IP connectivity. **Notes:** 1. If you want 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. 2. DB2 for Solaris also has a server IPX communications manager.
• DB2 Client Application Enabler for Windows 3.x	• Microsoft Windows 3.x	IPX/SPX, NetBIOS, or TCP/IP • For IPX/SPX connectivity, you require Novell NetWare client for Windows, which comes with Novell Netware Server Version 3.x or Version 4.x; or Novell NetWare Workstation for Windows Version 1.0 or later with the latest update kit installed. • For NetBIOS connectivity, you require the LAN Adapter and Protocol Support in any of these products: – IBM LAN Support Program Version 1.2.1 or later – DOS LAN Services (LAN Server 4.0) – Banyan Vines NetBIOS Version 5.52 – NetBEUI (available with Microsoft Windows for Workgroups 3.11) • For TCP/IP connectivity, you require a TCP/IP stack that is compliant with the Windows Sockets Version 1.1 specification.
• DB2 Client Application Enabler for Windows 3.x using WIN-OS/2	• OS/2 Warp Version 3 or 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	NetBIOS, IPX/SPX, TCP/IP, or Named Pipes (Local) • For NetBIOS connectivity, you require IBM NTS/2 Version 1.0, IBM Communications Manager Version 1.1, or IBM OS/2 LAN Requester. • For IPX/SPX connectivity, you require Novell NetWare client for OS/2 Version 2.10 or later with virtual session support. • For TCP/IP connectivity, you require IBM TCP/IP for OS/2 with the Windows Access kit.
• DB2 Client Application Enabler for Windows 95	• Windows 95 4.00.950 or later	IPX/SPX, Named Pipes, NetBIOS, or TCP/IP • The Windows 95 base operating system provides NetBIOS, IPX/SPX, TCP/IP, and Named Pipes connectivity. **Note:** IPX/SPX connectivity is supported between Windows 95 clients and Windows NT servers. There is no support for IPX/SPX connectivity between Windows 95 clients and OS/2 and UNIX servers.

Table 3 (Page 5 of 5). Software Requirements for Clients

Component	Operating System	Communications
• DB2 Client Application Enabler for Windows 98	• Windows 98	IPX/SPX, Named Pipes, NetBIOS, or TCP/IP • The Windows 98 base operating system provides NetBIOS, IPX/SPX, TCP/IP, and Named Pipes connectivity. **Note:** IPX/SPX connectivity is supported between Windows 98 clients and Windows NT servers. There is no support for IPX/SPX connectivity between Windows 98 clients and OS/2 and UNIX servers.

• DB2 Client Application Enabler for Windows NT	• Windows NT Version 3.51
	• Windows NT Version 4.0 or later
		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 Communications Server for Windows NT Version 5.01.
		  – Microsoft SNA Server Version 2.11 or later on the LAN. You do not have to install the SNA Server on the same workstation as the DB2 Client Application Enabler for Windows NT.
		  – PCOMM AS/400 and 3270 V4.1 or later
		  – Wall Data Rumba
		
		Note: 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 DB2 Client to a specific DB2 Connect Server.

Table 4 (Page 1 of 2). Possible Client-to-Server Connectivity Scenarios

	DB2 Connect Servers							
	AIX	**HP-UX**	**OS/2**	**SCO UnixWare 7**	**Solaris**	**Windows NT**	**SCO OpenServer**	**SINIX**
AIX	APPC TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP	APPC TCP/IP	TCP/IP
HP-UX	APPC TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP	APPC TCP/IP	TCP/IP
Macintosh	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP
OS/2	APPC IPX/SPX(1),(2) TCP/IP	IPX/SPX(1),(2) TCP/IP	APPC IPX/SPX(1),(2) NetBIOS TCP/IP	IPX/SPX(1), TCP/IP	APPC IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) NetBIOS TCP/IP	APPC IPX/SPX(1) TCP/IP	TCP/IP
SCO OpenServer	APPC IPX/SPX(1) TCP/IP	IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) TCP/IP	IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) TCP/IP	TCP/IP
SCO UnixWare 7	APPC IPX/SPX(1) TCP/IP	IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) TCP/IP	IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) TCP/IP	TCP/IP

Table 4 (Page 2 of 2). Possible Client-to-Server Connectivity Scenarios

| | DB2 Connect Servers | | | | | | | |
	AIX	HP-UX	OS/2	SCO UnixWare 7	Solaris	Windows NT	SCO OpenServer	SINIX
Silicon Graphics IRIX	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP
SINIX	APPC TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP	APPC TCP/IP	TCP/IP
Solaris	APPC TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP	APPC TCP/IP	TCP/IP
Windows 3.x	IPX/SPX(1),(2) TCP/IP	IPX/SPX(1),(2) TCP/IP	IPX/SPX(1),(2) NetBIOS TCP/IP Local Named Pipes	IPX/SPX(1) TCP/IP	IPX/SPX(1) TCP/IP	IPX/SPX(1) NetBIOS TCP/IP	IPX/SPX(1) TCP/IP	TCP/IP
Windows 95 or Windows 98	IPX/SPX(1) TCP/IP	IPX/SPX(1) TCP/IP	IPX/SPX(1) NetBIOS TCP/IP	IPX/SPX(1) TCP/IP	IPX/SPX(1) TCP/IP	IPX/SPX(1) Named Pipes NetBIOS TCP/IP	IPX/SPX(1) TCP/IP	TCP/IP
Windows NT	APPC IPX/SPX(1) TCP/IP	IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) NetBIOS TCP/IP	IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) Named Pipes NetBIOS TCP/IP	APPC IPX/SPX(1) TCP/IP	TCP/IP
1 Direct Addressing								
2 File Server Addressing								
Note: SCO OpenServer and SINIX are DB2 Version 2 only.								

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 to 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 diver itself to each database that will be accessed.

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

DB2 for OS/390 or DB2 for MVS

> BINADD 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 5. Installing DB2 Connect on OS/2 Systems

If you need to install software on many OS/2 systems, see Chapter 43, "Unattended DB2 Installation on OS/2 Operating Systems" on page 419.

This chapter describes how to install DB2 Connect on an OS/2 workstation.

Before You Begin Installing on OS/2 Operating Systems

Before you begin the installation, be sure that you have the following items and information:

- The protocol to be used for host connectivity:
  - APPC
  - TCP/IP
  - MPTN
- A user ID that has local administrator or administrator authority in User Profile Management (UPM). The Administration Server uses this user ID to log on when it is started.

  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; see Chapter 42, "Administering and Using OS/2 User Profile Management on OS/2 Systems" on page 409 for more information.

  When prompted for this user ID and password during install, the user ID will be checked to ensure that it exists, can logon, and has administrative authority on the system. If the checks fail, install will not continue until a user ID and password are properly verified. You can minimize the install window if necessary to create the user ID, but it is recommended that this be done prior to starting the install.

  If UPM is not installed, DB2 will install it, and the user ID and password entered will be used to create a user ID with the correct authorities so that the Administration Server can be logged on and started when the system is booted.

- The names of the products you want and are licensed to install (see "Selecting Products and Components" on page 46). To see descriptions of each of the products, see Chapter 1, "About DB2 Connect" on page 3.

- If you decide to install the Control Center, you must also decide whether you want the Control Center to autostart. The Control Center is a graphical tool used to perform the following DB2 administration tasks: managing databases, tables and views; configuring systems; performing database backup and recovery; scheduling jobs; and replicating data.

Selecting Products and Components

The following table lists the products and selectable components that you can install with DB2 Connect Enterprise Edition.

Table 5. Products and Components for DB2 Connect Enterprise Edition for OS/2	
Product	**Components**
DB2 Connect Enterprise Edition	• DB2 Connect Enterprise Edition • Graphical Tools • Client Configuration Assistant • Control Center • Performance Monitor • Visual Explain • Windows Support • Documentation • Japanese Conversion Support • Korean Conversion Support • Simplified Chinese Conversion Support • Traditional Chinese Conversion Support
DB2 Client Application Enabler	• DB2 Client Application Enabler • Graphical Tools • Client Configuration Assistant • Control Center • Performance Monitor • Visual Explain • Documentation

Performing the Installation on OS/2

To install DB2 from CD-ROM, do the following:

1 Insert the CD-ROM in the drive.

2 There are two ways to begin the DB2 installation. These are:

- If you have the OS/2 Warp Server installed, double-click on the **Server Installation** icon located in the **Server** folder on the desktop.

OR

- Open an OS/2 windows and set the drive to *x:*, where *x:* represents your CD-ROM drive.
- Set the current directory to `\db2\`*`language`*`\install,` where *`language`* `is the two-character country code that represents your language (for example,` `EN` for English). Table 49 on page 531 lists the codes for each available language.
- Enter the command **install**.

> You can invoke the install command with optional parameters to create error and history log files. See "Step 3. Run the CMD File from the Remote Workstation" on page 423 for more information.

3 The IBM DB2 for OS/2 Version 5 Installation window opens. Select the product that you want to install on your system. Select the **Install** radio button and then click on the **Continue** push button. Following is a sample of the window:

4 In the Update CONFIG.SYS File window, indicate whether or not you want to update the `config.sys` file as part of the installation.

- If you want the `config.sys` file updated, click on **OK**. A backup copy of your existing file is kept as config.0xx.

- If you do not want the `config.sys` file updated, clear the **Update CONFIG.SYS** check box and click on **OK**. You will need to manually update your config.sys file with the values that are stored in the `config.add` file that will be created in the root directory of your boot drive.

5 The Install - Directories window provides a list of the product's components. You can choose which of the components you want to install on your system.

For the Install - Directories window, complete the entries as follows:

a Select each of the components you want to install.

b Click on the **Descriptions** button for a brief description of the selected components.

c In the **File directory** field, type the directory where you want the product installed. The default value is `c:\sqllib`.

Note: If a DB2 Version 5 product is already installed on the workstation, you must install on the same drive and directory.

d Click on the **Disk Space** button to see how much space you have on each of the drives on your machine and to change disks if necessary.

e Click on the **Install** button to continue.

6 The Specify System Name window opens. Enter a name for your system that is unique in your network. This is an arbitrary name that will be used by remote clients to locate databases on your system. Click on **Next** to continue.

7 The Customize Communication Protocols window opens. The installation software detects the communications protocols installed on the system and configures the default instance (called DB2) and the Administration Server to use them. Values are generated for the protocol parameters; if your system has APPC, the APPC communications subsystem is updated to support the operation of DB2.

Click on **Next** to accept these values. If you want to override the detected protocols or the generated values, you can do so for either the DB2 instance or the Administration Server, or both. Refer to the online help for this panel for more information.

You can also choose to have the DB2 instance started automatically when your system is started; this is the default. If you do not want the DB2 instance started automatically, clear the **Auto start DB2 instance at boot time** check box.

8 The Enter User ID and Password window opens. Use this to enter the user ID and password that will be used to log on and start the Administration Server each time your system is started. If UPM already exists on your system, the user ID and password you provide must exist and have one of the following:

- UPM administrator authority on your system.
- UPM local administrator authority on your system.

If UPM is not on your system, it will be installed as part of the DB2 installation and the user ID and password you supply will be set up with the appropriate authority. Click on **Done** to continue.

9. The product and components you have chosen are installed on your system. A progress window appears until the installation is complete.

10. A message appears when the installation is complete. Click on **OK** to dismiss the message, shut down and reboot your system.

This completes the installation.

> If DB2 fails to start after you reboot your system, see the file `db2cnfg.out` in the `x:\sqllib\misc` directory, where `x:` is the drive where you installed DB2. This file contains the results of database manager configuration updates, and other actions necessary for automated startup upon reboot.

Chapter 6. Installing DB2 Connect on Windows NT Systems

If you need to install software on many Windows NT systems, see Chapter 44, "Unattended DB2 Installation on Windows 32-bit Operating Systems" on page 429.

This chapter describes how to install DB2 Connect on a Windows NT workstation.

Before You Begin Installing on Windows NT

Read and perform the steps in this section before you begin the installation to ensure that you have the items and information that you will need.

Creating Usernames for DB2 Installation and Operation

This section describes the usernames required to install the DB2 product and its components.

Creating a Username for Installing DB2 Products

You need to have a username that will be used to install DB2. The username may belong to the Domain or local Administrators group, and also be a valid DB2 username or have the *"Act as part of the operating system"* advanced user right.

A valid DB2 username is eight characters or less, and complies with DB2's naming rules. For more information on DB2's naming rules, see Appendix G, "Naming Rules" on page 553.

If this username does not comply with DB2's naming rules, but has the *"Act as part of the operating system"* advanced user right, the setup program will create the username *DB2ADMIN* to perform the installation.

> This username will be removed from the system when the installation is complete, unless it will be used by the Administration Server. See "Determining the Username for the Administration Server" on page 52 for more information.

Determining the Username for the Administration Server

During installation, you will be asked to provide a username and password that will be used by the Administration Server to log on to the system and to start itself as a service. You are strongly advised to use the same username that you used as your domain username.

By default, the setup program will fill the **Username**, **Password**, and **Confirm Password** fields with *db2admin*. You can accept these default values, or provide your own. If you provide your own username, you must ensure that it is eight characters or less and complies with DB2's naming rules. For more information, see Appendix G, "Naming Rules" on page 553.

The setup program will check to see if the username specified for the Administration Server exists, if it does not, it will be created. If it does exist, the setup program will:

- Verify that the username is a member of the Administrators group.

- Verify that the password is valid; provided that the username used to install DB2 has the *"Act as part of the operating system"* advanced user right.

> If you used the default username *db2admin*, and did not change the default password for this username, you should change this password immediately following the installation.
>
> When the setup program creates the *db2admin* username, it also makes it a member of the Administrators group. Since its password is well known, you should do the following:
>
> **1** Change the password for *db2admin*, using the User Manager function of the DB2 administration tools.
>
> **2** Change the password for the *DB2-DB2DAS00* service to match the new password that you specified for the *db2admin* username.

Selecting Products and Components

The following table lists the products and selectable components that you can install on DB2 Connect Enterprise Edition. For information on the products and components, see Chapter 1, "About DB2 Connect" on page 3. The marks in the columns for **Typical Install** and **Compact Install** indicate the components that are installed when these types of install are used. If you want to install specific components and subcomponents,

you can choose the **Compact Install** type. See "Performing the Installation" on page 53 for more information on install types.

Table 6. Products and Components for DB2 Connect Enterprise Edition for Windows NT			
Product	**Components and Subcomponents**	**Typical Install**	**Compact Install**
DB2 Connect Enterprise Edition	□ Graphical Tools	√	
	□ Client Configuration Assistant	√	
	□ Control Center	√	
	□ Performance Monitor	√	
	□ Visual Explain	√	
	□ DB2 ODBC Driver	√	√
	□ East Asian Conversion Support		
	□ Documentation	√	
DB2 Client Application Enabler	□ Graphical Tools	√	
	□ Client Configuration Assistant	√	
	□ Control Center		
	□ Performance Monitor		
	□ Visual Explain		
	□ DB2 ODBC Driver	√	√
	□ Documentation	√	

Performing the Installation

To install DB2 Connect Enterprise Edition on a Windows NT workstation:

1. Log on as a user that meets the requirements for installing DB2. For more information, see "Creating Usernames for DB2 Installation and Operation" on page 51.

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

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

> To manually invoke the setup program, do the following:
>
> **1** Click on **Start** and select the **Run** option.
>
> **2** Type the following in the **Open** field:
>
> x:\setup /i *language*
>
> where:
>
> - x: represents your CD-ROM drive
> - *language* represents the two-character country code for your language (for example, EN for English). Table 49 on page 531 lists the code for each available language.
>
> **3** Click on **OK**.

4 The Welcome window opens. Click on the **Next** push button to open the Select Products window, as shown below. Select the product that you want to install and click on the **Next** push button.
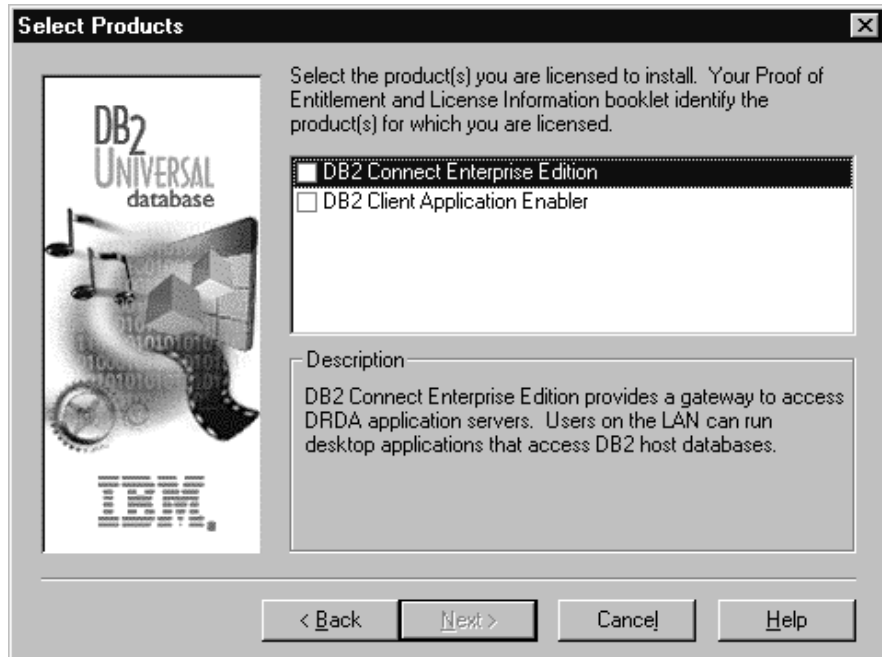
5 You can select the installation type you prefer by clicking on the appropriate push button:

The setup program does not detect or configure an APPC communications subsystem; as a result, the setup program will not automatically configure your DB2 server to support APPC.

If you want to set up your DB2 server to support inbound client requests using APPC, you must perform a Custom Installation. The setup program will allow you to select support for APPC and provide the required DB2 parameters; however, it cannot configure the APPC communications subsystem.

To configure the APPC communications subsystem, see Chapter 11, "Configuring Communications to Host and AS/400 Databases Manually" on page 93.

Typical Install: Installs those DB2 components that are used most often, including all required components, ODBC support, documentation, and commonly used DB2 tools such as the Information Center, the Client Configuration Assistant, and the Control Center. The DB2 instance and the Administration server are created and customized to use the protocols detected on your system.

Compact Install: Installs only required DB2 components and ODBC support. The DB2 instance and the Administration server are created and customized to use the protocols detected on your system.

Custom Install: Installs only those components that you select. The DB2 instance and the Administration server are created and customized to use the protocols detected on your system. The default for a Custom install is to install those components and subcomponents you would get in a Typical install.

Note: You cannot selectively uninstall components after the setup program completes the installation.

6 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 at any time.

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

7 After you install the product, you must reboot your workstation before you can begin to use it. Select a reboot option and click on the **Finish** push button.

8 After your workstation has rebooted, check that the network adapter is bound to the DLC communications subsystem:

a Click on the **Start** button and select **Settings**->**Control Panel**.

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

c In the Network window, select the **Bindings** tab.

d From the **Show bindings for:** drop down box, select **All Adapters**

e Double-click on adapter for which you want to see the bounded protocols

| **f** Ensure that **DLC** is enabled. If it is not, click on the **Enable** push button to
| enable the bind the network adapter to the communications subsystem.

This completes 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 installation and uninstall activities. By default, the `db2.log` file
> is located in the `x:\db2log` directory; where x: is the drive on which your
> operating system is installed.

The installation program has:

- Created DB2 program groups and items (or shortcuts).

- Registered a security service.

- Updated the Windows registry.

| - Created a default instance named DB2, added it as a service, and configured it for
| communications. If you selected to **Automatically start the DB2 instance at boot**
| **time**, the service's startup type was set to **Automatic**; otherwise, it was set to
| **Manual**.

- Created the DB2 Administration Server, added it as a service, and configured it so
  that DB2 tools can administer the server. The service's start type was set to
  Automatic.

Chapter 7. Installing DB2 Connect on UNIX Systems

If you need to migrate databases that were created using previous versions of DB2, you must complete certain procedures after installing Version 5 of DB2. See Chapter 9, "Migrating from Previous Versions and Releases on UNIX Systems" on page 75 for further information.

We recommend that you install and configure DB2 Universal Database products using the DB2 Installer program. Other methods to install DB2 Universal Database products are also supported.

This section describes how to use the DB2 Installer program. For other advanced installation and configuration methods, refer to the following:

- Chapter 45, "Other Methods to Install DB2 Connect for AIX" on page 449.
- Chapter 46, "Other Methods to Install DB2 Connect for HP-UX" on page 459.
- Chapter 47, "Other Methods to Install DB2 Connect for Solaris" on page 469.

For information on how to install the DB2 clients, refer to Chapter 27, "Installing DB2 Clients" on page 273.

The table that follows lists the selectable components you can install.

Table 7. Products and Selectable Components for DB2 Connect Enterprise Edition	
Product / Component Description	**Status**
DB2 Client Application Enabler	Required
Open Database Connectivity (ODBC) support	Recommended
Java Support (JDBC)	Recommended
Administration Server	Required
DB2 Run-time Environment	Required
DB2 Connect Support	Required
Communication Support for TCP/IP	Required
Communication Support for IPX/SPX	Required
Communication Support for SNA	Required
Communication Support for DRDA Application Server	Required
License Support for DB2 Connect Enterprise Edition	Required
DB2 Replication	Optional
DB2 Product Messages (non-English)[1]	Optional
DB2 Product Library (HTML) [1]	Optional
Required	Required components must be installed.
Recommended	Recommended components are installed by default. You can select whether or not to install this component.
Optional	Optional components can be installed, but if you want to install it, you must select it.
Note: [1] There is a separate component of the DB2 Product Messages and the DB2 Product Library for each supported locale.	

Before You Begin

Before you begin installing DB2 products using the DB2 Installer program, you need to gather the following information:

Where is the CD-ROM mount point?
You need to mount the CD-ROM before you can install the DB2 product. To mount the CD-ROM, you must know where the mount point is. For example, the CD-ROM mount point could be /cdrom.

Note: On the Solaris operating system, the CD-ROM is automatically mounted if the Volume Manager (vold) is running.

How much disk space does my operating system require for all selected products?
See "Estimating Fixed Disk Requirements" on page 27 and "Server Components" on page 27 to find out how much disk space is required for selected products and how to estimate disk space requirements.

How do I assign a group name and user name for a DB2 instance?
A separate user name must be used for each DB2 Instance. We recommend that a new group be created which should be used as a primary group for the DB2 instance user.

How do I assign a group name and user name for the Administration Server?
You need a dedicated group name and user name for the Administration Server. For security reasons, we recommend that you do not use the DB2 Instance user name and group name for the Administration Server.

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

- The DB2 Installer's **db2setup** command only works with 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 the DB2 products, perform the following steps:

1 Identify and record parameter values.

2 Update kernel configuration parameters. (This step is not required on AIX.)

3 Mount the CD-ROM.

4 Install DB2 products.

Step 1. Identify and Record Parameter Values

Table 8 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 8, 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 8 (Page 1 of 2). Parameter Values Required for Installation		
Information Required for DB2 Installer	**Default Value**	**Your Value**
Product/Component		
• DB2 Product Name[1]	None	
• DB2 Product Messages[2]	None	
• Documentation[2]	None	
DB2 Instance		
• User Name	db2inst1	
• UID	System-generated UID	
• Group Name	db2iadm1	
• GID	System-generated GID	
• Password	ibmdb2	
• TCP/IP Service Name	db2cdb2inst10	
• TCP/IP Port Number	50000	
• 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	
• User Name (UDF)	db2fenc1	
• UID (UDF)	System-generated UID	
• Group Name (UDF)	db2fadm1	
• GID (UDF)	System-generated GID	
• Password (UDF)	ibmdb2	
Administration Server		

Table 8 (Page 2 of 2). Parameter Values Required for Installation		
Information Required for DB2 Installer	**Default Value**	**Your Value**
• 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. See Appendix D, "Contents of the DB2 Products" on page 537 for the names of filesets for DB2 Product Messages and Documentation.		

Step 2. Updating Kernel Configuration Parameters

Depending on your workstation's operating system and its kernel configuration, you may have to update the kernel configuration parameters.

This step is not required on AIX.

Recommended Values for HP-UX Version 10 and Version 11

The values in Table 9 are recommended for the HP-UX kernel configuration parameters.

Table 9. HP-UX Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Physical Memory		
	64MB - 128MB	128MB - 256MB	256MB+
maxuprc	256	384	512
maxfiles	256	256	256
nproc	512	768	1024
nflocks	2048	4096	8192
ninode	512	1024	2048
nfile	(4 * ninode)	(4 * ninode)	(4 * ninode)
msgseg	8192	16384	32768
msgmnb	65535 (1)	65535 (1)	65535 (1)
msgmax	65535 (1)	65535 (1)	65535 (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	67108864	134217728 (2)	268435456 (2)
shmseg	16	16	16
shmmni	300	300	300

Notes:

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

2. To maintain the interdependency among kernel parameters, change parameters in the same sequence in which they appear in the preceding table.

3. 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 184968806 (176*1024*1024).

Recommended Values for SCO UnixWare 7

The values in Table 10 are recommended for SCO UnixWare 7 kernel configuration parameters.

Table 10. SCO UnixWare 7 Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Recommended Value
msgmax	65535 (1)
msgmnb	65535 (1)
msgssz	524288
msgmni	256
shmmax	268435456
shmmni	300
shmseg	15
semmi	1024

Notes:

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

2. To maintain the interdependency among kernel parameters, change parameters in the same sequence in which they appear in the preceding table.

3. Parameter *shmmax* 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 *shmmax* to 184968806 (176*1024*1024).

To change a value, do the following:

1 Enter the **scoadmin** command to start the System Administration tool.

2 Double-click on the **System** folder.

3 Double-click on the **System Tuner** icon.

4 Click on the drop down box and select the **Inter-Process Communication (IPC) Parameters**.

5 Select the parameter to be changed and enter the new value.

6 Click on **OK** when you have finished changing all the parameters.

7 Click on the **Yes** push button to rebuild the kernel.

8 Reboot the system so that the changes can take effect.

Recommended Values for Solaris

The values in Table 11 are recommended for Solaris kernel configuration parameters.

Kernel Parameter	Physical Memory			
	64MB - 128MB	128MB - 256MB	256MB - 512MB	512MB+
msgsys:msginfo_msgmax	65535 (1)	65535 (1)	65535 (1)	65535 (1)
msgsys:msginfo_msgmnb	65535 (1)	65535 (1)	65535 (1)	65535 (1)
msgsys:msginfo_msgmap	130	258	258	258
msgsys:msginfo_msgmni	128	256	256	256
msgsys:msginfo_msgssz	16	16	16	16
msgsys:msginfo_msgtql	256	512	1024	1024
msgsys:msginfo_msgseg	8192	16384	32768	32768
shmsys:shminfo_shmmax	67108864	134217728 (2)	268435456 (2)	536870912 (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

Table 11. Solaris Kernel Configuration Parameters (Recommended Values)

Notes:

1. The *msgsys:msginfo_msgmnb* and *msgsys:msginfo_msgmax* parameters must be set to 65535.

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 (176*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/V5.0/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 more than 256MB–512MB of physical memory
- kernel.param.512MB for systems with more than 512MB 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.

Step 3. Mount the CD-ROM

To install DB2 products using the DB2 Installer program, you must first mount the CD-ROM. Once you have mounted the CD-ROM, you can start installing DB2 Universal Database.

Mounting on AIX Systems

Perform the following steps to mount the CD-ROM on AIX operating systems:

1 Log in as user with root authority.

2 Insert the DB2 Client Application Enablers CD-ROM in the drive.

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

```
mkdir -p /cdrom
```

where cdrom is the CD-ROM mount directory.

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

```
smitty storage
```

5 Select **File Systems**.

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

7 Select **CDROM File Systems**.

8 Select **Add CDROM File System**.

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.

10 In the pop-up window, enter /cdrom as the **mount point**.

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

```
smit mountfs
```

12 Select the **FileSystem** name. For example, the name could be /dev/cd0.

13 Select the **Directory** name, /cdrom.

14 Select the **Type of filesystem**, cdrfs.

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

16 Log off.

After mounting the CD-ROM, proceed to "Step 4. Install the DB2 Products" on page 67.

Mounting on HP-UX Systems

Perform the following steps to mount the CD-ROM on HP-UX operating systems:

1 Log in as user with root authority.

2 Insert the CD-ROM in the drive and mount it as in the following example:

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

where /cdrom is the CD-ROM mount directory.

3 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" on page 67.

Mounting on SCO UnixWare 7 Systems

Perform the following steps to mount the CD-ROM on SCO UnixWare 7 operating systems:

1 Log in as user with root authority.

| **2** Insert the CD-ROM in the drive and mount it as in the following example:

```
mount -F cdfs -o ro /dev/cdrom/c0b0t5l0 /cdrom
```

| where `c0b0t5l0` is the device name found under the `/dev/cdrom` directory and varies with the particular hardware on the system.

| **3** Log out.

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

Mounting on Solaris Systems

Perform the following steps to mount the CD-ROM on Solaris operating systems:

1 Log in as user with root authority.

| **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* is the CD-ROM mount directory.

| 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
```

3 Log out.

Step 4. Install the DB2 Products

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

> If you are installing the DB2 Client Application Enabler 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.

1 Log in as root.

2 Insert the DB2 CD-ROM in the drive.

3 If required, mount the CD-ROM. Refer to "Step 3. Mount the CD-ROM" on page 65 if required.

4 Change to the directory where the CD-ROM is mounted by entering the following command:

a On AIX, HP-UX, or SCO UnixWare 7:

```
cd /cdrom
```

b On Solaris:

```
cd /cdrom/unnamed_cdrom
```

where /cdrom is the mount point of the CD-ROM drive on AIX, HP-UX, or SCO UnixWare 7, and /cdrom/unnamed_cdrom is the mount point of the CD-ROM on Solaris.

5 Enter the **./db2setup** command to start the DB2 Installer program. The Install DB2 V5 screen opens.

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

```
+ - - - - - - - - - - - - - - - - - - - - - - - Install DB2 V5 - - - - - - - - - - - - - - - - - - - - - - - +
|                                                                                                          |
|                                                                                                          |
|   Select the products you are licensed to install. Your Proof of                                         |
|   Entitlement and License Information booklet identify the products for                                   |
|   which you are licensed.                                                                                 |
|                                                                                                          |
|   To see the preselected components or customize the selection, select                                   |
|   Customize for the product.                                                                              |
|   [   ] DB2 Client Application Enabler                          :  Customize. . . :                       |
|   :   : DB2 UDB Enterprise Edition                              :  Customize. . . :                       |
|   [ * ] DB2 Connect Enterprise Edition                          [  Customize. . . ]                       |
|                                                                                                          |
|    To choose a language for the following components, select Customize for                               |
|    the product.                                                                                           |
|      DB2 Product Messages                                       [   Customize. . . ]                      |
|      DB2 Product Library                                        [   Customize. . . ]                      |
|                                                                                                          |
|                                                                                                          |
|                                                                                                          |
|                                                                                                          |
|   [   OK    ]                     [  Cancel  ]                             [   Help   ]                   |
+ - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - +
```
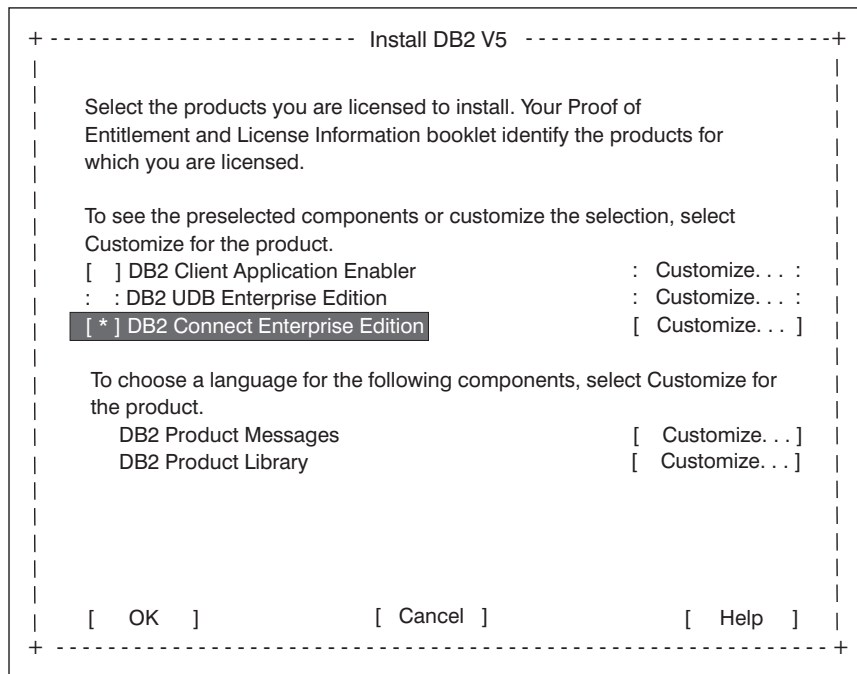
Note: Your screen will be different if you have already installed DB2 Version 5
products on your system. See Chapter 8, "Installing Additional Products
and Creating Additional Instances" on page 73 for more information.

6 From the product list on the Install DB2 V5 screen, select the products that you
want to install.

To display the required and optional components for the product you want to
install, select **Customize**. The optional components that are most typically used
are pre-selected for you. Make your selections and select **OK**.

To refresh the current screen, press the F5 key or Ctrl+L.
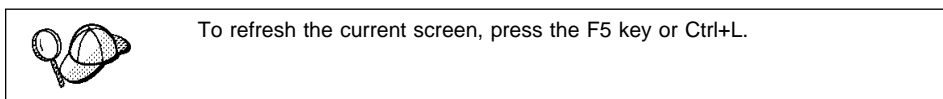
When you have finished selecting the DB2 product and its components, select
OK. The Create DB2 Services window opens. To undo any selections you made,
select **Cancel**.

Go to step 9 on page 70 if you do not want to create a DB2 Instance at this time.

---

7 At the Create DB2 Services panel, select **Create a DB2 Instance** to display the
DB2 Instance screen.

```
+ - - - - - - - - - - - - - - - - - - - -  Create DB2 Services  - - - - - - - - - - - - - - - - - - - - +
|                                                                                                        |
|   + - - -  DB2 Instance  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - +     |
|   |                                                                                             |     |
|   |    Authentication:                                                                          |     |
|   |        Enter User ID, Group ID, Home Directory and Password that                            |     |
|   |        will be used for the DB2 Instance.                                                   |     |
|   |        User Name                [ db2inst1 ]                                                 |     |
|   |        User ID               :        :              [ * ] Use default UID                  |     |
|   |        Group Name               [db2iadm1]                                                  |     |
|   |        Group ID              :        :              [ * ] Use default GID                  |     |
|   |        Home Directory        [/home/db2inst1 ]                                              |     |
|   |        Password              [ ******         ]                                             |     |
|   |        Verify Password       [ ******        ]                                             |     |
|   |                                                                                             |     |
|   |        Select Properties to view or change                      [Properties]               |     |
|   |        more options.                                                                        |     |
|   |        Select Default to restore all                            [ Default  ]               |     |
|   |        default settings.                                                                    |     |
|   |                                                                                             |     |
|   |                                                                                             |     |
|   |    [   OK    ]                  [ Cancel  ]                  [  Help   ]                     |     |
|   + - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - +     |
+ - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - +
```

You can use the default values displayed at the DB2 Instance screen or change
them:

- To change the default **User ID** for the instance, deselect **Use Default UID**
  and enter a new value for the **User ID**.

- To configure the communication protocol(s), select **Properties**. Only the
  protocols you selected from the product component lists will display on the
  DB2 Instance Protocol screen. For example, if you selected TCP/IP and
  wanted to change the protocol properties, select **Properties**. At the TCP/IP
  screen, enter a new Service Name and Port Number. To restore all
  system-generated values, select **Default**.

8 When you have finished entering the values for the DB2 Instance, select **OK**.

You will have to enter values for the User ID, Group ID and Password for the
fenced user defined Functions (UDFs) and stored procedures. The User Name for
the fenced UDFs should be different from the User Name of the DB2 Instance for
security reasons.

9 At the Create DB2 Services screen, select **Create an Administration Server** to
display the Administration Server screen.

You can use the default values on the Administration Server screen or change them:

- To change the default **User ID** for the server, deselect **Use default UID** and enter a new value for **User ID**.

| - To configure the communication protocol(s), select **Properties**. Only the
| protocols you selected from the product component lists will display on the
| Administration Server Protocol screen. To restore all system-generated
| values, select **Default**.

10 When you have finished entering the values for the Administration Server, select **OK**.

11 After entering the values for the DB2 Instance and the Administration Server, select **OK** to display the Summary Report. The report lists the installable items as well as the location of the installation log file.

12 Use the Up or Down arrow keys to review the Summary Report. If the selections are not correct, press the **F3** key to return to the previous screen. Otherwise, select **Continue** to start the installation.

13 When the installation is complete, use the Up or Down arrow keys to review the Status Report. Select **View Log** to view the installation log file. Select **OK** to close the Status Report screen.

14 Select **Close** from the DB2 Installer screen to terminate the DB2 Installer program.

After the installation is complete, the software is installed in the DB2DIR directory,

| where *DB2DIR* | = /usr/lpp/db2_05_00 | on AIX |
| | = /opt/IBMdb2/V5.0 | on HP-UX, SCO UnixWare 7, or Solaris |

You can use the DB2 Installer program to create additional DB2 instances after you have installed DB2 on your system. To start the DB2 Installer program from the DB2 product directory, type the following command:

On AIX

/usr/lpp/db2_05_00/install/db2setup

| **On HP-UX, Solaris, or SCO UnixWare 7**

| /opt/IBMdb2/V5.0/install/db2setup

Go to Chapter 8, "Installing Additional Products and Creating Additional Instances" on page 73 for information on optional installation activities or proceed directly to Chapter 9, "Migrating from Previous Versions and Releases on UNIX Systems" on page 75.

Chapter 8. Installing Additional Products and Creating Additional Instances

The installation activities in this section are optional following the installation of DB2 Version 5 on your system. It describes what you need to do if you plan to:

- Install additional products.
- Create additional DB2 Instances.
- Create an Administration Server (if required and not created previously).

The next time you start the DB2 Installer program, after having installed DB2 Version 5, the main menu will look like the following screen.

```
+ - - - - - - - - - - - - - - - - - - - - DB2 Installer  - - - - - - - - - - - - - - - - - - - - +
|                                                                                                |
|                                                                                                |
|     Select Install to select products and their components to install, or                      |
|     select Create to create the DB2 services.                                                  |
|                                                                                                |
|                                                                                                |
|                                                                                                |
|                                                                                                |
|     To select products and their components, select          [ Install... ]                    |
|     Install.                                                                                    |
|                                                                                                |
|     To create a DB2 Instance, or the Administration          [ Create... ]                     |
|     Server, select Create.                                                                      |
|                                                                                                |
|                                                                                                |
|                                                                                                |
|                                                                                                |
|                                                                                                |
|          [   Close   ]                                        [   Help   ]                      |
+ - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - +
```
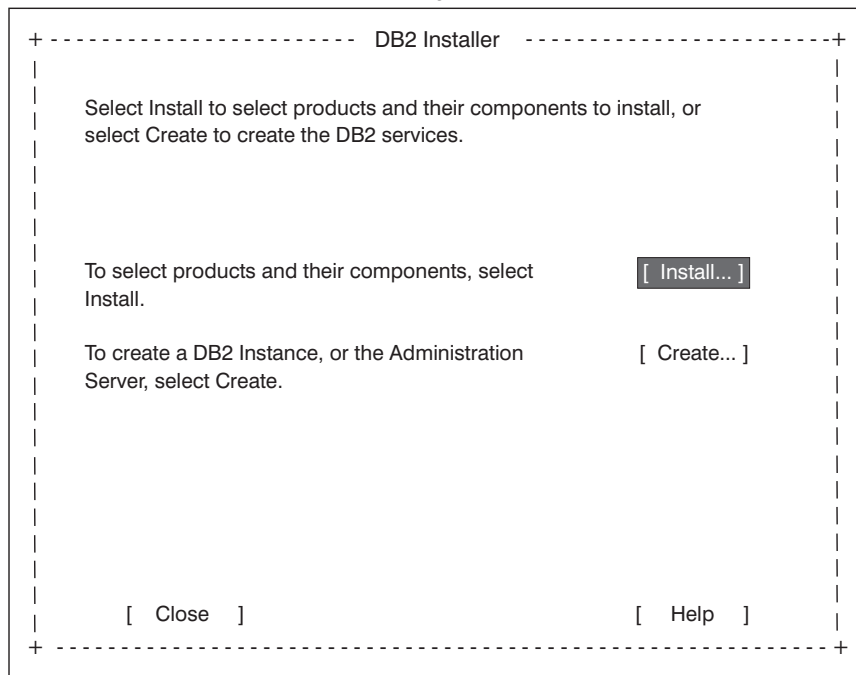
To select additional products and their components for installation, select **Install** from the DB2 Installer screen. See step 6 on page 69 for instructions.

To create a DB2 instance or the Administration Server on your system, select **Create** from the DB2 Installer screen. See step 7 on page 69 and step 9 on page 70 for instructions.

To terminate the DB2 Installer program, select **Close**.

Chapter 9. Migrating from Previous Versions and Releases on UNIX Systems

This section discusses how to migrate from previous versions of DB2 to Version 5.2 and what you should do if you upgrade from Release 5.0 to Release 5.2 of DB2. It also discusses how to migrate between different levels of UNIX operating systems.

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 DDCS Multi-User Gateway on a UNIX system.

Note: At this point, you must have Version 5 of DB2 Connect installed on your system.

DB2 migration involves the following:

- "Migrating Instances" on page 76.

Upgrading from DB2 Release 5.0 to Release 5.2

If you are upgrading from Release 5.0 to Release 5.2 of DB2, we recommend that you run the **db2upd52** command to support the new functionality added in the SYSIBM.SYSDATATYPES catalog table. See "Updating Catalog Table Data" on page 79 for more information.

You should run the **db2upd52** command to update the databases after you run the **db2iupdt** command to update the instance. See "Updating Catalog Table Data" on page 79 for further information.

Migrating Instances

This procedure describes how to migrate DB2 instances that were created using a previous version of DB2.

If you upgraded your installed DB2 product by applying a PTF or a FixPak, you should update instances, using the **db2iupdt** command, instead of migrating them. Instance updates do not apply to DB2 Product Documentation and DB2 Product Messages. See "Updating Instances on UNIX Systems" on page 361 for further information.

Before you can migrate an instance to use the latest version of DB2, you must install DB2 Version 5 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, you need to perform the following steps:

1 Prepare the DB2 instance for migration.

2 Ensure that the user exit program can be migrated.

3 Migrate the DB2 instance.

If you want to migrate several instances, you must repeat these steps for each instance.

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, you need to perform the following steps:

1 Log in as the DB2 instance owner.

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.

3 When all applications are complete, stop all database server processes owned by the DB2 instance by entering the **db2stop** command.

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

| **5** Stop all command line processor sessions by entering the **db2 terminate** command in each session that was running the command line processor.

| **6** Enter the **db2_kill** command to clean up any remaining DB2 resources.

| **7** Log off.

| The DB2 instance is now ready for migration.

Migration Considerations for the User Exit Program

> Follow these instructions if you are using the **db2uexit** user exit program with previous versions of DB2.

DB2 Version 5 has changed the interface it uses to invoke the user exit program to archive and retrieve log files. For more information on these new interfaces, refer to the *Administration Guide*. The name for the user exit program has changed to **db2uext2** in Version 5. (In previous versions, it was called **db2uexit**.)

The following should be considered before migrating instances:

- If the pre-Version 5 **db2uexit** program is installed in the INSTHOME/sqllib/adm directory before migration, it will remain in this directory after migration. The DB2 Version 5 **db2uext2** program will be also installed in this directory. Its function is to invoke **db2uexit** using the pre-Version 5 interface. This allows the old user exit program to be used on DB2 Version 5.

- If **db2uexit** is installed in a directory other than INSTHOME/sqllib/adm, it will not be installed after migration. For example, if **db2uexit** was in the INSTHOME/sqllib/bin directory, after migration the **db2uexit** file will not be in the INSTHOME/sqllib/bin directory. If you want to continue using the old user exit after migration, you must copy **db2uexit** to the INSTHOME/sqllib/adm directory. Then, you can do one of the following:

  – If you are migrating from DB2 Version 1.x or Version 2.x, copy **db2uext2.v2** from the DB2DIR/misc directory to the INSTHOME/sqllib/adm directory and rename it to **db2uext2**. You can use the following command to copy the file:

    ```
    cp DB2DIR/misc/db2uext2.v2 INSTHOME/sqllib/adm/db2uext2
    ```

    where *DB2DIR*   = /usr/lpp/db2_05_00   on AIX
              = /opt/IBMdb2/V5.0   on HP-UX, SCO UnixWare 7, or Solaris

– If you are migrating from DB2 Parallel Edition Version 1.x, copy **db2uext2.pe**
from the DB2DIR/misc directory to the INSTHOME/sqllib/adm directory and
rename it to **db2uext2**. You can use the following command to copy the file:

```
cp DB2DIR/misc/db2uext2.pe INSTHOME/sqllib/adm/db2uext2
```

where DB2DIR = /usr/lpp/db2_05_00 on AIX.

Note: You must ensure that **db2uext2** is owned by the instance owner and is
executable by the owner.

At a convenient time, you should modify your user exit program to use the new DB2
Version 5 interfaces. The new user exit program should replace **db2uext2** in the
INSTHOME/sqllib/bin or sqllib\bin directory, used to support the pre-Version 5 user
exit program, **db2uexit**, which should be removed.

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, SCO UnixWare 7, or Solaris, and there is a link in
> /usr/lib or /opt/lib to the Version 5 libdb2.a DB2 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* is:
>
> • *LIBPATH* on AIX
>
> • *SHLIB_PATH* on HP-UX
>
> • *LD_LIBRARY_PATH* on Solaris or SCO UnixWare 7
>
> 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_05_00 | on AIX |
| | = /opt/IBMdb2/V5.0 | on HP-UX, SCO UnixWare 7, or Solaris |

and where:

-d   Sets the debug mode that you can use for problem
              determination

| **-a** *AuthType*   Is an optional parameter that 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).

| **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.

| *InstName*   Is the login name of the instance owner.

| If you are migrating a DB2 Version 2.1 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 5. Set the *db2sort* registry value to the run time library
| for the sort command as follows:
|
| db2set DB2SORT="/usr/lib/libsort.a"

| *Updating Catalog Table Data*

| You only need to run the **db2upd52** command if you are upgrading from
| Version 5 to Version 5.2 of DB2. If you upgrade from Version 2 to Version
| 5.2 of DB2, database migration will update the data types and the SYSFUN
| schema.

| For DB2 Version 5.2, the SYSIBM.SYSDATATYPES catalog table includes a new data
| type, BIGINT, and other associated functions in the SYSFUN schema. To support these
| new features, we recommend that you run the **db2upd52** command for each database
| owned by a DB2 instance being upgraded to Version 5.2. The command adds the new
| SYSFUN functions signatures that support the BIGINT data type as follows:

| • Add SYSIBM.BIGINT to the SYSIBM.SYSDATATYPES catalog table.

| • Add the following function signatures to the SYSIBM.SYSFUNCTIONS table:

```
create function sysfun.abs(bigint) returns bigint ...
create function sysfun.absval(bigint) returns bigint ...
create function sysfun.ceil(bigint) returns bigint ...
create function sysfun.ceiling(bigint) returns bigint ...
create function sysfun.floor(bigint) returns bigint ...
create function sysfun.mod(bigint,bigint) returns bigint ...
create function sysfun.power(bigint,bigint) returns bigint ...
create function sysfun.round(bigint,integer) returns bigint ...
create function sysfun.sign(bigint) returns bigint ...
create function sysfun.trunc(bigint,integer) returns bigint ...
create function sysfun.truncate(bigint,integer) returns bigint ...
```

The **db2upd52** command also adds the REAL data type to the
SYSIBM.SYSDATATYPES catalog table and the function signature (SYSFUN.UCASE)
to the SYSIBM.SYSFUNCTIONS table. For information on the syntax of the **db2upd52**
command, refer to the *Command Reference*.

Migrating the DB2 Syncpoint Manager to V5.2

The DB2 Syncpoint Manager V5.2 internal log formats differ from previous versions of
the DB2 Syncpoint Manager. Before installing Db2 COnnect Enterprise Edition V5
ensure there are no indoubt transactions (please see the Db2 Administration Guide).

Migrating from HP-UX Version 10 to Version 11

Before you migrate databases or instances from HP-UX Version 10 to Version 11, you
need to perform the following steps:

1 Stop all DB2 instances using the **db2stop** command .

2 Stop the Administration Server using the **db2admin stop** command (see
   "Stopping the Administration Server" on page 366 for more information).

3 Back up all files under the instance's sqllib directory and any tablespaces. Refer
   to the *Administration Guide* for more detailed information.

4 Back up all files under the Administration Server's sqllib directory, if you created
   an Administration Server.

5 Back up the DB2 registry repository located under `/var/opt/db2/v5`.

6 Back up or record all DB2-related entries from the `/etc/passwd`, `/etc/group`, and `/etc/services` files.

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 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:

1 Adjust the kernel parameters if you have not done so. You can find a list of recommended kernel parameters in "Step 2. Updating Kernel Configuration Parameters" on page 61.

2 Install DB2 (see Chapter 7, "Installing DB2 Connect on UNIX Systems" on page 57).

3 Recreate the DB2-specific user, group and TCP services entries in the `/etc/passwd`, `/etc/group`, and `/etc/services` files.

4 Restore from backup the instance's `sqllib` directory. Refer to the *Administration Guide* for further information.

5 Restore from backup the Administration Server's `sqllib` directory. Refer to the *Administration Guide* for further information.

6 Restore the DB2 registry repository to `/var/opt/db2/v5`.

7 Update the DB2 instances that you have, one at a time (see "Updating Instances on UNIX Systems" on page 361).

8 Update the Administration Server (see Chapter 38, "Using the Administration Server" on page 365).

9 Perform the post migration procedures.

10 Start all DB2 instances and the Administration Server as required .

Migrating from SCO OpenServer to SCO UnixWare 7

You cannot migrate databases or instances created using DB2 for SCO OpenServer to DB2 for SCO UnixWare 7. Instead you have to perform the following steps before installing DB2 for SCO UnixWare 7:

1. Install the **db2ckmig** command on DB2 for SCO OpenServer.

   The **db2ckmig** command is available in the /cdrom directory on the DB2 Universal Database for SCO UnixWare 7 CD-ROM. Before proceeding to the next step, ensure that you correct any errors generated by the **db2ckmig** command.

2. Backup any databases that you want to migrate.

3. Record instance-level information and drop any instances. Collect the following information using the command line processor:

   - Database manager configuration. Enter the following command:

         db2 get database manager configuration

   - Node directory. Enter the following command:

         db2 list node directory show detail

     You should note the following details:

     - TCP/IP service names and numbers; these will need to be mapped to /etc/services.

     - Any communications configurations which you will need to set up later.

   - DCS directory. Enter the following command:

         db2 list dcs directory

     You should note any communications configurations which you will need to set up later.
   - Database directory for database file systems/locations. Enter the following command:

         db2 list database directory

   - Database configuration for log file paths. Enter the following command:

         db2 get database configuration for *database*

   See "Migrating Instances" on page 76 for further information.

4. Identify any stored procedures and User Defined Functions (UDFs). All stored procedures, UDFs and user exits must be recompiled and relinked after installing SCO UnixWare 7 and DB2 Version 5.2.

5 Drop all databases and DB2 instances on the SCO OpenServer machine by entering the **db2idrop** command. See "Removing Instances" on page 363 for further information.

6 Install SCO UnixWare 7 and configure the operating system as described in the product documentation.

7 Install and configure DB2 for SCO UnixWare 7 using the recorded instance-level information - see Chapter 7, "Installing DB2 Connect on UNIX Systems" on page 57.

8 Restore database backups. Refer to the *Administration Guide* for further information.

> Due to incompatibilities between file system layout and raw device names used in SCO OpenServer and those used in SCO UnixWare 7, Version 2 databases that use DMS tablespaces or SMS tablespaces with containers on absolute paths may need to be restored using the **redirected restore** command.

9 Verify the database manager and database configuration parameters are tuned for DB2 for SCO UnixWare 7. Refer to the *Administration Guide* for further information.

To install clients, see Chapter 27, "Installing DB2 Clients" on page 273.

Part 3. Configuring Access to Host and AS/400 Databases

Chapter 10. Configuring Host and AS/400 Connections on OS/2 or Windows NT Workstations

If you have installed the Client Configuration Assistant on your workstation, you can use this tool to configure your DB2 Connect workstation to access host or OS/400 databases. Although the Client Configuration Assistant provides three methods to configure connection to DB2 Universal Database databases, you must use the "Manual" method to define a connection to a DRDA database. Perform the following steps:

1 If the Client Configuration Assistant is not already running, start it. For OS/2 , start the Client Configuration Assistant. In Windows, click on **Start** and select **Programs**->**DB2 for Windows**->**Client Configuration Assistant**. You are presented with a Welcome panel.

   Note: The Welcome panel appears whenever you use the Client Configuration Assistant and have no databases cataloged.

2 Click on the **Add Database** push button to configure connections using the Add Database SmartGuide.

3 Select the **Manually configure a connection to a DB2 database** radio button, then click on the **Next** push button.

4 Choose the protocol you want to use, either APPC or TCP/IP:

   • If you want to use APPC:

      a Select APPC as the protocol for the connection, then select the **Target Operating System** for the host to which you want to connect. Click on the **Next** push button.

      b In the next panel you are presented with two **Symbolic destination** fields. The first field is mandatory; the second is required only if you wish to do password maintenance on the host. For the **Connection** field, follow these guidelines:

         – If you have already defined a symbolic destination (also known as the CPI-C side information), for the database to which you will be connecting, type in the **Symbolic destination** name. If you would like to configure a symbolic destination name for your database, type in the name you want and click on the **configure** push button. You do not have to type in the symdestname before clicking on the **Configure** push button. Once you are done with the configuration, the program will provide you with a symdestname.

         – If the **Configure** push button is greyed and cannot be selected, it means that the CCA cannot guide you through the process of

defining a symbolic destination name for your database, and you
will need to configure this manually. If your SNA product is one of
those described in this manual, go to those configuration
instructions now. (Refer to Chapter 11, "Configuring
Communications to Host and AS/400 Databases Manually" on
page 93 for a list of the SNA products that are described.)
Otherwise, you need to use the documentation supplied with your
SNA product to configure the CPI-C name (symbolic destination).
When you have defined the symbolic destination for the database,
come back to this CCA page and type in the name. Then skip to
step 5.

– If you wish to do password maintenance, enter the symbolic
destination name used by the host for password maintenance in
the second field. If the **Configure** push button is enabled, you can
click it to bring up another dialog box where you can fill in the new
password maintenance LU. Once you are done with the
configuration, the program will provide you with a symdestname.

– Select either the **APPC (SNA)** radio button or the **APPC over
TCP/IP** radio button, then click on the **Next** push button. You are
presented with two new pages.

– Fill in the fields on the **This PC** page and the **Server** page. (In
most situations you do not need to fill in values for the **Session**
section.) Click on the **Done** push button.

- If you want to use TCP/IP:

  a Select TCP/IP as the protocol for the connection, then select the **Target
  Operating System** for the host to which you want to connect.

  b Click on the **Next** push button.

  c Fill in the **Hostname** and **Port Number** fields. Optionally, fill in the
  Service Name field. Click on the **Next** push button.

5 On the Target Database page, fill in the requested value, then click on the **Next**
push button.

6 Fill in values for the Alias page, and, if you want to run ODBC applications, the
ODBC page. Click on the **Done** push button to complete the definition.

7 Click on the **Test Connection** push button to test the connection to the specified
database.

8 Enter your user ID and password if needed to access the database and click on
the **OK** push button. If the connection is successful, a message confirming the
connection appears. If not, refer to the *Troubleshooting Guide* for possible
causes. You are now able to use the database.

9 It is strongly recommended that you bind DB2 utilities to the database you just
defined. To do this:

a. Select the database to which you want to bind the utilities.

b. Click on the **Bind** push button.

c. Select whether you want to bind utilities or applications.

d. Click on the **Continue** push button.

e. Enter a user ID and password to connect to the database. The user ID must have the authority to bind new packages against the database.

f. Select the utilities you want to bind and click on **OK**.

If you want to access another database, select the **Add Another** push button.

Now that you have configured host connections, go to Chapter 27, "Installing DB2 Clients" on page 273 to install DB2 clients.

Part 4. Configuring Other Connectivity Options

Chapter 11. Configuring Communications to Host and AS/400 Databases Manually

This section describes how to configure manually the DB2 Connect workstation to use the following SNA communications subsystems:

- IBM Communications Server for OS/2 or Communications Manager for OS/2 (see Chapter 12, "Configuring Communications Server for OS/2 for DB2 Connect for OS/2" on page 95).

- IBM Personal Communications for Windows NT (see Chapter 14, "Configuring IBM Personal Communications for Windows 32-Bit Operating Systems" on page 123).

- IBM Communications Server for NT (see Chapter 13, "Configuring IBM Communications Server for Windows NT" on page 111).

- IBM Communications Server for NT SNA Client (see Chapter 15, "Configuring IBM Communications Server for Windows NT SNA Client" on page 135).

- Microsoft SNA Server (see Chapter 16, "Configuring Microsoft SNA Server Version 4.0 for Windows NT" on page 143).

- Microsoft SNA Client (see Chapter 17, "Configuring Microsoft SNA Client" on page 151).

- SNA Server on AIX (see Chapter 18, "Configuring SNA Server for DB2 Connect on AIX" on page 157).

- Bull SNA on AIX (see Chapter 19, "Configuring Bull SNA for DB2 Connect on AIX" on page 173).

- SNAPlus on HP-UX (see Chapter 21, "Configuring SNAPlus for DB2 Connect on HP-UX" on page 195).

- Solaris users should see Chapter 22, "Configuring SunLink SNA for DB2 Connect for Solaris" on page 209.

- To configure two-phase commit over SNA, see Chapter 24, "Configuring the DB2 Syncpoint Manager" on page 225.

- To configure host connections using TCP/IP, see: "Configuring TCP/IP for DB2 for OS/390" on page 502.

You can find more information in the following publications:

- For more information about SNA Server for AIX, refer to the *IBM SNA Server for AIX User's Guide*.

- For information on how to configure DRDA hosts for DB2 Connect, refer to:

  - Chapter 49, "Configuring DRDA Hosts for DB2 Connect" on page 493 in this manual

- – The online *DB2 Connectivity Supplement* (which is installed with the DB2 Connect software)
- – The *Distributed Relational Database Architecture Connectivity Guide*, SC26-4783.
- – The *DB2 for OS/390 V5 Installation Guide*, GC26-8970.

Chapter 12. Configuring Communications Server for OS/2 for DB2 Connect for OS/2

Most users will find it easiest to use the DB2 Client Configuration Assistant tool to configure Communications Server for OS/2 or Communications Manager for OS/2, as described in Chapter 10, "Configuring Host and AS/400 Connections on OS/2 or Windows NT Workstations" on page 87. However, if you need to perform a manual configuration, read this chapter.

This chapter tells you how to manually configure APPC communications between your DB2 Connect for OS/2 workstation and DRDA servers. Before you begin, ensure that your workstation has IBM Communications Server or Communications Manager for OS/2 installed. (The steps in this section describe how to use Communications Server Version 4. If you have Communications Manager for OS/2 V.1.x, the steps you perform are similar, but the interface and menu names are different.) Note that in the examples in this chapter, a Token Ring network is used as the communications medium.

Fill in the Worksheet

Before you configure the DB2 Connect workstation, have your host-side administrator and LAN administrator fill in copies of the worksheets that follow for each host to which you want to connect:

- For OS/390, MVS, VM, and VSE hosts, use Table 12 on page 96
- For AS/400, use Table 13 on page 98

To help you fill in the worksheets, Figure 9 illustrates a sample network that has DB2 Connect running on an OS/2 system and uses APPC to connect to DB2 for OS/390. The values shown in this diagram correspond to the *Sample Value* entries in the worksheet.

After you fill in the *Your Value* entries, you can use the worksheet to configure IBM Communications Server. As you configure Communications Server, replace the sample values that appear in the configuration instructions with your values from the worksheet. Use the boxed numbers **1** to relate the configuration instructions to the worksheet values.

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

Node Directory

Node name **DB2NODE**
Symbolic dest name **DB2CPIC**
Security **PROGRAM**

System Database Directory

DB alias **NYC3**
DB name **DB2DB**
Node **DB2NODE**
Authentication **DCS**

DCS Directory

Database **DB2DB**
Target DB name **NEW_YORK3**

Communications Server

Local node characteristics
  Network ID **SPIFNET**
  Local node name **NYX1**
  Local node ID **05D 27509**
Mode definition **IBMRDB**
Local LU **NYX1GW01**
Connection to a host/ peer node
  LAN destination addr. **400009451902**
  Partner node name **NYX**
 Partner LUs **NYM2DB2**
CPI communications side information
Symbolic dest. name **DB2CPIC**
Qualified partner LU **SPIFNET.NYM2DB2**
Mode name **IBMRDB**

VTAM

NETID **SPIFNET**
APPL **NYM2DB2**
PU **NYX1**
IDBLK= **05D**
IDNUM= **27509**
LU **NYX1GW01**
SSCP **NYX**
MODEENT **IBMRDB**

NCP

LOCADD=
400009451902

LOCATION **NEW_YORK3** **DB2 for OS390**
LUNAME **NYM2DB2**

DB2 CONNECT TO NYC3 USER <USERID> USING <PASSWORD>

Figure 9. Configuration on the DRDA Server and DB2 Connect Workstation

Ref.	CS/2 Name	VTAM Name	Sample Value	Your Value

Table 12 (Page 1 of 2). Worksheet for Planning OS/390, MVS, VM, or VSE Host Connections

Ref.	CS/2 Name	VTAM Name	Sample Value	Your Value
Network Elements at the Host				
1	Host Name	Network name	SPIFNET	
2	Partner LU Name	Application Name	NYM2DB2	
3	Network ID		SPIFNET	
4	Partner Node Name	SSCP Name	NYX	

Table 12 (Page 2 of 2). Worksheet for Planning OS/390, MVS, VM, or VSE Host Connections

Ref.	CS/2 Name	VTAM Name	Sample Value	Your Value
5	Database name	**OS/390 or MVS:** Location Name **VM/VSE:** RDB_Name	NEW_YORK3	
6	Mode Name		IBMRDB	
Network Connection Information				
7	Connection name (Link name)		LINKHOST	
8	LAN destination address		400009451902	
Network Elements at the DB2 Connect Workstation				
9	Network ID or C&SM LAN ID		SPIFNET	
10	Local Node name or Local PU Name		NYX1	
11	(Local) LU name		NYX1GW01	
12	(Local LU) alias		NYX1GW01	
13	Local Node or Node ID	ID BLK	05D	
14		ID NUM	27509	
15	Mode name		IBMRDB	
16	Symbolic Destination name		DB2CPIC	
17	(Remote) Transaction program (TP) name		X'QCNTEDDM' (or RDB_NAME for VM, AXE transactions name for VSE, or DB2DRDA for MVS or OS/390)	
DB2 Directory Entries (at the DB2 Connect workstation)				
18	Node name		db2node	
19	Security		program	
20	Database name		db2db	
21	Database alias		nyc3	

Notes:

1. The Local LU NYX1GW01 should be the LU for the SPM. If you use the SPM with this LU, you cannot use this LU to be the Control Point LU.

2. For a connection to an OS/390, MVS, VSE, or VM system, you must know the local node name of your machine. You can find this by reviewing the Local Node Characteristics specification in your existing Communications Server configuration.

Table 13. Worksheet for Planning OS/400 Connections				
Ref.	CS/2 Name	Network Name	Sample Value	Your Value
Network Elements at the Host				
1	Host name	Local Network ID	SPIFNET	
2	Partner LU Name	Application Name	NYM2DB2	
3	Network ID		SPIFNET	
4	Partner Node name	Local CP Name	SYD2101A	
5	Database name	Relational Database Name	NEW_YORK3	
6	Link Name or Mode Name		IBMRDB	
Network Connection Information				
7	Connection name (Link name)		LINKHOST	
8	Remote Network address	Local Adapter Address	400009451902	
Network Elements at the DB2 Connect Workstation				
9	Network ID or C&SM LAN ID		SPIFNET	
10	Local Node Name or Local PU Name		NYX1	
11	(Local) LU name		NYX1GW01	
12	(Local LU) alias		NYX1GW01	
13	Local Node or Node ID	ID BLK	05D	
14		ID NUM	27509	
15	Mode name		IBMRDB	
16	Symbolic Destination name		DB2CPIC	
17	(Remote) Transaction program (TP) name		X'QCNTEDDM'	
DB2 Directory Entries (at the DB2 Connect workstation)				
19	Node name		db2node	
19	Security		program	
20	Database name		db2db	
21	Database alias		nyc3	

Note: You can determine some of the above values by running commands at the DB2 for AS/400 system:

- To find the values for **1** , (known at the OS/400 as the local network ID), and for **4** , (the local control point name), enter: DSPNETA
- To find the value for **8** , (known at the OS/400 as the local adapter address), enter: WRKLIND *TRLAN

  Next, enter option 5 (**Display**) at the _ when prompted:

```
Opt   Line      Type      Text
 _    TRNLINE   *TRLAN
```

In the screen that appears one of the lines will be similar to this:

```
Local adapter address ........:   400009451902
```

- To generate a list of mode names for **15** , enter: WRKMODD
- To find the value for **5** , (known at the OS/400 as the relational database name), enter: DSPRDBDIRE

    Use the RDB name associated with the entry containing *LOCAL in the Remote Location column. If no *LOCAL entry exists, either have one created or use the Current System Name displayed when you run the DSPNETA command. If the user profile under which the initial connect is made has authority to run the ADDRBDIRE command, the *LOCAL entry will be created automatically using that user profile's name on the connect attempt.

Configuring APPC Using Communications Server

Most users will find it easiest to use the DB2 Client Configuration Assistant tool to configure Communications Server for OS/2 or Communications Manager for OS/2, as described in Chapter 10, "Configuring Host and AS/400 Connections on OS/2 or Windows NT Workstations" on page 87.

These instructions describe how to create new profiles within a new configuration. If you are modifying an existing configuration, you may need to delete some profiles before you can verify the configuration.

Begin to configure your DB2 Connect system with the following steps:

1 Double-click on the **Communications Server** icon.

2 Double-click on the **Communications Manager Setup** icon.

3 On the Communications Server Setup panel, click on the **Setup** push button.

4 On the Open Configuration panel:

   a Specify the name of an existing configuration file if you have one, or provide a name for a new file to be created.

   b Click on the **OK** push button to proceed to the Communications Server Configuration Definition panel.

5 The Configuration Definition panel opens.
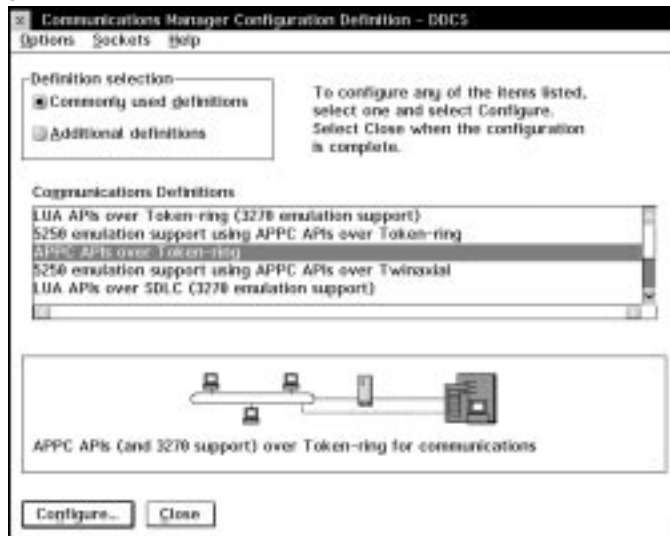
  a Select the **Commonly used definitions** radio button.

  b In the Communications Definitions window, select the protocol that you want
     to use. These examples use `APPC APIs over Token-Ring`.

  c Click on the **Configure** push button to proceed.

     If this is a new configuration file, the next panel displayed will be the APPC
     APIs over Token-Ring panel. Otherwise the next panel displayed will be the
     Communications Server Profile List panel.

6 The APPC APIs over Token-Ring panel opens.

  a Enter your values for:
     • Network ID **9**
     • Local node name **10**

  b Click on the **End node** push button that your network administrator advises
     you to use.

> You can select either the **End node - to a network node server** radio
> button or the **End node - no network node server** radio button. A network
> node server is used when many users are routed through the same
> connection. The example here presumes no network node server is used.

  c Click on the **Advanced** push button. The Communication Manager Profile
     List window opens.
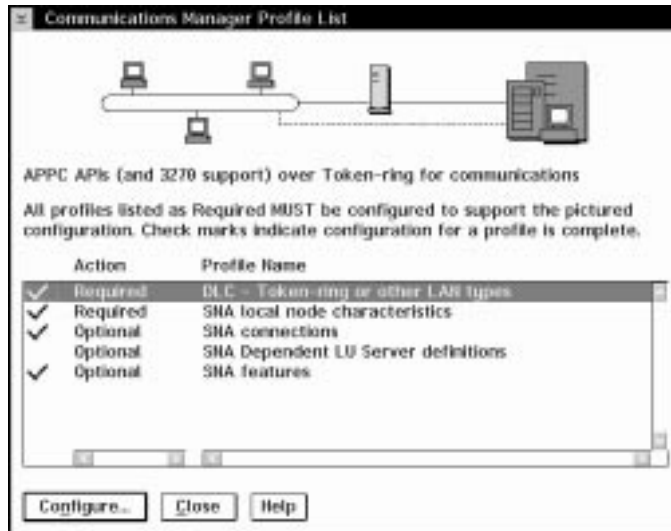
Subsequent steps begin from this panel. You will return to this panel when each step is complete.

Preparing the LAN DLC Profile

From the Communications Server Profile List panel, prepare a LAN DLC profile as follows:

1 Select **DLC - Token ring or other LAN types**->**Configure**.

2 Enter your value for **Network ID** or **C&SM LAN ID**. **9**

3 Check that the other values are appropriate for your environment. The values in the example are default values.

4 Click on **OK** to return to the Communications Server Profile List panel.

Updating the SNA Local Node Characteristics

Update SNA Local Node Characteristics as follows:

1 On the Communications Server Profile List panel, select **SNA local node characteristics**->**Configure**. The Local Node Characteristic panel opens.

2 Enter your value for **Network ID** ▉9▉ .

3 The **Local node name** was probably set when Communications Server was installed. If you are not sure, consult your local network administrator.

4 Enter your value for **Local node ID (hex)** ▉13▉ and ▉14▉ .

> The first part should be filled in for you already when you display the profile. You only need to complete the second part.

5 Click on the **Options** push button. The Local Node Options panel opens.

    a Verify that the **Activate Attach Manager at startup** check box is selected.

    b Click on **OK** to return to the Local Node Characteristics panel.

6 Click on **OK** to return to the Communications Server Profile List panel.

Preparing the SNA Connection Profiles

Prepare the SNA connection profiles as follows:

1 From the Communications Server Profile List panel, select **SNA Connections**->**Configure**.

2 On the Connections List panel for **Partner Type**, select either the **To peer node** radio button (normally used for OS/400 connections), or the **To host** radio button

(normally used for OS/390, MVS, VSE, and VM connections), and click on the **Create** push button.

3 The Adapter List window opens.
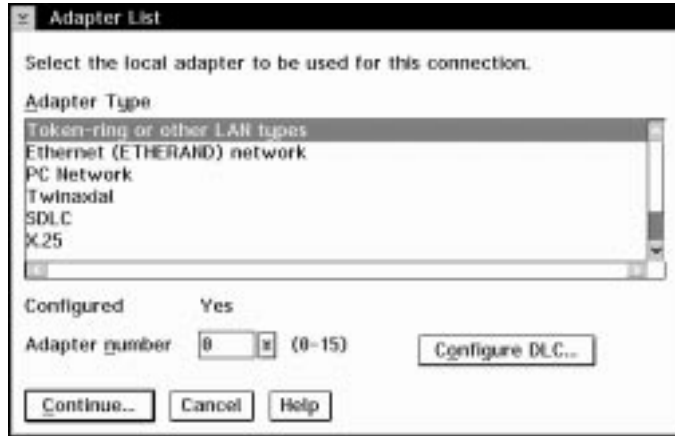
4 Select the **Token-ring, or other LAN types** adapter type, and specify the same **adapter number** that you specified in the DLC profile.

5 Click on the **Continue** push button to proceed to the Connection to a Peer Node panel or the Connection to a Host panel.

Connection to a Peer or Host Node

The Connection to a Peer Node or Connection to a Host Node windows opens.
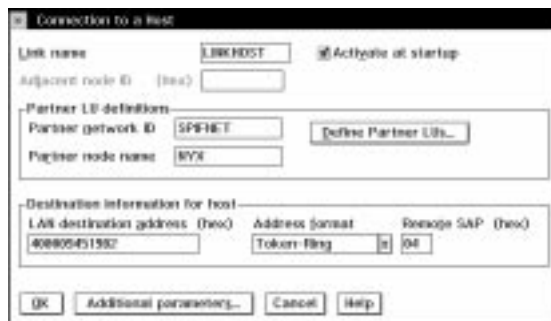
At the Connection to a Peer Node panel or the Connection to Host panel:

1 Specify the **Link name** value that you wrote in item **7** of the worksheet.

2 On the Connection to Host panel, select **Additional parameters** push button and change the **Local PU name** field to your value for **10** .

3 Change the node ID field to your values for **13** and **14** .

4 Change **LAN destination address** field to your value for **8** .

5 Change **Partner network ID** field to your value for **1** .

6 Change **Partner node name** field to your value for **4** .

7 Select **Define Partner LUs** push button on either the Connection to a Peer Node panel or the Connection to Host panel to proceed.

Partner LUs

Create a Partner LUs Profile as follows:

1 Enter your value for **Network ID** **3** .

2 Enter your value for **LU name** and **Alias** (use **2** for both).

3 Click on the **Add** push button to add the partner LU profile to the connection profile.

4 Click on **OK** to return to the previous panel.

5 On the Connection to Host panel, click on the **Additional Parameters** push button. The Partner LU window opens

Additional Connection Parameters

If you have selected to configure connections to a host, the following window appears.
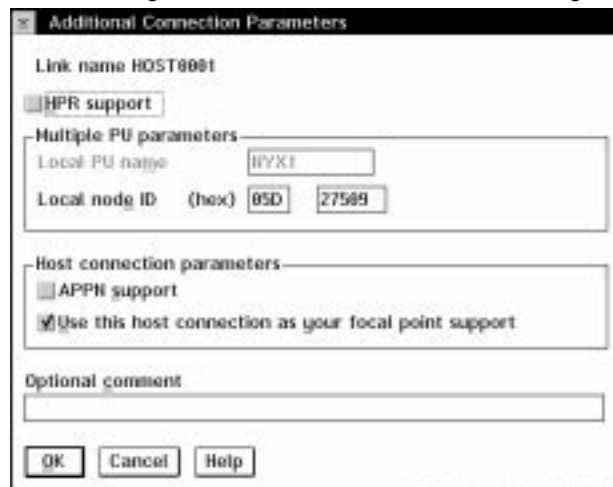
1 Verify that the **Multiple PU Parameters** fields are filled in. This value is the Local Node ID in hex, items **13** and **14** in the worksheet.

   Local node ID   05D 27509

2 Click on **OK** to return to the Connection to a Host panel.

3 Click on **OK** to return to the Connections List panel.

4 Click on the **Close** push button to return to the Communications Server Profile List panel.

Setting the SNA Features

On the Communications Server Profile List panel, select **SNA features**->**Configure**. Subsequent steps begin from the SNA Features List panel that appears, as follows:
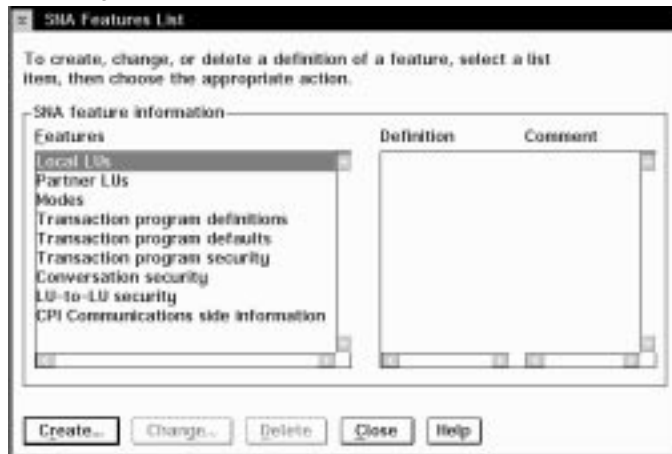
Preparing a Local LU Profile

If the DB2 Connect workstation is defined as an independent LU, prepare a Local LU Profile as follows. In most cases, a VTAM administrator on OS/390, MVS, VSE, or VM would define an independent LU for DB2 Connect. For OS/400, the control point would normally be used instead of an independent LU.

1 On the SNA Features List panel, click on **Local LUs**->**Create**.

2 Enter your value for **LU name** **11**.

3 Enter your value for **alias** **12**.

4 For the **NAU address** box, select the **Independent LU** radio button.

5 Click on **OK** to return to the SNA Features List panel.

6 In order to use this local LU when the DB2 Connect workstation starts the APPC connection, select the **Use this local LU as your default local LU alias** check box. By default, all APPC connections that are started from this DB2 Connect workstation will use this local LU.
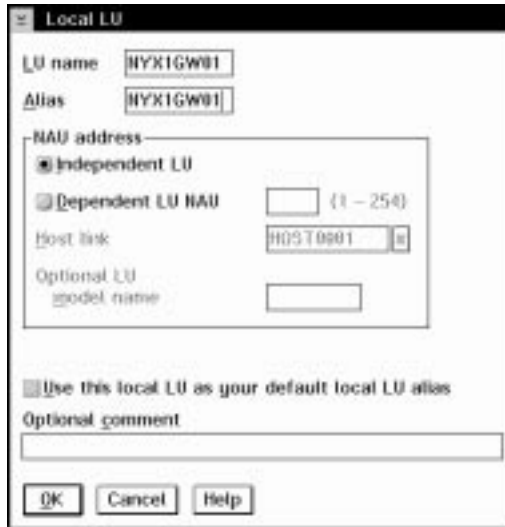
Verifying the Partner LU Profile

The partner LU profile was configured in a previous step. To verify, select the **Partner LU Profile** option from the SNA Features List panel to see if a partner LU is defined.

Preparing a Mode Definition

From the SNA Features List panel, prepare a Mode Definition as follows:

1 Select **Modes**->**Create**.

2 Define your mode profile as follows:

    a Enter your value for **mode name** **15** . It must also match item **6** .

b On the other lines, you can either specify values that match the mode profile defined on your DRDA server systems, or tune the parameters.

3 Click on **OK** to finish the creation of the mode and to return to the SNA Features List panel.

Creating the CPIC Side Information

On the SNA Features List panel, select **CPI Communications Side Information**->**Create**. The CPI Communications Side Information opens.

Complete the CPI Communications Side Information panel as follows:

1 Enter your value for **Symbolic destination name** `16`.

2 Select the **Alias** radio button. Click on the **Alias** drop down box to view a list of all defined aliases and choose the alias that corresponds to item `12`.

3 In the **Partner TP** box, specify the remote Transaction Program (TP) name `17`.

Select the **None** radio button as the **Security type**.

> This does not mean that you will have no security, you will specify the security type later when you update the DB2 directories.

4 Enter your value for the **Mode name** field `6`.

5 Click on **OK** to save the CPI side information profile and return to the SNA Features List panel.

6 Click on **Close** to return to the Communications Server Profile List panel.

Save Your Configuration

You are now ready to save your Communications Server configuration file:

1 Click on **Close** to return to the Communications Server Configuration Definition panel.

2 Click on **Close** to automatically verify and save the new configuration file, and leave the configuration panels.

3 Stop and start Communications Server. Click on **Stop Communications Normally**->**Start Communications**.

Update the DB2 Directories

To configure the DB2 directories, enter the following commands in the DB2 Connect command line processor:

1 Catalog the DRDA server as an APPC node. The syntax of the command is:

```
catalog appc node node_name remote sym_dest_name security program
```

| For example:

```
catalog appc node DB2NODE remote DB2CPIC security program
```

2 Catalog the remote database as a Data Connection Services (DCS) database. The syntax of the command is:

```
catalog dcs Database local_dbname as real_host_dbname
```

| For example:

| ```
catalog dcs database DB2DB as NEW_YORK3
```

**3** Catalog a database alias for the remote database. The syntax of the command is:

```
catalog db local_dbname as db_alias at node node_name authentication dcs
```

For example:

```
catalog db DB2DB as NYC3 at node DB2NODE authentication dcs
```

In the DB2 commands above:

- *node_name* can be any valid eight-character name
- *sym_dest_name* is the name of your Side Information Profile (**16**).
- *local_dbname* can be any valid eight-character name

- *db_alias* can be any valid eight-character name
- *real_host_dbname* is the name of the database you want to connect to at the DRDA server (**5**).

Test the Connection

Issue the following command from the command line processor window at the DB2 Connect server, remembering to substitute your *db_alias* value from the previous step:

```
connect to db_alias user userid using password
```

| For example:

| ```
connect to NYC3 user userid using password
```

The user ID and password values required are those defined at the host or AS/400, and must be provided to you by your DB2 Administrator.

Complete the Configuration

The steps you have just completed set up the DB2 Connect workstation to communicate with the host. You must now bind the utilities and applications to the DRDA server.

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*.

To install remote clients, see Chapter 27, "Installing DB2 Clients" on page 273.

Chapter 13. Configuring IBM Communications Server for Windows NT

Read this chapter if you have a Windows NT workstation that has IBM Communications Server for Windows NT installed.

Before you begin, ensure that the IBM Communications Server for Windows NT you installed:

- is Version 5.0 or higher if you are planning to update multiple databases within the same transaction; if you are planning to use 2-phase commit then Version 5.01 of IBM Communication Server is required

- has the IBM Communications Server IEEE 802.2 LAN interface (this is an installation option for Communications Server)

- has the LLC2 driver installed from the IBM Communications Server installation directory. During installation CS/NT asks if you want to install LLC2. If you are not sure whether LLC2 was installed with your copy of CS/NT, you can find out as follows:

    1 Click on the **Start** button, then select **Settings**->**Control Panel**.

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

    3 On the Network window, click on the **Protocols** tab. **IBM LLC2 Protocol** must be one of the protocols listed. If it is not, you need to install this protocol from your IBM Communications Server for Windows NT software. Refer to its documentation for instructions.

Step 1. Fill In the Worksheet

Before you configure the DB2 Connect workstation, have your host-side administrator and LAN administrator fill in copies of the following worksheet for each host to which you want to connect (see Table 14 on page 113).

To help you fill in the worksheets, Figure 10 illustrates a sample network that has DB2 Connect using APPC to connect to DB2 for OS/390. The values shown in this diagram correspond to the *Sample Value* entries in the worksheet.

After you fill in the *Your Value* entries, you can use the worksheet to configure IBM Communications Server for Windows NT. As you perform the configuration, replace the sample values that appear in the configuration instructions with your values from the

worksheet. Use the boxed numbers **1** to relate the configuration instructions to the worksheet values.

Node Directory

Node name	**DB2NODE**
Symbolic dest name	**DB2CPIC**
Security	**PROGRAM**

System Database Directory

DB alias	**NYC3**
DB name	**DB2DB**
Node	**DB2NODE**
Authentication	**DCS**

DCS Directory

Database	**DB2DB**
Target DB name	**NEW_YORK3**

Communications Server

Local node characteristics

Network ID	**SPIFNET**
Local CP name	**NYX1**
Local node ID	**05D 27509**
Mode definition	**IBMRDB**
Local LU name	**NYX1GW01**

LAN connection to a host

Destination addr.	**400009451902**
Partner LU name	**NYM2DB2**

CPI communications side information

Symbolic dest. name	**DB2CPIC**
Qualified partner LU	**SPIFNET.NYM2DB2**
Mode name	**IBMRDB**

| LOCATION | **NEW_YORK3** | DB2 for OS390 |
| LUNAME | **NYM2DB2** | |

VTAM

NETID	**SPIFNET**
APPL	**NYM2DB2**
PU	**NYX1**
IDBLK=	**05D**
IDNUM=	**27509**
LU	**NYX1GW01**
MODEENT	**IBMRDB**

NCP

LOCADD=	
	400009451902

DB2 CONNECT TO NYC3 USER <USERID> USING <PASSWORD>

Figure 10. Configuration on the DRDA Server and DB2 Connect Workstation

Figure 10 illustrates the correspondences between information specified on the DRDA server system, information specified in Communications Server, and information specified in DB2 directories. The values shown in the diagram are the example values used in the instructions in this chapter.

Table 14. Worksheet for Planning OS/390, MVS, VM, VSE, or OS/400 Connections

Ref.	CS/NT Admin Name	VTAM Name	Sample Value	Your Value
Network Elements at the Host				
1	Host Name	Network name	SPIFNET	
2	Partner LU Name	Application Name	NYM2DB2	
3	Network ID		SPIFNET	
4	Control Point Name	**OS/390, MVS, VM, VSE:** SSCP Name **OS/400:** Local Control Point Name	NYX	
5	Database name	**OS/390 or MVS:** Location Name **VM/VSE:** RDB_Name	NEW_YORK3	
6	Mode Name		IBMRDB	
7	Link Station Name		LINKHOST	
Network Connection Information				
8	Destination address		400009451902	
Network Elements at the DB2 Connect Workstation				
9	Network Name		SPIFNET	
10	Local Control Point Name		NYX1	
11	Local LU name		NYX1GW01	
12	Local LU alias		NYX1GW01	
13	Local Node ID	Block ID	05D	
14		Physical Unit ID	27509	
15	Mode name		IBMRDB	
16	Symbolic Destination name		DB2CPIC	
17	(Remote) Transaction program (TP) name		X'07F6C4C2' (or RDB_NAME for VM, AXE transaction name for VSE, DB2DRDA for MVS or OS/390, QCNTEDDM for AS/400)	
DB2 Directory Entries (at the DB2 Connect workstation)				
18	Node name		db2node	
19	Security		Program	
20	Database name		db2db	
21	Database alias		nyc3	

Step 2. Configure the SNA Node

To start IBM Communications Server for NT, click on the **Start** button, then select **Programs**->**IBM Communications Server**->**SNA Node Configuration**. The IBM Communications Server SNA Node Configuration screen appears.

From the **File** button on the menu bar, select **New**->**Advanced**. The **Configuration options** field appears.

To configure the DB2 Connect workstation, you need to configure the following **Configuration options**:

- "Configure Node" on page 115
- "Configure Devices" on page 116
- "Configure the Gateway" on page 116 (used with Communications Server for Windows NT SNA Client only)
- "Configure Connections" on page 116
- "Configure Partner LU 6.2" on page 117
- "Configure Modes" on page 117
- "Configure Local LU 6.2" on page 118
- "Configure CPI-C Side Information" on page 118
- "Configure Transaction Programs" on page 119. (Used when clients will connect using APPC. For example, a Communications Server for Windows NT SNA Client connecting to a Communications Server, DB2 Client Application Enablers connecting to a DB2 Connect Enterprise Edition workstation, or DRDA clients connecting to a DRDA AS DB2 Universal Database server.)

After each step, you return to the window that has the **Configuration options** field.

Configure Node

To configure the node:

1 In the **Configuration options** field, select **Configure Node**, then click on the **New** button. The Define the Node window appears.

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

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

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

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

6 Click on **OK**.

Configure Devices

To configure the device:

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

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

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

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

Configure the Gateway

You need to perform this step only if you are setting up Communications Server to accept requests from Communications Server for Windows NT SNA Client, as described in Chapter 15, "Configuring IBM Communications Server for Windows NT SNA Client" on page 135. To configure the gateway:

1 In the **Configuration options** field, select **Configure the Gateway**, then click on the **New** button. The Define Gateway window appears.

2 Click on the **SNA Clients** tab.

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

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

Configure Connections

To configure the connections:

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

2 Ensure that in the **DLCs** field, **LAN** is highlighted.

3 Click on the **New** button. The Define a LAN connection window appears.

4 On the Basic tab panel:

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

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

5 On the Security tab panel:

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

   b In the **Adjacent CP type** field, select the appropriate CP type (eg.
   Back-level LEN).

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

   d Click on **OK**.

Configure Partner LU 6.2

To configure the partner LU:

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

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

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

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

Leave the other fields blank.

5 Click on **OK**.

Configure Modes

To configure the mode:

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

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

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

Accept the defaults for the other fields.

4 Click on **OK**.

Configure Local LU 6.2

To configure the local LU 6.2:

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

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

3 Type in a value for the **LU session limit** field. The default, 0, specifies the maximum allowed value.

Accept the defaults for the other fields.

4 Click on **OK**.

Configure CPI-C Side Information

To configure the CPI-C side information:

1 In the **Configuration options** field, select **Configure CPI-C side information**, then click on the **New** button. The Define CPI-C side information window appears.

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

3 In the **Mode name** field, type in the name **15** from the worksheet (IBMRDB).

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

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

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

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

Accept the defaults for the other fields.

6 Click on **OK**.

Configure Transaction Programs

You need to configure Transaction Programs if you want Communications Server to accept APPC clients. For DB2 users, examples of this include:

- Configuring Communications Server to accept SNA Client requests as described in Chapter 15, "Configuring IBM Communications Server for Windows NT SNA Client" on page 135.
- Configuring a DB2 Universal Database server to act as a DRDA AS, which accepts requests from DRDA hosts. (This does not apply to DB2 Connect users).
- Configuring a DB2 Universal Database server to accept APPC clients.

You should create a service TP and a non-service TP.

To create a service Transaction Program:

1 In the **Configuration options** field, select **Configure Transaction Programs**, then click on the **New** button. The Define a Transaction Program window appears.

2 On the **Basic** tab window:

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

3 If you are configuring Communications Server for use with Communication Server SNA Client, on the **Advanced** tab window, ensure that there is a check mark in the **For SNA API Client use** check box.

Accept the defaults for the other fields.

4 Click on **OK**.

To create a non-service Transaction Program:

1 In the **Configuration options** field, select **Configure Transaction Programs**, then click on the **New** button. The Define a Transaction Program window appears.

2 On the **Basic** tab window:

- In the **TP name** field, type in the name **17** from the worksheet (DB2DRDA).
- Ensure that there is **no** check mark in the **Service TP** check box.
- To specify a non-service TP, in the **TP name** field, type in the name of the non-service TP, for example DB2DRDA, and ensure that the Background Process check box is checked, and that the **Service TP** check box is **not** checked.

3 If you are configuring Communications Server for use with Communication Server SNA Client, on the **Advanced** tab window, ensure that there is a check mark in the **For SNA API Client use** check box.

Accept the defaults for the other fields.

4 Click on **OK**.

Save the Configuration

To save the configuration:

1 From the **File** button on the menu bar, select **Save As**. The Save As window appears.

2 Type in a file name, for example ny3.acg, then click on **OK**.

3 In the dialog box that appears, you are asked if you want this configuration to be the default. Click on the **Yes** button.

You now need to update the DB2 directories, test the connection, and bind utilities and applications to the server. The easiest way to do this is to use the CCA as described in Chapter 10, "Configuring Host and AS/400 Connections on OS/2 or Windows NT Workstations" on page 87. However, you can also perform these steps manually as described in the sections that follow.

Update the Environment

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

1. Click the **Start** button and choose **Settings**->**Control Panel**. Double-click on the **System** icon. When the **System Properties** window appears, select the **Environment** tab.

2. Type appcllu in the **Variable** field, and type your local LU name **11** in the **Value** field.

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

The environment variable will now remain set for future sessions.

Step 3. Start SNA Node Operations

To start SNA node operations on your machine:

1. Click on the **Start** button, then choose **Programs**->**IBM Communication Server**->**SNA Node Operations**. The **SNA Node Operations** window opens.

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

SNA node operations will now begin running.

Step 4. Update the DB2 Directories

To configure the DB2 directories, do the following at the DB2 Connect workstation:

1 Catalog the DRDA server as an APPC node. The syntax of the command is:

    catalog appc node *node_name* remote *sym_dest_name* security program

For example:

    catalog appc node DB2NODE remote DB2CPIC security program

Note: The case of the *sym_dest_name* (DB2CPIC in this example) must match the case of the Symbolic Destination Name in the CPI-C Symbolic Destination Name Properties definition.

2 Catalog a database alias for the remote database. The syntax of the command is:

    catalog db *local_dbname* as *db_alias* at node *node_name* authentication dcs

For example:

    catalog db DB2DB as NYC3 at node DB2NODE authentication dcs

3 Catalog the remote database as a Data Connection Services (DCS) database. The syntax of the command is:

    catalog dcs db *local_dbname* as *real_host_dbname*

For example:

    catalog dcs db DB2DB as NEW_YORK3

In the DB2 commands above:

- *node_name* can be any valid eight-character name
- *sym_dest_name* is the name of your Side Information Profile (**16**)

- *local_dbname* can be any valid eight-character name
- *db_alias* can be any valid eight-character name
- *real_host_dbname* is the name of the database you want to connect to at the DRDA server (**5**).

Step 5. Test the Connection

Issue the following command from the command line processor window at the DB2 Connect server, remembering to substitute your *db_alias* value from the previous step:

```
connect to db_alias user userid using password
```

For example:

```
connect to nyc3 user userid using password
```

The user ID and password values required are those defined at the host or AS/400, and must be provided to you by your DB2 Administrator.

Step 6. Bind the Utilities and Applications

The steps you have just completed set up the DB2 Connect workstation to communicate with the host. You must now bind the utilities and applications to the DRDA server.

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*.

Chapter 14. Configuring IBM Personal Communications for Windows 32-Bit Operating Systems

Read this chapter if you have a Windows NT, Windows 95 or Windows 98 workstation that has IBM Personal Communications for Windows NT or Windows 95 installed.

Before you begin, ensure that the IBM Personal Communications for Windows NT or Windows 95 you installed:

- Is Version 4.2 or higher

- Has the IBM Personal Communications IEEE 802.2 LAN interface (this is an installation option for IBM Personal Communications)

- Has the LLC2 driver installed from the IBM Communications Server installation directory. To confirm this:

  1 Click on the **Start** button, then select **Settings**->**Control Panel**.

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

  3 On the Network window, click on the **Protocols** tab. **IBM LLC2 Protocol** must be one of the protocols listed. If it is not, you need to install this protocol from your IBM Personal Communications for Windows NT or Windows 95 software. Refer to its documentation for instructions.

Step 1. Fill In the Worksheet

Before you configure the DB2 Connect workstation, have your host-side administrator and LAN administrator fill in copies of the following worksheet for each host to which you want to connect (see Table 15 on page 125).

To help you fill in the worksheets, Figure 11 illustrates a sample network that has DB2 Connect using APPC to connect to DB2 for OS/390. The values shown in this diagram correspond to the *Sample Value* entries in the worksheet.

After you fill in the *Your Value* entries, you can use the worksheet to configure IBM Personal Communications for Windows NT or Windows 95. As you perform the configuration, replace the sample values that appear in the configuration instructions with your values from the worksheet. Use the boxed numbers **1** to relate the configuration instructions to the worksheet values.

Node Directory

Node name	**DB2NODE**
Symbolic dest name	**DB2CPIC** ◄
Security	**PROGRAM**

Personal Communications

Local node characteristics
- Network ID **SPIFNET** ◄
- Local CP name **NYX1**
- Local node ID **05D 27509**

Mode definition **IBMRDB**
Local LU name **NYX1GW01**
LAN connection to a host
- Destination addr. **400009451902**
- Partner LU name **NYM2DB2**

CPI communications side information
Symbolic dest. name **DB2CPIC**
Qualified partner LU **SPIFNET.NYM2DB2**
Mode name **IBMRDB**

VTAM

NETID	**SPIFNET**
APPL	**NYM2DB2** ◄
PU	**NYX1**
► IDBLK=	**05D**
► IDNUM=	**27509**
LU	**NYX1GW01**
MODEENT	**IBMRDB**

System Database Directory

DB alias	**NYC3**
DB name	**DB2DB**
Node	**DB2NODE**
Authentication	**DCS**

NCP

LOCADD=
► **400009451902**

DCS Directory

Database	**DB2DB** ◄
Target DB name	**NEW_YORK3**

► LOCATION	**NEW_YORK3**	**DB2 for OS390**
LUNAME	**NYM2DB2**	

DB2 CONNECT TO NYC3
USER <USERID> USING <PASSWORD>

Figure 11. Configuration on the DRDA Server and DB2 Connect Workstation

Figure 11 illustrates the correspondences between information specified on the DRDA server system, information specified in Personal Communications, and information specified in DB2 directories. The values shown in the diagram are the example values used in the instructions in this chapter.

Table 15. Worksheet for Planning OS/390, MVS, VM, VSE, or OS/400 Connections

Ref.	Personal Communications Admin Name	VTAM Name	Sample Value	Your Value
Network Elements at the Host				
1	Host Name	Network name	SPIFNET	
2	Partner LU Name	Application Name	NYM2DB2	
3	Network ID		SPIFNET	
4	Control Point Name	**OS/390, MVS, VM, VSE:** SSCP Name **OS/400:** Local Control Point Name	NYX	
5	Database name	**OS/390 or MVS:** Location Name **VM/VSE:** RDB_Name	NEW_YORK3	
6	Mode Name		IBMRDB	
7	Link Station Name		LINKHOST	
Network Connection Information				
8	Destination address		400009451902	
Network Elements at the DB2 Connect Workstation				
9	Network Name		SPIFNET	
10	Local Control Point Name		NYX1	
11	Local LU name		NYX1GW01	
12	Local LU alias		NYX1GW01	
13	Local Node ID	Block ID	05D	
14		Physical Unit ID	27509	
15	Mode name		IBMRDB	
16	Symbolic Destination name		DB2CPIC	
17	(Remote) Transaction program (TP) name		X'07F6C4C2' (or RDB_NAME for DB2 for VSE & VM) (or DB2DRDA for DB2 for OS/390 or DB2 for MVS)	
DB2 Directory Entries (at the DB2 Connect workstation)				
18	Node name		db2node	
19	Security		Program	
20	Database name		db2db	
21	Database alias		nyc3	

Step 2. Configure the SNA Node

To start IBM Personal Communications, click on the **Start** button, then select **Programs**->**IBM Communications Server**->**SNA Node Configuration**. The IBM Personal Communications SNA Node Configuration screen appears.

From the **File** button on the menu bar, select **New**. The **Define the Node** field appears.

To configure the DB2 Connect workstation, you need to configure the following **Configuration options**:

- "Configure Node"
- "Configure Devices" on page 127
- "Configure Connections" on page 127
- "Configure Partner LU 6.2" on page 128
- "Configure Modes" on page 128
- "Configure Local LU 6.2" on page 129
- "Configure CPI-C Side Information" on page 129
- "Configure Transaction Programs" on page 130. (Used when clients will connect using APPC. For example, a Personal Communications for Windows NT or 95 SNA Client connecting to a Communications Server, DB2 Client Application Enablers connecting to a DB2 Connect Enterprise Edition workstation, or DRDA clients connecting to a DRDA AS DB2 Universal Database server.)

After each step, you return to the window that has the **Configuration options** field.

Configure Node

To configure the node:

1 In the **Configuration options** field, select **Configure Node**, then click on the **New** button. The Define the Node window appears.

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

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

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

5 Click on **OK**.

| *Figure 12. Configuration Screen for Personal Communications.*

Configure Devices

| To configure the device:

| **1** In the **Configuration options** field, select **Configure devices**.

| **2** Ensure that in the **DLCs** field, the appropriate DLC is highlighted. For example,
| **LAN**.

| **3** Click on the **New** button. The appropriate window appears with default values
| displayed. For example, the Define a LAN device window.

| **4** Click on **OK** to accept the default values.

Configure Connections

| To configure the connections:

| **1** In the **Configuration options** field, select **Configure connections**.

| **2** Ensure that in the **DLCs** field, **LAN** is highlighted.

| **3** Click on the **New** button. The Define a LAN connection window appears.

| **4** On the Basic tab panel:

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

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

| **5** On the Adjacent Node tab panel:

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

| b In the **Adjacent CP type** field, select **Back-level LEN**.

| c Ensure that **TG number** is set to 0 (the default).

| d Click on **OK**.

Configure Partner LU 6.2

| To configure the partner LU:

| **1** In the **Configuration options** field, select **Configure partner LU**, then click on
| the **New** button. The Define a partner LU 6.2 window appears.

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

| **3** In the **Partner LU alias** field, type in the partner LU name **2** from the
| worksheet (NYM2DB2).

| **4** In the **Fully-qualified CP name** fields, type in the network ID **3** and the
| adjacent control point SSCP name **4** (SPIFNET.NYX).

| Accept the defaults in the Advanced tab panel.

| **5** Click on **OK**.

Configure Modes

| To configure the mode:

| **1** In the **Configuration options** field, select **Configure modes**, then click on the
| **New** button. The Define a mode window appears.

| **2** In the **Mode name** field **6** of the Basic tab panel, type in the mode name
| (IBMRDB).

| **3** Click on the **Advanced** tab and ensure that the **Class of Service Name** is set to
| **#CONNECT**.

| Accept the defaults for the other fields.

| **4** Click on **OK**.

Configure Local LU 6.2

To configure the local LU 6.2:

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

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

3 Type in a value for the **LU session limit** field. The default, 0, specifies the maximum allowed value.

Accept the defaults for the other fields.

4 Click on **OK**.

Configure CPI-C Side Information

To configure the CPI-C side information:

1 In the **Configuration options** field, select **Configure CPI-C side information**, then click on the **New** button. The Define CPI-C side information window appears.

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

3 In the **Mode name** field, type in the name **15** from the worksheet (IBMRDB).

4 In the **Partner LU Name** fields, type the Net ID **3** in the first field, and the Partner LU Name **2** (SPIFNET.NYM2DB2) in the second field.

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

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

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

Accept the defaults for the other fields.

6 Click on **OK**.

Configure Transaction Programs

You need to configure Transaction Programs if you want Communications Server to accept APPC clients. For DB2 users, examples of this include:

- Configuring Communications Server to accept SNA Client requests as described in Chapter 15, "Configuring IBM Communications Server for Windows NT SNA Client" on page 135.
- Configuring a DB2 Universal Database server to act as a DRDA AS, which accepts requests from DRDA hosts. (This does not apply to DB2 Connect users).
- Configuring a DB2 Universal Database server to accept DB2 client connections via the APPC protocol.

To create an Application Transaction Program:

1 In the **Configuration options** field, select **Configure Transaction Programs**, then click on the **New** button. The Define a Transaction Program window appears.

2 On the **Basic** tab window:

- In the **TP name** field, type in the name **17** from the worksheet (DB2DRDA).
- Ensure that there is **no** check mark in the **Service TP** check box.

Accept the defaults for the fields in the Advanced tab panel.

3 Click on **OK**.

Save the Configuration

To save the configuration:

1 From the **File** button on the menu bar, select **Save As**. The Save As window appears.

2 Type in a file name, for example ny3.acg, then click on **OK**.

3 In the dialog box that appears, you are asked if you want this configuration to be the default. Click on the **Yes** button.

You now need to update the DB2 directories, test the connection, and bind utilities and applications to the server. The easiest way to do this is to use the CCA as described in Chapter 10, "Configuring Host and AS/400 Connections on OS/2 or Windows NT Workstations" on page 87. However, you can also perform these steps manually as described in the sections that follow.

Update the Environment

IBM Personal Communications uses an environment variable called **appcllu** to communicate with DB2. You may set this variable on a per-session basis by opening a command window and typing `set appcllu=local_lu_name`, however you will probably find it more convenient to permanently set the variable. In order to permanently set the variable in Windows NT, do the following:

1. Click the **Start** button and choose **Settings**->**Control Panel**. Double-click on the **System** icon. When the **System Properties** window appears, select the **Environment** tab.

2. Type `appcllu` in the **Variable** field, and type your local LU name **11** in the **Value** field.

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

The environment variable will now remain set for future sessions.

Step 3. Start SNA Node Operations

To start SNA node operations on your machine:

1. Click on the **Start** button, then choose **Programs**->**IBM Personal Communications**->**Administrative and PD Aids**-> **SNA Node Operations**. The **Personal Communications SNA Node Operations** window opens.

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

SNA node operations will now begin running.

Step 4. Update the DB2 Directories

To configure the DB2 directories, do the following at the DB2 Connect workstation:

1 Catalog the DRDA server as an APPC node. The syntax of the command is:

   `catalog appc node node_name remote sym_dest_name security program`

   For example:

```
| 		        catalog appc node DB2NODE remote DB2CPIC security program
```

   Note: The case of the *sym_dest_name* (DB2CPIC in this example) must match
   the case of the Symbolic Destination Name in the CPI-C Symbolic
   Destination Name Properties definition.

2 Catalog a database alias for the remote database. The syntax of the command is:

```
| 		    catalog db local_dbname as db_alias at node node_name authentication dcs
```

For example:

```
| 		    catalog db DB2DB as NYC3 at node DB2NODE authentication dcs
```

3 Catalog the remote database as a Data Connection Services (DCS) database.
The syntax of the command is:

```
| 		    catalog dcs db local_dbname as real_host_dbname
```

For example:

```
| 		    catalog dcs db DB2DB as NEW_YORK3
```

In the DB2 commands above:

- *node_name* can be any valid eight-character name
- *sym_dest_name* is the name of your Side Information Profile (**16**)
- *local_dbname* can be any valid eight-character name
- *db_alias* can be any valid eight-character name
- *real_host_dbname* is the name of the database you want to connect to at the
  DRDA server (**5**).

Step 5. Test the Connection

Issue the following command from the command line processor window at the DB2
Connect server, remembering to substitute your *db_alias* value from the previous step:

```
| 		 connect to db_alias user userid using password
```

For example:

```
| 	 connect to NYC3 user userid using password
```

The user ID and password values required are those defined at the host or AS/400,
and must be provided to you by your DB2 Administrator.

Step 6. Bind the Utilities and Applications

The steps you have just completed set up the DB2 Connect workstation to communicate with the host. You must now bind the utilities and applications to the DRDA server.

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*.

To install remote clients, see Chapter 27, "Installing DB2 Clients" on page 273.

Chapter 15. Configuring IBM Communications Server for Windows NT SNA Client

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

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

Note: The instructions in this chapter describe how to configure the SNA Client portion of the split client. See Chapter 13, "Configuring IBM Communications Server for Windows NT" on page 111 to configure the server portion of the split client.

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

Step 1. Fill In the Worksheet

Before you configure the DB2 Connect workstation, have your host-side administrator and LAN administrator fill in copies of the following worksheet for each host to which you want to connect (see Table 16 on page 136).

After you fill in the *Your Value* entries, you can use the worksheet to configure IBM Communications Server for Windows NT SNA Client. As you perform the configuration, replace the sample values that appear in the configuration instructions with your values from the worksheet. Use the boxed numbers **1** to relate the configuration instructions to the worksheet values.

Table 16. Worksheet for Planning SNA Client Connections to Communications Server/NT

Ref.	SNA Client Name	Sample Value	Your Value
Network Elements at the Host			
1	Host Name	SPIFNET	
2	Partner LU Name	NYM2DB2	
3	Network ID	SPIFNET	
4	Control Point Name	NYX	
5	Database name	NEW_YORK3	
6	Mode Name	IBMRDB	
7	Link Station Name	LINKHOST	
Network Connection Information			
8	Destination address	400009451902	
Network Elements at the DB2 Connect Workstation			
9	Network Name	SPIFNET	
10	Local Control Point Name	NYX1	
11	Local LU name	NYX1GW01	
12	Local LU alias	NYX1GW01	
13	Block ID	05D	
14	Physical Unit ID	27509	
15	Mode name	IBMRDB	
16	Symbolic Destination name	DB2CPIC	
17	(Remote) Transaction program (TP) name	X'07F6C4C2' (or RDB_NAME for VM, AXE transaction name for VSE, or DB2DRDA for MVS or OS/390)	
DB2 Directory Entries (at the DB2 Connect workstation)			
18	Node name	db2node	
19	Security	Program	
20	Database name	db2db	
21	Database alias	nyc3	
Elements at the Communications Server			
22	User name	CSNTUS1	
23	Password	********	
24	IP address	123.123.123.123	

Step 2. Create a User Name on the Communications Server for Windows NT Server

On the Communications Server for Windows NT server, you need to create a user name that permits the SNA client to access the server. To create a user name:

1 Click on the **Start** button, then select **Programs**->**Administrative Tools (Common)**->**User Manager**. The User Manager window appears.

2 On the User Manager's menu bar, select **Users**->**New User**. The New User window appears.

3 Type in values for the following fields:

User Name	CSNTUS1
Full Name	CS/NT Client 1
Description	optional
Password	********
Confirm Password	********

4 Click on the **Groups** button. The Group Memberships window appears. By default, the user name you are defining is a member of only the **Users** group.

5 Make your new user name a member of each of the following groups by selecting the group name, then clicking on the **Add** button:

- The **Administrators** group
- The **IBMCSADMIN** group
- The **IBMCSAPI** group.

6 Click on **OK**.

Step 3. Configure the SNA Client

To configure the IBM Communications Server for Windows NT SNA Client, at the client workstation click on the **Start** button, then select **Programs**->**IBM Communications Server SNA Client**->**Configuration**. The Configuration File (*.acg) – CS/NT SNA Client Configuration window appears.

To configure the client workstation, you need to configure the following options:

- "Configure Global Data"
- "Configure APPC Server List" on page 139
- "Configure CPI-C Side Information" on page 139
- "Configure Transaction Programs" on page 139

After each step, you return to the CS/NT SNA Client Configuration window.

```
╔══════════════════════════════════════════════════════════════════╗
║ ░░ Configuration File (*.ini) - CS/NT SNA Client Configuration  _□✕ ║
╠══════════════════════════════════════════════════════════════════╣
║  File  View  Help                                                  ║
║ ────────────────────────────────────────────────────────────────── ║
║  ┌─ Configuration Options: ─────────────────────────────────────┐  ║
║  │ ┌──────────────────────────────────────────────────────────┐ │  ║
║  │ │ Configure Global Data                                    │ │  ║
║  │ │ Configure APPC Server List                               │ │  ║
║  │ │ Configure CPI-C Side Information                          │ │  ║
║  │ │ Configure Transaction Programs                           │ │  ║
║  │ │ Configure LUA Sessions                                   │ │  ║
║  │ │ Configure EHNAPPC                                        │ │  ║
║  │ └──────────────────────────────────────────────────────────┘ │  ║
║  └──────────────────────────────────────────────────────────────┘  ║
║  ┌─ Description: ───────────────────────────────────────────────┐  ║
║  │  Click on the New button to define the User ID, password and │  ║
║  │  Translation table name. You can then view and change its    │  ║
║  │  parameters or delete it.                                    │  ║
║  └──────────────────────────────────────────────────────────────┘  ║
║  ┌─ Global Data: ───────────────────────────────────────────────┐  ║
║  │  ┌────────────────────────────────┐   ┌──────────────────┐    │  ║
║  │  │                                │   │      New...       │    │  ║
║  │  └────────────────────────────────┘   └──────────────────┘    │  ║
║  │                                        ┌──────────────────┐    │  ║
║  │                                        │  View/Change/Add...│   │  ║
║  │                                        └──────────────────┘    │  ║
║  │                                        ┌──────────────────┐    │  ║
║  │                                        │      Delete       │    │  ║
║  │                                        └──────────────────┘    │  ║
║  └──────────────────────────────────────────────────────────────┘  ║
║ ────────────────────────────────────────────────────────────────── ║
║  Ready                                              □  □  □         ║
╚══════════════════════════════════════════════════════════════════╝
```

Configure Global Data

To configure the global data:

1 In the **Configuration options** field, select **Configure Global Data**, then click on the **New** button. The Define Global Data window appears.

2 In the **User name** field, type in the name **22** from the worksheet (CSNTUS1). This is the user name that was defined in "Step 2. Create a User Name on the Communications Server for Windows NT Server" on page 137.

3 In the **Password** and **Confirm Password** fields, type in the password **23** that was defined in "Step 2. Create a User Name on the Communications Server for Windows NT Server" on page 137.

4 Click on **OK**.

Configure APPC Server List

To configure the APPC Server list:

1 In the **Configuration options** field, select **Configure APPC Server List**, then click on the **New** button. The Define APPC Server list window appears.

2 Type in the IP address **24** of the server (123.123.123.123).

3 Click on **OK**.

Configure CPI-C Side Information

To configure the CPI-C side information:

1 In the **Configuration options** field, select **Configure CPI-C side information**, then click on the **New** button. The Define CPI-C side information window appears.

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

3 In the **Local LU alias** field, type in the name **12** from the worksheet (NYX1GW01).

> **Note:** Ensure that this Transaction Program has a check mark in the **For SNA API Client use** check box.

4 In the **Mode name** field, type in the name **15** from the worksheet (IBMRDB).

5 In the **TP name** field, type in the name **17** from the worksheet (DB2DRDA).

6 In the **Partner LU name** field, type in the network ID **3** and the partner LU name **2** from the worksheet (SPIFNET.NYM2DB2), or type in the **Partner LU alias**.

7 Click on **OK**.

Configure Transaction Programs

To configure a transaction program:

1 In the **Configuration options** field, select **Configure Transaction Programs**, then click on the **New** button. The Define a Transaction Program window appears.

2 In the **Transaction Program** field, type in the name **17** from the worksheet (DB2DRDA).

3 In the **Local LU alias** field, type in **12** from the worksheet (NYX1GW01).

4 If the Transaction Program you specified is a service TP, ensure that there is a check mark in the **Service TP** check box. The example TP DB2DRDA is not a service TP.

5 Ensure that there is **no** check mark in the **Attach Manager started** check box.

6 Ensure that the **Background Process** box is checked.

7 Click on **OK**.

Save the Configuration

To save the configuration:

1 From the **File** button on the menu bar, select **Save As**. The Save As window appears.

2 Type in a file name, then click on **Save**.

Step 4. Update the DB2 Directories

To configure the DB2 directories, do the following at the SNA client workstation:

1 Catalog the DRDA server as an APPC node. The syntax of the command is:

    catalog appc node node_name remote sym_dest_name security program

For example:

    catalog appc node DB2NODE remote DB2CPIC security program

Note: The case of the *sym_dest_name* (DB2CPIC in this example) must match the case of the Symbolic Destination Name in the CPI-C Symbolic Destination Name Properties definition.

2 Catalog a database alias for the remote database. The syntax of the command is:

    catalog db local_dbname as db_alias at node node_name authentication dcs

For example:

    catalog db DB2DB as NYC3 at node DB2NODE authentication dcs

3 Catalog the remote database as a Data Connection Services (DCS) database. The syntax of the command is:

```
|                        catalog dcs db local_dbname as real_host_dbname
|           For example:
|                        catalog dcs db DB2DB as NEW_YORK3
```

In the DB2 commands above:

- *node_name* can be any valid eight-character name
- *sym_dest_name* is the name of your Side Information Profile (**16**).
- *local_dbname* can be any valid eight-character name
- *db_alias* can be any valid eight-character name
- *real_host_dbname* is the name of the database you want to connect to at the DRDA server (**5**).

You now need to update the DB2 directories, test the connection, and bind utilities and applications to the server. The easiest way to do this is to use the CCA as described in Chapter 10, "Configuring Host and AS/400 Connections on OS/2 or Windows NT Workstations" on page 87. However, you can also perform these steps manually as described in the sections that follow.

Step 5. Test the Connection

Issue the following command from the command line processor window at the SNA Client, remembering to substitute your *db_alias* value from the previous step:

```
connect to db_alias user userid using password
```

For example:

```
connect to nyc3 user CSNTUS1 using password
```

The user ID and password values required are those defined at the host or AS/400, and must be provided to you by your DB2 Administrator.

Step 6. Bind the Utilities and Applications

The steps you have just completed set up the DB2 Connect workstation to communicate with the host. You must now bind the utilities and applications to the DRDA server.

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*.

Chapter 16. Configuring Microsoft SNA Server Version 4.0 for Windows NT

Read this chapter if you have a Windows NT Server system that has Microsoft SNA Server Version 4.0 installed. Although Microsoft SNA Server will run on Windows NT 4.0 Workstation, Windows NT 4.0 Server is recommended.

Note: You must have Windows NT Fix Pack 3 installed in order to run SNA Server Version 4.0.

Step 1. Fill in the Worksheet

Before you configure the system for DB2 Connect, have your host-side administrator and LAN administrator fill in copies of the following worksheet for each host to which you wish to connect.

To help you fill in the worksheet, Figure 13 on page 146 illustrates a sample network that has DB2 Connect running on an OS/2 system and uses APPC to connect to DB2 for OS/390. The values shown in this diagram correspond to the *Sample Value* entries in the worksheet.

After you fill in the *Your Value* entries, you can use the worksheet to configure Microsoft SNA Server. As you configure Microsoft SNA Server, replace the sample values that appear in the configuration instructions with your values from the worksheet. Use the boxed numbers (eg. **1**) to relate the configuration instructions to the worksheet values.

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

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Table 17. Worksheet for Planning OS/390, MVS, VM, VSE, or OS/400 Connections

Ref.	SNA Server Admin Name	VTAM Name	Sample Value	Your Value
Network Elements at the Host				
1	Host Name	NETID	SPIFNET	
2	Remote LU Name	APPL	NYM2DB2	
3	Network ID		SPIFNET	
4	Control Point Name	**OS/390, MVS, VM, VSE:** SSCP Name **OS/400:** Local Control Point Name	NYX	
5	Database name	**OS/390 or MVS:** Location Name **VM/VSE:** RDB_Name	NEW_YORK3	
6	Mode Name		IBMRDB	
7	Connection Name		LINKHOST	
Network Connection Information				
8	Remote Network address		400009451902	
Network Elements at the DB2 Connect Workstation				
9	NETID		SPIFNET	
10	Local Control Point Name	PU Definition	NYX1	
11	(Local) LU name	LU Definition	NYX1GW01	
12	(Local) LU alias	Modeent	NYX1GW01	
13	Local Node ID	ID BLK	05D	
14		ID NUM	27509	
15	Mode name		IBMRDB	
16	Symbolic Destination name		DB2CPIC	
17	(Remote) Transaction program (TP) name		X'07F6C4C2' (or RDB_NAME for VM, AXE transaction name for VSE, or DB2DRDA for MVS or OS/390)	
DB2 Directory Entries (at the DB2 Connect workstation)				
18	Node name		db2node	
19	Security		Program	
20	Database name		db2db	
21	Database alias		nyc3	

For an OS/390, MVS, VSE, or VM connection, you need the control point name of your DB2 Connect workstation. Your network administrator can provide you with this information.

Step 2. Define Server Properties

You can define the properties of your SNA connections in the Microsoft SNA Server Manager. To access the manager, click on the Windows NT Start button, then select Programs->Microsoft SNA Server->Manager.

The Microsoft SNA Server Manager uses an interface similar to that of the Windows NT Explorer. Figure 13 on page 146 shows the interface. There are two panes in the main window of the Manager. All the configuration options we will be using can be accessed by clicking the right mouse button on objects in the left-hand pane of the window. Every object has a *context menu* that you can access by right-clicking on the object.

Define Control Point Name

The first step to configuring Microsoft SNA Server for DB2 Connect is to define the correct Control Point Name for your NT Server. Do the following:

1. Right-click on SNA Service and select Properties. The Properties dialog box appears.
2. Enter the correct **NETID 9** and **Control Point Name 4** in the corresponding fields of the dialog box.
3. Click OK to accept the changes.

Define Link Service (802.2)

Your next step is to set the properties of the link server. Perform the following steps:

1. Open the Servers folder in the left pane of the Manager by clicking the mouse on the plus sign next to the Server folder icon.
2. Click the right mouse button (right-click) on the server icon nested underneath the Servers folder.
3. Select Insert->Link Service. The Insert Link Service pop-up window appears.
4. Select DLC 802 2 Link Service. Press Add, then Finish.

Define Connection Properties

To specify the type of connection DB2 Connect will be using, do the following:

1. Right-click on SNA Service and select Insert->Connection->802.2. The **Connection Properties** dialog box appears.

Figure 13. The Microsoft SNA Server Manager.

2. Under the **General** tab, enter a connection name **7** in the Name field.

3. Choose the **Link Service Type** (SnaDlc1).

4. Set the **Remote End** radio button to **Host System**.

   a. Set the **Allowed Directions** radio button to **Both Directions**.

   b. Set the **Activation** radio button to **On Server Startup**.

5. Select the **Address** tab and fill in the **Remote Network Address** **8** field. Accept the default numbers in the other fields.

6. Select the **System Identification** tab. Enter the following information

   a. For the **Local Node Name**, add the **NETID** **1** , the **Control Point Name** **4** , and the **Local Node ID** (**13** plus **14**). Accept the **XID Type** default.

   b. For the **Remote Node Name**, add the **NETID** **1** and the **Control Point Name** **4** . Accept the other defaults

7. Click **OK** to exit.

Define Local LU

To define the properties of the Local LU, do the following:

1. Right-click on **SNA Service** and select Insert->APPC->Local Lu. The **Local APPC LU Properties** dialog box appears.

2. Under the **General** tab, enter the following information:

   a. The **LU Alias** `12` .

   b. The **NETID** `9` .

   c. The **LU Name** `11` .

3. Select the **Advanced** tab, and select **Member of Default Outgoing Local APPC LU Pool**. Accept the other defaults.

4. Click **OK** to exit.

Define Remote LU

To define the properties of the Remote LU, do the following:

1. Right-click on **SNA Services** and select Insert->APPC->Remote LU.

2. Under the **General** tab, select **Connection** and enter the **LU Alias** `2` . The other fields will be filled in by the program.

   Note: If your LU alias is not the same as your LU Name, make sure you specify the LU Name in the appropriate field. The program will fill it in automatically, but it will be incorrect if the alias and the name are not the same.

3. Click **OK** to exit.

Define Mode

To define the properties of the APPC Mode, do the following:

1. Right-click on the **APPC Modes** folder icon, and select Insert->APPC->Mode Definition.

2. Under the **General** tab, enter the **Mode Name** `6` .

3. Select the **Limits** tab, and enter appropriate numbers for the **Parallel Session Limit** (eg. 30) and **Minimum Contention Winner Limit** (eg. 15). Your Host-Side or LAN administrator should be able to supply you with the numbers if you do not know the limits you should place here.

4. Accept the other defaults, and click **OK** to exit.

Define the CPIC Name Properties

To define the properties of the CPIC Name, do the following:

1. Right-click on **CPIC Symbolic Name** and select Insert->APPC->CPIC Symbolic Name. The **CPIC Name Properties** dialog box appears.

2. Under the **General** tab, enter the Symbolic Destination Name **16** in the **Name** field. Select a **Mode Name** of *IBMRDB*. Accept the other defaults.

3. Select the **Partner Information** tab.

   a. Under **Partner TP Name**, select the **SNA Service TP (in hex)** radio button.

   b. Under **Partner LU Name**, select **Fully Qualified** and enter the fully-qualified Partner LU Name (**1** and **2**) or alias.

4. Click **OK** to exit.

Step 3. Save the Configuration

Once you have entered all the settings for your SNA connection to DB2 Connect, click on the File menu of the Server Manager window and select **Save**. The Save File dialog box appears. Type a unique name for your configuration into the File Name field and click **Save**. Your configuration is now saved.

Step 4. Update the DB2 Directories

To configure the DB2 directories, do the following at the DB2 Connect workstation:

1 Catalog the DRDA server as an APPC node. The syntax of the command is:

```
catalog appc node node_name remote sym_dest_name security program
```

For example:

```
catalog appc node DB2NODE remote DB2CPIC security program
```

Note: The case of the *sym_dest_name* (DB2CPIC in this example) must match the case of the Symbolic Destination Name in the CPI-C Symbolic Destination Name Properties definition.

2 Catalog the remote database as a Data Connection Services (DCS) database. The syntax of the command is:

```
catalog dcs db local_dbname as real_host_dbname
```

For example:

```
catalog dcs db nyc3 as NEW_YORK3
```

3 Catalog a database alias for the remote database. The syntax of the command is:

```
catalog db local_dbname as db_alias at node node_name authentication dcs
```

For example:

```
catalog db DB2DB as nyc3 at node DB2NODE authentication dcs
```

In the DB2 commands above:

- *node_name* can be any valid eight-character name
- *sym_dest_name* is the name of your Side Information Profile (**16**).
- *local_dbname* can be any valid eight-character name
- *db_alias* can be any valid eight-character name
- *real_host_dbname* is the name of the database you want to connect to at the DRDA server (**5**).

Step 5. Test the Connection

Issue the following command from the command line processor window at the DB2 Connect server, remembering to substitute your *db_alias* value from the previous step:

```
connect to db_alias user userid using password
```

For example:

```
connect to DB2DB user userid using password
```

The user ID and password values required are those defined at the host or AS/400, and must be provided to you by your DB2 Administrator.

Step 6. Bind the Utilities and Applications

The steps you have just completed set up the DB2 Connect workstation to communicate with the host. You must now bind the utilities and applications to the DRDA server.

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*.

To install remote clients, see Chapter 27, "Installing DB2 Clients" on page 273.

Chapter 17. Configuring Microsoft SNA Client

| Read this chapter if you have a Windows NT workstation that has DB2 Connect
| installed. This chapter provides step-by-step instructions for setting up the
| communications between your DB2 Connect workstation and a Windows NT
| workstation that has Microsoft SNA Server V2.11 (or later) installed.

Figure 14 on page 152 illustrates the example DB2 Connect Server scenario.

Assumptions

The rest of this chapter assumes:

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

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

Step 1. Obtain Required Information

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

1 Obtain the proper license for you to use Microsoft SNA Client on your workstation.

2 Define a user ID for you on the SNA Server domain.

3 Define connections to the host and AS/400 databases that you need to access,
as described in Chapter 16, "Configuring Microsoft SNA Server Version 4.0 for
Windows NT" on page 143.

4 Provide you with the symbolic destination name to use for each database
connection defined in the previous step.
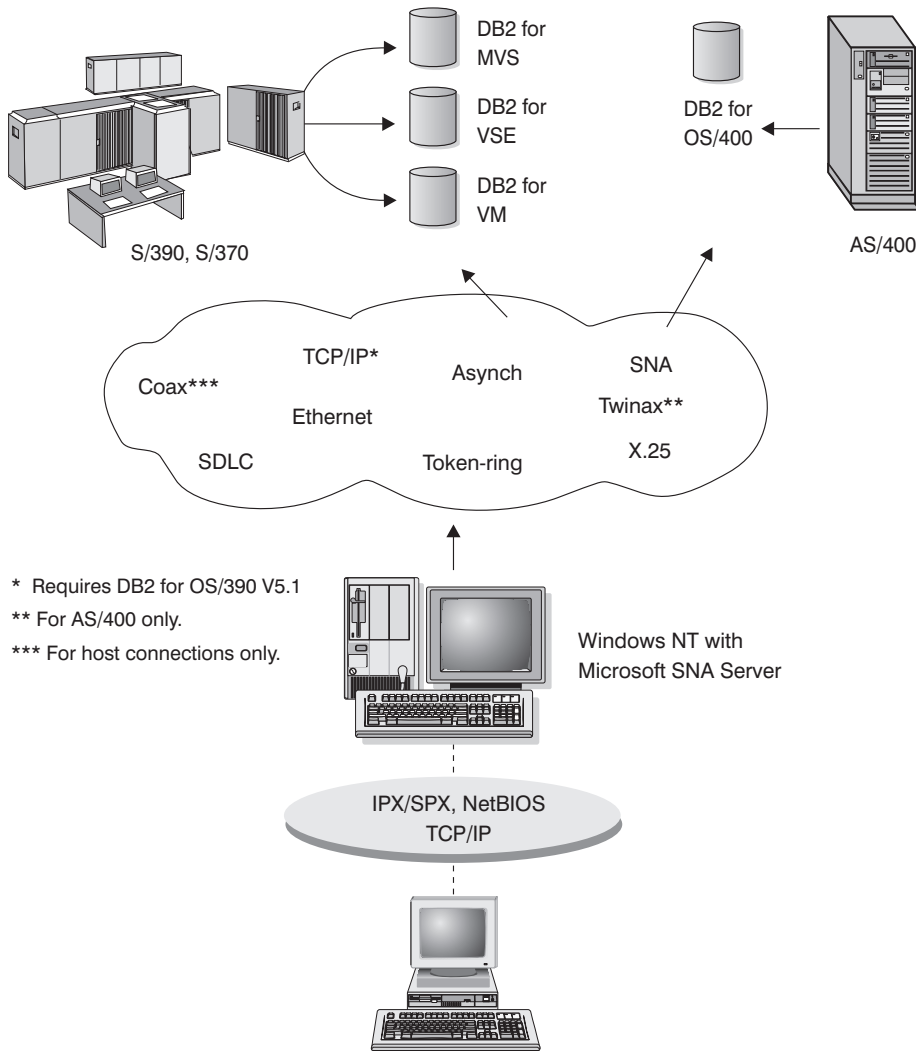
Figure 14. DB2 Connect Server Scenario Using DB2 Connect, MS SNA Client, and MS SNA Server

If you plan to change host passwords, the SNA administrator will also need to provide you with symbolic destination names for password management tasks on each host. See Appendix B, "Changing Your MVS Password" on page 525 for more information on changing host passwords.

Your host or AS/400 database administrator will need to:

1 Define a user ID and password on the host or AS/400 security system for you to use.

2 Make sure that your user ID is granted proper access to database objects that you will be working with.

3 Provide you with the database name:

Location name	on DB2/MVS or DB2 for OS/390
RDB	on AS/400
DBNAME	on DB2 for VM/VSE (SQL/DS)

Step 2. Install SNA Client on the DB2 Connect Workstation

1 Obtain the Microsoft SNA Client software, and follow the instructions provided with it to start the installation program. For example, if you are installing from a Microsoft SNA Server V2.11 CD-ROM, you will need to execute `setup.exe` in the `sna/clients/win3x` subdirectory to install on a Windows 3.1 or Windows for Workgroups 3.11 workstation.

| **2** Follow the instructions on the screen to complete the installation. Choose your
| SNA Server domain name and communication protocol according to the
| instructions provided by your SNA Server administrator.

3 When you reach the *Optional Components* panel deselect *Install ODBC/DRDA driver* so that it will *not* be installed.

Step 3. Install DB2 Connect for Windows

| **1** Install DB2 Connect.

2 When the installation is completed, reboot.

3 Open the DB2 Folder, and click on the **Client Configuration Assistant** to start the configuration dialog.

4 You need to provide the following information:

    a The Symbolic Destination Name defined at the Microsoft SNA Server for the Partner LU of the target DRDA host. This is **7** on the example worksheet for this configuration (Table 18 on page 154), and **24** on the worksheet provided for use with SNA Server (Table 17 on page 144).

    b The real database name, for example the DB2 for OS/390 or DB2 for MVS/ESA "LOCATION NAME." This is **12** on both worksheets.

No.	Description	Sample Value	Your Value
User Information			
1	User Name	A.D.B.User	
2	Contact Info	(123)-456-7890	
	Location		
MS SNA Server Information (provided by SNA Server administrator)			
3	MS SNA Server domain name	ACCOUNTS	
4	Protocol used for communicating with SNA Server (TCP/IP, NetBEUI, IPX/SPX)	NetBEUI	
5	User ID used to login to the MS SNA Server domain	ADBUSER	
6	Password used to login to the MS SNA Server domain	XXXXXXX	
7	Database CPI-C symbolic destination name (defined to MS SNA Server).	DB2CPIC	
8	Password management CPI-C symbolic destination name	DB2PEM	
Database Information (provided by host or AS/400 administrator)			
9	Alias	NYC3	
10	Description	New York DB #3	
11	Database Type	DB2 for MVS/ESA or DB2 for OS/390	
12	Host database name	NEW_YORK3	
13	User ID assigned to you on your host or AS/400 system	ADBUSER	
14	Password to be used to connect to your host or AS/400 system	XXXXXXXX	

Table 18. Example Worksheet for Microsoft SNA Client Users

Update the DB2 Directories

To configure the DB2 directories, enter the following commands in the command line processor:

1 Catalog the DRDA server as an APPC node. The syntax of the command is:

```
catalog appc node node_name remote sym_dest_name security program
```

For example:

```
catalog appc node DB2NODE remote DB2CPIC security program
```

Note: The case of the *sym_dest_name* (DB2CPIC in this example) must match the case of the Symbolic Destination Name that you defined when you installed MS Client.

| **2** Catalog the remote database as a Data Connection Services (DCS) database.
| The syntax of the command is:

| ```
| catalog dcs db local_dbname as real_host_dbname
| ```

| For example:

| ```
| catalog dcs db DB2DB as NEW_YORK3
| ```

3 Catalog a database alias for the remote database. The syntax of the command is:

```
catalog db local_dbname as db_alias at node node_name authentication dcs
```

For example:

```
catalog db DB2DB as nyc3 at node DB2NODE authentication dcs
```

In the DB2 commands above:

- *node_name* can be any valid eight-character name
- *sym_dest_name* is the name of your Side Information Profile.
- *local_dbname* can be any valid eight-character name
- *db_alias* can be any valid eight-character name
- *real_host_dbname* is the name of the database you want to connect to at the DRDA server.

Test the Connection

Issue the following command from the command line processor window, remembering to substitute your *db_alias* value from the previous step:

```
connect to db_alias user userid using password
```

| For example:

| ```
| connect to NYC3 user userid using password
| ```

The user ID and password values required are those defined at the host or AS/400, and must be provided to you by your DB2 Administrator.

Chapter 18. Configuring SNA Server for DB2 Connect on AIX

This chapter describes how you configure your DB2 Connect workstation to connect to DRDA hosts using IBM SNA Server for AIX. Note that the examples in this chapter use a Token Ring network and IBM SNA Server for AIX Version 3.1.

For more information about SNA Server for AIX, refer to the *IBM SNA Server for AIX User's Guide*.

Step 1. Fill in the Worksheet

Before you configure the DB2 Connect workstation, have your host-side administrator and LAN administrator fill in copies of the worksheets that follow for each host to which you want to connect:

- For OS/390, MVS, VM, and VSE hosts, use Table 19 on page 159
- For AS/400, use Table 48 on page 508.

To help you fill in the worksheets, Figure 15 illustrates a sample network that has DB2 Connect system and uses APPC to connect to DB2 for OS/390. The values shown in this diagram correspond to the *Sample Value* entries in the worksheet.

After you fill in the *Your Value* entries, you can use the worksheet to configure DB2 Connect. During the configuration process, replace the sample values that appear in the configuration instructions with your values from the worksheet. Use the boxed numbers **1** to relate the configuration instructions to the worksheet values.

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

Node Directory

Node name	**DB2NODE**
Symbolic dest name	**DB2CPIC**
Security	**PROGRAM**

System Database Directory

DB alias	**NYC3**
DB name	**DB2DB**
Node	**DB2NODE**
Authentication	**DCS**

DCS Directory

Database	**DB2DB**
Target DB name	**NEW_YORK3**

SNA Server for AIX

Link	
XID node ID	**07127509**
Network name	**SPIFNET**
Control point name	**NYX1**
Mode profile	**IBMRDB**
Local LU profile	**NYX1GW01**
Token ring link station profile	
Remote link address	**400009451902**
Side information profile	**DB2CPIC**
Local LU or CP	**NYX1GW01**
Mode name	**IBMRDB**
Partner LU profile	**NYM2DB2**
Qualified partner LU	**SPIFNET.NYM2DB2**
Qualified owning CP	**SPIFNET.NYX**

LOCATION	**NEW_YORK3**
LUNAME	**NYM2DB2**

DB2 for OS/390

VTAM

NETID	**SPIFNET**
APPL	**NYM2DB2**
PU	**NYX1**
IDBLK=	**05D**
IDNUM=	**27509**
LU	**NYX1GW01**
SSCP	**NYX**
MODEENT	**IBMRDB**

NCP

LOCADD=	
	400009451902

DB2 CONNECT TO NYC3 USER <USERID> USING <PASSWORD>
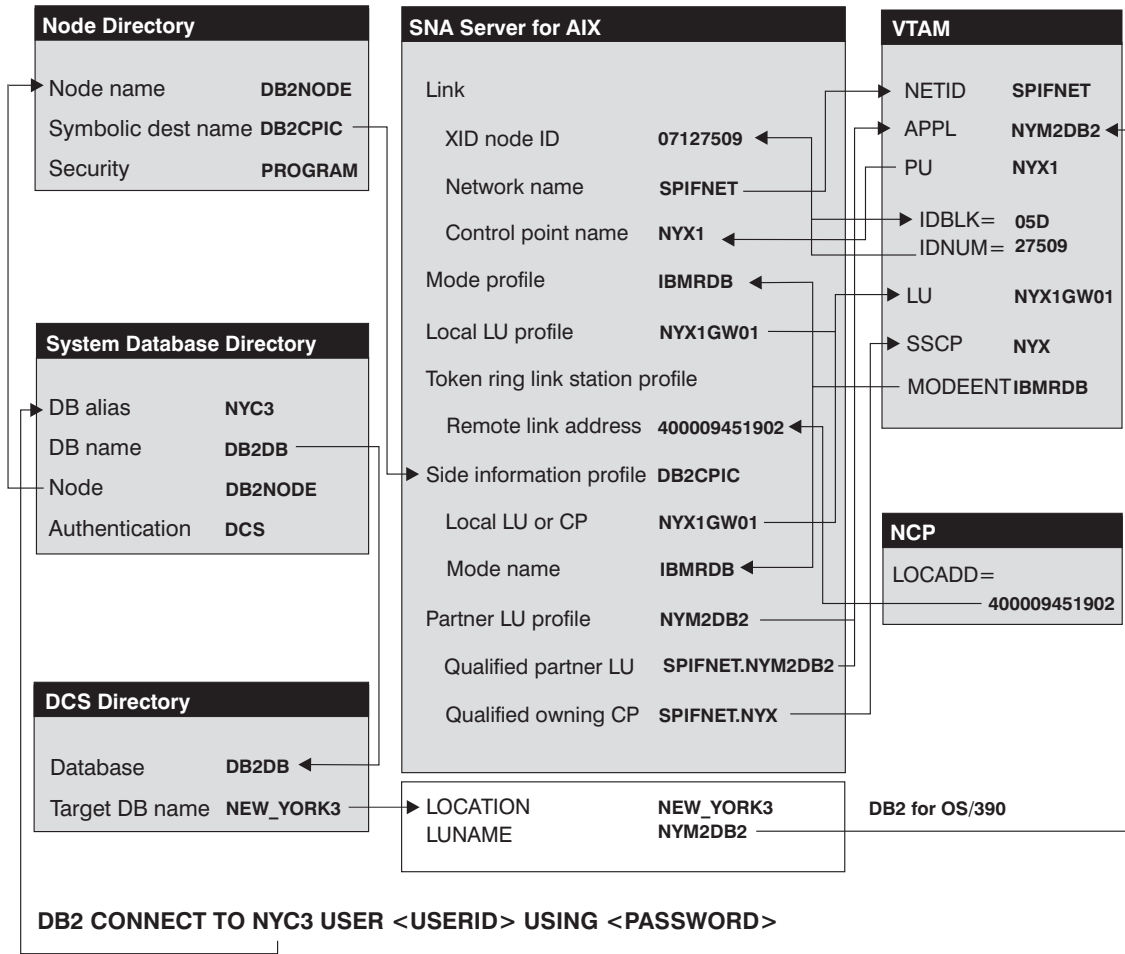
Figure 15. Configuration on the DRDA Server and DB2 Connect

Table 19. Example Worksheet for Planning APPC Host Connections from SNA Server for AIX

Ref.	Description	VTAM Name	Sample Value	Your Value
Network Elements at the Host				
1	Network name		SPIFNET	
2	Remote partner LU name		NYM2DB2	
3	Network name of adjacent node		SPIFNET	
4	Control point name of adjacent (partner) node		NYX	
5	Target database name		NEW_YORK3	
6	Mode Name		IBMRDB	
Network Connection Information				
7	Link station profile name		NYX1LS	
8	Remote link address		400009451902	
9	DLC profile name		tok0.00001	
Network Elements at the DB2 Connect Workstation				
10	Network name	NETID	SPIFNET	
11	Local CP name	PU	NYX1	
12	Local LU name (to be used by DB2 Connect)		NYX1GW01	
13	Local LU alias	LU	NYX1GW01	
14	XID node id	ID BLK	071	
15		ID NUM	27509	
16	Mode name	MODEENT	IBMRDB	
17	Symbolic Destination name		DB2CPIC	
18	Remote Transaction program (TP) name		X'07F6C4C2' (default), (or *RDB_NAME* for VM, *AXE* transaction name for VSE, or DB2DRDA for MVS or OS/390)	
DB2 Directory Entries (at the DB2 Connect workstation)				
19	Node name		db2node	
20	Security		Program	
21	Database name		db2db	
22	Database alias		nyc3	
27	TPNAME		NYSERVER	

Notes:

1. *Partner CP Name* (**4**) is the System Services Control Point (SSCP) name for OS/390, MVS, VM, and VSE. For AS/400 it is the CP name of the AS/400.

2. *Target database name* (**5**) is the DB2 for MVS/ESA *LOCATION NAME*, the DB2 for AS/400 RDB name, or the *RDB_NAME* for DB2 for VSE & VM.

3. If you use a Syncpoint Manager, the Local LU (NYX1GW01) should be the LU used for the SPM. In this case, that LU cannot also be the Control Point LU.

Completing the Worksheet

Fill in a copy of the primary worksheet for each AS/400, OS/390, MVS, VM, or VSE connection that you want to set up. Note the following:

1 XID node ID is the concatenation of the IDBLK and IDNUM values for the DB2 Connect workstation **14** and **15** . For an OS/400 connection, write an asterisk (*) at **14** . This value means that you will use the default XID.

2 The network name at the host (**1**) may be the same as that at the DB2 Connect workstation (**10**); check with your network administrator.

3 The Control Point name of the DB2 Connect workstation (**11**) is usually the same as the PU name. You can find the control point name of your DB2 Connect workstation by entering **smit** and selecting panels in the following order:

    a Communications Applications and Services

    b SNA Server for AIX

    c Configure SNA Profiles

    d Advanced Configuration

    e Control Point

    f Change/Show a Profile.

4 The Control Point name for the host (**4**) is the System Services Control Point (SSCP) name for an OS/390, MVS, VM, or VSE system, or the Local Control Point name for an AS/400 system (see "Preparing DB2 for AS/400 for DB2 Connect" on page 507 and Table 48 on page 508).

5 The same mode name should be used at both the host and the DB2 Connect (see **6** and **16**).

6 For Local LU alias (**13**), use the same name as the Local LU name (**12**). This helps to avoid confusion.

7 For Link station profile name (**7**), choose a value.

8 For Remote link address (**8**), provide the controller address or the adapter address for the host.

9 For Symbolic destination name (**17**) choose a suitable value. Note that this value is case sensitive.

10 For Partner LU name (**2**), for OS/390, MVS, VM, or VSE, this is the VTAM application name (APPL) defined to the host database server. For OS/400, it is the Local Control Point name.

11 For Remote transaction program (**18**), The default is X'07F6C4C2' for OS/390, MVS, and OS/400, the *RDB_NAME* (real database name) for VM and the *AXE* transaction name for VSE.

12 The target database name (**5**) is the *LOCATION NAME* for DB2 for OS/390 or DB2 for MVS/ESA, the *RDB_NAME* for DB2 for VM or the relational database name for DB2 for AS/400.

Step 2. Configure Your DB2 Connect System

Configure your DB2 Connect system as follows:

1 Log on to the AIX machine as *root*.

2 On the command line, enter:

        smit

3 Select panels in the following order:

   a Communications Applications and Services

   b SNA Server/6000

   c Configure SNA Profiles

   d Advanced Configuration.

   The next several steps begin from the Advanced Configuration panel.

4 Update the Control Point Profile as follows:

   a Select the Control Point panel.

   b Select the Change/Show a Profile panel.

c Between the square brackets [ ], enter the value of the XID node ID (combine the values for **14** (ID NUM plus IDBLK) plus **15** (Network name), or specify [*].

The control point name was probably set when the SNA Server for AIX was installed. For OS/390, MVS, VSE, and VM, check that this value matches **11**.

To minimize confusion, use the same value for the control point alias as for the control point name.

For example, the panel could look like this:

```
            Change / Show Control Point Profile

 *Profile name                            node_cp
  XID node ID                             [07127509]        14 + 15
  Network name                            [SPIFNET]         10
  Control Point (CP) name                 [NYX1]            11
  Control Point alias                     [NYX1]            12
  Control Point type                      appn_end_node
  Maximum number of cached routing trees  [500]
  Maximum number of nodes in the TRS database[500]
  Route addition resistance               [128]
```

5 Check the Token Ring SNA DLC Profile as follows:

    a Select the Links panel.

    b Select the Token Ring panel.

    c Select the Token Ring SNA DLC panel.

    d Select the Change/Show a Profile panel.

    e The profile name and data link device name were probably set when SNA Server for AIX was installed. If you have a reason to change these values, you can do so. If no values appear in the profile, talk to your LAN administrator.

    Write down the profile name **9**.

    For example, the profile might look like this:

```
             Add Token Ring SNA DLC Profile

 *Profile name                           [tok0.00001]    9
  Data link device name                  [tok0]
  Force disconnect time-out (1-600 seconds) [120]
  User-defined maximum I-Field size?     no
     If yes, Max. I-Field size (265-30729) [30729]
```

    f If you will use APPC for connections from remote clients, make sure that the profile has the following value:

```
                Dynamic link stations supported?              yes
```

6 Create a Mode Profile as follows:

a Select the Sessions panel.

b Select the LU 6.2 panel.

c Select the LU 6.2 Mode panel.

d Select the Add a Profile panel.

e Define your mode profile. For profile name and mode name, use the value that you wrote in item **16** of the worksheet. On the other lines, specify values that match the mode profile defined on your DRDA server systems. If you are using the mode IBMRDB, specify the following values:

```
*Profile name                                    [IBMRDB] 16
 Mode name                                       [IBMRDB] 16
 Maximum number of sessions (1-5000)             [30]     *
 Minimum contention winners (0-5000)             [15]     *
 Minimum contention losers (0-5000)              [15]     *
 Auto activate limit (0-500)                     [0]
 Upper bound for adaptive receive pacing window  [16]
 Receive pacing window (0-63)                    [8]      *
 Maximum RU size (128,...,32768: multiples of 32) [4096]  *
 Minimum RU size (128,...,32768: multiples of 32) [1024]  *
 Class of Service (COS) name                     [#CONNECT]
```

7 If the DB2 Connect workstation is defined as an LU, update the Local LU Profile as follows. In most cases, a VTAM administrator on OS/390, MVS, VSE, or VM would define an LU for DB2 Connect. For OS/400, control point routing would normally be used instead of an LU.Create a Local LU profile as follow:

a Select the Sessions panel.

b Select the LU 6.2 panel.

c Select the LU 6.2 Local LU panel.

d Select the Add a Profile panel.

e Update the three lines with the following values: Use **12** for the first two lines, and **13** for the third line. For example, the file could look like this:

```
                    Add LU 6.2 Local LU Profile

*Profile name                                  [NYX1GW01]    12
 Local LU name                                 [NYX1GW01]    12
 Local LU alias                                [NYX1GW01]    13
 Local LU is dependent?                        no
    If yes,
        Local LU address (1-255)               []
        System services control point
            (SSCP) ID (*, 0-65535)             [*]
        Link Station Profile name              []
 Conversation Security Access List Profile name []
```

Configuring Each Server Connection

Before using this section, be sure that you have completed the worksheet Table 19 on page 159 for each OS/400, OS/390, MVS, VM, or VSE host, plus the worksheet Table 48 on page 508 for each OS/400 host.

Configure each DRDA server connection that you require as follows:

1 Update the Token Ring Link Station Profile as follows:

    a Select the Links panel.

    b Select the Token Ring panel.

    c Select the Token Ring Link Station panel.

    d Select the Add a Profile panel.

    e Update the profile, as follows:

       • Change the profile name to the value for **7**. For example:

```
*Profile name                        [NYX1LS]       7
 Use Control Point's XID node ID?     yes
```

       • Change the SNA DLC profile name to the value for **9**. For example:

```
 SNA DLC Profile name       [tok0.00001]    9
Stop link station on inactivity?      no
```

       • Change the remote link address to the value for **8**. For example:

```
 If link_address,
 Remote link address        [400009451902]  8
 Remote SAP address (04-ec)  [04]
```

       • If you want to activate the link only when it is needed (rather than activating it when the SNA starts up), update several lines of the profile, as follows:

```
                 Adjacent Node Identification Parameters
                 Verify adjacent node?                      yes           *
                 Network ID of adjacent node                SPIFNET       3
                 CP name of adjacent node                   NYX           4
                 XID node ID of adjacent node (LEN node only) [*]
                 Node type of adjacent node                 appn_end_node *

                Link Activation Parameters
                Solicit SSCP sessions?                       yes
                Initiate call when link station is activated? yes
                Activate link station at SNA start up?       no            *
                Activate on demand?                          yes           *
                CP-CP sessions supported?                    yes
                If yes,
                 Adjacent network node preferred server?     no
                Partner required to support CP-CP sessions?  no
                Initial TG number (0-20)                 [1]               *
```

2 Update the LU 6.2 Side Information Profile as follows:

   a Select the Sessions panel.

   b Select the LU 6.2 panel.

   c Select the LU 6.2 Side Information panel.

   d Select the Add a Profile panel.

   e Update the profile, as follows:
   - For the profile name, use the value for **17** . This value is case-sensitive; it is recommended that you use uppercase letters.
   - For the local LU or control point alias, use the value for **12** .
   - For the fully qualified partner LU name, use the value for **1** followed by a period and the value for **2** .
   - For the mode name, use the value for **6** .
   - For the next two lines, specify the remote transaction program name. You must specify a value. There is no default value in SNA Server for AIX. On the DRDA server, the default for OS/390, MVS, or OS/400 is X'07F6C4C2'. For VM the default is the *RDB_NAME* and for VSE the default is the *AXE* transaction name.

     Use the value from **18** on the worksheet, or enter the default value. If the value is hexadecimal, specify yes for the second line; otherwise, specify no.

   For example, the file could look like this:

```
                       Add LU 6.2 Side Information Profile

        *Profile name                          [DB2CPIC]           17
         Local LU or Control Point alias        [NYX1GW01]          12
         Provide only one of the following:
            Partner LU alias
            Fully qualified partner LU name     [SPIFNET.NYM2DB2]   1.2
        Mode name                               [IBMRDB]            6
        Remote transaction program name (RTPN)  [07F6C4C2]          18
        RTPN in hexadecimal?                             yes
```

Note that if you are retrieving information about this server from the DCE
Directory, then you do not need to have the Side Information Profile. More
information about configuring DB2 Connect with DCE is provided in the
Administration Guide, and *DB2 Connect User's Guide*.

3 Update the Partner LU 6.2 Location Profile as follows:

   a Select the Sessions panel.

   b Select the LU 6.2 panel.

   c Select the Partner LU 6.2 Location panel.

   d Select the Add a Profile panel.

   e Update the profile, as follows:

   - For the profile name, use the value for **2** .
   - For the fully qualified partner LU name, use the value for **1** followed
     by a period and the value for **2** .
   - For the fully qualified CP name, use the value for **3** followed by a
     period and the value for **4** .

   For example, the file could look like this:

```
                      Add Partner LU 6.2 Location Profile

   *Profile name                                 [NYM2DB2]    2
    Fully qualified partner LU name              [SPIFNET.NYM2DB2]  1.2
   Partner LU location method                              owning_cp
    If owning_cp,
     Fully qualified owning Control Point (CP) name[SPIFNET.NYX]  3.4
     Local node is network server for LEN node?                 no
```

Configuring DB2 Connect for Remote Clients

Configure your DB2 Connect server to accept inbound APPC requests from remote
clients as follows:

   1 Select the Sessions panel.

   2 Select the LU 6.2 panel.

3 Select the LU 6.2 Transaction Program Name (TPN) panel.

4 Select the Add a Profile panel.

5 Add the following profile, replacing NYSERVER with the TP name for your DB2 server.

```
*Profile name                                     [db2v5]    *
 Transaction program name (TPN)                   [NYSERVER] 27
 Transaction program name (TPN) is in hexadecimal? no
 PIP data?                                         no
   If yes, Subfields (0-99)                        [0]
 Conversation type                                 basic      *
 Sync level                                        none/confirm
 Resource security level                           none
     If access, Resource Security Access List Prof. []
 Full path to TP executable    [INSTHOME/sqllib/bin/db2acntp] *
 Multiple instances supported?                     yes        *
 User ID                                           [1918]     *
 Server synonym name                               []
 Restart action                                    once
 Communication type                                signals
   If IPC, Communication IPC queue key             [0]
 Standard input file/device                        [/dev/console]
 Standard output file/device                       [/dev/console]
 Standard error file/device                        [/dev/console]

 Comments                                          []
```

Notes:

a. This profile will be used for both database connections and interrupts by DB2 Universal Database Version 5 and Version 2.1 clients.

b. If you are migrating from a previous release of DB2 Connect, you should be aware that the **db2acntp**, **db2aittp** and **db2cnsm** executables have been consolidated into the **db2acntp** executable.

6 Create any additional APPC partner LU and link profiles that may be required.

7 Ensure the clients are also properly configured.

8 Use SNA Server functions, without using DB2 Connect, in order to validate that all the APPC sessions that you need to establish can be.

9 Configure the database manager. You must add the TP name that will be used by the client. to the database manager configuration file. One way to do this is to issue the following CLP command:

```
update database manager configuration using tpname NYSERVER
```

The name **NYSERVER** is the TP name for the DB2 server.

10 Stop the database manager, if it is running:

```
db2stop
```

11 Set the value of the DB2COMM environment variable to include the string **APPC**.

12 Start the database manager:

```
db2start
```

Step 3. Complete the Configuration

When you have configured all of your server connections, do the following on the DB2 Connect workstation:

1 Confirm that the db2comm environment variable includes APPC. Enter:

```
db2set db2comm
```

If APPC is not set, set it using a command similar to the following:

```
db2set db2comm=appc -g
```

For more details on this command, refer to Chapter 41, "Controlling Your DB2 Environment" on page 395.

2 If your token ring has never before been used for SNA, issue the following command:

```
mkdev -c dlc -s dlc -t tokenring
```

3 Choose the Verify SNA Configuration Profiles panel. This checks that all of the required profiles exist on your system and that the information in them does not conflict. You should repeat this step any time you change your configuration, even if you only update one profile.

Verification can take several minutes. For each error message that you receive, correct the error. When you have corrected all the errors, redo the verification. The verification program does not guarantee that your network parameters are accurate. It verifies only parameters that can be checked within the local system.

4 Stop and start SNA Server for AIX. You can use **smit** or issue the following commands:

```
sna -stop sna
sna -start
```

5 Update the node directory, system database directory, and DCS directory. Enter the following commands in the command line processor, replacing the text in italics with your values from the worksheet:

```
catalog appc node db2node remote DB2CPIC security program
db2 catalog database db2db as nyc3 at node db2node authentication dcs
db2 catalog dcs database db2db as new_york3
```

Refer to the worksheet for:

- The node name, worksheet item **19**, example value *db2node*
- The symbolic destination name, worksheet item **17**, example value *DB2CPIC*
- The database name, worksheet item **21**, example value *db2db*
- The security type, worksheet item **20**, example value *Program*
- The database alias, worksheet item **22**, example value *nyc3.*
- The target database name, worksheet item **5**, example value *new_york3*

6 Connect to the DRDA Server and bind the utilities and applications to the DRDA server using 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 path contained in the registry value *DB2PATH*.

For further information, refer to the online *DB2 Connect User's Guide*.

To install remote clients, see Chapter 27, "Installing DB2 Clients" on page 273.

APPC Security Considerations for Connections from Clients

SNA Server should be configured appropriately to accept the type of APPC security requested by the client. The APPC security type may be one of the following:

- NONE
- PROGRAM
- SAME

The following section provides some guidance and examples of how to configure the SNA subsystem at the server to handle each of the security types requested by the client. See your SNA Server documentation for more detailed information on configuring APPC security.

Configuring for APPC Security Type NONE

Do the following:

- LU 6.2 TPN Profile

  For the LU 6.2 TPN Profile that you are using, set the "Resource security level" to **none**.

- LU 6.2 Partner LU Profile

  When configuring for APPC security type NONE, you do not need to define an LU 6.2 Partner LU Profile.

  If you have a specific LU 6.2 Partner LU Profile defined for the client partner LU; in that profile, set the "Conversation security level" to **none**.

Configuring for APPC Security Type PROGRAM

Do the following:

- LU 6.2 TPN Profile

  For the LU 6.2 TPN Profile that you are using, set the "Resource security level" to **conversation**. The system will check that the username and password are a valid AIX login username and password.

  Note: You can also set the "Resource security level" to **access**. If so, the system will check that the username and password are a valid AIX login username and password, and if a Resource Security Access List Profile is also specified in the LU 6.2 TPN Profile, the system will also check that the username is contained in the specified resource security access list.

- LU 6.2 Partner LU Profile

  When configuring for APPC security type PROGRAM, you do not need to define an LU 6.2 Partner LU Profile.

  If you have a specific LU 6.2 Partner LU Profile defined for the client partner LU; in that profile, set the "Conversation security level" to **conversation**.

Configuring for APPC Security Type SAME

Do the following:

- LU 6.2 TPN Profile

  For the LU 6.2 TPN Profile that you are using, set the "Resource security level" to **conversation**.

  Note: You can also set the "Resource security level" to **access**. If so, the system will check that the username is a valid AIX login username, and if a

Resource Security Access List Profile is also specified in the LU 6.2 TPN Profile, the system will also check that the username is contained in the specified resource security access list.

- LU 6.2 Partner LU Profile

When configuring for APPC security type SAME, you must create a specific LU 6.2 Partner LU Profile for the client partner LU, and in that profile you must set "Conversation security level" to **already_verified**.

> If you specify a "Conversation security level" of **already_verified** in the LU 6.2 Partner LU Profile, SNA Server will actually accept both APPC security type SAME and APPC security type PROGRAM from remote clients.

Chapter 19. Configuring Bull SNA for DB2 Connect on AIX

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 SNA Server for AIX.

To determine if Bull SNA is installed on your AIX 4.1.4 (or later) system, issue the 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 SNA Server for AIX, log on as root and run the command:

```
/usr/lpp/db2_05_00/cfg/db2cfgos
```

Example Bull SNA Configuration

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

- AIX V4.1.4
- Express SNA Server V2.1.3

You will also need the Bull DPX/20 SNA/20 Server Configuration Guide.

Note: 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.

Configuring the Bull DPX/20 SNA/20 Server

The following is a sample configuration:

```
              Client            Controller  Server (MVS)
              ----------------- ----------  ------------
Host name     robocop
LU 6.2 name   SPIFNET.NYX1GW01  NYX         NYM2DB2
```

Use the command *express* to configure the following:

```
Config       Express            Default configuration for EXPRESS
 Node        NYX1               SPIFNET.NYX1 (HOSTNAME=ROBOCOP)
   Indep. LUs  6.2 LUs Using All Stations
     LU        NYX1             Control Point LU
   Link        tok0.00001       Link (tok0)
    Station    MVS              To MVS from ROBOCOP
     LU        NYX1GW01         To MVS from ROBOCOP
      LU Pair  NYM2DB2          To MVS from ROBOCOP
       Mode    IBMRDB           IBMRDB
```

Use default values for fields not listed.

```
Defining hardware:

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

Defining SNA node:

Name         = NYX1
Description   = SPIFNET.NYX1 (HOSTNAME=ROBOCOP)
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 ROBOCOP
Remote MAC address = 400009451902
Remote Node name
  Network ID      = SPIFNET
  Control Point   = NYX

Defining Local LU 6.2:

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

Defining Remote LU 6.2:

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

Figure 16. Sample Bull DPX/20 SNA/20 Configuration

Starting and Stopping SNA/20

The following commands are reproduced from the `Bull DPX/20 SNA/20 Administrator's Guide` for your convenience:

1 Log on the system as superuser (root)

2 Make sure your PATH `contains $express/bin (/usr/lpp/express/bin)`

3 Start EXPRESS by entering:

   `express_adm start`

4 To immediately stop all EXPRESS activity:

   `express_adm stop`

5 To check for active users before stopping:

   `express_adm shutdown`

Chapter 20. Configuring IBM eNetwork Communications Server for AIX

This chapter describes how you configure your DB2 Connect workstation to connect to DRDA hosts using IBM eNetwork Communications Server for AIX. Note that the examples in this chapter use a Token Ring network and IBM eNetwork Communications Server for AIX Version 5.0.

For more information about IBM eNetwork Communications Server for AIX, refer to the *IBM SNA Server for AIX User's Guide*.

Step 1. Fill in the Worksheet

Before you configure the DB2 Connect workstation, have your host-side administrator and LAN administrator fill in copies of the worksheets that follow for each host to which you want to connect:

- For OS/390, MVS, VM, and VSE hosts, use Table 20 on page 179
- For AS/400, use Table 48 on page 508.

To help you fill in the worksheets, Figure 17 illustrates a sample network that has a DB2 Connect system and uses APPC to connect to DB2 for OS/390. The values shown in this diagram correspond to the *Sample Value* entries in the worksheet.

After you fill in the *Your Value* entries, you can use the worksheet to configure DB2 Connect. During the configuration process, replace the sample values that appear in the configuration instructions with your values from the worksheet. Use the boxed numbers **1** to relate the configuration instructions to the worksheet values.

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

Node Directory

Node name	DB2NODE
Symbolic dest name	DB2CPIC
Security	PROGRAM

System Database Directory

DB alias	NYC3
DB name	DB2DB
Node	DB2NODE
Authentication	DCS

DCS Directory

Database	DB2DB
Target DB name	NEW_YORK3

eNetwork Server for AIX

Link	
XID node ID	07127509
Network name	SPIFNET
Control point name	NYX1
Mode profile	IBMRDB
Local LU profile	NYX1GW01
Token ring link station profile	
Remote link address	400009451902
Side information profile	DB2CPIC
Local LU or CP	NYX1GW01
Mode name	IBMRDB
Partner LU profile	NYM2DB2
Qualified partner LU	SPIFNET.NYM2DB2
Qualified owning CP	SPIFNET.NYX

VTAM

NETID	SPIFNET
APPL	NYM2DB2
PU	NYX1
IDBLK=	05D
IDNUM=	27509
LU	NYX1GW01
SSCP	NYX
MODEENT	IBMRDB

NCP

LOCADD=	
	400009451902

LOCATION	NEW_YORK3	DB2 for OS/390
LUNAME	NYM2DB2	

DB2 CONNECT TO NYC3 USER <USERID> USING <PASSWORD>
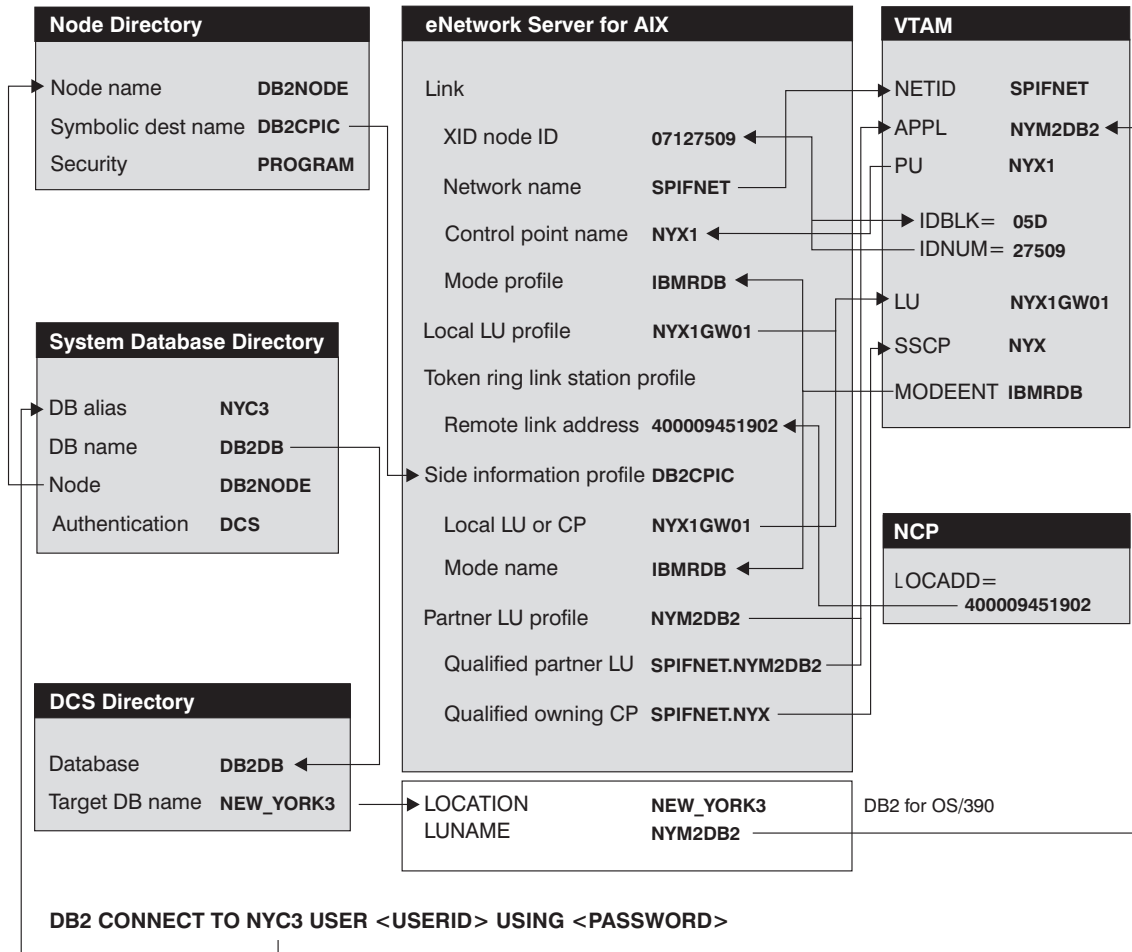
Figure 17. Sample Network.

Table 20. Example Worksheet for Planning APPC Host Connections from SNA Server for AIX

Ref.	Description	VTAM Name	Sample Value	Your Value
Network Elements at the Host				
1	Network name		SPIFNET	
2	Remote partner LU name		NYM2DB2	
3	Network name of adjacent node		SPIFNET	
4	Control point name of adjacent (partner) node		NYX	
5	Target database name		NEW_YORK3	
6	Mode Name		IBMRDB	
Network Connection Information				
7	Link station profile name		NYX1LS	
8	Remote link address		400009451902	
9	DLC profile name		tok0.001	
Network Elements at the DB2 Connect Workstation				
10	Network name	NETID	SPIFNET	
11	Local CP name	PU	NYX1	
12	Local LU name (to be used by DB2 Connect)		NYX1GW01	
13	Local LU alias	LU	NYX1GW01	
14	XID node id	ID BLK	071	
15		ID NUM	27509	
16	Mode name	MODEENT	IBMRDB	
17	Symbolic Destination name		DB2CPIC	
18	Remote Transaction program (TP) name		X'07F6C4C2' (default), DB2DRDA for MVS or OS/390, RDB_NAME for VM and the AXE transaction name for VSE.	
DB2 Directory Entries (at the DB2 Connect workstation)				
19	Node name		db2node	
20	Security		Program	
21	Database name		db2db	
22	Database alias		nyc3	
27	TPNAME		nyserver	

Notes:

1. *Partner CP Name* (**4**) is the System Services Control Point (SSCP) name for OS/390, MVS, VM, and VSE. For AS/400 it is the CP name of the AS/400.

2. *Target database name* (**5**) is the DB2 for MVS/ESA *LOCATION NAME*, the DB2 for AS/400 RDB name, or the *RDB_NAME* for DB2 for VSE & VM.

3. If you use a Syncpoint Manager, the Local LU (NYX1GW01) should be the LU used for the SPM. In this case, that LU cannot also be the Control Point LU.

Completing the Worksheet

Fill in a copy of the primary worksheet for each AS/400, OS/390, MVS, VM, or VSE connection that you want to set up. Note the following:

1 XID node ID is the concatenation of the IDBLK and IDNUM values for the DB2 Connect workstation **14** and **15** . For an OS/400 connection, write an asterisk (*) at **14** . This value means that you will use the default XID.

2 The network name at the host (**1**) may be the same as that at the DB2 Connect workstation (**10**); check with your network administrator.

3 The Control Point name of the DB2 Connect workstation (**11**) is usually the same as the PU name. You can find the control point name of your DB2 Connect workstation by entering **smit** and selecting panels in the following order:

    a Communications Applications and Services

    b SNA Server/6000

    c Configure SNA Profiles

    d Advanced Configuration

    e Control Point

    f Change/Show a Profile.

4 The Control Point name for the host (**4**) is the System Services Control Point (SSCP) name for an OS/390, MVS, VM, or VSE system, or the Local Control Point name for an AS/400 system (see "Preparing DB2 for AS/400 for DB2 Connect" on page 507 and Table 48 on page 508).

5 The same mode name should be used at both the host and the DB2 Connect (see **6** and **16**).

6 For Local LU alias (**13**), use the same name as the Local LU name (**12**). This helps to avoid confusion.

| **7** For Link station profile name (**7**), choose a value.

| **8** For Remote link address (**8**), provide the controller address or the adapter address for the host.

| **9** For Symbolic destination name (**17**) choose a suitable value. Note that this value is case sensitive.

| **10** For Partner LU name (**2**), for OS/390, MVS, VM, or VSE, this is the VTAM application name (APPL) defined to the host database server. For OS/400, it is the Local Control Point name.

| **11** For Remote transaction program (**18**), The default is X'07F6C4C2' for OS/390, MVS, and OS/400, the *RDB_NAME* (real database name) for VM and the *AXE* transaction name for VSE.

| **12** The target database name (**5**) is the *LOCATION NAME* for DB2 for OS/390 or DB2 for MVS/ESA, the *RDB_NAME* for DB2 for VSE and VM or the relational database name for DB2 for AS/400.

Step 2. Configure Your DB2 Connect System

| Configure your DB2 Connect system as follows:

| 1. Log on to the AIX machine as root.

| 2. On the command line, enter

| smit

| 3. Select panels in the following order:

| a. Communications Applications and Services

| b. Communications Server for AIX

| c. Configure SNA Resources

| d. Local Node Resources

| 4. Select Node Definition. Add the control point name **4** and fully qualified Control Point name (**3** . **4** as follows:

```
|                                     Node Definition

|         Type or select values in entry fields.
|         Press Enter AFTER making all desired changes.


|                                                        [Entry Fields]
|           * Control Point alias                        [NYX]
|             Description                                 []
|           * Fully-qualified Control Point name         [SPIFNET.NYX]
|             Node type                                  END_NODE              +
|             Node identifier                            [05d29798]                X
|             Management Services support                NORMAL                +

|             If BACK_LEVEL,

|                 Queue NMVTs?                            NO                    +
```

5. Return to the Local Node Resources panel and select panels in the following order:

   a. Connectivity

   b. DLCs, Ports and Link Stations

   c. Add Connectivity Resources

   d. Add Token Ring Resource

   e. Add Token Ring DLC

Between the square brackets, enter your DLC Profile name **9** :

```
|                                   Add Token Ring DLC

|         Type or select values in entry fields.
|         Press Enter AFTER making all desired changes.


|                                                        [Entry Fields]
|           * DLC name                                   [tok0.001]
|             Description                                []
|             Negotiable link stations supported?        YES                   +
|             Initially active?                          YES                   +
|             Adapter Number                             [0]                   #
|             Maximum number of SAPs on the DLC          [16]                  #
```

6. Return to the Add Token Ring Resource panel and select Add Token Ring Port.
   Between the square brackets, add your DLC Profile name **9** . An example screen
   might look like:

```
|                              Add Token Ring Port

|         Type or select values in entry fields.
|         Press Enter AFTER making all desired changes.


|                                                    [Entry Fields]
|             * Port name                            [sap04]
|               Description                          []
|             * DLC Name                             [tok0.001]                    +
|               Local SAP address                    [04]                   X
|               Initially active?                    YES                    +
|               Use HPR on implicit links?           NO                     +
|               Use HPR link level error recovery?   NO                     +
|               Maximum receive BTU size allowed     [4105]                 #
|               Maximum number of active links allowed  [255]               #
|               Local name                           []
|               XID retry count                      [2]                    #
|               Frame retransmit (T1) timer (1=500ms)  [8]                  #
|               Frame retransmit limit               [2]                    #
|               Receive ack (T2) timer (1=500ms)     [1]                    #
```

| 7. Return to the Add Token Ring Resource panel and select Add Token Ring Link
| Station. Between the square brackets, add the adjacent note Control Point name
| (**4** on your worksheet). A sample screen might look like:

```
|                            Add Token Ring Link Station

|            Type or select values in entry fields.
|            Press Enter AFTER making all desired changes.

|            [TOP]                                         [Entry Fields]
|            * Link station name                           [3745]
|              Description                                 []
|            * Port name                                   [sap04]                    +
|              Adjacent node Control Point name            [NYX]
|              Adjacent node type                          LEARN_NODE               +
|              Downsteam PU services supplied              NONE                     +

|              If SNA Gateway or DLUR,
|                   Downstream PU name                     []

|              If DLUR,
|                   DLUS server name                       []
|              Local node id                               [05d29798]               X
|              Adjacent node id                            [05d29801]               X
|              Adjacent node MAC address                   [400011528901]
|              Adjacent node SAP address                   [04]                     X
|              Maximum BTU size to be sent                 [4105]                   #
|              Host type                                   SNA                      +
|              Request CP-CP sessions?                     YES                      +
|              HPR supported?                              NO                       +
|              Use HPR link-level error recovery?          NO                       +
|              Solicit SSCP sessions?                      NO                       +
|              Remote node is a network node server        NO                       +
|              Link station role                           USE_PORT_DEFAULTS        +
|              Activation                                  USE_INITIALLY_ACTIVE     +
|              XID retry limit                             [2]                      #
|              Frame retransmit (T1) timer (1=500ms)       [8]                      #
|              Frame retransmit limit                      [2]                      #
|              Receive ack (T2) timer (1=500ms)            [1]                      #
```

8. Create a Mode Profile as follows. From the Local Node Resources panel, choose the following:

   a. Lu 6.2 Configuration

   b. Lu 6.2 Mode

   c. Add Mode

   Define your Mode Profile. For profile name and mode name, use the value that you wrote in item **16** of the worksheet. On the other lines, specify values that match the mode profile defined on your DRDA server systems. If you are using the mode IBMRDB, specify the following values:

```
|                    Type or select values in entry fields.
|                    Press Enter AFTER making all desired changes.


|                                                          [Entry Fields]
|                 * Name                                   [IBMRDB]
|                   Description                            []

|                   Session limits

|                       Maximum number of sessions         [256]                    #
|                       Initial session limit              [128]                      #
|                       Min con. winner sessions           [64]                       #
|                       Min con. loser sessions            [64]                       #
|                       Auto-activate sessions             [0]                        #

|                   Receive pacing window

|                       Initial                            [4]                        #
|                       Maximum                            [0]                        #


|                   Use default RU sizes?                  YES                        +

|                   If YES,

|                       Maximum RU size upper bound        [32767]                       #
|                       Maximum RU size lower bound        [1024]                           #
```

| 9. If the DB2 Connect workstation is defined as an LU, update the local LU Profile as
| follows. In most cases, a VTAM administrator on OS/390, MVS, VSE, or VM would
| define an LU for DB2 Connect. For OS/400, control point routing would normally be
| used instead of an LU. Create a local LU profile as follows:

| a. From the Local Node Resources panel, select LU 6.2 Configuration

| b. Select LU 6.2

| c. Select Add Independent LU Type 6.2

| d. Update the LU Alias and LU name lines with the following values...

```
|                                          Add Independent LU Type 6.2

|          Type or select values in entry fields.
|          Press Enter AFTER making all desired changes.


|                                                            [Entry Fields]
|              * LU alias                                    [NYX1GW01]
|                List name                                   []                    +
|                Description                                 []
|              * LU name                                     [NYX1GW01]
|                Support Syncpoint?                          NO                    +
|                Additional LU properties                    NONE                  +
|                Restrict SSCP to SSCP id                    [0]
```

Configuring Each Server Connection

Before using this section, be sure that you have completed the worksheet Table 19 on page 159 for each OS/400, OS/390, MVS, VM, or VSE host, plus the worksheet Table 48 on page 508 for each OS/400 host.

Configure each DRDA server connection that you require as follows:

1 Update the Token Ring Link Station Profile as follows:

    a Select the Links panel.

    b Select the Token Ring panel.

    c Select the Token Ring Link Station panel.

    d Select the Add a Profile panel.

    e Update the profile, as follows:

- Change the profile name to the value for **7** . For example:

```
*Profile name                            [NYX1LS]       7
 Use Control Point's XID node ID?         yes
```

- Change the SNA DLC profile name to the value for **9** . For example:

```
 SNA DLC Profile name          [tok0.00001]    9
 Stop link station on inactivity?       no
```

- Change the remote link address to the value for **8** . For example:

```
 If link_address,
 Remote link address           [400009451902]  8
 Remote SAP address (04-ec)    [04]
```

- If you want to activate the link only when it is needed (rather than activating it when the SNA starts up), update several lines of the profile, as follows:

```
|         Adjacent Node Identification Parameters
|         Verify adjacent node?                        yes            *
|         Network ID of adjacent node                  SPIFNET        3
|         CP name of adjacent node                     NYX            4
|         XID node ID of adjacent node (LEN node only) [*]
|         Node type of adjacent node                   appn_end_node  *
|
|         Link Activation Parameters
|         Solicit SSCP sessions?                        yes
|         Initiate call when link station is activated? yes
|         Activate link station at SNA start up?        no             *
|         Activate on demand?                           yes            *
|         CP-CP sessions supported?                     yes
|         If yes,
|          Adjacent network node preferred server?      no
|         Partner required to support CP-CP sessions?   no
|         Initial TG number (0-20)                     [1]             *
```

2 Update the LU 6.2 Side Information Profile as follows: from the Local Node Resources panel,

    a Select the LU 6.2 Configuration panel.

    b Select the LU 6.2 Side Information panel.

    c Select the Add Side Information panel.

    d Update the profile, as follows:

- For the profile name, use the value for **17** . This value is case-sensitive; it is recommended that you use uppercase letters.
- For the local LU or control point alias, use the value for **12** .
- For the fully qualified partner LU name, use the value for **1** followed by a period and the value for **2** .
- For the mode name, use the value for **6** .
- For the next two lines, specify the remote transaction program name. You must specify a value. There is no default value in SNA Server for AIX. On the DRDA server, the default for OS/390, MVS, or OS/400 is X'07F6C4C2'. For VM the default is the *RDB_NAME* and for VSE the default is the *AXE* transaction name.

Use the value from **18** on the worksheet, or enter the default value. If the value is hexadecimal, specify yes for the second line; otherwise, specify no.

For example, the file could look like this:

```
|                                Add Side Information

|        Type or select values in entry fields.
|        Press Enter AFTER making all desired changes.


|                                                         [Entry Fields]
|          * Symbolic destination name                   nfcpic
|           Description                                   []
|           Local LU Alias                               [NYX1GW01]              +
|           Partner LU name                              [SPIFNET.NYM2DB2]         +
|           Mode                                         [IBMRDB]                +
|           TP name type                                 APPLICATION_TP          +
|           TP name                                      [DB2DRDA]               +
|           Conversation security                        NONE                    +
|           User ID                                      []
|           Password                                     []
```

| Note that if you are retrieving information about this server from the DCE
| Directory, then you do not need to have the Side Information Profile. More
| information about configuring DB2 Connect with DCE is provided in the
| *Administration Guide*, and *DB2 Connect User's Guide*.

| **3** Update the Partner LU 6.2 Location Profile as follows:

| **a** From the LU 6.2 Configuration panel, select the Partner LU 6.2 Location
| panel.

| **b** Select the Location by Link Station panel.

| **c** Update the profile, as follows:

| • For the profile name, use the value for **2** .
| • For the fully qualified partner LU name, use the value for **1** followed
| by a period and the value for **2** .
| • For the fully qualified CP name, use the value for **3** followed by a
| period and the value for **4** .

| For example, the file could look like this:

```
|                            Location By Link Station

|        Type or select values in entry fields.
|        Press Enter AFTER making all desired changes.

|                                                         [Entry Fields]
|          * Local LU name                               [NYX1GW01]
|           Fully-qualified partner LU name              [SPIFNET.NYM2DB2]
|           Partner name contains wildcards?             NO                      +
|           Description                                  []
|          * Link station name                           [NYX1LS]
```

Configuring DB2 Connect for Remote Clients

Configure your DB2 Connect server to accept inbound APPC requests from remote clients as follows.

Note: If inbound APPC requests are from remote DRDA Application Requestors, you will need to:

- apply APAR IX77539 if you are using CS/AIX V5.

- Update the SNA server list of Trusted group names to include the groups which will start the APPC listener to accept incoming DRDA connections. Issue the following command:

  `snaadmin define_trusted_groups, group_id=gid`

1 From the LU 6.2 Configuration panel:

2 Select the LU 6.2 Transaction panel.

3 Select the Add Transaction Program panel.

4 Add the following profile, replacing NYSERVER with the TP name for your DB2 server.

```
                           Add Transaction Program

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                              [Entry Fields]
  * Name                                      [NYSERVER]
    Description                               []
    List name                                 []                          +
    Conversation type(s) supported            BASIC                       +
    Conversation security is required?        NO                          +
    Synchronization level supported?          NONE                        +
    Program Initialization Parameters (PIP) allowed?   YES                +
```

Note: When creating new TP profiles (as opposed to migrating TP profiles from CS/AIX V4 profiles), you will need to perform the following steps:

   a. Edit the file /etc/sna/sna_tps.

   b. Search for TP profiles created for DB2 connections and modify the field STYLE=EXTENDED to STYLE=COMPATIBLE.

5 This profile will be used for both database connections and interrupts by DB2 Universal Database Version 5 and Version 2.1 clients.

Create any additional APPC partner LU and link profiles that may be required.

6 Ensure the clients are also properly configured.

7 Use Manage SNA Resources, without using DB2 Connect, in order to validate that all the APPC sessions that you need can be established.

8 Configure the database manager. You must add the TP name that will be used by the client. to the database manager configuration file. One way to do this is to issue the following CLP command:

```
update database manager configuration using tpname NYSERVER
```

The name **NYSERVER** is the TP name for the DB2 server.

9 Stop the database manager, if it is running:

```
db2stop
```

10 Set the value of the DB2COMM environment variable to include the string **APPC**.

11 Start the database manager:

```
db2start
```

Step 3. Complete the Configuration

When you have configured all of your server connections, do the following on the DB2 Connect workstation:

1 Confirm that the db2comm environment variable includes APPC. Enter:

```
db2set db2comm
```

If APPC is not set, set it using a command similar to the following:

```
db2set db2comm=appc -g
```

For more details on this command, refer to Chapter 41, "Controlling Your DB2 Environment" on page 395.

2 If your token ring has never before been used for SNA, issue the following command:

```
mkdev -c dlc -s dlc -t tokenring
```

3 Stop and start SNA Server for AIX. You can use **smit** or issue the following commands:

```
sna -stop sna
sna -start
```

4 Update the node directory, system database directory, and DCS directory. Enter the following commands in the command line processor, replacing the text in italics with your values from the worksheet:

```
catalog appc node db2node remote DB2CPIC security program
db2 catalog database db2db as nyc3 at node db2node authentication dcs
db2 catalog dcs database db2db as new_york3
```

Refer to the worksheet for:

- The node name, worksheet item **19**, example value *db2node*
- The symbolic destination name, worksheet item **17**, example value *DB2CPIC*
- The database name, worksheet item **21**, example value *db2db*
- The security type, worksheet item **20**, example value *Program*
- The database alias, worksheet item **22**, example value *nyc3.*
- The target database name, worksheet item **5**, example value *new_york3*

5 Connect to the DRDA Server and bind the utilities and applications to the DRDA server using 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.

For further information, refer to the online *DB2 Connect User's Guide*.

To install remote clients, see Chapter 27, "Installing DB2 Clients" on page 273.

APPC Security Considerations for Connections from Clients

SNA Server should be configured appropriately to accept the type of APPC security requested by the client. The APPC security type may be one of the following:

- NONE
- PROGRAM
- SAME

The following section provides some guidance and examples of how to configure the SNA subsystem at the server to handle each of the security types requested by the client. See your SNA Server documentation for more detailed information on configuring APPC security.

Configuring for APPC Security Type NONE

Do the following:

- LU 6.2 TPN Profile

  For the LU 6.2 TPN Profile that you are using, set the "Resource security level" to **none**.

- LU 6.2 Partner LU Profile

  When configuring for APPC security type NONE, you do not need to define an LU 6.2 Partner LU Profile.

  If you have a specific LU 6.2 Partner LU Profile defined for the client partner LU; in that profile, set the "Conversation security level" to **none**.

Configuring for APPC Security Type PROGRAM

Do the following:

- LU 6.2 TPN Profile

  For the LU 6.2 TPN Profile that you are using, set the "Resource security level" to **conversation**. The system will check that the username and password are a valid AIX login username and password.

  Note: You can also set the "Resource security level" to **access**. If so, the system will check that the username and password are a valid AIX login username and password, and if a Resource Security Access List Profile is also specified in the LU 6.2 TPN Profile, the system will also check that the username is contained in the specified resource security access list.

- LU 6.2 Partner LU Profile

  When configuring for APPC security type PROGRAM, you do not need to define an LU 6.2 Partner LU Profile.

  If you have a specific LU 6.2 Partner LU Profile defined for the client partner LU; in that profile, set the "Conversation security level" to **conversation**.

Configuring for APPC Security Type SAME

Do the following:

- LU 6.2 TPN Profile

  For the LU 6.2 TPN Profile that you are using, set the "Resource security level" to **conversation**.

  Note: You can also set the "Resource security level" to **access**. If so, the system will check that the username is a valid AIX login username, and if a

Resource Security Access List Profile is also specified in the LU 6.2 TPN Profile, the system will also check that the username is contained in the specified resource security access list.

- LU 6.2 Partner LU Profile

When configuring for APPC security type SAME, you must create a specific LU 6.2 Partner LU Profile for the client partner LU, and in that profile you must set "Conversation security level" to **already_verified**.

> If you specify a "Conversation security level" of **already_verified** in the LU 6.2 Partner LU Profile, SNA Server will actually accept both APPC security type SAME and APPC security type PROGRAM from remote clients.

Chapter 21. Configuring SNAPlus for DB2 Connect on HP-UX

This chapter describes how to configure your DB2 Connect workstation to connect to DRDA servers using APPC. Products that work with DB2 Connect include:

- HP-UX CICS Version 1.4 (A.01.35)
- Encina Version 1.2 (A.02.20).

Before you begin, ensure that your workstation has HP-UX SNAplus installed. Note that in the examples in this chapter, a Token Ring network is used as the communications medium.

If you need further information in order to set up your environment, refer to:

- *HP-UX SNA products Remote System Configuration Guide*
- *HP-UX SNAplusLink Administrator's Guide*
- *HP-UX SNAplus Installation Guide*
- *HP-UX SNAplus Diagnostics Guide*

Configuring Your DRDA Servers

Before you configure the DB2 Connect workstation, have your host-side administrator and LAN administrator fill in copies of the worksheets that follow for each host to which you want to connect:

- For OS/390, MVS, VM, and VSE hosts, use Table 21 on page 198
- For AS/400, use Table 48 on page 508.

To help you fill in the worksheets, Figure 18 illustrates a sample network that has DB2 Connect system and uses APPC to connect to DB2 for OS/390. The values shown in this diagram correspond to the *Sample Value* entries in the worksheet.

After you fill in the *Your Value* entries, you can use the worksheet to configure DB2 Connect. During the configuration process, replace the sample values that appear in the configuration instructions with your values from the worksheet. Use the boxed numbers **1** to relate the configuration instructions to the worksheet values.

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

Sample Network Scenario

Figure 18 illustrates a sample network scenario involving DB2 Connect with an APPC connection between HP SNAplus and DB2 for OS/390 or DB2 for MVS/ESA. The diagram shows the correspondences between information specified on the DRDA server system, information specified in DB2 Connect configuration files, and information specified in the DB2 node, database, and data connection services directories. The values used in this diagram correspond to the examples shown in Table 21 on page 198.

DB2 Connect For HP-UX Correlations

Node Directory

Node name	**DB2NODE**
Protocol	**CPIC**
Symbolic dest name	**db2cpic**
Security	**PROGRAM**

System Database Directory

DB alias	**NYC3**
DB name	**DB2DB**
DB type	**REMOTE**
Node	**DB2NODE**
Authentication	**DCS**

DCS Directory

Database	**DB2DB**
Target DBN	**NEW YORK3**

DB2 CONNECT TO NYC3

SNAplus

Local node Characteristics
Local node name **NYX1**
Network Name **SPIFNET**

Local LU Characteristics
Network Name **SPIFNET.NYX1QWO1**
LU Alias **NYX1GW01**
Mode **IBMRDB**

Remote LU Characteristics
Network Name **SPIFNET.NYM2DB2**
Uninterpreted LU Name **NYM2DB2**

Connections
Remote Network Address
= ('Remote Link Address Value')

Mode
Mode Name **IBMRDB**
Sym Dest Name **db2cpic**

VTAM

NETID	**SPIFNET**
APPL	**NYM2DB2**
PU	**NYX1**
	IDBLK= **071**
	IDNUM= **27509**
LU	**NYX1GW01**
	LOCADDR=0
MODEENT	**IBMRDB**

NCPI - NTRI

TIC Address
LOCADD=
400009451902

DB2 for OS/390

LOCATION	**NEW YORK3**
LUNAME	**NYM2DB2**

Figure 18. Configuration on the DRDA Server and DB2 Connect

Example Worksheets

Table 21. Worksheet for Planning OS/390, MVS, VM, or VSE Host Connections				
Ref.	SNAPlus Name	VTAM Name	Sample Value	Your Value
Network Elements at the Host				
1	Host Name	Network name	SPIFNET	
2	Partner LU Name	Application Name	NYM2DB2	
3	Network ID		SPIFNET	
4	Partner Node Name	SSCP Name	NYX	
5	Database name	**OS/390 or MVS:** Location Name **VM/VSE:** RDB_Name	NEW_YORK3	
6	Mode Name		IBMRDB	
Network Connection Information				
7	Connection name (Link name)	LINKHOST		
8	LAN destination address		400009451902	
Network Elements at the DB2 Connect Workstation				
9	Network ID or C&SM LAN ID		SPIFNET	
10	Local Node name or Local PU Name		NYX1	
11	(Local) LU name		NYX1GW01	
12	(Local LU) alias		NYX1GW01	
13	Local Node or Node ID	ID BLK	05D	
14		ID NUM	27509	
15	Mode name		IBMRDB	
16	Symbolic Destination name		DB2CPIC	
17	(Remote) Transaction program (TP) name		X'07F6C4C2' (or RDB_NAME for DB2 for VSE & VM) (or DB2DRDA for DB2 for OS/390 or DB2 for MVS)	
DB2 Directory Entries (at the DB2 Connect workstation)				
18	Node name		db2node	
19	Security		program	
20	Database name		db2db	
21	Database alias		nyc3	

> **Note:** For a connection to an OS/390, MVS, VSE, or VM system, you must know the local node name of your machine. You can find this by reviewing the Local Node Characteristics specification in your existing SNA configuration.

Table 22. Worksheet for Planning OS/400 Connections

Ref.	SNAPlus Name	Network 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 Name	SYD2101A	
5	Database name	Relational Database Name	NEW_YORK3	
6	Link Name or Mode Name		IBMRDB	
Network Connection Information				
7	Connection name (Link name)	LINKHOST		
8	Remote Network address	Local Adapter Address	400009451902	
Network Elements at the DB2 Connect Workstation				
9	Network ID or C&SM LAN ID		SPIFNET	
10	Local Node Name or Local PU Name		NYX1	
11	(Local) LU name		NYX1GW01	
12	(Local LU) alias		NYX1GW01	
13	Local Node or Node ID	ID BLK	05D	
14		ID NUM	27509	
15	Mode name		IBMRDB	
16	Symbolic Destination name		DB2CPIC	
17	(Remote) Transaction program (TP) name		X'07F6C4C2'	
DB2 Directory Entries (at the DB2 Connect workstation)				
19	Node name		db2node	
19	Security		program	
20	Database name		db2db	
21	Database alias		nyc3	

Note: You can determine some of the above values by running commands at the DB2 for AS/400 system:

- To find the values for **1**, (known at the OS/400 as the local network ID), and for **4**, (the local control point name), enter: DSPNETA
- To find the value for **8**, (known at the OS/400 as the local adapter address), enter: WRKLIND *TRLAN

Next, enter option 5 (**Display**) at the _ when prompted:

```
Opt   Line      Type      Text
 _    TRNLINE   *TRLAN
```

In the screen that appears one of the lines will be similar to this:

```
Local adapter address ........:   400009451902
```

- To generate a list of mode names for **15** , enter: WRKMODD
- To find the value for **5** , (known at the OS/400 as the relational database name), enter: DSPRDBDIRE

If you are configuring a connection to an OS/390, MVS, VSE, or VM system, you need to know the control point name to be used for the DB2 Connect workstation. Your LAN administrator can provide this information.

Planning to Configure Your DB2 Connect System

For an OS/390, MVS, VSE, or VM connection, do the following:

1 For XID node ID, determine the IDBLK and IDNUM of the DB2 Connect workstation (**13** plus **14**).

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

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

4 Leave the token ring profile name blank for now.

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

6 Determine the local LU name to be used by DB2 Connect (**11**).

7 For Local LU alias (**12**), you usually use the same value as for the local LU name (**11**). This helps to avoid confusion.

8 Repeat steps 6 and 7 above for any additional LUs that you may need to define.

For an OS/400 connection, complete Table 48 on page 508 as follows:

1 For XID node ID, write an asterisk (*). This means that you will use the default.

2 For Network name, use the Network ID (**1**).

3 For Mode name, use your value for (**6**).

4 Leave the other items blank for now.

Planning for Each Server Connection

For each server that you are connecting to, fill in a copy of the example worksheet Table 21 on page 198 as follows:

1. For Link station profile name (**7**), choose a suitable value.

2. For Remote link address (**8**), determine the controller address or local adapter address of the target host.

3. For Symbolic Destination name (**16**), choose a suitable value.

4. For Partner CP name, use **4** . For OS/390, MVS, VM, or VSE it is the System Services Control Point (SSCP) name. For an AS/400 it is the local control point name at the AS/400. See Table 48 on page 508.

5. The remote (partner) LU name for OS/390, MVS, VSE, or VM (**2**), is the VTAM application (APPL) name. You will also need to provide the network name for the remote node (**1**). (For example, SPIFNET.NYM2DB2). Usually the host network name is the same as the network name of the DB2 Connect workstation (**9**). For OS/400, use the local CP name.

6. For Application transaction program (**17**), the default is X'07F6C4C2' for OS/390, MVS and OS/400, *RDB_NAME* for VM and the *AXE* transaction name for VSE. We recommend you use *DB2DRDA* for OS/390 and MVS.

7. For database name (**5**), provide 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 OS/400.

Configuring Your DB2 Connect System

In the example shown in Figure 19 on page 202, the DB2 Connect workstation is connected to a DB2 for AS/400 system, a DB2 for VSE & VM system, and a DB2 for OS/390 or DB2 for MVS/ESA system.

The following assumptions are made:

- The basic installation of the SNAplus package has already been completed, including the execution of the *snapconfig* script.
- DB2 Connect has been installed.
- The user is logged on as root.

The names and addresses used in the sample scenario are:

CP name	NYX1
Remote LINK Address	400009451902 (DB2 for MVS, DB2 for OS/390, DB2 for VSE or DB2 for VM)
	400050132101 (for AS/400)
XID Node ID	07127509
Network Name	SPIFNET
Local LU Name	NYX1GW01
Remote LU Name	NYM2DB2 (DB2 for OS/390, DB2 for MVS or DB2 for VSE)
	NYVMGAT (DB2 for VM)
	SYD2101A (AS/400)
Remote Transaction Program name	X'07F6C4C2' (DB2 for OS/390, DB2 for MVS, OS/400, DB2 for VSE)
	NYVMDB (for DB2 for VM)

```
                        ┌─────────────────────────┐
                        │ DB2 Connect for HP-UX    │
                        │ CP=NYX1                  │
                        │ LU=NYX1GW01              │
                        │ XID=07127509             │
                        └─────────────────────────┘
              ┌──────────────────┼──────────────────┐
┌──────────────────────┐ ┌──────────────────────┐ ┌──────────────────────┐
│ DB2 for OS/390       │ │ DB2 for VM & VSE     │ │ DB2 for OS/400       │
│ LU=NYM2DB2           │ │ LU=NYVMGAT           │ │ LU=SYD2101A          │
│ RTPN=07F6C4C2        │ │ RTPN=NYVMDB          │ │ RTPN=07F6C4C2        │
│ RLA=400094501902     │ │ RLA=400094501902     │ │ RLA=400050132101     │
└──────────────────────┘ └──────────────────────┘ └──────────────────────┘
```
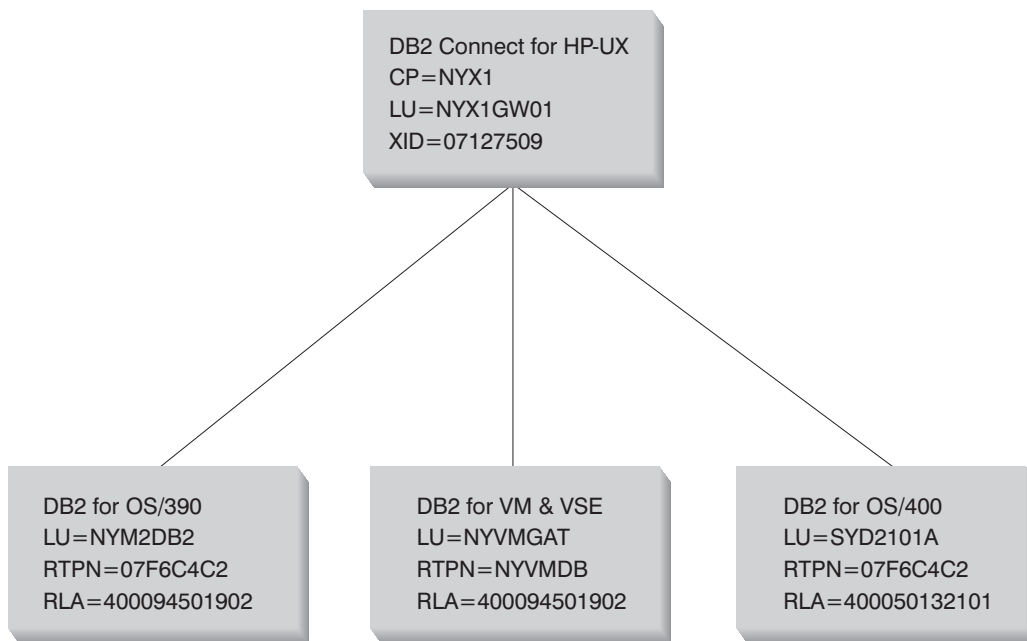
NOTE:
RLA is REMOTE LINK ADDRESS
RTPN is REMOTE TRANSACTION PROGRAM NAME

Figure 19. Sample scenario

Configuring SNAplus

To configure SNAplus for DB2 Connect, log on as root and use either the **/opt/sna/bin/snapconfig** program or the **/opt/sna/bin/X11/xsnapconfig** program. Information about these programs can be found in the HP-UX documentation. The following steps describe how to use these programs to configure SNAplus for DB2 Connect.

Note: These steps contain suggested values for configuration parameters. For other parameters, use the SNAplus default values.

1 Ensure that the SNA daemon is running. Enter:

```
snapstart daemon
```

2 Open the configuration file

    a From the **File** menu, select **Open**.

    b Select **Open running configuration file**, then click on **OK**.

3 Select the links

    a From the **Services** menu, select **Links**.

    b Select the option marked **NEW** associated with the type of link you want to use: Token Ring (LAN), SDLC, or QLLC, then select **Add**. Enter a name for this link, for example, TR1 or SDLC4.

    For Token Ring links, use the default Device Name and Port Number. For SDLC and QLLC links, consult with your network administrator for the appropriate values. When you have filled in the information, or chosen to use the default values, click on **OK** followed by **Done** to get back to the main screen.

4 Select the connections

    a From the **Services** menu, select **Connections**. Select the option marked **NEW** corresponding to the value selected in the previous step. For example, for Token Ring, select **NEW** next to **LAN.** Enter a name for this connection. You may optionally enter a description.

    b Set **Remote End** to **Host System** and **Activation** to **On Demand**.

    c Enter the first three characters of the XID Node ID in the first **Node ID to Send** field. For this example, enter 071.

    d Enter the SNA Physical Unit Number associated with your system in the second **Node ID to Send** field. For this example, enter 27509.

    e Set the "Node ID to Receive" field to X'071' and X'FFFFF'.

    f Enter your SNA Network Name in the first field of the **Full Control Point Name**. For this example, enter SPIFNET.

g Enter the Physical Unit Name associated with your HP computer in the second field of the **Full Control Point Name**. For this example, enter NYX1.

h Move the link you configured in the previous step from the **Other Links** box to the **Links Usable** box.

i Select **Parameters** and enter any necessary connection information. For Token Ring, enter the SNA Destination Address assigned for the DRDA server system in the **Remote Network Address** field and leave the other fields with their default values. For this example, use 400009451902 for DB2 for OS/390 DB2 for MVS/ESA and DB2 for VSE & VM and 400050132101 for DB2 for AS/400. For SDLC and QLLC connections, additional information is required. Ask your network administrator for the required values.

j Click on **OK** to return to the connection configuration panel, then click on **OK** again, then **DONE**.

5 Select the local nodes

   a From the **Services** menu, select **Local Nodes**.

   b Select **NEW**.

   c Enter a name for the node and click on **OK**. You may optionally enter a description for the node, but you must enter your network name in the **Name of Network** field. For this example, use SPIFNET for this value.

   d Move the connection you created in the previous step from the **Available Connections** box to the **Connections Used** box using the **Move** button.

   e Click on **OK**, then **DONE**.

6 Select the modes

   a From the **APPC** menu, select **Modes**.

   b Select **NEW**.

   c Enter IBMRDB in the **Mode Name** field, and optionally enter a description.

   d In the **Connection** box, highlight the connection you configured above. Make sure that **High priority mode** is not selected. The following configuration values are suggested:

- Session limit = 020
- Minimum contention winner limit = 010
- Partner minimum contention winner limit = 010
- Automatic activation limit = 001
- Send and Receive Pacing Counts = 08

Other values can be left as defaults.

   e Click on **OK**, then **DONE**.

7 Select Remote LUs

        a From the **APPC** menu, select **Remote LUs**.

        b Select **NEW**.

        c Enter the Remote LU Name as the LU alias, and click on **OK**. For this example, use NYM2DB2 for DB2 for OS/390, DB2 for MVS/ESA or DB2 for VSE, NYVMGAT for DB2 for VM, and SYD2101A for DB2 for AS/400. You may optionally enter a description of the remote LU.

        d The **Full network name** field is made up of the SNA network name in the first field and the Remote LU Name associated with the DRDA server database in the second field. For this example, use SPIFNET.NYM2DB2 for MVS/ESA or DB2 for VSE;, SPIFNET.NYVMGAT for DB2 for VM, and SPIFNET.SYD2101A for DB2 for AS/400.

        e The **Uninterpreted LU name** must be set to the Remote LU name specified in the previous step (use the same values).

        f Select **Supports parallel sessions** and **No session level security**

        g Click on **OK**, then **DONE**.

8 Select Local LUs

        a From the **APPC** menu, select **Local LUs**.

        b In the **Local Nodes** box, select the node you configured above.

        c In the **Configured LUs** box, select **NEW**.

        d For the APPC LU alias, enter your Independent LU Name; for this example, it is NYX1GW01. You may optionally enter a description for the Local LU.

        e Make sure that the **Full Network Name** fields contain your Network Name and your Independent LU Name. The LU number should be 000 for an independent LU.

        f Change the **Session Limit** parameter to 020

        g Make sure that you have selected the radio buttons to indicate that this LU is in the pool of default LUs, and that it is locally usable.

        h Move the Remote LU you configured above from the **Other Remote LUs** box to the **Partner LUs** box.

        i Select **Modes**.

        j Move the IBMRDB mode from the **Other Modes** box to the **Associated Modes** box.

        k Click on **OK**, then **OK** again, then **DONE**.

9 Select the symbolic destination name

        a From the **APPC** menu, select **Sym Dest Name**.

b Select **NEW**.

c Enter the Symbolic Destination Name you want to associate with the DRDA server database and click on **OK**. You may optionally enter a description.

| **d** For the **Partner TP name**, for **DB2 for MVS/ESA** and **DB2 for AS/400**,
| select **SNA Service TP (in hex)** and enter the hexadecimal TP number. For
| DRDA, this is 07F6C4C2. (For DB2 for OS/390 or DB2/MVS, you can also
| use the application TP DB2DRDA. For DB2 for VSE you can also use the
| *AXE* transaction name as the APPLICATION TP.) For **DB2 for VM**, select
| **Application TP** and enter the DB2 for VM database name. For **DB2/400**,
| the default TP name is *QCNTEDDM*.

e For the **Partner LU type**, make sure that **Alias** is selected.

f In the **Partner LU** box, ensure that the **Remote LU** (not the Local LU) you configured above is highlighted.

g In the **Mode Name** box, highlight IBMRDB.

h Click on **Security** and indicate what kind of conversation level security you want to use: **none**, **same**, or **program**.

i When done, click on **OK**, then **OK**, then **DONE**.

10 Saving your configuration

a From the **File** menu, select **Save**.

b Select **Update running configuration file**, then click on **OK**. This saves your new configuration as the default, running configuration.

Notes:

1. You may need to stop and restart SNA for your configuration changes to take effect.

2. 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 DRDA server database.

Starting the SNAplus Subsystem

Use **/opt/sna/bin/snapstart** to start the SNAplus subsystem. You can use **/opt/sna/bin/snapstop** to stop the SNAplus subsystem first, if required.

To start the SNAplus connections you can use either the **/opt/sna/bin/snapmanage** program, or the **/opt/sna/bin/X11/xsnapmanage** program.

1 From the **Manage** menu, select **Services**.

2 Highlight the node you configured in the previous section, and select **start**.

3 Highlight the computer you want to start it on, then click on **OK**.

4 Highlight the connection you configured in the previous section, and select **start**.

5 Highlight the computer you want to start it on, then click on **OK**.

Both the node and the connection lines should indicate that they have been started.

Completing the Configuration

When you have configured your system and all of the server connections, do the following:

1 Install your token-ring adapter using the procedures provide by the manufacturer.

2 Use SAM to enable data link control for the adapter.

3 Stop and start the HP-UX SNAplus subsystem. Enter:

```
db2stop
db2start
```

4 Update the DB2 node directory, system database directory, and DCS directory.

To do this, you will need to know the symbolic destination name (**16**) and the target database name (**5**) from the worksheet (see Table 21 on page 198). The commands are:

```
db2 catalog appc node db2node remote db2cpic security program
db2 catalog dcs database db2db as new_york3
db2 catalog database db2db as nyc3 at node db2node authentication dcs
```

For additional information, refer to the online *DB2 Connect User's Guide*.

5 Connect to the DRDA server and bind the utilities and applications to the DRDA server using commands similar to the following in the command line processor:

```
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.

For further information, refer to the online *DB2 Connect User's Guide*.

To install remote clients, see Chapter 27, "Installing DB2 Clients" on page 273.

Chapter 22. Configuring SunLink SNA for DB2 Connect for Solaris

This chapter describes how to configure an APPC connection between your DB2 Connect for Solaris workstation and a DRDA server. Before you begin, ensure that your workstation has SunLink SNA for Solaris installed. Note that in the examples in this chapter, a Token Ring network is used as the communications medium.

For additional information about configuring a DB2 for MVS/ESA or DB2 for OS/390 server, see Chapter 49, "Configuring DRDA Hosts for DB2 Connect" on page 493.

If you still need further information in order to set up your environment, refer to:

- *DB2 Connectivity Supplement*
- *DRDA Connectivity Guide*
- *SunLink PU 2.1 Server Configuration and Administrator's Manual*.

Configuring Your DRDA Servers

Before you configure the DB2 Connect workstation, have your host-side administrator and LAN administrator fill in copies of the worksheets that follow for each host to which you want to connect:

- For OS/390, MVS, VM, and VSE hosts, use Table 23 on page 211
- For AS/400, use Table 48 on page 508.

To help you fill in the worksheets, Figure 20 on page 210 illustrates a sample network that has DB2 Connect running on a Solaris system and uses APPC to connect to DB2 for OS/390. The values shown in this diagram correspond to the *Sample Value* entries in the worksheet.

After you fill in the *Your Value* entries, you can use the worksheet to configure your Solaris workstation. As you work through the configuration steps, replace the sample values that appear in the configuration instructions with your values from the worksheet. Used the boxed numbers **1** to relate the configuration instructions to the worksheet values.

For additional information about configuring your DRDA host, see Chapter 49, "Configuring DRDA Hosts for DB2 Connect" on page 493.

DB2 Connect for Solaris Correlations

Node Directory

Node name	**DB2NODE**
Protocol	**CPIC**
Sym dest name	**cpicmvs**
Security	**PROGRAM**

System Database Directory

DB alias	**NYC3**
DB name	**DB2DB**
Node	**DB2NODE**
Authentication	**DCS**

DCS Directory

Database	**DB2DB**
Target DBN	**NEW_YORK3**

DB2 CONNECT TO **NYC3**

Sunlink SNA

DEFINE PU
PU name **NYX1**
Network Name **SPIFNET**

DEFINE DLC
ID Number **07127509**

DEFINE LOCAL LU
LU Name **NYX1GW01**

DEFINE PARTNER LU
Partner LU Name **NYM2DB2**

DEFINE ALS
Remote Mac **400002851039**
Address

DEFINE MODE
Mode Name **IBMRDB**

Sym Dest Name & Filename cpicmvs

PARTNER LU NAME	**NYM2DB2**
MODE NAME	**IBMRDB**
TP NAME	**x'07F6C4C2'**
SECURITY	**PROGRAM**

DB2 for OS390

LOCATION	**NEW_YORK3**
LUNAME	**NYM2DB2**

VTAM

NETID	**SPIFNET**
APPL	**NYM2DB2**
PU	**NYX1**
IDBLK=	**071**
IDNUM=	**27509**
LU	**NYX1GW01**
LOCADDOR=0	
MODEENT	**IBMRDB**

NCP-NTRI

TIC Address
LOCADD=**400009451902**

Figure 20. Configuration on the DRDA Server and DB2 Connect Workstation

Table 23. Example Worksheet for Planning APPC Host Connections

Ref.	Description	Sample Value	Your Value
Network Elements at the Host			
8	Network name	SPIFNET	
9	Remote partner LU name	NYM2DB2	
10	Network name of adjacent node	SPIFNET	
11	Control point name of adjacent (partner) node	NYX	
12	Target database name	NEW_YORK3	
13	Mode Name	IBMRDB	
Network Connection Information			
14	Type	Token-ring	
15	Link station profile name	NYX1LS	
16	Remote link address	400009451902	
17	DLC profile name	tok0.00001	
Network Elements at the DB2 Connect Workstation			
18	Network name	SPIFNET	
19	Local CP name	NYX1	
20	Local LU name (to be used by DB2 Connect)	NYX1GW01	
21	Local LU alias	NYX1GW01	
22	ID BLK	071	
23	ID NUM	27509	
24	Mode name	IBMRDB	
25	Symbolic Destination name	cpicmvs	
26	Remote Transaction program (TP) name	X'07F6C4C2' (default), DB2DRDA for MVS or OS/390, RDB_NAME for VM or AXE transaction name for VSE.	
27	TP name in Hex?	No	
DB2 Directory Entries at the DB2 Connect Workstation			
28	Node name	db2node	
29	Security	Program	
30	Database name	db2db	
31	Database alias	nyc3	

Note: If you are configuring a connection to an OS/390, MVS, VM, or VSE system, you need to know the control point name to be used for the DB2 Connect workstation. Refer to your LAN administrator to obtain the control point name for your Solaris workstation.

Planning to Configure Your DB2 Connect for Solaris System

Refer to the example worksheet (Table 23 on page 211):

For an OS/390, MVS, VM, or VSE connection, do the following:

1 For XID node ID, use a combination of the IDBLK and IDNUM values (**22** and **23**). For example, X'07127509'.

2 For Network name, use the NETID (**18**).

3 For Control point name, use the PU name (**19**).

4 Leave the token ring (DLC) profile name (**17**) blank for now.

5 For Mode name, use the MODEENT (**24**).

6 For Local LU name, use **20** .

7 For Local LU alias, choose an alias (**21**). This can be the same as the LU name or different. Usually we recommend this be the same as the LU name itself.

8 Repeat steps 6 and 7 above for any additional LUs that you may need to define.

For an OS/400 connection, do the following:

1 For XID node ID, write an asterisk (*). This means that you will use the default.

2 For Network name, use the host network name (**8**).

3 For the host mode name, use **13** .

4 Leave the other items blank for now.

Planning for Each Server Connection

For each DRDA server that you are connecting to, fill in a copy of the worksheet (Table 23 on page 211) as follows:

1 For DLC profile name (**17**), choose a suitable value.

2 For Remote link address, use **16** .

3 For Symbolic destination name (**25**), choose a suitable value.

4 For the host partner CP name, use **11** . For OS/390, MVS, VM, or VSE it is the host System Services Control Point (SSCP) name. For an OS/400 it is the local

control point name (see "Preparing DB2 for AS/400 for DB2 Connect" on page 507).

5 For Partner LU name for OS/390, MVS, VM, or VSE, use **9** (VTAM APPL name) from the worksheet.

You will also need to provide the network name (**8**) for the remote node (for example, SPIFNET). Usually this is the same as the network name at the DB2 Connect workstation. Together, these make up the fully-qualified partner LU name (SPIFNET.NYM2DB2).

For OS/400, use the local CP name of the AS/400.

6 For Remote transaction program (**26**), copy the value from the worksheet. The default is X'07F6C4C2' for OS/390, MVS, and OS/400, and the *RDB_NAME* for VM and the *AXE* transaction name for VSE. We recommend that you use *DB2DRDA* for OS/390 or MVS.

7 For Target database name (**12**), this is the *LOCATION NAME* value for OS/390 or MVS, the *RDB_NAME* for VM or VSE, or a relational database name for OS/400.

Planning for Inbound APPC Client Connections

In addition to setting up an SNA connection between DB2 Connect and your DRDA host AR, you may also want to support inbound APPC connections from one or more clients, either workstations running DB2 Universal Database Client Application Enabler, or a DRDA host acting as an AR. If so, please see the additional definitions that may also be required in the SNA Server configuration file in "Optional sections" on page 215.

Configuring SunLink SNA for Solaris

You can use or your favorite editor to create the configuration files.

CPIC Side File

This file must be placed in the application's path for a standalone DB2 Connect for Solaris system. However, for DB2 agents to be able to access it on DB2 Connect for Solaris, the file should be in either:

- 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.

Sample CPIC side file

The file name must be the same as the Symbolic destination name specified in the DB2 node directory for the server.

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

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 example shown in Figure 21 on page 215 matches the scenario in *DB2 Connect Enterprise Edition Quick Beginnings* Figure 20 on page 210.

```
// 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.NYX11         // Network Qualified Name
        ;

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

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
        ;

LU      NAME=NYX1GW01                   // Local name (8 char max)
        NQ_LU_NAME=SPIFNET.NYX1GW01  // Network Qualified Name
        SESS_LMT=50                     // Max LU sessions
        LUTYPE=6.2
        ;

PTNR_LU NAME=NYM2DB2                     // Partner LU name(8 char max)
        LOC_LU_NAME=NYX1GW01            // Associated Local LU
        NQ_LU_NAME=SPIFNET.NYM2DB2      // Network Qualified Name
        ;

MODE    NAME=IBMRDB                     // Mode Name (8 char max)
        DLC_NAME=HOSTLINK               // Associated DLC
        PTNR_LU_NAME=NYM2DB2NYX1GW01            // Associated Partner LU
        LCL_MAX_SESS_LMT=30             // Max Session Limit
        MIN_CW_SESS=15                  // Min Conwinners
        MIN_CL_SESS=15                  // Min Conlosers
        ;
```

Figure 21. Sample Solaris PU 2.1 SNA Server Configuration File

Optional sections: The following additional sections would also be required in the
configuration file in order to support the inbound APPC client support.

```
// This section adds DLC for the inbound APPC client NYX2

DLC      NAME=NYX2,                      // 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'400011528901',     // sysB_mac_addr
         TERMID=x'05d27510',             // IDNUM and IDBLK = XID
         MAXDATA=4096,
         ACTIVITY_TIMEOUT=0,
         RETRIES=20,
         REPLY_TIMEOUT=20,
         RESPONSE_TIMEOUT=20,
         ACTPU_SUPPRESS=yes
         ;

// This section defines the partner LU NYX2

PTNR_LU NAME=NYX2,                       // Partner LU name(8 char max)
         LOC_LU_NAME=NYX2,               // Associated Local LU
         NQ_LU_NAME=SPIFNET.NYX2         // Network Qualified Name
         SEC_ACCEPT=ALREADY_VERIFIED     // Accept client as already verified
         ;

// This section adds the TP name NYSERVER
// and associates it with the local LU NYX1GW01

TP       TP_NAME=NYSERVER,               // TP Name
         LOC_LU_NAME=NYX1GW01,           // Associated Local LU
         CONV_TYPE=BASIC,                // Conversation Type
         ;

//

SECURITY LOC_LU_NAME=NYX1GW01,           // Local LU Alias
         USER_ID=USERID,                 // User id
         PASSWORD=PASSWORD,              // Password (since UNIX_SEC=NO)
         ;

         ;
```

Figure 22. Additional Sun SNA Server configuration sections for inbound APPC client

Additional Steps Required to Enable Inbound APPC Clients: You need to:

1. Create any additional APPC partner LU and link profiles that may be required.

2. Ensure the inbound clients are also properly configured.

3. Use SNA session control functions, without using DB2 Connect, in order to validate that all the APPC sessions that you need can be established.

4 Update the database manager configuration on the DB2 Connect workstation by entering the following command in the command line processor:

```
update dbm cfg using tpname NYSERVER
```

5 Add the string `APPC` to the DB2COMM environment variable.

6 Stop and restart DB2 in order to activate the APPC listener.

Starting the SunLink SNA Subsystem

Perform the following steps, in sequence:

1 Logon as root.

2 Change to the SunLink directory, usually;

```
cd /opt/SUNWpu21
```

3 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.

4 Ensure you have created the CPIC side file as described in "CPIC Side File" on page 213, and that it is in the right directory.

5 Ensure you have created the SNA server configuration file in the `/opt/SUNWpu21` directory, as shown in Figure 21 on page 215.

6 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*. Refer to the SunLink documentation for details of the `sunop` utility.

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

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

8 Start SunLink using the following command:

```
sunpu2.1
```

You can use `sunop` to check the status of links.

Restart the Database Manager

1 Stop the database manager, if it is running:

```
db2stop
```

2 Ensure that the db2comm environment variable setting includes APPC. Enter:

```
db2set -lr
```

If APPC does not appear as a value for db2comm, you need to add it. One way to do this would be to enter a command similar to this:

```
db2set db2comm=tcpip,appc,ipxspx -g
```

(You should remove any protocols you do not use from that command. There are several different options available with the **db2set** command. For details, see Chapter 41, "Controlling Your DB2 Environment" on page 395.)

3 Start the database manager:

```
db2start
```

Completing the Configuration

When you have configured your system and all of the server connections, do the following:

1 Start and stop the SunLINK subsystem (see "Starting the SunLink SNA Subsystem" on page 217).

2 Update the DB2 node directory, system database directory, and DCS directory.

To do this, you will need to know the symbolic destination name (**25**) and the target database name (**12**) from the worksheet.

Enter the following commands in the command line processor:

```
catalog appc node db2node remote sym_dest_name security program
```

Note that the *sym_dest_name* value must be the same name in the same case as the name of the CPIC side file (cpicmvs in the examples in this chapter).

```
db2 catalog dcs database db2db as new_york3
db2 catalog db db2db as nyc3 at node db2node authentication dcs
```

3 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 (usually sunpu2.config).

For a DB2 Connect for Solaris server, export these on the DB2 Connect machine before issuing db2start.

4 Connect to the DRDA Server and bind the utilities and applications to the DRDA server using commands similar to the following in the command line processor:

```
            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.

For further information, refer to the online *DB2 Connect User's Guide*.

To install remote clients, see Chapter 27, "Installing DB2 Clients" on page 273.

Chapter 23. 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 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 upate is used.

Both the native SQL and TP Monitor multi-site 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 multi-site 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 muilti-update, the normal `SQL COMMIT` and `ROLLBACK` must be used.

TP Monitor multi-site 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
- 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

A distributed transaction can update any mix of supported database servers. For example, your application can update several tables in DB2 UDB on Windows NT, a DB2 for OS/390 database and a DB2/400 database all within a single transaction.

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 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 Table ?? on page 223 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
Yes	TCP/IP	Yes	• DB2 Connect Enterprise Edition • DB2 UDB Enteprise Edition • DB2 UDB Extended Enterprise Edition	• DB2 for OS/390 V5.1 • DB2 UDB for OS/390 V6.1
Yes	SNA	Yes	• DB2 Connect Enterprise Edition* • DB2 UDB Enterprise Edition* • DB2 UDB Extended Enterprise 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 UDB for OS/390 V6.1 • DB2/400 V3.1 or later • DB2 Server for VM or VSE V5.1
No	TCP/IP	No	• DB2 Connect Personal Edition • DB2 Connect Enterprise Edition • DB2 UDB Enterprise Edition • DB2 UDB Extended Enterprise Edition	• DB2 for OS/390 V5.1 • DB2 UDB for OS/390 V6.1

No	SNA	Yes	• DB2 Connect Enterprise Edition*	• DB2 for MVS/ESA V3.1 and 4.1
			• DB2 UDB Enterprise Edition*	• DB2 for OS/390 V5.1
			• DB2 UDB Extended Enterprise Edition*	• DB2 UDB for OS/390 V6.1
			Note: *AIX, OS/2 and Windows NT platforms only	• DB2/400 V3.1 or later
				• DB2 Server for VM and VSE V5.1

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".

Chapter 24. Configuring the DB2 Syncpoint Manager

This chapter was previously titled "Setting Up Two-phase Commit Using SNA".

This chapter describes how to enable multisite updates using the DB2 Syncpoint Manager. Please refer to Chapter 23, "Enabling Multisite Updates (Two-Phase Commit)" on page 221 to determine when DB2 Connect requires the DB2 Syncpoint Manager. Please refer to the DB2 Administration Guide for information on Multisite Update (Distributed Unit of Work, Two Phase commit).

Additionally, host and AS/400 database clients who wish to access DB2 UDB servers using multisite upate require the DB2 UDB server (or an upstream DB2 UDB Server which routes the connection to the destination server) to use the DB2 Syncpoint manager.

For the most recent information about DB2 Connect two-phase commit support, 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" and "SPM".

Planning to Use the SPM

This section describes important planning considerations that you should take into account before attempting to install and use the SPM.

Software Prerequisites for the SPM

The following minimum software levels are required to support the SPM. Refer to the Readme file for any additional PTFs that may be required.

- AIX SNA connectivity:

    - SNA Server for AIX Version 2.1 or higher must be installed on the system where DB2 Connect Enterprise Edition is installed or on the DB2 Universal Database server that has SPM support installed.

    - The following PTFs are also required:

        ```
        AIX SNA Server/6000 2.1 PTFs
          PTF U437491 (fixes for APAR IX50393)
          PTF U437840 (fixes for APAR IX51831)
          PTF U440157 (fixes for APAR IX54025)

        AIX SNA Server/6000 2.2 PTFs
          PTF U437857 (fixes for APAR IX50393)
          PTF U440318 (fixes for APAR IX51831)
          PTF U444012 (fixes for APAR IX54025)

        AIX SNA Server/6000 3.1 PTFs
          PTF U440156 (fixes for APAR IX54025)
        ```

- OS/2 SNA connectivity:

    - IBM Communications Server for OS/2 Warp Version 4 or higher must be installed on the system where DB2 Connect Enterprise Edition is installed or on the DB2 Universal Database server that has SPM support installed.

- Windows NT SNA Connectivity:

    - IBM Communications Server for Windows NT Version 5.01 or higher must be installed on the system where DB2 Connect Enterprise Edition is installed or on the DB2 Universal Database server that has SPM support installed.

- DB2 for MVS/ESA or DB2 for OS/390:

```
|                      All DB2/MVS V3.1 systems
|                        PTFs UN73393 and UN76673   (fixes APARs PN67179 and PN70102)

|                      All DB2/MVS V4.1 systems
|                        PTF UN76674 (fixes APARs PN70102 and PQ03146)

|                      All DB2 for OS/390 systems
|                        Apply ESO tape 9802 (February, 1998)
|                        Exclude the following PTFs from ESO tape 9802:
|                          UQ12940
|                          UQ12897
|                          UQ13903
|                        Install the following additional PTFs:
|                          UQ15503
|                          UQ15036
|                        Install the fix for APAR PQ15977

|                      OS/390 TCP/IP
|                        PTF PQ14253 (V3R3, V3R4)
|                        PTF PQ14383 (V3R3)
```

| • DB2 for AS/400:

```
|                      All DB2/400 V3R1 systems
|                        PTF SF27513 (fixes for OS/400 V3R1M0, product 5763SS1)

|                      All DB2/400 V3R6 systems
|                        PTF SF31329 (fixes APAR SA46917)
|                        PTF SF31329 (fixes for APAR SA48935)
```

| • With DB2 for VSE & VM:

```
|                      The following APAR fixes are required:
|                        PQ01680
|                        PQ03829
|                        VM60922
|                        VM61072
|                        VM61194
```

| **Note:** DB2 clients that will issue syncpoint coordination requests to the SPM must be
| at DB2 Version 2.1.1 or higher.

| *Database Manager Configuration Parameters for* | *SPM*

| The following database manager configuration parameters are required in order to use
| SPM, on workstations where a DB2 Connect Enterprise Edition is installed:

SPM_LOG_FILE_SZ

Determines the size of the SPM log file, in 4K pages. For more information about SPM logging, see "SPM Logging" on page 243. The default value is 256.

SPM_MAX_RESYNC

Determines the number of SPM agents that can simultaneously perform resync operations. The default is 20.

SPM_NAME

Identifies SPM to both DB2 and, if SNA connectivity is being used, for the SNA product. This parameter must be set in order for SPM to start when the database manager is started. The default value for this parameter is NULL. If TCP/IP connectivity is being used with the host system, ensure this name is unique in your network.

See "Configuring Communications Server for OS/2 and Windows NT" on page 238 for additional information about the use of this parameter with OS/2 and Windows NT.

See "Configuring SNA Server for AIX" on page 235 for additional information about the use of this parameter with AIX.

For more details about these parameters, see the *Administration Guide*.

Other Requirements

1. In addition to having the correct software prerequisites installed, additional planning is required in order to assign LU names for use by the SPM and its partners if you are using SNA connectivity. See "Setting up SNA Communications for the DB2 Syncpoint Manager (SPM)" on page 235 for further information about what actions may be required in your installation.

2. Additional planning may also be required prior to defining your transaction manager database, and arranging for database manager configuration parameters to be set accordingly at application requesters and application servers.

3. Ensure that your host databases are syncpoint-enabled. Contact your database administrator. For example, when using DB2 for MVS/ESA or DB2 for OS/390 and SNA connectivity, the VTAM APPL statement that defines the DDF LU must include SYNCLVL=SYNCPT. See "Sample VTAM APPL Definition for OS/390" on page 496 and the *DB2 Connectivity Supplement* .

Configuring the SPM

This section describes the steps required to install the SPM on a DB2 Connect server or on a DB2 Universal Database server, and to configure remote clients and remote DB2 Universal Database servers. It also lists considerations that apply with respect to the location of the transaction manager database, which may reside:

- At the DB2 Connect server (the recommended location)
- At a DB2 server.

The following rules apply throughout the remainder of this section:

Notes:

1. For both the TM database and the SPM instance, when cataloguing them for remote client access ,the database alias *must* be the same as the database name.

   Inbound connections from host or AS/400 database clients using two phase commit via SNA to Db2 Universal Database servers do not require a TM database, nor do they need such a database to be defined. The DB2 Syncpoint Manager maintains logs regarding inflight transactions. Information regarding these transactions can be obtained by connecting to the SPM as if it were a DB2 instance. Please note, however, it is*not* a DB2 instance and hence does not appear in the output from the`db2ilist` command.

2. If the SPM is on a different node to the TM database, then the SPM and the TM database need to be able to connect to each other. Hence each needs to be catalogued on the other workstation to permit these connections to occur.

Summary of Steps

Applications Which Use DB2 UDB to Coordinate the Multisite Update:

In this situation, only SNA connectivity requires the DB2 Syncpoint Manager. TCP/IP connectivity does not require the SPM for multisite updates.

1. On the workstation which has the DB2 Syncpoint Manager

   This could be either Db2 Connect Enterprise Edition, DB2 Universal Database Enterprise Edition, or Db2 Universal Database Enterprise Edition - Extended.

   a. Install DB2 Connect Enterprise Edition or DB2 Universal Database Enterprise Edition or Enterprise Edition - Extended in order to provide multisite update support with host or AS/400 database servers.

b. Create a database instance on the same system. For example, you can use the default instance DB2, or use the following command to create a new instance:

```
db2icrt myinstance
```

c. Supply licensing information as required.

d. Create a TM database. Any DB2 Version 5 database can be used for this purpose. The TM database should be a local database on the DB2 Connect workstation. For example, to create the TM database, enter the following command in the command line processor:

```
create Database TMB alias TMB
```

The Database alias name *must* be the same as the actual database name.

Note: If you have only DB2 Connect Enterprise Edition installed, you are licensed to create one database that can be used as the TM database.

e. If the TM database is local, update the *TM_DATABASE* Database Manager Configuration parameter with the name of the TM database. For example:

```
update database manager configuration using tm_database TMB
```

f. If the TM database is remote, in order for the SPM to be able to access it during resync operations, you must catalog the TM database and node directory entries on the DB2 Connect workstation. For example:

```
catalog tcpip node TMBNODE remote SERVERB server dbinst1c
db2 catalog database TMB as TMB at node TMBNODE
```

The Database alias name*must* be the same as the actual database name.

You must also perform the following steps at the TM database node, in order that it can connect to the location of the SPM. For example:

```
catalog tcpip node SPMNODE remote SERVERD server dbinst1c
db2 catalog database SPMNAME as SPMNAME at node SPMNODE
```

The Database alias name *must* be the same as the actual database name.

g. configure SNA communications as required. See "Setting up SNA Communications for the DB2 Syncpoint Manager (SPM)" on page 235.

The configuration will be easier if the SPM_NAME value is the same as the LU name, and the SPM uses the same LU as the DB2 Connect workstation.

On an AIX system, the SPM_NAME value *must* be same as the names of:

1) The transaction program (TP) profile used by the SPM.

2) The local side information profile used by the SPM.

3) The SPM instance name on application requesters.

Refer to Figure 23 on page 236.

h. Determine the value to be specified for the SPM_NAME database manager configuration parameter, and optionally values for the SPM_LOG_FILE_SZ and SPM_MAX_RESYNC database manager configuration parameters if the

| defaults are not appropriate for your situation. See "Database Manager
| Configuration Parameters for SPM" on page 227 for further details.

  i. Update SPM_NAME on the DB2 Connect workstation/DB2 Universal Database
     server. For example, you can use the following command:

     ```
     update database manager configuration using spm_name SPMNAME
     ```

  j. Ensure that the registry value db2comm includes the value APPC.

  k. Stop and restart the database manager on the DB2 Connect workstation/DB2
     Universal Database server to start the SPM LU for the first time.

  l. For AIX SNA Server, ensure any Symbolic Destination Name configured to
     access the host or AS/400 database server uses the same LU as specified for
     the SPM_NAME.

2. On Each Remote DB2 Client which will access the Host or AS/400 database server

   The database administrator must also perform the following steps at each system
   where a DB2 client will use DB2 Syncpoint services when accessing a host or
   AS/400 database server.

   a. Update the *TM_DATABASE* Database Manager Configuration parameter with
      the name of the TM database. For example:

      ```
      update database manager configuration using tm_database TMB
      ```

   b. Configure communications as required for the DB2 client to connect to the the
      DB2 Connect/DB2 UDB workstation.

   c. If the TM database is remote, catalog the database directory entry for the TM
      database, and catalog the node entry for the location of the TM database. For
      example:

      ```
      catalog tcpip node TMBNODE remote SERVERB server db2inst1c
      db2 catalog database TMB as TMB at node TMBNODE
      ```

      The Database alias name *must* be the same as the actual database

      You should be able to connect to the TM database from the DB2 Client. name.

   d. If the DB2 Syncpoint Manager (SPM) is remote, catalog the database directory
      entry for the SPM instance, and catalog the node entry for the location of the
      SPM. For example:

      ```
      catalog tcpip node SPMNODE remote SERVERD server db1inst1c
      db2 catalog database SPMNAME as SPMNAME at node SPMNODE
      ```

      The Database alias name *must* be the same as the actual database

      You should be able to connect to the SPM from the DB2 Client. name.

   e. Stop and restart the database manager on the application requester.

Applications Which Use a TP Monitor to Coordinate the Multisite Update:

In this situation, SNA and TCP/IP connectivity requires the DB2 Syncpoint Manager. Both SNA and TCP/IP connectivity can be simultaneously supported by the DB2 Syncpoint Manager.

1. On the workstation which has the DB2 Syncpoint Manager

   a. Install DB2 Connect Enterprise Edition or DB2 Universal Database Enterprise Edition or Enterprise Edition - Extended in order to provide multisite update support with host or AS/400 database servers.

   b. Create a database instance on the same system. For example, you can use the default instance DB2, or use the following command to create a new instance:

      db2icrt *myinstance*

   c. Supply licensing information as required.

   d. If SNA connectivity

      1) Ensure that the registry value db2comm includes the value APPC.

      2) Configure SNA communications as required. See "Setting up SNA Communications for the DB2 Syncpoint Manager (SPM)" on page 235.

         The configuration will be easier if the SPM_NAME value is the same as the LU name, and the SPM uses the same LU as the DB2 Connect workstation.

         On an AIX system, the SPM_NAME value *must* be same as the names of:

         a) The transaction program (TP) profile used by the SPM.

         b) The local side information profile used by the SPM.

         c) The SPM instance name on application requesters.

      Refer to Figure 23 on page 236.

   e. If TCP/IP connectivity

      You must ensure the DB2 TCP/IP Listener is activated. Do the following

      1) Ensure that the registry value db2comm includes the value TCPIP.

      2) Ensure the Database Manager Configuration parameter SVCENAME is set to the proper TCP/IP port.

   f. Determine the value to be specified for the SPM_NAME database manager configuration parameter, and optionally values for the SPM_LOG_FILE_SZ and SPM_MAX_RESYNC database manager configuration parameters if the defaults are not appropriate for your situation. Ensure that the SPM_NAME value is unique within your network. See "Database Manager Configuration Parameters for SPM" on page 227 for further details.

g. Update SPM_NAME on the DB2 Connect workstation/DB2 Universal Database server. For example, you can use the following command:

```
update database manager configuration using spm_name SPMNAME
```

h. Stop and restart the database manager on the DB2 Connect workstation/DB2 Universal Database server to start the SPM for the first time.

i. For AIX Server, ensure any SNA Symbolic Destination Name configured to access the host or AS/400 database server uses the same LU as specified for the SPM_NAME.

Host or AS/400 Applications Which Access a DB2 Universal Database Server in a Multisite Update

In this situation, SNA connectivity is the only type supported. The DB2 Syncpoint Manager is required in order to permit multisite update. DB2 Universal Database does not support multisite update from host or AS/400 database clients using TCP/IP connectivity.

The database server which is being accessed from the host or AS/400 database client does not have to be local to the workstation which has the DB2 Syncpoint Manager. The host or AS/400 database client could connect to a DB2 UDB server using the DB2 Syncpoint Manager workstation as an interim gateway. This allows you to isolate the DB2 Syncpoint Manager workstation in a secure environment while the actaul DB2 UDB Servers are remote in your organisation. This also permits DB2 common server V2 database to be involved in multisite updates originating from host or AS/400 database clients.

The steps are as follwos:

1. On the workstation which has the DB2 Syncpoint Manager

   a. Install DB2 Universal Database Enterprise Edition or Enterprise Edition - Extended in order to provide multisite update support with host or AS/400 database clients.

   b. Create a database instance on the same system. For example, you can use the default instance DB2, or use the following command to create a new instance:

      ```
      db2icrt myinstance
      ```

   c. Supply licensing information as required.

   d. Ensure that the registry value db2comm includes the value APPC.

   e. Configure SNA communications as required. See "Setting up SNA Communications for the DB2 Syncpoint Manager (SPM)" on page 235.

      The configuration will be easier if the SPM_NAME value is the same as the LU name, and the SPM uses the same LU as the DB2 Connect workstation.

On an AIX system, the SPM_NAME value *must* be same as the names of:

1) The transaction program (TP) profile used by the SPM.

2) The local side information profile used by the SPM.

3) The SPM instance name on application requesters.

Refer to Figure 23 on page 236.

f. Determine the value to be specified for the SPM_NAME database manager configuration parameter, and optionally values for the SPM_LOG_FILE_SZ and SPM_MAX_RESYNC database manager configuration parameters if the defaults are not appropriate for your situation. See "Database Manager Configuration Parameters for SPM" on page 227 for further details.

g. Update SPM_NAME on the DB2 Universal Database server. For example, you can use the following command:

```
update database manager configuration using spm_name SPMNAME
```

h. Configure communications as required for this DB2 workstation to connect to remote DB2 UDB servers, if any.

i. Configure communications as required for remote DB2 UDB Servers to connect to this DB2 Syncpoint Manager workstation.

j. Stop and restart the database manager on the DB2 Universal Database server to start the SPM for the first time.

You should be able to connect to the remote DB2 UDB servers from this DB2 Syncpoint Manager workstation.

2. On Each Remote DB2 UDB Server which will be accessed by the Host or AS/400 Database Client

The database administrator must also perform the following steps at each remote system where a DB2 UDB Server will be accessed by a host or AS/400 database client.

The remote DB2 UDB Server must have its communications support configured so that the remote DB2 Syncpoint manager can connect to it AND so that this DB2 UDB Server can connect to the remote DB2 Syncpoint Manager.

a. Configure communications as required for the remote DB2 Syncpoint Manager workstation to connect to this DB2 UDB Server.

b. Catalog the database directory entry for the remote DB2 Syncpoint Manager (SPM) instance, and catalog the node entry for the location of the SPM. For example:

```
catalog tcpip node SPMNODE remote SERVERD server db1inst1c
db2 catalog database SPMNAME as SPMNAME at node SPMNODE
```

The Database alias name *must* be the same as the actual database

You should be able to connect to the SPM from the DB2 Client. name.

c. Stop and restart the database manager on the application requester.

Setting up SNA Communications for the DB2 Syncpoint Manager (SPM)

This section describes the SNA configuration requirements of the SPM, and explains the interdependencies between the SPM_NAME database manager configuration parameter and the communications configuration files.

The SPM using SNA connectivity is only supported on AIX, OS/2 and the Windows NT platform. The SPM using TCP/IP connectivity is supported on all DB2 UDB platforms.

These configuration steps are what is required for the SPM to initialise. They are not steps used for communications with remote host or AS/400 database servers or clients. Separate SNA configuration steps are required for actual communications. Please see Part 3 or Part 4 depending on your environment.

Configuring SNA Server for AIX

An LU6.2 Side Information profile and an LU6.2 Transaction Program Name profile must be defined to identify the SPM to the AIX SNA Server. The Side Information profile name and the Transaction Program Name profile name that SPM uses must match the SPM_NAME parameter of the database manager configuration. These profiles are used to allow DB2 to configure the syncpoint support. They *are not* used for any SNA communication.

Figure 23 on page 236 shows the relationships between these entities.

Using SMIT

In the examples which follow:

1. The Database Manager configuration has SPM_NAME set to SPMNAME.
2. The Local LU name for the SPM is SPMLUNAM.

SPM_NAME can be set using the following command:

    update database manager configuration using spm_name SPMNAME

Side Information: Figure 24 on page 236 illustrates the sample settings for defining the SPM LU in SMIT. The SPM Side Information profile identifies the local LU to be managed by the SPM. When a node directory entry is cataloged for a DRDA2 server, the Side Information profile (symbolic destination name) must use the same local LU alias as the local LU alias specified in the SPM Side Information profile.
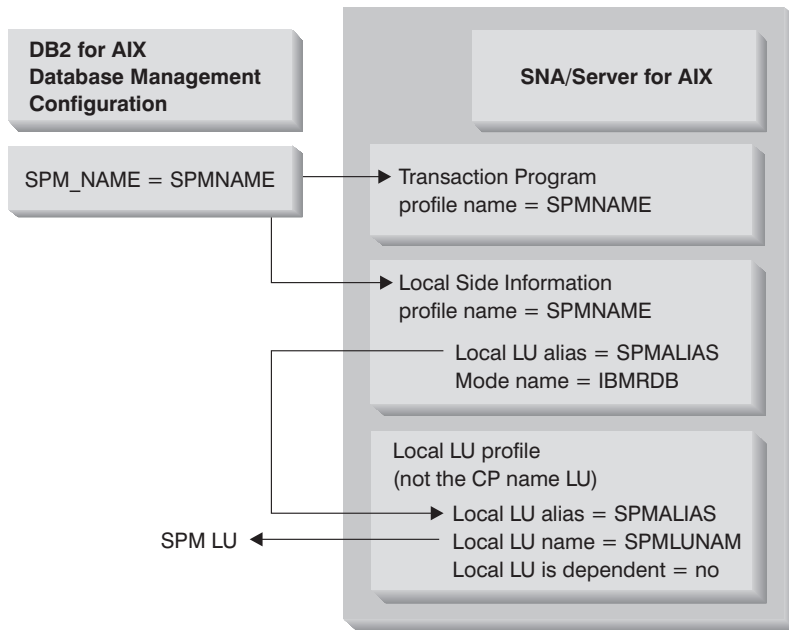
Figure 23. SPM_NAME Usage with SNA Server for AIX. This diagram shows the relationships between SPM_NAME and SNA Server for AIX configuration objects.

This example uses `SPMALIAS` as the name of the SPM LU alias and `SPMNAME` as the profile name.

```
                    Add LU 6.2 Side Information Profile
Type or select values in entry fields.
After making all desired changes, press Enter.

                                               [Entry Fields]
* Profile name                                 [SPMNAME]
  Local LU or Control Point alias              [SPMALIAS]            +
  Provide only one of the following:
     Partner LU alias                          []                   +
     Fully qualified partner LU name           []
  Mode name                                    [IBMRDB]             +
  Remote transaction program name (RTPN)       []
  RTPN in hexadecimal?                          no                  +

  Comments                                     [DB2 SyncPoint Profile]
```

Figure 24. Side Information Profile for the SPM Local LU

The SPM local LU cannot be the Control Point LU.

Transaction Program Name: Figure 25 on page 237 illustrates the sample settings for defining the SPM Transaction Program Name profile using SMIT. The SPM Transaction Program Name profile identifies that the SPM supports all sync level conversations. Also, multiple instances supported must be set to no. Each DB2 instance is required to have a unique SPM_NAME.

```
                          Add LU 6.2 TPN Profile
 Type or select values in entry fields.
 After making all desired changes, press Enter.

 [TOP]                                              [Entry Fields]

 * Profile name                              [SPMNAME]
   Transaction program name (TPN)            []
   Transaction program name (TPN) is in hexadecimal?  no               +
   PIP data?                                 no               +
      If yes, Subfields (0-99)               [0]                        #
   Use Command Line Parameters?              no               +
   Command Line Parameters                   []
   Conversation type                         either           +
   Sync level                                all              +
   Resource security level                   none             +
      If access, Resource Security Access List Prof.  []
   Full path to TP executable                [/dev/sna]
   Multiple instances supported?             no    +
   User ID                                   [100]                      #
   Server synonym name                       []
   Restart action                            once             +
   Communication type                        signals          +
      If IPC, Communication IPC queue key    [0]                        #
   Standard input file/device                [/dev/console]
   Standard output file/device               [/dev/console]
   Standard error file/device                [/dev/console]

   Comment                                   [DB2 SyncPoint TP]

 [BOTTOM]
```

Figure 25. Transaction Program Name Profile Required for SPM (for AIX)

SNA System Defaults

1. On AIX, the SNA Server list of Trusted Group Names should be updated to include the groups which will be able to start SPM. To list the trusted group name, use SNA Defaults.

2. For AIX SNA Version 2 enable the recovery resource support.

   For AIX SNA V3 enable the recovery resource support in the LU 6.2 profile representing the SPM_NAME value.

AIX/SNA Server Operational Considerations: Terminating SNA Server for AIX while the SPM is active causes the SPM to stop. Once SNA Server for AIX is restarted, you must issue db2stop and db2start on the DB2 Connect workstation in order to allow the SPM to reinitialize.

AIX SNA Server Coexistence Considerations: If a DB2 Connect workstation has Syncpoint Manager started and you want to use it as a DRDA1 AS or as a database server for clients accessing via APPC, you must do the following:

1. On the DB2 Connect for AIX Syncpoint Manager (SPM) Server Node:

   a. You must install DB2 UDB Enterprise Edition or Extended Enterprise Edition for AIX.

   b. Ensure that there are no SNA Server/UDB EE, EEE for AIX LU 6.2 Transaction Program Name (TPN) definitions defined for the following transaction programs:

      - X'07F6C4C2'
      - X'07F6E2D5'
      - X'06F2'
      - X'06F2F0F1'
      - DB2INTERRUPT (alphanumeric)
      - DB2DRDA (alphanumeric)
      - TP name defined in the database manager configuration parameter TPNAME.

   You can validate this by setting the SPM_NAME to the correct LU name and setting the DIAGLEVEL = 4 in the Database Manager Configuration. When you issue db2start to initiate the SPM you should NOT see the following message in the db2diag.log:

   ```
   SPM0445 The Transaction Program TPname will not be listened for
   by DB2. This is not a severe error, but if you require this Transaction
   Program, you must ensure that it is not defined in the Transaction
   Profile of the AIX SNA configuration.
   ```

2. On the Database Client Node:

   Ensure all clients use the LU specified on the SPM node in the Database Manager Configuration parameter SPM_NAME as their partner LU.

Configuring Communications Server for OS/2 and Windows NT

The following example assumes:

- Either IBM Communications Server for OS/2 V4.1 or IBM Communications Server for Windows NT V5.01 is installed
- SPMNAME is the local LU name
- SPM_NAME is set to SPMNAME.

These requirements must be met:

1. The SPM_NAME Database Manager Configuration parameter must specify the local LU to be used by SPM. The SPM_NAME cannot represent the Control Point LU. There is no need to configure any Communication Server profiles. DB2 will dynamically create or modify the necessary profiles. Ensure the LU represented by the SPM_NAME parameter is only used by DB2.

   SPM_NAME can be set using the following command:

   ```
   update database manager configuration using spm_name SPMNAME
   ```

2. If your DB2 Universal Database SPM workstation will be used as a server accepting DB2 Universal Database client connections through APPC, you will need to ensure that you configure the database manager configuration parameter *tpname* with an appropriate value. For example:

   ```
   db2 update dbm cfg using tpname NYSERVER
   ```

Note: If all of the following apply to your environment:

- You are using the SPM workstation to connect to host or AS/400 database servers.

- You are using the SPM workstation to accept connections from host or AS/400 database clients.

- You have DB2 Universal Database clients accessing the SPM workstation through APPC.

then the DB2 Universal Database clients and the host or AS/400 database clients must:

- Use the same transaction program name to connect to the SPM workstation.

- Use the SPM_NAME LU as their partner logical unit.

Communications Server Operational Considerations

Communications Server for OS/2 requires that syncpoint LUs be registered by the SPM before they can be used for DRDA2 calls. Thus DB2 must be started explicitly beforehand, in order that the SPM can register the syncpoint LU. Otherwise you may encounter the following message on DRDA2 calls:

```
SQL0859N Access to the Transaction Manager Database failed with
SQLCODE "-1032".  SQLSTATE=08502.
```

In order to execute DRDA1 calls successfully when DB2 is not started, the default LU should specify a non-SPM LU. You can use the APPCLLU environment variable to specify an LU name that is not the same as the value in SPM_NAME. Otherwise you may encounter the following message:

```
SQL30081N  A communication error has been detected. Communication protocol
being used: "APPC". Communication API being used: "CPI-C". Location where
the error was detected: "". Communication function detecting the error:
"xcstp". Protocol specific error codes: "20", "*", "*".  SQLSTATE=08001
```

Registering CS/NT as a Windows NT Service

After installing IBM Communications Server for Windows NT (CS/NT) you should
register it as a Windows NT Service. This will automatically start CS/NT when the
machine is booted.

To register CS/NT as an Windows NT Service execute the following command. Either:

    csstart -a

To autostart CS/NT with the default configuration file, or:

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

Where **c:\ibmcs\private\your.acg** is the name of the non-default CS/NT configuration
file you wish to be used.

The next time your machine is rebooted CS/NT will be started automatically with the
requested configuration file.

Support for SERVER Authentication

Before SPM, if a DB2 client specified SERVER authentication, connection requests
would fail if the userid could not be authenticated properly by the DB2 server. Now,
providing the SPM is configured at a DB2 server, SERVER authentication is supported
if the DRDA application requester connects to the DB2 server via the SPM LU.

SPM Migration Considerations

When migrating from DB2 or DDCS Version 2 to the Version 5 SPM, first ensure that there are no indoubt transactions. You can verify this by entering the following command in the command line processor:

```
list drda indoubt transactions
```

Note that, before issuing LIST DRDA INDOUBT TRANSACTIONS, the application must be connected to the Syncpoint Manager (SPM) instance - use the SPM_NAME database manager configuration parameter as the dbalias on the CONNECT statement. If any transactions are listed, ensure that automatic resolution occurs, or - if automatic resolution is not possible - you can force the resolution by issuing the following command:

```
list drda indoubt transactions with prompting
```

Migrating from the Encina PPC Gateway

If the Encina PPC Gateway was defined on a node different from the node on which the SPM will be defined, then the user must make sure that the required SNA definitions are available on the SPM node.

The following are special considerations when migrating from a DB2 for AIX V2.1.0 Encina Peer-to-Peer Communications (PPC) Gateway environment.

In this case, follow all the steps defined above in "Setting up SNA Communications for the DB2 Syncpoint Manager (SPM)" on page 235, including those for the TP Name and CPI-C Side Information profiles, which must be redefined.

Otherwise, if you will use the same non-CP LU name for SPM as in your DB2 for AIX V2.1.0 configuration, the existing CPI-C Side Information profile can be re-used without change, but you will have to define the TPN profiles that you require.

Additional PPC Gateway Migration Steps for CICS for AIX

1. Ensure that the userid cics is a member of a trusted group within SNA.

2. Re-create DB2 support for CICS. This involves:

   a. Re-creating the shared object db2.o.

   b. Rebuilding your switchload files.

   c. Re-executing CICSMKCOBOL for any COBOL applications which you may have.

| For details, refer to the *CICS for Open Systems Administration Guide*.

Encina PPC Gateway and SPM Coexistence

The Encina PPC Gateway and the DB2 SPM cannot share the same LUs. If the Encina
PPC Gateway is still required you must configure either the DB2 SPM or the PPC
Gateway to use a different LU.

SPM Processes

This section describes the SPM processes.

EDU Process Names

The LU 6.2 SPM has Engine Dispatchable Units (EDUs) with the following names:

db2spmcm The SPM APPC listener. This is a long-lived EDU that remains as long as
DB2 is started.

db2spmrm The SPM restart/resync manager EDU. This is a long-lived EDU that
remains as long as DB2 is started.

db2spmlw The log write EDU of the SPM Logger. This is a long-lived EDU that
remains as long as DB2 is started.

db2spmri The resynchronization initiator EDU. This is a short-lived EDU that exists
until the resync operation is completed. The number of EDUs of type
db2spmri are controlled by the SPM_RESYNC_AGENT_LIMIT.

db2spmrr The resynchronization receiver or XLN receiver EDU. This is a short-lived
EDU that is spawned by the SPM SNA listener when a syncpoint TP attach
request is received.

In UNIX, these EDU names can be displayed as separate processes.

SPM Logging

The SPM maintains a log in which it records information about connections, and UOW status. This log is contained in the *spmlog* directory which is a sub-directory of *sqllib*. This directory is created the first time that the SPM is started.

The SPM log consists of the following files and directories:

- SPMLOG - this is the log directory, under `sqllib`.
- SPMLOG.LCF - this is the log control file.
- SPMLOGSD - this is a sub-directory under `spmlog` which contains the primary and secondary log files:
  - SPM00000.LOG - the first primary log file.
  - SPM00001.LOG - the second primary log file.
  - SPM00002.LOG - the third primary log file.
  - SPM00003.LOG - the first secondary log file.
  - SPM00004.LOG - the second secondary log file.

SPM Log File Size

The SPM_LOG_FILE_SIZE database manager configuration parameter defines the number of 4K pages of each primary and secondary log file, and it can have the following values:

- Minimum - the minimum value is 4.
- Maximum - the maximum value is 1000 (4M bytes).
- Default - the default is 256 (1M byte).

The log normally only uses the primary extents which are allocated when the log is created. Secondary extents are allocated on demand when log space is constrained. Secondary extents are usually deleted during normal shutdown of the logger.

The SPM log size should be large enough so that performance is not adversely affected but small enough so that space is not wasted. The size that is required depends on the number of transactions using protected conversations and how often commit/rollback is issued. The SPM takes a checkpoint every time DB2 is started and stopped and when the log is 50% full. If the log is too small, the checkpoint process may be invoked often enough to impact performance. The log is probably too small if secondary log files are allocated. If the log is too large, then space will be wasted.

You should use the default log size to begin with.

Changing the SPM Log File Size

The size of the SPM log can be changed when the database manager is stopped and there are no in doubt transactions. The following procedure can be used:

1. Use the `LIST DRDA INDOUBT TRANSACTIONS` command to determine whether there are indoubt transactions for which the SPM is responsible. Note that, before issuing `LIST DRDA INDOUBT TRANSACTIONS`, the application must be connected to the Syncpoint Manager (SPM) instance - use the SPM_NAME database manager configuration parameter as the dbalias on the CONNECT statement. DB2 clients must be at Version 2.1.2 or higher to use the `WITH PROMPTING` capability of `LIST INDOUBT`.

2. If there are some indoubt transactions, stop the database manager:

   ```
   db2stop
   ```

3. Update the Database Manager Configuration with a new SPM_LOG_FILE_SIZE value. For example, to double the log size from the default of 256 * 4K pages:

   ```
   db2 update dbm configuration using spm_log_file_size 512
   ```

4. Go to the `sqllib` directory and delete the current SPM log. For example, on AIX:

   ```
   rm -fr spmlog
   ```

5. Start the database manager:

   ```
   db2start
   ```

   A new SPM log of the specified size will be created during DB2 start-up.

Performance Characteristics

Distributed two-phase commit requires more request/response message exchanges than single-phase commit, which requires only a single message exchange. The overhead of protected conversations, even for read only applications, depends on the SNA LU 6.2 Syncpoint options supported by the server.

Memory Utilization

In order to support the LU 6.2 Syncpoint function, most of the control blocks used by the SPM are in global memory. The amount of global memory required is dependent on the number of protected conversations active at any one time. The amount of memory required can also be affected by the number of resynchronization connections that are pending.

SPM Protocol Violation Records

These are documented in the *Messages Reference*.

Chapter 25. Using the Control Center to Configure Server Communications

The information in this section describes how to use the Control Center to configure communications on the server.

To configure an Administration Server for communications, go to Chapter 26, "Using the Command Line Processor to Configure the DB2 Connect Server to Accept Clients" on page 251.

The Control Center is a graphical tool available on OS/2 and Windows 32-bit operating systems. Use the Control Center's setup communications function to configure communications on the server. The Control Center allows you to:

- Display the protocols and configuration parameters that a server instance is configured to use.

- Maintain the configured protocols:

  - You can modify the parameter values of a configured protocol.

  - You can add or delete a protocol.

    When you add support for a new protocol to the server system, the setup communications function detects and generates server instance parameter values for the new protocol; you can accept or modify them before use. When you remove support for an existing protocol from the server system, the setup communications function detects the protocol that has been removed and disables its use by the server instance.

    You can add a protocol that has not been detected, however, you must supply all parameter values before you proceed.

The setup communications function can be used to maintain communications of both local and remote server instances.

Configuring DB2 Communications for Local Instances

1 To start the Control Center, do the following:

On an OS/2 system, double-click on the **Control Center** icon in the **Administration Tools** folder. (The **Administration Tools** folder is located in the DB2 folder.)

On a Windows NT system, click on **Start** and select **Programs**->**DB2 for Windows NT**->**Administration Tools**->**Control Center**.

2 Click on the **[+]** sign beside the **Systems** icon in the Control Center to get a list of systems.

3 Click on the **[+]** sign beside the system name to get a list of that system's database instances.

4 Select the instance you want to configure and click on the right mouse button.

5 Select the **Setup communications** option from the pop-up menu. The Setup Communications window opens.

6 Use the Setup Communications window to configure communication protocols for the instance. Click on the **Help** push button for more information.

7 You must stop and start the instance for these changes to take effect.

    a. To stop the database manager instance, select the instance, click with the right mouse button and select the **Stop** option from the pop-up menu.

    b. To start the database manager instance, select the instance, click with the right mouse button and select the **Start** option from the pop-up menu.

> Modifying an instance's communications settings may require you to update the database connection catalogs on the client.
>
> You do this as follows:
>
> - Using the Client Configuration Assistant on the client, select the database connection you want to change and then click on the **Properties** button. This will launch a Smartguide that will help you with the changes. For more information on cataloging using the Client Configuration Assistant, see Chapter 33, "Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 303.

Configuring DB2 Communications for Remote Instances

1 To start the Control Center, do the following:

On an OS/2 system, double-click on the **Control Center** icon in the **Administration Tools** folder. (The **Administration Tools** folder is located in the DB2 folder.)

On a Windows NT system, click on **Start** and select **Programs**->**DB2 for Windows NT**->**Administration Tools**->**Control Center**.

2 Click on the **[+]** sign beside the **Systems** icon in the Control Center to get a list of systems.

3 Select the **System** icon, click with the right mouse button and select the **Add** option. The Add System window opens.

4 To add a system to the Control Center, you can do one of the following:

    a Search the network for known servers.

- Click on the **Refresh** push button. If the *DISCOVER* configuration parameter is set to *ENABLE*, then the Administration Server will locate all servers on the network. For information on the *DISCOVER* parameter, see "Hiding Server Instances and Databases from Discovery" on page 486.

- Select the system you want to add from the **System name** drop-down list.

    or

    b Enter the server name.

- Enter the hostname or the IP address of the remote DB2 server in the **Host name** field.

- Click on the **Retrieve** push button to obtain this system's information.

5 Click on the **Apply** push button to add the system to the Control Center window.

6 Click on the **Close** push button.

7 Click on the **[+]** sign beside the system name you just added to get a list of that system's database instances.

8 Select the **Instances** folder for the new system and click on the right mouse button.

9 Select the **Add** option. The Add Instance window opens.

10 Click on the **Refresh** push button to obtain a list of available instances.

11 Select the instance that you want to add from the **Remote instance** drop-down list.

12 Click on the **Apply** push button.

13 Click on the **Close** push button.

14 Select the instance you want to configure and click on the right mouse button.

15 Select the **Setup communications** option from the pop-up menu. The Setup Communications window opens.

16 Use the Setup Communications window to configure communication protocols for the instance. Click on the **Help** push button for more information.

17 You must stop and start the instance for these changes to take effect.

    a. To stop the database manager instance, select the instance, click with the right mouse button and select the **Stop** option from the pop-up menu.

    b. To start the database manager instance, select the instance, click with the right mouse button and select the **Start** option from the pop-up menu.

> Modifying an instance's communications settings may require you to update the database connection catalogs on the client.
>
> You do this as follows:
>
> • Using the Client Configuration Assistant on the client, select the database connection you want to change and then clicm on the **Properties** button. This will launch a Smartguide that will help you wiht the changes. For more information on cataloging using the Client Configuration Assistant, see Chapter 33, "Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 303

Chapter 26. Using the Command Line Processor to Configure the DB2 Connect Server to Accept Clients

This section describes how to configure your DB2 Connect Enterprise Edition workstation to communicate with remote client workstations. Also described in this section are considerations when configuring the DB2 Administration Server for communications. The Control Center and the Discovery function of the Client Configuration Assistant are dependent on the Administration Server's protocol configuration.

Follow the instructions in this section if you deselected a detected communication protocol during the installation or, you have added a communication protocol to your network since running the DB2 setup program.

If you have installed the Control Center, you can use the Setup Communications function to configure an instance for communications; however, it cannot be used to set up communications for an Administration Server. The Control Center can be installed on OS/2 and Windows NT servers, or on OS/2 and Windows 32-bit operating systems clients.

On OS/2, the Setup Communications function can configure the APPC communications subsystem, in addition to updating the DB2 instance to use APPC.

For all other operating systems, the Setup Communications function cannot update the APPC communications subsystem; however, it will update the required DB2 instance parameters on the server.

For DB2 V5.2, the Control Center can also configure IBM Personal Communications for NT and IBM Communications Server for NT (server only, not the SNA API Client).

For instructions on using the command line processor, see Chapter 40, "Entering DB2 Commands and SQL Statements" on page 389. For a description of database naming rules, see Appendix G, "Naming Rules" on page 553.

Setting the DB2COMM Registry Value

Your DB2 Connect server can support multiple communication protocols concurrently; however, you only need to enable the protocols that you want to use.

If you deselected a detected protocol during installation, did not install the Control Center (for DB2 for OS/2 or Windows NT servers), or have added a communication

protocol to your network since installation, you must update the *db2comm* registry value with the protocol that you now want to support.

The *db2comm* registry value determines which protocol's connection managers will be enabled when the database manager is started. You can set this value for multiple communication protocols by separating the keywords with commas.

For your DB2 server, *DB2COMM* can be any combination of the following keywords:

appc   starts APPC support

ipxspx   starts IPX/SPX support

netbios   starts NetBIOS support

npipe   starts NAMED PIPE support (for Windows NT servers) or Local support (for OS/2 servers)

tcpip   starts TCP/IP support

> To avoid problems with the Control Center and the Client Configuration Assistant, ensure that the *DB2COMM* parameter is set in the DB2 registry using the db2set command. It is not recommended that you use any other mechanism to set the *DB2COMM* value.

To set the *db2comm* registry value for the current instance, enter the **db2set DB2COMM=***protocol_names* command. Change the *protocol_names* parameter to reflect those protocols that you want to start when the database manager is started.

For example, to set the database manager to start connection managers for the APPC and TCP/IP communication protocols, enter:

```
db2set DB2COMM=appc,tcpip
db2stop
db2start
```

> If you are setting up communications for the Administration Server, use the **db2set** command as follows:
>
> ```
> db2set DB2COMM=appc,tcpip -i DB2DAS00
> db2admin stop
> db2admin start
> ```
>
> where:
>
> **DB2DAS00**   The name of the Administration Server's instance. If you are not sure of the Administration Server name, enter the following command to view it:
>
> ```
> db2set DB2ADMINSERVER
> ```

When the **db2start** command is reissued, connection managers for the protocols specified by the *db2comm* registry value are started.

> If there are problems starting a protocol's connection managers, a warning message is displayed and the error messages are logged in the `db2diag.log` file.
>
> Refer to the *Troubleshooting Guide* for information on the `db2diag.log` file.

If *db2comm* is undefined or set to null, no protocol connection managers are started when the database manager is started.

For more information on setting DB2 parameters, see "Controlling the DB2 Profile Registry" on page 396.

You are now ready to configure the server workstation to use any of the following communication protocols:

- Named Pipes - see "Configuring Named Pipes on the Server"
- TCP/IP - see "Configuring TCP/IP on the DB2 Connect Server to Accept Clients" on page 254
- NetBIOS - see "Configuring NetBIOS on the DB2 Connect Server" on page 257
- IPX/SPX - see "Configuring IPX/SPX on the DB2 Connect Server" on page 262
- APPC - see "Configuring APPC on the DB2 Connect Server to Accept Clients" on page 267 to configure DB2 Connect to accept inbound clients requests

---

Configuring Named Pipes on the Server

To access a remote server through Named Pipes, you must first have installed and configured communication software for both the client and DB2 Connect server workstations. See "Software Requirements" on page 30 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 41 for the supported communication protocols for your particular client and server.

If you have read and completed the instructions in "Setting the DB2COMM Registry Value" on page 251, there are no further steps required to set up Named Pipe communications on the server or to support the Administration Server.

Now that you have configured the server, you are ready to install a DB2 client. Go to Chapter 27, "Installing DB2 Clients" on page 273 for more information.

Configuring TCP/IP on the DB2 Connect Server to Accept Clients

To access a remote server through TCP/IP, you must first have installed and configured communication software for both the client and DB2 Connect Server workstations. See "Software Requirements" on page 30 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 41 for the supported communication protocols for your particular client and server.

Before completing the steps in this section, be sure that you have completed the instructions in "Setting the DB2COMM Registry Value" on page 251.

> If you are setting up communications for the Administration Server, it was configured for TCP/IP (using the registered Port number *523*) when it was created. There are no further steps required to enable the Administration Server to use TCP/IP.

The following steps are required to set up TCP/IP communications:

1 Identify and record parameter values.

2 At the server:

    a Update the `services` file.

    b Update the database manager configuration file.

> Due to the characteristics of the TCP/IP protocol, the TCP/IP subsystem 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 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 24. TCP/IP Values Required at the DB2 Connect Server			
Parameter	**Explanation**	**Sample Value**	**Your Value**

Connection Port
 	
 • Connection Service name (*svcename*)
 • Port number/Protocol (port_number/tcp)
 	
 Interrupt Port
 	
 • Interrupt Service name
 • Port number/Protocol (port_number + 1/tcp)
	Values required in the `services` file.
	
	 The Connection and Interrupt Service names are arbitrary, but each must be unique within the `services` file.
	
	 The Connection and Interrupt Ports must be unique within the `services` file, with the Interrupt Port number equal to the Connection Service Port number plus one.
		`server1`
		
		 `3700/tcp`
		
		 `server1i`
		
		 `3701/tcp`	

Service name (*svcename*)	The name used to update the Service name (*svcename*) parameter in the database manager configuration file at the server. This value must be the same as the Connection Service name specified in the `services` file.	`server1`	

Step 2. Configure the DB2 Connect Server

The following steps describe how to configure this protocol on the server. Replace the sample values with your values and record them on your worksheet.

A. Update the Services File

The TCP/IP `services` file specifies ports that the DB2 Connect server will listen on for client requests. The `services` file must contain two entries for each database manager instance.

You need to update the `services` file and specify the ports that you want the DB2 Connect server to listen on for incoming client requests. The first entry describes the Connection Port, and the second entry describes the Interrupt Port.

The location of the `services` file depends on the operating system installed on the server.

OS/2   `\mptn\etc`

UNIX   `/etc`

Windows NT `\winnt\system32\drivers\etc`

> If you are using Network Information Services (NIS) on your network (for UNIX servers only) , you must update the services file located on your master server.
>
> The location of the services file can depend on the products you have installed on your system. See your TCP/IP documentation for more information.
>
> OS/2 users can type **set etc**, from a command window, to determine the location of the services file.

Using a local text editor, add the Interrupt Port and Connection Port entries to the services file for TCP/IP support. For example:

```
server1     3700/tcp      # DB2 connection service port
server1i    3701/tcp      # DB2 interrupt connection service port
```

where:

server1	is the Connection Service name
server1i	is the Interrupt Service name
3700 and 3701	are the port numbers for the Connection and Interrupt Ports
tcp	is the communication protocol that you are using

B. Update the Database Manager Configuration File

You must update the database manager configuration file with the Service name (*svcename*) parameter.

To update the database manager configuration file, perform the following steps:

1 Log on to the system with a user account that belongs to the local Administrators group on each machine in your partitioned database system.

> If you have trouble logging on to the system, see "Logging on to the System" on page 343.

2 Set up the instance environment and invoke the DB2 command line processor as follows:

    a Run db2profile or db2cshrc 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.

    b Start the DB2 command line processor by entering the **db2** command.

3 Update the database manager configuration file with the Service name (*svcename*) parameter using the following commands in the command line processor:

```
update database manager configuration using svcename svcename
db2stop
db2start
```

For example, if the Connection Service name in the `services` file was entered as *server1*, use:

```
update database manager configuration using svcename server1
db2stop
db2start
```

> The *svcename* used must match the Connection Service name specified in the `services` file.

After the database manager is stopped and started again, view the database manager configuration file to ensure that these changes have taken effect. Enter the following command in the command line processor:

```
get database manager configuration
```

Now that you have configured the server, you are ready to install a DB2 client. Go to Chapter 27, "Installing DB2 Clients" on page 273 for more information.

Configuring NetBIOS on the DB2 Connect Server

To access a remote server through NetBIOS, you must first have installed and configured communication software for both the client and DB2 Connect server workstations. See "Software Requirements" on page 30 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 41 for the supported communication protocols for your particular client and server.

Before completing the steps in this section, be sure that you have completed the instructions in "Setting the DB2COMM Registry Value" on page 251.

The following steps are required to set up NetBIOS communications:

1 Identify and record parameter values.

2 Configure the server:

    a Configure the NetBIOS Interface.

    b Update the `database manager configuration` file.

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 25. NetBIOS Values Required at the DB2 Connect Server			
Parameter	**Description**	**Sample Value**	**Your Value**
Adapter number (*adapter_number*)	The local logical adapters that will be used for the NetBIOS connection. The server uses adapter 0 if this parameter is not configured.	0	
Workstation name (*nname*)	The NetBIOS name of the server workstation. *nname* is a name, chosen by the user, which must be unique among all NetBIOS server nodes in the network. For more information on workstation names, see "Workstation Names (nname)" on page 556	server1	

Step 2. Configure the DB2 Connect Server

The following steps describe how to configure this protocol on the server. Replace the sample values with your values and record them on your worksheet.

A. Configure the NetBIOS Interface

This section describes how to configure the NetBIOS interface on your OS/2 or Windows NT DB2 Connect server.

- For OS/2:

  If the *db2nbadapters* parameter is not set, the default adapter will be *0*. If you want to use additional server adapters, or you need to specify a server adapter other than *0*, set the *db2nbadapters* parameter to the number you want to use.

- For Windows NT:

For a client to connect to a Windows NT server, the network route of the adapter number used must be **Nbf** for native NetBIOS operation. If the *db2nbadapters* parameter is not set, the default local adapter will be *0*. If you want to use additional server adapters, or you need to specify a server adapter other than *0*, set the *db2nbadapters* parameter to the number that you want to use.

> DB2 uses registry values to control its use of the NetBIOS resources on the server. Use the *db2nbadapters* registry parameter when you want to specify a value other than the default Logical adapter number 0.
>
> For the DB2 server, set the *db2nbadapters* parameter by entering the **db2set db2nbadapters=***adapter_number* command.
>
> For the Administration Server, set the *db2nbadapters* parameter by entering the **db2set db2nbadapters=***adapter_number -i DB2DAS00* command.
>
> For more information, see Chapter 41, "Controlling Your DB2 Environment" on page 395.

To view or modify the NetBIOS interface configuration, which maps network routes to adapter numbers, do the following:

- For OS/2:

    1 Double-click on the **MPTS** icon.

    2 Click on the **Configure** push button.

    3 Select the **LAN adapters and protocols** radio button and click on the **Configure** push button.

    4 Record the Logical adapter number associated with the **IBM OS/2 NETBIOS** entry in the Current Configuration window.

    5 If you want to change the logical adapter number associated with NetBIOS, select the **IBM OS/2 NetBIOS** entry from the Current Configuration window and click on the **Change number** push button.

    6 Select a logical adapter number and click on the **Change** push button.

    7 Record the new logical adapter number associated with the **IBM OS/2 NETBIOS** entry in the Current Configuration window on your worksheet.

    8 Click on **OK**.

    9 Click on the **Close** push button.

    10 Click on the **Exit** push button.

    11 Ensure that the **Update CONFIG.SYS** check box is selected and click on the **Exit** push button.

    12 Click on the **Exit** push button.

13 The Network Settings Change pop-up box opens. You must shutdown and reboot your system for these changes to take effect. Select the **Yes** push button to shutdown and reboot your system or select the **No** push button to shutdown and reboot your system at a later time.

- For Windows NT:

    1 Click on **Start** and select **Settings**->**Control Panel**.

    2 Double-click on the **Network** icon and select the **Services** tab.

    3 Select the **NetBIOS Interface** icon from the Network Services window and click on the **Properties** push button.

    4 Scroll through the network routes until you find the Logical adapter number associated with **Nbf** and record it on your worksheet. If this adapter number is associated with **Nbf**, and you do not want to change it, go to Step 7.

    5 To change the logical adapter number associated with **Nbf**, select the associated **Lana Number**, and click on the **Edit** push button. Enter the new adapter number 0 (or the value that you set for *db2nbadapters*).

    6 Record the new adapter number associated with **Nbf** on your worksheet.

    7 Click on **OK**.

    8 Click on the **Close** push button.

    9 The Network Settings Change pop-up box opens. You must shutdown and reboot your system for these changes to take effect. Select the **Yes** push button to shutdown and reboot your system or select the **No** push button to shutdown and reboot your system at a later time.

> Each adapter number must be uniquely associated with a network route. Windows NT has a built in checking facility that will not allow you to specify the same adapter number for different network routes. If a Network route already exists that is using the adapter number *0*, assign a different number to that route. (The valid range for adapter numbers is *0* to *255*.) This will allow you to select *0* as the adapter number that corresponds to **Nbf**. Approve the changes by clicking on **OK**.

B. Update the Database Manager Configuration File

You must update the database manager configuration file with the server's Workstation name (*nname*) parameter.

To update the database manager configuration file, perform the following steps:

1 Log on to the system with a user account that belongs to the local Administrators group on each machine in your partitioned database system.

> If you have trouble logging on to the system, see "Logging on to the System" on page 343.

2 Update the database manager configuration file with the server's Workstation name (*nname*) parameter using the following commands in the command line processor:

```
update database manager configuration using nname nname
db2stop
db2start
```

For example, if the server's workstation name (*nname*) is server1, use:

```
update database manager configuration using nname server1
db2stop
db2start
```

If you are configuring the Administration Server for NetBIOS, you must update the admin server configuration file. Use the following command:

```
update admin configuration using nname server1
db2admin stop
db2admin start
```

| Now that you have configured the server, you are ready to install a DB2 client. Go to Chapter 27,
| "Installing DB2 Clients" on page 273 for more information.

Autostarting DB2 with NetBIOS (for Windows NT only)

If your NetBIOS protocol was configured when you installed on the instance-owning machine, the setup program automatically created a dependency on NetBIOS for the Administration Server and the default instance (DB2). If you create additional DB2 instances, you will need to manually create a dependency on NetBIOS for each new instance.

You can create this dependency with the **db2depnb** command as follows:

1 Go to the x:\sqllib\misc directory, where x: is the drive on which DB2 was installed

2 Enter the **db2depnb** command as follows:

```
db2depnb instance_name
```

This records a dependency on the startup order which causes NetBIOS to start before any DB2 instances start.

> If you remove the NetBIOS protocol from your network, you **must** remove the dependencies that were created during installation, and any dependencies that you created for additional instances. Failure to remove these dependencies may cause problems when running DB2 after the NetBIOS protocol has been removed from the network.
>
> To remove a dependency, enter the **db2depnb** command as follows:
>
> ```
> db2depnb instance_name /r
> ```
>
> where *instance_name* is the name of the instance for which you removed a dependency.

> Now that you have configured the server, you are ready to install a DB2 client. Go to Chapter 27, "Installing DB2 Clients" on page 273 for more information.

Configuring IPX/SPX on the DB2 Connect Server

To access a remote database server through IPX/SPX, you must first have installed and configured communication software for both the client and DB2 Connect server workstations. See "Software Requirements" on page 30 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 41 for the supported communication protocols for your particular client and server.

Before completing the steps in this section, be sure that you have completed the instructions in "Setting the DB2COMM Registry Value" on page 251.

> If you are setting up communications for the Administration Server, it was configured for IPX/SPX (using the registered Socket number *87A2*) when it was created. There are no further steps required to enable the Administration Server to use IPX/SPX.

Your DB2 Connect server can be set up to support IPX/SPX client communications via Direct Addressing or File Server Addressing.

Direct Addressing:
The client connects to the DB2 Connect server by directly specifying the IPX/SPX internetwork address of the server (bypassing the NetWare file server). Using this method, a NetWare file server is not required on the network. Configure DB2 Connect

servers using this addressing method if they will be accessed solely by clients using Direct Addressing.

File Server Addressing:
The DB2 Connect server instance registers its address at the NetWare file server. The client connects to the DB2 Connect server instance through an address stored at a NetWare file server. Configure DB2 Connect servers using this addressing method if they will be accessed by clients using both File Server and Direct Addressing, or just File Server Addressing.

The following steps are required to set up IPX/SPX communications:

1 Identify and record parameter values.

2 Configure the server:

  a Update the database manager configuration file.

  b Register the server on the NetWare file server (for File Server Addressing only).

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 26 (Page 1 of 2). IPX/SPX Values Required at the DB2 Connect Server			
Parameter	**Explanation**	**Our Example**	**Your Value**
File server name (*FILESERVER*)	**Direct Addressing** A * value indicates that you are using Direct Addressing. **File Server Addressing** The name of the NetWare file server where the database server instance is registered. This parameter must be entered in UPPERCASE.	**Direct Addressing** * **File Server Addressing** NETWSRV	
DB2 server object name (*OBJECTNAME*)	**Direct Addressing** A * value indicates that you are using Direct Addressing. **File Server Addressing** The database manager server instance, represented as the object *OBJECTNAME* on the NetWare file server. The server's IPX/SPX internetwork address is stored and retrieved from this object. This parameter must be entered in UPPERCASE and be unique on the NetWare file server system.	**Direct Addressing** * **File Server Addressing** DB2INST1	

Table 26 (Page 2 of 2). IPX/SPX Values Required at the DB2 Connect Server			
Parameter	**Explanation**	**Our Example**	**Your Value**
Socket number (*IPX_SOCKET*)	Represents the connection end point in a DB2 Connect server's internetwork address. It must be unique for all server instances, and all IPX/SPX applications running on the workstation. It is entered in hexadecimal format. DB2 has registered well known sockets with Novell in the range 0x879E to 0x87A1. If you run more than 4 instances on the server machine, you must prevent socket collisions for instances 5 and up by choosing a socket number that is not *0x0000*, in the dynamic socket range *0x4000* to *0x7FFF*, or in the range *0x8000* to *0x9100* (these are well known sockets that are registered to various applications). The maximum value for this parameter is *0xFFFF*.	879E (default)	
IPX/SPX Internetwork Address	The internetwork address required when configuring a client to communicate with a server using Direct Addressing.	09212700.400011527745.879E	

Naming Restrictions for File Server Addressing
The following characters are not valid for the File server (*FILESERVER*) or the DB2
server object name (*OBJECTNAME*) parameters: / \ : ; , * ?

Step 2. Configure the DB2 Connect Server

The following steps describe how to configure this protocol on the server. Replace the
sample values with your values and record them on your worksheet.

A. Update the Database Manager Configuration File

You must update the database manager configuration file with the File server
(*FILESERVER*), DB2 server object name (*OBJECTNAME*), and Socket number
(*IPX_SOCKET*) parameters.

To update the database manager configuration file, perform the following steps:

   1 Log on to the system with a user account that belongs to the local Administrators
   group on each machine in your partitioned database system.

> If you have trouble logging on to the system, see "Logging on to the System" on page 343.

2 Set up the instance environment and invoke the DB2 command line processor as follows:

    a Run db2profile or db2cshrc 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.

    b Start the DB2 command line processor by entering the **db2** command.

3 In the database manager configuration file, update the File server (*FILESERVER*), DB2 server object name (*OBJECTNAME*), and Socket number (*IPX_SOCKET*) parameters using the following commands in the command line processor:

```
update dbm cfg using fileserver FILESERVER objectname OBJECTNAME ipx_socket IPX_SOCKET
db2stop
db2start
```

Direct Addressing

For example, if you have chosen a value of 879E for the Socket number (*IPX_SOCKET*) parameter, use:

```
update dbm cfg using fileserver * objectname * ipx_socket 879E
db2stop
db2start
```

File Server Addressing

For example, if the name of the File server (*FILESERVER*) is NETWSRV, the DB2 server's object name (*OBJECTNAME*) is DB2INST1, and you have chosen a value of 879E for the Socket number (*IPX_SOCKET*) parameter, use:

```
update dbm cfg using fileserver NETWSRV objectname DB2INST1 ipx_socket 879E
db2stop
db2start
```

After the database manager is stopped and started again, view the database manager configuration file to ensure that these changes have taken effect. Enter the following command in the command line processor:

```
get database manager configuration
```

If you are planning to only support clients that use Direct Addressing, you will be required to enter the server's IPX/SPX internetwork address as the DB2 server object name when cataloging the node on the client.

Determine the value for the *OBJECTNAME* parameter by entering the **db2ipxad** command on the server. This command is located in the `sqllib/misc/` directory for UNIX platforms, or the `sqllib\misc\` directory for all other platforms.

Make note of this output on your worksheet for use when you configure an IPX/SPX client using the command line processor.

If you are planning to support clients using only Direct Addressing, you are now finished the configuration and are ready to install a DB2 client. Go to Chapter 27, "Installing DB2 Clients" on page 273 for more information.

B. Register the DB2 DB2 Connect Server Instance on the NetWare File Server (for File Server Addressing Only)

The DB2 Connect server must be registered *after* the database manager configuration file has been updated with the IPX/SPX parameters. To register the DB2 Connect server instance at the NetWare File server, enter the following command in the command line processor:

```
register db2 server in nwbindery user USERNAME password PASSWORD
```

Notes:

1. *USERNAME* and *PASSWORD* must be specified in UPPERCASE.
2. The *USERNAME* and *PASSWORD* are used to log on to the NetWare file server and must have Supervisor/Administrator or Workgroup Manager security equivalence.
3. If you want to register at a NetWare 4.x file server (which uses directory services and provides bindery emulation capability), the *USERNAME* used must be created within the same context as the current bindery context used by Directory Services when it does bindery emulation. The bindery emulation context currently in use can be found by checking the bindery emulation setting on the NetWare 4.x file server (for example, by using the SERVMAN utility). For more information, refer to your IPX/SPX documentation.

Now that you have configured the server, you are ready to install a DB2 client. Go to Chapter 27, "Installing DB2 Clients" on page 273 for more information.

Configuring APPC on the DB2 Connect Server to Accept Clients

To access a remote server through APPC, you must first have installed and configured communication software for both the client and DB2 Connect server workstations. See "Software Requirements" on page 30 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 41 for the supported communication protocols for your particular client and server.

Before completing the steps in this section, be sure that you have completed the instructions in "Setting the DB2COMM Registry Value" on page 251.

The following steps are required to set up APPC communications:

1 Identify and record parameter values.

2 Configure the server:

    a Update the `database manager configuration` file.

    b Configure the APPC communications subsystem.

Step 1. Identify and Record Parameter Values

Before you proceed through the configuration steps, enter your value for the Transaction program name in the following table.

Table 27. APPC Values Required at the DB2 Connect Server			
Parameter	**Description**	**Sample Value**	**Your Value**
Transaction program name (*tpname*)	The Transaction program that the server listens on for client requests.	`nyserver`	

Step 2. Configure the DB2 Connect Server

The following steps describe how to configure this protocol on the server. Replace the sample value with your value as recorded on your worksheet.

A. Update the Database Manager Configuration File

You must update the database manager configuration file with the transaction program name (*tpname*).

To update the database manager configuration file, perform the following steps:

1 Log on to the system with a user account that belongs to the local Administrators group on each machine in your partitioned database system.

> If you have trouble logging on to the system, see "Logging on to the System" on page 343.

2 Set up the instance environment and invoke the DB2 command line processor as follows:

    a Run db2profile or db2cshrc 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.

    b Start the DB2 command line processor by entering the **db2** command.

3 Update the database manager configuration file with the server's transaction program name (*tpname*) using the following commands in the command line processor:

```
update dbm cfg using tpname tpname
db2stop
db2start
```

For example, if the server's transaction program name (*tpname*) is *nyserver*, use:

```
update dbm cfg using tpname nyserver
db2stop
db2start
```

If you are configuring the Administration Server to use APPC, you must update the admin server configuration file. Use the following command:

```
update admin configuration using tpname nyserver
db2admin stop
db2admin start
```

B. Configure the APPC Communications Subsystem

To configure your DB2 server to accept remote clients using APPC, you need to update the APPC communications subsystem to support the Transaction program name (*tpname*) that the server will use.

If you have not already configured your APPC communication subsystem to support the Transaction program name that you have specified for the DB2 Connect server, use the instructions in Chapter 11, "Configuring Communications to Host and AS/400 Databases Manually" on page 93 to complete the configuration.

If you have already configured your DB2 Connect server to support inbound APPC client communications, go to Chapter 34, "Configuring Client-to-Server Communications Using the Command Line Processor" on page 307.

Part 5. Installing and Configuring DB2 Clients

Chapter 27. Installing DB2 Clients

Use the instructions in this section to install a DB2 client.

A DB2 Client Application Enabler is installed with any DB2 Version 5 product. If a DB2 Version 5 product is already installed, there is no need to install a DB2 Client Application Enabler. To configure your client to access remote servers, see Chapter 33, "Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 303, or for UNIX users, see Chapter 34, "Configuring Client-to-Server Communications Using the Command Line Processor" on page 307.

Clients on a LAN that will connect to a DB2 Connect or DB2 Universal Database server must have the DB2 Client Application Enabler or the DB2 Software Developer's Kit installed. (The DB2 Software Developer's Kit must be ordered separately from DB2 Connect.)

DB2 Client Application Enablers and DB2 Software Developer's Kits are available for the following: AIX, DOS, HP-UX, Macintosh, OS/2, SCO UnixWare 7, SCO OpenServer, Silicon Graphics IRIX, SINIX, Solaris, Windows 3.x, and Windows 32-bit operating systems.

You may install DB2 Client Application Enablers on any number of workstations; licensing restrictions are controlled at the server.

Go to the section that gives instructions for the DB2 client that you want to install.

- Chapter 28, "Installing DB2 Clients on OS/2 Operating Systems" on page 275.
- Chapter 29, "Installing DB2 Clients on Windows 32-Bit Operating Systems" on page 277.
- Chapter 30, "Installing DB2 Clients on Windows 3.x Operating Systems" on page 281.
- Chapter 31, "Installing DB2 Clients on UNIX Operating Systems" on page 285.
- Chapter 32, "Installing DB2 Clients on Macintosh Operating Systems" on page 301.
- Chapter 43, "Unattended DB2 Installation on OS/2 Operating Systems" on page 419.
- Chapter 44, "Unattended DB2 Installation on Windows 32-bit Operating Systems" on page 429.

To obtain DB2 Client Application Enablers for all clients, including DOS, connect to the IBM Web site (http://www.software.ibm.com/data/db2/db2tech/clientpak.html), search for the `Client Application Enablers`, and follow the instructions provided.

Chapter 28. Installing DB2 Clients on OS/2 Operating Systems

This section contains the information that you need to install the DB2 Client Application Enabler on OS/2 operating systems.

To install the DB2 Client Application Enabler for OS/2:

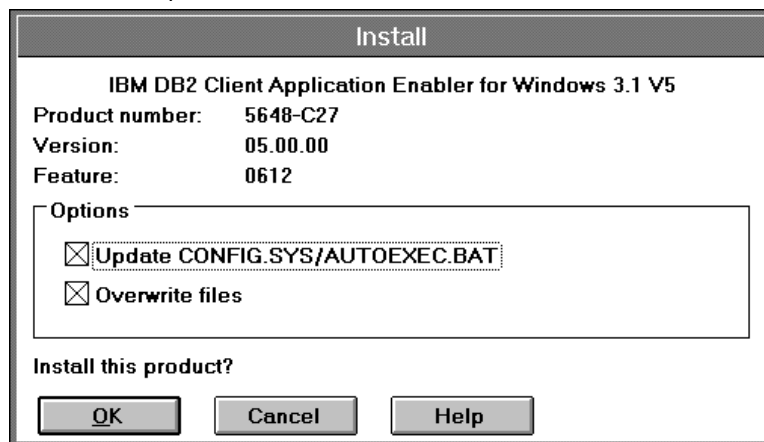**1** Insert the DB2 Client Application Enablers CD-ROM that contains the OS/2 client into the drive.

2 Begin the installation program as follows:

    a Open an OS/2 window and set the drive to *x:*, where *x* represents your CD-ROM drive.

    b Set the current directory to `\db2\os2\`*language*`\install`, where *language* is the two-character country code that represents your language (for example, `EN` for English). Table 49 on page 531 lists the codes for each available language.

    c Enter the **install** command.

The IBM DB2 for OS/2 Version 5 Installation window opens.

Select the **IBM DB2 Client Application Enabler** check box, and click on the **Continue** push button.

Invoke the online help by clicking on the **HELP** push button at any time. The Install window opens.

3 Indicate whether or not you want to update the config.sys file as part of the installation.

- If you want the config.sys file updated, click on **OK**. A backup copy of your existing file is kept as config.0xx. This is the recommended method.

- If you do not want the config.sys file updated, clear the **Update CONFIG.SYS** check box and click on **OK**. You will need to manually update your config.sys file with the values that are stored in the config.add file.

The Install - directories window opens.

4 The Install - directories window provides a list of components. You can choose which of the components you want to install on your system.

For the Install - directories window, complete the entries as follows:

a Select the components you want to install.

b In the **File directory** field, type the directory where you want the product installed. The default directory is c:\sqllib.

Note: If a DB2 Version 5 product is already installed on this workstation, you must install on the same drive and directory.

c Click on the **Disk Space** push button to see how much space you have on each of the drives on your machine, and to change disks if necessary.

d Click on the **Install** push button to begin the installation.

A progress window appears until the installation is complete. You can click on the **Stop** push button at any time to end the installation.

5 At the end of the installation, click on the **Exit** push button to exit the installation program. You must shut down and reboot before you can use the client.

Note: If you want to run Windows 3.x applications on your OS/2 client, you must also install the DB2 Client Application Enabler for Windows 3.x on your system. You should install this Client Application Enabler in the same directory as DB2 Client Application Enabler for OS/2. Having both DB2 Client Application Enablers in the same directory merges the DB2 directories and allows the CCA to configure the access to remote DB2 databases for both OS/2 and Windows 3.x applications.

To configure your client to access remote servers, go to Chapter 33, "Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 303.

Chapter 29. Installing DB2 Clients on Windows 32-Bit Operating Systems

This section contains the information you need to install the DB2 Client Application Enabler on Windows 32-bit operating systems.

To install a DB2 Client Application Enabler:

| **1** Log on as a local Administrator.

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

| **3** Insert the DB2 Client Application Enablers CD-ROM that contains the Windows
| 95, Windows 98, or Windows NT client 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, see the tip that follows.

To manually invoke the setup program, do the following:

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

2 Type the following in the **Open** field:

`x:\setup /i language`

where:

- `x:` represents your CD-ROM drive
- *language* represents the two-character country code for your language (for example, EN for English). Table 49 on page 531 lists the code for each available language.

3 Click on **OK**.

---

    4 The Welcome window opens.

Click on the **Next** push button to continue.

5 The Enable Remote Administration window opens. Select the **Install components required to administer remote servers** check box if you would like to administer remote servers from this client. Click on the **Next** push button.

6 Select the installation type you prefer:

 Typical Install: Installs those DB2 components that are used most often, including all required components, ODBC support, documentation, and commonly used DB2 tools such as the Client Configuration Assistant and the Information Center. A DB2 instance is created.

 Compact Install: Installs only the required DB2 components and ODBC support. A DB2 instance is created.

 Custom Install: Installs only those components that you select. A DB2 instance is created.

7 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 at any time.

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

8 After you install the product, you must reboot before you can begin to use it. Select a reboot option and click on the **Finish** push button. This completes the installation.

The installation program has:

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

To configure your client to access remote servers, go to Chapter 33, "Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 303.

Chapter 30. Installing DB2 Clients on Windows 3.x Operating Systems

If you are planning to support only local communications from a WIN-OS/2 session to an OS/2 server, it is recommended that you use the local Windows Support supplied with the DB2 for OS/2 server, and do not install the Windows 3.x Client Application Enabler. Go to Chapter 5, "Installing DB2 Connect on OS/2 Systems" on page 45 to install Windows support on your OS/2 server.

Note: If you have a previous version of the DB2 Client Application Enabler for Windows 3.x installed on your system, it is recommended that you back it up before beginning this installation procedure.

To install the DB2 Client Application Enabler on Windows 3.x:

1 Insert the DB2 Client Application Enablers CD-ROM that contains the Windows 3.x client into the drive.

2 To begin the installation program enter:

`x:\db2\windows\language\install\install.exe`

where `x:` represents your CD-ROM drive and where *language* is the two-character country code that represents your language (for example, `EN` for English). Table 49 on page 531 lists the codes for each available language.

The Install window opens.

```
┌──────────────────────────────────────────────────────┐
│                       Install                          │
├──────────────────────────────────────────────────────┤
│   IBM DB2 Client Application Enabler for Windows 3.1 V5 │
│   Product number:     5648-C27                         │
│   Version:            05.00.00                         │
│   Feature:            0612                             │
│  ┌─Options──────────────────────────────────────────┐ │
│  │   ☒ Update CONFIG.SYS/AUTOEXEC.BAT                │ │
│  │   ☒ Overwrite files                               │ │
│  │                                                    │ │
│  └────────────────────────────────────────────────────┘ │
│   Install this product?                                │
│   ┌────────┐   ┌────────┐   ┌────────┐                │
│   │   OK   │   │ Cancel │   │  Help  │                │
│   └────────┘   └────────┘   └────────┘                │
└──────────────────────────────────────────────────────┘
```

3 Indicate whether or not you want to update the `autoexec.bat` file as part of the installation.

Note: The `config.sys` file will not be modified by the installation.

- If you want the autoexec.bat file updated, check that the **Update CONFIG.SYS/AUTOEXEC.BAT** check box is selected, then click on **OK**. A backup copy, called autoexec.bak, is created in the same directory as your autoexec.bat file. This is the recommended method.
- If you do not want the autoexec.bat file updated, clear the **Update CONFIG.SYS/AUTOEXEC.BAT** check box. You will need to manually update your autoexec.bat file with the values that are stored in the autoexec.add file.

> The **Overwrite files** check box is selected by default, it is recommend that you do not change this setting.

4 Click on **OK** to continue. The Install - directories window opens.

5 Select the components that you want to install.

6 In the **File directory** field, type the directory where you want the product installed. The default directory is c:\sqllib.

> If you are installing the DB2 Client Application Enabler for Windows 3.x on an OS/2 system that already has the Version 5 DB2 Client Application Enabler for OS/2 installed, enter the same directory in the **File directory** field as the DB2 Client Application Enabler for OS/2. This will merge the two DB2 directories together, allowing tools like the Client Configuration Assistant to be used to configure clients to access a remote DB2 database for both Windows 3.x and OS/2 applications.

| **7** Click on the **Disk space** push button to see how much space you have on the
| selected drive.

8 Click on the **Install** push button to start the installation. A progress window
appears until the installation is complete.

You can click on the **Stop** push button at any time to exit the installation program.

| **9** Click on the **Exit** push button to end the installation.

10 Once you have completed the installation, restart your WIN-OS/2 session before
using the DB2 for Windows 3.x Client Application Enabler.

Chapter 31. Installing DB2 Clients on UNIX Operating Systems

This section contains the information that you need to install the DB2 Client Application Enabler on UNIX operating systems. See the following sections as appropriate:

- "Installing DB2 Version 5 Clients."

- "Installing DB2 Version 2 Clients" on page 295.

Before You Begin

Before you begin installing DB2 products using the DB2 Installer program, you need to gather the following information:

Where is the CD-ROM mount point?
You need to mount the CD-ROM before you can install the DB2 product. To mount the CD-ROM, you must know where the mount point is. For example, the CD-ROM mount point could be /cdrom.

Note: On the Solaris operating system, the CD-ROM is automatically mounted if the Volume Manager (vold) is running.

How do I assign a group name and user name for a DB2 instance?
A separate user name must be used for each DB2 Instance. We recommend that a new group be created which should be used as a primary group for the DB2 instance user.

Installing DB2 Version 5 Clients

To install the DB2 Client Application Enabler on AIX, HP-UX, SCO UnixWare 7, Silicon Graphics IRIX, and Solaris systems, perform the following steps:

Step 1. Update Kernel Configuration Parameters

To run DB2 Client Application Enabler for UNIX systems, you may have to update some kernel configuration parameters.

This step is not required on AIX. If you are installing an AIX client, skip this step and go to "Step 2. Mount the DB2 Client Application Enablers CD-ROM" on page 288.

Recommended Values for HP-UX Version 10 and Version 11

Table 28 lists the recommended values for the specified HP-UX kernel configuration parameters. These values are valid for HP-UX 10 and HP-UX 11.

Table 28. 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.

2. To maintain the interdependency among kernel parameters, change parameters in the same sequence in which they appear in Table 28.

To change a value:

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

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

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

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

5 Click on **OK**.

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

Recommended Values for SCO UnixWare 7

Table 29 lists the recommended values for the specified SCO UnixWare 7 kernel configuration parameters.

Table 29. SCO UnixWare 7 Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Recommended Value
msgmax	65535 (1)
msgmnb	65535 (1)
msgssz	524288
msgmni	256

Notes:

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

2. 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, do the following:

1 Enter the **scoadmin** command to start the System Administration tool.

2 Double-click on the **System** folder.

3 Double-click on the **System Tuner** icon.

4 Click on the drop down box and select the **Inter-Process Communication (IPC) Parameters**.

5 Select the parameter to be changed and enter the new value.

6 Click on **OK** when you have finished changing all the parameters.

7 Click on the **Yes** push button to rebuild the kernel.

8 Reboot the system so that the changes can take effect.

Recommended Values for Solaris

Table 30 lists the recommended values for the specified Solaris kernel configuration parameters.

Table 30. Solaris Kernel Configuration Parameters (Recommended Values)

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

Notes:

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

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 DB2 Client Application Enablers CD-ROM" to continue with the installation.

Step 2. Mount the DB2 Client Application Enablers CD-ROM

To install DB2 Client Application Enabler using the DB2 Installer, you must first mount the CD-ROM. Once you have mounted the CD-ROM, you can start installing the DB2 products.

Mounting on AIX Systems

Perform the following steps to mount the CD-ROM on AIX operating systems:

1. Log in as user with root authority.

2. Insert the DB2 Client Application Enablers CD-ROM in the drive.

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

   ```
   mkdir -p /cdrom
   ```

   where cdrom is the CD-ROM mount directory.

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

   ```
   smitty storage
   ```

5. Select **File Systems**.

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

7. Select **CDROM File Systems**.

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

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.

10. In the pop-up window, enter /cdrom as the **mount point**.

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

    ```
    smit mountfs
    ```

12. Select the **FileSystem** name. For example, the name could be /dev/cd0.

13. Select the **Directory** name, /cdrom.

14. Select the **Type of filesystem**, cdrfs.

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

16. Log off.

Go to "Step 3. Perform the Installation" on page 292 to continue with the installation.

Mounting on HP-UX Systems

Perform the following steps to mount the CD-ROM on HP-UX operating systems:

1 Log in as user with root authority.

2 Insert the CD-ROM in the drive and mount it as in the following example:

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

where `/cdrom` is the CD-ROM mount directory.

3 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**.

Mounting on SCO UnixWare 7

Perform the following steps to mount the CD-ROM on SCO UnixWare 7 operating systems:

1 Log in as user with root authority.

2 Insert the DB2 Client Application Enablers CD-ROM into the drive and mount it. For example, to mount the CD-ROM as /cdrom, type:

```
mount -F cdfs -o ro /dev/cdrom/c0b0t5l0 /cdrom
```

where `c0b0t5l0` is the device name found under `/dev/cdrom` directory and varies with the particular hardware on the system.

3 Log out.

Mounting on Silicon Graphics IRIX

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

1 Log in as user with root authority.

2 Insert the DB2 Client Application Enablers 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.

Mounting on Solaris Systems

Perform the following steps to mount the CD-ROM on Solaris operating systems:

1 Log in as user with root authority.

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* is the CD-ROM mount directory.

> 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
```

3 Log out.

Step 3. Perform the Installation

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

> If you are installing the DB2 Client Application Enabler 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.

1 Log in as user with root authority.

2 Insert the DB2 Client Application Enablers CD-ROM in the drive and if required, mount the CD-ROM. Refer to "Step 2. Mount the DB2 Client Application Enablers CD-ROM" on page 288 if you need to mount the CD-ROM.

3 Change to the directory where the DB2 install CD-ROM is mounted and run the following command:

```
./db2setup
```

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

- On AIX:

  ```
  cd /cdrom/db2/aix
  ```

- On HP-UX:

  ```
  cd /cdrom/db2/hpux10 (for HP-UX Version 10)
  cd /cdrom/db2/hpux11 (for HP-UX Version 11)
  ```

- On SCO UnixWare 7:

  ```
  cd /cdrom/db2/scouw
  ```

- On SGI:

  ```
  cd /cdrom/db2/sgi
  ```

- On Solaris:

  ```
  cd /cdrom/unnamed_cdrom/db2/solaris
  ```

5 To install the client, enter the following commands:

```
cd /cdrom
./db2setup
```

The installation program will proceed to install the appropriate client on your workstation.

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

```
+ - - - - - - - - - - - - - - - - - - - - -  Install DB2 V5  - - - - - - - - - - - - - - - - - - - - - +
|                                                                                      |
|                                                                                      |
|   Select the products you are licensed to install. Your Proof of                     |
|   Entitlement and License Information booklet identify the products for               |
|   which you are licensed.                                                            |
|                                                                                      |
|   To see the preselected components or customize the selection, select                |
|   Customize for the product.                                                         |
|   [ * ]  DB2 Client Application Enabler                  [  Customize. . . ]          |
|                                                                                      |
|                                                                                      |
|                                                                                      |
|                                                                                      |
|                                                                                      |
|                                                                                      |
|    To choose a language for the following components, select Customize for            |
|    the product.                                                                      |
|       DB2 Product Messages                              [   Customize. . . ]          |
|       DB2 Product Library                               [   Customize. . . ]          |
|                                                                                      |
|   [   OK    ]                   [ Cancel  ]                    [   Help   ]          |
+ - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - +
```
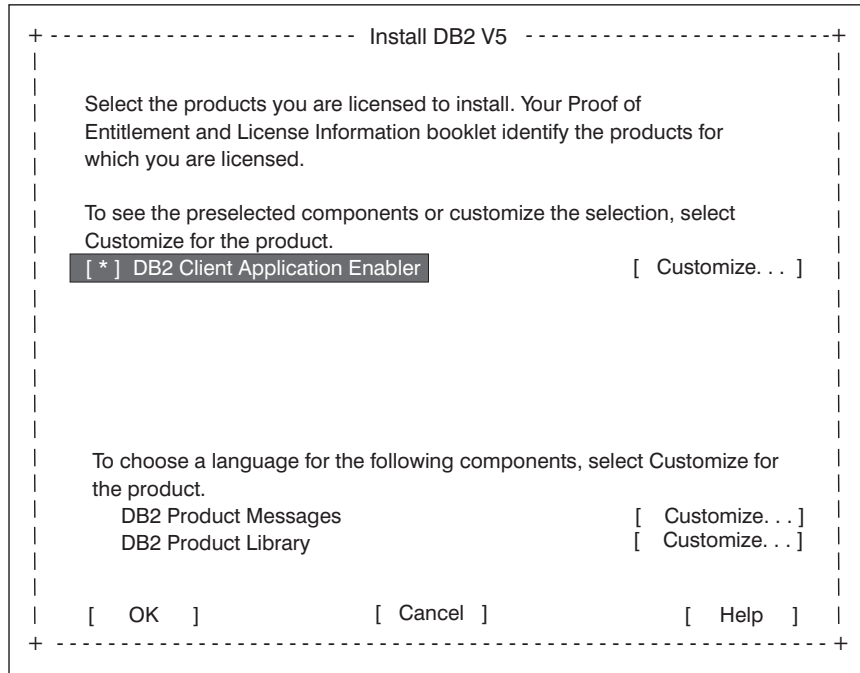
Note: Your screen will be different if you have already installed DB2 Version 5 products on your system. See Chapter 8, "Installing Additional Products and Creating Additional Instances" on page 73 for more information.

6 From the product list on the Install DB2 V5 window, select the DB2 products that you want to install.

To display the required and optional components for a product that you want to install, select **Customize**. The optional components that are most typically used are pre-selected for you.

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

When you have finished your selection, select **OK**. To undo any selections you made, select **Default**. The Create DB2 Services window opens.

7 At the Create DB2 Services window, select the **Create a DB2 Instance** option. The DB2 Instance window opens:

```
+ --------------------- Create DB2 Services -------------------- +
|                                                                |
|   + --- DB2 Instance --------------------------------------- + |
|   |                                                          | |
|   |   Authentication:                                        | |
|   |     Enter User ID, Group ID, Home Directory and Password that | |
|   |     will be used for the DB2 Instance.                   | |
|   |     User Name            [ db2inst1 ]                    | |
|   |     User ID              :      :         [ * ] Use default UID | |
|   |     Group Name           [db2iadm1]                      | |
|   |     Group ID             :      :         [ * ] Use default GID | |
|   |     Home Directory       [/home/db2inst1 ]               | |
|   |     Password             [ ******       ]                | |
|   |     Verify Password      [ ******       ]                | |
|   |                                                          | |
|   |     Select Properties to view or change    : Properties : | |
|   |     more options.                                        | |
|   |     Select Default to restore all          [ Default  ]  | |
|   |     default settings.                                    | |
|   |                                                          | |
|   |                                                          | |
|   |   [   OK    ]          [ Cancel ]          [  Help   ]   | |
|   + -------------------------------------------------------- + |
+ -------------------------------------------------------------- +
```

You can use the default values displayed at the DB2 Instance window or change them. To change the default **User ID** for the instance, deselect **Use default UID** and enter a new value for the **User ID**.

8 Complete the fields and select **OK**.

9 Select **OK** and the Summary Report window opens. The report lists the installable items as well as the location of the installation log file.

10 Select the Summary Report field and use the Up or Down arrow keys to review the Summary Report. If the selections are not correct, press the **ESC** or **F3** key, to return to the previous screen. Otherwise select **Continue** to start the installation.

11 When the installation is complete, use the Up or Down arrow keys to review the Status Report. Select **View Log** to view the installation log file. Select **OK** to close the Status Report screen.

12 Select **Close** from the DB2 Installer screen to terminate the DB2 Installer program.

After the installation is complete, the software is installed in the `DB2DIR` directory,

where DB2DIR	= /usr/lpp/db2_05_00	on AIX
	= /opt/IBMdb2/V5.0	on HP-UX, SCO UnixWare 7, SGI IRIX, or Solaris

Proceed to Chapter 34, "Configuring Client-to-Server Communications Using the Command Line Processor" on page 307.

Installing DB2 Version 2 Clients

| This section details installing DB2 products on SINIX and SCO OpenServer Clients.

Installing DB2 Version 2 Clients on SINIX

| To install the DB2 Client Application Enabler on SINIX, perform the following steps:

1 Log in as user with root authority.

2 Insert the DB2 Client Application Enablers CD-ROM into the drive and mount it using either the **sysadm** or the **mount** command as follows:

```
mkdir /cdrom
mount -F hs /dev/ios0/sdisk006s0 /cdrom
```

where `/cdrom` is the CD-ROM mount directory.

The install images for DB2 for SINIX products are available in the `/cdrom/db2/sinix/IBMdb2` directory.

| **3** Install the DB2 Client Application Enabler. Type the following command:

| ```
  pkgadd -d /cdrom/db2/sinix/IBMdb2 db2cliv21 db2msgDe db2conv
  ```

Some kernel configuration parameters must be changed to use DB2 Client Application Enabler for SINIX. Use the SINIX **idtune** command to update the values as given in Table 31 on page 296. After doing so, rebuild the SINIX kernel and reboot the system for the changes to take effect.

| Table 31 on page 296 lists the recommended values for the specified SINIX kernel
| configuration parameters.

| Table 31. SINIX Kernel Configuration Parameters (Recommended Values)

| SINIX RM600 Kernel Parameter | Recommended Value |
|---|---|
| msgmax | 65535 |
| msgmnb | 65535 |
| msgseg | 8192 |
| msgssz | 16 |

**Note:** The kernel configuration parameters msgmnb and msgmax must be changed to 65535.

# Installing DB2 Version 2 Clients on SCO OpenServer

To install the DB2 Client Application Enabler on SCO OpenServer, perform the following steps:

**1** Log in as user with root authority.

**2** Insert the DB2 Client Application Enablers CD-ROM into the drive and mount the CD-ROM by entering:

    mkdir /cdrom
    mount /dev/cd0 /cdrom

where /cdrom is the CD-ROM mount directory.

The install images for the DB2 products are available in the /cdrom/db2/sco/IBMdb2 directory.

**3** Enter the **custom** command. The Software Manager window opens.

**4** From the Software Manager window, do the following:

   **a** From the **Software** pulldown menu, select **Install New**.

   **b** If you are doing a remote install, select the host from which you want to install. Otherwise, select **Continue.**

   **c** From the **Media Images** menu, select **Media Images** and select **Continue**.

   **d** In the **Image Directory** field, enter:

        /cdrom/db2/sco/IBMdb2

   **e** Choose the software you want to install:

   - To install all components, select **Full**.

   - To install selected components, choose **Partial**. On the Software Selection window, highlight the products you want to install:

     – DB2 Client Application Enabler for SCO OpenServer

| – DB2 Software Developer's Kit for SCO OpenServer

| – DB2 Product Messages for SCO OpenServer.

| Press Enter.

| **f** Update the kernel configuration parameters.

| Change the values as given in Table 32 by updating the
| /etc/conf/cf.d/stune file. Then, rebuild the kernel and reboot the system
| for the changes to take effect.

| *Table 32. SCO OpenServer Kernel Configuration Parameters (Recommended Values)*

| Kernel Parameter | Recommended Value |
| --- | --- |
| msgssz | 64 |
| semmap | 100 |
| semmi | 100 |
| semmns | 100 |
| semmnu | 100 |

# *Create or Assign Groups and Users*

If you do not already have a user ID to own the instance and a system administration
group ID that is the primary group of the instance owner, create these as follows:

**1** Log in as user with root authority.

| **2** Create a system administration group ID using either the **sysadm** or **groupadd**
| command. For example, to create a group named dbadmin1, type:

| groupadd dbadmin1

| **3** Create a user ID that will be the instance owner using either the **sysadm** or
| **useradd** command. For example, to create a user named inst1 type:

| useradd -g dbadmin1 -G dbadmin1 -d /home/inst1 inst1
| passwd inst1

> - When choosing a name for a group or user, follow the rules described
>   in Appendix G, "Naming Rules" on page 553.
> - Dedicate the instance-owner user ID to that instance's use only. This
>   allows for easier error recovery if a system error occurs.

# Create an Instance of the Product

Use the **db2icrt** command to create an instance of the product. The **db2icrt** command is located in the `/opt/IBMdb2/V5.0/instance` directory.

On SCO OpenServer, go to the `/usr/IBMdb2/V2.1/instance` directory. On SINIX, go to the `/opt/IBMdb2/V2.1/instance` directory.

The syntax of the **db2icrt** command is:

```
►►─── db2icrt ──── InstName ──────── [-a AuthType] ─────── [-u FencedID] ──────────►◄
```

where:

instance_name   Is the login name of the instance owner.

-a *AuthType*   Is an optional parameter that 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 server product is installed. Otherwise, the *AuthType* is set to CLIENT.

        Note: The authentication type of the instance applies to all databases under the instance.

-u *FencedID*   Is the user under which the fenced UDFs and stored procedures will execute. This is not required if you install the DB2 Client Application Enabler or the DB2 Software Developer's Kit. For other products, this is an required parameter.

        Note: *FencedID* may not be root or bin.

To create an instance for the DB2 client, you can use the following command:

```
db2icrt db2inst1
```

When an instance is created, its name is also added to the list of instances on the system.

The **db2icrt** command creates the *INSTHOME*/sqllib directory, where *INSTHOME* is the home directory of the instance owner.

Set Up the DB2 Operating Environment

Before starting DB2, you must execute a script to set up the DB2 operating environment and select an instance. The sample script files, db2profile (for Bourne or Korn shell) and db2cshrc (for C shell) are provided to help you set up the operating environment for a DB2 instance.

The instance owner may customize these scripts for all users of an instance. These scripts are available in the `INSTHOME/sqllib` directory, where `INSTHOME` is the home directory of the instance.

Determine the most appropriate way to execute the commands in the sample `db2profile` or `db2cshrc` script file in your environment and instruct your users to do it. For example you could add the following to the start-up script:

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

Create Links for DB2 Files

If you are developing or running applications, you may want to create links for DB2 libraries to avoid specifying the full path to the product libraries and the include files. To create these links, use the **db2ln** command.

On SCO OpenServer systems, type:

```
/usr/IBMdb2/V2.1/cfg/db2ln
```

On SINIX systems, type:

```
/opt/IBMdb2/V2.1/cfg/db2ln
```

This creates links from the DB2 libraries to `/usr/lib`, and from the DB2 include files to `/usr/include`.

To configure your client to access remote DB2 Connect workstations or DB2 servers, go to Chapter 34, "Configuring Client-to-Server Communications Using the Command Line Processor" on page 307. To configure your DB2 Connect workstation to access remote hosts, go to Chapter 11, "Configuring Communications to Host and AS/400 Databases Manually" on page 93.

Chapter 32. Installing DB2 Clients on Macintosh Operating Systems

To install the DB2 Client Application Enabler on a Macintosh operating system, perform the following steps:

1 Insert the DB2 Client Application Enablers CD-ROM into the drive.

2 Double-click on the **DB2_CAE_V502** icon.

3 Double-click on the **MAC** folder.

4 Double-click on the *language* folder, where *language* is the two-character country code that represents your language (for example, EN for English). Table 49 on page 531 lists the codes for each available language.

5 Double-click on the **CLIENT** folder.

6 Double-click on the **CAEMAC** icon to start the installation. The Welcome window opens.

7 Follow the instructions provided to complete the installation.

8 When the install program is finished, click on the **Restart** push button to restart your computer and complete the installation.

To configure your client to access a remote DB2 Connect server, see Chapter 34, "Configuring Client-to-Server Communications Using the Command Line Processor" on page 307.

Chapter 33. Configuring Client-to-Server Communications Using the Client Configuration Assistant

The information in this section describes how to use the Client Configuration Assistant to configure OS/2 and Windows 32-bit operating systems to access remote DB2 Universal Database servers.

To configure all other clients, see Chapter 34, "Configuring Client-to-Server Communications Using the Command Line Processor" on page 307.

Use the Client Configuration Assistant to configure your OS/2 and Windows 32-bit operating systems to access remote DB2 Connect workstations or DB2 Universal Database servers. The Client Configuration Assistant provides three configuration methods:

- One method makes use of a server's access profile

- One method searches the network for databases

- One method requires that you enter the database name and the communication protocol parameters for the DB2 server.

Perform the following steps to configure your workstation to access remote servers:

1 Start the Client Configuration Assistant.

For OS/2:
Double-click on the **Client Configuration Assistant** icon, located in the **DB2 for OS/2** folder.

For Windows 32-bit operating systems:
Click on **Start** and select **Programs**->**DB2 for Windows**->**Client Configuration Assistant**.

The Welcome panel opens each time you start the CCA, until you have added at least one database to your client.

2 Click on the **Add Database** or **Add** push button to configure connections using the Add Database SmartGuide. Choose one of the following configuration methods:

- If your administrator provided you a server profile, select the **Use an access profile** radio button and click on the **Next** push button.

    a Click on the **Browse** push button and select the appropriate access profile.

b You are presented with a list of systems, instances, and databases. Select the database that you want to add and proceed to Step 3.

- If you want to search the network for databases, select the **Search the network** radio button and click on the **Next** push button.

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

   b 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 and proceed to Step 3.

> The **Other Systems (Search the network)** icon will only appear if the client's *DISCOVER* parameter is set to SEARCH (this is the default setting).

   c If the system that contains the database that you want to add is not listed, click on the **[+]** sign beside the **Other Systems (Search the network)** icon to search the network for additional systems. Click on the **[+]** sign beside a system to get a list of the instances and databases in it. Select the database that you want to add and proceed to Step 3.

   d If the system you want is still not listed, it can be added to the list of systems by clicking on the **Add System** push button. Enter the required communication protocol parameters for the remote Administration Server and click on **OK**. For more information, click on the **Help** push button.

   Select the database that you want to add and proceed to Step 3.

> The Client Configuration Assistant may be unable to detect the remote system if:
>
> - The Administration Server *DISCOVER* configuration parameter on the remote system is set to DISCOVER=DISABLE.
>
> - The *DB2COMM* registry value and the *DISCOVER_COMM* configuration parameter are not configured on the Administration Server of the remote system with a discovery protocol being used on the client (the client discovery protocol is specified by the *DISCOVER_COMM* configuration parameter in the client's configuration).
>
> - The Administration Server is not running on the remote system.
>
> - 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 configure the *DB2DISCOVERYTIME* registry value to specify a longer period of time.
>
> - The network that the Discovery request is running on may have been configured so that the Discovery request does not reach the remote system desired.
>
> - If you are using NetBIOS as the Discovery protocol, you may need to configure the *DB2NBDISCOVERRCVBUFS* registry value to a larger value to enable the client to receive more concurrent Discovery replies.

- If you have the protocol information for the database that you want to connect to, select the **Manually configure a connection to a DB2 database** radio button and click on the **Next** push button.

    a 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 selected the **TCP/IP** or **APPC** radio button, select the radio button that corresponds to the type of system where the database that you are trying to connect to resides.

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

    c Enter the database alias name of the database that you want to connect to in the **Target database** field and click on the **Next** push button.

> 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 specified.

3 To specify a local database alias name or to add a description, click on the **Next** push button. If you do not want to specify a database alias name, or add a description, click on the **Done** push button. If you do not specify a database alias name, the default will be the same as the remote database alias name.

4 If you want to run ODBC-enabled applications, click on the **Next** push button. If you do not plan to use ODBC, click on the **Done** push button to finish using the Add Database SmartGuide and proceed to Step 6.

5 If you are using ODBC applications:

    a Select the **Register this database for ODBC** check box, if it is not pre-selected.

    b Select the radio button that describes the type of data source that you want to register this database as. For more information, click on the **Help** push button.

    c Click on the **Application** drop down box and select the application that you want to use.

    d Click on the **Done** push button to finish using the Add Database SmartGuide and add the database that you selected.

6 The Confirmation window opens. Click on the **Test Connection** push button to test the connection to this database.

7 Enter your user ID and password to access the database and click on **OK**. If the connection is successful, a message confirming the connection appears. If the connection fails, click on the **Help** push button for more information. If you require additional information, refer to the *Troubleshooting Guide*.

8 You are now able to use this database. If you want to access another database, click on the **Add Another** push button. To finish using the Add Database SmartGuide, click on the **Close** push button.

Chapter 34. Configuring Client-to-Server Communications Using the Command Line Processor

This section describes how to use commands to configure a client to communicate with a DB2 Connect server using the command line processor.

> If you are planning to use an OS/2 or Windows 32-bit client for communications, the Client Configuration Assistant (CCA) makes it easy to automate the tasks of configuring and administering DB2 clients to communicate with DB2 servers. If you have installed the CCA, it is recommended that you use this utility to configure your DB2 clients for communications. See Chapter 33, "Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 303 for more information.

For instructions on using the command line processor, see Chapter 40, "Entering DB2 Commands and SQL Statements" on page 389. For a description of database naming rules, see Appendix G, "Naming Rules" on page 553.

Go to the communication protocol that you want your client to use to access a remote server.

- Named Pipes - see "Configuring Named Pipes on the Client"
- TCP/IP - see "Configuring TCP/IP on the Client" on page 312
- NetBIOS - see "Configuring NetBIOS on the Client" on page 321
- IPX/SPX - see "Configuring IPX/SPX on the Client" on page 329
- APPC - refer to the *Installing and Configuring DB2 Clients* online manual for more information.

Configuring Named Pipes on the Client

This section assumes that Named Pipes is functional on the client and DB2 Connect server workstations. See "Software Requirements" on page 30 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 41 for the supported communication protocols for your particular client and server.

The following steps are required to set up a client to use Named Pipe communications:

1 Identify and record parameter values.

2 Configure the client:

    a Catalog the Named Pipes node.

    b Catalog the database.

3 Test the connection between the client and server.

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 33. Named Pipe Values Required at the Client			
Parameter	**Description**	**Sample Value**	**Your Value**
Computer name (*computer_name*)	The computer name of the DB2 Connect server machine. On the server machine, to locate the value for this parameter, click on **Start** and select **Settings**-> **Control Panel**. Double-click on the **Network** folder and select the **Identification** tab. Record the computer name.	`server1`	
Instance name (*instance_name*)	The name of the instance on the DB2 Connect server.	`db2`	
Node name (*node_name*)	A local alias, or nickname, that describes the DB2 Connect server to the node where the database resides. 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 describe how to configure this protocol on the client. Replace the sample values with your worksheet values.

A. Catalog the Named Pipes 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 server's Computer name (*computer_name*), and the Instance name (*instance_name*) that the client will use to access the remote server.

To catalog the Named Pipes node, perform the following steps:

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

> If you have trouble logging on to the system, see "Logging on to the System" on page 343.

2 Catalog the node by entering the following commands in the command line processor:

```
catalog npipe node node_name remote computer_name instance instance_name
terminate
```

For example, to catalog a remote node called *db2node*, which is located on the server called *server1*, in the *db2* instance, use:

```
catalog npipe node db2node remote server1 instance db2
terminate
```

> If you need to change values that were set with the **catalog node** command, first run the **uncatalog node** command in the command line processor as follows:
>
> ```
> uncatalog node node_name
> ```
>
> Recatalog the node with the value that you want to use.

B. 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.

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

> If you have trouble logging on to the system, see "Logging on to the System" on page 343.

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

Table 34. 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`	

3 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 a remote database called *sample* so that it has the alias *tor1*, on the node *db2node*, use:

```
catalog database sample as tor1 at node db2node
terminate
```

	If you need to change values that were set with the **catalog** *database* command, first run the **uncatalog** *database* command in the command line processor as follows: `uncatalog database database_alias` Recatalog the database with the value that you want to use.

Step 3. Test the Client-to-Server Connection

When the configuration of the server and client is complete, use the following steps to verify that you can access data from a remote database:

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

1 Start the database manager by entering the **db2start** command on the server (if it was not automatically started at boot time).

2 Enter the following command in the client's Command Center or command line processor 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. Authentication for connecting to host databases is set while configuring the DB2 Connect server. Refer to the *DB2 Connect User's Guide* for more information.

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"
(for UNIX-based platforms)
"select tabname from syscat.tables"
(for other platforms)
```

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

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 *npipe*.

> Check the settings for the *db2comm* registry value by entering the **db2set DB2COMM** command. For more information, see Chapter 41, "Controlling Your DB2 Environment" on page 395.

2 The security service was started (enter the **net start db2ntsecserver** command - for Windows NT servers only).

3 The database was created and cataloged properly.

4 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 is displayed and the error messages are logged in the db2diag.log file.
>
> Refer to the *Troubleshooting Guide* for information on the db2diag.log file.

At the *client*:

1 The node was cataloged with the correct computer name (*computer_name*) and instance name (*instance_name*), of the server, where the database DB2 Connect server resides.

2 The node name (*node_name*), specified in the database directory, points to the correct entry in the node directory.

3 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.

After you verify these items, refer to the *Troubleshooting Guide* if the connection still fails.

Configuring TCP/IP on the Client

This section assumes that TCP/IP is functional on the client and DB2 server workstations. See "Software Requirements" on page 30 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 41 for the supported communication protocols for your particular client and server.

The following steps are required to set up a DB2 client to use TCP/IP communications:

1 Identify and record parameter values.

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.

3 Test the connection between the client and server.

> Due to the characteristics of the TCP/IP protocol, the TCP/IP subsystem 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 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 35 (Page 1 of 2). TCP/IP Values Required at the Client

Parameter	Description	Sample Value	Your Value
Hostname (*hostname*) or IP address (*ip_address*)	Use the *hostname* or *ip_address* of the remote server workstation. To resolve this parameter: • Issue the **hostname** command at the server to obtain the *hostname*. • Contact the server administrator to obtain the *ip_address*. (On AIX, you can enter the **ping** *server_hostname* command to obtain the *ip_address*).	serverhost or 9.21.15.235	

Table 35 (Page 2 of 2). TCP/IP Values Required at the Client			
Parameter	**Description**	**Sample Value**	**Your Value**
Connection Port • Connection Service name (*svcename*) • Port number/Protocol (*port_number*/tcp)	Values required in the services file. The Connection Service name is an arbitrary name used to represent the 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 DB2 server.) This value must not be in use by any another applications, and must be unique within the services file.	server1 3700/tcp	
Node name (*node_name*)	A local alias, or nickname, that describes the DB2 Connect server to the node where the database resides. 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 describe how to configure this protocol on the client. Replace the sample values with your worksheet values.

Step 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 316.

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 host in the local hosts file. See Table 36 on page 315 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 36. Location of the Local Hosts and Services Files

Platform	Location
Macintosh	The `hosts` file is located in the folder called **System Folder**. **Note:** This operating system does not use a `services` file. You must catalog this node using the *port_number* parameter. See "Step C. Catalog a TCP/IP Node" on page 316 for more information.
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.
Windows 3.x	Typically in the `tcpip_product\etc` directory, but it depends on the products that you have installed. Refer to your TCP/IP documentation for more information.
Windows 95 and Windows 98	`windows` directory
Windows NT	`winnt\system32\drivers\etc` directory
UNIX	`/etc` directory

Using a text editor, add an entry to the client's `hosts` file for the server's hostname. For example:

```
9.21.15.235     serverhost   # host address for serverhost
```

where:

9.21.15.235   is the *ip_address*

serverhost   is the *hostname*

is a comment describing the entry

Notes:

1. 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.

2. For specific information on resolving host addresses, refer to your TCP/IP documentation.

Step B. Update the Services File

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

If you are configuring a DB2 for Macintosh client, you must catalog the TCP/IP node using the port number (*port_number*). Go to "Step C. Catalog a TCP/IP Node" to catalog the node.

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	is the Connection Service name
3700	is the port number for the Connection Port
`tcp`	is the communication protocol that you are using
#	is 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 is using 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 "Step A. Resolve the Server's Host Address" on page 314.
>
> See Table 36 on page 315 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:

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

> If you have trouble logging on to the system, see "Logging on to the System" on page 343.

> If you are configuring communications for a Windows 3.x client, you can use the Client Setup tool to complete this task. Go to "Using the Client Setup Tool to Configure a Windows 3.x Client" on page 336 to catalog a node using the Client Setup tool.

---

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

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

3 Catalog the node by entering the following commands in the command line processor:

```
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*, use:

```
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*, use:

```
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, first run the **uncatalog node** command in the command line processor as follows:
>
> ```
> uncatalog node node_name
> ```
>
> Recatalog the node with the value 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.

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

> If you have trouble logging on to the system, see "Logging on to the System" on page 343.

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

Table 37. 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`	

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

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

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 a remote database called *sample* so that it has the alias *tor1*, on the node *db2node*, use:

```
catalog database sample as tor1 at node db2node
terminate
```

> If you need to change values that were set with the **catalog** *database* command, first run the **uncatalog** *database* command in the command line processor as follows:
>
> ```
> uncatalog database database_alias
> ```
>
> Recatalog the database with the value that you want to use.

Step 3. Test the Client-to-Server Connection

When the configuration of the server and client is complete, use the following steps to verify that you can access data from a remote database:

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

1 Start the database manager by entering the **db2start** command on the server (if it was not automatically started at boot time).

2 Enter the following command in the client's Command Center or command line processor 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. Authentication for connecting to host databases is set while configuring the DB2 Connect server. Refer to the *DB2 Connect User's Guide* for more information.

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"
(for UNIX-based platforms)
"select tabname from syscat.tables"
(for other platforms)
```

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

You are ready to start using the DB2 server. See Chapter 36, "Getting Started with DB2 Universal Database" on page 343 for details.

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, see Chapter 41, "Controlling Your DB2 Environment" on page 395.

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 is displayed and the error messages are logged in the `db2diag.log` file.
>
> Refer to the *Troubleshooting Guide* for information on the `db2diag.log` file.

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*), 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.

After you verify these items, refer to the *Troubleshooting Guide* if the connection still fails.

Configuring NetBIOS on the Client

This section assumes that NetBIOS is functional on the client and DB2 server workstations. See "Software Requirements" on page 30 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 41 for the supported communication protocols for your particular client and server.

The following steps are required to set up a client to use NetBIOS communications:

1 Identify and record parameter values.

2 Configure the client:

    a Record the network route for the Logical adapter number.

    b Update the database manager configuration file.

    c Catalog the NetBIOS node.

    d Catalog the database.

3 Test the connection between the client and server.

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 38 (Page 1 of 2). NetBIOS Values Required at the Client			
Parameter	**Description**	**Sample Value**	**Your Value**
Logical adapter number (*adapter_number*)	The local logical adapters that will be used for the NetBIOS connection.	0	

Table 38 (Page 2 of 2). NetBIOS Values Required at the Client			
Parameter	**Description**	**Sample Value**	**Your Value**
Workstation name (*nname*) - on the client	The NetBIOS name of the *client* workstation. *nname* is chosen by the user and must be unique among all NetBIOS nodes in the network.	`client1`	
Workstation name (*nname*) - on the server	The NetBIOS name of the *server* workstation. Locate this parameter in the database manager configuration file on the server.	`server1`	
Node name (*node_name*)	A local alias, or nickname, that describes the DB2 Connect server to the node where the database resides. 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 describe how to configure this protocol on the client. Replace the sample values with your worksheet values.

A. Record the Logical Adapter Number Used for the NetBIOS Connection

To view and record the logical adapter number (*adapter_number*) used for the NetBIOS connection, perform the following:

- For OS/2:

    1 Double-click on the **MPTS** icon.

    2 Click on the **Configure** push button.

    3 Select the **LAN adapters and protocols** radio button and click on the **Configure** push button.

    4 Record the Logical adapter number associated with the **IBM OS/2 NETBIOS** entry in the Current Configuration window.

    5 Click on the **Cancel** push button.

    6 Click on the **Close** push button.

    7 Click on the **Exit** push button.

- For Windows 3.x

  Record the logical adapter number *0*. If you experience problems making your NetBIOS connection, refer to the *Troubleshooting Guide* .

| - For Windows 95 and Windows 98:

| > There is no interface on the Windows 95 or Windows 98 operating system that you can use to record the adapter number used for the NetBIOS connection. Complete the following steps to have the NetBIOS protocol default to use the adapter number *0*.

| **1** Click on **Start** and select **Settings**->**Control Panel**.

| **2** Double-click on the **Network** icon.

| **3** Select the **NetBEUI** icon from the following Network components are installed window.

| **4** Click on the **Properties** push button.

| **5** Select the **Advanced** tab.

| **6** Select the **Set this protocol to be the default** check box.

| **7** Click on **OK** to exit this window.

| **8** Click on **OK**.

| **9** Record the value *0* as the logical adapter number on your worksheet.

| **10** Shut down and reboot your system for these changes to take effect.

- For Windows NT:

  > The logical adapter number (*adapter_number*) that you use *must* be associated with the **Nbf** Network Route for native NetBIOS.

  1 Click on **Start** and select **Settings**->**Control Panel**.

  2 Double-click on the **Network** icon and select the **Services** tab.

  3 Select the **NetBIOS Interface** icon from the Network Services window and click on the **Properties** push button.

  4 Scroll through the network routes until you find the logical adapter number associated with **Nbf** and record it on your worksheet.

  5 Click on **OK**.

  6 Click on the **Close** push button.

B. Update the Database Manager Configuration File

You must update the database manager configuration file with the *client's* workstation name (*nname*) parameter.

To update the database manager configuration file, perform the following steps:

1 Log on to the system with a user account that belongs to the local Administrators group on each machine in your partitioned database system.

> If you have trouble logging on to the system, see "Logging on to the System" on page 343.

2 Update the database manager configuration file with the client's Workstation name (*nname*) parameter using the following commands in the command line processor:

```
update database manager configuration using nname nname
terminate
```

For example, if the client's workstation name (*nname*) is client1, use:

```
update database manager configuration using nname client1
terminate
```

C. Catalog the NetBIOS 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 remote *server's* workstation name (*nname*), and the Logical adapter number (*adapter_number*) that the client will use to access the remote DB2 server.

To catalog the NetBIOS node, perform the following steps:

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

> If you have trouble logging on to the system, see "Logging on to the System" on page 343.

If you are configuring communications for a Windows 3.x client, you can use the Client Setup tool to complete this task. Go to "Using the Client Setup Tool to Configure a Windows 3.x Client" on page 336 to catalog a node using the Client Setup tool.

---

2 Catalog the node by entering the following commands in the command line processor:

```
catalog netbios node node_name remote nname adapter adapter_number
terminate
```

For example, to catalog a remote database server *server1* on the node called *db2node*, using the logical adapter number *0*, use:

```
catalog netbios node db2node remote server1 adapter 0
terminate
```

> If you need to change values that were set with the **catalog node** command, first run the **uncatalog node** command in the command line processor as follows:
>
> ```
> uncatalog node node_name
> ```
>
> Recatalog the node with the value that you want to use.

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.

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

> If you have trouble logging on to the system, see "Logging on to the System" on page 343.

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

Table 39. 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`	

If you are configuring communications for a Windows 3.x client, you can use the Client Setup tool to complete this task. Go to "Using the Client Setup Tool to Configure a Windows 3.x Client" on page 336 to catalog a database using the Client Setup tool.

3 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 a remote database called *sample* so that it has the alias *tor1*, on the node *db2node*, use:

```
catalog database sample as tor1 at node db2node
terminate
```

> If you need to change values that were set with the **catalog** *database* command, first run the **uncatalog** *database* command in the command line processor as follows:
>
> ```
> uncatalog database database_alias
> ```
>
> Recatalog the database with the value that you want to use.

Step 3. Test the Client-to-Server Connection

When the configuration of the server and client is complete, use the following steps to verify that you can access data from a remote database:

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

1 Start the database manager by entering the **db2start** command on the server (if it was not automatically started at boot time).

2 Enter the following command in the client's Command Center or command line processor 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. Authentication for connecting to host databases is set while configuring the DB2 Connect server. Refer to the *DB2 Connect User's Guide* for more information.

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"
(for UNIX-based platforms)
"select tabname from syscat.tables"
(for other platforms)
```

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

You are ready to start using the DB2 server. See Chapter 36, "Getting Started with DB2 Universal Database" on page 343 for details.

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 *netbios*.

2 The logical adapter number is equal to *0* (or the *DB2NBADAPTERS* registry value was updated to override the default value).

3 The server's workstation name (*nname*) parameter was updated correctly in the database manager configuration file (or the admin configuration file, if you are setting up the Administration Server)

4 The network route associated with the logical adapter number is **Nbf** (for Windows NT servers only).

5 The security service was started (enter the **net start db2ntsecserver** command - for Windows NT servers only).

6 The database was created and cataloged properly.

7 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 is displayed and the error messages are logged in the db2diag.log file.

Refer to the *Troubleshooting Guide* for information on the db2diag.log file.

At the *client*:

1 The client's workstation name (*nname*) parameter was updated correctly in the database manager configuration file

2 The node was cataloged with the correct *server's* workstation name (*nname*) and logical adapter number (*adapter_number*)

3 The node name (*node_name*), specified in the database directory, points to the correct entry in the node directory.

4 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.

After you verify these items, refer to the *Troubleshooting Guide* if the connection still fails.

Configuring IPX/SPX on the Client

This section assumes that IPX/SPX is functional on the client and DB2 server workstations. See "Software Requirements" on page 30 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 41 for the supported communication protocols for your particular client and server.

A client can access a DB2 server via Direct Addressing or File Server Addressing. See Table 40 for a list of the available IPX/SPX clients and their supported addressing methods. For a description of Direct Addressing or File Server Addressing, see "Configuring IPX/SPX on the DB2 Connect Server" on page 262.

> You need to know the IPX/SPX addressing method that was used to configure the server before you configure your DB2 client. If the DB2 Connect server was configured to use Direct Addressing, you must configure your client to use Direct Addressing to communicate with the server. If the DB2 server was configured for File Server Addressing, you can choose to configure your client to use either Direct Addressing or File Server Addressing, provided that your client supports the method that you want to use. See Table 40 for a list of client specific IPX/SPX supported addressing methods.

Table 40. IPX/SPX Supported Communication Methods for a DB2 Client

Client Platform	Direct Addressing	File Server Addressing
Macintosh	no support	
OS/2	√	√
SCO UnixWare 7	√	
UNIX (except SCO UnixWare 7)	no support	
SCO OpenServer	√	
Windows 3.x	√	√
Windows 95 and Windows 98	√	
Windows NT	√	

The following steps are required to set up a DB2 client to use IPX/SPX communications:

1 Identify and record parameter values.

2 Configure the client:

    a Catalog the IPX/SPX node.

    b Catalog the database.

3 Test the connection between the client and server.

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 41 (Page 1 of 2). IPX/SPX Values Required at the Client			
Parameter	**Description**	**Sample Value**	**Your Value**
File server name (*FILESERVER*)	**Direct Addressing** A * value indicates that you are using Direct Addressing. **File Server Addressing** The name of the NetWare file server where the database server instance is registered. This parameter must be entered in UPPERCASE. Locate this parameter in the database manager configuration file on the server.	**Direct Addressing** * **File Server Addressing** `NETWSRV`	

DB2 server object name (*OBJECTNAME*)	**Direct Addressing**
	The server's IPX/SPX internetwork address of the form:
	`netid`
	`(8 byte).nodeid`
	`(12 byte).`
	`socket # (4 byte)`
	To resolve this parameter, enter the **db2ipxad** command at the server. See "A. Catalog the IPX/SPX Node" on page 331 for more information.
	
	File Server Addressing
	The database manager server instance, represented as the object *OBJECTNAME* on the NetWare file server. The server's IPX/SPX internetwork address is stored and retrieved from this object.
	
	This parameter must be entered in UPPERCASE and be unique on the NetWare file server system.
	
	Locate this parameter in the database manager configuration file on the server.
		Direct Addressing
		`09212700.400011527745.879E`
		
		File Server Addressing
		`DB2INST1`	

Table 41 (Page 2 of 2). IPX/SPX Values Required at the Client			
Parameter	**Description**	**Sample Value**	**Your Value**
Node name (*node_name*)	A local alias, or nickname, that describes the DB2 Connect server to the node where the database resides. 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 describe how to configure this protocol on the client. Replace the sample values with your worksheet values.

A. Catalog the IPX/SPX 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 file server name (*FILESERVER*), and the DB2 server object name (*OBJECTNAME*) that the client will use to access the remote DB2 server.

To catalog the IPX/SPX node, perform the following steps:

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

> If you have trouble logging on to the system, see "Logging on to the System" on page 343.

If you are configuring communications for a Windows 3.x client, you can use the Client Setup tool to complete this task. Go to "Using the Client Setup Tool to Configure a Windows 3.x Client" on page 336 to catalog a node using the Client Setup tool.

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

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

3 Catalog the node by issuing the following commands in the command line processor:

```
catalog ipxspx node node_name remote FILESERVER server OBJECTNAME
terminate
```

Direct Addressing Example

You must assign a * to the *FILESERVER* parameter and specify the server's IPX/SPX internetwork address value as the *OBJECTNAME* parameter on the client.

To determine the value for the *OBJECTNAME* parameter, enter the **db2ipxad** command on the server. (This command is located in the `sqllib/misc/` directory for UNIX servers, and the `sqllib\misc\` directory for all other DB2 servers.)

Make note of the output that is generated, and use that value in place of the sample value (`09212700.400011527745.879E`) in the example that follows.

To catalog a remote node called *db2node*, using the IPX/SPX internetwork address *09212700.400011527745.879E* as the *OBJECTNAME*, use:

```
catalog ipxspx node db2node remote * server 09212700.400011527745.879E
terminate
```

File Server Addressing Example
To catalog a remote node called *db2node* at the file server *NETWSRV*, in the instance *DB2INST1*, use:

```
catalog ipxspx node db2node remote NETWSRV server DB2INST1
terminate
```

> If you need to change values that were set with the **catalog node** command, first run the **uncatalog node** command in the command line processor as follows:
>
> ```
> uncatalog node node_name
> ```
>
> Recatalog the node with the value that you want to use.

B. 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.

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

> If you have trouble logging on to the system, see "Logging on to the System" on page 343.

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

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	

Table 42. Worksheet: Parameter Values for Cataloging Databases

> If you are configuring communications for a Windows 3.x client, you can use the Client Setup tool to complete this task. Go to "Using the Client Setup Tool to Configure a Windows 3.x Client" on page 336 to catalog a database using the Client Setup tool.

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

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

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 a remote database called *sample* so that it has the alias *tor1*, on the node *db2node*, use:

```
catalog database sample as tor1 at node db2node
terminate
```

> If you need to change values that were set with the **catalog** *database* command, first run the **uncatalog** *database* command in the command line processor as follows:
>
> ```
> uncatalog database database_alias
> ```
>
> Recatalog the database with the value that you want to use.

Step 3. Test the Client-to-Server Connection

When the configuration of the server and client is complete, use the following steps to verify that you can access data from a remote database:

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

1 Start the database manager by entering the **db2start** command on the server (if it was not automatically started at boot time).

2 Enter the following command in the client's Command Center or command line processor 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. Authentication for connecting to host databases is set while configuring the DB2 Connect server. Refer to the *DB2 Connect User's Guide* for more information.

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"
(for UNIX-based platforms)
"select tabname from syscat.tables"
(for other platforms)
```

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

You are ready to start using the DB2 server. See Chapter 36, "Getting Started with DB2 Universal Database" on page 343 for details.

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 ipxspx. script file.

> Check the settings for the *db2comm* registry value by entering the **db2set DB2COMM** command. For more information, see Chapter 41, "Controlling Your DB2 Environment" on page 395.

2 The *FILESERVER*, *OBJECTNAME*, and *IPX_SOCKET* parameters were updated correctly in the database manager configuration file.

3 The database was created and cataloged properly.

4 The security service was started (enter the **net start db2ntsecserver** command - for Windows NT servers only).

5 If you are using File Server Addressing, ensure that the DB2 server was registered at the NetWare file server *after* the database manager configuration file was updated with the required IPX/SPX parameters. For more information, see "Configuring IPX/SPX on the DB2 Connect Server" on page 262.

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 is displayed and the error messages are logged in the db2diag.log file.
>
> Refer to the *Troubleshooting Guide* for information on the db2diag.log file.

At the *client*:

1 If you are using Direct Addressing, check that the node was cataloged with a value of * for *FILESERVER*, and the correct IPX/SPX internetwork address value for the *OBJECTNAME* parameter.

2 If you are using File Serving Addressing, check that the *FILESERVER* and *OBJECTNAME* parameters, used to catalog the node, match those configured on the server.

3 The node name (*node_name*), specified in the database directory, points to the correct entry in the node directory.

4 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.

After you verify these items, refer to the *Troubleshooting Guide* if the connection still fails.

Configuring APPC on the Client

This section assumes that APPC is functional on the client and server workstations. See "Software Requirements" on page 30 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 41 for the supported communication protocols for your particular client and server.

Refer to the online *Installing and Configuring DB2 Clients* manual for information on how to configure clients to communicate with a DB2 Connect server using the APPC protocol.

Using the Client Setup Tool to Configure a Windows 3.x Client

The Client Setup tool provides you with a graphical interface that you can use to complete the catalog node and database instructions in Chapter 34, "Configuring Client-to-Server Communications Using the Command Line Processor" on page 307. This section describes how to use the Client Setup tool to catalog a node or database for a Windows 3.x client.

Use the instructions in this section, along with the protocol-specific instructions in Chapter 34, "Configuring Client-to-Server Communications Using the Command Line Processor" on page 307, to configure your Windows 3.x client for communications with a DB2 server.

To invoke the Client Setup tool, double-click on the **Client Setup** icon, located in the DB2 product folder for your particular platform.

Cataloging the Node

1 Select **Node->New**, the New Node window opens.

2 Fill in the node name (*node_name*) parameter in the **Node** field and optionally add a comment describing the node in the **Comment** field.

3 Select the **Protocol** radio button for the protocol that you want the Windows 3.x client to use to communicate with the server.

4 Fill in the required parameters in the **Protocol Settings** box to catalog the node for the protocol that you selected.

5 Click on **OK**.

Cataloging the Database

1 Click on the **Databases** push button, the DB2 Client Setup - Databases window opens.

2 Select **Database**->**New**, the New Database window opens.

3 Fill in the **Name** (*database_name*) and **Alias** (*database_alias*) parameters and optionally add a comment in the **Comment** field describing the database.

4 Select the **Location** radio button that describes the location of the database that you are trying to connect to.

- If the database resides on a remote DB2 server, select the **Other Node** radio button and select the name of the Node that represents the remote server from the **At Node** drop down box.

- If the database resides locally, select the **This node** radio button and select the drive where the database is located from the **On** drop down box.

5 Select the **Authentication Type (DB2 1.x Database)** check box if you are configuring communications to a DB2 Version 1.x database.

> After you have cataloged the node and database for the Windows 3.x client, and completed the other specific steps for the protocol that you are using in Chapter 34, "Configuring Client-to-Server Communications Using the Command Line Processor" on page 307, you can test the database connection by clicking on the **Test Database Connection** push button.
>
> If the connection is not successful, see the "Troubleshooting the Client to DB2 Connect Gateway Connection" section for the protocol that you are trying to configure.

Part 6. Using DB2 Universal Database

Chapter 35. Sending Accounting Information to a DB2 for OS/390 Server

Many mainframe customers consider detailed accounting for resources used by different applications to be an important part of their operational procedures. DB2 for OS/390 provides extensive facilities for producing accounting reports that allow information systems departments to charge individual user departments for the mainframe resources they use. This is often called "charge-back accounting." DB2 Connect products allow for accurate accounting for the host resources used by the PC and UNIX applications using existing accounting reports and procedures.

DB2 Connect implements this feature in a flexible way by providing:

- A default accounting string for all usage generated by a particular DB2 Connect Enterprise Edition server.

- Two mechanisms for individual users or applications to specify the account to which their usage should be charged.

Setting the Accounting String

The default accounting string is set by the DB2 Connect workstation's dft_account_str configuration parameter. This default mechanism is useful for database clients that do not have the capability to forward an accounting string to DB2 Connect (for example, applications developed prior to Version 2 products). See the *DB2 Connect User's Guide* for additional information on accounting strings.

There are two ways for client applications to override the default accounting string set at the DB2 Connect server:

- Using the Set Accounting String API: **sqlesact()**

  The SQLESACT() API is called before the application connects to a database. You should use this method because:
  - Calling an API does not incur the cost of reading a registry value.
  - You do not need to call this API again unless you want to use a new accounting string for future connect requests. If you are using the registry value, you need to end the application process, redefine DB2ACCOUNT, and then restart the process.

  Refer to the *API Reference* for details on using this API.
- Using the DB2ACCOUNT registry value at the client workstation.

If the **sqlesact()** API is not called prior to the first database connect request, the DB2ACCOUNT registry value is read. The accounting string is used for all subsequent database connect requests. See Chapter 41, "Controlling Your DB2 Environment" on page 395 for information on setting registry values.

Note: When defining the accounting string, you should observe the following rules:

1. Use the characters A-Z, 0-9, or '_' (underscore).
2. Limit the accounting string to 199 bytes—longer strings are truncated.

Chapter 36. Getting Started with DB2 Universal Database

This section describes how to use DB2 Universal Database in a variety of ways.

Go to the section that gives instructions for the tasks that you want to perform.

- "Logging on to the System."
- "Connecting to a Database" on page 344.
- "Working with the System Administrative Group" on page 345.
- "Counting Concurrent Users" on page 348.
- "Upgrading from a Try-and-Buy License" on page 349.

Logging on to the System

To use DB2, log on with a valid DB2 user ID that has the appropriate authority level for the commands you want to execute. If the *sysadm_group* parameter is defined in the database manager configuration file, the user performing administration tasks (such as cataloging) must belong to the System Administrative (SYSDAM) group.

The *sysadm_group* parameter is not set when DB2 is first installed; therefore, the following criteria are used to determine default SYSADM authority:

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

UNIX
Any valid DB2 username that belongs to the primary group of the instance owner's user ID.

Windows 95 and Windows 98
Any Windows 95 or Windows 98 username that is a valid DB2 user ID.

Windows NT
Any valid DB2 user account which belongs to the local Administrators group.

See Appendix G, "Naming Rules" on page 553 for a list of naming restrictions.

As well as using the local operating system security to authenticate users, there is also the option of using DCE security. Refer to the *Administration Guide* for information on DCE security.

Connecting to a Database

You need to connect to a database before you can use SQL statements to query or update it. The CONNECT statement associates a database connection with a user ID.

A database is created in an instance using one of three different authentication types: CLIENT, SERVER, or DCS. If an authentication type is not specified when the instance is created, the default SERVER authentication is used. Depending on the authentication type and where the database resides, you connect to remote databases differently. While DCE authentication is an option, you cannot specify it when you create an instance. Refer to *Administration Guide* for more information on all authentication types.

Connecting to a local database

To connect to a local database called SAMPLE, enter the following command in the Command Center or the command line processor:

    connect to sample

Connecting to a remote database

- To connect a client to a remote database called SAMPLE, using SERVER authentication, enter the following command in the Command Center or the command line processor:

      connect to sample user *userid* using *password*

  (Be sure to choose values for *userid* and *password* that are valid on the server system.

  > UNIX passwords and userids are case sensitive.

- To connect a client to a remote database called SAMPLE, using CLIENT authentication, enter the following command in the Command Center or the command line processor:

      connect to sample

> If you are connecting to the database from an *OS/2* client, and are not currently logged on, you will be prompted to log on using a user ID and password.
>
> If you are connecting to a database from a *Windows NT* client using CLIENT authentication, and you provide a user ID and password on the **connect** command, you must start the DB2 for Windows NT Security Service on the system. The Security Service is installed by DB2 and set up to run as a Windows NT service; however, it is not started automatically. To start the DB2 Security Service, enter the **net start db2ntsecserver** command.

When a successful connection is made, a message similar to the following is displayed:

```
Database product     = DB2/NT 5.2.0
SQL authorization ID = USERID
Local database alias = SAMPLE

Database Server      = DB2/6000 5.2.0
SQL authorization ID = USERID
Local database alias = SAMPLE
```

If you receive an error message, make sure that the SAMPLE database exists on the server and the database manager was started on the server.

Refer to the *Administration Guide* for more information on authentication.

Working with the System Administrative Group

By default, System Administrative (SYSADM) authority is granted to the following:

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

UNIX
Any valid DB2 username that belongs to the primary group of the instance owner's user ID.

Windows 95 and Windows 98
Any Windows 95 or Windows 98 user.

Windows NT
Any valid DB2 user account which belongs to the local Administrators group.

You can change the users who have SYSADM privileges for each DB2 instance by changing the *sysadm_group* parameter; but before you do, ensure that the group exists.

To check to see if this group exists, do the following:

- For Windows NT users: Use the Windows NT User Manager Administrative Tool.
- For OS/2 users: Use a UPM administrator user ID to create groups and assign membership. For information on using UPM, see Chapter 42, "Administering and Using OS/2 User Profile Management on OS/2 Systems" on page 409.

> The *sysadm_group* parameter is not used for the Windows 95 operating system.

- To change the System Administrative group (sysadm_group) on the server instance: (For OS/2 and Windows NT workstations.)

    1 Start the Control Center.

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

    3 Click on the **[+]** sign for the system that contains the instance you want to update.

    4 Select the instance that you want to change the *sysadm_group* parameter for and click on the right mouse button.

    5 Select the **Configure** option.

    6 Select the **Administration** tab.

    7 Select the parameter you want to change and enter the name of an existing group that you want to assign this privilege to in the **Value** box.

    8 Click on **OK**.

    9 Stop and Start the database instance.

- To change the System Administrative group (sysadm_group) on the client instance: (For OS/2 and Windows NT workstations.)

    1 Start the Client Configuration Assistant (CCA).

    2 Click on the **Client Settings** push button.

    3 Select the **Administration** tab.

    4 Select the parameter you want to change and enter the name of an existing group that you want to assign this privilege to in the **Value** box.

    5 Click on **OK**.

> **6** Stop all applications that are using DB2, including the CCA. When restarted
> they will be using the new value for sysadm_group.

- Using the command line processor:

  To change the System Administrative group (sysadm_group) parameter to *dbadmin*
  on the server instance, use:

  ```
     update
  dbm cfg using sysadm_group dbadmin    db2stop    db2start
  ```

  To change the System Administrative group (sysadm_group) parameter to *dbadmin*
  on the client instance, use:

  ```
     update dbm cfg using sysadm_group
   dbadmin    terminate
  ```

  Stop all applications that are using DB2. When restarted they will be using the new
  value for sysadm_group.

Granting Users Authorization

For applications to access databases, DB2 performs two types of checking:

Authentication   Ensures that the user account and password are valid.

Authorization   Ensures that the user has sufficient authority to perform a task.

This section discusses the authorization process used in a Windows NT domain
environment. For more information on authentication and authorization, refer to the
Administration Guide.

When performing administration tasks (such as cataloging the database directory or
creating a database) System Administrative (SYSADM) authority is required. By default,
any user belonging to the Administrators group where the user account is defined has
SYSADM authority.

In a Windows NT domain environment, only domain users that belong to the
Administrators group at the Primary Domain Controller (PDC) have SYSADM authority.
Adding a domain user to the local Administrators group on the server machine does not
grant the domain user SYSADM authority, since DB2 always performs authorization at
the machine where the account is defined. To avoid adding a domain user to the
Administrators group of the Primary Domain Controller, perform the following steps:

1. Create a new global group. The name of the global group must be eight characters
   or less and comply with DB2's naming rule. For more information, see Appendix G,
   "Naming Rules" on page 553.

2. Add a domain user to this global group.

3. Grant SYSADM authority to this global group by entering the following command:

   ```
   db2 update database manager configuration using sysadm_group global_group_name
   ```

   where *global_group_name* is the name of the global group that you created.

Counting Concurrent Users

DB2 Connect Enterprise Edition is priced per user. If you need to support more users than currently entitled, you must acquire entitlements for additional users. An entitlement for additional users does not require a new license key. It is up to you, the purchaser of the product, to ensure that you have sufficient entitlements for the number of users.

To assist you in tracking the number of concurrent users connecting to your DB2 Connect Enterprise Edition server, DB2 uses the License Use Runtime client. It provides a way to monitor the number of concurrent users on your system, but it does not enforce the maximum limit; however, the runtime client will log an entry in the db2diag.log file each time the number of entitlements that you are licensed to is exceeded.

To update the number of concurrent users you are entitled to support on OS/2 or Windows NT systems, use the Nodelock Administration Tool (NAT) as follows:

1 Double-click on the **License Use Runtime - Client** folder on the desktop.

2 Double-click on the **Nodelock Administration Tool** icon.

3 Double-click on the product for which you want to monitor the number of concurrent users.

4 Select the **Concurrent** check box.

5 Update the **Licenses** field to reflect thenumber of concurrent users you are entitled to run.

6 Click on **OK**.

To update the number of concurrent users you are entitled to support on AIX systems, use the Nodelock Administration Tool (NAT):

1 Log in as root.

2 If you are using NAT Version 3.0, append the directory /var/ifor to the PATH environment variable, for example:

For Bourne or Korn shell:
```
PATH=$PATH:/var/ifor ; export PATH
```

For C shell:
```
setenv PATH "${PATH}:/var/ifor"
```

3 Use the **/var/ifor/i4nat** command to invoke NAT.

4 Select the product that you want to monitor the number of concurrent users for.

5 Update the **Concurrent licenses** field.

Check the db2diag.log file (located in the for OS/2 and Windows NT or, on UNIX systems, the INSTHOME/sqllib/db2dump directory, where INSTHOME is the home directory of the instance) to see if you have exceeded the maximum number of concurrent users that you are entitled to support. For example, an entry in the db2diag.log file might look like this:

```
SQL8009W The number of concurrent users of the DB2 Server
         product has exceeded the defined entitlement of
         "5". Concurrent user count is "6".
```

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

To acquire additional entitlements, you must purchase additional licenses from IBM or an IBM dealer. After you acquire the additional entitlements, use the NAT tool to update the number of concurrent users allowed.

Upgrading from a Try-and-Buy License

| Try-and-Buy versions are available for some DB2 products. If you install a product
| originally as Try-and-Buy, you do not need to reinstall the same product to upgrade the
| license. Simply add the license from the DB2 CD-ROM that comes in the product box.

| If you install a DB2 product as Try-and-Buy, and you buy a different product, you must
| uninstall the Try-and-Buy product and then install the new one that you have
| purchased. For example, if you install DB2 Workgroup Edition as a Try-and-Buy and
| then purchase DB2 Enterprise Edition, you must uninstall DB2 Workgroup Edition and
| then install DB2 Enterprise Edition. At installation time, the program will automatically
| install the required license.

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

The following steps describe how to upgrade a license:

On OS/2 Systems:

1 Put the product CD-ROM in the CD-ROM drive.

2 Double-click on the **Nodelock Administration Tool** icon in the **License Use Runtime - Client** folder to start the Nodelock Administration Tool.

3 Select **Products**->**New** from the menu bar.

4 Click on the **Import** push button.

5 In the Import window, locate the db2\license directory on your CD-ROM. A list of files is shown.

6 Select the license file that corresponds to the specific product that you have purchased and installed on your system:

| **db2conen.lic**   DB2 Connect Enterprise Edition

7 Click on **OK**.

On Windows NT Systems:

| **1** Click on **Start** and select **Programs**->**License Use Runtime**-> **Nodelock**
| **Administration Tool** to start the Nodelock Administration Tool.

| **2** Select **Products**->**New** from the menu toolbar.

| **3** Click on the **Import** push button.

| **4** Select the license file that corresponds to the specific product that you have
| purchased and installed on your system. It can be found in the x:\db2\licence
| directory, where x: represents the CD-ROM drive.

| **db2conen.lic**   DB2 Connect Enterprise Edition

| Click on **OK**.

| **5** Click on **OK** to return to the main screen.

On UNIX Systems:

1 Log in as root.

2 Mount the CD-ROM, if required.

| **3** Update your DB2 product license with the following command:

| DB2DIR/cfg/db2licinst license_filename

| where *DB2DIR*   = /usr/lpp/db2_05_00   on AIX
| = /opt/IBMdb2/V5.0   on HP-UX, SCO UnixWare 7,
| or Solaris

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

| **db2conen.lic**   DB2 Connect Enterprise Edition

| For example, if the CD-ROM is mounted in the /cdrom directory and the name of
| the license file is db2entr.lic, the command should be as follows:

| • For AIX, HP-UX, or SCO UnixWare 7:

| DB2DIR/cfg/db2licinst /cdrom/db2/license/db2entr.lic

| • For Solaris:

| DB2DIR/cfg/db2licinst /cdrom_unnamed/db2/license/db2entr.lic

where *DB2DIR*   = /usr/lpp/db2_05_00   on AIX
                                     = /opt/IBMdb2/V5.0   on HP-UX, SCO UnixWare 7, or Solaris

---

The DB2 product license key can be found in the `nodelock` file, located as follows:

- For AIX:

    `/usr/lib/netls/conf/nodelock`

- For HP-UX:

    `/usr/netls/nodelock`

- For Solaris or SCO UnixWare 7:

    `/var/netls/nodelock`

Chapter 37. Working with Instances

The information in this section describes DB2 instances and how to work with them.

An instance is a logical database manager environment where you catalog databases and set configuration parameters. Depending on your needs, you can create more than one instance. You can use multiple instances to do the following:

- Use one instance for a development environment and another instance for a production environment.

- Tune an instance for a particular environment.

- Restrict access to sensitive information.

- Control the assignment of SYSADM, SYSCTRL, and SYSMAINT authority for each instance.

- Optimize the database manager configuration for each instance.

- Limit the impact of an instance failure. In the event of an instance failure, only one instance is affected. Other instances can continue to function normally.

Each additional instance requires additional system resources (virtual storage and disk space) and more administration.

The Default Instance

On OS/2 and Windows 32-bit operating systems:

A default instance called DB2 is created when you install DB2. The instance name is used to set up the directory structure.

The following are set during installation: the environment variable *DB2INSTANCE=DB2*, and the DB2 registry value *DB2INSTDEF=DB2*. These settings establish DB2 as the default instance. You can change the instance that is used by default, but first you have to create an additional instance.

On UNIX:

There is no default instance on UNIX.

Instance Directory

The instance directory stores all information that pertains to a database instance. You cannot change the location of the instance directory once it is created. The directory contains:

- The database manager configuration file
- The system database directory
- The node directory
- The DB2 diagnostic file (db2diag.log)
- Any other files that contain debugging information, such as the exception/register dump or the call stack for the DB2 processes.

The instance directory is located in the `x:\sqllib` directory, where `x:` is the drive where you installed DB2.

Creating Instances

On OS/2 and Windows 32-bit operating systems:

If you have Administrative authority on OS/2 or you belong to the Administrators group on Windows NT, you can create additional DB2 instances by running the **db2icrt** command at a command prompt. The command syntax to create an instance is:

```
db2icrt instance_name
```

where *instance_name* is an alphanumeric string up to eight characters long. See Appendix G, "Naming Rules" on page 553 for more information about valid names.

> You can change the location of the instance directory from `DB2PATH` using the *DB2INSTPROF* environment variable. You require write access for the instance directory. If you want the directories created in a path other than *DB2PATH*, you have to set the *DB2INSTPROF* environment variable before entering the **db2icrt** command. See Chapter 41, "Controlling Your DB2 Environment" on page 395 for further information.

On UNIX operating systems:

The instance owner and the group that is the System Administrative (SYSADM) group are associated with every instance. The instance owner and the SYSADM group are assigned during the process of creating the instance. One user ID can be used for only one instance. That user ID is also referred to as the *instance owner*.

Each instance owner must have a unique home directory. All of the files necessary to run the instance are created in the home directory of the instance owner's user ID. If it becomes necessary to remove the instance owner's user ID from the system, you could potentially lose files associated with the instance and lose access to data stored in this instance. For this reason, it is recommended that you dedicate an instance owner user ID to be used exclusively to run DB2.

The primary group of the instance owner is also important. This primary group automatically becomes the system administrative group for the instance and gains SYSADM authority over the instance. Other user IDs that are members of the primary group of the instance owner also gain this level of authority. For this reason, you may want to assign the instance owner's user ID to a primary group that is reserved for the administration of instances. (Also make sure that you assign a primary group to the instance owner user ID; otherwise, the system-default primary group is used.)

If you already have a group that you want to make the system administrative group for the instance, you can simply assign this group as the primary group when you create the instance owner user ID. To give other users administrative authority on the instance, add them to the group that is assigned as the system administrative group.

To separate SYSADM authority between instances, ensure that each instance owner user ID uses a different primary group. However, if you choose to have common SYSADM authority over multiple instances, you can use the same primary group for multiple instances.

| You can use the DB2 Installer program or the **db2icrt** command to create an instance. See Chapter 8, "Installing Additional Products and Creating Additional Instances" on page 73 to create instances by using the DB2 Installer program. The DB2 Installer program is available for AIX, HP-UX, SCO UnixWare 7, SGI IRIX, and Solaris operating systems.

To create additional instances using the **db2icrt** command, enter:

```
DB2DIR/instance/db2icrt -u FencedID instance_name
```

where *instance_name* is an alphanumeric string up to eight characters long (see "Usernames, Group Names, and Instance Names" on page 555 for more information) and

| where *DB2DIR* | = /usr/lpp/db2_05_00 | on AIX |
| | = /opt/IBMdb2/V5.0 | on HP-UX, SCO UnixWare 7, or Solaris |

Note: To create instances on a SINIX operating system, see "Create an Instance of the Product" on page 298.

The syntax of the **db2icrt** command is:

```
►►── db2icrt ── [-h| -?] ── [-d]── [-a AuthType] ──── [-u FencedID] ────────►

►──── [-p PortName] ── [-s InstType] ── InstName ────────────────►◄
```

where:

-h | -?   Display a help menu for this command.

-d   Sets the debug mode that you can use for problem determination.

-a *AuthType*   Is an optional parameter that 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).

Notes:

1. The authentication type of the instance applies to all databases owned by the instance.

2. 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 UDFs and stored procedures will execute. This is not required if you install the DB2 Client Application Enabler. For other products, this is a required parameter.

Note: *FencedID* may not be *root* or *bin*.

-p *PortName*   Is an optional parameter that specifies the TCP/IP service name or port number to be used. This value will then be set in the instance's database configuration file.

-s *InstType*   Is an optional parameter that allows different types of instances to be created. Valid instance types are *ee*, *eee* and *client*.

instance_name   Is the login name of the instance owner.

If a server product is installed, the syntax is:

    db2icrt -u FencedID instance_name

Examples:

• You can use the instance name as the Fenced ID also:

    db2icrt -u db2inst1 db2inst1

• To create an instance for a DB2 client, you can use the following command:

    db2icrt db2inst1

When an instance is created, its name is also added to the list of instances on the system.

Listing Instances

On OS/2 and Windows 32-bit operating systems:

To get a list of all the instances that are available on a system, enter:

    db2ilist

| To determine which instance applies to the current session, enter:

| db2 get instance

On UNIX Systems:

| To get a list of all the instances that are available on a system, enter the **db2ilist**
| command. The **db2ilist** command is located in:

| DB2DIR/bin/db2ilist

        where DB2DIR   = /usr/lpp/db2_05_00   on AIX
                         = /opt/IBMdb2/V5.0   HP-UX, SCO UnixWare 7,
                                            Solaris, or SGI IRIX
                         = /usr/IBMdb2/V2.1   on SCO OpenServer
                         = /opt/IBMdb2/V2.1   on SINIX

To determine which instance applies in the current session, enter:

| db2 get instance

| **Note:** If you have changed to another instance, run the **db2 terminate** command
| before checking the instance.

Setting the Current Instance

| **On OS/2 and Windows 32-bit operating systems:**

| When you enter commands to start or stop an instance's database manager, DB2
| applies the command to the current instance. DB2 determines the current instance as
| follows:

| • Read the setting for the *DB2INSTANCE* environment variable for the current
| session. To set the *DB2INSTANCE* environment variable, enter:

| set db2instance=*new_instance_name*

| where *new_instance_name* represents the instance that you want to work with.

- If the *DB2INSTANCE* environment variable is not set for the current session, DB2 uses the setting for the *DB2INSTANCE* environment variable from the system environment variables:

  – On Windows NT, system environment variables are set in the System Environment. See "Setting Your Environment on Windows 32-Bit Operating Systems" on page 398 for instructions on setting *DB2INSTANCE*.

  – On Windows 95 and Windows 98, system environment variables are set in autoexec.bat or other batch file. See "Setting Your Environment on Windows 32-Bit Operating Systems" on page 398 for instructions on setting *DB2INSTANCE*.

  – On OS/2, system environment variables are set in config.sys or other command file. See "Setting Your Environment on OS/2" on page 397 for instructions on setting *DB2INSTANCE*.

- If the *DB2INSTANCE* environment variable is not set at all, DB2 uses the registry value, *db2instdef*.

  To set the *db2instdef* registry value globally, enter:

      db2set db2instdef=*new_instance_name* -g

  where *new_instance_name* represents the instance that you want to be the default for your system.

For more information on setting registry values, refer to Chapter 41, "Controlling Your DB2 Environment" on page 395.

On UNIX Systems:

To use a specific instance, you need to execute the startup script for that instance. Enter the following command:

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

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

To determine which instance applies in the current session, enter:

      db2 get instance

Auto-Starting Instances on UNIX Systems

To enable an instance to auto-start after each system restart, enter the following command:

```
DB2DIR/bin/db2iauto -on instance_name
```

	where *DB2DIR*	= /usr/lpp/db2_05_00	on AIX
		= /opt/IBMdb2/V5.0	on HP-UX, SCO UnixWare 7, or Solaris

and where *instance_name* is the login name of the instance.

To prevent an instance from auto-starting after each system restart, enter the following command:

```
DB2DIR/bin/db2iauto -off instance_name
```

	where *DB2DIR*	= /usr/lpp/db2_05_00	on AIX
		= /opt/IBMdb2/V5.0	on HP-UX, SCO UnixWare 7, or Solaris

and where *instance_name* is the login name of the instance.

Setting the Operating Environment for Each Instance User on UNIX Systems

Before using DB2, the database environment for each user must be updated so that it can access an instance and run the DB2 programs. This applies to all users (including administrative users).

The sample script files, `db2profile` (for Bourne or Korn shell) and `db2cshrc` (for C shell), are provided to help you set the database environment. These scripts are available in the *INSTHOME*/`sqllib` directory, where *INSTHOME* is the home directory of the instance owner.

The instance owner (or any user that belongs to the instance's SYSADM group) can customize the script for all users of an instance. Alternatively, the script can be copied and customized for each user.

> The sample script contains statements to:
>
> - Update a user's PATH by adding the following directories to the existing search path:
>
>   INSTHOME/sqllib/bin
>   INSTHOME/sqllib/adm
>   INSTHOME/sqllib/misc
>
>   where INSTHOME is the home directory of the instance.
>
> - Set the *DB2INSTANCE* environment variable to the instance name.

Setting the DB2 Environment Automatically

By default, the scripts affect the user environment for the duration of the current session only. You can change the `.profile` file to enable it to run the `db2profile` script automatically when the user logs on using the Bourne or Korn shell. For users of the C shell, you can change the `.login` file to enable it to run the `db2cshrc` script file.

Add one of the following statements to the `.profile` or `.login` script files.

- For users who share one version of the script, add:

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

  where INSTHOME is the home directory of the instance that you want to use.

- For users that have a customized version of the script in their home directory, add:

      . USERHOME/db2profile   (in Bourne or Korn Shell)
      source USERHOME/db2cshrc   (in C Shell)

  where USERHOME is the home directory of the user.

Setting the DB2 Environment Manually

To choose which instance that you want to use, enter one of the following statements at a command prompt. The period (.) and the space are required.

- For users who share one version of the script, add:

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

  where INSTHOME is the home directory of the instance that you want to use.

- For users that have a customized version of the script in their home directory, add:

      . USERHOME/db2profile   (in Bourne or Korn Shell)
      source USERHOME/db2cshrc   (in C Shell)

  where USERHOME is the home directory of the user.

If you want to work with more than one instance at the same time, run the script for each instance that you want to use in separate windows. For example, assume that you have two instances called `test` and `prod`, and their home directories are `/u/test` and `/u/prod`.

In window 1:

- In Bourne or Korn Shell, enter:

    . /u/test/sqllib/db2profile

- In C Shell, enter:

    source /u/test/sqllib/db2cshrc

In window 2:

- In Bourne or Korn Shell, enter:

    . /u/prod/sqllib/db2profile

- In C Shell, enter:

    source /u/prod/sqllib/db2cshrc

Use window 1 to work with the `test` instance and window 2 to work with the `prod` instance.

> Enter the **which db2** command to ensure that your search path has been set up correctly. This command returns the absolute path of the DB2 CLP executable. Verify that it is located under the instance's `sqllib` directory.

Updating Instances on UNIX Systems

Existing instances are designed to be as independent as possible from the effects of subsequent installation and removal of products.

In most cases, existing instances automatically inherit or lose access to the function of the product being installed or removed. However, if certain executables or components are installed or removed, existing instances do not automatically inherit the new system configuration parameters or gain access to all the additional function. The instance must be updated.

If DB2 is updated by installing a PTF or a patch, all the existing DB2 instances should be updated using the **db2iupdt** command. You should also update the Administration Server using the **dasiupdt** command. See "Updating the Administration Server" on page 367 for further information.

Running the **db2iupdt** command updates the specified instance by performing the following:

1 Replaces the files in the `INSTHOME/sqllib` directory, where `INSTHOME` is the home directory of the instance.

2 If the node type is changed, then a new database manager configuration file is created. This is done by merging relevant values from the existing database manager configuration file with the default database manager configuration file for the new node type. If a new database manager configuration file is created the old file is backed up to:

     `INSTHOME/sqllib/backup/db2systm.old`

The **db2iupdt** command is available in the `DB2DIR/instance` directory,

where *DB2DIR*	= /usr/lpp/db2_05_00	on AIX
	= /opt/IBMdb2/V5.0	on HP-UX, SCO UnixWare 7, or Solaris

The syntax of the **db2iupdt** command is:

```
►►── db2iupdt ── [-h| -?] ──── [-d] ──── [-a AuthType] ──── [-u FencedID] ──►

►──── [-k] ── InstName ──────────────────────────────────────────────────►◄
```

where:

-h | -?   Displays a help menu for this command.

-d   Sets the debug mode, which you can use for problem analysis.

-a *AuthType*   Is an optional parameter that 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).

                Notes:

                1. The authentication type of the instance applies to all databases owned by the instance.

                2. 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 UDFs and stored procedures will run. This is not required if you install the DB2 Client Application Enabler. For other products, this is a required parameter.

                Note: *FencedID* may not be root or bin.

| **-k** Is an optional parameter that preserves the current instance type. If
| you do not specify this parameter, the current instance will be
| upgraded to the highest instance type available in the following
| order:

| • Partitioned database server with local and remote clients (DB2
| Extended Enterprise Edition default instance type)

| • Database Server with local and remote clients (DB2 Universal
| Database Enterprise Edition default instance type)

| • Client (DB2 Client Application Enabler default instance type)

instance_name Is the login name of the instance owner.

If a server product is installed, the syntax is:

```
db2iupdt -u FencedID instance_name
```

Examples:

• If you installed DB2 Connect Enterprise Edition after creating the instance, you can
  use following command to update that instance:

```
db2iupdt -u db2inst1 db2inst1
```

| • To update client instances, you can use the following command:
| ```
| db2iupdt db2inst1
| ```

The **db2iupdt** command updates the files in the INSTHOME/sqllib directory, where
INSTHOME is the home directory of the instance owner.

Removing Instances

On OS/2 and Windows 32-bit operating systems:

Ensure that there are no applications using the instance before removing it.

To remove an instance, perform the following steps:

1 Close all applications that are currently using the instance.

2 Stop the Command Line Processor by entering the **db2 terminate** command in
each DB2 command window.

3 Stop the instance by entering the **db2stop** command.

4 Back up the files in the `x:\sqllib\instance_name` directory (where `x:` is the drive where DB2 is installed) to any directory outside of this path. Once you enter the **db2idrop** command, the `x:\sqllib\instance_name` directory is removed and cannot be recovered.

> **Note:** If the *DB2INSTPROF* registry value is set, these files will be in a different location than the one used in this example.

5 Enter the **db2idrop** command as follows:

```
db2idrop instance_name
```

where *instance_name* represents the instance you want to drop.

On UNIX Systems:

To remove an instance, perform the following steps:

1 Log in as the instance owner.

2 Back up files in the `INSTHOME/sqllib` directory, if needed.

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

3 Log off as the instance owner.

4 Log in as user with root authority.

5 Remove the instance using the **db2idrop** command. You can enter the DB2IDROP command as follows:

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

InstName is the login name of the instance.

where DB2DIR	= /usr/lpp/db2_05_00	on AIX
	= /opt/IBMdb2/V5.0	HP-UX, SCO UnixWare 7, Solaris, or SGI IRIX
	= /usr/IBMdb2/V2.1	on SCO OpenServer
	= /opt/IBMdb2/V2.1	on SINIX

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

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

The **db2idrop** command removes the instance entry from the list of instances and removes the `INSTHOME/sqllib` directory.

Chapter 38. Using the Administration Server

The Administration Server enables you to administer DB2 server systems from a local or remote client, using the Control Center. You must have an Administration Server running on the server if you want to use the Client Configuration Assistant or the Control Center to administer a DB2 server. For example, you can start or stop DB2, or schedule jobs to be run at the server from a local or remote system.

The Administration Server is also used to support client configuration using the Client Configuration Assistant, and system reporting using the Control Center. You can create only one Administration Server on a machine.

This section shows you how to manually create an Administration Server. It also describes how to start, stop, and remove an Administration Server, set up an Administration Server to use the CCA and the Control Center, and set an Administration Server's user account.

Creating the Administration Server

Use the **dasicrt** command to create an Administration Server. You must have root authority to issue this command.

The syntax of the **dasicrt** command is as follows:

| • On AIX:

| `/usr/lpp/db2_05_00/instance/dasicrt ASName`

| • On HP-UX, SCO UnixWare 7 or Solaris:

| `/opt/IBMdb2/V5.0/instance/dasicrt ASName`

where *ASName* is the name of the Administration Server, which is composed of a string of up to eight alphanumeric characters long. See Appendix G, "Naming Rules" on page 553 for more information.

Note: If you are running NIS and NIS+, you need to set up the user and group names in such a way that:

- The primary group of the Administration Server must be in the secondary group of all the instances.

- The secondary group of the Administration Server must contain the primary group of all the instances

Secondary group lists will be modified automatically only if NIS and NIS+ is not
running on your system.

Because a user ID can only own one instance, you must have a separate user ID to
own each Administration Server that you create.

Starting the Administration Server

To start the Administration Server, you must perform the following steps:

1 Log in as the Administration Server owner.

2 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.

3 Start the Administration Server using the **db2admin** command as follows:

```
db2admin start
```

> The Administration Server is automatically started after each system reboot.

Stopping the Administration Server

To stop the Administration Server, you must perform the following steps:

1 Log in as the Administration Server owner.

2 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.

3 Stop the Administration Server using the **db2admin** command as follows:

```
db2admin stop
```

where *DB2DIR* = /usr/lpp/db2_05_00 on AIX
= /opt/IBMdb2/V5.0 on HP-UX, SCO UnixWare 7, or Solaris

Listing the Administration Server

To obtain the name of the Administration Server on your machine, issue the **dasilist** command as follows:

```
DB2DIR/bin/dasilist
```

where *DB2DIR* = /usr/lpp/db2_05_00 on AIX
= /opt/IBMdb2/V5.0 on HP-UX, SCO UnixWare 7, or Solaris

Updating the Administration Server

If DB2 is updated by installing a PTF or a patch, all Administration Servers as well as all existing instances should be updated. To update an Administration Server, use the **dasiupdt** command available in the `DB2DIR/instance` directory,

where *DB2DIR* = /usr/lpp/db2_05_00 on AIX
= /opt/IBMdb2/V5.0 on HP-UX, SCO UnixWare 7, or Solaris

The syntax of the **dasiupdt** command is:

```
►►── dasiupdt ── [-h| -?] ──── [-d] ──── InstName ──────────────────►◄
```

where:

-h | -? Displays a help menu for this command.

-d Sets the debug mode, which you can use for problem analysis.

InstName Is the login name of the instance owner.

Removing the Administration Server

To remove an Administration Server, you must perform the following steps:

1 Log in as the Administration Server owner.

2 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.

3 Stop the Administration Server using the **db2admin** command as follows:

```
db2admin stop
```

4 Backup the files in the ASHOME/sqllib directory, if needed, where ASHOME is the home directory of the Administration Server.

5 Log off.

6 Log in as *root* and remove the Administration Server using the **dasidrop** command as follows:

```
DB2DIR/instance/dasidrop ASName
```

where *DB2DIR*	= /usr/lpp/db2_05_00	on AIX
	= /opt/IBMdb2/V5.0	on HP-UX, SCO UnixWare 7, or Solaris

and ASName is the name of the instance being removed.

Note: The **dasidrop** command removes the sqllib directory under the home directory of the Administration Server.

Chapter 39. 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 ODBC driver are included with the DB2 Client Application Enabler. This is contained on the DB2 Client Application Enablers CD-ROM or can be downloaded from the Web page at http://www.software.ibm.com/data/db2.

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 part of the separately orderable DB2 Application Development Kit product.

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 369 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.

1 Use the 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.

2 On all platforms other than OS/2 and Windows 3.x, the DB2 CLI/ODBC driver is automatically installed when the DB2 Client Application Enabler is installed, and therefore nothing needs to be done. On OS/2 and Windows 3.x you must use the **Install ODBC Driver** icon to install both the DB2 CLI/ODBC driver and the ODBC driver manager.

3 To access the DB2 database from ODBC:

> **a** The Microsoft, Visigenic, or other ODBC Driver Manager must already be installed (this is done by default during the installation of DB2).
>
> **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.

4 Various CLI/ODBC Configuration Keywords can be set to modify the behavior of DB2 CLI/ODBC and the applications using it.

5 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 381
- "How to Set CLI/ODBC Configuration Keywords" on page 381
- "Configuring db2cli.ini" on page 382

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 3.x, Windows 95, Windows 98, and Windows NT Client Access to DB2 using CLI/ODBC" on page 372
- "OS/2 Client Access to DB2 using CLI/ODBC" on page 374
- "UNIX Client Access to DB2 using CLI/ODBC" on page 376

Windows 3.x, Windows 95, Windows 98, and Windows NT 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:

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). See "Configuring Database Connections" on page 479 for more details.

For more information refer to the on-line help in the CCA (or the **CATALOG DATABASE** and **CATALOG NODE** commands in the *Command Reference*).

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. On Windows 3.x you must use the **Install ODBC Driver** icon to install the Microsoft ODBC Driver Manager and the DB2 CLI/ODBC driver.

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** for Windows 32-bit operating systems, **odbcadm.exe** on Windows 3.x.

    b Click on the **Drivers** push button, or the **ODBC Drivers** tab (depending on the platform).

    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, or double-click on the **Install ODBC Driver** icon in the DB2 program group in Windows 3.x.

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
  ```

4 Optional: Configure the DB2 CLI/ODBC driver using the CCA:

  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 *Installing and Configuring DB2 Clients* manual.

  For information on manually editing this file (db2cli.ini), see "Configuring db2cli.ini" on page 382.

5 Optional: Using 16-bit ODBC applications:

Although not directly related to DB2, some users have experienced problems when running 16-bit ODBC applications on Windows 32-bit operating systems.

Both 16- and 32-bit applications use the same 32-bit IBM DB2 CLI/ODBC Driver. The Microsoft ODBC Driver Manager takes care of the conversion between the 16-bit application and the 32-bit ODBC driver.

Some 16-bit applications were shipped with an old set of 16-bit Driver Manager DLLs (that is, before 1995). These DLLs do not function well in the 32-bit environment. The following symptoms may occur when running the old DLLs:

- Traps occur in odbc.dll or other ODBC related DLLs.
- 16-bit applications do not see data sources cataloged using the 32-bit ODBC Administrator (from the Control Panel).

If (and only if) you are experiencing these problems you may want to update the Microsoft 16-bit ODBC Driver Manager DLLs. These files are provided with DB2 in the SQLLIB\MSODBC16 subdirectory. Use these new DLLs to replace the older versions that are located in the system subdirectory of the Windows operating system directory.

6 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 380:

- "How to Bind the DB2 CLI/ODBC Driver to the Database" on page 381
- "How to Set CLI/ODBC Configuration Keywords" on page 381
- "Configuring db2cli.ini" on page 382

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 or "Configuring Database Connections" on page 479.

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 the ODBC Driver Manager (Visigenic or Intersolv) and the DB2 CLI/ODBC driver are installed:

        1 Run the ODBC Administration tool in one of two ways:

- Double-click on the **Control Panel** icon from the **Main** Folder in WIN-OS/2 or 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 either the ODBC Driver Manager or the IBM DB2 CLI/ODBC driver is not installed then double-click on the **Install ODBC Driver** icon in the DB2 folder to install both the DB2 CLI/ODBC driver and the ODBC driver manager.

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 Visigenic **ODBC Administration tool**, which you can access from the **ODBC** folder or by running **odbcadm.exe** from the command line:

    1 Click on the **Add** push button from the Data Sources window. The Add Data Source Window opens.

    2 Double-click on the IBM DB2 ODBC Driver in the list.

    3 Select the DB2 database to add and click on **OK**.

3 Optional: Configure the DB2 CLI/ODBC driver using the CCA:

    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 *Installing and Configuring DB2 Clients* manual.

      For information on manually editing this file (db2cli.ini), see "Configuring db2cli.ini" on page 382.

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 380:

- "How to Bind the DB2 CLI/ODBC Driver to the Database" on page 381
- "How to Set CLI/ODBC Configuration Keywords" on page 381
- "Configuring db2cli.ini" on page 382

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 34, "Configuring Client-to-Server Communications Using the Command Line Processor" on page 307 or the **CATALOG DATABASE** and **CATALOG NODE** commands in the *Command Reference*.

2 The DB2 CLI/ODBC driver is automatically installed when DB2 is installed, and therefore nothing needs to be done.

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 the Visigenic or Intersolv ODBC Driver Manager components are installed and that each user that will use ODBC has access to it.

- If DB2 installed the Driver Manager it would be located in the `sqllib/odbclib` subdirectory.
- If the Driver Manager was installed by another program, the file `.odbc.ini` (begins with a period) would be located in the home directory of the user ID that runs the ODBC application.
- DB2 does not install an ODBC Driver Manager on the SCO UnixWare operating system. 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. A sample template of these files are provided in the `sqllib/odbclib` subdirectory.

`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 has a
separate copy of this file. The sample template file is called
odbc.ini (without the first 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
```

See the sample file in the sqllib/odbclib subdirectory for an example.

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 be copied into the end user's home directory and
called .odbc.ini. 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 sample odbc.ini template shows:

• line 2 (part of 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.

• lines 4-6 (part of 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.

• line 11 (part of the [ODBC] stanza):

```
InstallDir=/u/thisuser/sqllib/odbclib
```

Indicates that /u/thisuser/sqllib/odbclib should be treated as the
location where ODBC is installed.

Note: If your application specifically installed the ODBC components
(such as the Driver Manager) elsewhere, you must update the
line starting with InstallDir under the [ODBC] stanza to reflect
this new location.

For example, if ODBC 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 382 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 382. For information about the specific keywords see the *CLI Guide and Reference*.

If you require additional information at this point you can refer to the following topics in "Detailed Configuration Information" on page 380:

- "How to Bind the DB2 CLI/ODBC Driver to the Database" on page 381
- "How to Set CLI/ODBC Configuration Keywords" on page 381
- "Configuring db2cli.ini" on page 382

Macintosh Client Access to DB2 using CLI/ODBC

Before DB2 CLI and ODBC applications can successfully access a DB2 database from a Macintosh 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 "Configuring Database Connections" on page 479.

2 If you are using ODBC applications to access DB2 data, perform the following steps. (If you are using only CLI applications, skip to step #4.)

    a An ODBC driver manager must be installed to handle the communications between the ODBC applications and the DB2 ODBC driver. DB2 does not supply a Macintosh ODBC driver manager, only the DB2 ODBC driver itself.

If your ODBC application does not supply an ODBC driver manager then you can obtain the MacODBC driver manager directly from Apple.

b Register the DB2 database with the ODBC driver manager list of data sources (contained in the ODBC Preferences file) as a *data source* using either of these methods:

- Running **ODBC Setup** (in a 68K environment) or **ODBC Setup PPC** (in a PowerMacintosh environment) from the Control Panel

- Editing the initialization (ODBC Preferences or ODBC Preferences PPC) file directly; refer to the next step in this process for more information.

3 Configuring ODBC Preferences or ODBC Preferences PPC: The ODBC initialization file is used to record information such as the available drivers and data sources. See the documentation for your driver manager for procedures on updating this file.

The MacODBC driver manager uses the ODBC Preferences file or the ODBC Preferences PPC file to record information about the available drivers and data sources.

It is also possible to modify these files manually. Do not change any of the existing entries in the files.

a Use an ASCII editor to edit the `ODBC Preferences` file or the `ODBC Preferences PPC` file.

68K Environment

The following is a sample `ODBC Preferences` file:

```
[ODBC Data Sources]
GLOBALDB=IBM ODBC DB2 for Macintosh
SAMPLE=IBM ODBC DB2 for Macintosh

[GLOBALDB]
Driver=appl:ODBC$DB2DriverFunctionSet
Description=My GLOBAL database

[SAMPLE]
Driver=appl:ODBC$DB2DriverFunctionSet
Description=My SAMPLE database
```

PowerMacintosh Environment

The following is a sample `ODBC Preferences PPC`:

```
[ODBC Data Sources]
SAMPLE=IBM ODBC DB2 for PPC

[SAMPLE]
Driver=DB2ODBCDriverPPC
Description=My SAMPLE database
```

b The [ODBC Data Source] 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 Source] section, there is a section that lists additional information about that data source. These are called the *Data Source Specification* sections.

Under the [ODBC DATA SOURCE] entry, add the following line:

68K Environment
    database_alias=IBM ODBC DB2 for Macintosh

PowerMacintosh Environment
    database_alias=IBM ODBC DB2 for PPC

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).

c Add a new entry in the Data Source Specification section to associate the data source with the driver:

68K Environment

    `[database_alias]`
    `Driver=appl:ODBC$DB2DriverFunctionSet`

PowerMacintosh Environment

    `[database_alias]`
    `Driver=DB2ODBCDriverPPC`

Where *database_alias* is the alias of the database cataloged in the database directory, and listed under the Data Source Specification section.

4 The DB2 CLI/ODBC driver can be configured further by 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 applications that access the database. For a complete description of all the keywords and their usage, refer to an appendix in the *Installing and Configuring DB2 Clients* manual.

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.

Detailed Configuration Information

The section "Platform Specific Details for CLI/ODBC Access" on page 371 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.

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 369 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 as follows:

Platform:	Location:
OS/2	`sqllib` directory
Windows NT	`sqllib` directory
Windows 95	`sqllib` directory
Windows 98	`sqllib` directory
Windows 3.x	`sqllib\win` directory
UNIX	`sqllib/cfg` directory of the database instance running the CLI/ODBC applications

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 *Installing and Configuring DB2 Clients*.

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 371 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 Visigenic's ODBC Driver Manager use the odbc.ini file to record information about the available drivers and data sources. Visigenic's ODBC Driver Manager also uses the odbcinst.ini file on UNIX platforms. 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:

Platform: **Location:**

Windows *x*:\windows (where *x* is the drive where Windows is installed)

WIN-OS/2 *x*:\os2\mdos\winos2 (where *x* is the drive where OS/2 is installed)

UNIX Home directory of user ID running 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.

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.

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).

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 Windows 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
```

Note: If you are running the ODBC application under WIN-OS/2, specify the equivalent path \OS2\MDOS\WINOS2\SYSTEM in place of the \WINDOWS\SYSTEM path.

UNIX Configuration of .ini files

The section "UNIX Client Access to DB2 using CLI/ODBC" on page 376 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, OS/2, SCO UnixWare, Solaris, or Windows 32-bit operating systems. The JDK includes Java Database Connectivity (JDBC), a dynamic SQL API for Java.

DB2 JDBC support is provided by the DB2 Client Application Enabler (DB2 CAE). 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:

- JDBC applications do not require any other component of DB2 on the client to be built. To run JDBC applications requires the DB2 Client Application Enabler (CAE) to connect to DB2.

- To build SQLJ applications requires the DB2 SDK. To run SQLJ applications requires the DB2 CAE to connect to DB2.

- JDBC applets do not require any other DB2 component on the client to be built or run.

- SQLJ applets require the DB2 SDK to be built. They do not require any other DB2 component to be run on the client.

For detailed information on building and running JDBC and SQLJ programs on UNIX platforms see *Building Applications for UNIX Environments*. Detailed information on building and running JDBC programs on Windows and OS/2 can be found in *Building Applications for Windows and OS/2 Environments*. Building and running SQLJ programs on Windows and OS/2 is explained in the *What's New* book. For more information on DB2 programming in Java, refer to the *Embedded SQL Programming Guide*, chapter 15, "Programming in Java". This covers creating and running JDBC applications, applets, stored procedures and UDFs. Information on SQLJ applications, applets, stored procedures and UDFs can be found in the *What's New* book.

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 for
AIX from IBM.

HP-UX: The HP-UX Developer's Kit for Java Release 1.1
from Hewlett-Packard.

OS/2: The Java Development Kit (JDK) Version 1.1 for
OS/2 from IBM.

SCO UnixWare: No installation necessary: Java Development Kit
(JDK) Version 1.1.3 for SCO UnixWare is already
installed in `/usr/java`.

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 the DB2 Client
Application Enabler for your platform from the DB2 Client Pack. It must be Version
2.1.2 or later, except for SCO UnixWare which must be Version 5.2 or later.

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,
see the *Command Reference*.

Note: 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 Windows and OS/2, and during instance creation on UNIX platforms.

On UNIX platforms:

- CLASSPATH includes "." and the file `sqllib/java/db2java.zip`
- On AIX, SCO UnixWare, 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.

Note: 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.

Note: An SQLJ applet must be bound to the database before it is run.

Chapter 40. Entering DB2 Commands and SQL Statements

You can use the Command Center to enter DB2 commands and SQL statements if you are working with DB2 on OS/2 or Windows 32-bit operating systems. Otherwise, you can enter commands in the command line processor or at a system command prompt.

Task: Entering DB2 commands, SQL statements, and operating system commands	
Operating System	**Tools**
Macintosh	• command line processor
OS/2	• Command Center
	• command line processor
	• command prompt
UNIX	• command line processor
	• command line prompt
Windows 3.x	• command line processor
Windows 32-bit operating systems	• Command Center
	• command line processor
	• command window

Using the Command Center

On OS/2 and Windows 32-bit operating systems, the Command Center provides an interactive window that allows you 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 such as the Control Center and the Journal from the main tool bar.
- Display all the command scripts known to the system through the Script Center, with summary information listed for each.

To invoke the Command Center on OS/2:

1 Double-click on the **DB2 for OS/2** folder.

2 Double-click on the **Command Center** icon.

To invoke the Command Center on Windows 32-bit operating systems:

1 Click on **Start**, and select **Programs->DB2 for Windows-> Command Center**.

The Command Center contains a large input area in which you type your commands. To run the commands you have entered, select the **Start or stop execution** icon from the menu toolbar, or use CTRL+Enter.

> It is no longer necessary to enter the commands with a db2 prefix; instead, enter the command as follows:
>
>   list node directory
>
> To enter operating system commands in interactive mode, precede the operating-system command with an exclamation mark (!). For example:
>
>   !dir

If you want to enter multiple commands, you must end each command with the termination character, then press Enter to start the next command on a new line. (The default termination character is a semicolon(;).) To specify a different termination character, click on the **Tools Settings** icon in the menu toolbar.

After you enter a command, the Command Center displays 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.

> 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.

Using the Command Line Processor

| You can use the command line processor to enter SQL statements, DB2 commands,
| and operating system commands. It operates in the following modes:

| **Interactive Input Mode**   You can enter operating systems commands, DB2
                                 commands or SQL statements and view their
                                 output.

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.

File Input Mode   Refer to the *Command Reference* for information
                                 on the file input mode.

Interactive Input Mode

To invoke the command line processor in interactive input mode, do the following:

- On OS/2:

    1 Double-click on the **DB2 for OS/2** folder.

    2 Double-click on the **Command Line Processor** icon.

- On Windows 32-bit operating systems:

    1 Click on **Start** and select **Programs** ->**DB2 for Windows**->**Command Line
    Processor**.

- On Windows 3.x use one of the following methods:

    – From a DOS full screen, enter the **win db2clpw** command.

    – From Windows:

        1 Double-click on the **DB2** folder.

        2 Double-click on the **Command Line Processor** icon.

- On Macintosh:

    1 Double-click on the **DB2** folder.

    2 Double-click on the **Command Line Processor** icon.

You can also invoke the command line processor in interactive input mode by entering the **db2cmd** command followed by the **db2** command at a command prompt. In interactive input mode, the prompt looks like this:

```
db2 =>
```

In interactive mode, you do not have to enter DB2 commands with a `db2` prefix; instead, you just enter the DB2 command. For example:

```
db2 => list node directory
```

To enter operating system commands in interactive mode, precede the operating-system command with an exclamation mark (!). For example:

```
db2 => !dir
```

> Windows 3.x does not support this method of running operating system commands.

If you need to enter a long command that does not fit on one line, use the line continuation character, \. For example:

```
db2 => select empno, lastname, birthdate, from \
db2 (cont.) => employee where sex='F' order by empno desc
```

Note: You do not need to use a line continuation character when entering long commands in interactive input mode on Windows 3.x workstations.

To end interactive input mode, enter the **quit** command.

For more information on advanced topics using the command line processor, refer the *Command Reference*.

Command Line Mode

On OS/2 and UNIX operating systems, you can enter DB2 commands from a command prompt. You must include the `db2` prefix. For example:

```
db2 list node directory
```

To invoke the command line processor in command line mode on Windows 32-bit operating systems, use one of the following methods:

- Click on **Start** and select **Programs**-> **DB2 for Windows**->**Command Window**.
- Enter the **db2cmd** command at a command prompt.

After you invoke the DB2 command environment, you can enter DB2 commands at the command prompt. You must include the `db2` prefix.

Notes:

1. 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 will successfully retrieve all the information from the *employee* table, even if the * character has a special meaning on the operating system:

   ```
   db2 "select * from employee"
   ```

2. The command line mode is not available on Windows 3.x systems.

For more information on using the command line processor, refer to the *Command Reference*.

Chapter 41. Controlling Your DB2 Environment

Registry values, environment variables, and configuration parameters control your database environment.

- To set registry values through the DB2 profile registry, see "Controlling the DB2 Profile Registry" on page 396.
- To set DB2 environment variables, see:
  - "Setting Your Environment on OS/2" on page 397.
  - "Setting Your Environment on Windows 32-Bit Operating Systems" on page 398.
  - "Setting Your Environment on UNIX Systems" on page 399.
  - "Setting Your Environment on Windows 3.x" on page 399.
- To set database manager configuration parameters on a client instance, see "Configuration Parameters" on page 407.

Prior to the introduction of the DB2 profile registry in Version 5, changing your DB2 environment on OS/2 or Windows 32-bit operating systems required you to change your system's environment variables. On UNIX platforms, changing your DB2 environment required you to change the script files, db2profile or db2cshrc in the home directory of the instance.

With Version 5, almost all of the environment variables have been moved to the DB2 profile registry. Users with system administrative (SYSADM) authority for a given instance can update registry values for that instance. Use the **db2set** command to update DB2 registry values without rebooting your system. The DB2 registry applies the updated information to DB2 server instances and DB2 applications started after the changes are made.

Note: There is no DB2 profile registry on Windows 3.x. See "Setting Your Environment on Windows 3.x" on page 399 for more information.

DB2 configures its operating parameters by checking for variable values according to the following search order:

- The environment variable settings. If you are using a UNIX server, you can also set this variable in the script files, db2profile or db2cshrc.
- Profile registry values set with the **db2set** command in the instance-level profile.
- Profile registry values set with the **db2set** command in the global-level profile.

See "DB2 Registry Values and Environment Variables" on page 401 for descriptions of the subset of registry values and environment variables that you may want to adjust to get DB2 up and running. For more detailed information about all registry values and environment variables, refer to the *Administration Guide*.

Controlling the DB2 Profile Registry

The DB2 profile registry stores DB2 registry values. The "levels" of registry values are as follows:

DB2 instance-level profile:
This profile contains instance level variable settings and overrides. Values defined in this level will override their settings in the global level.

DB2 global-level profile:
This profile contains machine global variable settings. Any variable not defined at the node or instance levels will be evaluated at this level.

To modify registry variable values, enter the **db2set** command.

The syntax of the **db2set** command is as follows:

- To set a parameter, enter:

  db2set *parameter*=*value*

  This command will set the parameter that you specify at the default level for that parameter.

- To set a parameter's value for a specific instance, enter:

  db2set *parameter*=*value* -i *instance_name*

- To set a parameter at the global profile level, enter:

  db2set *parameter*=*value* -g

  Notes:

  1. Some parameters will always default to the global level profile. They cannot be set at the instance or node level profiles; for example, *DB2SYSTEM* and *DB2INSTDEF*.

  2. On UNIX, you must have system administrative (SYSADM) authority to change registry values for an instance. Only users with root authority can change parameters in global-level registries.

- To delete a parameter's value at a specified level, you can use the same command syntax to set the parameter, but specify nothing for the parameter value. For example, to delete the parameter's setting at the instance level, enter:

  db2set *parameter*= -g instance

- To delete a parameter's setting and to restrict its use, if it is defined at a higher profile level, enter:

  db2set *parameter*= -null -i *instance*

  This command will delete the setting for the parameter you specify and restrict high level profiles from setting this parameter (in this case, the DB2 global-level profile).

| However, the parameter you specify could still be set by a lower level profile (in
| this case, the DB2 node-level profile).

- To view the current session's parameter's value, enter:

    db2set *parameter*

- To view the parameter's value at all levels, enter:

    db2set *parameter* -all

- To view a list of all values defined in the profile registry, enter:

    db2set -all

| For more information on the **db2set** command and the administration of the DB2 profile
| registry, refer to the *Command Reference*.

Setting Your Environment on OS/2

It is strongly recommended that all DB2 specific registry values be defined in the DB2
profile registry. If DB2 variables are set outside of the registry, remote administration of
those variables will not be possible, and the workstation will have to be rebooted in
order for the variable values to take effect.

On OS/2, there are three system environment variables that are not stored in the DB2
profile registry: *DB2INSTANCE*, *DB2PATH*, and *DB2INSTPROF*. *DB2INSTANCE* and
DB2PATH are set when DB2 is installed; *DB2INSTPROF* can be set after installation.
The environment variable *DB2PATH* must be set; this environment variable is set
during install and you should not modify it. Setting *DB2INSTANCE* and *DB2INSTPROF*
is optional. Because the system environment variables are not set in the profile registry,
you will need to reboot if you change their settings.

To determine the setting of an environment variable, enter:

    set *variable*

To change the setting of an environment variable, enter the following command:

    set *variable*=value

| To modify system environment variables you must edit the config.sys file, then reboot
| to make the changes take effect.

Setting Your Environment on Windows 32-Bit Operating Systems

It is strongly recommended that all DB2 specific registry values be defined in the DB2 profile registry. If DB2 variables are set outside of the registry, remote administration of those variables will not be possible, and the workstation will have to be rebooted in order for the variable values to take effect.

Windows 32-bit operating systems have one system environment variable, *DB2INSTANCE*, that can only be set outside the profile registry; however, you are not required to set *DB2INSTANCE*. The DB2 profile registry variable *DB2INSTDEF* may be set in the global level profile to specify the instance name to use if *DB2INSTANCE* is not defined.

To determine the setting of an environment variable, enter:

    set *variable*

To set system environment variables, do the following:

On Windows 95 and Windows 98:
Edit the `autoexec.bat` file and reboot to make the change take effect.

On Windows NT:
Set environment variables as follows:

1. Click on **Start** and select **Settings**->**Control Panel**.

2. Double-click on the **System** icon.

3. In the System Properties window, select the **Environment** tab and do the following:

   a. If the variable does not exist:

      1. Select any environment variable in the System Variables window.

      2. Change the name in the **Variable** field to the name of the environment variable you want to set, for example *DB2INSTANCE*.

      3. Change the **Value** field to the value that you would like this parameter to take, for example, *db2inst*.

   b. If the variable already exists in the System Variables window, you can set a new value:

      1. Select the environment variable you want to change or append, for example *DB2INSTANCE*.

| **2** Change the **Value** field to the value that you would like this parameter
| to take, for example, *db2inst*.

c Click on the **Set** push button.

d Click on **OK**.

4 You may have to reboot your system for these changes to take effect.

Setting Your Environment on UNIX Systems

It is strongly recommended that all DB2 specific registry values be defined in the DB2 profile registry. If DB2 variables are set outside of the registry, remote administration of those variables will not be possible.

On UNIX, you must set the system environment variable *DB2INSTANCE*.

The sample script files, db2profile (for Bourne or Korn shell) and db2cshrc (for C shell), are provided to help you set the database environment. These scripts are available in the *INSTHOME*/sqllib directory, where *INSTHOME* is the home directory of the instance owner.

Note: Except for *PATH* and *DB2INSTANCE*, all other DB2-supported variables must be set in the DB2 profile registry. To set variables that are not supported by DB2, define them in your script files, db2profile or db2cshrc.

An instance owner or SYSADM user may customize these script files for all users of an instance. Alternatively, you can copy and customize a script file, then invoke a script directly or add it to your .profile or .login file.

To work with another instance for the current session, execute the db2profile script file (for Bourne shell or Korn shell) or the db2cshrc script file (for C shell) in the sqllib directory of the instance's home directory.

Setting Your Environment on Windows 3.x

The DB2 environment on Windows 3.x is not controlled by profile registries. Instead, Windows 3.x clients define environment keywords in the file db2.ini file (typically found in C:\windows directory).

> On Windows 3.x, the parameters that control the DB2 environment are called environment keywords. However, because many Windows 3.x keywords are also used on operating systems that use the DB2 profile registries, environment keywords may also be referred to as registry values in this manual.

The db2.ini initialization file is an ASCII file that stores values for the Windows 3.x client environment keywords. Within this file, there is just one section header titled:

```
[DB2 Client Application Enabler]
```

The parameters are set by specifying a keyword with its associated keyword value in the form:

```
KEYWORD=keywordValue
```

The following is a sample db2.ini file:

```
[DB2 Client Application Enabler]
; This is for my Windows 3.x Client
DB2PATH=C:\SQLLIB\WIN
DB2INSTANCE=DB2
DB2INSTPROF=C:\SQLLIB
DB2TRACEON=N
```

Notes:

1. All the keywords and their associated values must be located below the section header.

2. The keywords are not case sensitive; however, their values can be if the values are character based.

3. Comment lines use a semicolon in the first position of a new line.

4. Blank lines are permitted. If duplicate entries for a keyword exist, the first entry is used (and no warning is given).

This file is located in the Windows product directory.

On Windows 3.x, the Client Application Enabler for DB2 Version 2.x, Version 4, and Version 5 must set this information *only* in the db2.ini file.

DB2 Registry Values and Environment Variables

The following subset of the DB2 registry values and environment variables are those that you may need to know about to get up and running. Each has a brief description; some may not apply to your environment.

You can view a list of all supported variables for your platform. On all operating systems except Windows 3.x, enter the following command:

```
db2set -lr
```

Note: Windows 3.x clients define environment variables in the file db2.ini. See "Setting Your Environment on Windows 3.x" on page 399 for details.

Parameter	Operating System	Values	Description
General			
DB2ACCOUNT	All	Default: (not set)	The accounting string that is sent to the remote host. Refer to the *DB2 Connect User's Guide* for details.
DB2BIDI	All	Default: (not set)	Enables bi-directional CCSID processing by UDB. Refer to the *DB2 Connect User's Guide* for details.
DB2CODEPAGE	All	Default: derived from the language ID, as specified by the operating system.	Specifies the code page of the data presented to DB2 for database client application. The user should not set *db2codepage* unless explicitly stated in DB2 documents, or asked to do so by DB2 service. Setting *DB2CODEPAGE* to a value not supported by the operating system can produce unexpected results. Normally, you do not need to set *DB2CODEPAGE* because DB2 automatically derives the code page information from the operating system.
DB2COUNTRY	All	Default: derived from the language ID, as specified by the operating system.	Specifies the country code of the client applications, which influences date and time formats.
DB2DBDFT	All	Default: (not set)	Specifies the database alias name of the database that will be implicitly connected to when applications are started and no implicit connect has been done. This keyword is ignored if it is not set.

Parameter	Operating System	Values	Description
DB2DBMSADDR	Windows 32-bit operating systems	Default= (not set), value for Windows 95 and Windows 98: (90000000), value for Windows NT: (20000000)	Specifies the default database manager shared memory address in hexadecimal format. If a shared memory address collision occurs, this value can modified to force the database manager instance to allocate its shared memory at a different address. Use the DB2DMSADDR registry profile variable to assign an address value in the range of x'20000000' to x'B0000000' on Windows NT or x'80000000' to x'B0000000' on Windows 95 using increments of x'40000000'. Use the **db2set** command to change the shared memory address. For example, to set DB2DBMSADDR to x'84000000, use the following command: `db2set DB2DBMSADDR=84000000`
DB2DISCOVERYTIME	OS/2 and Windows 32-bit operating systems	Default: (default time of 40 seconds is used when this parameter is not set)	Specifies the amount of time that a SEARCH discovery will search for DB2 systems.
DB2DMNBCKCTLR	Windows NT	Default: (not set)	If DB2 is installed on a backup domain controller, setting DB2DMNBCKCTLR=DOMAIN_NAME allows DB2 to use the security database on the backup domain controller, thereby reducing LAN traffic. (DOMAIN_NAME must be in upper case.) **Note:** A backup domain controller shadows the security database on the primary domain controller.

Parameter	Operating System	Values	Description
DB2ENVLIST	UNIX	Default: (not set)	Lists specific variable names for either stored procedures or user defined functions. By default, the **db2start** command filters out all user environment variables except those prefixed with **DB2** or **db2**. If specific environment variables must be passed to either stored procedures or user defined functions, you can list the variable names in the *db2envlist* environment variable. Separate each variable name by one or more spaces. DB2 constructs its own PATH and LIBPATH, so if PATH or LIBPATH is specified in *db2envlist*, the actual value of the variable name is appended to the end of the DB2-constructed value. For example, LIBPATH becomes DB2LIBPATH.
DB2INCLUDE	All	Default: (not set)	Specifies a path to be used during the processing of the SQL INCLUDE text-file statement during DB2 PREP processing. It provides a list of directories where the INCLUDE file might be found. Refer to the *Embedded SQL Programming Guide* for descriptions of how *db2include* is used in the different precompiled languages.
DB2INSTDEF	OS/2 and Windows 32-bit operating systems	Default=DB2 (on OS/2 and Windows 32-bit operating systems)	Sets the default instance to be used if *DB2INSTANCE* is not defined.
DB2LIBPATH	UNIX	Default: (not set)	Specifies the value of LIBPATH in the *db2libpath* environment variable. On UNIX operating systems, the value of LIBPATH cannot be inherited between parent and child processes if the user ID has changed. Since the **db2start** executable is owned by root and its execute permissions are setuid to root, DB2 cannot inherit the LIBPATH settings of end users. If you list the variable name, LIBPATH, in the *db2envlist* environment variable, you must also specify the value of LIBPATH in the *db2libpath* registry value. The **db2start** executable will then read the value of *db2libpath* and append this value to the end of the DB2-constructed LIBPATH.
DB2OPTIONS	All	Default: (not set)	Sets command line processor options.

Parameter	Operating System	Values	Description
DB2SLOGON	Windows 3.x	Default (not set), Values: Y, N	Enables a secure logon in DB2 for Windows 3.x . If *db2slogon*=YES DB2 does not write user IDs and passwords to a file, but instead uses a segment of memory to maintain them. When *db2slogon* is enabled, the user must logon each time Windows 3.x is started.
DB2TIMEOUT	Windows 3.x and Macintosh	Disabled	Used to control the timeout period for Windows 3.x and Macintosh clients during long SQL queries. After the timeout period has expired a dialog box pops up asking if the query should be interrupted or allowed to continue. The minimum value for this variable is 30 seconds. If *db2timeout* is set to a value between 1 and 30, the default minimum value will be used. If *db2timeout* is set to a value of 0, or a negative value, the timeout feature is disabled. This feature is disabled by default.
DB2TRACENAME	Windows 3.x and Macintosh	Default (not set)	On Windows 3.x and Macintosh, specifies the name of the file where trace information is stored. The default on Windows 3.x is *db2tracename*=DB2WIN.TRC, and is saved in your current instance directory (for example, \sqllib\db2). The default on Macintosh is *db2tracename*=DB2MAC.TRC. We strongly recommend that you specify the full path name when naming the trace file.
DB2TRACEON	Windows 3.x and Macintosh	Default (not set), Values: Y, N	On Windows 3.x and Macintosh, turn trace on to provide information to IBM in case of a problem. (It is not recommended that you turn trace on unless you encounter a problem you cannot resolve.) Refer to the *Troubleshooting Guide* for information on using the trace facility with DB2 Client Application Enabler.

Parameter	Operating System	Values	Description
DB2TRCFLUSH	Windows 3.x and Macintosh	Default (not set), Values: Y, N	On Windows 3.x and Macintosh, *db2trcflush* can be used in conjunction with *db2traceon*=Y. *db2trcflush*=Y will cause each trace record to be written immediately into the trace file. Setting this will slow down your DB2 system considerably, so the default setting is *db2trcflush*=N. This setting is useful in cases where an application hangs the system and therefore needs to be rebooted. Setting this keyword guarantees that the trace file and trace entries are not lost by the reboot.
DB2TRCSYSERR	Windows 3.x and Macintosh	Default: (not set), Values: Y, N	Specifies the number of system errors to trace before the client turns off tracing. The default value traces one system error, after which, trace is turned off.
DB2YIELD	Windows 3.x	Default (not set), Values: Y, N	Specifies the behavior of the Windows 3.x client while communicating with a remote server. When N is set, the client will not yield the CPU to other Windows 3.x applications, and the Windows environment is halted while the client application is communicating with the remote server. You must wait for the communications operation to complete before you can resume any other tasks. When set to Y, your system functions as normal. It is recommended that you try to run your application with *db2yield*=YES. If your system crashes, you will need to set *db2yield*=NO. For application development, ensure your application is written to accept and handle Windows messages while waiting for a communications operation to complete.
System Environment			
DB2INSTANCE	All	Default=*DB2INSTDEF* on OS/2 and Windows 32-bit operating systems	The environment variable used to specify the instance that is active by default. On UNIX, users must set the environment variable *DB2INSTANCE*.
DB2INSTPROF	OS/2, Windows 3.x, and Windows 32-bit operating systems	Default (not set)	The environment variable used to specify the location of the instance directory on OS/2 and Windows 32-bit operating systems if different than *DB2PATH*.

Parameter	Operating System	Values	Description
DB2PATH	OS/2, Windows 3.x, and Windows 32-bit operating systems		The environment variable used to specify the directory where the product is installed on OS/2 and Windows 32-bit operating systems. By default it is set to x:\sqllib\win on Windows 32-bit operating systems; where x: is the install drive.
Communications			
DB2COMM	All, server only	Default (not set), values: any combination of APPC, IPXSPX, NETBIOS, NPIPE,TCPIP	Specifies the communication managers that are started when the database manager is started. If this is not set, no DB2 communications managers are started at the server.
DCE Directories			
DB2DIRPATHNAME	OS/2 and UNIX	Default: (not set)	Specifies a temporary override of the DIR_PATH_NAME parameter value in the database manager configuration file. If a directory server is used and the target of a CONNECT statement or ATTACH command is not explicitly cataloged, then the target is concatenated with *db2dirpathname* (if specified) to form the fully qualified DCE name. **Note:** The *db2dirpathname* value has no effect on the instance's global name, which is always identified by the database manager configuration parameters DIR_PATH_NAME and DIR_OBJ_NAME.
DB2CLIENTCOMM	OS/2 and UNIX	Default: (not set)	Specifies a temporary override of the DFT_CLIENT_COMM parameter value in the database manager configuration file. If both DFT_CLIENT_COMM and *db2clientcomm* are not specified, then the first protocol found in the object is used. If either one or both of them are specified, then only the first matching protocol will be used. In either case, no retry is attempted if the first connect fails.
DB2CLIENTADPT	OS/2	Default: (not set), range: 0-15	Specifies the client adapter number for NETBIOS protocol on OS/2 operating systems. The *db2clientadpt* value overrides the DFT_CLIENT_ADPT parameter value in the database manager configuration file.

Parameter	Operating System	Values	Description
DB2ROUTE	OS/2 and UNIX	Default: (not set)	Specifies the name of the Routing Information Object the client uses when it connects to a database with a different database protocol. The *db2route* value overrides the ROUTE_OBJ_NAME parameter value in the database manager configuration file.

> **Note:** There are three registry values that are related to ADSM:
>
> - *DSMI_CONFIG*
> - *DSMI_DIR*
> - *DSMI_LOG*
>
> Refer to the *Administration Guide* for information about ADSM and these values.

Configuration Parameters

Configuration parameters are values that affect the operating characteristics of a database or database management system.

Database manager configuration parameters exist on servers and clients; however, only certain database manager configuration parameters can be set on the client. These parameters are a subset of the database management configuration parameters that can be set on the server.

Database configuration parameters can be set only on the server, or remotely from the Control Center.

For information on setting database or database manager configuration parameters, refer to the *Administration Guide*.

Setting Database Manager Configuration Parameters on a Client Instance

To control database management configuration parameters on a client instance on OS/2 or Windows 32-bit operating systems, use the Client Configuration Assistant (CCA).

- On OS/2:

1 Double-click on the **Client Configuration Assistant** icon in the **DB2 for OS/2** folder.

2 Click on the **Client Settings** push button.

- On Windows 32-bit operating systems:

  1 Click on **Start** and select **Programs**->**DB2 for Windows**->**Client Configuration Assistant**. The Client Configuration window opens.

  2 Click on the **Client Settings** push button.

To modify a configuration parameter:

1 Select the tab that corresponds to the type of configuration parameter that you want to modify.

2 Select the configuration parameter that you want to modify from the **Parameter** window.

3 Select the value for this parameter from the **Value** window.

4 Click on **OK**.

For more information, refer to the online help.

To control database management configuration parameters on a client instance on UNIX, use the command line processor.

- For information on using Client Configuration Assistant, see Chapter 48, "Using the Client Configuration Assistant" on page 479.
- For information on using the command line processor, see "Using the Command Line Processor" on page 391.

Chapter 42. Administering and Using OS/2 User Profile Management on OS/2 Systems

User Profile Management (UPM) provides access control to workstation resources through a set of user ID validation and user and group ID management functions. UPM is installed with the DB2 products.

Three icons appear in the **UPM Services** folder:

- **Logoff**
- **Logon**
- **User Account Management**

Special Note for Users of Warp Connect and Warp Server

DB2 for OS/2 Version 5 includes UPM Version 4.0. Peer Services ships as a part of OS/2 Warp Connect and Warp Server includes a later version of UPM.

If DB2 for OS/2 detects that UPM is already installed it does not attempt to re-install it. Note that Version 4.06 of UPM does not include default user ID USERID with password PASSWORD defined. For DB2 for OS/2 Version 5 local logon, either:

- Use your Peer Services user ID, or

- Create a new user ID called USERID with password PASSWORD in UPM when logged on with your Peer Services user ID, which is an Administrator by default.

Using UPM for the First Time

The first time you use UPM, you have to use a default user ID. Your first task is to establish a permanent user ID and delete the default ID:

1 Make a backup copy of the `net.acc` file. This is stored on your workstation as `c:\muglib\accounts\net.acc` and contains the UPM defaults.

Note: If IBMLAN is also installed, you will find `net.acc` under
`x:\ibmlan\accounts`

You may use the **backacc.exe** and **restacc.exe** commands to backup and restore the `net.acc` file. Refer to your operating system or LAN documentation for further information.

2 Log on to UPM, following the procedure in "Logging on to UPM" on page 411. Use the default user ID, `USERID`, and the default password, `PASSWORD`.

3 Establish a permanent user ID, following the procedures in "Adding a New User ID and Password" on page 412. Select the:

- **Administrator** radio button in the **User type** box
- **Allowed** radio button in the **Logon** box
- **Password Required** radio button in the **Options** box.

   Note: Use a password that is not trivial.

4 Log off from UPM, following the procedures in "Logging Off" on page 414.

5 Log on to UPM again. Use the user ID you established in step 3.

6 Delete the default user ID, `USERID`, following the procedure in "Changing or Deleting a User ID" on page 413. This is a safeguard against unauthorized use of your workstation.

7 Do other work in UPM, as required.

8 When you are finished, log off from UPM.

Using UPM Every Day

This section covers everyday usage of UPM.

- "Logging on to UPM" on page 411
- "Logging On at the Command Prompt" on page 411
- "Adding a New User ID and Password" on page 412
- "Changing or Deleting a User ID" on page 413
- "Logging Off" on page 414
- "Managing UPM Groups" on page 414

Logging on to UPM

To log on to UPM, follow these steps:

1 Double-click on the **UPM Services** folder on the desktop.

2 Double-click on the **Logon** icon.

3 In the Logon window, type your user ID and password. (The password does not display.)

4 Click on **OK**.

Logging on to UPM with Multiple IDs

You can log on to UPM with multiple user IDs. You can use this feature to start several application programs under different user IDs. There are two ways to enable multiple logons at your workstation (and control selective logoffs). Use either of these methods:

- Type LOGON /O=MULTI at the OS/2 prompt and press Enter. As each application starts, the UPM logon window appears.

- Embed UPM logon and logoff commands in each application program you want to start with its own user ID. UPM provides two application programming interfaces (APIs), one for logon and one for logoff.

Logging On at the Command Prompt

You may also log on at the command prompt using the following syntax:

```
►►──logon──userid──/P:──password──/N:──node──/D:──domain──/L:────────►◄
```

userid	Identifies the user logging on. If *userid* is not specified, the Logon window is displayed so you can enter the user ID.
/P:*password*	Allows you to specify a password. If you enter a password, UPM tries to log on using the *password* specified. If no *password* is specified, UPM tries to log on without a password. If a password is required, the Logon window is displayed so you can enter it.
	/P is ignored if *userid* was not specified.
/N:*node*	Specifies the node to be used the next time a node must be accessed. If you use /N, the user ID and password are not validated until the program attempts to connect to the node.
	If no *node* is specified, the Logon window for Remote Node Access is displayed so you can enter the node name.

If only /N is specified, the Logon window for Remote Node Access is displayed so you can enter the user ID, password, and node name.

/D:_domain_ Specifies the domain on which a logon is to be attempted. An attempt to start a LAN requester is issued and, if successful, the domain logon completes.

If a LAN requester cannot be started, then a local logon is attempted.

If only /D is specified, the Logon window for a domain logon is displayed. If the workstation is a server, the default domain name is displayed on the domain logon window and you cannot change this domain name. If the workstation is a requester, the default domain name is displayed and you can use the default domain name or type a new domain name.

If you do not specify any parameters with the LOGON command, domain logon is the default if you are not already logged on to a domain. If you are already logged on to a domain, and you want to log on to another domain, specify the logon command, user ID, and password with the new domain name. You are logged off the old domain and logged on to the new domain without windows being displayed.

/L Forces a local logon. If you issue the LOGON command with no parameters, a domain logon is automatically attempted. To force a local logon, you must use the /L parameter.

Adding a New User ID and Password

To add a new UPM user ID and password, follow these steps:

1 Double-click on the **User Account Management** icon in the **UPM Services** folder. You must logon to UPM with a user ID that has *Administrator* authority.

If you are currently logged on to a domain and want to *Manage Users* locally, to use a local logon you must:

- Click on **Actions** in the **User Profile** window.
- Select **Use domain** from the pulldown menu.
- Select the **Local** radio button.
- Click on **OK**.

2 Select **Manage**->**Manage Users** from the menu bar.

3 Select **—NEW—** from the list.

4 Select **Actions**->**Add a new user ID** from the menu bar.

5 Type a new user ID and an optional comment. The user ID can be 1-8 characters and must comply with the guidelines in "Naming Rules" on page 415.

6 Select the values you want for **User type** and **Logon**. For most users, use the defaults, **User** and **Allowed**.

7 In the **Confirmation** box, type a password in the first **Type password twice** field, and type the password again in the second field for verification. The password must comply with the guidelines in "Naming Rules" on page 415.

8 Select the value you want for **Options**. For most users, use the default, **Required**.

9 Click **OK**. You are returned to the User Profile Management—User Management window.

Changing or Deleting a User ID

To change or delete a UPM user ID, follow these steps:

1 Log on to UPM.

2 Double-click on the **User Account Management** icon in the **UPM Services** folder.

3 Select **Manage**->**Manage Users** from the menu bar.

4 Select the user ID you want from the list.

5 Select **Actions** from the menu bar; then select one of the following:

Update user information
> To change a user's attributes, such as authorization level and password

View user profile...
> To see a user's profile information

Select groups for user ID...
> To add a user to, or remove the user ID from, groups

Erase user ID...
> To delete a user ID

Add/Change user logon profile...
> To add a new logon profile for a user, change an existing logon profile, or delete a logon profile

Erase user logon profile...
> To delete a user's logon profile

6 When you return to the User Profile Management - User Management window, select **Exit**->**Exit user management** from the menu bar.

Logging Off

To log off from UPM, follow these steps:

1 Display the User Profile Services window, either by exiting the UPM window in which you are working or by selecting **User Profile Management** from the desktop.

2 Double-click on the **UPM Services** folder.

3 Double-click on the **Logoff** icon.

4 Select a user ID from the list; then click on the **Logoff** push button. To log off all the user IDs from UPM, click on the **Logoff all** push button.

Managing UPM Groups

With administrator authority, you can put user IDs into groups and perform the following tasks:

- Create a new group
- Add or delete users in a group
- Delete a group.

All of the procedures below begin at the User Profile Management - Group Management window. To get there, follow these steps:

- Double-click on the **User Account Management** icon in the **UPM Services** folder.

- Select **Manage**->**Manage Groups** from the menu bar.

Creating a New Group

To create a new group, follow these steps:

1 Select **—NEW—** from the list in the window.

2 Select **Actions**->**Add a new group** from the menu bar.

3 In the **Group ID** field, type the name of the new group. Group IDs follow the same naming conventions as user IDs (see "Naming Rules" on page 415).

4 Type an optional comment in the **Group comment** field.

5 In the **User ID** list, select the user IDs for membership in the group.

6 Click on **OK**.

Adding and Deleting Users in a Group

To add or delete users in a group, follow these steps:

1 Select the group ID you want from the list in the window.

2 Select **Actions**->**Update group** from the menu bar.

3 Update the **Group comment** field by entering new text.

4 Select the user IDs you want to add to the group.

5 Deselect the user IDs you want to delete from the group.

6 Click on **OK**.

Deleting a Group

To delete a group, follow these steps:

1 Select the group ID you want from the list in the window.

2 Select **Actions**->**Erase group** from the menu bar.

3 Click on *Erase ID* push button to confirm the request.

Naming Rules

The user ID must conform to the following rules:

- Cannot start with a digit (0 to 9) or end with a dollar sign ($).

- Can be 1 to 8 characters long and may contain the following characters:
    - Upper or lower case letters A to Z
    - Special characters #, @, or $
    - Digits 0 to 9.

- Cannot be PUBLIC, USERS, ADMINS, LOCAL, or GUESTS, or a name that starts with IBM, SYS, or SQL.

User Profile Management Passwords

UPM provides default values for user ID and password; some countries have translated these values as shown in Table 43 on page 416.

Table 43. Default UPM User IDs and Passwords

Country	USERID	Password
<default>	USERID	PASSWORD
Denmark	BRUGERID	KODEORD
Finland	OMATUNN	TUNNSANA
France	IDUTIL	MOTDEPAS
Germany	BENUTZER	KENNWORT
Italy	ID	CHIAVE
Norway	BRUKER	PASSORD
Portugal	IDUTIL	PASSE
Spain	IDUSUAR	CONTRASE

Part 7. Advanced Installation and Configuration

Chapter 43. Unattended DB2 Installation on OS/2 Operating Systems

During a regular installation, you interact with the install program, filling in a series of panels to set up and configure the DB2 product.

In an unattended installation, these tasks run automatically without any intervention. The setup and configuration data is supplied by response files you set in place beforehand.

You can use this feature to install DB2 products on OS/2 operating systems:

- Locally, from a CD-ROM (refer to "Installing DB2 Products from a Hard Disk or CD-ROM").

- Remotely, across a network connection from a hard disk/CD-ROM (refer to "Installing DB2 Products from a Hard Disk or CD-ROM").

- Remotely, using the Netfinity server, if it is installed on your system (refer to "Installing DB2 Products Remotely Using TME Netfinity Server" on page 426).

> If you need to install the same DB2 product on several machines, you can use unattended installation's "response file" feature to create a customized configuration, save the customized response file, then reuse it as a template for each installation.

Installing DB2 Products from a Hard Disk or CD-ROM

To install DB2 products on local or remote workstations, from a hard disk or CD-ROM, perform the steps in the following sections:

- "Step 1. Make DB2 Files Available for Installation" on page 420

- "Step 2. Create a Response File for Unattended Installation" on page 420

- "Step 3. Run the CMD File from the Remote Workstation" on page 423

> You can also use the following procedure to *remove* all DB2 products from a target workstation. Simply follow the instructions below, but when editing the command file, specify D (Delete) instead of I (Install).

Step 1. Make DB2 Files Available for Installation

In this section, you make the DB2 install files accessible to the client machine where DB2 will be installed.

- If performing *remote* installs directly from the CD-ROM:

    1 Insert the appropriate Client Pack CD-ROM into the drive.

    2 Ensure that the CD-ROM will remain in the drive for as long as it is needed for the install. If the drive is often used for other tasks as well, consider installing from the hard disk instead.

- If installing from a hard disk, you must copy the required files from the CD-ROM directories to the hard disk. At the command prompt, use the **xcopy** command with the **/s** option.

    - The syntax for the two commands required is:

        ```
        xcopy x:\db2\os2\language e:\clients\os2\language /s
        xcopy x:\db2\os2\common e:\clients\os2\common /s
        ```

    where:

    - *x:* represents the CD-ROM drive
    - *language* is the two-character code that represents your language (for example, EN for English). Table 49 on page 531 lists the code for each available language.
    - *e:* represents the destination drive

If performing a remote installation, you must enable your network clients to access the DB2 install files.

Grant *shared access* authority to the directory that you just created, or to the CD-ROM drive if installing directly from CD-ROM.

Step 2. Create a Response File for Unattended Installation

During an interactive installation, you provide the information needed to install DB2 and configure its environment. During an unattended installation, this information is provided as keywords and values in a response file. DB2's install package includes a ready-to-use sample response file, with default entries already in place.

If you intend to use the sample response file provided, without making any changes to its values, you can skip this step and go to "Step 3. Run the CMD File from the Remote Workstation" on page 423.

To edit the sample response file:

1 Find the correct sample response files for the product you want to install. Copy the files to a local directory.

If installing directly from the CD-ROM, substitute *x:\os2* where *x:* represents the CD-ROM drive for `e:\clients` in the directory names below.

- Edit one of:
  - `e:\clients\os2\`*language*`\db2conen.rsp` for DB2 Connect Enterprise Edition
  - `e:\clients\os2\`*language*`\db2cae.rsp` for DB2 Client Application Enabler

  where *language* is the two-character country code that represents your language (for example, `EN` for English). Table 49 on page 531 lists the codes for each available language.

2 The response file contains:

- Keywords unique to installation
- Registry value/environment variable settings
- Database manager configuration parameter settings.

For more information on:

- DB2 environment variables and registry values, see "DB2 Registry Values and Environment Variables" on page 401, or refer to the *Administration Guide*.
- Database manager configuration parameters, refer to the *Administration Guide*.

---

3 To activate an item in the response file, remove the asterisk (*) to the left of the keyword/environment variable, erase the current setting to the right of the value and type in a new setting. The possible settings are listed to the right of the current setting.

An example section of a response file appears below:

```
...
FILE             = c:\sqllib
COMP             = Client Application Enabler
...
*DB2ACCOUNT      = BLANK or char(199)
*DB2BQTIME       = BLANK or 1 - MAX
...
```

Keywords unique to installation are parameters that are only specified in a response file during an unattended installation. The following is a list of keywords unique to OS/2 and Windows 3.x unattended installation:

- *FILE*

Specifies the destination directory for DB2. If you do not change this value, it defaults to `x:\sqllib` where *x:* is the drive on which your operating system is installed.

> • Install DB2 products only on a drive which is local to the target workstation. Installing on a non-local drive can cause performance and availability problems.

- *COMP*

  Specifies the components you want installed. By default, all components of the DB2 product are installed. If you do not want to install a component, add an asterisk (*) to the left of the *COMP* line for that component in the response file.

- *OVERWRITE*

  Specifies whether to automatically overwrite files during installation. Valid values for this keyword are `YES` and `NO`.

- *CFGUPDATE*

  Specifies whether the `config.sys` file is automatically updated. Valid values for this keyword are:

  - `AUTO`

    Automatically updates CONFIG.SYS.

  - `MANUAL`

    Does not update CONFIG.SYS.

- *SAVEBACKUP*

  Specifies whether to save a backup version of the product when it is updated. Valid values for this keyword are `YES` and `NO`.

- *DB2SYSTEM*

  On OS/2, specifies a name for the system which is unique within a network.

  Note: This parameter must be specified.

- *AUTOSTART_CONTROL_CENTER*

  On OS/2, specifies whether or not to automatically start the Control Center each time the system is rebooted.

  Note: By default the Control Center will be automatically started unless this parameter is set to `NO`.

- *DB2.AUTOSTART*

  On OS/2, specifies whether or not to automatically start the DB2 instance each time the system is rebooted.

  Note: By default the DB2 instance will be automatically started unless this parameter is set to `NO`.

- *ADMIN.USERID* and *ADMIN.PASSWORD*

  On OS/2, specifies the user ID and password that will be used to log on and start the Administration Server each time your system is started. If UPM already exists on your system, the user ID and password you provide must exist and have one of the following:

  – UPM administrator authority on your system.

  – UPM local administrator authority on your system.

  If UPM is not on your system, it will be installed as part of the DB2 installation and the user ID and password you provide will be set up with the appropriate authority.

4 Exit the file. If you have made any changes, save the file under a new file name to preserve the original sample response file.

If you are installing directly from the CD-ROM, you must store the renamed response file on a local drive.

Step 3. Run the CMD File from the Remote Workstation

A command (CMD) file contains the commands which will start the installation program. You must edit this file before running the installation.

1 Find and open the correct CMD file.

If installing directly from the CD-ROM, substitute x:\os2 for `e:\clients\os2\` in the directory names below.

- The CMD files are available in the `e:\clients\os2\`*language* directory where *language* is the two-character country code that represents your language (for example, `EN` for English). Table 49 on page 531 lists the codes for each available language. For example:

  – `db2conen.cmd` for DB2 Connect Enterprise Edition

  – `db2cae.cmd` for DB2 Client Application Enabler

2 Edit the command in the file, to fill in the information needed for the installation.

- For OS/2:

  a You must specify the complete install command. A complete command requires the following syntax:

```
►►─┬────────────┬─ install ── /A:action ─┬──────┬─ /P:"product" ──►
   └─ d:\path ──┘                         └─ /X ─┘
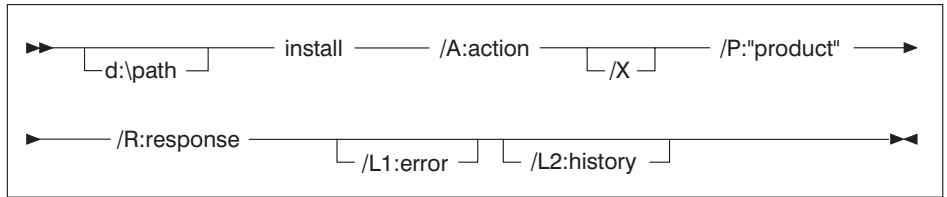
►──── /R:response ─┬──────────────┬─┬─────────────────┬──────────►◄
                   └─ /L1:error ──┘ └─ /L2:history ───┘
```

The following is an example of a complete command in the sample command files:

```
e:\clients\os2\language\install\install /A:I /X
    /P:"IBM DB2 Client Application Enabler"
    /R:e:\clients\os2\language\db2cae.rsp /L1:d:\error.log
    /L2:d:\history.log
```

where:

/d:\path   Specifies the location of the install files. If installing from the hard drive, specify the directory created in Step 1.

/A   Specifies the action to be performed.

    I   Specifies install.

        Note: If you want to *remove* all DB2 products from a target workstation, specify D (Delete) instead of I (Install).

/X   Specifies that the installation will run in unattended mode.

/P   Specifies the name of the product you want to install.

/R   Specifies the fully qualified response file name. If you changed and renamed the sample response file provided, make sure this parameter matches the new name.

/L1   Specifies the fully qualified log file name, where setup information and any errors occurring during setup are logged.

/L2   Specifies the fully qualified history log name, where all the files processed by the installation program are listed.

- On Windows 3.1:

  A complete command requires the following syntax:

```
►►── win.com ─┬────────────┬─ install ── /A:action ─┬──────┬──────►
              └─ d:\path ──┘                          └─ /X ─┘
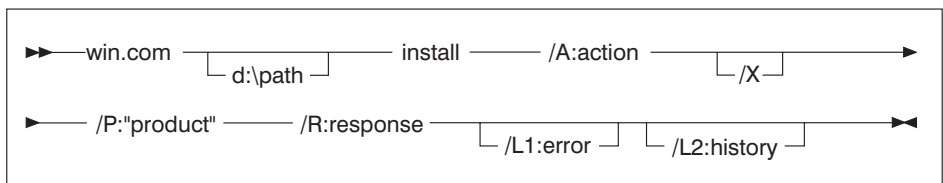
►── /P:"product" ── /R:response ─┬──────────────┬─┬─────────────────┬──►◄
                                 └─ /L1:error ──┘ └─ /L2:history ───┘
```

The following is an example of a complete command in the sample command files:

```
win e:\clients\windows\install\install /A:I /X
    /P:"IBM Client Application Enabler V5"
    /R:e:\clients\windows\db2caew.rsp /L1:d:\error.log
    /L2:d:\history.log
```

where:

/d:\path   Specifies the location of the install files. If installing from the hard drive, specify the directory created in Step 1.

/R   Specifies the fully qualified response file name. If you changed and renamed the sample response file provided, make sure this parameter matches the new name.

/A   Specifies the action to be performed.

        I   Specifies install.

        Note: If you want to *remove* all DB2 products from a target workstation, specify D (Delete) instead of I (Install).

/X   Specifies that the installation will run in unattended mode.

/P   Specifies the name of the product you want to install.

/L1   Specifies the fully qualified log file name, where setup information and any errors occurring during setup are logged.

/L2   Specifies the fully qualified history log name, where all the files processed by the installation program are listed.

  3 Save and exit the CMD file.

If you are installing directly from the CD-ROM, you must rename the CMD file, store it on a local drive, and use that file name in the next step.

  4 Start the installation by entering the CMD file's name on the command line. The DB2 Client Application Enabler is now ready to install on the target workstation.

  5 When installation is complete, check the error and history logs for any errors or problems.

To configure your DB2 Connect workstation to access remote hosts, go to the Chapter 11, "Configuring Communications to Host and AS/400 Databases Manually" on page 93 manual. To configure your client to access remote DB2 Connect workstations or DB2 servers, go to Chapter 33, "Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 303.

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Installing DB2 Products Remotely Using TME Netfinity Server

To install a DB2 product in a Netfinity Server environment, perform the steps in the following sections:

- "Step 1. Copy the DB2 Install Files to the Code Server"
- "Step 2. Add the DB2 Product to the Software Library" on page 427
- "Step 3. Configure the DB2 Product" on page 427
- "Step 4. Install DB2 Products on the Remote Workstation" on page 428

Note: The following are the required levels of Netfinity:

Netfinity Server Product: IBM TME 10 Netfinity Server - Manager Version 4
Product Number: 5697-288, Feature 0000
Must have component: Software Distribution Server at service level 00000003
Netfinity Server cannot be used for Windows 3.x workstations.

Netfinity Client Product: IBM TME 10 Netfinity Server - Client Version 4
Product Number: 5697-288, Feature 0000
Must have component: Software Distribution Client at service level 00000003

Step 1. Copy the DB2 Install Files to the Code Server

1 Insert the appropriate CD-ROM into the drive.

2 Copy the required files from the CD-ROM directories to the code server's hard drive. At the command prompt, use the **xcopy** command with the **/s** option.

The syntax for the two commands required is:

```
xcopy x:\db2\os2\language e:\cid\img\language /s
xcopy x:\db2\os2\common e:\cid\img\common /s
```

where

- *x:* represents the CD-ROM drive
- *language* is the two-character code that represents your language (for example, EN for English. Table 49 on page 531 lists the code for each available language.
- *e* is the letter that designates the code server's hard disk

3 Leave the CD-ROM in the drive; it is required for the next step.

Step 2. Add the DB2 Product to the Software Library

> Once you have added a particular DB2 product to the software library, you can omit this step for later installations of that product.

To add a DB2 product to the software library:

1 Start Netfinity Server.

2 Double-click on the **Netfinity Server Service Manager** icon.

3 Double-click on the **CID Software Preparation** icon.

4 Double-click on the **Software Library** icon.

5 Select **Software**->**New** from the menu bar on the Software Library window.

6 Enter the name of the product you are adding.

7 Select the **Find** push button.

8 In the Find definition file window, select:

- The CD-ROM drive letter in the **Drive** list
- en\install*.adf in the **Directory** list
- The appropriate .adf file name in the **File** list:

    – db2conen.adf for DB2 Connect Enterprise Edition

    – db2cae.adf for DB2 Client Application Enabler

9 Click on **OK**.

10 Select the **Add** push button to associate the application definition file with DB2.

   This copies the remote installation files (.adf, .var, .cmd and .mrf) from the CD-ROM to the subdirectory where Netfinity Server resides.

An icon is created in the **Software Library** folder, representing the DB2 product you have just added.

Step 3. Configure the DB2 Product

In this step, you configure the DB2 product for the target workstation, just as you would during a standard interactive installation. To perform this task:

1 Double-click on the **DB2** product icon in the Software Library window.

2 Select **Configuration**->**New**.

The Settings notebook opens.

3 Enter a unique identifier to define this configuration.

4 On each page of the notebook, select each of the items in the **Variables** list and choose the setting. A description of each variable is displayed in the **Explanation** field of the notebook page.

5 When you have completed all of the pages of the notebook, click on **OK**.

6 When the message `Do you want to catalog the database?` appears, click on the **Yes** push button.

The values entered in the notebook are used to create a response file which will supply the information needed to run the installation.

Step 4. Install DB2 Products on the Remote Workstation

To install DB2 products on the remote workstation, you can use either the Event Scheduler or the Remote System Manager. For information on how to use these tools, refer to the Netfinity Server documentation.

After installation, you must reboot the workstation before using DB2.

To configure your DB2 Connect workstation to access remote hosts, go to Chapter 11, "Configuring Communications to Host and AS/400 Databases Manually" on page 93. To configure your client to access remote DB2 Connect workstations or DB2 servers, go to Chapter 48, "Using the Client Configuration Assistant" on page 479.

Chapter 44. Unattended DB2 Installation on Windows 32-bit Operating Systems

During a regular installation, you interact with the install program, filling in a series of panels to set up and configure DB2.

In an unattended installation, you supply the setup and configuration data in a response file you create before running the installation.

You can use this feature to install DB2 products on Windows 32-bit operating systems operating systems:

- Locally, from a CD-ROM (see "Installing DB2 Products from a Hard Disk or CD-ROM")

- Remotely, across a network connection from a hard disk or CD-ROM (see "Installing DB2 Products from a Hard Disk or CD-ROM")

- Remotely, across a network connection to target workstations, using Microsoft Systems Management Server (SMS) if it is installed on your Windows NT system (see "Installing DB2 Remotely Using SMS" on page 439).

> If you need to install the same DB2 product on several machines, you can use unattended installation's "response file" feature to create a customized configuration, save the customized response file, then reuse it as a template for each installation.

Installing DB2 Products from a Hard Disk or CD-ROM

To install DB2 products for Windows 32-bit operating systems, from a hard disk or CD-ROM to local or remote workstations, perform the steps in the following sections:

- "Step 1. Make DB2 Files Available for Installation" on page 431

- "Step 2. Create a Response File for Unattended Installation" on page 432

- "Step 3. Run Setup from the Workstation" on page 437

You can also use this procedure to perform an *interactive* remote install instead of an unattended remote one. Follow the instructions below.

Before You Begin

Read and perform the steps in this section before you begin the installation to ensure that you have the required items and information you will need.

Creating Usernames for DB2 Installation and Operation

This section describes usernames required to install the DB2 product and its components.

Creating a Username for Installing DB2 Products:

Windows 95 and Windows 98

> The username must be a valid DB2 username.
>
> A valid DB2 username is eight characters or less, and complies with DB2's naming rules. For more information on DB2's naming rules, see Appendix G, "Naming Rules" on page 553.

Windows NT

> You need to have a username that will be used to install DB2. The username may belong to the Domain or local Administrators group.

On servers, this username will be removed from the system when the installation is complete, unless it will be used by the Administration Server. See "Determining the Username for the Administration Server When Using a Response File:" for more information.

On clients, this username will be removed from the system when the installation is complete.

Determining the Username for the Administration Server When Using a Response File:

Note: This section only applies to Windows NT.

During installation, you will be asked to provide a username and password that will be used by the Administration Server to log on to the system and to start itself as a service.

By default, for installations that use a response file, the setup program sets the parameters *ADMIN.USERID* to DB2ADMIN and *ADMIN.PASSWORD* to DB2ADMIN. *ADMIN.USERID* specifies the username for Windows NT. You can accept these default values, or provide your own. If you provide your own *ADMIN.USERID*, you must ensure that it is eight characters or less, and complies with DB2's naming rules. For more information, see Appendix G, "Naming Rules" on page 553.

The setup program checks to see if the username specified for the Administration Server exists. If that username does not exist, the setup program creates it. If it does exist, the setup program will:

- Verify that the username is a member of the Administrators group.

- Verify that the password is valid; provided that the username used to install DB2 has the *"Act as part of the operating system"* advanced user right.

> If you use the default username *db2admin*, and did not change the default password for this username, you should change this password immediately following the installation.
>
> When the setup program creates the *db2admin* username, it also makes it a member of the Administrators group. Since its password is well-known, you should do the following:
>
> **1** Change the password for *db2admin*, using the User Manager function of the DB2 administration tools.
>
> **2** Change the password for the *DB2-DB2DAS00* service to match the new password that you specified for the *db2admin* username.

Step 1. Make DB2 Files Available for Installation

To make the DB2 install files accessible to the machine where DB2 will be installed:

- If performing *remote* installs directly from the CD-ROM:

    1 Insert the appropriate Client Pack CD-ROM into the drive.

    2 Ensure that the CD-ROM remains in the drive for as long as the installation requires it. If the drive is often used for other tasks as well, consider installing from the hard disk instead.

- If installing from a code server, you must copy the required files from the CD-ROM directories to the hard disk:

    1 Insert the appropriate CD-ROM into the drive.

    2 Create a directory on the code server, for example, `q:\db2prods`.

    3 At the command prompt, use the **cpysetup.bat** command to copy the files necessary for a particular language install to a code server.

    The command syntax is:

    – `x:\db2\winnt95\common\cpysetup.bat` `q:\db2prods` *language*

    for:

    - DB2 Client Application Enabler
    - DB2 Connect Enterprise Edition

    where:

- *x:* represents your CD-ROM drive
- *q:* represents the code server's disk.
- *language* is the two-character country code that represents your language (for example, `EN` for English). See Table 49 on page 531

If performing a remote installation, you must enable your network clients to access the DB2 install files.

Grant *shared access* to the directory that you just created, or to the CD-ROM drive.

To set up a share:

1 Click on **Start** and select **Programs**->**Windows Explorer**.

2 Select the directory that you want to share, for example `q:\db2prods`.

3 Select **Files**->**Properties** from the menu bar. The properties window for the directory will open. Click on the **Sharing** tab.

4 Select the **Shared As** radio button.

5 In the **Share Name** field type a share name. For example, type `db2nt`.

6 To specify read access for everyone on Windows NT:

a Select the **Permissions** push button. The Access Through Share Permissions window opens.

b In the **Name** box, make sure that **Everyone** is selected.

c In the **Type of Access** box, select **Read**.

d Click on **OK**.

On Windows 95 and Windows 98, you do not need to specify type of access when you set up a share. By default, everyone is allowed read access.

In our example scenario, `q:\db2prods` uses a share name of `db2nt`. We will use this value in the examples that follow.

Step 2. Create a Response File for Unattended Installation

During an interactive installation, you interact with the install program, filling in a series of panels to set up and configure the DB2 product. During an unattended installation, you supply the setup and configuration data in a response file you create before running the installation. DB2's install package includes a number of ready-to-use sample response files, with default entries already in place.

The sample response files are located in:

- *x*:\db2\winnt95\common

  for:

  – DB2 Client Application Enabler
  – DB2 Connect Enterprise Edition

where *x* is the letter that designates the CD-ROM drive. There is a different response file for each product on the CD, so that the user has a valid list of parameters for each product.

If you intend to use the sample response file provided, without making any changes to its values, you can skip this step and go to "Step 3. Run Setup from the Workstation" on page 437.

Edit the sample response file. For example, you can use Notepad or WordPad.

1 Open the sample response file for the package you want to install.

- `db2cae.rsp` for DB2 Client Application Enabler

- `db2conen.rsp` for DB2 Connect Enterprise Edition

2 The response file contains:

- Keywords unique to installation

- Registry value/environment variable settings

- Database manager configuration parameter settings.

> For more information on:
>
> - DB2 environment variables and registry values, see "DB2 Registry Values and Environment Variables" on page 401, or refer to the *Administration Guide*.
>
> - Database manager configuration parameters, refer to the *Administration Guide*.

3 To activate an item in the response file, remove the asterisk (*) to the left of the keyword/environment variable, erase the current setting to the right of the value and type in a new setting. The possible settings are listed to the right of the current setting.

An example section of a response file appears below:

```
...
FILE            = c:\sqllib
REBOOT          = No
*COMP           = Control Center
...
```

Keywords unique to installation are parameters that are only specified in a response file during an unattended installation. The following is a list of keywords

unique to installation for Windows 32-bit operating systems unattended installation:

- *FILE*

  Specifies the destination directory for DB2.

  Note: Check the value for the *FILE* keyword. *FILE* specifies where to install the product. If you do not change this value, it defaults to `x:\sqllib` where *x:* is the drive on which your operating system is installed.

- *REBOOT*

  Specifies whether to restart the system following installation.

- *TYPE*

  Specifies the type of install. The options are:

  `0`=Compact

  `1`=Typical (default)

  `2`=Custom

  For `0` and `1` (compact and typical), any Custom Keywords (COMP) value will be ignored.

  For all types, default communication values will be used where applicable, as follows:

  a `DB2.DB2COMM` and `ADMIN.DB2COMM` will be set for the protocols detected on your system.

  b If a protocol is detected on the system, or if you have specified values for `DB2.DB2COMM` or `ADMIN.DB2COMM`, values for its parameters will be generated so that the protocol will be enabled for DB2's use at the end of the install. Checks are made to ensure that the generated values are not duplicates, and that they conform to the protocols set up on your system. Default values will be generated for the following:

    – For NetBIOS:

  ```
  DB2.DB2NBADAPTERS      ADMIN.DB2NBADAPTERS
  DB2.NNAME              ADMIN.NNAME
  ```

    – For TCP/IP:

  ```
  DB2.PORT_NUMBER        ADMIN.PORTNUMBER
  DB2.SVCENAME           ADMIN.SVCENAME
  ```

    – For IPX/SPX:

  ```
  DB2.FILESERVER         ADMIN.FILESERVER
  DB2.OBJECTNAME         ADMIN.OBJECTNAME
  DB2.IPX_SOCKET         ADMIN.IPX_SOCKET
  ```

    – For APPC:

```
                        DB2.TPNAME              ADMIN.TPNAME
```

> **Note:** You may override these values; however, if the associated protocol has not been detected or specified, the values will not be used.

- *PROD*

  Specifies the product you want installed. The options are:

  - `DB2_CAE` for DB2 Client Application Enabler
  - `CONNECT_ENTERPRISE` for DB2 Connect Enterprise Edition

  Note: You can use this parameter more than once.

- *COMP*

  Specifies the components you want installed. The installation program automatically installs components that are required for a product, and ignores requested components that are not available.

  Note: Component selections have no effect unless you specify a `custom` installation.

  The following table lists *COMP* keywords and the components they represent.

Table 44 (Page 1 of 2). Component Keywords for Windows 32-bit Operating Systems Unattended Install

Keyword	Component
Product Components	
GRAPHICAL_TOOLS	Graphical Tools
CLIENT_CONFIGURATION_ASSISTANT	Client Configuration Assistant
CONTROL_CENTER	Control Center
WEB_CONTROL_CENTER	Web Control Center
PERFORMANCE_MONITOR	Performance Monitor
VISUAL_EXPLAIN	Visual Explain
ODBC_DRIVER	DB2 ODBC Driver
SAMPLE_APPLICATIONS [1]	Sample Applications
THIN_CLIENT_CODE_SERVER	Thin Client Code Server
DB2 Books	
API_REFERENCE [1]	API Reference
ADMINISTRATION_GUIDE	Administration Guide
ADMINISTRATION_GETTING_STARTED	Administration Getting Started
DB2_PROGRAMMING_GETTING_STARTED [1]	Road Map to DB2 Programming
BUILDING_OS2_WIN_APPLICATIONS [1]	Building Applications for Windows and OS/2 Environments

Table 44 (Page 2 of 2). Component Keywords for Windows 32-bit Operating Systems Unattended Install	
Keyword	**Component**
CLI_GUIDE_REFERENCE [1]	CLI Guide and Reference
COMMAND_REFERENCE	Command Reference
SQL_PROGRAMMING_GUIDE [1]	Embedded SQL Programming Guide
GLOSSARY	Glossary
MASTER_INDEX	Master Index
MESSAGES_REFERENCE	Messages Reference
SQL_GETTING_STARTED	SQL Getting Started
SQL_REFERENCE	SQL Reference
SYSTEM_MONITOR_GUIDE	System Monitor Guide and Reference
TROUBLESHOOTING_GUIDE	Troubleshooting Guide
Note:	
1. Software Developer's Kit only	

- *AUTO_CTRL_CENTER*

  Specifies whether or not to automatically start the Control Center each time the system is rebooted.

  Note: By default the Control Center starts automatically unless this parameter is set to N0.

- *DB2.AUTOSTART*

  Specifies whether or not to automatically start the DB2 instance each time the system is rebooted.

  Note: By default, the DB2 instance stars automatically unless this parameter is set to N0.

- *AUTOSTART_CCA*

  Specifies whether or not to automatically start the Client Configuration Assistant each time the system is rebooted.

  Note: By default, the Client Configuration Assistant starts automatically unless this parameter is set to N0.

- *ADMIN.USERID*

  Specifies the username that the DB2 Administration Server will use to log on to the system. If *ADMIN.USERID* is not activated, the account DB2ADMIN/DB2ADMIN will be created and used, if applicable. See "Determining the Username for the Administration Server When Using a Response File:" on page 430

- *ADMIN.PASSWORD*

Specifies the password for the DB2 Administration Server.

> • Install DB2 products only on a drive which is local to the target workstation. Installing on a non-local drive can cause performance and availability problems.
> • By default, the name of the response file will be used to determine the products to be installed. You can override this setting by providing one or more **PROD** parameter values in the response file.

4 Exit the file. If you have made any changes, save the file under a new file name to preserve the original sample response file.

If you are installing directly from the CD-ROM, you must store the renamed response file on another drive.

Step 3. Run Setup from the Workstation

To perform the installation:

1 At the workstation where DB2 will be installed, logon as a username that meets the requirements for installing DB2. See "Creating Usernames for DB2 Installation and Operation" on page 430 for more information.

2 If performing a remote install, connect to the shared directory of the hard disk, or to the CD-ROM drive, using a command similar to the following:

```
net use e: \\machine\directory
```

where:

- • *e* is the drive letter used to connect to the shared directory on the hard disk or CD-ROM drive.
- • *machine* is the machine name of the code server.
- • *directory* is the share name of the code server or CD-ROM drive.

For example, type:

```
net use e: \\codeserv\db2nt
```

Based on the example set up in previous steps, this points to `q:\db2prods` on the code server.

3 Run the setup program:

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

b In the Open Window, type the path to the setup program. The path accepts the following command line arguments:

```
>>─┬──────────────┬── setup ────── /U drive:path\responsefile ──────────>
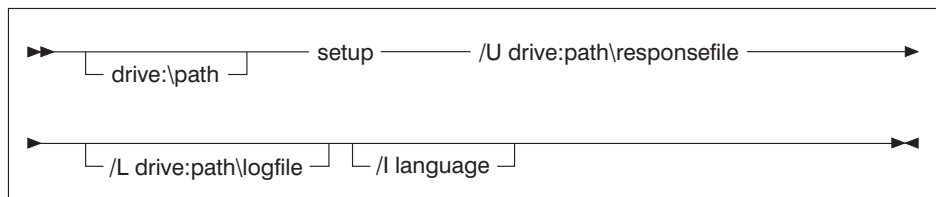
>──┬────────────────────────┬──┬──────────────┬──────────────><
   └─ /L drive:path\logfile ─┘  └─ /I language ─┘
```

Specify the fully qualified path to start the program. For example:

```
e:\setup /U d:\db2\common\db2setup.rsp /L db2log.log /I language
```

where:

/U   Specifies the fully qualified response file name. If you changed and renamed the sample response file provided, make sure that this parameter matches the new name.

/L   Specifies the fully qualified log file name, where setup information and any errors occurring during setup are logged.

      If you do not specify the log file's name, DB2 names it db2.log, and stores it in a directory called db2log, on the drive on which your operating system is installed.

/I   Specifies the two-character country code that represents your language (for example, EN for English). Table 49 on page 531 lists the code for each available language.

      If you do not specify the language, setup will determine the system language, and launch the appropriate DB2 install for that language.

c Click on **OK** to start the setup program.

d The installation proceeds without further action on your part.

4 Check the messages in the log file when the installation finishes.

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

5 Following installation, you must reboot the workstation before using DB2.

    Note: If you specified *REBOOT*=yes in your response file, the workstation will reboot automatically.

> If you are installing a server and used the default username DB2ADMIN, remember to change the default password for this username. You should change this password immediately following installation.

To configure your DB2 Connect workstation to access remote hosts, go to Chapter 11, "Configuring Communications to Host and AS/400 Databases Manually" on page 93. To configure your DB2 software to access remote DB2 servers, go to Chapter 48, "Using the Client Configuration Assistant" on page 479 .

Installing DB2 Remotely Using SMS

With Microsoft Systems Management Server (SMS), you can install DB2 across a network onto remote Windows NT systems, setting up the installation from a central location.

> You can also use SMS to *remove* all DB2 products from a target workstation. Simply follow the instructions below, but when creating the SMS package, select **Uninstall DB2 Products** instead of selecting the packages to be installed.

To install DB2 using SMS, perform the steps in the following sections:

- "Step 1. Make DB2 Files Available for Installation" on page 441
- "Step 2. Create a Response File for Unattended Installation" on page 443
- "Step 3. Import the DB2 Install Files into SMS" on page 446
- "Step 4. Distribute the DB2 Installation Package Using SMS" on page 447
- "Step 5. Run the Installation on the SMS Client" on page 448

Before You Begin

Read and perform the steps in this section before you begin the installation to ensure that you have the required items and information you will need.

Creating Usernames for DB2 Installation and Operation

This section describes usernames required to install DB2 and its components.

Creating a Username for Installing DB2

Windows 95 and Windows 98

The username must be a valid DB2 username.

A valid DB2 username is eight characters or less, and complies with DB2's naming rules. For more information on DB2's naming rules, see Appendix G, "Naming Rules" on page 553.

Windows NT

You need to have a username that will be used to install DB2. The username may belong to the Domain or local Administrators group.

> On servers, this username will be removed from the system when the installation is complete, unless it will be used by the Administration Server. See "Determining the Username for the Administration Server When Using a Response File:" for more information.
>
> On clients, this username will be removed from the system when the installation is complete.

Determining the Username for the Administration Server When Using a Response File:

Note: This section only applies to Windows NT.

During installation, you will be asked to provide a username and password that will be used by the Administration Server to log on to the system and to start itself as a service.

By default, for installations that use a response file, the setup program sets the parameters *ADMIN.USERID* to DB2ADMIN and *ADMIN.PASSWORD* to DB2ADMIN. *ADMIN.USERID* specifies the username for Windows NT. You can accept these default values, or provide your own. If you provide your own *ADMIN.USERID*, you must ensure that it is eight characters or less, and complies with DB2's naming rules. For more information, see Appendix G, "Naming Rules" on page 553.

The setup program checks to see if the username specified for the Administration Server exists. If that username does not exist, the setup program creates it. If it does exist, the setup program will:

- Verify that the username is a member of the Administrators group.

- Verify that the password is valid; provided that the username used to install DB2 has the *"Act as part of the operating system"* advanced user right.

> If you use the default username *db2admin*, and did not change the default password for this username, you should change this password immediately following the installation.
>
> When the setup program creates the *db2admin* username, it also makes it a member of the Administrators group. Since its password is well known, you should do the following:
>
> **1** Change the password for *db2admin*, using the User Manager function of the DB2 administration tools.
>
> **2** Change the password for the *DB2-DB2DAS00* service to match the new password that you specified for the *db2admin* username.

SMS Requirements

You must already have SMS installed and configured on your network. Refer to *Microsoft's Systems Management Server for Windows NT Administrator's Guide* for information on how to:

- Set up SMS (including setting up primary and secondary sites).
- Add clients to the SMS system.
- Set up inventory collection for clients.

To create an SMS package that copies the required files directly from the CD-ROM, insert the appropriate CD-ROM into the drive and go to "Step 2. Create a Response File for Unattended Installation" on page 443.

Step 1. Make DB2 Files Available for Installation

To make the DB2 install files accessible to the machine where DB2 will be installed:

- If performing *remote* installs directly from the CD-ROM:

    1 Insert the appropriate CD-ROM into the drive.

    2 Ensure that the CD-ROM remains in the drive for as long as the installation requires it. If the drive is often used for other tasks as well, consider installing from the hard disk instead.

- If installing from a code server, you must copy the required files from the CD-ROM directories to the hard disk:

    1 Insert the appropriate CD-ROM into the drive.

    2 Create a directory on the code server, for example, `q:\db2prods`.

    3 At the command prompt, use the **cpysetup.bat** command to copy the files necessary for a particular language install to a code server.

Chapter 44. Unattended DB2 Installation on Windows 32-bit Operating Systems   **441**

The command syntax is:

   – `x:\db2\winnt95\common\cpysetup.bat` `q:\db2prods` *language*

     for:

       - DB2 Client Application Enabler
       - DB2 Connect Enterprise Edition

   where:

     – *x:* represents your CD-ROM drive
     – *q:* represents the code server's disk.
     – *language* is the two-character country code that represents your language (for example, `EN` for English). Table 49 on page 531

If performing a remote installation, you must enable your network clients to access the DB2 install files.

Grant *shared access* to the directory that you just created, or to the CD-ROM drive.

To set up a share:

1 Click on **Start** and select **Programs**->**Windows Explorer**.

2 Select the directory that you want to share, for example `q:\db2prods`.

3 Select **Files**->**Properties** from the menu bar. The properties window for the directory will open. Click on the **Sharing** tab.

4 Select the **Shared As** radio button.

5 In the **Share Name** field type a share name. For example, type `db2nt`.

6 To specify read access for everyone on Windows NT:

    a Select the **Permissions** push button. The Access Through Share Permissions window opens.

    b In the **Name** box, make sure that **Everyone** is selected.

    c In the **Type of Access** box, select **Read**.

    d Click on **OK**.

On Windows 95 and Windows 98, you do not need to specify type of access when you set up a share. By default, everyone is allowed read access.

In our example scenario, `q:\db2prods` uses a share name of `db2nt`. We will use this value in the examples that follow.

Step 2. Create a Response File for Unattended Installation

During an interactive installation, you interact with the install program, filling in a series of panels to set up and configure DB2. During an unattended installation, you supply the setup and configuration data in a response file you create before running the installation. DB2's install package includes a number of ready-to-use sample response files, with default entries already in place.

The sample response files are located in:

- *x*:\db2\winnt95\common

  for:

  - DB2 Client Application Enabler
  - DB2 Connect Enterprise Edition

where *x* is the letter that designates the CD-ROM drive. There is a different response file for each product on the CD, so that the user has a valid list of parameters for each product.

If you intend to use the sample response file provided, without making any changes to its values, you can skip this step and go to "Step 4. Distribute the DB2 Installation Package Using SMS" on page 447.

Edit the sample response file. For example, you can use Notepad or WordPad.

1 Open the sample response file for the package you want to install.

- db2cae.rsp for DB2 Client Application Enabler
- db2conen.rsp for DB2 Connect Enterprise Edition

2 The response file contains:

- Keywords unique to installation
- Registry value/environment variable settings
- Database manager configuration parameter settings.

> For more information on:
>
> - DB2 environment variables and registry values, see "DB2 Registry Values and Environment Variables" on page 401, or refer to the *Administration Guide*.
> - Database manager configuration parameters, refer to the *Administration Guide*.

3 To activate an item in the response file, remove the asterisk (*) to the left of the keyword/environment variable, erase the current setting to the right of the value

and type in a new setting. The possible settings are listed to the right of the current setting.

An example section of a response file appears below:

```
...
FILE              = c:\sqllib
REBOOT            = No
*COMP             = Control Center
...
```

Keywords unique to installation are parameters that are only specified in a response file during an unattended installation. The following is a list of keywords unique to installation for Windows 32-bit operating systems unattended installation:

- *FILE*

  Specifies the destination directory for DB2.

  Note: Check the value for the *FILE* keyword. *FILE* specifies where to install the product. If you do not change this value, it defaults to `x:\sqllib` where *x:* is the drive on which your operating system is installed.

- *REBOOT*

  Specifies whether to reboot the system following installation.

- *TYPE*

  Specifies the type of install. The options are:

    0=Compact

    1=Typical (default)

    2=Custom

  For 0 and 1 (compact and typical), any Custom Keywords (COMP) value will be ignored.

  For all types, default communication values will be used where applicable, as follows:

    a `DB2.DB2COMM` and `ADMIN.DB2COMM` will be set for the protocols detected on your system.

    b If a protocol is detected on the system, or if you have specified values for `DB2.DB2COMM` or `ADMIN.DB2COMM`, values for its parameters will be generated so that the protocol will be enabled for DB2's use at the end of the install. Checks are made to ensure that the generated values are not duplicates, and that they conform to the protocols set up on your system. Default values will be generated for the following:

      – For NetBIOS:

        ```
        DB2.DB2NBADAPTERS     ADMIN.DB2NBADAPTERS
        DB2.NNAME             ADMIN.NNAME
        ```

– For TCP/IP:

```
DB2.PORT_NUMBER        ADMIN.PORTNUMBER
DB2.SVCENAME           ADMIN.SVCENAME
```

– For IPX/SPX:

```
DB2.FILESERVER         ADMIN.FILESERVER
DB2.OBJECTNAME         ADMIN.OBJECTNAME
DB2.IPX_SOCKET         ADMIN.IPX_SOCKET
```

– For APPC:

```
DB2.TPNAME             ADMIN.TPNAME
```

Note: You may override these values; however, if the associated protocol has not been detected or specified, the values will not be used.

- *PROD*

  Specifies the product you want installed. The options are:

  – `DB2_CAE` for DB2 Client Application Enabler

  – `CONNECT_ENTERPRISE` for DB2 Connect Enterprise Edition

  Note: You can use this parameter more than once.

- *COMP*

  Specifies the components you want installed. The installation program automatically installs components that are required for a product, and ignores requested components that are not available.

  Note: Component selections have no effect unless you specify a `custom` installation.

  Table 44 on page 435 lists *COMP* keywords and the components they represent.

- *AUTO_CTRL_CENTER*

  Specifies whether or not to automatically start the Control Center each time the system is rebooted.

  Note: By default, the Control Center starts automatically unless this parameter is set to `NO`.

- *DB2.AUTOSTART*

  Specifies whether or not to automatically start the DB2 instance each time the system is rebooted.

  Note: By default, the DB2 instance starts automatically unless this parameter is set to `NO`.

- *AUTOSTART_CCA*

Specifies whether or not to automatically start the Client Configuration
Assistant each time the system is rebooted.

Note: By default, the Client Configuration Assistant starts automatically
unless this parameter is set to `NO`.

- ADMIN.USERID

  Specifies the username that the DB2 Administration Server will use to log on
  to the system. If *ADMIN.USERID* is not activated, the account
  `DB2ADMIN/DB2ADMIN` will be created and used, if applicable. See "Determining
  the Username for the Administration Server When Using a Response File:"
  on page 440

- ADMIN.PASSWORD

  Specifies the password for the DB2 Administration Server.

- Install DB2 only on a drive that is local to the target workstation.
  Installing on a non-local drive can cause performance and availability
  problems.
- By default, the name of the response file will be used to determine the
  products to be installed. You can override this setting by providing one
  or more **PROD** parameter values in the response file.

---

4 Exit the file. If you have made any changes, save the file under a new file name
to preserve the original sample response file.

If you are installing directly from the CD-ROM, you must store the renamed
response file on another drive.

Step 3. Import the DB2 Install Files into SMS

To import the DB2 install files into SMS:

1 Insert the appropriate CD-ROM into the drive.

2 From the **Start** button select **Programs**, then **Systems Management Server**, and
then **SMS Administrator**. The SMS Administrator window opens.

3 Open the Package Properties window. The first time you start the SMS
Administrator program you will see a dialog box prompting you to open an SMS
Window. You can select the Packages option from there. Otherwise, select
File->**New** from the menu bar.

4 Click on the **Import** push button. The **File Browser** opens.

5 In the **File Name** field, select the db2.pdf file.

The server db2.pdf file for DB2 Universal Database is located in the

```
|                        x:\db2\common directory (for DB2 Server)
|                        x:\db2\winnt95\common directory (for DB2 CAE or DB2 SDK)

|              where x: designates your CD-ROM drive
```

Step 4. Distribute the DB2 Installation Package Using SMS

In this step, you create an SMS package and send it to the SMS client where you want to install DB2.

To create the SMS package:

1 From the Package Properties window, click on the **Workstations** push button. The Setup Package For Workstations window opens, showing a list of predefined DB2 installation packages that you can use.

2 In the **Source Directory** field, type the name of the parent directory where you put the copied DB2 files (for example, q:\db2prods).

3 Select the name of the product to install from the **Workstation Command Lines** list.

4 If you changed and renamed the sample response file, click on the **Properties** push button and change the value of the parameter to match the new response file name.

If you do not specify the language, setup will determine the system language, and launch the appropriate DB2 install for that language. If you want to install a different language, use the /l parameter to specifies the two-character code that represents your language (for example, EN for English). Table 49 on page 531 lists the code for each available language.

5 Click on the **Close** push button.

6 Click on **OK** to close the opened windows.

The Packages window shows the name of the new SMS package.

7 Specify where to run the package:

   a Open the Sites and Packages windows.

   b In the Packages window, select the appropriate package and drag it onto the target client in the Sites window. The Job Details window opens.

   c Select the **Run Workstation Command** check box and select the installation package that you want to use for the Run Command on Workstation job. For more information about completing the Job Details

window, refer to *Microsoft's Systems Management Server for Windows NT Administrator's Guide*.

d When the job specifications are complete, click on **OK** to close the opened windows.

The job is created and sent to the SMS client.

Step 5. Run the Installation on the SMS Client

Now that the remote installation package has been prepared and sent, the SMS client on the target machine can run the installation.

1 On the SMS client where DB2 will be installed, logon as a username that meets the requirements for installing DB2. See "Creating Usernames for DB2 Installation and Operation" on page 439 for more information.

2 Select **Start->Programs -> Systems Management Client** and then click on **Package Command Manager**. The Package Command Manager window opens.

3 When packages are sent from the SMS server, they are listed in the window. Select the DB2 package, then click on the **Execute** push button. The installation runs automatically.

4 Following installation, you must reboot the SMS client before using DB2.

Note: If you specified *REBOOT*=yes in your response file the SMS client will reboot automatically.

> If you are installing a server and used the default username DB2ADMIN, remember to change the default password for this username. You should change this password immediately following installation.

To configure your DB2 Connect workstation to access remote hosts, go to Chapter 11, "Configuring Communications to Host and AS/400 Databases Manually" on page 93. To configure your DB2 software to access remote DB2 servers, go to Chapter 48, "Using the Client Configuration Assistant" on page 479 .

Chapter 45. Other Methods to Install DB2 Connect for AIX

This section describes the other methods you can use to install DB2 Universal Database products. Some of the advanced methods to install DB2 are detailed in this section. The DB2 Installer program can perform all of the steps described in this section.

We recommend that you use the DB2 Installer program when installing DB2, but if you prefer not to use the DB2 Installer program, you can use any one of the methods described in this chapter. See Chapter 7, "Installing DB2 Connect on UNIX Systems" on page 57 for information on how to use the DB2 Installer program to install the DB2 product. See Chapter 27, "Installing DB2 Clients" on page 273 for information on how to install the DB2 clients.

Installation Steps

To install DB2, perform the following steps:

1 Install DB2. As part of this installation step, the following installation activities are optional:

    a Install the DB2 product online documentation.

    b Install the DB2 product translated messages.

2 Create or assign groups and user IDs.

3 Create a DB2 instance.

4 Create the Administration Server.

5 Install the license key.

6 Create links for DB2 files (optional).

You can install DB2 using any of the following methods:

Using dsh
Allows you to simultaneously install DB2 on multiple RS/6000 SP nodes.

Using SMIT
Allows you to install a subset of products and filesets on a single machine. If you want
to install only a selected set of DB2 filesets or components, see "Install Products or
Filesets Using SMIT" on page 450.

Installing software bundles using SMIT
A software bundle contains a list of filesets that are suited for a particular use.
Installation, although easier with software bundles, only occurs on a single machine.

If you prefer to use the **installp** command, you must first mount the DB2 CD-ROM. You
also need to mount the CD-ROM if you want to view the *Installation Notes* or print the
postscript manuals prior to installation.

Step 1. Install DB2

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

Go to the installation method that you would like to use to install DB2.

- "Install Products or Filesets Using SMIT."
- "Install Software Bundles Using SMIT" on page 451.
- Chapter 7, "Installing DB2 Connect on UNIX Systems" on page 57.

Install Products or Filesets Using SMIT

1 Log in as user with root authority.

2 Insert and mount the DB2 CD-ROM.

3 Enter the **smit install_latest** command. The Software Installation and
Maintenance menu opens.

4 Specify the `INPUT device/directory` for DB2 and press Enter.

For example, if `/cdrom` is the CD-ROM mount directory, enter the following as the
INPUT device:

    /cdrom/db2

> If you are installing the DB2 Client Application Enabler or the DB2 Software Developer's Kit, enter the following as the INPUT device:
>
> /cdrom/db2/aix

5 Press F4 to display a list of software to install. For a detailed description of the software packages, refer to Appendix D, "Contents of the DB2 Products" on page 537 for more information.

6 Press F7 to mark one or more packages and filesets for installation.

7 Press Enter to install DB2.

8 Press F10 to exit when the command displays **OK**.

After the installation is complete, DB2 will be installed in the /usr/lpp/db2_05_00 directory on that machine; now you must repeat the above steps on all machines.

Now that you have finished installing DB2, go to "Install the DB2 Product Library (Optional)" on page 452 and "Install the DB2 Product Messages (Optional)" on page 453 to optionally install the product documentation and messages. If you do not want to install product documentation or messages, proceed to the next step.

Install Software Bundles Using SMIT

The following procedure shows how to install DB2 Extended Enterprise Edition using the *Software Bundles* feature. A software bundle is a collection of filesets. When you install a software bundle, every fileset in that bundle is installed.

1 Log in as root.

2 Insert and mount the DB2 CD-ROM in the drive.

3 To proceed directly to the automatic bundle processing application, issue the **smit easy_install_bundle** command.

4 Specify the installation device or directory for the installation media by pressing F4 to display a list.

5 Select the CD-ROM drive in which you placed the DB2 CD-ROM, then press Enter.

6 If you did not install the DB2 Media-Defined software bundle on this system, use the following procedure to install it:

   a In the **Bundle to Install** menu, select the **Media-Defined** option, then press Enter.

| **b** In the **Install Bundle Contents** menu, press Enter to continue with the
| installation. Messages may appear to indicate the status of the installation.
| Press Enter to continue.

| **c** Press F3 to return to the **Install Bundle Contents** menu.

| **d** Press F4 to re-display the list of software bundles.

7 From the displayed menu, select the DB2-Connect-Enterprise software bundle.

8 Press Enter to start the installation.

Messages will appear to indicate the status of the installation. Press Enter to
continue, or F3 if you want to cancel.

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

Now that you have finished installing DB2, go to "Install the DB2 Product Library (Optional)" and
"Install the DB2 Product Messages (Optional)" on page 453 to optionally install the product
documentation and messages. If you do not want to install product documentation or messages,
proceed to the next step.

Install the DB2 Product Library (Optional)

When you install DB2 using SMIT, the DB2 Product Library (HTML) is not automatically
installed.

To install the DB2 Product Library, do the following:

| **1** Log in as user with root authority.

| **2** Insert and mount the DB2 CD-ROM.

| **3** Enter the **smit install_latest** command. The Software Installation and
| Maintenance menu opens.

4 Enter the directory for the **INPUT device/directory for software**. For example, if
/cdrom is the CD-ROM mount directory, enter the following as the INPUT device:

/cdrom/db2

| **5** Press F4 to display a list of software to install. For a detailed description of the
| software packages, refer to Appendix D, "Contents of the DB2 Products" on
| page 537 for more information.

6 Select the fileset for the DB2 Product Library (HTML) that you want to install. A
separate fileset exists for every language in which DB2 documentation is
translated.

Note: Not every manual is translated into multiple languages. The *DB2 Product Library (HTML) - English* fileset contains a complete set of books in English. When you select any non-English HTML fileset without selecting English, the English HTML fileset is also installed.

> The DB2 Product Library (HTML) fileset is listed as follows:
> ```
> DB2 Product Library (HTML) - language
> ```

7 Press ENTER to start the installation.

8 Press F10 to exit SMIT when the command completes.

9 Run the following command to uncompress and untar the HTML files:

```
/usr/lpp/db2_05_00/doc/db2insthtml locale
```

where *locale* is the desired locale; for example, locale=en_US for English.

10 From your Web browser, open the following file URL to view DB2 online manuals:

```
file:/usr/lpp/db2_05_00/doc/en_US/html/index.htm
```

To recover some disk space, you may want to remove the compressed tar files. It is recommended that you do not just remove the compressed tar HTML files; instead, you should remove the fileset for the DB2 Product Library.

After the fileset is removed, only compressed tar files will be removed. You will still be able to view the online DB2 books.

Install the DB2 Product Messages (Optional)

When you install DB2 using SMIT, DB2 product messages for locales, other than en_US (English - ISO 88591), are not automatically installed.

To install DB2 product messages in other locales, do the following:

1 Log in as user with root authority.

2 Insert and mount the DB2 CD-ROM.

3 Enter the **smit install_latest** command. The Software Installation and Maintenance menu opens.

4 Enter the directory for the **INPUT device/directory for software**. For example, if /cdrom is the CD-ROM mount directory, enter the following as the INPUT device:

```
/cdrom/db2
```

5 Press F4 to display a list of software to install. For a detailed description of the software packages, refer to Appendix D, "Contents of the DB2 Products" on page 537 for more information.

6 List the software to be installed using the **SOFTWARE to install** option.

7 Select the messages options for the locales you want to install.

Step 2. Create or Assign a Group and User ID

If you want to use an existing user or group ID, you do not need to create new ones at this time. Instead, you can proceed to the next step.

> If you are using Network Information Services (NIS), NIS+, or any other tools to manage system configuration files, you must perform this step on the master server. After you have completed the following, ensure that the changes have taken effect on all DB2 servers.

You must perform this step using the *root* user ID.

1 Create a system administration (SYSADM) group that will be the primary group of the user ID for the instance owner. Any user of the instance owner that belongs to the SYSADM group will have system administrator authority for a given instance.

Next, create a user ID that will be the instance owner. This user ID will be the name of the instance. Make this user's primary group the SYSADM group you created. In our examples, the instance user ID is db2inst1 and the SYSADM group is dbadmin1.

> Dedicate the instance owner user ID to that instance's use only. This allows for easier error recovery if a system error occurs.

2 Use the **mkgroup** command to create groups, and the **mkuser** command to create users. For example, to create a user called db2inst1 with user ID *1004*, which will use dbadmin1 with group ID *999* as its primary group and use /home/db2inst1 as its home directory, type:

```
mkgroup id=999 dbadmin1
mkuser id=1004 pgrp=dbadmin1 groups=dbadmin1 home=/home/db2inst1 db2inst1
passwd db2inst1
```

3 Create a group and user ID for fenced user defined functions and stored procedures.

For example:

```
mkgroup id=991 db2fadm1
mkuser id=1001 pgrp=db2fadm1 groups=db2fadm1 home=/home/db2fenc1 db2fenc1
passwd db2fenc1
```

Fenced user defined functions (UDFs) and stored procedures will execute under this user and group. The group must be the primary group of the user. The user for fenced UDFs and stored procedures is specified as a parameter of the instance creation script. The group for fenced UDFs and stored procedures is implicitly set to the primary group of this specified user (db2fenc1).

For security reasons, we recommend that you do not use the instance name as the FencedID. However, if you are not planning to use fenced user defined functions or stored procedures, you can set the FencedID to the instance name instead of creating another user for the FencedID.

Notes:

1. You have to repeat Steps 1 and 2 above to create a user name and group name for the Administration Server. You must use different user IDs for the Administration Server and a DB2 instance (for example, db2as and db2inst). For security reasons, you should not use the primary group of a DB2 instance as the primary group for the user ID for the Administration Server. It is recommended that you create a different group ID (for example, db2asgrp).

2. In addition to the rules imposed by the operating system for login names and groups, you must also adhere to the rules described in Appendix G, "Naming Rules" on page 553.

Step 3. Create a DB2 Instance

| A DB2 instance is an environment where you store data and run applications. Use the
| **db2icrt** command to create an instance. You must have *root* authority to enter this
| command. For more information about database instances, see Chapter 37, "Working with Instances" on page 353.

The **db2icrt** command is in the DB2DIR/instance directory, where DB2DIR is /usr/lpp/db2_05_00.

The syntax of the **db2icrt** command is:

```
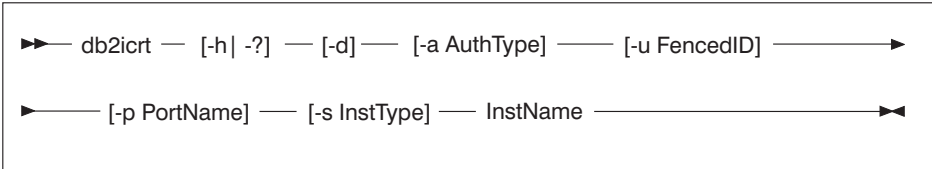►►── db2icrt ── [-h| -?] ── [-d] ── [-a AuthType] ──── [-u FencedID] ──────────►

►──── [-p PortName] ── [-s InstType] ── InstName ─────────────────────────►◄
```

where:

**-h	-?**	Display a help menu for this command.
-d	Sets the debug mode that you can use for problem determination.
-a *AuthType*	Is an optional parameter that 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).

Notes:

1. The authentication type of the instance applies to all databases owned by the instance.

2. 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 UDFs and stored procedures will execute. This is not required if you install the DB2 Client Application Enabler. For other products, this is a required parameter.

Note: *FencedID* may not be *root* or *bin*.

-p *PortName*	Is an optional parameter that specifies the TCP/IP service name or port number to be used. This value will then be set in the instance's database configuration file.
-s *InstType*	Is an optional parameter that allows different types of instances to be created. Valid instance types are *ee*, *eee* and *client*.
instance_name	Is the login name of the instance owner.

If a server product is installed, the syntax is:

```
db2icrt -u FencedID instance_name
```

Examples:

- You can use the instance name as the Fenced ID also:

  ```
  db2icrt -u db2inst1 db2inst1
  ```

- To create an instance for a DB2 client, you can use the following command:

  ```
  db2icrt db2inst1
  ```

When an instance is created, its name is also added to the list of instances on the system.

Step 4. Create the Administration Server

The Administration Server provides services to support client tools that:

- Automate the configuration of connections to DB2 databases.
- Administer DB2 from your server system or a remote client using the Command Center.

To create an Administration Server, see the procedures described in "Creating the Administration Server" on page 365.

Install the License Key

The following steps describe how to upgrade the license:

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

1 Log in as a user with root authority.

2 The DB2 product license key can be found in the `nodelock` file:

`/usr/lib/netls/conf/nodelock`

3 Update your DB2 product license with the following command:

`/usr/lpp/db2_05_00/cfg/db2licinst license_filename`

where `license_filename` is the full pathname and filename for the license file that corresponds to the product you have purchased. The name of the license file for these products is:

db2conen.lic   DB2 Connect Enterprise Edition

For example, if the CD-ROM is mounted in the /cdrom directory and the name of the license file is db2entr.lic, the command should be as follows:

`/usr/lpp/db2_05_00/cfg/db2licinst /cdrom/db2/license/db2entr.lic`

Step 6. Create Links for DB2 Files (Optional)

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

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

| Log in as a user with root authority and invoke the **db2ln** command as follows:

| /usr/lpp/db2_05_00/cfg/db2ln

If there are existing links to the /usr/lib and /usr/include directories from previous versions of DB2, they will automatically be removed by entering the **db2ln** command to create links for this version of DB2. If you want to re-establish the links to the libraries or previous versions, then you must execute the **db2rmln** command from Version 5 before you execute the **db2ln** command from the previous versions of DB2.

> Links can be established for only one version of DB2 on a given system.

Chapter 46. Other Methods to Install DB2 Connect for HP-UX

This section describes the other methods you can use to install DB2 Universal Database products. Some of the advanced methods to install DB2 are detailed in this section. The DB2 Installer program can perform all of the steps described in this section.

We recommend that you use the DB2 Installer program when installing DB2, but if you prefer not to use the DB2 Installer program, you can use any one of the methods described in this chapter. See Chapter 7, "Installing DB2 Connect on UNIX Systems" on page 57 for information on how to use the DB2 Installer program to install the DB2 product. See Chapter 27, "Installing DB2 Clients" on page 273 for information on how to install the DB2 clients.

Installation Steps

To install DB2 for HP-UX products, perform the following steps:

1 Install the product from the CD-ROM to the target machine. As part of this installation step, the following installation activities are optional:

    a Install the DB2 product messages.

    b Install the translated messages.

2 Update the kernel configuration parameters and reboot the system.

3 Create or assign groups and user IDs.

4 Create a DB2 instance.

5 Create an Administration Server.

6 Install the license key.

7 Create links for DB2 files (optional).

Step 1. Install DB2

Use the **swinstall** program to install DB2 for HP-UX. To install, perform the following steps:

1 Log in as a user with root authority.

2 Insert the DB2 CD-ROM into the CD-ROM drive and mount it. For example:

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

where /cdrom is the CD-ROM mount directory.

3 Run the **swinstall** program using the following command:

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

This opens the Software Selection window and the Specify Source window.

4 If necessary, change the **Source Host Name** in the Specify Source window.

5 Enter the following as the value for the **Source Depot Path** field:

- For HP-UX Version 10:

  /cdrom/db2/hpux10

- For HP-UX Version 11:

  /cdrom/db2/hpux11

where /cdrom is the CD-ROM mount directory.

6 To return to the Software Selection window, select the **OK** button.

7 On the Software Selection window, highlight DB2V5CONN.

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

Note: Ignore the error message similar to the following:

```
The software "DB2V5CAE r=5.0.0,a=HP-UX_B.10.10_700/800,v=IBM" was
successfully marked, but it depends on the following software items
which could not be found in the source. However, these items may
already be in the target. This will be checked during the Analysis
Phase: OS-Core.CMDS-AUX,r>=B.10.10,a=HP-UX_?.10.??_7800,v=HP
OS-Core.CMDS-MIN,r>=B.10.10,a=HP-UX_?.10.??_7800,v=HP
SOE.SOE,r>=B.10.10,a=HP-UX_?.10.??_7800,v=HP
```

9 Select **OK** when the following message appears:

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

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

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

12 Select the **Yes** button in the Confirmation window windows to confirm that you want to install the HP-UX software products.

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

13 Select **Exit** from the **File** menu to exit out of **swinstall**.

The HP-UX operating system provides detailed help for **swinstall**. For help, type:

```
man swinstall
```

Install the DB2 Product Library (Optional)

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

The DB2V5HTML product includes filesets for all the DB2 product documentation. A separate fileset exists for each language. For example, the fileset name for the DB2 product library in English is DB2V5HTML.en_US. For a complete list of filesets in the DB2V:1TML product, see Appendix D, "Contents of the DB2 Products" on page 537.

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

1 Log in as a user with root authority.

2 Insert and mount the DB2 product CD-ROM as described in "Step 1. Install DB2" on page 460.

3 Run the **swinstall** command as follows:

- For HP-UX Version 10:

    ```
    swinstall -s /cdrom/db2/hpux10
    ```

- For HP-UX Version 11:

    ```
    swinstall -s /cdrom/db2/hpux11
    ```

4 From the list of products displayed, highlight the **DB2V:ITML** product and press Enter.

This will display a list of all the filesets in the **DB2V:ITML** product.

5 Highlight one or more filesets that you want to install and select **Mark for Install** from the Actions menu.

For example, to install the DB2 product Library in English, highlight the following fileset:

```
en_US    DB2 Product Library (HTML) - English
```

6 Follow the remaining installation procedure, starting at Step 9 on page 460 in "Step 1. Install DB2" on page 460.

This will install the **compressed-tar** files for the DB2 documents in the /opt/IBMdb2/V5.0/doc/<lang>/html directory, where `<lang>` is the language/locale identifier.

7 Run the following command to uncompress and un-tar the HTML files:

```
/opt/IBMdb2/V5.0/doc/db2insthtml lang
```

where *lang* is the language/locale identified. For example, lang=en_US for English. For valid language/locale identifiers, see Table 52 on page 539.

8 From your Web browser, open the following URL to view DB2 online manuals:

```
file:/opt/IBMdb2/V5.0/doc/en_US/html/index.htm
```

To recover some disk space, you may want to remove the compressed tar files. It is recommended that you do not just remove the compressed tar HTML files; instead, you should remove the fileset for the DB2 Product Library.

After the fileset is removed, only compressed tar files will be removed. You will still be able to view the online DB2 books.

Install DB2 Product Messages (Optional)

While DB2 Product Message documents are translated into several languages, the English language DB2 Product Messages are always installed. To install the DB2 Product Messages in other locales, you have to install one or more filesets in the DB2V5MSG product.

The DB2V5MSG product includes a separate fileset for every locale in which DB2 Product Messages are available. There is no fileset for the English (en_US.iso88591 or en_US.roman8) locale since these messages are installed with the base product. For example, to install the DB2 Product messages in the fr_FR.iso88591 locale, you need to install the fileset DB2V5MSG.fr_FR. For a complete list of filesets in the DB2V5MSG product, see Appendix D, "Contents of the DB2 Products" on page 537.

To install DB2 Product Message filesets, do the following:

1 Log in as a user with root authority.

2 Insert and mount the DB2 product CD-ROM as described in "Installation Steps" on page 459.

| **3** Run the **swinstall** command as follows:

| • For HP-UX Version 10:

| ```
swinstall -s /cdrom/db2/hpux10
```

| • For HP-UX Version 11:

| ```
swinstall -s /cdrom/db2/hpux11
```

| where /cdrom is the CD-ROM mount directory.

**4** From the list of products displayed, highlight the **DB2V5MSG** product and press Enter.

This will display a list of all the filesets in the **DB2V5MSG** product.

| **5** Highlight one or more filesets that you want to install and select **Mark for Install**
| from the Actions menu.

**6** Follow the remaining installation procedure, starting at Step 9 on page 460 in "Step 1. Install DB2" on page 460.

# Step 2. Update the Kernel Configuration Parameters

To run DB2 for HP-UX, you may have to update some kernel configuration parameters; the following values are recommended:

*Table 45. HP-UX Kernel Configuration Parameters (Recommended Values)*

| Kernel Parameter | Physical Memory | | |
|---|---|---|---|
| | **64MB - 128MB** | **128MB - 256MB** | **256MB+** |
| maxuprc | 256 | 384 | 512 |
| maxfiles | 256 | 256 | 256 |
| | | | |
| nproc | 512 | 768 | 1024 |
| nflocks | 2048 | 4096 | 8192 |
| ninode | 512 | 1024 | 2048 |
| nfile | (4 * ninode) | (4 * ninode) | (4 * ninode) |
| | | | |
| msgseg | 8192 | 16384 | 32768 |
| msgmnb | 65535  (1) | 65535  (1) | 65535  (1) |
| msgmax | 65535  (1) | 65535  (1) | 65535  (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 | 67108864 | 134217728  (2) | 268435456  (2) |
| shmseg | 16 | 16 | 16 |
| shmmni | 300 | 300 | 300 |

**Notes:**

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

2. To maintain the interdependency among kernel parameters, change parameters in the same sequence in which they appear in the preceding table.

3. 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 184968806 (176*1024*1024).

# *Step 3. Create or Assign Groups and User IDs*

If you want to use an existing user or group ID, you do not need to create new ones at this time. Instead, you can proceed to the next step.

You must be a user with root authority to perform the following:

**1** Create a system administration (SYSADM) group that will be the primary group of the user ID for the instance owner. Any user of the instance owner that belongs to the SYSADM group will have system administrator authority for a given instance.

Next, create a user ID that will be the instance owner. This user ID will be the name of the instance. Make this user's primary group the SYSADM group you created. In our examples, the instance user ID is `db2inst1` and the SYSADM group is `dbadmin1`.

> Dedicate the instance owner user ID to that instance's use only. This allows for easier error recovery if a system error occurs.

**2** Use **SAM** or **groupadd** to create groups, and **SAM** or **useradd** to create users. For example:

```
groupadd dbadmin1
useradd -g dbadmin1 -d /home/instl -m db2inst1
passwd db2inst1
```

For security reasons, we recommend that you do not use the instance name as the FencedID. However, if you are not planning to use fenced user defined functions or stored procedures, you can set the FencedID to the instance name instead of creating another user for the FencedID.

Notes:

1. You have to repeat Steps 1 and 2 above to create a user name and group name for the Administration Server. You must use different user IDs for the Administration Server and a DB2 instance (for example, `db2as` and `db2inst`). For security reasons, you should not use the primary group of a DB2 instance as the primary group for the user ID for the Administration Server. It is recommended that you create a different group ID (for example, `db2asgrp`).

2. In addition to the rules imposed by the operating system for login names and groups, you must also adhere to the rules described in Appendix G, "Naming Rules" on page 553.

Step 4. Create a DB2 Instance

| A DB2 instance is an environment where you store data and run applications. Use the
| **db2icrt** command to create an instance. You must have *root* authority to enter this
| command. For more information about database instances, see Chapter 37, "Working with Instances" on page 353.

The **db2icrt** command is located in the `DB2DIR/instance` directory, where `DB2DIR` is /opt/IBMdb2/V5.0.

The syntax of the **db2icrt** command is:

```
►►── db2icrt ── [-h| -?] ── [-d]── [-a AuthType] ────── [-u FencedID] ──────────►

►────── [-p PortName] ──── [-s InstType] ──── InstName ─────────────────────────►◄
```

 where:

-h | -?	Display a help menu for this command.
-d	Sets the debug mode that you can use for problem determination.
-a *AuthType*	Is an optional parameter that 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).

> **Notes:**
>
> 1. The authentication type of the instance applies to all databases owned by the instance.
>
> 2. 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 UDFs and stored procedures will execute. This is not required if you install the DB2 Client Application Enabler. For other products, this is a required parameter.

> **Note:** *FencedID* may not be *root* or *bin*.

-p *PortName*	Is an optional parameter that specifies the TCP/IP service name or port number to be used. This value will then be set in the instance's database configuration file.
-s *InstType*	Is an optional parameter that allows different types of instances to be created. Valid instance types are *ee*, *eee* and *client*.
instance_name	Is the login name of the instance owner.

If a server product is installed, the syntax is:

```
db2icrt -u FencedID instance_name
```

Examples:

- You can use the instance name as the Fenced ID also:

    ```
    db2icrt -u db2inst1 db2inst1
    ```

- To create an instance for a DB2 client, you can use the following command:

    ```
    db2icrt db2inst1
    ```

When an instance is created, its name is also added to the list of instances on the system.

Step 5. Create an Administration Server

The Administration Server provides services to support client tools that:

- Automate the configuration of connections to DB2 databases.
- Administer DB2 from your server system or a remote client using the Command Center.

To create an Administration Server, see the procedures described in "Creating the Administration Server" on page 365.

Step 6. Install the License Key

The following steps describe how to upgrade the license:

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

1 Log in as a user with root authority.

2 The DB2 product license key can be found in the `nodelock` file:

   `/usr/netls/nodelock`

3 Update your DB2 product license with the following command:

   `/opt/IBMdb2/V5.0/cfg/db2licinst license_filename`

where `license_filename` is the full pathname and filename for the license file that corresponds to the product you have purchased. The name of the license file for these products is:

db2conen.lic   DB2 Connect Enterprise Edition

For example, if the CD-ROM is mounted in the `/cdrom` directory and the name of the license file is `db2entr.lic`, the command should be as follows:

   `/opt/IBMdb2/V5.0/cfg/db2licinst /cdrom/db2/license/db2entr.lic`

Step 7. Create Links for DB2 Files (Optional)

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

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

Log in as root and invoke the **db2ln** command as follows:

    /opt/IBMdb2/V5.0/db2ln

If there are existing links to the /usr/lib and /usr/include directories from previous versions of DB2, they will automatically be removed by entering the **db2ln** command to create links for this version of DB2. If you want to re-establish the links to the libraries or previous versions, then you must execute the **db2rmln** command from Version 5 before you execute the **db2ln** command from the previous versions of DB2.

> Links can be established for only one version of DB2 on a given system.

Now that you have installed DB2 Enterprise Edition, see Chapter 26, "Using the Command Line Processor to Configure the DB2 Connect Server to Accept Clients" on page 251 for information on how to set up your server to accept in-bound client connections.

Chapter 47. Other Methods to Install DB2 Connect for Solaris

This section describes the other methods you can use to install DB2 Universal Database products. Some of the advanced methods to install DB2 are detailed in this section. The DB2 Installer program can perform all of the steps described in this section.

We recommend that you use the DB2 Installer program when installing DB2, but if you prefer not to use the DB2 Installer program, you can use any one of the methods described in this chapter. See Chapter 7, "Installing DB2 Connect on UNIX Systems" on page 57 for information on how to use the DB2 Installer program to install the DB2 product. See Chapter 27, "Installing DB2 Clients" on page 273 for information on how to install the DB2 clients.

Installation Steps

To install DB2 Extended Enterprise Edition for Solaris, perform the following steps:

1 Install DB2. As part of this installation step, the following installation activities are optional:

a Install the DB2 Product Library (documents).

b Install the DB2 Product Messages.

2 Update the kernel configuration parameters.

3 Create or assign groups and user IDs.

4 Create a DB2 instance.

5 Create an Administration Server.

6 Install the license key.

7 Create links for DB2 files (optional).

Step 1. Install DB2

Use the **db2_install** command, which is available on the DB2 CD-ROM, to install DB2. If your system does not have a local CD-ROM drive, you can mount the CD-ROM on a different system and NFS mount on the current system.

To install DB2 from the DB2 CD-ROM, perform the following steps:

1 Log in as a user with root authority.

2 Insert the DB2 CD-ROM into the CD-ROM drive.

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

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

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

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

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

```
/cdrom/unnamed_cdrom
```

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

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

The **db2_install** command prompts you for the product to be installed and for the base directory where the product files are to be installed. Select DB2.CONN to install DB2 Connect Enterprise Edition.

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

5 Type the keyword of the products to be installed when prompted.

6 Type the name of the base directory when prompted. The default base directory is `/opt`.

If the default base directory is used, all files will be installed in the `/opt/IBMdb2/V5.0` directory.

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

Installing the DB2 Product Library (Optional)

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

A separate package exists for every language in which DB2 documents are translated. Packages for DB2 documentation are given names such as `db2ht%L50`, where `%L` represents two letters for the language and locale identifier.

For example, the package name for the DB2 Product Library in English is `db2hten50`. For a complete list of packages for the DB2 Product Library, see Appendix D, "Contents of the DB2 Products" on page 537.

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

1 Log in as a user with root authority and mount the DB2 product CD-ROM as described in "Step 1. Install DB2" on page 470.

2 Run the **pkgadd** command as follows:

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

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

   ```
   pkgadd -d /cdrom/unnamed_cdrom/db2 db2hten50
   ```

   This command installs the compressed-tar files for the DB2 documents in the `/opt/IBMdb2/V5.0/doc/`*lang*`/html` directory, where *lang* is the language and locale identifier.

3 Run the following command to uncompress and untar the HTML files:

   ```
   /opt/IBMdb2/V5.0/doc/db2insthtml lang
   ```

   where *lang* is the language and locale identifier.

   For example, *lang*=en_US for English. For valid language/locale identifiers, see Table 52 on page 539.

4 From your Web browser, open the following URL to view the DB2 manuals:

   ```
   file:/opt/IBMdb2/V5.0/doc/en_US/html/index.htm
   ```

To recover some disk space, you may want to remove the compressed tar files. It is recommended that you do not just remove the compressed tar HTML files; instead, you should remove the fileset for the DB2 Product Library.

After the fileset is removed, only compressed tar files will be removed. You will still be able to view the online DB2 books.

Installing the DB2 Product Messages (Optional)

A separate package exists for every locale in which DB2 Product Messages are translated. Packages for DB2 Product Messages are given names such as `db2ms%L50`, where `%L` represents two letters for the language name. For example, the package name for the DB2 Product Messages in the `de` (German) locale is `db2msde50`. For a complete list of DB2 Product Messages, see Appendix D, "Contents of the DB2 Products" on page 537.

To install DB2 Product Message packages, do the following:

1 Log in as a user with root authority and mount the DB2 CD-ROM as described in "Step 1. Install DB2" on page 470.

2 Run the **pkgadd** command as follows:

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

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

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

```
pkgadd -d /cdrom/unnamed_cdrom/db2 db2msde50
```

Step 2. Update the Kernel Configuration Parameters

To run DB2 for Solaris, you may have to update some kernel configuration parameters; the following minimum values are recommended:

Table 46. Solaris Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Physical Memory			
	64MB - 128MB	128MB - 256MB	256MB - 512MB	512MB+
msgsys:msginfo_msgmax	65535 (1)	65535 (1)	65535 (1)	65535 (1)
msgsys:msginfo_msgmnb	65535 (1)	65535 (1)	65535 (1)	65535 (1)
msgsys:msginfo_msgmap	130	258	258	258
msgsys:msginfo_msgmni	128	256	256	256
msgsys:msginfo_msgssz	16	16	16	16
msgsys:msginfo_msgtql	256	512	1024	1024
msgsys:msginfo_msgseg	8192	16384	32768	32768
shmsys:shminfo_shmmax	67108864	134217728 (2)	268435456 (2)	536870912 (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.

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 (176*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/V5.0/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 more than 256MB–512MB of physical memory
- kernel.param.512MB for systems with more than 512MB 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.

Step 3. Create or Assign Groups and User IDs

If you want to use an existing user or group ID, you do not need to create new ones at this time. Instead, you can proceed to the next step.

> If you are using Network Information Services (NIS), NIS+, or any other tools to manage system configuration files, you must perform this step on the master server. After you have completed the following, ensure that the changes have taken effect on all DB2 servers.

You must perform the following as a user with root authority.

1 Create a system administration (SYSADM) group that will be the primary group of the user ID for the instance owner. Any user of the instance owner that belongs to the SYSADM group will have system administrator authority for a given instance.

Next, create a user ID that will be the instance owner. This user ID will be the name of the instance. Make this user's primary group the SYSADM group you created. In our examples, the instance user ID is `db2inst1` and the SYSADM group is `dbadmin1`.

> Dedicate the instance owner user ID to that instance's use only. This allows for easier error recovery if a system error occurs.

2 Use **admintool** or **groupadd** to create groups, and **admintool** or **useradd** to create users. For example:

```
groupadd -g 999 dbadmin1
useradd -g dbadmin1 -u 1004 -d /export/home/db2inst1 -m db2inst1
passwd db2inst1
```

For security reasons, we recommend that you do not use the instance name as the FencedID. However, if you are not planning to use fenced user defined functions or

stored procedures, you can set the FencedID to the instance name instead of creating another user for the FencedID.

Notes:

1. You have to repeat Steps 1 and 2 above to create a user name and group name for the Administration Server. You must use different user IDs for the Administration Server and a DB2 instance (for example, db2as and db2inst). For security reasons, you should not use the primary group of a DB2 instance as the primary group for the user ID for the Administration Server. It is recommended that you create a different group ID (for example, db2asgrp).

2. In addition to the rules imposed by the operating system for login names and groups, you must also adhere to the rules described in Appendix G, "Naming Rules" on page 553.

Step 4. Create a DB2 Instance

| A DB2 instance is an environment where you store data and run applications. Use the
| **db2icrt** command to create an instance. You must have *root* authority to enter this
| command. For more information about database instances, see Chapter 37, "Working with Instances" on page 353.

The **db2icrt** command is located in the DB2DIR/instance directory, where DB2DIR is /opt/IBMdb2/V5.0.

The syntax of the **db2icrt** command is:

```
►►── db2icrt ── [-h | -?] ── [-d] ── [-a AuthType] ──── [-u FencedID] ──────────►

►────── [-p PortName] ── [-s InstType] ── InstName ──────────────────────►◄
```

 where:

-h | -?   Display a help menu for this command.

-d   Sets the debug mode that you can use for problem determination.

| **-a** *AuthType*   Is an optional parameter that 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).

Notes:

1. The authentication type of the instance applies to all databases owned by the instance.

2. 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 UDFs and stored procedures will execute. This is not required if you install the DB2 Client Application Enabler. For other products, this is a required parameter.

   Note: *FencedID* may not be *root* or *bin*.

-p *PortName*   Is an optional parameter that specifies the TCP/IP service name or port number to be used. This value will then be set in the instance's database configuration file.

-s *InstType*   Is an optional parameter that allows different types of instances to be created. Valid instance types are *ee*, *eee* and *client*.

instance_name   Is the login name of the instance owner.

If a server product is installed, the syntax is:

```
db2icrt -u FencedID instance_name
```

Examples:

- You can use the instance name as the Fenced ID also:

```
db2icrt -u db2inst1 db2inst1
```

- To create an instance for a DB2 client, you can use the following command:

```
db2icrt db2inst1
```

When an instance is created, its name is also added to the list of instances on the system.

Step 5. Create the Administration Server

The Administration Server provides services to support client tools that:

- Automate the configuration of connections to DB2 databases.
- Administer DB2 from your server system or a remote client using the Command Center.

To create an Administration Server, see the procedures described in "Creating the Administration Server" on page 365.

Step 6. Install the License Key

The following steps describe how to upgrade the license:

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

1 Log in as a user with root authority.

2 The DB2 product license key can be found in the `nodelock` file:

    /var/netls/nodelock

3 Update your DB2 product license with the following command:

    /opt/IBMdb2/V5.0/cfg/db2licinst license_filename

where `license_filename` is the full pathname and filename for the license file that corresponds to the product you have purchased. The name of the license file for these products is:

db2conen.lic   DB2 Connect Enterprise Edition

For example, if the CD-ROM is mounted in the `/cdrom` directory and the name of the license file is `db2entr.lic`, the command should be as follows:

    /opt/IBMdb2/V5.0/cfg/db2licinst /cdrom_unnamed/db2/license/db2entr.lic

Step 7. Create Links for DB2 Files (Optional)

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

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

Log in as a user with root authority and invoke the **db2ln** command as follows:

    /opt/IBMdb2/V5.0/cfg/db2ln

If there are existing links to the `/usr/lib` and `/usr/include` directories from previous versions of DB2, they will automatically be removed by entering the **db2ln** command to create links for this version of DB2. If you want to re-establish the links to the libraries or previous versions, then you must execute the **db2rmln** command from Version 5 before you execute the **db2ln** command from the previous versions of DB2.

Links can be established for only one version of DB2 on a given system.

Chapter 48. Using the Client Configuration Assistant

Use the information in this section to use the Client Configuration Assistant (CCA) to perform administration tasks on OS/2 and Windows 32-bit operating systems.

When you install the DB2 server, if your protocols are set up and configured, DB2 server communications are automatically configured to allow DB2 to accept requests from remote clients.

> The CCA can be installed on OS/2 and Windows 32-bit operating systems. If it is not installed on your system, you can rerun the setup program and select to install the CCA.

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.
- Import or export client 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 password.

Configuring Database Connections

> To complete the steps in this section, you must be logged on to the local system as a user with System Administrative (SYSADM) authority on the instance.

You can configure database connections through the Add Database SmartGuide, by:

- Using a profile as a source of information to add database connections, see "Using an Access Profile" on page 480.
- Searching the network for databases, see "Searching the Network for Databases" on page 483.
- Adding database connections manually, see "Manually Configure a Connection to a DB2 Database" on page 488.

Using an Access Profile

You can use either a Server profile or a Client profile to configure database connections on a client.

Server Profiles

Server profiles can be generated for a DB2 Connect server. They contain information about instances on the 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 server profiles, use the Generate Access Profile function provided in the Control Center. When a profile is generated for the DB2 Connect server, it includes server instances that have the *discover_inst* configuration parameter and databases with the *discover_db* 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.

For information on setting the *discover_inst*, *discover_db* and *discover* configuration parameters, see "Setting Discovery Parameters" on page 486.

Generating a Server Profile: To generate an access profile, perform the following steps:

1 Click on **Start** and select **Programs**->**DB2 for Windows NT**->**Administration Tools**->**Control Center**.

2 Click on the **[+]** sign beside the **Systems** icon to get a list of systems.

3 Select the system to be profiled and click on the right mouse button.

4 Select the **Generate access profile** option.

5 Select the path and type in a file name for this profile, then click on the **Generate** push button.

To process a server profile and add its databases to the client's connection configuration list, use the Client Configuration Assistant's Import or Add functions. Using the Add function is the preferred method.

Using a Server Profile on the Client: To add a database using the Add function:

| **1** Click on **Start** and select **Programs**->**DB2 for Windows NT**->**Client Configuration Assistant**.

  2 Click on the **Add** push button.

  3 Select the **Use an access profile** radio button, and click on the **Next** push button.

| **4** Click on the **Browse** push button and select the profile for the server that you
| want to access.

  5 Select a database to be added and click on the **Next** push button.

  6 If desired, you can select the **Alias** and **ODBC** tabs at the top of the panel to specify a database alias name for the database, or to select CLI/ODBC options for the database. This step is optional.

  7 Click on the **Done** push button.

  8 You can test the connection that has been added by clicking on the **Test Connection** push button.

Client Profiles

Information in client profiles can be added to another client using the:

- Add function, which allows you to selectively process the database connection data in the client profile and add it to a new client. (This function invokes the Add Database SmartGuide.)

| - Import function, which allows you to selectively process database connection data,
| client configuration settings, and CLI or ODBC common parameters.

Note: This scenario assumes that the database connections configured on one client will be exported and used to set up one or more additional clients.

Exporting a Client Profile: Client profiles are generated from clients using the Export function of the CCA. Use the Export function to copy the database information used by one client to other clients.

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).
| - CLI or ODBC common parameters.

- Configuration data for the local APPC communications subsystem.

The Export function can be used to generate a customized profile that can be imported on another client to set it up, or update it.

To export a profile from the client, configure the client for communications and do the following:

1 Enter the **db2cca admin** command at a command prompt to start the Client Configuration Assistant in administrator mode. (You must belong to the local Administrator group to perform this command.)

> The Export function of the CCA is only available when the CCA is started in administrator mode. The CCA can be started permanently in administrator mode by modifying the **Client Configuration Assistant** icon to add the parameter *admin* to the startup. To add the parameter *admin* to the CCA startup:
>
> **1** Select the **CCA** icon and click on the right mouse button.
>
> **2** Select the **Properties** option.
>
> **3** Add the *admin* parameter to the:
>
> - **Parameters** field on OS/2
> - **Target** field (located on the **Security** tab) on Windows 32-bit operating systems.

2 Click on the **Export** push button.

3 Select the databases to be exported from the **Available DB2 Databases** window, and add them to the **Databases to be exported** window.

4 Select the check boxes 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.

5 Click on **OK**.

6 Enter a path and file name for the Client profile.

Importing a Client Profile:: Perform these steps at the client that you want to set up.

1 Click on **Start** and select **Programs**->**DB2 for Windows NT**->**Client Configuration Assistant**.

2 Click on the **Import** push button.

3 Select the path and filename of the client profile you want to import and click on **OK**.

4 The Import Client Profile window opens. Select the items you want to import. For more information, click on the **Help** push button.

5 Click on **OK**.

> If databases are contained in the client profile that you are importing, and you select to import them, the Add Database SmartGuide starts to allow you to selectively import the databases you want to connect to.

Searching the Network for Databases

Instead of entering protocol information to make a connection to remote database servers, you can use the CCA to find all the databases on your local network by following these steps:

> The following scenario assumes that messages used by the *Search* method of discovery are not filtered by your network, and that the installation defaults on the client and the server have not been changed. To run the following scenario, you must ensure that the *discover* parameter in the database manager configuration file on the client, and the *discover* parameter in the Administration Server configuration file on the server are set to *SEARCH*. Also, the *discover_comm* parameter must be set to the search protocols used on the client and Administration Server.

1 Start the Client Configuration Assistant (CCA).

2 Click on the **Add** push button on the CCA's main panel to start the Add Database SmartGuide.

3 Select the **Search the network** radio button, and click on the **Next** push button.

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

    a 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 and proceed to Step 5.

    b If the system that contains the database that you want is not listed, click on the **[+]** sign beside the **Other Systems (Search the network)** icon to search the network for additional systems. 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 and proceed to Step 5.

    c If the system you want is still not listed, it can be added to the list of systems by clicking on the **Add Systems** push button.

5 If desired, you can select the **Alias** and **ODBC** tabs at the top of the panel to specify a database alias name for the database, or to select CLI/ODBC options for the database. This step is optional.

6 Click on the **Done** push button.

7 You can test the connection that has been added by clicking on the **Test Connection** push button.

Searching the network can be customized to meet the needs of individual organizations. The material that follows provides details on this customization. Refer to the *Administration Guide* for more information on individual configuration parameters and profile registry values.

Choosing a Discovery Method

Network searching uses a DB2 facility called *Discovery* to obtain information from DB2 servers. This information is used to configure clients for database connections.

Note: Discovery cannot retrieve information about pre-Version 5 DB2 systems.

Two discovery methods are available for searching the network:

- **Known**

  Known discovery allows you to discover instances and databases on systems that are known to your client, and add new systems so that their instances and databases can be discovered.

  Initially, the list of systems will be blank; however, if you are running the CCA on the server, an entry for the local server will be shown. Add systems to the list by clicking on the **Add System** push button. To use this option you must know a few details about the Administration Server on the DB2 system to be searched:

  - A protocol configured and running on the Administration Server.
  - The protocol's configuration information.

  The Administration Server will listen for Known discovery requests, from clients, on the protocols specified by the *db2comm* registry value in the Administration Server.

- **Search**

  This mode provides all of the facilities of Known discovery, and adds the option to allow your local network to be searched for DB2 Connect servers.

Search may appear to be a simpler discovery method. However, in larger networks, network routers and bridges can filter the messages that *Search* uses to find DB2 servers on the network, resulting in an incomplete or even empty list. In this case, use the *Add System* method; its messages are not filtered by routers and bridges. If in doubt, contact your network administrator for assistance.

To have the server support Known discovery, set the *discover* parameter in the Administration Server configuration file to *KNOWN*. To have it support Search discovery, set this parameter to *SEARCH* (which also supports all the facilities of Known discovery). To prevent discovery of a server, and all of its instances and databases, set *discover* to *DISABLE*.

On the client, enabling discovery is also done using the *discover* parameter; however, in this case, the *discover* parameter is set in the client instance (or a server acting as a client) as follows:

Known   Allows the CCA to refresh systems in the known list, and to add new systems to the list by using the **Add Systems** push button. When the *discover* parameter is set to *KNOWN*, the CCA will not be able to search the network.

Search   Enables all the facilities of Known discovery, and enables network searching.

Disable   Disables discovery. In this case, the **Search the network** option is not available in the Add Database SmartGuide.

> The *discover* parameter defaults to *SEARCH* on all client and server instances. The *discover* parameter defaults to *SEARCH* on all Administration Servers except Administration Servers installed in a UNIX Extended Enterprise Edition environment, where *discover* defaults to *KNOWN*.

Additional Settings for Search Discovery

Search discovery requires that the *discover_comm* parameter be set on both the server (in the Administration Server's configuration file) and the client (in the database manager configuration file).

The *discover_comm* parameter is used to control the communication protocols that the server will listen to for search requests from clients, and that clients will use to send out search requests. The *discover_comm* parameter can be any combination of TCP/IP and NetBIOS; the protocols supported by Search discovery.

On the Administration Server, the values specified for *discover_comm* must be equal to, or a subset of, the values set for *db2comm*.

> To avoid problems with the Control Center and the Client Configuration Assistant, ensure that the *DB2COMM* parameter is set in the DB2 registry using the db2set command. It is not recommended that you use any other mechanism to set the *DB2COMM* value.

On the server, the *discover_comm* parameter is set in the Administration Server's configuration file. On the client (or a server acting as a client), *discover_comm* is set in the database manager configuration file.

Note: When using Search discovery, at least one protocol specified by the *discover_comm* parameter on the client must match those specified by the *discover_comm* parameter on the Administration Server. If there is no match, the server will not respond to the client's requests.

> Check the settings for the *db2comm* registry value by entering the **db2set DB2COMM** command. For more information, see Chapter 41, "Controlling Your DB2 Environment" on page 395.

In addition, there are two DB2 profile registry values that can be used to tune Search discovery via NetBIOS on the client: *db2discoverytime* and *db2nbdiscoverrcvbufs*. The default values should be suitable in most cases. For more information, refer to the *Administration Guide*.

Hiding Server Instances and Databases from Discovery

You may have multiple instances, and multiple databases within these instances, on a server. You may want to hide some of these from the discovery process.

To allow clients to discover server instances on a system, set the *discover_inst* database manager configuration parameter in each server instance on the system to *ENABLE* (this is the default value). Set this parameter to *DISABLE* to hide this instance and its databases from discovery.

To allow a database to be discovered from a client, set the *discover_db* database configuration parameter to *ENABLE* (this is the default value). Set this parameter to *DISABLE* to hide the database from discovery.

Setting Discovery Parameters

discover and discover_comm
The *discover* and *discover_comm* parameters are set in the Administration Server configuration file on the server system, and in the database manager configuration file on the client. Set these parameters as follows:

• On the Administration Server:

Update the Administration Server's configuration file, in the command processor, as follows:

```
update admin cfg using discover [ DISABLE | KNOWN | SEARCH ]
update admin cfg using discover_comm [ TCPIP ]
```

Stop and restart the Administration Server by entering the following commands:

```
db2admin stop
db2admin start
```

Note: Search Discovery will only operate on TCP/IP.

- On the client:

    1 Start the Client Configuration Assistant (CCA).

    2 Click on the **Client Settings** push button.

    3 Select the **Communications** tab.

    4 Select the parameters that you want to modify from the **Parameters** window.

    5 Select a value for the parameter that you want to modify from the **Value** box.

    6 Click on the **OK** push button to close the **Client Settings** window. A DB2 message window opens.

    7 Click on the **OK** push button and restart your applications so that your changes can take affect.

discover_inst and discover_db

Use the Control Center to set the *discover_inst* and *discover_db* parameters. To set these parameters, follow these steps:

1 Start the Control Center.

2 Click on the **[+]** sign beside the **Systems** icon to get a list of systems.

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

4 Select the instance that you want to configure and click on the right mouse button.

5 Select the **Configure** option from the pop-up menu. The Configuration Instance window opens.

6 Select the **Environment** tab and select the *discover_inst* parameter from the **Parameters** box.

7 Select the desired value from the **Value** box and click on **OK**.

8 Click on the **[+]** beside an instance icon to get a list of databases in it.

9 Select the database that you want to configure and click on the right mouse button.

10 Select the **Configure** option from the pop-up menu. The Configuration Database window opens.

11 Select the **Environment** tab and select the *discover_db* parameter.

12 Select the desired value from the **Value** box and click on **OK**.

db2discoverytime and db2nbdiscoverrcvbufs

The *db2discoverytime* and *db2nbdiscoverrcvbufs* profile registry values are set in the client instance (or a server acting as a client). Set these parameters as follows:

- To set the *db2discoverytime* registry value to 60 seconds, enter the following command:

      db2set db2discoverytime=60

  This specifies that Search discovery should wait 60 seconds for a response from servers.

- To set the *db2nbdiscoverrcvbufs* registry value to 20, enter the following command:

      db2set db2nbdiscoverrcvbufs=20

  This specifies the number of NetBIOS buffers that will be allocated for concurrent response messages from discovered servers.

Manually Configure a Connection to a DB2 Database

Manually configuring a database connection requires you to know:

- One of the protocols supported by the server instance containing the database.
- The protocol connection information required to configure the connection to the server instance.
- The name of the database on the server system.

With this information, the SmartGuide will guide you through the steps necessary to add the database connection.

  1 Start the Client Configuration Assistant (CCA).

  2 Click on the **Add** push button on the CCA's main panel to start the Add Database SmartGuide.

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

  4 Select the protocol that you will use to connect to the database and click on the **Next** push button.

  5 Enter the required protocol parameters and click on the **Next** push button.

  6 In the **Target database** panel, enter the name of the remote database alias in the **Target Database** field.

> 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 specified.

7 If desired, you can select the **Alias** and **ODBC** tabs at the top of the panel to specify a local database alias name or select **CLI/ODBC** options for the remote database. This step is optional.

8 Click on the **Done** push button.

9 You can test the connection that has been added by clicking on the **Test Connection** push button.

When you add a database using this configuration method, the Client Configuration Assistant will generate a default node name for the database.

For example, if you used TCP/IP to add the database to your system, the instance name could be *TCP0000*.

Part 8. Configuring DRDA Hosts

Chapter 49. Configuring DRDA Hosts for DB2 Connect

This chapter details steps to be taken by your network or system administrator and your DB2 administrator in order for you to be able to successfully connect DB2 Connect to a *DRDA application server (AS)* on an MVS or OS/390 DRDA host.

Note that the steps listed in this chapter must be performed by users who have the necessary privileged system access and special expertise. You should make this information available to your support staff if required.

This section also provides some information for DB2 for AS/400 users, and pointers to additional information sources for MVS, OS/390, OS/400, VM, and VSE users, as follows:

- *DB2 for OS/390 Version 5 Installation Guide*, GC26-8970 contains the most complete and up to date information for DB2 for OS/390.

- Information about how to set up DB2 Universal Database as a DRDA AS is provided in the *Quick Beginnings* manuals for DB2 Universal Database products.

- Selected information about how to set up an MVS, OS/390, OS/400, VM, or VSE system as a DRDA AS for use over SNA connections with the DB2 Connect *DRDA application requester* (AR) is provided with DB2 Connect in the *DB2 Connectivity Supplement*.

- More information about how to set up an MVS, OS/390, OS/400, VM, or VSE system as a DRDA AR for use with DB2 Universal Database DRDA AS is also provided in the *DB2 Connectivity Supplement*.

- *Distributed Relational Database Cross Platform Connectivity and Applications*, SG24-4311 contains useful post-configuration information.

The examples in this chapter match those provided elsewhere in this book. When you use these examples 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 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 for OS/390 host for use with DB2 Connect SNA connections. These should be compared with current definitions. See "Configuring VTAM" on page 495.

- Instructions for establishing TCP/IP network connections between DB2 Connect and DB2 for OS/390. See "Configuring TCP/IP for DB2 for OS/390" on page 502.

- DB2 host configuration steps (see "Configuring DB2 for OS/390" on page 499, or "Configuring DB2 for MVS/ESA" on page 500). Many details of these steps have changed with the introduction of DB2 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 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 495. For TCP/IP names, see "Configuring TCP/IP for DB2 for OS/390" on page 502.

Note: If you will use the LU6.2 Syncpoint Manager (SPM) function of DB2 Connect Enterprise Edition for AIX or OS/2, it is particularly important to read Chapter 24, "Configuring the DB2 Syncpoint Manager" on page 225. The examples documented here do not include the additional steps required to set up the SPM.

Summary of Steps

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

1 Configure VTAM - see "Configuring VTAM" on page 495, or:

2 Configure TCP/IP - see "Configuring TCP/IP for DB2 for OS/390" on page 502, or:

3 Configure DB2 for OS/390 or DB2 for MVS/ESA - see "Configuring DB2 for OS/390" on page 499, or "Configuring DB2 for MVS/ESA" on page 500.

Configuring VTAM

VTAM needs to be configured only if DB2 Connect will use SNA connections; it is not required if DB2 Connect will only use TCP/IP database connections (see "Configuring TCP/IP for DB2 for OS/390" on page 502).

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 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.)

   Note: If you are using SNA two-phase commit, the LU definition must be the name defined at the DB2 Connect server using the SPMNAME database manager configuration parameter.

3 The VTAM Log Mode Definition for DB2. (The log mode entry to be used for the connection is IBMRDB in these examples.)

The VTAM sample 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)

All the examples in this section use the same names as elsewhere in this book, as shown in Figure 26 on page 496:

```
DB2 Connect GATEWAY:
        - 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 DRDA-AS,
                                               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 26. 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.

Note: If you are using SNA two-phase commit, the LU Name must be the same as the
SPM LU name at the DB2 Connect server.

Sample VTAM APPL Definition for OS/390

Figure 27 on page 497 lists the sample VTAM application major node definition used
for DB2 for OS/390 in this book. In most cases, such a definition will already exist with
a different LU name.

Otherwise, this *application major node* must be defined, and DB2 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 27. Sample VTAM APPL Definition for DB2 for OS/390 or DB2 for MVS/ESA

Notes:

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

2. To use the DB2 Syncpoint Manager (SPM), you must also include:

   `SYNCLVL=SYNCPT`

   This enables Syncpoint support, which allows you to use two-phase commit over SNA connections to DB2 for OS/390.

Sample VTAM PU and LU Definitions for DB2 Connect

Figure 28 on page 498 lists the sample VTAM switched major node definition used for the example DB2 Connect workstation in this book.

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 28. Sample VTAM Switched Major Node Definition for DB2 Connect

Alternatively, you can enable DYNPU and DYNLU in VTAM to allow any PU and LU access through VTAM.

Sample VTAM Log Mode Definition for DB2

Figure 29 on page 499 lists the sample VTAM logon mode table definition IBMRDB used in this book. 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 29. Sample VTAM Log Mode Definition for DB2 Connect

Note that you must define SNASVCMG when using APPC.

Configuring DB2 for OS/390

Before you can use DB2 Connect, your DB2 for OS/390 Administrator must configure
DB2 for OS/390 to permit connections from the DB2 Connect workstation. This section
indicates the *minimum* updates required in order to permit the DB2 Connect Application
Requester to make a connection to DB2 for OS/390. More detailed examples can be
found in *DB2 Connectivity Supplement*, and *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
for OS/390. Work with your DB2 Administrator to determine the updates required for

your DB2 for OS/390 system. The DB2 for OS/390 Communications Database tables are described in *DB2 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 command such as the following:

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

Alternatively, if you want to restrict access by LU name, you can use an SQL command such as 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 password
is sent to the server).

Updating SYSIBM.SYSLUNAMES

If you want to restrict access by LU name, you can use an SQL command such as 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 = PU name of server involved
- IBMRDB = name of VTAM logon mode
- 150 = max. number of conversations
- Y = 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 for OS/390

This section tells you how to configure TCP/IP communications between your DB2 Connect workstation and DRDA servers running DB2 for OS/390 Version 5.1. 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 for OS/390 Version 5.1.
- All the necessary software prerequisites are installed.
- DB2 clients have been set up as required.

These examples use the default port number 446 which has been defined for DRDA.

Collecting Information

Before you can use DB2 Connect over a TCP/IP connection, you must collect some information about both the DRDA host and the DB2 Connect workstation. For each DRDA host server that you are connecting to via TCP/IP, you must know in advance:

- 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 with IBM TCP/IP for OS/2 Version 3 the location of this file is usually \mptn\etc\services. If you have LAPS and TCP/IP, the location is usually \tcpip\etc\services.
  - On Windows NT, the location of this file may be \winnt\system32\drivers\etc\services or \tcpip\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 with MPTN and IBM TCP/IP for OS/2 Version 3, the location of this file is usually \mptn\etc\hosts. If you have LAPS and TCP/IP, the location is usually \tcpip\etc\hosts.

- On Windows NT, the location of this file may be
  `\winnt35\system32\drivers\etc\hosts`, `\winnt\system32\drivers\etc\hosts`,
  or `\tcpip\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 for OS/390 host.

- The TCP/IP *port number* defined to DB2 for OS/390. (Note that the associated *service name* information is not exchanged between the DB2 Connect workstation and DB2 for OS/390). Port number 446 has been registered for DRDA, and this is the port number used in these examples.

- The TCP/IP addresses and host names for both the host and the DB2 Connect workstation.

- The *target database name* of the database you will connect to at the DB2 for OS/390 host. (This is the same as the *LOCATION NAME* of the database).

- 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 47, to plan *each* TCP/IP connection between DB2 Connect and a DRDA host server.

Example Worksheet

Table 47 (Page 1 of 2). Example Worksheet for Planning TCP/IP Connections to DB2 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	Target database name	NEW_YORK3	
TCP-13	User ID		
TCP-14	Password		
Network Elements at the DB2 Connect Workstation			
TCP-18	Host name	mcook02	

Table 47 (Page 2 of 2). Example Worksheet for Planning TCP/IP Connections to DB2 for OS/390			
Ref.	**Description**	**Sample Value**	**Your Value**
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	
TCP-34	TM_DATABASE	1ST_CONN (recommended)	

Notes:

1. If a DB2 Universal Database server is also installed on the same workstation as DB2 Connect, then the port numbers and service names defined should be the same: they are shared by DB2 Connect and DB2 Universal Database.

2. *Target database name* (item 12) is the DB2 for OS/390 *LOCATION NAME*.

3. TM_DATABASE is required only if you will use two-phase commit.

4. To obtain the host's IP address (item 9), enter at the host:

   TSO NETSTAT HOME

5. To obtain the port number (item 11), look for DSNL004I in the DB2 master address space or system log. Port number 446 has been registered for DRDA, and this is the port number used in these examples.

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 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 host database name that you will connect to (the DB2 for OS/390 *LOCATION name* (item 12).

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

6 Determine the value to be used for **TM_DATABASE** at the DB2 Connect workstation, item 34. In most cases we recommend **1ST_CONN** (the default is **NULL**).

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 for OS/390 Host: At your DB2 for 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 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 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 Workstation: At your DB2 Connect workstation:

1 Verify the *host name*. Enter the *hostname* command at a system prompt. This will return the TCP/IP host name for the DB2 Connect workstation.

2 Verify the *host address*. Use the *ping* command, for example:

```
ping myhost
```

This will return the host address.

3 Verify the *port number*. Examine the TCP/IP `services` file on the workstation (see above for location information).

4 Verify the *service name*. Same as the previous step.

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

6 Update the `hosts` file (or the Domain Name Server used by the DB2 Connect workstation) with the hostname and IP address of the DB2 for OS/390 system. This may not need to be done if it has already been defined there. Check with your network administrator.

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

8 Check with the local DB2 administrator that you have a valid user ID and password for use when accessing DB2 Connect. You will need this in order to update the local Database Manager Configuration, as well as the DB2 Database, Node, and Data Connection Services directories, prior to issuing a *CONNECT* statement for the host database.

9 PING the DB2 for OS/390 host, using the correct port number if that option is supported by TCP/IP on the DB2 Connect workstation:

```
ping MVS_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 database, or a DB2 for OS/390 Version 5.1 database. This is the recommended setting.

- *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 database, or a DB2 for OS/390 Version 5.1 database.

Note: *TM_DATABASE* cannot be left to default. If no TM_DATABASE value is provided then any CONNECT issued will fail with SQLCODE 865. If you want more information about TM_DATABASE options, refer to *Administration Guide*.

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 dbs2inst1c
```

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 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 `hostsfile on the DB2`

Connect workstation, or via a Domain Name Server (DNS) referenced by the DB2 Connect workstation.

- *db2inst1c* is either the *service name* or 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.

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 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 for OS/390 *LOCATION NAME* for the target database.

CONNECT and BIND: Finally, connect to the DRDA Server and bind the utilities and applications to the DRDA 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 messages ddcsmvs.msg grant public
disconnect all
```

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

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

Preparing DB2 for AS/400 for DB2 Connect

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

- The local network name. You can get this information by entering **DSPNETA**.
- The local adapter address. You can get this information by entering **WRKLIND (*trlan)**.
- The mode name. You can get a list of mode names by entering **WRKMODD**. If the mode IBMRDB has been defined on your OS/400 system, you should use it.
- The local control point name. You can get this information by entering **DSPNETA**.

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

- 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.

  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
      _     RCH2PDH3             RCHASDH3
      _     R7BDH3SNA            RCH2PDH3
      _     RCHASDH3             RCHASDH3
```

When you have obtained these parameters from OS/400, enter your values into the worksheet that follows:

Table 48. 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 for AS/400 as an application server, refer to the online *DB2 Connectivity Supplement* provided with your DB2 Connect product.

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

Preparing DB2 for VSE & VM

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

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

Part 9. Appendixes

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Appendix A. How the DB2 Library Is Structured

The DB2 Universal Database library consists of SmartGuides, online help, and books. 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 "Information Center" on page 523 for details.

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. The following table lists the SmartGuides.

Note: Not all SmartGuides 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 on **Add**.
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**->**New**.
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 performance**.
Backup Database	Determine, create, and schedule a backup plan.	From the Control Center, click with the right mouse button on the database you want to backup and select **Backup**->**Database 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**.

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**.

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 "Information Center" on page 523.

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.
Control 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 on the **Help** push button or press the F1 key.

Type of Help	Contents	How to Access...
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.
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 the *class-code* is 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 Books

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 UNIX-based and Intel-based platforms.

Platform-specific books These books are for DB2 on a specific platform. For example, for DB2 on OS/2, on Windows NT, and on the UNIX-based platforms, there are separate *Quick Beginnings* books.

Most books are available in HTML and PostScript format, and in hardcopy that you can order from IBM. The exceptions are noted in the table.

If you want to read the English version of the books, they are always provided in the directory that contains the English documentation.

You can obtain DB2 books and access information in a variety of different ways:

Book Name	Book Description	Form Number / File Name
	Cross-Platform Books	
Administration Getting Started	Introduces basic DB2 database administration concepts and tasks, and walks you through the primary administrative tasks.	S10J-8154 / db2k0x50
Administration Guide	Contains information required to design, implement, and maintain a database to be accessed either locally or in a client/server environment.	S10J-8157 / db2d0x51
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.	S10J-8167 / db2b0x51
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.	S10J-8159 / db2l0x50
Command Reference	Explains how to use the command line processor, and describes the DB2 commands you can use to manage your database.	S10J-8166 / db2n0x51

Book Name	Book Description	Form Number File Name
DB2 Connect Enterprise Edition Quick Beginnings	Provides planning, migrating, installing, configuring, and using information for DB2 Connect Enterprise Edition. Also contains installation and setup information for all supported clients.	S10J-7888 db2cyx51
DB2 Connect Personal Edition Quick Beginnings	Provides planning, installing, configuring, and using information for DB2 Connect Personal Edition.	S10J-8162 db2c1x51
DB2 Connect User's Guide	Provides concepts, programming and general using information about the DB2 Connect products.	S10J-8163 db2c0x51
DB2 Connectivity Supplement	Provides setup and reference information for customers who want 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 customers who want to use DRDA Application Servers with DB2 Connect (formerly DDCS) application requesters. **Note:** Available in HTML and PostScript formats only.	No form number db2h1x51
Embedded SQL Programming Guide	Explains how to develop applications that access DB2 databases using embedded SQL, and includes discussions about programming techniques and performance considerations.	S10J-8158 db2a0x50
Glossary	Provides a comprehensive list of all DB2 terms and definitions. **Note:** Available in HTML format only.	No form number db2t0x50
Installing and Configuring DB2 Clients	Provides installation and setup information for all DB2 Client Application Enablers and DB2 Software Developer's Kits. **Note:** Available in HTML and PostScript formats only.	No form number db2iyx51
Master Index	Contains a cross reference to the major topics covered in the DB2 library. **Note:** Available in PostScript format and hardcopy only.	S10J-8170 db2w0x50
Messages Reference	Lists messages and codes issued by DB2, and describes the actions you should take.	S10J-8168 db2m0x51
DB2 Replication Guide and Reference	Provides planning, configuring, administering, and using information for the IBM Replication tools supplied with DB2.	S95H-0999 db2e0x52
Road Map to DB2 Programming	Introduces the different ways your applications can access DB2, describes key DB2 features you can use in your applications, and points to detailed sources of information for DB2 programming.	S10J-8155 db2u0x50

Book Name	Book Description	Form Number File Name
SQL Getting Started	Introduces SQL concepts, and provides examples for many constructs and tasks.	S10J-8156 db2y0x50
SQL Reference	Describes SQL syntax, semantics, and the rules of the language. Also includes information about release-to-release incompatibilities, product limits, and catalog views.	S10J-8165 db2s0x51
System Monitor Guide and Reference	Describes how to collect different kinds of information about your database and the database manager. Explains how you can use the information to understand database activity, improve performance, and determine the cause of problems.	S10J-8164 db2f0x50
Troubleshooting Guide	Helps you determine the source of errors, recover from problems, and use diagnostic tools in consultation with DB2 Customer Service.	S10J-8169 db2p0x50
What's New	Describes the new features, functions, and enhancements in DB2 Universal Database, Version 5.2, including information about Java-based tools.	S04L-6230 db2q0x51
Platform-Specific Books		
Building Applications for UNIX Environments	Provides environment setup information and step-by-step instructions to compile, link, and run DB2 applications on a UNIX system.	S10J-8161 db2axx51
Building Applications for Windows and OS/2 Environments	Provides environment setup information and step-by-step instructions to compile, link, and run DB2 applications on a Windows or OS/2 system.	S10J-8160 db2a1x50
DB2 Personal Edition Quick Beginnings	Provides planning, installing, migrating, configuring, and using information for DB2 Universal Database Personal Edition on OS/2, Windows 95, and the Windows NT operating systems.	S10J-8150 db2i1x50
DB2 SDK for Macintosh Building Your Applications	Provides environment setup information and step-by-step instructions to compile, link, and run DB2 applications on a Macintosh system. **Note:** Available in PostScript format and hardcopy for DB2 Version 2.1.2 only.	S50H-0528 sqla7x02
DB2 SDK for SCO OpenServer Building Your Applications	Provides environment setup information and step-by-step instructions to compile, link, and run DB2 applications on a SCO OpenServer system. **Note:** Available for DB2 Version 2.1.2 only.	S89H-3242 sqla9x02
DB2 SDK for SINIX Building Your Applications	Provides environment setup information and step-by-step instructions to compile, link, and run DB2 applications on a SINIX system. **Note:** Available in PostScript format and hardcopy for DB2 Version 2.1.2 only.	S50H-0530 sqla8x00

Book Name	Book Description	Form Number File Name
Quick Beginnings for OS/2	Provides planning, installing, migrating, configuring, and using information for DB2 Universal Database on OS/2. Also contains installing and setup information for all supported clients.	S10J-8147 db2i2x50
Quick Beginnings for UNIX	Provides planning, installing, configuring, migrating, and using information for DB2 Universal Database on UNIX-based platforms. Also contains installing and setup information for all supported clients.	S10J-8148 db2ixx51
Quick Beginnings for Windows NT	Provides planning, installing, configuring, migrating, and using information for DB2 Universal Database on the Windows NT operating system. Also contains installing and setup information for all supported clients.	S10J-8149 db2i6x50
DB2 Extended Enterprise Edition for UNIX Quick Beginnings	Provides planning, installing, configuring, and using information for DB2 Universal Database Extended Enterprise Edition for UNIX. This book supercedes the *DB2 Extended Enterprise Edition Quick Beginnings for AIX* book, and is suitable for use with all versions of DB2 Extended Enterprise Edition that run on UNIX-based platforms.	S99H-8314 db2v3x51
DB2 Extended Enterprise Edition for Windows NT Quick Beginnings	Provides planning, installing, configuring, and using information for DB2 Universal Database Extended Enterprise Edition for Windows NT.	S09L-6713 db2v6x51

Notes:

1. The character in the sixth position of the file name indicates the language of a book. For example, the file name db2d0e50 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	Language	Identifier
Brazilian Portuguese	B	Japanese	J
Bulgarian	U	Korean	K
Czech	X	Norwegian	N
Danish	D	Polish	P
English	E	Russian	R
Finnish	Y	Simp. Chinese	C
French	F	Slovenia	L
German	G	Spanish	Z
Greek	A	Swedish	S
Hungarian	H	Trad. Chinese	T
Italian	I	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_05_00 on AIX
- /opt/IBMdb2/V5.0 on HP-UX, Solaris, SCO UnixWare 7, and SGI.

- On other platforms, see the RELEASE.TXT file. This file is located in the directory where the product is installed.

Viewing Online Books

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 use any HTML Version 3.2-compliant browser to view the online books.

To view online books:

- If you are running DB2 administration tools, use the Information Center. See "Information Center" on page 523 for details.

- Use the open file function of your Web browser. The page you open contains descriptions of and links to DB2 books:

  - 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.

    You can also 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.

    Note: The **DB2 Online Books** icon is only available if you do not install the Information Center.

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 sub-directories from \sqllib\doc\html on your local system to a web server. Each book has its own sub-directory 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 *Setting up DB2 Online Documentation on a Web Server* at:

    http://www.software.ibm.com/data/pubs/papers/db2html.html

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 such as:

    - List of books
    - Tables of contents of frequently used books
    - Frequently referenced articles like the *ALTER TABLE* topic
    - Search form.

For information about setting up a search, see the *What's New* book.

Searching Online Books

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.

- 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 "Information Center" on page 523 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 Books" on page 516.

Note: 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. The result from this step is a printable PostScript file with a file extension of `.psz`.

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.psz
```

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 Silicon Graphics IRIX and SINIX:

     ```
     zcat < filename | lp -d PSPrinter_queue
     ```

   where *filename* is the name of 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 *Quick Beginnings for UNIX* on AIX, you can use the following command:

   ```
   zcat /cdrom/doc/en/ps/db2ixe50.ps.Z | qprt -P ps1
   ```

Ordering the Printed DB2 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-8915-00. The form number for the set of books updated for Version 5.2 is SBOF-8921-00. The form number for the books listed under the heading "Cross-Platform Books" is SBOF-8914-00.

Note: These form numbers only apply if you are ordering books that are printed in the English language.

You can also order books individually by the form number listed in "DB2 Books" on page 516. 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.

Information Center

The Information Center provides quick access to DB2 product information. You must install the DB2 administration tools to obtain the Information Center.

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
- **db2ic** command.

The Information Center provides the following kinds of information. Click on 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, follow the *Search DB2 Books* link in each HTML file, or use the search feature of the help viewer.

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 via 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.

Appendix B. Changing Your MVS Password

DB2 Connect now provides an ability to change user passwords. This facility is especialy usefull for situations where host security service such as RACF is used to authenticate users. Previously changing host password would require users to log in to a TSO session to change their password. With the new password maintenace support provided by the DB2 Connect products users can issue SQL CONNECT statement from DB2 Command Line Processor (CLP), use PASSWORD button on DB2 Client Configuration Assistant (CCA), or press CHANGE button on the ODBC login dialog to change their host password.

Changing MVS passwords from DB2 Connect workstations connected to DB2 for OS/390 V5.1 via TCP/IP does not require special set up on either MVS host or the DB2 Connect workstation. Changing of MVS passwords on host systems conencted via SNA, however, does require that a special password expiration management program be set up on the host and that DB2 Connect workstation be configured to comunicate with this host program.

The host password expiration management program is provided as part of the following MVS program products:

- MVS/ESA SP Version 4.2 or higher (password expiration management is a part of the APPC/MVS component)
- CICS/ESA Version 3.3 or higher

and have IBM Resource Access Control Facility (RACF) 1.9.2 installed.

You need to:

1 Configure the host's transaction program to receive your requests for password expiration maintenance.

2 Configure your DB2 Connect workstation for communications with the host transaction program.

Configuring the Host for Password Expiration Management

Setting up Password Expiration Management facilities on MVS hosts is the responsibility of MVS system programmers and is beyond the scope of this book. The following publications provide detailed documentation:

- *MVS/ESA SP V5.x Planning: APPC Management*, GC28-1503
- *MVS/ESA SP V5.x APPC/MVS Handbook for the OS/2 Administrator*, GC28-1504
- *MVS/ESA SP V4.3 Planning: APPC Management*, GC28-1110
- *MVS/ESA SP V4.2 APPC/MVS Handbook for the OS/2 Administrator*, GC28-1133
- *CICS/ESA: RACF Security Guide (CICS 4.1)*, SC33-1185
- *CICS/ESA: CICS-APPC Password Expiration Management Guide (CICS 3.3)*, SC33-0921
- *APPC Security MVS/ESA CICS/ESA OS/2*, GG24-3960.

Configuring the DB2 Connect Workstation for Password Expiration Management

Once the host password expiration management transaction program is configured you will need to configure your DB2 Connect workstation to communicate with the host program. This configuration involves two steps:

1. Define a symbolic destination name for the host password maintenance program in the SNA subsystem on your DB2 Connect workstation.

2. Record this symbolic destination name in the DCS directory for the databases that reside on this host system.

Step 1. Define Symbolic Destination Name

How you define symbolic destination name for the host password expiration management program depends on what SNA subsystem you are using:

- If you are using an SNA subsystem that can be configured by the DB2 Client Configuration Assitant (CCA) then you should use CCA to configure this symbolic destination name. You will need to obtain the LU name for the password expiration management program from your MVS administrator.

- If your SNA subsystem can not be configured using DB2 CCA you should follow documentation provided with your SNA subsystem to configure the symbolic destination name. You will need to obtain the following information from your MVS administrator:

  - Network name for the host that you are connecting to

  - LU name for the host password expiration management program

  When configuring symbolic destination name you will also need to specify x'06F3F0F1' (hexadecimal number) for the Transaction Program (TP) name and

set security to "NONE". You can specify mode such as #INTER or any other mode
that your MVS may sugest to you.

Step 2. Record Symbolic Destination Name in the DCS Directory

| If you are running DB2 Connect on a platform that provides DB2 CCA then you should
| use DB2 CCA to update your DCS directory with the symbolic destination name for the
| host password expiration management program. You should be able to do this
| regardless of the SNA subsystem on your DB2 Connect workstation.

| You can also use `catalog dcs database` command (from DB2 CLP) to record the
| symbolic destination name in the DCS directory. For example:

| `catalog dcs database db1 as dsn_db_1 parms ",,,,,,,CHGPWD_SDN=pempgm"`

| records "pempgm" as the symbolic destination name that is to be used when users
| request to change passwords for database "db1".

Appendix C. National Language Support (NLS)

This section contains information about configuring national language support for the DB2 Connect product, and includes information on:

- Which languages are supported by DB2 Connect Enterprise Edition and DB2 Connect Personal Edition.

- How DB2 Connect handles the conversion of data between 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_05_00/msg/%L`
DB2 for HP-UX	`/opt/IBMdb2/V5.0/msg/%L`
DB2 for SCO UnixWare 7	`/opt/IBMdb2/V5.0/msg/%L`
DB2 for Solaris	`/opt/IBMdb2/V5.0/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. You can, however, change these settings after installing DB2. This includes changing 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 49 on page 531 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*.

Country Code	Language	Country Code	Language
BG	Bulgarian	HU	Hungarian
BR	Brazilian Portuguese	IL	Hebrew
CN	Simplified Chinese (PRC)	IT	Italian
CZ	Czech	JP	Japanese
DE	German	KR	Korean
DK	Danish	NO	Norwegian
EN	English	PL	Polish
ES	Spanish	RU	Russian
FI	Finnish	SE	Swedish
FR	French	SI	Slovenian
GR	Greek	TR	Turkish
		TW	Traditional Chinese (Taiwan)

Table 49. Languages and Code Pages

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 DRDA 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 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 for OS/390 converts the data to an EBCDIC CCSID and processes it.

3. DB2 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 50. 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 is 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 5.2.

   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 5.2 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 for OS/390 to DB2 UDB on a Windows 32-bit operating systems workstation displays incorrectly.

Bidirectional-specific CCSIDs

The following bidirectional Coded Character Set Identifiers (CCSID) have been defined and are implemented with DB2 UDB:

```
CCSID -  Code  - String
      -  Page  -  Type
-------+--------+----------
  00420    420      4
  00424    424      4
  08612    420      5
  08616    424      6
  12708    420      7
X'3F00'    856      4
X'3F01'    862      4
X'3F02'    916      4
X'3F03'    424      5
X'3F04'    856      5
X'3F05'    862      5
X'3F06'    916      5
X'3F07'   1255      5
X'3F08'   1046      5
X'3F09'    864      5
X'3F0A'   1089      5
X'3F0B'   1256      5
X'3F0C'    856      6
X'3F0D'    862      6
X'3F0E'    916      6
X'3F0F'   1255      6
X'3F10'    420      6
X'3F11'    864      6
X'3F12'   1046      6
X'3F13'   1089      6
X'3F14'   1256      6
X'3F15'    424      8
X'3F16'    856      8
X'3F17'    862      8
X'3F18'    916      8
X'3F19'    420      8
X'3F1A'    420      9
X'3F1B'    424     10
X'3F1C'    856     10
X'3F1D'    862     10
X'3F1E'    916     10
X'3F1F'   1255     10
X'3F20'    424     11
X'3F21'    856     11
X'3F22'    862     11
X'3F23'    916     11
X'3F24'   1255     11
```

Where CDRA String Types are defined:

```
String - Text - Numerical  - Orientation - Shaping  - Symmetrical
Type  - Type -  Shape    -            -          - Swapping
---------+-------+------------+-------------+-----------+-------------
   4     Visual   Arabic        LTR         Shaped        OFF
   5     Implicit Arabic        LTR         Unshaped      ON
   6     Implicit Arabic        RTL         Unshaped      ON
   7(*)  Visual   Arabic     Contextual(*)  Unshaped-Lig  OFF
   8     Visual   Arabic        RTL         Shaped        OFF
   9     Visual   Passthru      RTL         Shaped        ON
  10     Implicit            Contextual-L                 ON
  11     Implicit            Contextual-R                 ON
```

Note: Field orientation is left-to-right (LTR) when the first alphabetic character is a Latin one, and right-to-left (RTL) when it is a bidirectional (RTL) character. Characters are unshaped, but LamAlef ligatures are kept, and not broken into constituents.

Appendix D. Contents of the DB2 Products

This section lists the contents of various DB2 Universal Database products.

Packaging

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

Table 51 (Page 1 of 2). DB2 Components, Packages or Filesets			
	Fileset Name		
Description	**DB2 for AIX**	**DB2 for HP-UX**	**DB2 for Solaris / DB2 for SCO UnixWare 7**
DB2 Client	db2_05_00.client	DB2V5CAE.client	db2cliv50
Open Database Connectivity (ODBC)	db2_05_00.odbc	DB2V5CAE.odbc	db2odbc50
Java Support (JDBC)	db2_05_00.jdbc	DB2V5CAE.jdbc	db2jdbc50
DB2 Web Control Center	db2_05_00.wcc	DB2V5CAE.wcc	db2wcc50
Administration Server	db2_05_00.das	DB2V5WGRP.das	db2das50
DB2 Run-time Environment	db2_05_00.db2.rte	DB2V5WGRP.db2rte	db2rte50
DB2 Sample Database Source	db2_05_00.db2.samples	DB2V5WGRP.dbsmpl	db2smpl50
DB2 Engine	db2_05_00.db2.engn	DB2V5WGRP.db2engn	db2engn50
DB2 Replication	db2_05_00.repl	DB2V5WGRP.repl	db2repl50
DB2 Connect	db2_05_00.conn	DB2V5CONN.conn	db2conn50
DB2 Communication Support - TCP/IP	db2_05_00.cs.rte	DB2V5WGRP.csrte	db2crte50
DB2 Communication Support - SNA	db2_05_00.cs.sna	DB2V5WGRP.cssna	db2csna50
DB2 Communication Support - DRDA Application Server	db2_05_00.cs.drda	DB2V5WGRP.csdrda	db2cdrd50
DB2 Communication Support - IPX	db2_05_00.cs.ipx	DB2V5WGRP.csipx	db2cipx50
License Support of DB2 Enterprise Edition	db2_05_00.esrv	DB2V5ENTP.esrv	db2entp50
License Support of DB2 Connect Enterprise Edition	db2_05_00.cent	DB2V5CONN.cent	db2cent50
DB2 Application Development Tools (ADT)	db2_05_00.adt.rte	DB2V5SDK2.adtrte	db2adt50

Table 51 (Page 2 of 2). DB2 Components, Packages or Filesets

Description	Fileset Name		
	DB2 for AIX	**DB2 for HP-UX**	**DB2 for Solaris / DB2 for SCO UnixWare 7**
DB2 ADT Sample Programs	db2_05_00.adt.samples	DB2V5SDK.adtsamp	db2adts50
Code Page Conversion Tables - Uni Code Support	db2_05_00.cnvucs	DB2V5CAE.convucs	db2cucs50
Code Page Conversion Tables - Japanese	db2_05_00.conv.jp	DB2V5WGRP.convjp	db2cnvj50
Code Page Conversion Tables - Korean	db2_05_00.conv.kr	DB2V5WGRP.convkr	db2cnvk50
Code Page Conversion Tables - Simplified Chinese	db2_05_00.conv.sch	DB2V5WGRP.convsch	db2cnvc50
Code Page Conversion Tables - Traditional Chinese	db2_05_00.conv.tch	DB2V5WGRP.convtch	db2cnvt50
DB2 Product Messages - %L [1, 2]	db2_05_00.msg.%L[4]	DB2V5MSG.%L	db2ms%L50
DB2 Product Document (HTML) - %L [1]	db2_05_00.html.%L[4]	DB2V5HTML.%L	db2ht%L50

Notes:

1. %L in the fileset name represents the locale name. There is a separate fileset for each locale. For Solaris and HP-UX systems, abbreviated names are used for some of the locales.

2. English messages are always installed.

3. DB2 supports a number of locales. However, DB2 messages are not translated in every supported locale. For a complete list of DB2 supported locales, see the *"National Language Support (NLS)"* appendix in the *Administration Guide*.

4. While DB2 Product Messages and Documentation are translated in several locales, not every message catalog or book is translated in every locale.

Abbreviated names for locale names are given in the following table. %L represents the abbreviated locale name.

Table 52. Abbreviated Names for Locales			
DB2 for HP-UX		**DB2 for Solaris/ DB2 for SCO UnixWare 7**	
Locale	**%L**	**Locale**	**%L**
bg_BG.iso88595	bg_BG_I	-	-
da_DK.iso88591	da_DK_I	da	da
da_DK.roman8	da_DK_R	-	-
de_DE.iso88591	de_DE_I	de	de
de_DE.roman8	de_DE_R	-	-
en_US.iso88591	en_US_I	en_US	en
en_US.roman8	en_US_R	-	-
es_ES.iso88591	es_ES_I	es	es
es_ES.roman8	es_ES_R	-	-
fi_FI.iso88591	fi_FI_I	fi	fi
fi_FI.roman8	fi_FI_R	-	-
fr_FR.iso88591	fr_FR_I	fr	fr
fr_FR.roman8	fr_FR_R	-	-
ja_JP.eucJP	ja_JP	ja	ja
ko_KR.eucKR	ko_KR	ko	ko
no_NO.iso88591	no_NO_I	no	no
no_NO.roman8	no_NO_R	-	-
pt_BR.iso88591	pt_BR_I	pt	pt
pt_BR.roman8	pt_BR_R	-	-
sl_SI.iso88592	sl_SI_I	sl	sl
sv_SE.iso88591	sv_SE_I	sv	sv
sv_SE.roman8	sv_SE_R	-	-
zh_CN.eucCN	zh_CN	zh	zh
zh_TW.eucTW	zh_TW	tw	tw

Products and Selectable Components

Table 53 (Page 1 of 2). Components for DB2 Products				
Product / Component Description	**DB2 Client Application Enabler**	**DB2 Universal Database Workgroup Edition**	**DB2 Universal Database Enterprise Edition**	**DB2 Connect**
DB2 Client Application Enabler	√√	√√	√√	√√
Open Database Connectivity (ODBC) support	√	√	√	√
Java Support (JDBC)	√	√	√	√
DB2 Web Control Center support	√	√	√	√
Administration Server	n/a	√√	√√	√√
DB2 Run-time Environment	n/a	√√	√√	√√
DB2 Sample Database Source	n/a	√√	√√	n/a
DB2 Engine	n/a	√√	√√	n/a
DB2 Connect	n/a	√√	√√	√√
Communication Support for TCP/IP	n/a	√√	√√	√√
Communication Support for IPX/SPX	n/a	√√	√√	√√
Communication Support for SNA	n/a	√√	√√	√√
Communication Support for DRDA Application Server	n/a	√√	√√	√√
Code Page Conversion Tables - Japanese	n/a	√	√	√
Code Page Conversion Tables - Korean	n/a	√	√	√
Code Page Conversion Tables - Simplified Chinese	n/a	√	√	√
Code Page Conversion Tables - Traditional Chinese	n/a	√	√	√
Licensed Support for DB2 Universal Database Workgroup Edition	n/a	√√	n/a	n/a
License Support for DB2 Universal Database Enterprise Edition	n/a	n/a	√√	n/a
Licensed Support for DB2 Connect	n/a	n/a	n/a	√√
DB2 Replication	n/a	√	√	√
DB2 Product Messages (non-English)[1]	o	o	o	o
DB2 Product Library (HTML)[1]	o	o	o	o

Table 53 (Page 2 of 2). Components for DB2 Products				
Product / Component Description	**DB2 Client Application Enabler**	**DB2 Universal Database Workgroup Edition**	**DB2 Universal Database Enterprise Edition**	**DB2 Connect**
√√ This is a required component that must be installed.				
√ This is a recommended component that is installed by default. You can choose not to install this component.				
o This is an optional component that is not installed by default. If you want to install it, you must select it.				
n/a This component is not available for installation.				
Notes:				
1. There is a separate component of the DB2 Product Messages and the DB2 Product Library for each locale.				
2. The DB2 SDK is available only with the SDK Pack. Refer to "Developing Applications Using the DB2 Software Developer's Kit" on page 6.				

Table 54 lists the DB2 Connect products and selectable components that you can install.

Table 54 (Page 1 of 2). Products and Selectable Components for UNIX Systems	
Product / Component Description	**Status**
DB2 Client Application Enabler	√√
Open Database Connectivity (ODBC) support	√
Java Support (JDBC)	√
Administration Server	√
DB2 Run-time Environment	√√
DB2 Connect Support	√√
Communication Support for TCP/IP	√√
Communication Support for IPX/SPX	√
Communication Support for SNA	√
Communication Support for DRDA Application Server	√
Licensed Support for DB2 Connect	√√
DB2 Replication	o
DB2 Product Messages (non-English)[1]	o
DB2 Product Library (PostScript)[1]	o
DB2 Product Library (HTML)[1]	o

Table 54 (Page 2 of 2). Products and Selectable Components for UNIX Systems	
Product / Component Description	**Status**
√√ This is a required component that must be installed.	
√ This is a recommended component that is installed by default. You can select whether or not to install this component.	
o This is an optional component. If you want to install it, you must select it.	
Notes:	
1. There is a separate component of the DB2 Product Messages and the DB2 Product Library for each supported locale.	

Prerequisites

The DB2 filesets are listed below with their corresponding prerequisites.

Table 55. Prerequisites for DB2 Filesets	
Fileset Description	**Prerequisite Fileset**
DB2 Client Application Enabler	Appropriate version of the operating system
Open Database Connectivity (ODBC) support	DB2 Client Application Enabler
Java Support (JDBC)	DB2 Client Application Enabler
DB2 Web Control Center support	DB2 Client Application Enabler
Administration Server	DB2 Run-time Environment
DB2 Run-time Environment	DB2 Client Application Enabler
DB2 Sample Database Source	DB2 Engine
DB2 Engine	DB2 Run-time Environment
DB2 Replication	DB2 Run-time Environment
DB2 Connect	DB2 Run-time Environment
Communication Support for TCP/IP	DB2 Run-time Environment
Communication Support for IPX/SPX	DB2 Run-time Environment
Communication Support for SNA	Communication Support for TCP/IP
Communication Support for DRDA Application Server	Communication Support for SNA
Licensed Support for DB2 Universal Database: Enterprise Edition	DB2 Engine
Licensed Support for DB2 Connect Enterprise Edition	DB2 Connect
DB2 Application Development Tools (ADT)	DB2 Client Application Enabler
DB2 ADT Sample Programs	DB2 Application Development Tools
DB2 Product Messages	DB2 Client Application Enabler
DB2 Product Library (HTML)	DB2 Client Application Enabler

Appendix E. DB2 Connect SYSPLEX Support

SYSPLEX permits DB2 Connect to seamlessly transfer an incoming connection from one remote database server to a designated backup server in the event that the first server fails. DB2 Connect support for SYSPLEX is enabled by default. Note: *active* connections are **not** transferred between hosts in the event of server failure; if a server fails all existing connections to that server are lost

How DB2 Sysplex Exploitation Works

In a typical scenario, the DB2 Connect Enterprise Edition (EE) gateway machine A would be in conversation with a SYSPLEX containing two DB2 for OS/390 hosts, say machines B and C:

SYSPLEX machine B	SYSPLEX machine C
LOCATION_NAME_B	LOCATION_NAME_C
LU Address=NETB.LUB	LU Address=NETC.LUC

Suppose that in this scenario an application now issues:

```
db2 connect to aliasb user xxxxxxx using xxxxxxxx
```

The connection to database `LOCATION_NAME_B` is established, and because SYSPLEX exploitation is enabled both for the gateway and the DCS directory entry, DB2 for OS/390 identifies to DB2 Connect the network addresses for each SYSPLEX participant (NETB.LUB and NETC.LUC. DRDA4 protocols and message flows are used to return this information. Once an initial connection has been made, the returned list of addresses is cached at the DB2 Connect gateway. The list is either a list of SNA LU names (as in this example), or a list of IP addresses, but the list cannot contain a mixture of these address types, so that if the initial `CONNECT` is issued for an APPC node, only SNA addresses are returned, and if the initial `CONNECT` is issued for a TCP/IP node, then only IP addresses are returned.

Priority Information Used for Load Balancing and Fault Tolerance

The list of addresses provided by DB2 for OS/390 also includes priority information, including the number of connections for each network address, and the list is refreshed whenever a new connection is made by DB2 Connect. This additional information is used for load balancing purposes, as well as for fault tolerance.

How DB2 Connect Uses the Cached Address List

If subsequently, the database connection to ALIASB fails, then an error message SQL30081N is issued, and the connection will be dropped. If a further connection request is received for ALIASB, DB2 Connect does the following:

1. It tries the best choice from the cached list of addresses based on the priority information that was returned by DB2 for OS/390. Note that this strategy is always used by DB2 Connect, and it is by this means that load balancing is achieved.

2. If this connection attempt fails, then the other addresses in the list are tried, in descending order of priority, as returned by DB2 for OS/390. This is how DB2 Connect exploits the SYSPLEX information to achieve fault tolerance.

3. If all other attempts to connect fail, then DB2 Connect will retry the connection to ALIASB using the address contained in the cataloged node directory.

Configuration Requirements for SYSPLEX

1. On the DB2 Connect EE gateway, SYSPLEX exploitation is enabled by default (it can be turned off by setting the DB2SYSPLEX_SERVER profile variable to the value zero).

2. SYSPLEX exploitation will not be used for a given database unless the DCS directory entry for that database contains "SYSPLEX" (not case-sensitive) in the 6th positional parameter.

3. For APPC connections, these additional considerations apply:

   a. A Partner LU definition must exist for each LU that is a DB2 for OS/390 participant in the SYSPLEX.

   b. Matching CPIC symbolic destination name profiles must be defined for each participant, each having the same name as the related LU.

   Therefore, in this scenario, the SNA subsystem that the DB2 Connect gateway uses, must contain:

| a. A Partner LU profile for NETB.LUB, referenced from a CPIC symbolic
| destination profile called LUB

| b. A Partner LU profile for NETC.LUC, referenced from a CPIC symbolic
| destination profile called LUC.

| 4. For the scenario described below, only the primary DB2 for OS/390 database
| (`LOCATION_NAME_B`) need be defined in the catalog on the DB2 Connect gateway
| system, as follows:

```
db2 catalog  appc node nodeb remote lub security program
db2 catalog dcs database dbb as location_name_b parms ',,,,,sysplex'
db2 catalog database dbb as aliasb at node nodeb authentication dcs
```

| No DB2 directory entries need be defined in the catalog on the DB2 Connect
| gateway machine in order to reach the database LOCATION_NAME_C, since it is
| a secondary participant in the SYSPLEX . However, the symbolic destination name
| "luc" must reference the Partner LU definition for NETB.LUC since an APPC
| connection is being used.

Considerations for System/390 SYSPLEX Exploitation

| DB2 Connect Enterprise Edition gateways now provide load balancing and
| fault-tolerance when routing connections to multiple SYSPLEXes. When connected to
| DB2 for OS/390 running in a data sharing environment, DB Connect will spread the
| workload amongst the different DB2 subsytems comprising the data sharing group,
| based on the system load information provided by the Workload Manager (WLM). This
| support requires DB2 for OS/390 Version 5.1.

| Each SYSPLEX returns weighted priority information for each connection address, and
| this information is cached by DB2 Connect at the gateway, where it is used to balance
| connections by distributing them among the returned addresses, based on the returned
| priorities.

| DB2 Connect gateways also provide fault-tolerance by trying alternate addresses in the
| event of a connection failure. An error will only be returned to the application if all
| known connections have failed. Since for SNA addresses there is no equivalent to
| Domain Name Server (DNS) lookup, in order to ensure that a connection can be made
| the first time after a db2start, DB2 Connect writes the addresses returned for SNA to
| the file db2con.ini, and this file is read on db2start. This provides a means to recover if
| the catalogued node is down.

| In the event of failure to connect to a particular SNA address the following message is
| written to the db2diag.log:

```
DIA4805E A connection cannot be established to the DRDA application server
at SNA address "%1" due to unknown symbolic destination name "%2".
```

A new profile (or registry) variable DB2SYSPLEX_SERVER has been created to enable this feature. If DB2SYSPLEX_SERVER is not present or is set to a non-zero value, then SYSPLEX exploitation is enabled. If DB2SYSPLEX_SERVER is set to zero then SYSPLEX exploitation is disabled. Setting DB2SYSPLEX_SERVER to a value of zero disables the SYSPLEX exploitation for the gateway regardless of how the DCS database catalog entry has been specified.

Appendix F. Microsoft Transaction Server (MTS) Support

DB2 UDB can be fully integrated with Microsoft Transaction Server (MTS) Version 2.0, as long as DB2 has FixPak 3 installed and MTS has Microsoft hotfix 0772 installed. Applications running under MTS on Windows 32-bit operating systems can use MTS to coordinate two-phase commit with multiple DB2 UDB databases (DB2 Version 2 or DB2 UDB Version 5, FixPak 3), as well as with other MTS-compliant resource managers. You can also connect to the following remote DRDA Application Servers: DB2 for MVS Versions 3 and 4, DB2 for OS/390 Version 5 or greater, DB2 for AS/400 Version 3.1 or greater, and DB2 for VM and VSE Version 5 or greater.

Enabling MTS Support in DB2

You can enable DB2 to support Microsoft Transaction Server by setting the TP_MON_NAME database manager configuration parameter to "MTS". You do this on the machine where the DB2 CAE client runs with MTS.

Use the following CLP command to enable support:

```
db2 update dbm cfg using tp_mon_name MTS
```

A sample application will be provided to verify the installation. When this sample becomes available, it will be identified on the IBM website. Set your URL to "http://www.software.ibm.com/data/db2/library" and search for a DB2 Universal Database "Technote" with the keyword "MTS".

MTS Software Prerequisites

MTS support requires the DB2 CAE to be at the FixPak 3 level of corrective service, or higher, and MTS must be at Version 2.0 with Hotfix 0772.

The installation of the DB2 ODBC driver on Windows 32-bit operating systems will automatically add a new keyword into the registry:

```
HKEY_LOCAL_MACHINE\software\ODBC\odbcinit.ini\IBM DB2 ODBC Driver:
Keyword Value Name: CPTimeout
Data Type: REG_SZ
Value: 60
```

Installation and Configuration

Following is a summary of installation and configuration considerations for MTS. To use DB2's MTS support, the user must:

1. Install MTS on the same machine where the MTS application runs.

2. On the same machine, install the DB2 CAE client and set the database manager configuration parameter TP_MON_NAME to MTS.

3. In order to use a remote DRDA server with MTS:

   a. Either install DB2 Connect Enterprise Edition (EE) on the same machine as MTS, or install DB2 Connect EE on a separate AIX, OS/2, or Windows NT machine, or install DB2 Connect EE on a separate machine to act as a gateway to the DRDA server.

   b. Configure and enable the SPM on the DB2 Connect EE machine.

Please refer to Chapter 24, "Configuring the DB2 Syncpoint Manager" on page 225.

Note: Additional technical information may be provided on the IBM web site to assist you with installation and configuration of DB2 MTS support. Set your URL to "http://www.software.ibm.com/data/db2/library", and search for a DB2 Universal Database "Technote" with the keyword "MTS".

Verifying the Installation

1. Configure CS/NT, DB2 CAE, and DB2 Connect EE to access your DB2 database or DRDA server.

2. Verify the connection from the DB2 Connect machine to your DB2 database with DB2 CLP and issue a few queries.

3. Verify the connection from the DB2 CAE machine via the DB2 Connect gateway to your DB2 database and issue a few queries.

Using Two-Phase Commit with DB2

1. Configure the SNA Syncpoint Manager (SPM) support of DB2 Connect in the DB2 Connect machine. See Chapter 24, "Configuring the DB2 Syncpoint Manager" on page 225.

2. Configure the DB2 CAE client to support SPM (See the sections on "Summary of Steps for DB2 Clients Connecting to a Host" and "Summary of Steps for Remote DB2 Universal Database Servers Accessed from DRDA Hosts" in Chapter 22 of the Quick Beginnings manual for DB2 Connect EE.

3. Configure CS/NT to support the SPM.

4. Verify the two-phase commit support with a simple SQL program that is precompiled with the CONNECT 2 SYNPCOINT TWOPHASE option. See the PREP or BIND command for details. The program should simply connect to the DB2 database and perform a few SQL queries and updates.

Set up MTS and DB2 for OS/390 to support the MTS "Bank" sample application

1. Configure DB2 CAE to support the MTS "Bank" sample application See "Testing DB2 With The MTS "BANK" Sample Application" on page 552.

2. Do other MTS testing as you wish.

Note: Known problems:

- MTS and DB2 Connect EE currently cannot be run on the same NT machine because they both try to use the same shared memory address. You must install MTS and DB2 CAE on one machine, and DB2 Connect EE and the CS/NT on another. That is, DB2 Connect must be used as a gateway when running MTS applications.

Testing DB2 With The MTS "BANK" Sample Application

Follow these steps:

1. Change the file `\Program Files\Common Files\ODBC\Data Sources\MTSSamples.dsn` so that it looks like this:

   ```
   [ODBC]    DRIVER=IBM DB2 ODBC DRIVER    UID=your_user_id    PWD=your_password
   DSN=your_database_alias    Description=MTS Samples
   ```

   where:

   - `your_user_id` and `your_password` are the user-ID and password used to connect to the host.
   - `your_database_alias` is the database alias used to connect to the host.

2. Go to ODBC Admin in the Control Panel, click on System DSN tab and add the data source:

   a. Choose IBM ODBC Driver and click on Finish.

   b. When presented with the list of database alias, choose the one that was specified previously.

   c. When asked if you want to CONNECT, respond NO as there is an outstanding problem if you respond YES (ODBC Admin will hang and you must use Task Manager to kill runn32dl process or reboot).

   d. Click on OK.

3. Use DB2 CLP to connect to a DB2 database under the ID `your_user_id`, as above. A number of utilities will be bound automatically (for DB2 for OS/390, the bind files in `ddcsmvs.lst` will be bound automatically).

   Then create the sample table and data for the MTS sample application as follows:

   ```
   CREATE TABLE ACCOUNT (ACCOUNTNO INT, BALANCE INT)
   INSERT INTO ACCOUNT VALUES (1, 1)
   ```

4. On the client, make sure that the DBM Configuration Parameter `TP_MON_NAME` is set to the string MTS.

5. Run the bank application: Select the Account option and the Visual C++ or Visual Basic option and then click on Submit to execute. Other options may use server-specific SQL that will not work.

Appendix G. Naming Rules

Go to the section that describes the naming rules that you require information on:

- "General Naming Rules"
- "Database, Database Alias, and Catalog Node Names" on page 554
- "Object Names" on page 554
- "Usernames, Group Names, and Instance Names" on page 555
- "DB2SYSTEM Naming Rules" on page 556
- "Workstation Names (nname)" on page 556
- "Password Rules" on page 556

General Naming Rules

Unless otherwise specified, all names can include the following characters:

- A through Z

  Note: When used in most names, characters A through Z are converted from lowercase to uppercase.

- 0 through 9
- @
- #
- $
- _ (underscore)

Unless otherwise specified, all names must begin with one of the following characters:

- A through Z
- @
- #
- $

Do not use SQL reserved words to name tables, views, columns, indexes, or authorization IDs. A list of SQL reserved words is included in the *SQL Reference*.

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Database, Database Alias, and Catalog Node Names

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 553.

In addition, the name you specify can contain 1 to 8 characters.

Notes:

1. 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.
2. On Windows NT systems, ensure that no instance name is the same as a service name.

Object Names

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 553.

In addition, the name you specify:

- Can contain 1 to 18 characters

- Cannot be any of the SQL reserved words that are listed in the *SQL Reference*.

Note: 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.

Usernames, Group Names, and Instance Names

Usernames are the identifiers assigned to individual users. When naming users, groups, or instances, see "General Naming Rules" on page 553.

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:
  - On OS/2, use uppercase names.
  - On Windows 32-bit operating systems, use any case.
  - On UNIX, use lowercase names.

Workstation Names (nname)

A workstation name is used to specify the NetBIOS name for a database server or database 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 553.

In addition, the name you specify:

- Can contain 1 to 8 characters;
- Cannot include &, #, and @;
- Must unique within the network.

DB2SYSTEM Naming Rules

DB2SYSTEM names are used by DB2 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 553.

In addition, the name you specify:

- Must be unique within a network;
- Can contain a maximum of 21 characters.

Password Rules

When determining passwords on OS/2 and Windows 3.x, the password you specify can consist of a maximum of 8 characters. On all other operating systems, the word or name you specify can consist of a maximum of 18 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
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
xSz	Clients for SCO OpenServer
xGz	Clients for Silicon Graphics

List Files Associated with DRDA Servers

The following table lists which bind files are included in the `.lst` file associated with a particular DRDA host. The package associated with each bind file is also listed:

DRDA Server   **List File**

OS/390 and MVS ddcsmvs.lst

VSE   ddcsvse.lst

VM   ddcsvm.lst

OS/400   ddcs400.lst

Table 56 (Page 1 of 2). DRDA Bind Files and Packages					
Component	**Bind File Name**	**Package Name**	**MVS**	**VM/VSE**	**OS/400**
DB2 Call Level Interface					
Isolation level CS	db2clics.bnd	sqll1*xyz*	yes	yes	yes
Isolation level RR	db2clirr.bnd	sqll2*xyz*	yes	yes	yes
Isolation level UR	db2cliur.bnd	sqll3*xyz*	yes	no	yes
Isolation level RS	db2clirs.bnd	sqll4*xyz*	no	no	yes
Isolation level NC	db2clinc.bnd	sqll5*xyz*	no	no	yes
Using MVS table names	db2clims.bnd	sqll7*xyz*	yes	no	no
Using OS/400 table names (OS/400 3.1 or later)	db2clias.bnd	sqlla*xyz*	no	no	yes
Using VSE/VM table names	db2clivm.bnd	sqll8*xyz*	no	yes	no
Command Line Processor					
Isolation level CS	db2clpcs.bnd	sqlc2*xyz*	yes	yes	yes
Isolation level RR	db2clprr.bnd	sqlc3*xyz*	yes	yes	yes
Isolation level UR	db2clpur.bnd	sqlc4*xyz*	yes	yes	yes
Isolation level RS	db2clprs.bnd	sqlc5*xyz*	no	no	yes
Isolation level NC	db2clpnc.bnd	sqlc6*xyz*	no	no	yes
REXX					
Isolation level CS	db2arxcs.bnd	sqla1*xyz*	yes	yes	yes
Isolation level RR	db2arxrr.bnd	sqla2*xyz*	yes	yes	yes
Isolation level UR	db2arxur.bnd	sqla3*xyz*	yes	yes	yes
Isolation level RS	db2arxrs.bnd	sqla4*xyz*	yes	yes	yes

Table 56 (Page 2 of 2). DRDA Bind Files and Packages					
Component	**Bind File Name**	**Package Name**	**MVS**	**VM/VSE**	**OS/400**
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

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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DATABASE 2	SP
DatagLANce	SQL/DS
DataHub	SQL/400
DataJoiner	S/370
DataPropagator	System/370
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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/

then performing a search using the keyword "handbook."

Note that in some countries, IBM-authorized dealers should contact their dealer support structure instead of the IBM Support Center.

World Wide Web

http://www.software.ibm.com/data/
http://www.software.ibm.com/data/db2/library/

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

All DB2 products are supported through these forums.

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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