

**IBM DB2 Universal Database  
for UNIX\*\*  
Quick Beginnings  
Version 5**

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IBM DB2 Universal Database  
for UNIX\*\*



# Quick Beginnings

*Version 5*



IBM DB2 Universal Database  
for UNIX\*\*



# Quick Beginnings

*Version 5*

Before using this information and the product it supports, be sure to read the general information under Appendix E, "Notices" on page 291.

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# *Welcome to DB2 Universal Database*

This book describes how to install and use the basic functions of DB2 Universal Database in a simple environment.

**Part 1** gives an overview of DB2 Universal Database.

**Part 2** provides planning, installing, and basic configuration information for the DB2 Universal Database.

**Part 3** describes how to install the DB2 Client Application Enabler or the DB2 Software Developer's Kit on any supported operating system.

**Part 4** provides information on configuring communications between DB2 Universal Database and its clients.

**Part 5** describes how to use DB2 Universal Database.

**Part 6** describes how to perform advanced installation and configuration tasks, such as installing DB2 products on UNIX operating systems using SMIT, swinstall, or db2\_install, and performing administration tasks using the Client Configuration Assistant, or using the command line processor for setting up communications.

**Part 7** contains reference information and describes viewing, printing, and ordering the manuals that are provided in online format.



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# 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.
- Monospace type indicates examples of text you enter exactly as shown.
- *Italics* indicates variables that you should replace with a value. It is used also to indicate book titles, and to emphasize words.



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 – additional information that can help you complete a task.

---

# Road Map



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

If you want to...	Refer to...
Understand the relationship between DB2 and related products,	Chapter 2, "About DB2 Universal Database" on page 9.
Plan your network configuration,	Chapter 4, "Planning for Installation" on page 29.
Confirm that your system meets the DB2 hardware and software prerequisites,	"Disk Requirements" on page 32 and "Software Requirements" on page 35.
Migrate from a previous release of DB2,	Chapter 6, "Migrating from Previous Versions" on page 63.
Install the DB2 Universal Database product from a CD-ROM,	"Preparing to Install the DB2 Products" on page 45.
Install the client products,	Chapter 7, "Installing DB2 Clients" on page 77.
Use the DB2 components,	Chapter 15, "Getting Started with the DB2 Universal Database" on page 133.



If you want to...	Refer to...
Set up communications on the client to access databases,	Chapter 13, "Configuring Client to DB2 Server Communications Using the CCA" on page 109 or Chapter 14, "Configuring Client-to-Server Communications Using the Command Line Processor" on page 113.
Connect to a database,	"Connecting to a Database" on page 135.
Create the sample database,	"Creating the Sample Database" on page 134.
Print or view online documentation,	"Printing the PostScript Books" on page 277 or "Viewing Online Books" on page 278.
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 157.
Control access to database objects,	"Changing Default Privileges for Users" on page 136.
Use the DB2 Command Center or the DB2 command line processor to enter SQL statements or DB2 commands interactively,	Chapter 19, "Entering DB2 Commands and SQL Statements" on page 173.
Learn about last-minute changes to the product,	The Installation Notes on the CD-ROM or the Release Notes that are installed with the products.

To locate information on other topics, see Appendix A, "Obtaining Information" on page 269 for a complete description of the DB2 library.



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# ***Part 1. Introduction to DB2 Universal Database***



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# Chapter 1. Introducing IBM Software Servers



Go directly to Chapter 2, "About DB2 Universal Database" on page 9 if you want to start reading about the DB2 product immediately.

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When you choose the newest version of *DB2 Universal Database* you'll be putting your business on the fast path toward client/server and network computing.

One of the best network enhancements you can make, this exciting new server and client software is part of a family of IBM\*, Lotus\*\*, and Tivoli\*\* products. They comprise middleware plus administration and end-user tools. These software products run in hardware servers and are designed to support state-of-the-art applications, so we refer to them as **application servers**.

IBM Software Servers are packaged to help you to quickly install and make use of a family of multifunctional, compatible application servers — designed to work in harmony. With modular IBM Software Servers, you can build a high-function, reliable environment for decision support, messaging and groupware, transaction processing, and other client/server functions vital to today's business. And with new Web functions, you can exploit new technologies and move into the world of network computing.

The family of products provides:

- New Web functions and improved integration, now available in Version 5.0
- Popular software chosen by application providers to run their applications
- Greatest depth and breadth of application servers — providing unequaled depth in each server, as well as the widest breadth of application servers — making it easy to grow from the smallest departmental servers to the largest systems of a modern enterprise.
- Open solutions available on multiple platforms — popular clients (such as Windows, Windows 95, Windows NT \*\*, Macintosh\*\*, OS/2\*, UNIX\*\*, and popular browsers used on the Internet or in intranets) and servers (such as OS/2, Windows NT, and AIX\*) — and in conformance with all key industry-standard interfaces
- Support for existing investments, since IBM Software Servers work with your existing systems, are thoroughly tested, and work together
- Growth paths for future needs, allowing you to add new servers when needed, move applications to more powerful platforms as demand grows, and extend your existing systems with new technologies in the move to collaborative and network computing

- Ease of installation and simple administration, with common packaging and documentation

The IBM Software Servers family includes several servers, designed to meet your needs.

---

## ***IBM Communications Server***

IBM Communications Server will meet your requirements for interconnecting diverse networks and prove to be a winner for your business. With Communications Server, workstation users and applications can communicate with other workstations and central computer applications. Communications Server has full-function gateways to connect clients to hosts, plus support of a broad range of industry-standard networking protocols. Communications Server will help you to get users communicating with each other in networks of all sizes, from small workgroups to large corporate headquarters.

Communications Server provides businesses with a variety of opportunities to:

- Expand the use of applications, while protecting current network investments
- Reduce operation and management costs by connecting networks without impacting existing applications
- Increase productivity and convenience by giving employees access to applications while at work, home, or when traveling
- Reduce costs of central computer and peer-to-peer connectivity by sharing communication resources
- Gain efficiency in response times by assigning priority to short, interactive data transmissions rather than to batch-oriented bulk data traffic.

---

## ***IBM Directory and Security Server***

With IBM Directory and Security Server, you can simplify the effort involved in having increased control over complex networks, multivendor systems, and multiple platforms, while maintaining security within your network. With Directory and Security Server, you can generate and manage secure, distributed applications that are interoperable and portable. Directory services make it easy to combine multiple directories, even across WANs, into a simple, single view. Plus, it can be done without deleting users and resources with the same names. You get a single integrated view of all available

resources, including printers, files, and applications — no matter where they are located.

Directory and Security Server gives systems administrators a single logical view of all LAN and WAN resources — regardless of installed platforms and vendors. And users get convenient single sign-on, providing transparent access to any authorized enterprise resource, which can include the IBM Software Servers.

The security services are based on the Kerberos security model, which uses a third-party authentication server. This server authenticates both the client and server, making impersonation virtually impossible. Another security measure allows only authentication tickets to flow over the network, to protect passwords. Data encryption standard (DES) and commercial data masking facility (CDMF) data encryption technologies are also available for total data privacy.

---

## ***IBM Transaction Series***

IBM Transaction Series lets you make flexible and strategic use of new technology, while continuing to meet your business needs using established technology. Transaction Series coordinates and integrates the functions of multiple application servers, locally or throughout your enterprise. This helps you to produce and manage very high-performance applications. It also enables organizations to get and use the operational data needed on customer transactions and stay a jump ahead of the competition.

Transaction Series provides the ideal environment for applications to run anywhere, any time, no matter where they reside in the network. No matter how demanding your applications and requirements are, Transaction Series gives you the safety, security, and integrity you need for your business.

Transaction Series offers two flexible programming styles. The CICS\* API is available for those who want to leverage existing CICS applications. Encina supports those who want to exploit an open-standards-based API.

---

## ***IBM MQSeries***

In an open-systems environment, communications coding is complex and difficult to manage. IBM MQSeries simplifies things, giving you time to develop the solutions that deliver your business mission. IBM MQSeries messaging software enables business applications to exchange information across different operating system platforms in a way that is straightforward and easy for programmers to implement.

IBM's MQSeries simplifies the task of connecting your applications across unlike environments. Programs communicate using the IBM MQSeries API, an easy-to-use, high-level program interface that shields your programmers from the complexities of different operating systems and underlying networks. You focus on the business logic, while IBM MQSeries manages your connections to the computer systems.

IBM MQSeries also provides an immensely flexible infrastructure, on which you can build mobile communications, multimedia applications, transaction-based systems, and a whole new generation of network applications.

---

## ***Tivoli Management Servers***

Controlling distributed computing resources can be difficult, expensive, and time consuming. Companies need to be business-driven, not technology-driven.

With Tivoli Management Servers, you can take control of your distributed computing environment and concentrate on what's important — the business that makes you money. These servers bring state-of-the-art systems management to your desktop.

Tivoli Management Servers provide total, open, flexible systems management. Some functions include:

- Host connectivity
- Help desk utilities
- Asset management
- Virus protection
- Software distribution
- License metering
- System monitoring
- User administration
- Performance management
- Job scheduling



These are just a few! With Tivoli Management Servers you get the best of IBM SystemView technology and Tivoli's TME10\*\* technology.

---

## ***IBM Internet Connection Server***

If you've browsed the Internet, you know what a valuable resource it can be. If you want to market your products and services around the world, IBM has the server software to get you started — IBM Internet Connection Server.

With Internet Connection Server, you can host and manage Hypertext Markup Language (HTML) pages and other online documents, and create your own corporate Web site. From the corporate home page, your company can:

- Distribute up-to-date information to the world using text, high-quality graphics, audio, and video.
- Create information that customers and suppliers can access through electronic forms or e-mail.
- Publish product descriptions and price lists with electronic order forms, so customers can purchase your products and services with a credit card — right from their own computers.
- Track how customers, suppliers, and personnel use your published information, so you can tell when you are reaching your target audience.
- Gain a competitive edge by creating a worldwide presence for your company.

---

## ***IBM DB2 Universal Database***

IBM DB2\* Universal Database gives you the foundation for reliable data management, offering complete integrity, high availability, and fast performance. DB2 Universal Database makes it easy to create multimedia applications to present your data through video, audio, and image techniques. Local and remote users can store, retrieve, manipulate, manage, and share data — easily and reliably, using the latest and highly tested technology in the relational database industry.

With the IBM DB2 family of products, you can access data on multiple platforms. Access to IBM and non-IBM relational and nonrelational data is available through optional components of the DB2 family.

---

# *Lotus Domino*

Lotus Domino transforms Lotus Notes into an interactive Web application server, allowing any Web client to participate in Notes applications securely. Domino bridges the open networking environment of Internet standards and protocols with the powerful application development facilities of Notes. You get a solution that combines messaging, groupware, and the Internet — all built in.

With Domino, you can rapidly develop a broad range of business applications for the Internet and intranet. Plus, you get support for many popular operating systems for both clients and servers, as well as Web browsers. Domino can be your central access point for finding and sharing the information you need — whether it's centrally located in an e-mail message, a relational database, a host-based system, in your favorite desktop application, or on the World Wide Web. How? You can combine with Lotus Domino any of the other Software Servers, plus other vendors' application servers and applications.

---

## Chapter 2. About DB2 Universal Database

DB2 is a *relational* database management system that is web-enabled with Java support; scalable from single processors to symmetric multi-processors; and multimedia capable with image, audio, video, and text support. The DB2 products and components provided on your CD-ROM include: *DB2 Enterprise Edition*, *DB2 Workgroup Edition*, *DB2 Connect Enterprise Edition*, and *DB2 Client Application Enabler*. Features of each are listed below.

### DB2 Workgroup Edition

- The *DB2 Universal Database server* enables local and remote clients and applications to create, update, control, and manage relational databases using Structured Query Language (SQL), ODBC, or CLI.
- The *DB2 Client Pack* CD-ROM contains all the latest DB2 Client Application Enablers. With DB2 Client Application Enabler, clients from a variety of platforms can connect to any DB2 Universal Database, DB2 Connect and DataJoiner multi-user products.
- The *DB2 Net.Data* CD-ROM contains all supported DB2 Net.Data (formerly known as DB2 World Wide Web Connection) products. DB2 Net.Data enables application developers to create Internet applications that access data from DB2 databases.
- DB2 Workgroup Edition is licensed on a per user basis.

### DB2 Enterprise Edition

The DB2 Enterprise Edition includes all the functions provided in the DB2 Workgroup Edition, plus support for host connectivity providing users with access to DB2 databases residing on host systems such as MVS/ESA, OS/390, AS/400, VM, and VSE.

The DB2 Enterprise Edition supports unlimited LAN database access.

### DB2 Connect Enterprise Edition

The *DB2 Connect Enterprise Edition* (formerly known as DDCS Multi-User Gateway) to provide access from clients on the network to DB2 databases residing on host systems such as MVS/ESA, OS/390, AS/400, VM, and VSE. DB2 Connect Enterprise Edition is available for the AIX, HP-UX, OS/2, Solaris, and Windows NT platforms.

### DB2 Client Application Enabler

The *DB2 Client Application Enabler* enables a client workstation to access the DB2 server.

There are a variety of other DB2 products, which you can order separately:

- *DB2 Application Developer's Kit (AD 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 platforms. The AD Kit gives you

all the tools you need to create multimedia database applications that can run on a variety of platforms and can connect to any DB2 server, including DataJoiner.

- *DB2 Universal Database Personal Edition* allows you to create and use local databases and to access remote databases if they are available. This product is available for the OS/2, Windows NT, and Windows 95 operating systems.
- *DB2 Connect Personal Edition* (formerly known as DDCS Single-User) 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 Universal Databases. This product is available for the OS/2, Windows 3.1x, Windows NT, and Windows 95 operating systems.
- *DB2 Universal Database Extended Enterprise Edition* (formerly known as DB2 Parallel Edition) provides the ability for a database to be partitioned across multiple independent computers of a common platform. To the end-user and application developer, it still appears as a single database on a single computer. This fully scalable database system enables an application to use a database that is simply too large for a single computer to handle efficiently. SQL operations and utilities can operate in parallel on the individual database partitions, thereby speeding up the execution time of a single query or utility.

**Note:** DB2 Workgroup Edition, DB2 Enterprise Edition, DB2 Personal Edition, and DB2 Extended Enterprise Edition are commonly referred to as DB2 server throughout this book.

---

## ***Working with Data Using DB2 Universal Database***

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

DB2 Universal Database includes tools that enable you to tune performance, access remote DB2 servers, manage all servers from a single site, develop powerful applications, and process SQL queries. These tools are described in “Administering Databases with DB2 Tools” on page 13.

## ***Accessing DB2 Data from Remote Clients***

The DB2 Universal Database can run applications locally and can be accessed by applications running on remote clients that have the DB2 Client Application Enabler installed. The DB2 Client Application Enabler provides a run-time environment that enables client applications to access one or more remote databases. Software on the

DB2 Client Pack CD-ROM provides support for clients on the following operating systems:

- OS/2
- Windows NT, Windows 95, Windows 3.x
- UNIX (AIX, HP-UX, Solaris, SINIX, Silicon Graphics IRIX, SCO OpenServer)
- Macintosh

The Client Application Enabler for DOS V1.2 is available only from the Web. See Chapter 7, "Installing DB2 Clients" on page 77 for information on how to download the DOS client.

Figure 1 shows a DB2 Universal Database with local applications and applications running on remote clients. Either DB2 Workgroup Edition or DB2 Enterprise Edition is installed on the server. This is the system that contains your databases. Any applications running on this system are known as local applications. The client systems need one of the DB2 Client Application Enabler products installed, which allows applications to access the data on the remote server system.

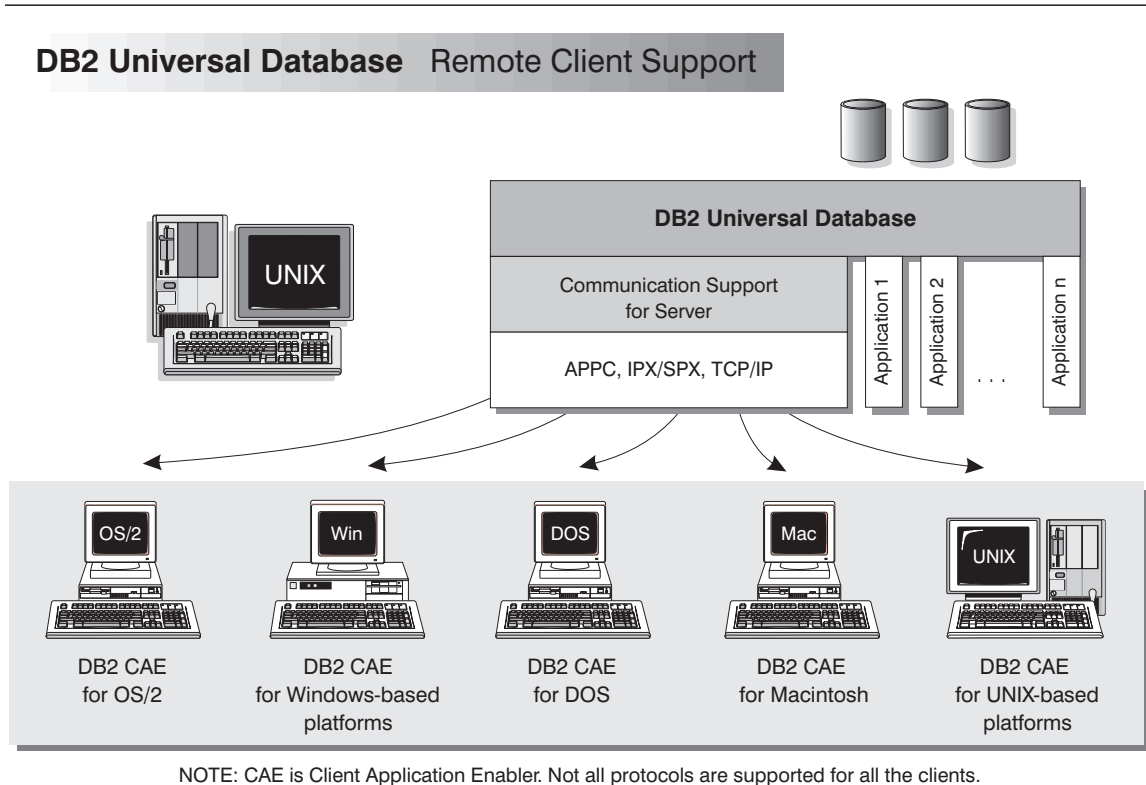


Figure 1. DB2 with Local Applications and Remote Clients

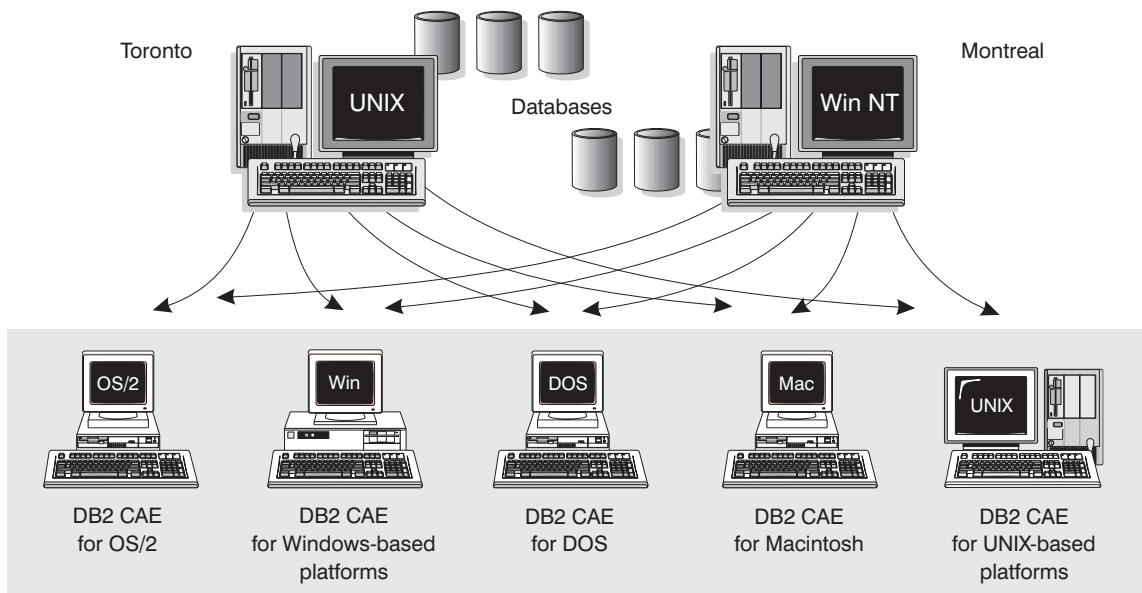
In addition to accepting requests from the clients listed above, DB2 Universal Database has the DRDA Application Server feature built in. It accepts requests from MVS, OS/400, VM, and other DRDA clients. (The DRDA Application Server feature is not supported on the HP-UX platform.) Refer to the *Administration Guide* for more information.

## Accessing Multiple DB2 Servers

Once a network is operational and protocols are functional on the workstations, LAN-to-LAN connections between DB2 servers and clients require no additional software.

For example, you can have a DB2 server on a Windows NT workstation that is connected to a LAN located in Montreal, and another DB2 server on a UNIX system connected to a LAN located in Toronto. As long as there is a connection between the two LANs, clients on either network can access either server. See Figure 2.

### Communicating between DB2 Universal Database Servers



NOTE: CAE is Client Application Enabler.

Figure 2. Accessing Data on Multiple Servers

Within a single transaction, databases on both servers are accessed and updated, and the integrity of the data on both servers is maintained. This is commonly known as two-phase commit, or distributed-unit-of-work access. Refer to the *Administration Guide* for more information.

---

## ***Administering Databases with DB2 Tools***

You can administer local databases on UNIX servers using the command line processor. You can also perform database administration tasks remotely from an OS/2, Windows NT, or Windows 95 client by using DB2 GUI tools. Use the *Control Center* to graphically perform server administrative tasks such as configuring, backing up and recovering data, managing directories, scheduling jobs, and managing media. Use the *Command Center* to access and manipulate databases from a graphical interface.

## ***Managing Databases Using the Control Center***

The Control Center displays database objects (such as databases, tables, and packages) and their relationships to each other. Using the Control Center, you can manage a local database server or multiple remote database servers and the database objects within them, all from a single point of control. See Figure 3 on page 14 for an example of the main Control Center window. You can install the Control Center on an OS/2, Windows NT, or Windows 95 client to remotely manage your UNIX server.

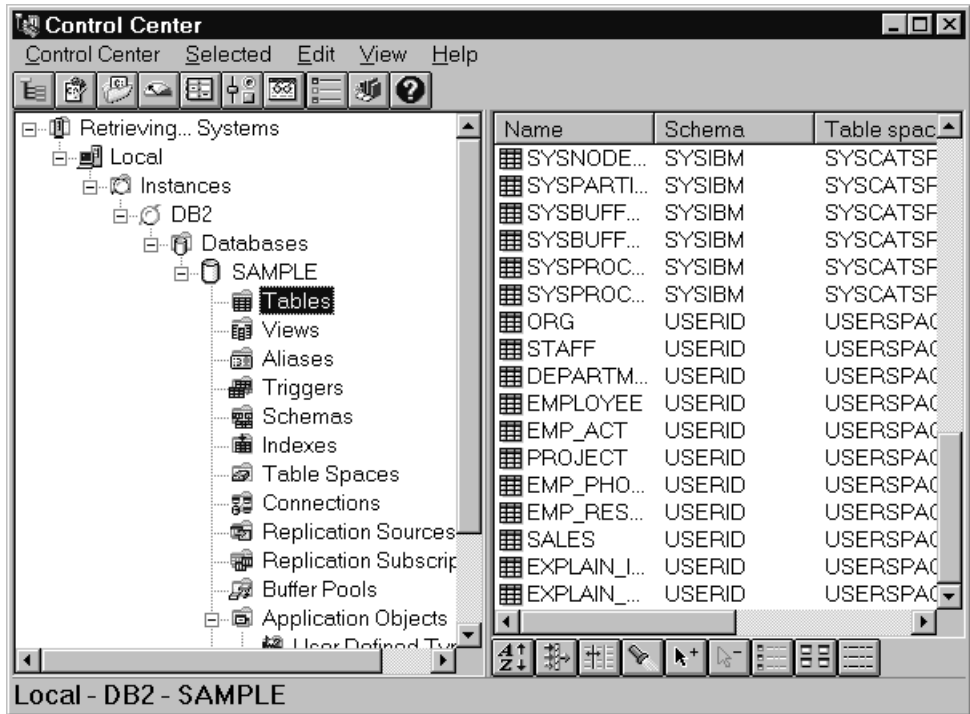


Figure 3. Control Center Main Window

From the Control Center you can perform the following tasks on database objects:

- Create and drop a database
- Create, alter, and drop a table space or table
- Create, alter, and drop an index
- Backup and recover a database or table space
- Define the replication sources and subscriptions to replicate data between systems

You can also manage database manager environments (known as DB2 instances).

You can:

- Maintain the communications protocols
- Set database manager configuration values that affect performance

SmartGuides are provided to help you perform complex tasks. For example, a SmartGuide is available to tune the performance of your system. See “SmartGuides” on page 269 for descriptions of the various SmartGuides and how to invoke them.



The Control Center provides additional facilities to assist you in managing your DB2 servers:



Use the **Command Center** to enter DB2 commands and SQL statements in an interactive window and see the execution result in a result window. You can scroll through the results and save the output to a file.



Use the **Script Center** to create mini applications called scripts, which can be stored and invoked at a later time. These scripts can contain DB2 commands, SQL statements, as well as operating system commands. Scripts can be scheduled to run unattended. These jobs can be run once or set up to run on a repeating schedule; a repeating schedule is particularly useful for tasks like backups.



Use the **Journal** to view all available information about jobs that are pending execution, executing, or that have completed execution; the recovery history log; the alerts log; and the messages log. The Journal also allows you to review the results of jobs that are run unattended.



Use the **Alert Center** to monitor your system for early warnings of potential problems or to automate actions to correct problems discovered.



Use the **Tools Setting** to change the settings for the Control Center, Alert Center, and Replication.

You can run these facilities from the Control Center toolbar or from icons in the Administration Tools folder.

You can install the following options for the Control Center:

<b>DB2 Performance Monitor</b>	Use the <b>DB2 Performance Monitor</b> to monitor the performance of your DB2 system. You can monitor activity using snapshots of data over a period of time or using data for a particular event. See "Monitoring Databases Using DB2 Performance Monitor" on page 16 for more information.
<b>Visual Explain</b>	Use <b>Visual Explain</b> to graphically analyze and tune SQL statements and to analyze query access plans. See "Viewing SQL Access Plans Using Visual Explain" on page 16 for more information.

You can find additional information in the *Administration Getting Started* Guide or in the Control Center's online help.

## ***Understanding the Administration Server***

The Administration Server is used as a service by the DB2 Administration Tools to satisfy requests. It is implemented as a DB2 instance, and has interfaces to start, stop, catalog, and configure it. The Administration Server resides on every DB2 server that you want to administer and detect. The Administration Server is required in order to use any of the administration tools described above.

# Monitoring Databases Using DB2 Performance Monitor

With the DB2 Performance Monitor, you can:

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

You can choose to monitor snapshots or events. The Snapshot Monitor allows you to capture point-in-time information at specified intervals. The Event Monitor allows you to record information over the duration of an event such as a connection.

You can find additional information in the *Administration Getting Started* Guide or in the online help for DB2 Performance Monitor.

## Viewing SQL Access Plans Using Visual Explain

Visual Explain helps database administrators and application developers to:

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

You can find additional information in the *Administration Getting Started* or in the online help for Visual Explain.

## Managing Communications on the Server

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

- Configure database manager communications parameters.

- Generate database information in a profile that can be used to configure clients.

You can find additional information in the online help for the Control Center.

---

## ***Managing Connections to Databases Using the Client Configuration Assistant***

The Client Configuration Assistant helps you manage your database connections to remote database servers. The Client Configuration Assistant is available on OS/2, Windows 95, and Windows NT systems. Use the command line processor to set up DB2 clients on UNIX platforms. With the Client Configuration Assistant, you can:

- Define connections to databases (catalogs) so that the databases can be used by applications. Three methods are available:
  - Search the network for available databases and select 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.
  - Manually configure a connection to a database by entering a few required connection parameters.
- Remove cataloged databases, or modify the properties of a cataloged database.
- Test connections to local or remote databases identified on your system to ensure that you can make a connection to the server that you need.
- 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 hints are provided on the interface as parameters are selected.
- Set up a connection to a DRDA server if DB2 Connect is installed.

---

## ***Developing Applications Using the DB2 Software Developer's Kit***

The DB2 Software Developer's Kit (DB2 SDK) 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 DB2 SDK on the server with the DB2 Universal Database, or on a remote workstation. If you install it on the server, the DB2 SDK can access both remote

and local databases. If you install it on a client, the DB2 SDK can access only remote databases.

There is a platform-specific version of the DB2 SDK available for each of the supported operating systems. The *DB2 Application Developer's Kit (DB2 AD Kit)* product provides the DB2 Software Developer's Kits for all supported platforms, the DB2 Extender development toolset, and VisualAge for Basic. Applications developed with the DB2 SDK will run on any platform where the equivalent DB2 Client Application Enabler component is installed. Through the DB2 Client Application Enabler, these applications can access all DB2 servers and, by using DB2 Connect, they can also access other database servers that support DRDA.

The DB2 SDK allows you to develop applications that use the following interfaces:

- Embedded SQL.
- Call level interface (CLI) development environment (which is compatible with ODBC from Microsoft).
- Java Database Connectivity (JDBC).
- Application programming interfaces to access database utilities.

DB2 SDK supports several programming languages (including 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 SDK, and for a list of the supported compilers.

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## ***Accessing Host Data from the Desktop Using DB2 Connect Enterprise Edition***

*DB2 Connect Enterprise Edition* gives clients on your LAN access to data that is stored on host systems. It provides applications with transparent access to host data through a standard architecture for managing distributed data. This standard is known as Distributed Relational Database Architecture (DRDA). DRDA allows your applications to establish a fast connection to databases on MVS, OS/390, OS/400, VM, and VSE hosts.

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

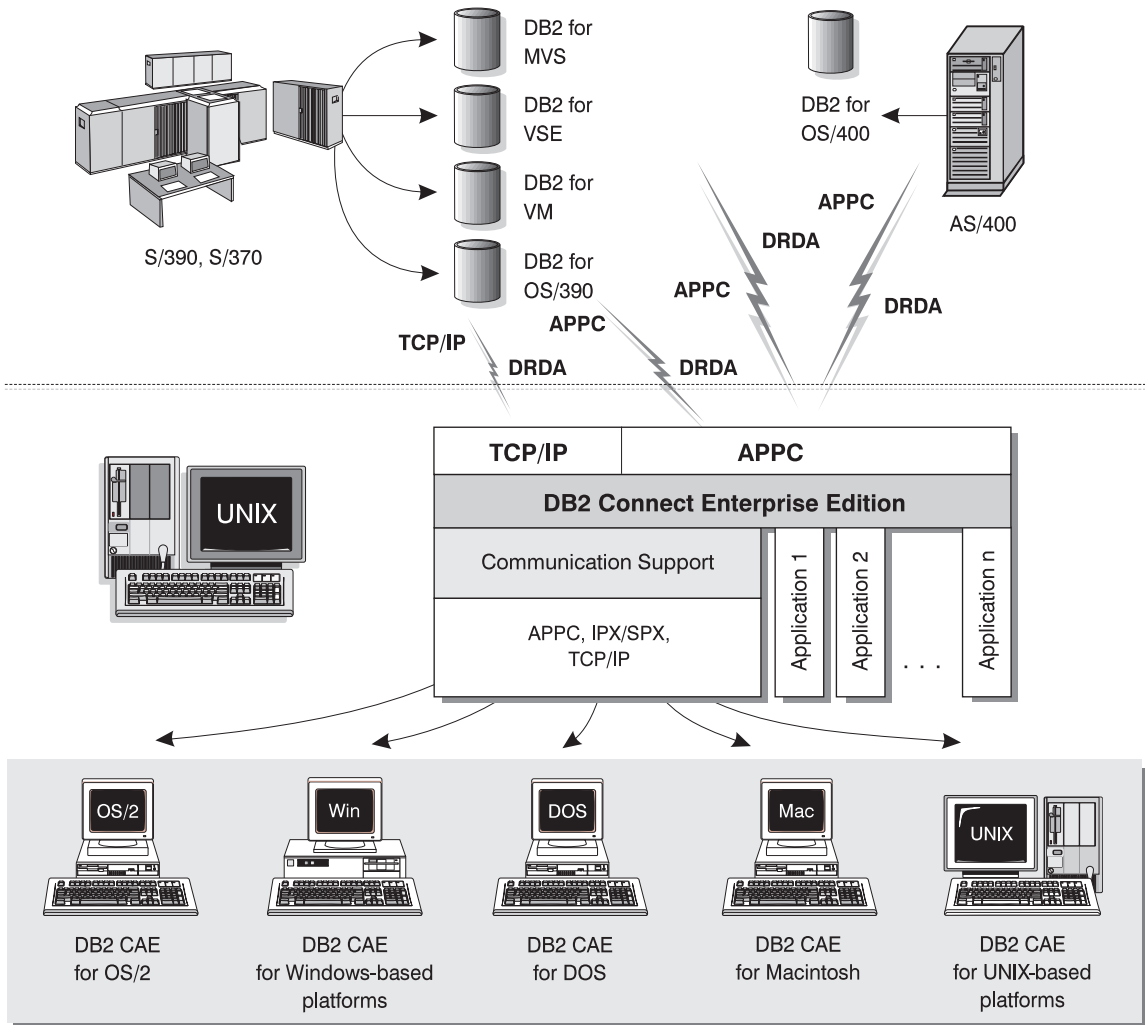
The following tools and products can access host data easily using DB2 Connect:

- *Spreadsheets*, such as Lotus 1-2-3 and Microsoft Excel, to analyze real-time data without the cost and complexity of data extract procedures and import procedures.

- *Decision support tools*, such as Business Objects, Intersolv Q+E Database Editor, and Crystal Reports, to provide real-time information.
- *Personal database products*, such as Lotus Approach and Microsoft Access.
- *Development tools*, such as IBM VisualAge, PowerBuilder, Microsoft VisualBasic, and Borland Delphi to create client/server solutions.

DB2 Connect Enterprise Edition enables multiple clients to connect to host data and can significantly reduce the effort that is required to establish and maintain access to enterprise data. See Figure 4 on page 20 for an example of clients connecting to host databases through the DB2 Connect Enterprise Edition.

## DB2 Connect Enterprise Edition



NOTE: CAE is Client Application Enabler. Not all protocols are supported for all the clients.

Figure 4. DB2 Connect Enterprise Edition

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## Accessing DB2 Data from the Web

The popularity of the Internet and the World Wide Web has created a demand for Web access to enterprise data. Java Database Connectivity (JDBC) and Net.Data are provided with DB2 to allow you to create applications that access data in DB2 databases.

Use *Java Database Connectivity* to create applications or applets that access data in DB2 databases. JDBC applets can be run inside HTML web pages on any system with a Java-enabled browser, regardless of the platform of your client. No additional software is required on your client system beyond this browser. The processing of JDBC applets is shared between the client and the server.

The JDBC server and the DB2 Client Application Enabler must reside on the same machine as the Web server. The JDBC server calls into the DB2 Client Application Enabler to connect to local or remote databases, or into MVS/ESA to connect to host databases. When a connection to a DB2 database is requested by the applet, the JDBC client opens a TCP/IP socket to the JDBC server on the machine where the Web server is running. See Figure 5 for an example of Java-enabled browsers accessing data from DB2 databases remotely.

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### Accessing DB2 Data Using JDBC

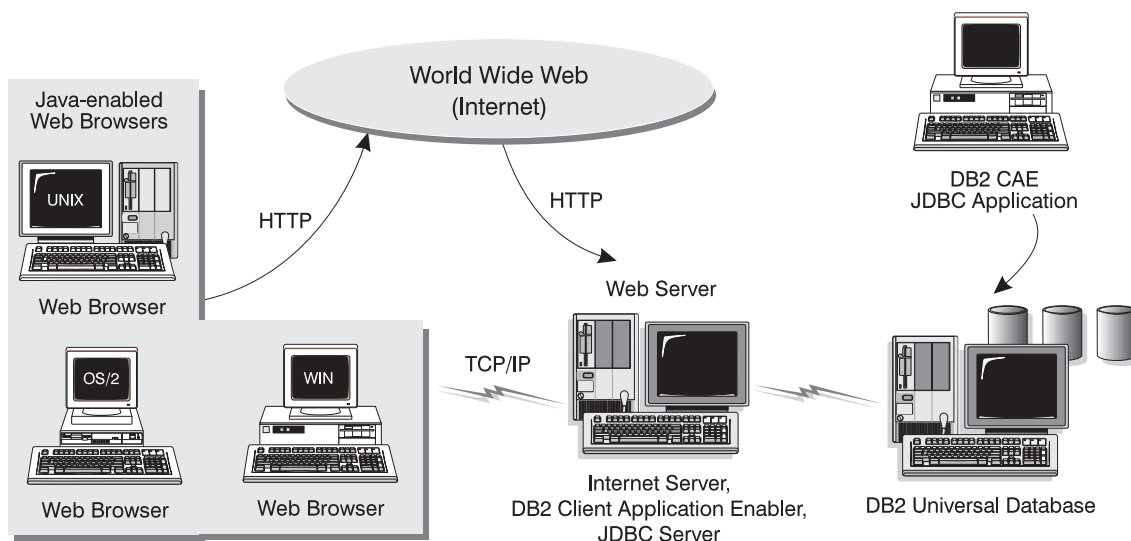


Figure 5. Accessing Internet Data Stored on DB2 Using JDBC

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

For more information on Java enablement, see the IBM Software Page under the Data Management link (<http://www.software.ibm.com/data/db2/java>). For more information on the JDBC API, see <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 (hypertext markup language) document and, when selected, they trigger existing SQL queries and return the results from the DB2 database. These links can be triggered repeatedly to access current DB2 data. Customized queries require user input. Users define the search criteria on the Web page by selecting options from a list or by typing 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.

*Net.Data* can be installed with the server, DB2 Universal Database, to allow local access to databases. *Net.Data* can be installed with DB2 Client Application Enabler software to allow remote access to databases. In both cases, *Net.Data* and a Web Server must be installed on the same system. See Figure 6 on page 23 for an example of *Net.Data* accessing data from DB2 databases remotely.



## Accessing DB2 Data Using DB2 Net.Data

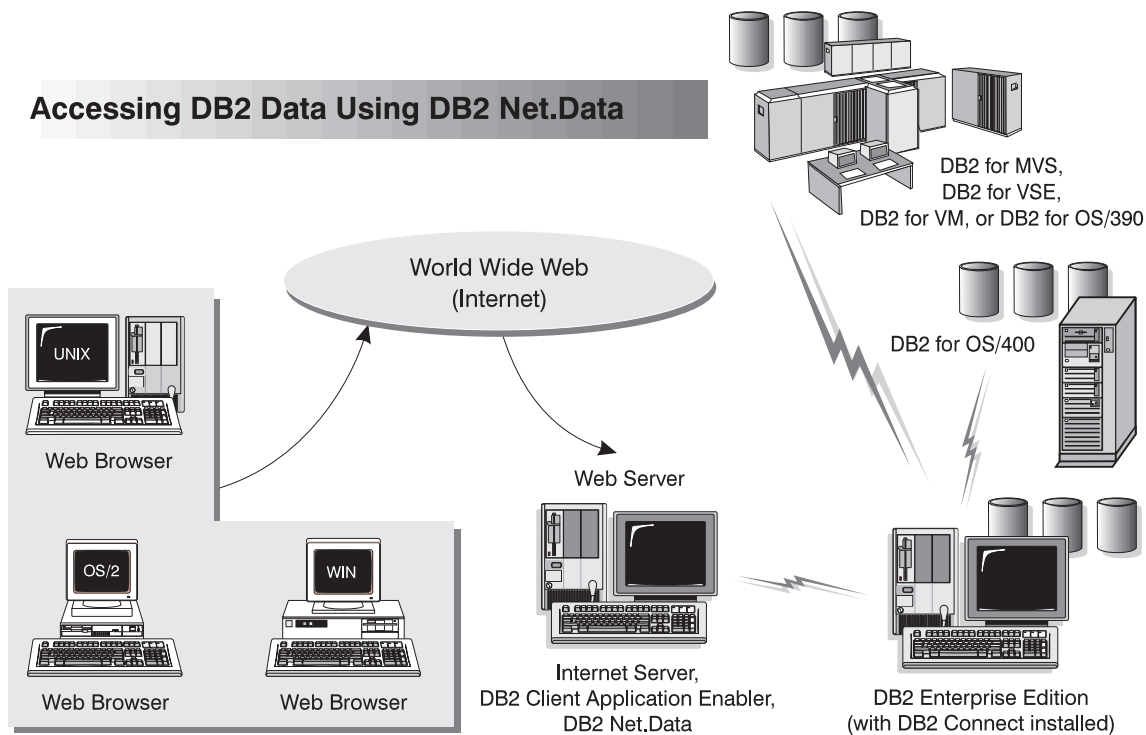


Figure 6. Accessing Internet Data Stored on DB2 Using Net.Data



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## Chapter 3. What's New in DB2 Version 5?

Version 5 of DB2 Universal Database is the follow-on product to DB2 Version 2 and Database Server Version 4, and offers many new features and enhancements. This section describes some of the major changes for this version, and points you to sources of more information in the DB2 library. The numerous enhancements include:

### **Exploitation of symmetric multiprocessors (SMP) for improved scalability and performance**

DB2 now exploits the ability of an SMP system to share resources across multiple processors, performing your SQL queries more quickly. Utilities like LOAD, BACKUP, and RESTORE also take advantage of the multiprocessor environments.

For more information on parallelism, refer to the *Administration Guide*. The utilities are described in more detail in the *Command Reference*.

### **New graphical tools that make it easy to install, configure, and administer DB2 databases**

From the Control Center on OS/2, Windows 95, and Windows NT platforms, you can accomplish just about any administrative task. A number of SmartGuides walk you through common tasks, such as configuring communications and creating tables. You can also use the graphical tools from an OS/2, Windows 95, or Windows NT client to administer DB2 servers on UNIX platforms. Improved online help and the Information Center help you easily find the information you need to use DB2. For more details, refer to Chapter 2, "About DB2 Universal Database" on page 9 or try out the Control Center.

### **Extensions to SQL, including support for online analytical processing**

With the new CUBE and ROLLUP aggregations, you can now create "super groups", like "overall total" and "cross-tabulation", for improved online analytical processing. You can also perform outer joins, rename tables, define unique constraints on tables, and create your own table functions. DB2 has refined its authorization support, so you can grant authority at a more granular level; you can also create schemas to grant various attributes and privileges. For more details on these and other new SQL features, refer to the *SQL Reference*.

### **Performance, capacity, and memory improvements**

DB2 now provides global caching for SQL statements, creating a public repository that improves performance. You can create multiple buffer pools of various sizes to better control the data in memory. Client/server communications are more efficient, crash and rollforward recovery are faster, and LOAD features numerous performance enhancements. For information on how to exploit these enhancements, refer to the *Administration Guide*.

### **Security enhancements, including support for Open Software Foundation's Distributed Computing Environment (DCE)**

You can now use the DCE architecture to manage users, passwords, and groups more easily, and authenticate users more securely. DB2 also provides a "Trusted Clients" option so you can choose whether to trust all clients or only those that come from an operating system with inherent security. Security considerations are described more fully in the *Administration Guide*.

### **Additional support for communicating with host databases using DB2 Connect and the Distributed Relational Database Architecture (DRDA)**

You can now communicate with host systems using TCP/IP, as well as SNA. In addition, DB2 servers can accept requests from host systems using TCP/IP, meaning you can use your DB2 workstation server as an application server to the host. On OS/2 and UNIX platforms, you can perform two-phase commits using DB2 Connect and TCP/IP; if you're using SNA, you can invoke a two-phase commit involving both the host and the DB2 server. For more details about connecting to host databases, refer to the *DB2 Connect Enterprise Edition Quick Beginnings* and *DB2 Connect User's Guide*.

### **Enhancements to application programming for DB2**

The DB2 Call Level Interface (DB2 CLI) now reflects the Microsoft Open Database Connectivity 3.0 specifications, meaning that you can connect to DB2 databases from ODBC 3.0 applications. Additions to user-defined functions include scrollable cursors and the UCT\_UNIQUE function to return a unique value to use in a table column. You can also invoke external UDFs that are methods of OLE automation servers. For more details on these and other improvements, refer to the *CLI Guide and Reference*, *Embedded SQL Programming Guide*, and *API Reference*.

There are many other new features, from the DB2 Governor, which you can use to handle application behavior, to table space features, such as recovery to a point in time and selective restore, to improved error messages. For a comprehensive list of what's new, see the Information Center.

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## ***Part 2. Installation and Initial Configuration***



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## **Chapter 4. Planning for Installation**



If you know that your system meets DB2's hardware and software requirements, and you want to start installing DB2 right away, go directly to "Preparing to Install the DB2 Products" on page 45.

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DB2 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.

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### **Memory Requirements**

Before you install the product, decide what system configuration you need.

This section shows diagrams of the most common configurations that use the DB2 products. Each diagram shows the products and filesets that are required for each system in the network (excluding operating system and communication requirements) and the approximate amount of memory required for such a configuration.

### **Configuration for Accessing DB2 Servers on the LAN**

If you want to access data across the LAN from a remote database server, use the configuration shown in Figure 7 on page 30. The diagram shows DB2 Universal Database Workgroup Edition installed on the server machine and various clients connected to this server to access data. The same configuration is also possible with the DB2 Universal Database Enterprise Edition product. You must install the DB2 Client Application Enabler component on each client.

Connect the clients to DB2 Universal Database Enterprise Edition or DB2 Universal Database Workgroup Edition server using one of the supported protocols: APPC, IPX/SPX, or TCP/IP.

## DB2 Workgroup Edition - Memory Requirements

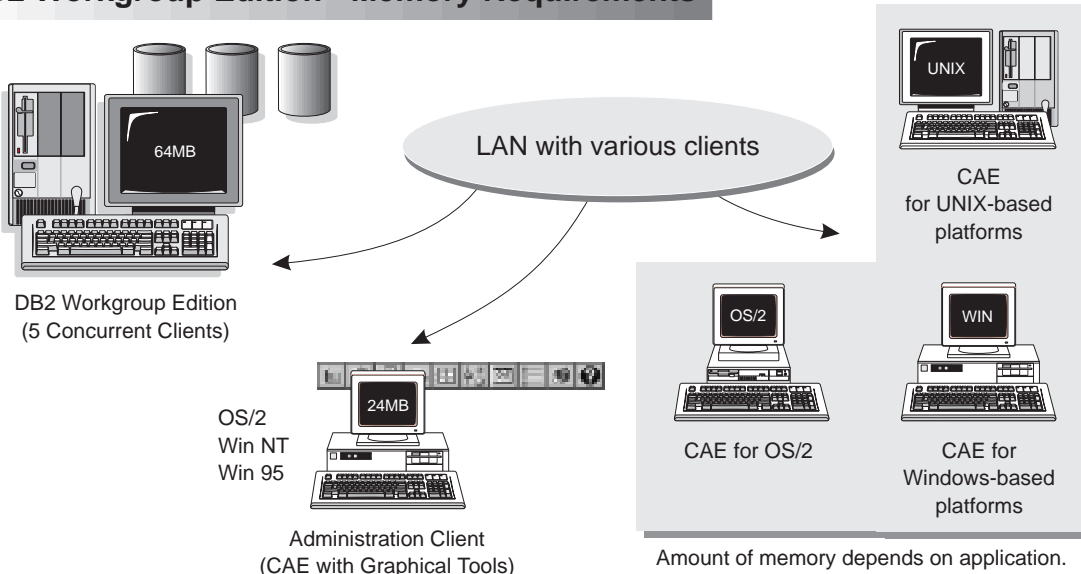


Figure 7. Configuration for Accessing DB2 Servers on the LAN

The amount of memory you need on your server depends on the number of concurrent users you will have, and the size of the databases. The diagram shows a scenario with five concurrent clients connected to the server with a simple application using static SQL. For the server, it is recommended that a minimum of 64 MB of memory be installed to accommodate five concurrent clients. 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. (If you have a more complex application environment, your server may require significantly more memory.) 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, Windows 95, or Windows NT workstation and can be used to remotely manage the DB2 servers on your network. A minimum of 24 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.



# Configuration for Accessing LAN and Host Data

If you want to access databases on both your local LAN and 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 the DB2 Connect Support option of the DB2 Enterprise Edition.

Connect clients to DB2 Enterprise Edition or DB2 Workgroup Edition 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 and either APPC or TCP/IP. (TCP/IP is supported on DB2 for OS/390 Version 5.1 or later.)

## DB2 Enterprise Edition - Memory Requirements

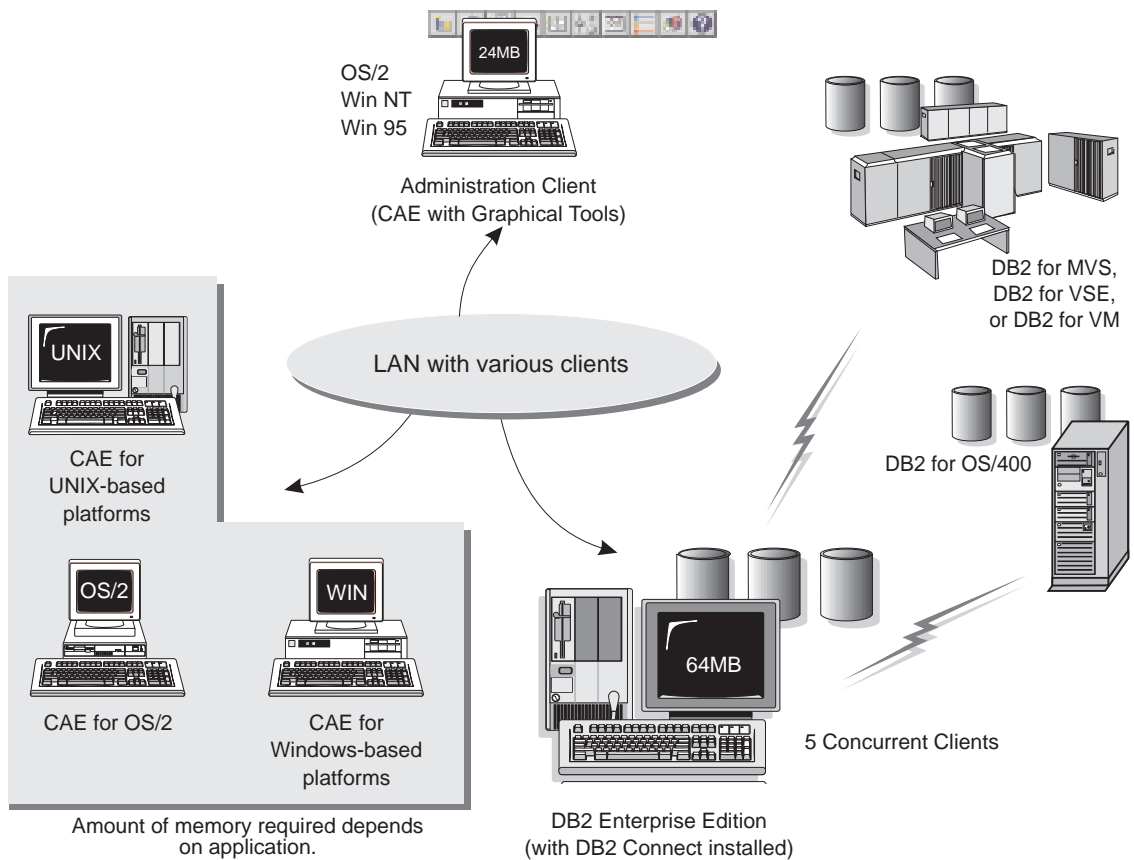


Figure 8. Configuration for Accessing LAN and Host Data

The amount of memory you need on your system to use both DB2 Connect and DB2 Universal Database Enterprise Edition depends on the number of concurrent clients you intend to connect. The diagram shows a scenario with five concurrent clients connected to the server using a simple application with static SQL. For the server, it is recommended that a minimum of 64 MB of memory be installed to accommodate five concurrent clients. 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. (If you have a more complex application environment, your server may require significantly more memory.) 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, Windows 95, or Windows NT workstation and can be used to remotely manage the DB2 servers on your network. A minimum of 24 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.

## ***Configuration for Accessing from the Web***

If you want Internet clients using Web browsers to access data in databases on both LAN and host-based DB2 servers, use the configuration shown in Figure 6 on page 23 or Figure 5 on page 21.

Follow the guidelines in "Configuration for Accessing DB2 Servers on the LAN" on page 29 and "Configuration for Accessing LAN and Host Data" on page 31 to determine the memory required on your DB2 server and administration client.

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## ***Disk Requirements***

This section shows the *minimum* amount of disk space that is required by DB2 products. 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.

# Estimating Fixed Disk Requirements

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

## Disk Requirements Table

Use Table 1 to estimate the amount of disk space you need to install DB2 and associated products on your operating system.

Table 1. Estimating Disk Requirements

	Recommended Minimum Disk (MB)
<b>DB2 Universal Database for AIX</b>	
DB2 Universal Database Workgroup Edition	51 MB
• Online documentation in HTML format (English)	72 MB
• Far-East Code Page Conversion Support	5 MB
DB2 Universal Database Enterprise Edition	52 MB
• Online documentation in HTML format (English)	72 MB
• Far-East Code Page Conversion Support	5 MB
<b>DB2 Universal Database for HP-UX</b>	
DB2 Universal Database Workgroup Edition	76 MB
• Online documentation in HTML format (English)	72 MB
• Far-East Code Page Conversion Support	5 MB
DB2 Universal Database Enterprise Edition	77 MB
• Online documentation in HTML format (English)	72 MB
• Far-East Code Page Conversion Support	5 MB
<b>DB2 Universal Database for Solaris</b>	
DB2 Universal Database Workgroup Edition	73 MB
• Online documentation in HTML format (English)	72 MB
• Far-East Code Page Conversion Support	5 MB
DB2 Universal Database Enterprise Edition	74 MB
• Online documentation in HTML format (English)	72 MB
• Far-East Code Page Conversion Support	5 MB

**Note:** The disk amounts listed are approximations.

## Client Components

Use Table 2 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

	<b>Recommended Minimum Disk (MB)</b>
<b>DB2 Client Application Enabler for AIX</b>	
DB2 Client Application Enabler for AIX — all components	22 MB
<b>DB2 Client Application Enabler for HP-UX — all components</b>	
DB2 Client Application Enabler for HP-UX — all components	18 MB
<b>DB2 Client Application Enabler for Macintosh</b>	
DB2 Client Application Enabler for Macintosh	8 MB
• Documentation	7 MB
<b>DB2 Client Application Enabler for OS/2</b>	
DB2 Client Application Enabler for OS/2 — this amount includes the following components:	55 MB
• Client Configuration Assistant	5 MB
• Graphical Tools	5 MB
• Control Center	30 MB
• Performance Monitor	10 MB
• Visual Explain	5 MB
Online documentation in HTML format	25 MB
<b>DB2 Client Application Enabler for Solaris</b>	
DB2 Client Application Enabler for Solaris — all packages	16 MB
<b>DB2 Client Application Enabler for SCO OpenServer Version 2</b>	
DB2 Client Application Enabler for SCO OpenServer	16 MB
• Online documentation in HTML format	25 MB
<b>DB2 Client Application Enabler for Silicon Graphics IRIX Version 2</b>	
DB2 Client Application Enabler for Silicon Graphics IRIX	14 MB
• Documentation	19 MB
<b>DB2 Client Application Enabler for SINIX Version 2</b>	
DB2 Client Application Enabler for SINIX	16 MB
• Documentation	21 MB
<b>DB2 Client Application Enabler for Windows 3.1x</b>	
DB2 Client Application Enabler for Windows	10 MB
• Online documentation in HTML format	10 MB

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

	<b>Recommended Minimum Disk (MB)</b>
<b>DB2 Client Application Enabler for Windows 95 &amp; Windows NT</b>	
DB2 Client Application Enabler for Windows 95 & Windows NT — this amount includes the following components:	54 MB
• Graphical Tools (Client Configuration Assistant, Control Center, Performance Monitor, and Visual Explain)	35 MB
Online documentation in HTML format	25 MB

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## ***Software Requirements***

This section outlines the software required to run the DB2 Universal Database and its associated products or components. These associated products include the DB2 Client Application Enabler, DB2 Software Developer's Kit, Net.Data, and DB2 Connect.

## ***Server Product Requirements***

Table 3 on page 36 lists the operating system and communications software required for the Server products.

Table 3 (Page 1 of 3). Software Requirements for DB2 Servers

Product	Hardware/Operating System	Communications
<ul style="list-style-type: none"> <li>• DB2 Universal Database Enterprise Edition (including DB2 Connect Enterprise Edition)</li> <li>• DB2 Universal Database Workgroup Edition</li> </ul>	Risc System/6000 and the following: <ul style="list-style-type: none"> <li>• AIX Version 4.1.4 or later</li> </ul>	APPC, IPX/SPX, or TCP/IP <ul style="list-style-type: none"> <li>• For APPC connectivity with two-phase commit, you require IBM Communications Server Version 4.1 or later for AIX in order to use the LU6.2 Syncpoint Manager function. If you do not need to use two-phase commit, IBM SNA Server/6000 Version 1.x or later is sufficient.</li> <li>• The AIX base operating system provides TCP/IP connectivity. For two-phase commit, TCP/IP connectivity is supported only on the AIX Version 4.1.4 or later server.</li> <li>• IPX/SPX connectivity is provided by IBM NetBIOS and IPX/SPX for AIX Version 2.1, IBM NetWare for AIX Version 3.11B, or the AIX Connections feature of AIX 4.1.4.</li> </ul>
<p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. DB2 Connect for AIX requires SNA Server for AIX Version 2.1 or higher, or Bull DPX/20 SNA/20.</li> <li>2. If you want to install the DRDA Application Server function of the DB2, you must install the Syncpoint Manager (SPM) and its prerequisites in order to use two-phase commit.</li> <li>3. If you want to use DCE (Distributed Computing Environment) with Version 5 of the DB2 Universal Database products, you require a DCE product that is at OSF DCE level 1.1, which is provided by the AIX Version 4.1.4 operating system with its latest DCE PTF. For DB2 Connect support, you require DB2/MVS Version 5.1 plus its prerequisite, OS/390 DCE Base Services Version 3 for DCE support.  With DB2 Connect, you must install DCE Directory Services on the client and the DRDA server. You do not need DCE installed on a DB2 Connect Enterprise Edition server.</li> <li>4. If you plan to use the ADSTAR Distributed Storage Manager (ADSM) facilities for backup and restore of your databases, you require the ADSM Client Version 2.1.0.6.</li> </ol>		

Table 3 (Page 2 of 3). Software Requirements for DB2 Servers

Product	Hardware/Operating System	Communications
<ul style="list-style-type: none"> <li>• DB2 Universal Database Enterprise Edition (including DB2 Connect Enterprise Edition)</li> <li>• DB2 Universal Database Workgroup Edition</li> </ul>	<p>HP 9000 series 700 or 800 system and the following:</p> <ul style="list-style-type: none"> <li>• HP-UX Version 10.10 or later</li> </ul> <p>The following patches are required:</p> <ul style="list-style-type: none"> <li>• For HP-UX Version 10.20               <ul style="list-style-type: none"> <li>– PHSS_10556</li> <li>– PHSS_10436</li> </ul> </li> <li>• For HP-UX Version 10.10               <ul style="list-style-type: none"> <li>– PHSS_10437</li> </ul> </li> <li>• For systems with the ANSI C or C++ compilers:               <ul style="list-style-type: none"> <li>– PHSS_10261</li> <li>– PHSS_7505</li> <li>– PHSS_9096 for C++</li> </ul> </li> </ul>	<p>APPC, IPX/SPX, or TCP/IP</p> <ul style="list-style-type: none"> <li>• For APPC connectivity, you require either of the following:           <ul style="list-style-type: none"> <li>– HP-UX Version 10.10 for SNAplusLink Version A.10.10</li> <li>– HP-UX Version 10.10 for SNAplusAPI Version A.10.10</li> </ul> </li> </ul> <p><b>Note:</b> HP-UX does not provide support for inbound client APPC requests.</p> <ul style="list-style-type: none"> <li>• TCP/IP is provided with the HP-UX base operating system. For two-phase commit, TCP/IP connectivity is supported only on the latest-level server.</li> <li>• For IPX/SPX connectivity, you require Netware Version 3.12 for the HP 9000.</li> </ul> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. DB2 Connect for HP-UX requires SNA software and the following communication products:           <ul style="list-style-type: none"> <li>• HP-UX Version 10.10 for SNAplusLink Version A.10.10</li> <li>• HP-UX Version 10.10 for SNAplusAPI Version A.10.10</li> <li>• DB2 Connect for HP-UX supports DCE CDS</li> </ul> </li> <li>2. If you want to use DCE (Distributed Computing Environment) with Version 5 of the DB2 Universal Database products, you require a DCE product that is at OSF DCE level 1.1, which is provided by the HP-UX Version 10 and later operating system. For DB2 Connect support, you require DB2/MVS Version 5.1 plus its prerequisite, OS/390 DCE Base Services Version 3 for DCE support.           <p>With DB2 Connect, you must install DCE Directory Services on the client and the DRDA server. You do not need DCE installed on a DB2 Connect Enterprise Edition server.</p> </li> <li>3. If you plan to use the ADSTAR Distributed Storage Manager (ADSM) facilities for backup and restore of your databases, you require the ADSM Client Version 2.1.0.6.</li> </ol>

Table 3 (Page 3 of 3). Software Requirements for DB2 Servers

Product	Hardware/Operating System	Communications
<ul style="list-style-type: none"> <li>DB2 Universal Database Enterprise Edition (including DB2 Connect Enterprise Edition)</li> <li>DB2 Universal Database Workgroup Edition</li> </ul>	Solaris SPARCstation and the following: <ul style="list-style-type: none"> <li>Solaris Version 2.5.1 or later</li> </ul> The following patches are required: <ul style="list-style-type: none"> <li>103600-13</li> <li>103640-08</li> </ul>	APPC, IPX/SPX, or TCP/IP <ul style="list-style-type: none"> <li>For APPC connectivity, you require SunLink SNA 9.0 and the following communication products:               <ul style="list-style-type: none"> <li>SunLink P2P LU6.2 9.0</li> <li>SunLink PU2.1 9.0</li> <li>SunLink P2P CPI-C 9.0</li> </ul> </li> <li>TCP/IP is provided with the Solaris base operating system. For two-phase commit, TCP/IP connectivity is supported only on the latest-level server.</li> <li>IPX/SPX connectivity is provided with SolarNet PC Protocol Services 1.1 with IPX/SPX for the Solaris 2.x Operating Environment.</li> </ul> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>DB2 Connect for Solaris requires Solaris Version 2.5.1 or later and the following communication products:               <ul style="list-style-type: none"> <li>SunLink P2P LU6.2 9.0</li> <li>SunLink SNA PU2.1 9.0 Server</li> <li>SunLink P2P CPI-C 9.0</li> </ul> </li> <li>If you want to use DCE (Distributed Computing Environment) with Version 5 of the DB2 Universal Database products, you require Transarc DCE Version 1.1 for Solaris 2.5 and 2.5.1, patch level 18 or higher.               <p>With DB2 Connect, you must install DCE Directory Services on the client and the DRDA server. You do not need DCE installed on a DB2 Connect Enterprise Edition server.</p> </li> </ol>

## Client Product Requirements

Table 4 lists the software requirements needed for the DB2 client products.

Table 4 (Page 1 of 4). Software Requirements for Clients

Component	Hardware/Operating System	Communications
<ul style="list-style-type: none"> <li>DB2 Client Application Enabler for AIX</li> <li>DB2 Software Developer's Kit for AIX</li> <li>Net.Data for AIX</li> </ul>	Risc System/6000 and the following: <ul style="list-style-type: none"> <li>AIX Version 4.1.4 or later</li> </ul>	APPC or TCP/IP <ul style="list-style-type: none"> <li>For APPC connectivity, you require IBM Communications Server for Version 4.1.4 or later for AIX</li> <li>The AIX base operating system provides TCP/IP connectivity, if selected during install.</li> </ul> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>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.</li> <li>DB2 for AIX also has an IPX listener.</li> </ol>



Table 4 (Page 2 of 4). Software Requirements for Clients

Component	Hardware/Operating System	Communications
<ul style="list-style-type: none"> <li>• DB2 Client Application Enabler for HP-UX</li> <li>• DB2 Software Developer's Kit for HP-UX</li> </ul>	<p>HP 9000 Series 700 or 800 system and the following:</p> <ul style="list-style-type: none"> <li>• HP-UX Version 10.10 or later</li> </ul> <p>The following patches are required:</p> <ul style="list-style-type: none"> <li>• For HP-UX Version 10.20               <ul style="list-style-type: none"> <li>– PHSS_10556</li> <li>– PHSS_10436</li> </ul> </li> <li>• For HP-UX Version 10.10               <ul style="list-style-type: none"> <li>– PHSS_10437</li> </ul> </li> <li>• For systems with the ANSI C or C++ compilers:               <ul style="list-style-type: none"> <li>– PHSS_10261</li> <li>– PHSS_7505</li> <li>– PHSS_9096 for C++</li> </ul> </li> </ul>	<p>APPC or TCP/IP</p> <ul style="list-style-type: none"> <li>• For APPC connectivity, you require either of the following:               <ul style="list-style-type: none"> <li>– HP-UX Version 10.10 for SNAPplusLink Version A.10.10</li> <li>– HP-UX Version 10.10 for SNAPplusAPI Version A.10.10</li> </ul> </li> <li>• The HP-UX base operating system provides TCP/IP connectivity.</li> </ul> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. To support database clients using IPX/SPX, the following IPX/SPX software must be installed:               <ul style="list-style-type: none"> <li>• Netware Version 3.12 for the HP 9000</li> </ul> </li> <li>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.</li> </ol>
<ul style="list-style-type: none"> <li>• DB2 Client Application Enabler for Macintosh</li> <li>• DB2 Software Developer's Kit for Macintosh</li> </ul>	<ul style="list-style-type: none"> <li>• System 7.5 or later</li> </ul>	<p>TCP/IP</p> <ul style="list-style-type: none"> <li>• For TCP/IP connectivity, you require MacTCP Version 2.0.6.</li> </ul> <p><b>Note:</b> If you are running in a 68K environment, you need to install Apple Shared Library Manager (ASLM) Version 2.0 or later.</p>
<ul style="list-style-type: none"> <li>• DB2 Client Application Enabler for OS/2</li> <li>• DB2 Software Developer's Kit for OS/2</li> <li>• Net.Data for OS/2</li> </ul>	<ul style="list-style-type: none"> <li>• OS/2 Warp Version 3 or Version 4</li> <li>• OS/2 Warp Connect Version 3</li> <li>• OS/2 Warp Server Version 4</li> <li>• OS/2 Warp Server Advanced V4</li> <li>• OS/2 Warp Server SMP</li> </ul>	<p>APPC, IPX/SPX, Named Pipes (Local), NetBIOS, or TCP/IP</p> <ul style="list-style-type: none"> <li>• For APPC connectivity, you require IBM Communications Manager Version 1.x or later.</li> <li>• For NetBIOS connectivity, you require IBM NTS/2 Version 1.0, IBM Communications Manager Version 1.1, or IBM OS/2 LAN Requester.</li> <li>• For IPX/SPX connectivity, you require Novell NetWare Requester, Version 2.10 or later.</li> <li>• For TCP/IP connectivity, you require IBM TCP/IP Version 2.0 or later.</li> <li>• The OS/2 base operating system provides Named Pipes (Local) connectivity. Named Pipes is supported in DOS and WIN-OS/2 sessions.</li> </ul> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. OS/2 Warp Server provides the SystemView LAN client that SystemView LAN needs for installing clients and servers.</li> <li>2. Net.Data requires OS/2 Warp Version 3 or later and a Web server such as IBM's Internet Connection Server.</li> <li>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.</li> </ol>

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

Component	Hardware/Operating System	Communications
<ul style="list-style-type: none"> <li>• DB2 Client Application Enabler for SCO OpenServer</li> <li>• DB2 Software Developer's Kit for SCO OpenServer</li> <li>• Net.Data for SCO OpenServer</li> </ul>	<p>Intel-based personal computer supported by SCO OpenServer and the following:</p> <ul style="list-style-type: none"> <li>• SCO OpenServer Version 5.0.2 or later</li> </ul>	<p>APPC, IPX/SPX, or TCP/IP</p> <ul style="list-style-type: none"> <li>• For APPC connectivity, you require Interface Systems CLEO SNA Version 4.1.1.1.</li> <li>• The SCO OpenServer base operating system provides IPX/SPX and TCP/IP connectivity.</li> </ul>
<ul style="list-style-type: none"> <li>• DB2 Client Application Enabler for Silicon Graphics IRIX</li> <li>• DB2 Software Developer's Kit for Silicon Graphics IRIX</li> </ul>	<ul style="list-style-type: none"> <li>• Silicon Graphics IRIX, Version 5.3 or later.</li> </ul>	<p>TCP/IP</p> <p><b>Note:</b> The Silicon Graphics IRIX base operating system provides TCP/IP connectivity.</p>
<ul style="list-style-type: none"> <li>• DB2 Client Application Enabler for SINIX</li> <li>• DB2 Software Developer's Kit for SINIX</li> </ul>	<p>Siemens Nixdorf RM200 or RM400 or RM600 system and the following:</p> <ul style="list-style-type: none"> <li>• SINIX-N or SINIX-Y Version 5.42 or later</li> <li>• Reliant UNIX</li> </ul>	<p>APPC or TCP/IP</p> <ul style="list-style-type: none"> <li>• For APPC connectivity, you require the following: <ul style="list-style-type: none"> <li>– SINIX TRANSIT-SERVER V3.3, SNA Communication Server</li> <li>– SINIX TRANSIT-CLIENT V3.3 SNA Communication Server / Local Function</li> <li>– SINIX TRANSIT-CPIC V3.3 SNA LU6.2 Communication and CPI-C.</li> </ul> </li> <li>• The SINIX base operating system provides TCP/IP connectivity.</li> </ul>
<ul style="list-style-type: none"> <li>• DB2 Client Application Enabler for Solaris</li> <li>• DB2 Software Developer's Kit for Solaris</li> <li>• Net.Data for Solaris</li> </ul>	<p>Solaris SPARCstation and the following:</p> <ul style="list-style-type: none"> <li>• Solaris Version 2.5.1 or later</li> </ul> <p>The following patches are required:</p> <ul style="list-style-type: none"> <li>• 103600-13</li> <li>• 103640-08</li> </ul>	<p>APPC or TCP/IP</p> <ul style="list-style-type: none"> <li>• For APPC connectivity, you require SunLink SNA 9.0 and the following: <ul style="list-style-type: none"> <li>– SunLink P2P LU6.2 9.0</li> <li>– SunLink PU2.1 9.0</li> <li>– SunLink P2P CPI-C 9.0</li> </ul> </li> <li>• The Solaris base operating system provides TCP/IP connectivity.</li> </ul> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. For database clients using IPX/SPX, the following IPX/SPX software be installed: <ul style="list-style-type: none"> <li>• SolarNet PC Protocol Services 1.1 with IPX/SPX</li> </ul> </li> <li>2. 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.</li> </ol>

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

Component	Hardware/Operating System	Communications
<ul style="list-style-type: none"> <li>DB2 Client Application Enabler for Windows, (Windows 3.1 and Windows for Workgroups)</li> <li>DB2 Software Developer's Kit for Windows</li> </ul>	<ul style="list-style-type: none"> <li>Microsoft Windows 3.1</li> <li>Windows for Workgroups 3.11</li> </ul>	<p>IPX/SPX, NetBIOS, or TCP/IP</p> <ul style="list-style-type: none"> <li>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.</li> <li>For NetBIOS connectivity, you require the LAN Adapter and Protocol Support in any of these products: <ul style="list-style-type: none"> <li>IBM LAN Support Program Version 1.2.1 or later</li> <li>DOS LAN Services (LAN Server 4.0)</li> <li>Banyan Vines NetBIOS Version 5.52</li> <li>NetBEUI (available with Microsoft Windows for Workgroups 3.11)</li> </ul> </li> <li>For TCP/IP connectivity, you require one of the following: <ul style="list-style-type: none"> <li>IBM TCP/IP for DOS Version 2.1.1 or later</li> <li>PC/TCP Network Software for DOS Version 2.3 or later from FTP Software Inc.</li> <li>TCP/IP compliant with the Windows Sockets Version 1.1 specification</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>DB2 Client Application Enabler for Windows (WIN-OS/2)</li> <li>DB2 Software Developer's Kit for Windows (WIN-OS/2)</li> </ul>	<ul style="list-style-type: none"> <li>OS/2 Warp Version 3 or Version 4</li> <li>OS/2 Warp Connect Version 3</li> <li>OS/2 Warp Server Version 4</li> <li>OS/2 Warp Server Advanced V4</li> <li>OS/2 Warp Server SMP</li> </ul>	<p>NetBIOS, IPX/SPX, TCP/IP, or Named Pipes (Local)</p> <ul style="list-style-type: none"> <li>For NetBIOS connectivity, you require IBM NTS/2 Version 1.0, IBM Communications Manager Version 1.1, or IBM OS/2 LAN Requester.</li> <li>For IPX/SPX connectivity, you require Novell NetWare client for OS/2 Version 2.10 or later with virtual session support.</li> <li>For TCP/IP connectivity, you require IBM TCP/IP for OS/2 with the Windows Access kit.</li> </ul>
<ul style="list-style-type: none"> <li>DB2 Client Application Enabler for Windows 95</li> <li>DB2 Software Developer's Kit for Windows 95</li> </ul>	<ul style="list-style-type: none"> <li>Windows 95 4.00.950 or later</li> </ul>	<p>IPX/SPX, Named Pipes, NetBIOS, or TCP/IP</p> <ul style="list-style-type: none"> <li>The Windows 95 base operating system provides NetBIOS, IPX/SPX, TCP/IP, and Named Pipes connectivity.</li> </ul>
<ul style="list-style-type: none"> <li>DB2 Client Application Enabler for Windows NT</li> <li>DB2 Software Developer's Kit for Windows NT</li> <li>Net.Data for Windows NT</li> </ul>	<ul style="list-style-type: none"> <li>Windows NT Version 3.51</li> <li>Windows NT Version 4.0 or later</li> </ul>	<p>APPC, IPX/SPX, Named Pipes, NetBIOS, or TCP/IP</p> <ul style="list-style-type: none"> <li>The Windows NT base operating system provides NetBIOS, IPX/SPX, TCP/IP, and Named Pipes connectivity.</li> <li>For APPC connectivity, you require one of the following products: <ul style="list-style-type: none"> <li>IBM Communications Server for Windows NT Version 5.0.</li> <li>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.</li> <li>PCOMM AS/400 and 3270 V4.1 or later</li> <li>Wall Data Rumba</li> </ul> </li> </ul> <p><b>Note:</b> If you have the IBM Antivirus program installed on your operating system, it must be Version 3.0 or later.</p>

# Possible Client-to-DB2 Server Connectivity Scenarios

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

*Table 5 (Page 1 of 2). Possible Client-to-Server Connectivity Scenarios*

Clients	DB2 Servers				
	AIX	HP-UX	OS/2	Solaris	Windows NT
AIX	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP	APPC TCP/IP
HP-UX	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP	APPC TCP/IP
Macintosh	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP
OS/2	APPC IPX/SPX <sup>1,2</sup> TCP/IP	IPX/SPX <sup>1,2</sup> TCP/IP	APPC IPX/SPX <sup>1,2</sup> NetBIOS TCP/IP	APPC IPX/SPX <sup>1</sup> TCP/IP	APPC IPX/SPX <sup>1</sup> NetBIOS TCP/IP
SCO OpenServer	APPC IPX/SPX <sup>1</sup> TCP/IP	IPX/SPX <sup>1</sup> TCP/IP	APPC IPX/SPX <sup>1</sup> TCP/IP	APPC IPX/SPX <sup>1</sup> TCP/IP	APPC IPX/SPX <sup>1</sup> TCP/IP
Silicon Graphics IRIX	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP	APPC TCP/IP
SINIX	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP	APPC TCP/IP
Solaris	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP	APPC TCP/IP
Windows 3.1x	IPX/SPX <sup>1,2</sup> TCP/IP	IPX/SPX <sup>1,2</sup> TCP/IP	IPX/SPX <sup>1,2</sup> NetBIOS TCP/IP Local (Named Pipes)	IPX/SPX <sup>1</sup> TCP/IP	IPX/SPX <sup>1</sup> NetBIOS TCP/IP
Windows 95	IPX/SPX <sup>1</sup> TCP/IP	IPX/SPX <sup>1</sup> TCP/IP	IPX/SPX <sup>1</sup> NetBIOS TCP/IP	IPX/SPX <sup>1</sup> TCP/IP	IPX/SPX <sup>1</sup> Named Pipes NetBIOS TCP/IP

Table 5 (Page 2 of 2). Possible Client-to-Server Connectivity Scenarios

Clients	DB2 Servers				
	AIX	HP-UX	OS/2	Solaris	Windows NT
Windows NT	APPC IPX/SPX <sup>1</sup> TCP/IP	IPX/SPX <sup>1</sup> TCP/IP	APPC IPX/SPX <sup>1</sup> NetBIOS TCP/IP	APPC IPX/SPX <sup>1</sup> TCP/IP	APPC IPX/SPX <sup>1</sup> Named Pipes NetBIOS TCP/IP
1	Direct Addressing				
2	File Server Addressing				

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## ***Understanding System Administrative (SYSADM) Authority***

System Administrative authority is required in order to perform administration tasks such as cataloging, starting the database manager, or creating the sample database. By default, any user belonging to the primary group of the instance owner has System Administrative authority on the instance created during the installation. Throughout the book, IDs that have this authority are referred to as having SYSADM authority. To change the group that has SYSADM authority on the default instance, see “Changing Default Privileges for Users” on page 136.

# Locating DB2 Universal Database Products on the CD-ROMs

Table 6 shows you where DB2 Universal Database products are located on the Version 5 CD-ROMs.

<i>Table 6 (Page 1 of 2). DB2 Universal Database Products on CD-ROMs</i>	
<b>Product</b>	<b>Where to find it</b>
DB2 Universal Database Workgroup Edition	<ul style="list-style-type: none"> <li>• DB2 Universal Database for OS/2 CD-ROM</li> <li>• DB2 Universal Database for Windows NT CD-ROM</li> <li>• DB2 Universal Database and DB2 Connect for AIX CD-ROM</li> <li>• DB2 Universal Database and DB2 Connect for HP-UX CD-ROM</li> <li>• DB2 Universal Database and DB2 Connect for Solaris CD-ROM</li> </ul>
DB2 Universal Database Enterprise Edition	<ul style="list-style-type: none"> <li>• DB2 Universal Database for OS/2 CD-ROM</li> <li>• DB2 Universal Database for Windows NT CD-ROM</li> <li>• DB2 Universal Database and DB2 Connect for AIX CD-ROM</li> <li>• DB2 Universal Database and DB2 Connect for HP-UX CD-ROM</li> <li>• DB2 Universal Database and DB2 Connect for Solaris CD-ROM</li> </ul>
DB2 Universal Database Personal Edition	<ul style="list-style-type: none"> <li>• DB2 Personal Edition CD-ROM</li> </ul>
DB2 Extended Enterprise Edition	<ul style="list-style-type: none"> <li>• DB2 Extended Enterprise Edition for AIX CD-ROM</li> </ul>
DB2 Connect Enterprise Edition	<ul style="list-style-type: none"> <li>• DB2 Connect for OS/2 CD-ROM</li> <li>• DB2 Connect for Windows NT CD-ROM</li> <li>• DB2 Universal Database and DB2 Connect for AIX CD-ROM</li> <li>• DB2 Universal Database and DB2 Connect for HP-UX CD-ROM</li> <li>• DB2 Universal Database and DB2 Connect for Solaris CD-ROM</li> </ul>
DB2 Connect Personal Edition	<ul style="list-style-type: none"> <li>• DB2 Personal Edition CD-ROM</li> </ul>
DB2 Client Application Enabler	<ul style="list-style-type: none"> <li>• DB2 Universal Database for OS/2 CD-ROM</li> <li>• DB2 Universal Database for Windows NT CD-ROM</li> <li>• DB2 Universal Database and DB2 Connect for AIX CD-ROM</li> <li>• DB2 Universal Database and DB2 Connect for HP-UX CD-ROM</li> <li>• DB2 Universal Database and DB2 Connect for Solaris CD-ROM</li> <li>• DB2 Connect for OS/2 CD-ROM</li> <li>• DB2 Connect for Windows NT CD-ROM</li> <li>• Client Pack CD-ROM</li> </ul>
DB2 Software Developer's Kit	<ul style="list-style-type: none"> <li>• SDK Pack CD-ROM</li> </ul>

Table 6 (Page 2 of 2). DB2 Universal Database Products on CD-ROMs

Product	Where to find it
<b>Notes:</b>	
<ol style="list-style-type: none"> <li>1. When installing the DB2 Client Application Enabler, we recommend that you install it from the DB2 Universal Database CD-ROM, if available. However, if a DB2 Universal Database CD-ROM is not available, install the DB2 Client Application Enabler from the Client Pack CD-ROM. For example, install the DB2 Client Application Enabler for AIX from the DB2 Universal Database and DB2 Connect for AIX CD-ROM. When installing other DB2 Client Application Enablers on an AIX operating system, install the client code from the Client Pack CD-ROM.</li> <li>2. The installation instructions are available in several languages; however, they are not translated into all languages in which DB2 is available.</li> </ol>	

## Preparing to Install the DB2 Products

Before you install DB2 Universal Database products on UNIX operating systems, it is important to know which products and components you must install and which are optional. "Selecting Products and Components on UNIX Systems" lists these DB2 products and their components. For installation and configuration instructions for DB2 Servers, refer to Chapter 5, "Installing and Configuring DB2" on page 47. For information on how to install DB2 Clients, refer to Chapter 7, "Installing DB2 Clients" on page 77.

## Selecting Products and Components on UNIX Systems

Table 7 lists the DB2 products components that you can select to install on your system.

Table 7 (Page 1 of 2). Components for DB2 Products

Product / Component Description	DB2 CAE	DB2 Universal Database Enterprise Edition	DB2 UDB Workgroup Edition	DB2 Connect
DB2 Client Application Enabler	√√	√√	√√	√√
Open Database Connectivity (ODBC) support	√	√	√	√
Java Database Connectivity (JDBC) support	√	√	√	√
Administration Server		√	√	√

Table 7 (Page 2 of 2). Components for DB2 Products

Product / Component Description	DB2 CAE	DB2 Universal Database Enterprise Edition	DB2 UDB Workgroup Edition	DB2 Connect
DB2 Run-time Environment		√√	√√	√√
DB2 Engine		√√	√√	√√
DB2 Connect Support		√√		√√
Communication Support for TCP/IP		√√	√√	√√
Communication Support for IPX/SPX		√√	√√	√√
Communication Support for SNA		√√	√√	√√
Communication Support for DRDA Application Server		√√	√√	√√
Code Page Conversion Tables - Japanese		√	√	√
Code Page Conversion Tables - Korean		√	√	√
Code Page Conversion Tables - Simplified Chinese		√	√	√
Code Page Conversion Tables - Traditional Chinese		√	√	√
Licensed Support for DB2 Universal Database Workgroup Edition			√√	
Licensed Support for DB2 Universal Database Enterprise Edition		√√		
Licensed Support for DB2 Connect				√√
DB2 Replication	o	o	o	o
DB2 Product Messages (non-English) <sup>1</sup>	o	o	o	o
DB2 Product Library (HTML) <sup>1</sup>	o	o	o	o
<p>√√ This is a required component that must be installed.</p> <p>√ This is a recommended component that is installed by default. You can choose not to install this component.</p> <p>o This is an optional component that is not installed by default. If you want to install it, you must select it.</p> <p><b>Notes:</b></p> <p>1. There is a separate component of the DB2 Product Messages and the DB2 Product Library for each locale.</p> <p>2. The DB2 SDK is available only with the SDK Pack. Refer to "Developing Applications Using the DB2 Software Developer's Kit" on page 17.</p>				



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# Chapter 5. Installing and Configuring DB2

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If you need to migrate databases that were created using previous versions of DB2, you must complete certain procedures after installing DB2 Version 5. See Chapter 6, “Migrating from Previous Versions” on page 63 for further information.

---

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

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

- Chapter 21, “Other Methods to Install DB2 for AIX” on page 193
- Chapter 22, “Other Methods to Install DB2 for HP-UX” on page 201
- Chapter 23, “Other Methods to Install DB2 for Solaris” on page 211.

For information on how to install the DB2 clients, refer to Chapter 7, “Installing DB2 Clients” on page 77.

---

## Before You Begin

Before you begin installing DB2 products using the DB2 Installer, 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 can be `/cdrom`.

**Note:** On some UNIX operating systems, the CD-ROM is automatically mounted.

### Which DB2 products should I install?

Table 7 on page 45 lists the required and optional components for all of the DB2 products available. It also shows the recommended components that are installed by default.

### How much disk space does my operating system require for all selected products?

See “Estimating Fixed Disk Requirements” on page 33 and “Disk Requirements Table” on page 33 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.

**Note:** If you plan to install the DB2 Universal Database Workgroup Edition or the DB2 Universal Database Enterprise Edition product, you also need another dedicated user name and group name for the fenced user-defined functions (UDFs) and stored Procedures. For security reasons, we recommend that you do not use the DB2 instance user name and group name for the fenced UDFs and Stored Procedures.

#### **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.

## ***Installation Steps***

To install the DB2 products on UNIX systems, 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. Identifying and Recording Parameter Values***

Table 8 on page 49 will help you determine the values required to install DB2 products and for setting up a DB2 Instance and 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 fact, in Table 8 on page 49, 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 <sup>1</sup>	None	
• DB2 Product Messages <sup>2</sup>	None	
• Documentation	None	
DB2 Instance		
• User Name	db2inst1	
• UID	System-generated UID	
• Group Name	db2iadm1	
• GID	System-generated GID	
• Password	ibmdb2	
• TCP/IP Service Name	dbc0db2inst1	
• TCP/IP Port Number	30000	
• 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		
• User Name	db2as	
• UID	System-generated UID	
• Group Name	db2asgrp	
• GID	System-generated GID	
• Password	ibmdb2	
• TCP/IP Port Number	523	523
• IPX/SPX File Server Name	*	
• IPX/SPX Object Name	*	
• IPX/SPX Socket Number	87A2	87A2
• IPX/SPX NetWare User ID	None	
• IPX/SPX NetWare Password	None	

Table 8 (Page 2 of 2). Parameter Values Required for Installation

Information Required for DB2 Installer	Default Value	Your Value
<b>Notes:</b> <ol style="list-style-type: none"><li>1. You must select at least one DB2 product to install. See Table 7 on page 45 for a list of DB2 products available for installation.</li><li>2. You can optionally select one or more filesets in this product. There is a separate fileset for each locale. See Appendix B, "Contents of the DB2 Products" on page 279 for the names of filesets for DB2 Product Messages and Documentation.</li></ol>		



To continue the installation on AIX systems, proceed to "Step 3. Mounting the CD-ROM" on page 53.

## 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

The values in Table 9 on page 51 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	128	256	256
msgmap	130	258	258
msgmni	128	256	256
msgssz	16	16	16
semnmi	128	256	512
semmap	130	258	514
semms	256	512	1024
semnu	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).

To change the values, do the following:

- 1 Use **SAM** and select **Kernel Configuration**.
- 2 Select **Configurable Parameters**.
- 3 Highlight the parameter to be changed.
- 4 Select **Modify Configurable Parameter** from the **Actions** menu and make the appropriate changes.
- 5 Repeat the previous two steps for every kernel parameter which needs to be updated.
- 6 Create a new kernel by selecting **Create a New Kernel** from the **Actions** menu.

## 7 Reboot the system so that the changes can take effect.



To continue with the installation on HP-UX systems, proceed to "Step 3. Mounting the CD-ROM" on page 53.

## Recommended Values for Solaris

The values in Table 10 are recommended for Solaris kernel configuration parameters.

Kernel Parameter	Physical Memory		
	64MB - 128MB	128MB - 256MB	256MB+
<code>msgsys:msginfo_msgmax</code>	65535 (1)	65535 (1)	65535 (1)
<code>msgsys:msginfo_msgmnb</code>	65535 (1)	65535 (1)	65535 (1)
<code>msgsys:msginfo_msgmap</code>	130	258	258
<code>msgsys:msginfo_msgmni</code>	128	256	256
<code>msgsys:msginfo_msgssz</code>	16	16	16
<code>msgsys:msginfo_msgtql</code>	128	256	256
<code>msgsys:msginfo_msgseg</code>	8192	16384	32768
<code>shmsys:shminfo_shmmax</code>	67108864	134217728 (2)	268435456 (2)
<code>shmsys:shminfo_shmseg</code>	16	16	16
<code>shmsys:shminfo_shmmni</code>	300	300	300
<code>semsys:seminfo_semmni</code>	128	256	512
<code>semsys:seminfo_semmap</code>	130	258	514
<code>semsys:seminfo_semmns</code>	256	512	1024
<code>semsys:seminfo_semmnu</code>	256	512	1024

### Notes:

1. Parameters `msgsys:msginfo_msgmnb` and `msgsys:msginfo_msgmax` must be set to 65535.
2. Parameters `shmsys:shminfo_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 the `shmsys:shminfo_shmmax` 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 parameter `msgsys:msginfo_msgmax`, 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 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 `shmsys:shminfo_shmmax` as described in Note 2 above.

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

---

## Step 3. Mounting the CD-ROM

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

### Mounting on AIX Systems

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

- 1 Log in as root.
- 2 Insert the CD-ROM in the drive.
- 3 Create a root directory by typing the following command:

```
mkdir -p /cdrom
```



The directory name `/cdrom` is used here as an example only. You may use a different name for your root directory.

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

```
smit storage
```
- 5 Select **FileSystems**.
- 6 Select **Add/Change/Show/Delete FileSystems**.
- 7 Select **CD-ROM FileSystems**.
- 8 Select **Add CDRom FileSystems**.

**9** Select the **DEVICE Name**.



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

**10** Respond to the prompt, mount point, by typing the following:

```
/cdrom
```

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

```
smit mountfs
```

**12** Select the **FileSystem** name. For example, the name can 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 out.



---

After mounting the CD-ROM, proceed to “Step 4. Installing the DB2 Products” on page 55.

---

## ***Mounting on HP-UX Systems***

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

**1** Log in as root.

**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.



---

After mounting the CD-ROM, proceed to “Step 4. Installing the DB2 Products” on page 55.

---



## Mounting on Solaris Systems

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

- 1 Log in as root.
- 2 Insert the CD-ROM in the drive.

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

```
/cdrom/unnamed_cdrom
```

where /cdrom/unnamed\_cdrom is the CD-ROM mount directory.

If the Volume Manager is not installed on your system, mount the CD-ROM by entering commands as shown in the following example:

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

- 3 Log out.

---

## Step 4. Installing the DB2 Products

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

**Note:** DB2 Version 5 products can co-exist on the same machine with previous versions of DB2.



If you are installing the DB2 Client Application Enabler from a remote server, it is better to open a **telnet** session instead 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. Mounting the CD-ROM” on page 53 if required.

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

**a** On AIX or HP-UX:

```
cd /cdrom
```

**b** On Solaris:

```
cd /cdrom/unnamed_cdrom
```

where /cdrom is the mount point of the CD-ROM drive on AIX and HP-UX and /cdrom/unnamed\_cdrom is the mount point of the CD-ROM on Solaris.

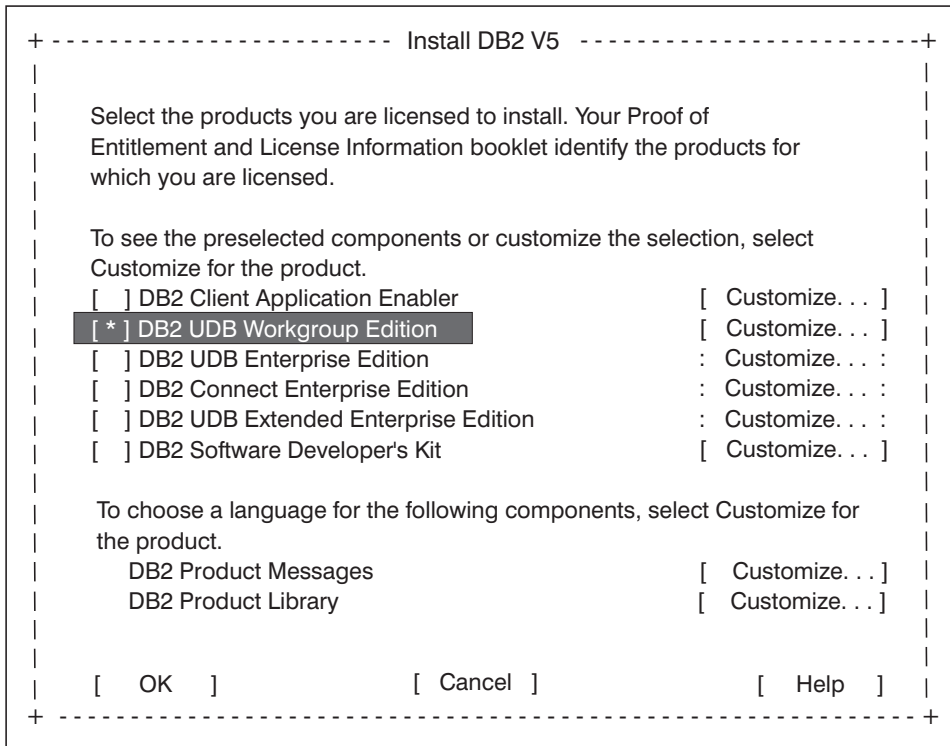
5 Type the following command to start the DB2 Installer:

```
./db2setup
```



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

**Note:** Your screen will be different if you already installed DB2 Version 5 products on your system. See “Installing Additional Products and Creating Additional Instances” on page 60 for more information.



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

You can install only one of the following products:

- DB2 Universal Database Workgroup Edition
- DB2 Universal Database Enterprise Edition
- DB2 Client Application Enabler

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**.

When you have finished choosing product components, select **OK** to go to the Create DB2 Services screen. To undo any selections you made, select **Cancel**.



Go to step 9 on page 58 if you do not want to create a DB2 Instance at this time.

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

```

+ ----- Create DB2 Services ----- +
|                                     |
| + --- DB2 Instance --- +          |
|                                     |
| Authentication:                    |
| Enter User ID, Group ID 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 |
| Password       [*****]          |
| Verify Password [*****]          | [ Default ] |
|                                     |
| Protocol:                          |
| Select Customize to change the default [ Customize... ] |
| communication protocol.            |
|                                     |
| [ * ] Auto start DB2 Instance at system boot. |
| [ ] Create a sample database for DB2 Instance. |
|                                     |
| [ 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 change the default communication protocol, select **Customize**. 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**.
- To create a sample database for the DB2 Instance, select **Create a sample database for DB2 Instance**. The sample database requires a minimum of 15 MB.

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

If you have the DB2 Universal Database Enterprise Edition or the DB2 Universal Database Workgroup Edition or DB2 Connect Enterprise Edition installed, 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.



Go to step 11 if you do not want to create an Administration Server at this time.

---

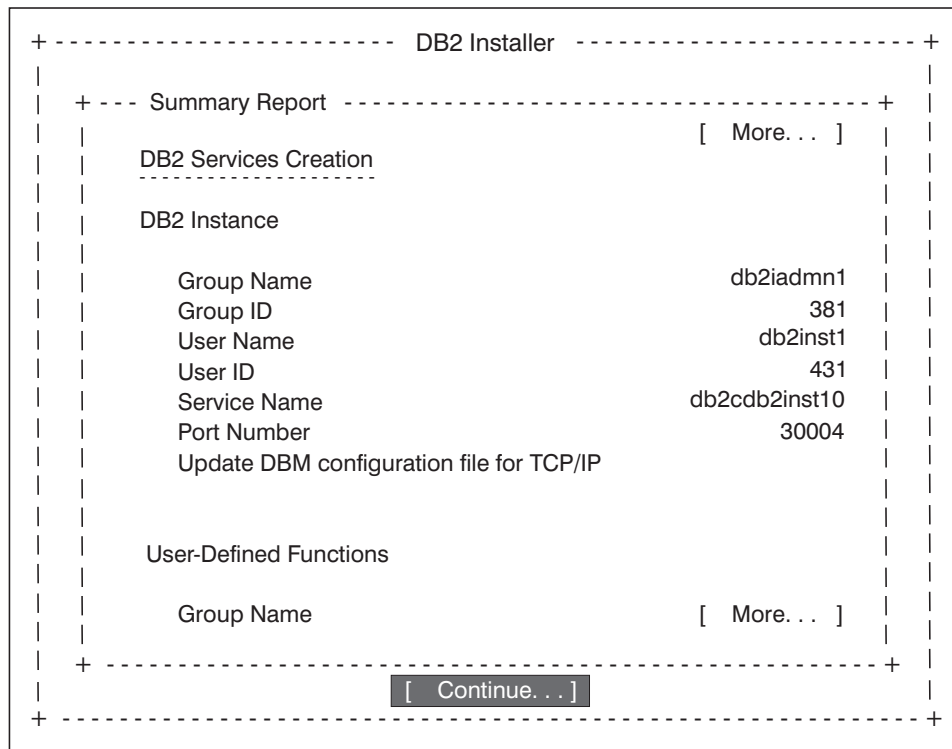
**9** At the Create DB2 Services screen, select **Create an Administration Server** to display the Administration Server screen.

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 change the default communication protocol, select **Customize**. Only the protocols you selected from the product component lists will display on the Administration Server 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**.

**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 **ViewLog** 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.

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

```

where      DB2DIR      = /usr/lpp/db2_05_00      on AIX
           = /opt/IBMcdb2/V5.0      on HP-UX or Solaris

```



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

**On AIX**

```
/usr/lpp/db2_05_00/install/db2setup
```

**On HP-UX or Solaris**

```
/usr/IBMcdb2/V5.0/install/db2setup
```



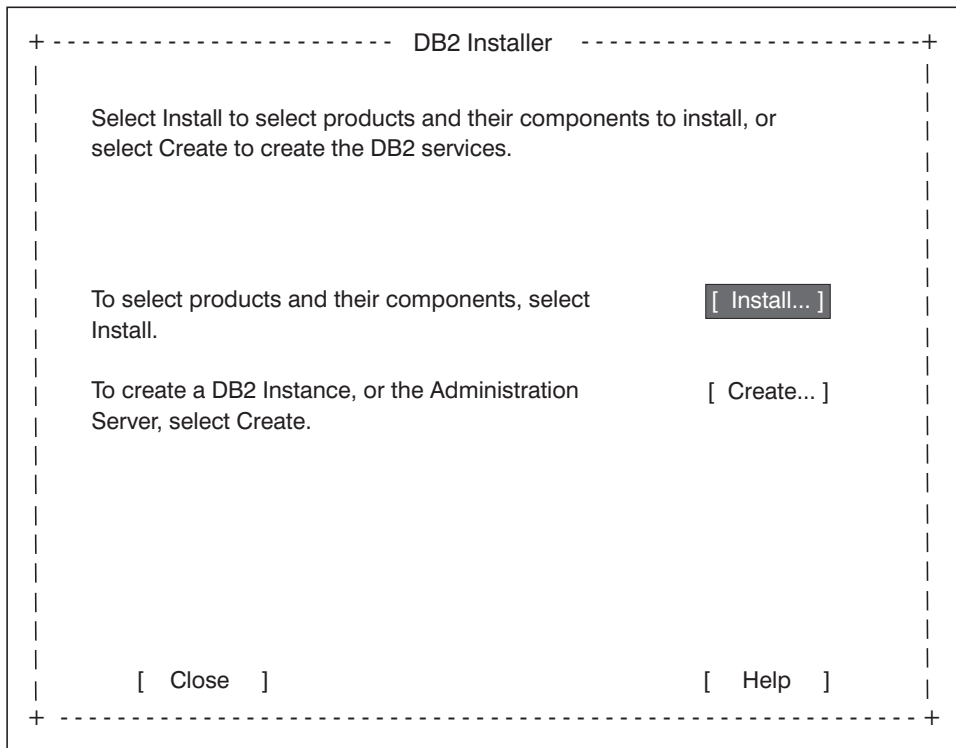
Go to "Installing Additional Products and Creating Additional Instances" on page 60 for information on optional installation activities or proceed directly to Chapter 6, "Migrating from Previous Versions" on page 63.

## ***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, after having installed DB2 Version 5, the main menu will look like the following screen.



To select additional products and their components for installation, select **Install** from the DB2 Installer screen. See step 6 on page 57 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 57 and step 9 on page 58 for instructions.

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





---

## Chapter 6. Migrating from Previous Versions

DB2 migration involves the following procedures:

- “Pre-Migration.”
- “Migrating Instances” on page 64.
- “Migrating Databases” on page 69.
- “Post Migration” on page 70.

To avoid difficulties during database migration, read this entire section before starting the migration process. It is strongly recommended that you follow all the steps listed in this chapter.

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

---

### Pre-Migration

This procedure helps you to ensure that all databases on your system can be migrated to DB2 Version 5. You need to perform the following steps:

- 1 Complete all database transactions.
- 2 Ensure all applications disconnect from each database.
- 3 Ensure all databases are cataloged.



The database migration verification tool, **db2ckmig** does not verify uncataloged databases. See “Verify that Databases Can Be Migrated” on page 65 for a description of how **db2ckmig** works.

- 4 Make a backup copy of all databases. Refer to the *Version 5 Administration Guide* for information on making a backup copy of a database and to the *Command Reference* for the syntax of the backup command.

**Note:** Make sure that this is the most recent backup copy of the database before you start the next procedure.

- 5 Stop the database manager.

---

# Migrating Instances

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

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 products, 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 products.

Each DB2 instance must be migrated separately. To successfully migrate a DB2 instance, you need to perform the following steps:

- Prepare the DB2 instance for migration.
- Verify that databases can be migrated. This step is optional. However, we recommend that you perform this step before migrating an instance.
- Migrate the DB2 instance.

**Note:** 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 or terminated. To prepare a DB2 instance for migration, you need to perform the following steps:

- 1 Log in as the DB2 instance.
- 2 Ensure that there are no applications using any databases owned by this DB2 instance.
  - You can get the list of all applications using databases owned by the instance using the following command:

```
db2 list applications
```
  - You can force termination of all applications using the following command:

```
db2 force applications all
```

**Note:** It is not recommended to force termination of applications. Some applications may have unexpected behavior when terminated using this command.

For usage and details of this command, refer to your current release *Command Reference*.

- Get a list of applications again to ensure that all applications have terminated, using the following command:

```
db2 list applications
```

- 3 Stop all database server processes owned by the DB2 instance by issuing the **db2stop** command.
- 4 Stop the DB2 license daemon by issuing the **db2licd end** command.
- 5 Stop all command line processor sessions by issuing a **db2 terminate** command in each session that was running the command line processor.

The DB2 instance is now ready for migration.

- 6 Log out as the DB2 instance.

## ***Verify that Databases Can Be Migrated***

Version 5 of DB2 provides the **db2ckmig** migration tool. This tool verifies whether all cataloged databases can be migrated. The **db2imigr** command in “Migrate the DB2 Instance” on page 68 uses the **db2ckmig** command to verify whether the cataloged databases can be migrated. However, to ensure that you can migrate all databases to Version 5, you should run the **db2ckmig** program before you migrate the instance.

You must correct errors reported by this program before continuing with instance migration. For detailed information about the **db2ckmig** program, refer to the Version 5 *Command Reference*.

For example, to verify that all cataloged databases can be migrated, log in as the instance owner and use the following command:

```
DB2DIR/instance/db2ckmig -e -a SERVER -l INSTHOME/migration.log
```

where	DB2DIR	= /usr/lpp/db2_05_00	on AIX
		= /opt/IBMd2/V5.0	on HP-UX or Solaris

and INSTHOME is the home directory of the instance.

Check the log file, INSTHOME/migration.log. If it shows any errors, see Table 11 on page 66 for suggested corrective actions.

**Note:** The log file displays the errors that occur when you run the **db2ckmig** program. Check that the log is empty before continuing with the instance migration. Backup the database after making corrections.

Table 11. Correcting Error Messages

Error	Action
A database is in Backup pending state	Perform a backup of the database.
A database is in Roll-forward pending state	Recover the database as required; perform or resume a Roll-forward Database to end of log and stop.
Table space ID not in normal state	Recover the database and table space as required; perform or resume a Roll-forward Database to end of logs and stop.
A database is in Database transaction inconsistent state	Restart the database to return it to a consistent state.
The database contains database objects that have a schema name of SYSCAT, SYSSTAT, or SYSFUN	<p>These schema names are reserved for the Version 5 database manager. To correct this error, do the following:</p> <ol style="list-style-type: none"> <li>1 Back up the database.</li> <li>2 Export the data from the database object (catalogs or tables).</li> <li>3 Drop the object.</li> <li>4 Recreate the object with the corrected schema name.</li> <li>5 Import/Load the data into the object.</li> <li>6 Run <b>db2ckmig</b> against the database again, ensuring that the database passes the <b>db2ckmig</b> check.</li> <li>7 Make a backup copy of the database.</li> </ol>
<p>The database contains database objects that have a dependency on the SYSFUN.DIFFERENCE function. Possible violated database objects are:</p> <ul style="list-style-type: none"> <li>• Constraint</li> <li>• Function</li> <li>• Trigger</li> <li>• View</li> </ul>	<p>The SYSFUN.DIFFERENCE function must be dropped and recreated during database migration. However, if there is a database object that is dependent on this function, migration will fail. To ensure that database migration is successfully completed and correct this error, do the following:</p> <p><b>Constraint</b> Issue the <b>alter table</b> command to drop the constraint.</p> <p><b>Function</b> Issue the <b>drop function</b> command to drop the function dependent on SYSFUN.DIFFERENCE.</p> <p><b>Trigger</b> Issue the <b>drop trigger</b> command to drop the trigger.</p> <p><b>View</b> Issue the <b>drop view</b> command to drop the view.</p> <p><b>Note:</b> Any package dependent on SYSFUN.DIFFERENCE will be marked inoperative after migration. Therefore, the <b>db2ckmig</b> program will not report any package that is dependent on the SYSFUN.DIFFERENCE function.</p>

All local databases now have the same authentication type as the instance where they reside; the authentication type in the database directory is ignored by DB2 Version 5 servers. If a warning is logged due to a conflicting authentication type, and you want a database to retain its previous authentication type, then you can do one of the following:

- Change the authentication type of the instance to the previous one.
- Move the database to another instance that has the desired authentication type.



Before changing the authentication type of the instance, you should make sure that the new authentication type will be appropriate for all databases residing there. Be certain to consider the security implications of the different authentication types.

If there are databases that you do not want to migrate, you can uncatalog them (along with all aliases); **db2ckmig** does not perform any verification of uncataloged databases.

Refer to the *Administration Guide* for more information about the actions required to correct these conditions.

## ***Migration Considerations for the User Exit Program***



Follow these instructions if you are using the user exit program, **db2uexit**, 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. These new interfaces are documented in the *Administration Guide*. The name for the user exit program has changed to **db2uexit2** in Version 5; in previous versions, it was called **db2uexit**.

The following should be considered before migrating instances:

- If the pre-version 5 **db2uexit** is installed in the INSTHOME/sql/lib/adm directory before migration, it will remain in this directory after migration. The Version 5 **db2uexit2** 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 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, following migration, you must copy **db2uexit** to `INSTHOME/sqllib/adm` directory. Then, you can do one of the following:

- If you are migrating from DB2 Version 2 or DB2/6000 Version 1, copy **db2uext2.v2** from `DB2DIR/misc` directory to `INSTHOME/sqllib/adm` directory and rename it to **db2uext2**. You can use the following command to copy the file:

```
cp DB2DIR/misc/db2uext.v2 INSTHOME/sqllib/adm/db2uext2
```

where            DB2DIR        = /usr/lpp/db2\_05\_00        on AIX  
                                       = /opt/IBMd2/V5.0            on HP-UX or Solaris

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

```
cp DB2DIR/misc/db2uext.pe INSTHOME/sqllib/adm/db2uext2
```

where            DB2DIR        = /usr/lpp/db2\_05\_00        on AIX  
                                       = /opt/IBMd2/V5.0            on HP-UX or Solaris

**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 Version 5 interfaces. The new user exit program should replace **db2uext2** in the `INSTHOME/sqllib/bin` directory, used to support the pre-version 5 user exit program, **db2uexit**, which should be removed.

## Migrate the DB2 Instance



Only local cataloged databases, owned by the DB2 instance, are checked for migration. Uncataloged databases may be unusable after the instance has been migrated.

After an instance is ready for migration, use the **db2imigr** command to migrate the instance. You need to perform the following steps:

- 1 Log in as root.
- 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/IBMd2/V5.0            on HP-UX 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 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.

**Notes:**

- a. The authentication type of the instance applies to all databases owned by the instance.
- b. Authentication type, DCE, is valid. However, it is not valid to choose DCE as an *AuthType* for this command. To enable DCE authentication for a DB2 instance, refer to the *Administration Guide*.

- 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.

- 3** If there are any errors in verifying that all databases can be migrated, see Table 11 on page 66 and take the suggested corrective actions. Then, reissue the **db2imigr** command.

---

## ***Migrating Databases***

To migrate databases owned by an instance, you need to perform the following steps:

- 1** Logon with a user ID that has SYSADM authority.
- 2** Ensure that the databases you want to migrate are cataloged.
- 3** Migrate the database. Refer to the *Version 5 Command Reference* for the database migration syntax command.

---

# Post Migration

There are optional activities you may want to undertake following database migration.

**Note:** You can also apply these optional activities to a down-level database backup which is restored to Version 5, because at the end of the restore, the database is migrated to Version 5.

- Unique index conversion to DB2 Universal Database Version 5 semantics

Version 5 of DB2 supports deferred unique constraint checking until end of statement. This can result in correct processing of multiple row updates, that in previous releases of DB2, returned an error because the updates temporarily created duplicate values in the transient state. Deferred unique constraint checking will guarantee that updates, that result in a table with only unique keys (for example,  $key = key + 1$ ), will succeed regardless of the order of the data.

**Note:** This change only applies for unique indexes that are created in Version 5 of DB2.

All unique indexes in a migrated database do not automatically migrate to Version 5 semantics during database migration because of the following reasons:

- Converting unique indexes is a very time-consuming operation.
- You may have applications that depend on the previous version's unique index semantics.
- You may want to manage the staged conversion of unique indexes on your own schedule, when needed.



All existing applications will continue to work even if the unique indexes are not converted to Version 5 semantics. You have to convert unique indexes to Version 5 semantics only if support for deferred uniqueness checking is required.

To convert unique indexes, you need to perform the following steps:

- 1 Log in with a user ID that has SYSADM authority.
- 2 Issue the **db2start** command.
- 3 Run the **db2uiddl** command against your migrated database. Refer to the Version 5 *Command Reference* for the syntax of this command.

The **db2uiddl** command searches the database catalog tables and generates all the CREATE UNIQUE INDEX statements for user tables in an output file.

- 4 Review the output generated from the **db2uiddl** command, and make changes, if needed. Comments in the output will flag any situations that require your attention.



- 5 Execute the file as a DB2 Command Line Processor command file, using a command similar to the following:

```
db2 -tvf filename
```

where `filename` is an output file from **db2uiddl**.

DB2 interprets the re-creation of an already-existing unique index to signal that the index is ready to be converted to Version 5 semantics.

- Update Statistics

When database migration is completed, the old statistics, used to optimize query performance, are retained in the catalogs. However, Version 5 of DB2 has statistics that are modified or do not exist in the previous version. To take advantage of these, you may want to issue the **RUNSTATS** command on tables, particularly those tables that are critical to the performance of your SQL queries.

Refer to the Version 5 *Command Reference* for the syntax of the **RUNSTATS** command. For details on the statistics, refer to the Version 5 *Administration Guide*.

- Rebind Packages

During database migration, all existing packages are invalidated. After the migration, each package is rebuilt when it is used for the first time by the Version 5 database manager. However, for better performance, we recommend that you run the **db2rbind** command to rebuild all packages stored in the database, after database migration is complete. Refer to the Version 5 *Command Reference* for the syntax of this command.

- Update database and database manager configuration

Some of the database configuration parameters are changed to Version 5 defaults or to other values during database migration. The same is true for database manager configuration parameters which may have changed, during instance migration, to Version 5 defaults or to other values.

The following database manager configuration parameters are changed to Version 5 defaults:

- **Sort heap threshold (sheapthres)**

If the migrating database configuration file has this parameter at a value which is less than the Version 5 default, the parameter is reset to its Version 5 default value.

- **Backup buffer (backbufsz)**

If the migrating database configuration file has this parameter at a value which is less than the Version 5 minimum, the parameter is reset to its Version 5 minimum value.

- **Restore buffer (restbufsz)**

If the migrating database configuration file has this parameter at a value which is less than the Version 5 minimum, the parameter is reset to its Version 5 minimum value.

- **Number of concurrent databases running against the database manager (numdb)**  
If the migrating database configuration file has this parameter at a value which is greater than the Version 5 maximum, the parameter is reset to its Version 5 maximum value.
- **TM-database (tmdatabase)**  
If the migrating database configuration file has this parameter set to NULL, the parameter is reset to 1ST\_CONNECT.
- **Query heap size (queryheapsz)**  
If the migrating database configuration file has this parameter at a value less than the Application Support Layer heap size (aslheapsz) of the same file, the parameter is reset to aslheapsz + 1.
- **Maximum number of idle agents (idleagents)**  
If the migrating database configuration file has this parameter greater than the Maximum Simultaneous agents (maxagents) of the same file, the parameter is reset to maxagents - 1.

The following database configuration parameters are changed to Version 5 defaults:

- **Application Control heap size (app\_ctl\_heap\_sz)**  
If the migrating database configuration file has this parameter at a value which is less than the Version 5 default, the parameter is reset to its Version 5 default value.
- **Lock List (locklist)**  
For Version 1 DB2 databases, the lock list parameter will be first adjusted to  $\text{locklist} * 32 / 25$ . If the migrating database configuration file has this parameter at a value less than the Version 5 default value, the parameter is reset to its Version 5 default value.
- **Database Heap (dbheap)**  
For Version 1 DB2 databases, the database heap size will first be adjusted to  $\text{dbheap} * 16$ . If the migrating database configuration file has this parameter at a value that is less than the Version 5 default, the parameter is reset to its Version 5 default value.
- **Default log space (logfilsiz)**  
The database migration process will attempt to increase the logfilsiz value, if the log file related parameters have a total logfilsiz that is less than the default logfilsiz value.

- **Application Heap size (applheapsz)**

For Version 1 DB2 databases, application heap size will be first adjusted to `applheapsz * 16`. If the migrating database configuration file has this parameter at a value which is less than the Version 5 default, the parameter is reset to its Version 5 default value.

- **Sort heap (sortheap)**

For Version 1 DB2 databases, the value of the sort heap parameter will be adjusted to `sortheap * 16`.

For better performance, you may want to tune your database and database manager configuration parameters to take advantage of Version 5 enhancements. Refer to the Version 5 *Command Reference* for the syntax of updating database and database manager configuration.

- Migrate Explain Tables



If you are not using explain tables in DB2 Version 2, skip this task.

---

Version 5 of DB2 has added several new columns to the explain tables. These columns provide for the capture of:

- Data for new SQL features added in Version 5
- More detailed access plan information.

While the explain function in Version 5 will continue to work with explain tables created for Version 2, the new Version 5 data will not be captured in them.

For better performance of SQL statements, we recommend that the Version 2 explain tables be dropped and new explain tables be created; see the *SQL Reference* and the *Administration Guide* for details on creating new explain tables. If, however, there are Version 2 explain tables that you need for ongoing comparison, you can use the `EXPLMIG.DDL` script to migrate them.

To migrate the explain tables in a database that has been migrated to Version 5, connect to the database and run the following command from the `sqliib/misc` directory:

```
db2 -tf EXPLMIG.DDL
```

The explain tables belonging to the user ID that is used to connect to the database will be migrated. To migrate explain tables belonging to another user, connect to the database with that user ID and run the command.



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## ***Part 3. Installing DB2 Clients***



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## Chapter 7. Installing DB2 Clients

Use the instructions in this section to perform an interactive installation of a DB2 client. You can also run unattended installations of DB2 products to remote target machines running OS/2, Windows 3.x, Windows 95, or Windows NT.



Go to the section that gives instructions for the DB2 client that you want to install.

- Chapter 8, "Installing DB2 Clients on OS/2 Workstations" on page 79.
- Chapter 9, "Installing DB2 Clients on Windows 95 or Windows NT Workstations" on page 81.
- Chapter 10, "Installing DB2 Clients on Windows 3.x Workstations" on page 85.
- Chapter 11, "Installing DB2 Clients on UNIX Workstations" on page 89.
- Chapter 12, "Installing DB2 Clients on Macintosh Workstations" on page 105.

---

Clients on a LAN that will connect to a DB2 Universal Database must have the DB2 Client Application Enabler or the DB2 Software Developer's Kit installed.



The DB2 Client Application Enabler is installed with any DB2 Version 5 product. If a DB2 Version 5 product currently exists on this workstation, the DB2 Client Application Enabler component has already been installed, and there is no need to install a DB2 Client Application Enabler. To configure your client to access remote servers, go to Chapter 13, "Configuring Client to DB2 Server Communications Using the CCA" on page 109.

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DB2 Client Application Enablers and DB2 SDKs are available for the following operating systems: AIX, DOS, HP-UX, Macintosh, OS/2, SCO OpenServer, Silicon Graphics IRIX, SINIX, Solaris, Windows 3.1x, Windows 95, and Windows NT.

You may install DB2 Client Application Enablers on any number of workstations; there are no licensing restrictions for installation. DB2 Enterprise Edition allows an unlimited number of users to connect to the server, DB2 Workgroup has use-based entitlement restrictions for the number of users that can connect to the server.

The DB2 Software Developer's Kits are on the DB2 SDK CD-ROM that comes with the AD Kit. The DB2 Client Application Enablers (except the DOS client) are on the Client Pack CD-ROM.



To obtain DB2 Client Application Enablers for all clients, including DOS, connect to the IBM Web site (<http://www.software.ibm.com>), search for the IBM Database 2 Client Application Enabler Pack, and follow the instructions provided.





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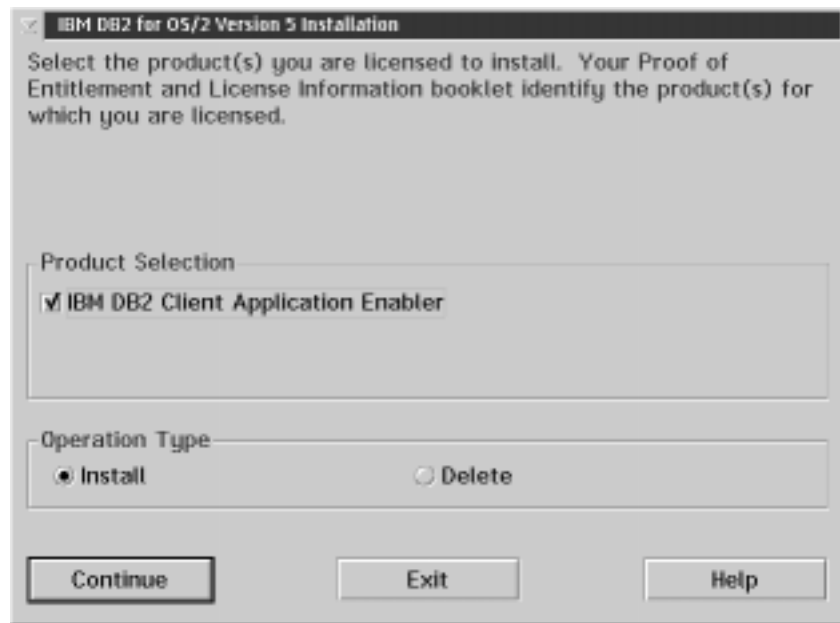
## Chapter 8. Installing DB2 Clients on OS/2 Workstations

This section contains the information you need to install the DB2 Client Application Enabler or the DB2 Software Developer's Kit on OS/2 workstations.

To install the DB2 Client Application Enabler for OS/2:

- 1 Insert the DB2 Client Pack CD-ROM that contains the OS/2 client into the drive.
- 2 Begin the installation program as follows:
  - Open an OS/2 windows and set the drive to x:, where x is the letter that represents your CD-ROM drive.
  - 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 35 on page 286 lists the code for each available language.
  - Enter the command **install**.

The IBM DB2 for OS/2 Version 5 Installation window opens.



To select the product that you want to install on your system, click on the **Continue** push button. The Update CONFIG.SYS File 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.
  - 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.
- 4 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.

You have the option of installing the Client Configuration Assistant component. The Client Configuration Assistant makes it easy for you to configure and administer connections to databases and to bind applications and utilities to a database. If the Client Configuration Assistant is not installed, you will need to manually configure connections to DB2 servers. Refer to "Managing Connections to Databases Using the Client Configuration Assistant" on page 17 for a complete description of the Client Configuration Assistant's features.
- b In the **File directory** field, type the directory where you want the product installed. The default value is c:\sqlib.

**Note:** If a DB2 Version 5 product is already installed on the 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 continue.

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, shut down and reboot your workstation before you can use the client.

**Note:** If you want to run Windows 3.1 applications on your OS/2 client, you must also install the DB2 Client Application Enabler for Windows 3.1 component on your system. You should install this client component 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 be used 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 13, "Configuring Client to DB2 Server Communications Using the CCA" on page 109.

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## **Chapter 9. Installing DB2 Clients on Windows 95 or Windows NT Workstations**

This section contains the information you need to install the DB2 Client Application Enabler on Windows 95 or Windows NT workstations.

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### **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 that you will need.

---

### **Creating a Username for Installing DB2 Products**

#### **Windows 95**

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 D, "Naming Rules" on page 287.

#### **Windows NT**

You need to have a username that will be used to install DB2. The username must belong to the 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 D, "Naming Rules" on page 287.

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.

---

## Performing the Installation

To install a DB2 Client Application Enabler for Windows 95 or Windows NT:

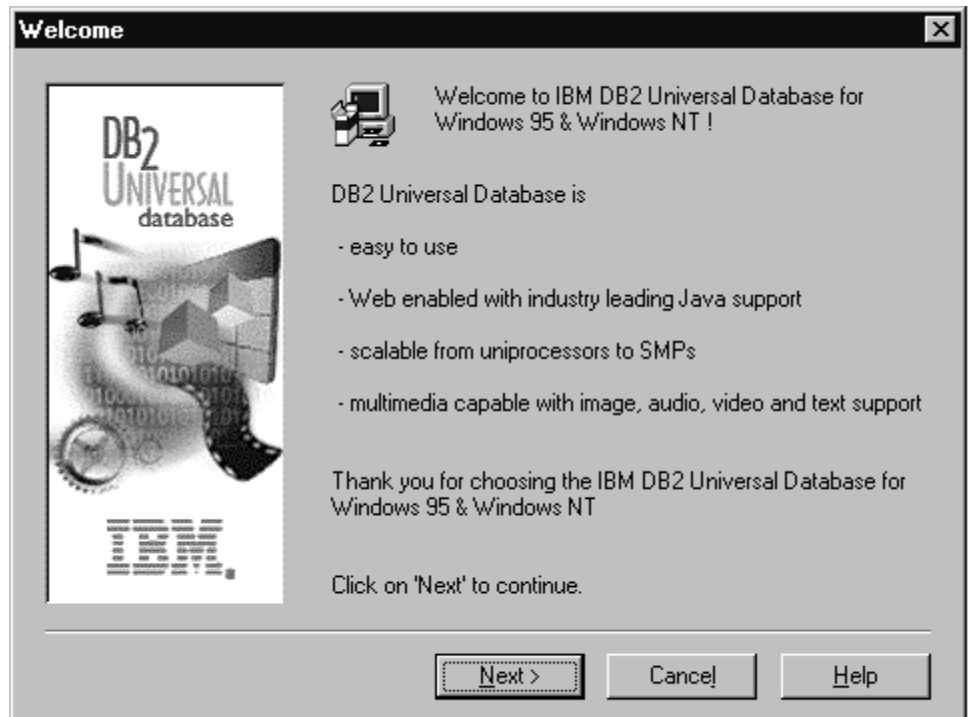
- 1 Log on as a user that meets the requirements for installing DB2. For more information, see “Creating a Username for Installing DB2 Products” on page 81.
- 2 Shut down any other programs so that the setup program can update files as required.
- 3 Insert the DB2 Client Pack CD-ROM that contains the Windows 95 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 the **Start** button and select **Run**
- 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 35 on page 286 lists the code for each available language.
- 3 Select **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, then 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. The DB2 instance is created.



**Compact Install:** Installs only the required DB2 components and ODBC support. The DB2 instance is created.



**Custom Install:** Installs only those components that you select. The DB2 instance is created.



The Client Configuration Assistant (CCA) component makes it easy for you to configure and administer connections to databases and bind applications and utilities to a database. See “Managing Connections to Databases Using the Client Configuration Assistant” on page 17 for a complete description of the CCA's features.

If the CCA is not installed, you will need to use the command line processor to configure connections to a DB2 server.

See Chapter 14, “Configuring Client-to-Server Communications Using the Command Line Processor” on page 113 to configure clients using the command line processor.

- 7 Respond to the setup program's prompts. Online help is available to walk you through the remaining steps. Invoke online help by clicking on the **Help** push button at any time.

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

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

- 8 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. This completes the installation.



For information on errors encountered during product 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 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).
- 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 13, “Configuring Client to DB2 Server Communications Using the CCA” on page 109.

---

## Chapter 10. Installing DB2 Clients on Windows 3.x Workstations

**Note:** If you have a previous version of the DB2 Client Application Enabler for Windows 3.1 installed on your system, it is recommended that you back it up before beginning this installation procedure.

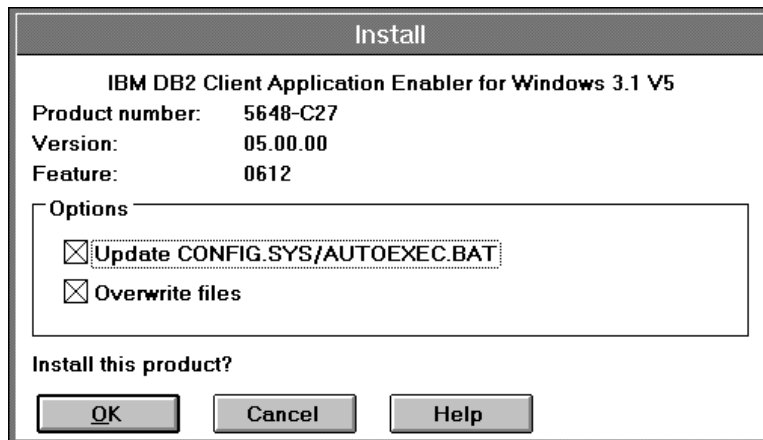
To install the DB2 Client Application Enabler on Windows 3.x workstations:

- 1 Insert the DB2 Client Pack 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*: is the letter representing your CD-ROM drive and where *language* is the two-character country code that represents your language (for example, EN for English). Table 35 on page 286 lists the code for each available language.

The Install window opens.



- 3 In the Install window, indicate whether or not you want to update the autoexec.bat file as part of 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.
  - 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.

Install - directories

Select the components that you want to install:

Client Application Enabler  
Documentation

Bytes needed: Unknown

Descriptions...  
Select all  
Deselect all

Enter the directories where you want to install the components.  
These directories will be created if they do not already exist.

File directory: C:\SQLLIB

Install... Disk space... Cancel Help

- 5 In the **File directory** field, type the directory where you want the product installed. The default value 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 DB2 Client Application Enabler for OS/2 Version 5 product installed, enter the same directory in the **File directory** field as the DB2 Client Application Enabler for OS/2 product. 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.

- 6 Select the components that you want to install.
- 7 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 end the installation.
- 8 Once you have completed the installation, shut down and reboot your system.





To configure your client to access a remote DB2 server, see Chapter 14, “Configuring Client-to-Server Communications Using the Command Line Processor” on page 113.

---



---

# **Chapter 11. Installing DB2 Clients on UNIX Workstations**

This section contains the information you need to install the DB2 Client Application Enabler on UNIX systems. Refer to the following sections as appropriate:

- “Installing on AIX, HP-UX and Solaris Systems” on page 90.
- “Installing on Other UNIX Systems” on page 98.

---

## **Before You Begin**

Before you begin installing DB2 products using the DB2 Installer, 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 can be /cdrom.

**Note:** On some UNIX operating systems, the CD-ROM is automatically mounted.

### **How much disk space does my operating system require for all selected products?**

See “Estimating Fixed Disk Requirements” on page 33 and “Disk Requirements Table” on page 33 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.

---

# Installing on AIX, HP-UX and Solaris Systems

To install the DB2 Client Application Enabler on AIX, HP-UX and Solaris systems, you will perform the following steps:

- 1 Update the kernel configuration parameters - see "Step 1. Updating Kernel Configuration Parameters." This step is not required on AIX.
- 2 Mount the DB2 Client Pack CD-ROM (see "Step 2. Mounting the DB2 Client Pack CD-ROM" on page 92).
- 3 Install the DB2 products - see "Step 3. Performing the Installation" on page 94.

## Step 1. Updating 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.

## Recommended Values for HP-UX

The following values in Table 12 are recommended for the HP-UX kernel configuration parameters.

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 the preceding table.

To change the values, do the following:

- 1 Use **SAM** and select **Kernel Configuration**.
- 2 Select **Configurable Parameters**.
- 3 Highlight the parameter to be changed.
- 4 Select **Modify Configurable Parameter** from the **Actions** menu and make the appropriate changes.
- 5 Repeat the previous two steps for every kernel parameter which needs to be updated.
- 6 Create a new kernel by selecting **Create a New Kernel** from the **Actions** menu.
- 7 Reboot the system so that the changes can take effect.



Go to "Step 2. Mounting the DB2 Client Pack CD-ROM" on page 92 to continue with the installation.

## ***Recommended Values for Solaris***

The following values in Table 13 are recommended for Solaris kernel configuration parameters.

<b>Kernel Parameter</b>	<b>Recommended Value</b>
<i>msgsys:msginfo_msgmax</i>	65535 (1)
<i>msgsys:msginfo_msgmnb</i>	65535 (1)
<i>msgsys:msginfo_msgseg</i>	8192
<i>msgsys:msginfo_msgssz</i>	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
```

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.

## Step 2. Mounting the DB2 Client Pack CD-ROM

To install DB2 Client Application Enabler using the DB2 Installer, you must first mount the CD-ROM. Use either the SDK Pack CD-ROM (to install the DB2 Software Developer's Kit) or the Client Pack CD-ROM to perform the installation. 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 root.
- 2 Insert the CD-ROM in the drive.
- 3 Create a root directory by typing the following command:

```
mkdir -p /cdrom
```



The directory name `/cdrom` is used here as an example only. You may use a different name for your root directory.

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

```
smit storage
```
- 5 Select **FileSystems**.
- 6 Select **Add/Change/Show/Delete FileSystems**.
- 7 Select **CD-ROM FileSystems**.
- 8 Select **Add CDROM FileSystems**.
- 9 Select the **DEVICE Name**.



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

- 10 Respond to the prompt, mount point, by typing the following:  
`/cdrom`
- 11 Mount the CD-ROM file system by typing the following command:  
`smit mountfs`
- 12 Select the **FileSystem** name. For example, the name can 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 out.



Go to "Step 3. Performing the Installation" on page 94 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 root.
- 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.



Go to "Step 3. Performing the Installation" on page 94 to continue with the installation.

---

## ***Mounting on Solaris Systems***

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

- 1 Log in as root.
- 2 Insert the CD-ROM in the drive.

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

```
/cdrom/unnamed_cdrom
```

where /cdrom/unnamed\_cdrom is the CD-ROM mount directory.

If the Volume Manager is not installed on your system, mount the CD-ROM by entering commands as shown in the following example:

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

- 3 Log out.

## Step 3. Performing the Installation

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



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

- 1 Log in as root.
- 2 Insert the DB2 Client Pack in the drive.
- 3 If required, mount the CD-ROM. Refer to “Step 2. Mounting the DB2 Client Pack CD-ROM” on page 92 if required.
- 4 Change to the directory where DB2 install images are available by typing the following command:
  - On AIX:

```
cd /cdrom/db2/aix
```
  - On HP-UX:

```
cd /cdrom/db2/hpux
```
  - On Solaris:

```
cd /cdrom/unnamed_cdrom/db2/solaris
```
- 5 Type the following command to start the DB2 Installer:

```
./db2setup
```



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



**Note:** Your screen will be different if you already installed DB2 Version 5 products on your system. See "Installing Additional Products and Creating Additional Instances" on page 60 for more information.

**6** Select **Install** to display the Install DB2 V5 screen as shown as follows.

```

+----- 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 Workgroup Edition               [ Customize. . . ]
|   [   ] DB2 UDB Enterprise Edition              : Customize. . . :
|   [   ] DB2 Connect Enterprise Edition          : Customize. . . :
|   [   ] DB2 UDB Extended Enterprise Edition     : Customize. . . :
|   [   ] DB2 Software Developer's Kit           [ 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 ]
+-----+

```

**7** From the product list on the Install DB2 V5 screen, select the DB2 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.

When you have finished selecting the product components to install, select **OK** to go to the Create DB2 Services screen. To undo any selections you made, select **Cancel**.



Go to step 10 on page 96 if you do not want to create a DB2 Instance at this time.

- 8 At the Create DB2 Services screen, select **Create a DB2 Instance** to display the DB2 Instance screen as shown as follows.

```

+----- Create DB2 Services -----+
|
| +--- DB2 Instance -----+
|
| Authentication:
|   Enter User ID, Group ID 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
|   Password      [           ]
|   Verify Password [           ]           [ Default ]
|
| Protocol:
|   Select Customize to change the default : Customize. . . :
|   communication protocol.
|
|   : : Auto start DB2 Instance at system boot.
|   : : Create a sample database for DB2 Instance.
|
|   [ 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**.

- 9 Enter the information and select **OK** to return to the Create DB2 Services screen.
- 10 After entering the values for the DB2 Instance, select **OK** to display the Summary Report as shown in the following screen. The report lists the installable items as well as the location of the installation log file.

```

+----- DB2 Installer -----+
|                               |
| +--- Summary Report ---+     |
|                               |
| DB2 Services Creation         |
|-----|                       |
| DB2 Instance                  |
|                               |
| Group Name                     db2iadmn1 |
| Group ID                       381       |
| User Name                      db2inst1  |
| User ID                        431       |
| Service Name                   db2cdb2inst10 |
| Port Number                    30004     |
| Update DBM configuration file for TCP/IP |
|                               |
| User-Defined Functions        |
|                               |
| Group Name                      [ More... ] |
|                               |
+-----+-----+
|                               |
| [ Continue... ]              |
|                               |
+-----+-----+

```

- 11** 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.
- 12** When the installation is complete, use the Up or Down arrow keys to review the Status Report. Select **ViewLog** to view the installation log file. Select **OK** to close the Status Report screen.
- 13** Select **Close** from the DB2 Installer screen to terminate the DB2 Installer.

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 or Solaris



Proceed either to Chapter 13, "Configuring Client to DB2 Server Communications Using the CCA" on page 109 or "Installing on Other UNIX Systems" on page 98.

---

## Installing on Other UNIX Systems

To install the DB2 Client Application Enabler on SINIX, SCO OpenServer or Silicon IRIX, you will perform the following steps:

- 1 Install the DB2 products. This includes mounting the DB2 Client Pack CD-ROM.
- 2 Update the kernel configuration parameters.
- 3 Create or assign groups and users.
- 4 Create an instance of the product.

You can also set the DB2 operating environment and optionally create links for DB2 files.

## Installing on a SINIX System

On the CD-ROM, the installation image for the DB2 Client Application Enabler for SINIX is available in the `/cdrom/db2/sinix/IBMdb2` directory. To install the DB2 products, you must use the **pkgadd** command.

Install the DB2 products as follows:

- 1 Log in as root.
- 2 Insert the Client Pack CD-ROM into the drive.
- 3 Mount the CD-ROM 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.

- 4 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 14 on page 99. After doing so, rebuild the SINIX kernel and reboot the system for the changes to take effect.

The following values are the minimum recommended:

SINIX RM600 Kernel Parameter	Recommended Value
MSGMAX	65535
MSGMNB	65535
MSGSEG	8192
MSGSSZ	16

**Note:** The kernel configuration parameters MDGMNB and MSGMAX must be changed to 65535.



Go to "Creating or Assigning Groups and Users" on page 101.

---

## Installing on an SCO OpenServer System

Install the DB2 products as follows:

- 1 Log in as root.
- 2 Insert the Client Pack CD-ROM into the drive.
- 3 Mount the CD-ROM. For example, to mount the CD-ROM as /cdrom, type:  

```
mkdir /cdrom  
mount /dev/cd0 /cdrom
```

Install images for DB2 products are available in the /cdrom/db2/sco/IBMdb2 directory.
- 4 Run the **custom** command. Type:  

```
custom
```

The Software Manager window opens.
- 5 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 Device** 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 Product Messages for SCO OpenServer.

Press Enter.

## 6 Update the kernel configuration parameters.

Change the values as given in the table that follows by updating the **/etc/conf/cf.d/stune** file. Then, rebuild the kernel and reboot the system for the changes to take effect.

Table 15. SCO OpenServer Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Recommended Value
MSGSSZ	64
SEMAP	100
SEMMNI	100
SEMMNS	100
SEMMNU	100



Go to “Creating or Assigning Groups and Users” on page 101.

## Installing on a Silicon Graphics IRIX System

On the CD-ROM, the installation image for Silicon Graphics IRIX products is contained in the **/cdrom/db2/sgi/IBMdb2** directory.

Install the DB2 software as follows:

- 1 Log in as root.
- 2 Insert the Client Pack CD-ROM into the drive.
- 3 Mount the CD-ROM 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/sc0d710 /cdrom
```

- 4 Install the DB2 Client Application Enabler. Type the following command:

```
pkgadd -d /cdrom/db2/sgi/IBMdb2 db2cliv21 db2conv
```



Go to "Creating or Assigning Groups and Users."

## *Creating or Assigning 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 root.
- 2 Create a system administration group ID. Use these commands on the following operating systems:

**SINIX, SGI** Use **sysadm** or **groupadd**

**SCO OpenServer** Use **scoadmin** or **groupadd**

For example, to create a group named dbadmin1 on SCO OpenServer, type:

```
groupadd dbadmin1
```

Use the appropriate command for the other operating systems when you create a group.

- 3 Create a user ID that will be the instance owner.

**SINIX, SGI** Use **sysadm** or **useradd**

**SCO OpenServer** Use **scoadmin** or **useradd**

For example, to create a user named inst1 on SCO OpenServer, type:

```
useradd -g dbadmin1 -G dbadmin1 -d /home/inst1 inst1  
passwd inst1
```

Use the appropriate command for the other operating systems when you create a user.



- When choosing a name for a group or user, follow the rules described in Appendix D, "Naming Rules" on page 287.
- Dedicate the instance-owner user ID to that instance's use only. This allows for easier error recovery if a system error occurs.

---

## Creating an Instance of the Product

Use the **db2icrt** command to create an instance of the product. Where you find **db2icrt** depends on your operating system:

- On SCO OpenServer, go to the `/usr/IBMdb2/V2.1/instance` directory.
- On SINIX and Silicon Graphics IRIX operating systems, go to the `/opt/IBMdb2/V2.1/instance` directory.

The syntax of the **db2icrt** command is:

```
▶▶ db2icrt — InstName — [-a AuthType] — [-u FencedID] —▶▶
```

where:

*InstName* 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 of the instance owner.



You should not create files or directories under *INSTHOME* other than those created by DB2 products. This avoids a potential loss of data if an instance is deleted. There is one exception. If your system supports fenced User Defined Functions and fenced Stored Procedures, put the fenced User Defined Functions and the fenced Stored Procedures applications in the *INSTHOME*/sqllib/function directory.



---

## Setting the DB2 Operating Environment

You must execute a script to set the DB2 operating environment and select an instance before starting DB2. On AIX, HP-UX, and Solaris, see Chapter 20, “Controlling Your DB2 Environment” on page 179 for more information on how to do this. For other UNIX operating systems, the sample scripts, **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 in your environment and instruct your users to do it.

---

## Creating Links for DB2 Files

If you are developing or running applications, you may want to create links for DB2 libraries to avoid needing to specify the full path to the product libraries and include files. To create these links, use the **db2ln** command.

- On SCO OpenServer systems, type:  
`/usr/IBMDB2/V2.1/cfg/db2ln`
- On SINIX and Silicon Graphics IRIX 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 servers, go to Chapter 14, “Configuring Client-to-Server Communications Using the Command Line Processor” on page 113.

---



---

## Chapter 12. Installing DB2 Clients on Macintosh Workstations

To install the DB2 Client Application Enabler on a Macintosh workstation, perform the following steps:

- 1 Insert the Client Pack CD-ROM into the drive.
- 2 Double-click on the **DB2 CLIENTS** 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 35 on page 286 lists the code 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, you will need to restart your computer to complete the installation. Click in the **Restart** push button to restart your computer and complete the installation.



To configure your client to access a remote DB2 server, see Chapter 14, "Configuring Client-to-Server Communications Using the Command Line Processor" on page 113.

---



---

## ***Part 4. Configuring DB2 Communications***



---

## Chapter 13. Configuring Client to DB2 Server Communications Using the CCA

---



Use the information in this section to use the Client Configuration Assistant to configure OS/2, Windows 95, and Windows NT workstations to access remote DB2 Universal Database servers.

To configure all other clients, see Chapter 14, "Configuring Client-to-Server Communications Using the Command Line Processor" on page 113.

---

Use the Client Configuration Assistant to configure your OS/2, Windows 95, or Windows NT client workstation to access remote DB2 Universal Database servers. The Client Configuration Assistant provides three configuration methods: one makes use of a server's access profile, one searches the network for databases, and the other requires that you enter the database name and the communication protocol values of the DB2 server.

Perform the following steps to configure your workstation to access remote servers:

- 1 Start the Client Configuration Assistant (CCA).

**For OS/2:**

Double-click on the **Client Configuration Assistant** icon, located in the **DB2 for OS/2** folder.

**For Windows 95 or Windows NT:**

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 with a file containing database access information, select the **Use an access profile** radio button and click on the **Next** push button.
    - a Click on the **Browse** push button to select an access profile, or enter the path and name of the file in the **File** field.
    - b You are presented with a list of systems, instances, and databases. Select the database that you want to use 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.



The **Other Systems (Search the network)** icon will only appear if the client's *discover* parameter is set to SEARCH.

- a Click on the **[+]** sign beside the **Known Systems** icon to list all the systems known to your client.
    - b Click on the **[+]** sign beside the 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.
    - c 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 the 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.
    - d 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. Enter the required communication protocol parameters and click on the **Next** push button. For more information, click on the **Help** push button.

Select the database that you want to add and proceed to Step 3.
  - 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. Click on the **Next** push button.
    - b Enter the required communication protocol parameters and click on the **Next** push button. For more information, click on the **Help** push button.
    - c Specify the name of the database that you want to connect to in the **Target database** field and proceed to Step 3.
- 3** To specify the database alias name or to add a description, click on the **Next** push button. If you do not specify a database alias name, the default will be the same as the database 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, select the **Register this database for ODBC** check box, select the radio button that describes the type of data source that you want to register this database as, and select the application that you want to use from the **Application** drop down box. Click on the **Done** push button to finish using the Add Database SmartGuide.



- 6 The Confirmation window opens. Click on the **Test Connection** push button to test the connection to the specified 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 the database. If you want to access another database, select the **Add Another** push button. To finish using the Add Database SmartGuide, click on the **Close** push button.

---

## Verifying the 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. If you do not have a database on the server, create the SAMPLE database on the server to test the connection. See "Creating the Sample Database" on page 134 for more information.

- 1 Start the database manager by issuing the **db2start** command on the server (if it was not automatically started at boot time).
- 2 Issue 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 database alias (*database\_alias*) is 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.

The values for *userid* and *password* must be valid for the system on which they are authenticated. By default, authentication takes place on the SERVER. If the database manager is configured for CLIENT authentication, the *userid* and *password* must be valid on the client.

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 tablename from sycat.tables"
```

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



You are ready to start using the DB2 client to communicate with a DB2 server . See Chapter 15, "Getting Started with the DB2 Universal Database" on page 133 for details.

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# Chapter 14. Configuring Client-to-Server Communications Using the Command Line Processor

This section describes how to use commands to configure a client workstation to communicate with a DB2 server using the command line processor.



If you are planning to use an OS/2, Windows 95, or Windows NT client for communications, the Client Configuration Assistant (CCA) makes it easy to automate the tasks of configuring and administering clients to communicate with servers. If you have installed the CCA, it is recommended that you use this utility to configure your clients for communications. See Chapter 13, "Configuring Client to DB2 Server Communications Using the CCA" on page 109 for more information.

For instructions on using the command line processor, see Chapter 19, "Entering DB2 Commands and SQL Statements" on page 173.



Go to the communication protocol that you want your client to use to access a remote server.

- TCP/IP - see "Configuring TCP/IP on the Client"
- IPX/SPX - see "Configuring IPX/SPX on the Client" on page 122
- APPC - refer to the *Installing and Configuring DB2 Clients* online manual for more information

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## 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 35 for the communication protocol requirements for your platform. See "Possible Client-to-DB2 Server Connectivity Scenarios" on page 42 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 the 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 16 (Page 1 of 2). TCP/IP Values Required at the Client

Parameter	Description	Sample Value	Your Value
Hostname ( <i>hostname</i> ) or IP address ( <i>ip_address</i> )	Use the <i>hostname</i> or <i>ip_address</i> of the remote server workstation.  To resolve this parameter: <ul style="list-style-type: none"> <li>• Issue the <b>hostname</b> command at the server to obtain the <i>hostname</i> parameter.</li> <li>• Issue the <b>ping server_hostname</b> command to obtain the <i>ip_address</i> parameter.</li> </ul>	serverhost or 9.21.15.235	

Table 16 (Page 2 of 2). TCP/IP Values Required at the Client

Parameter	Description	Sample Value	Your Value
Connection Port <ul style="list-style-type: none"> <li>• Connection Service name (<i>svcname</i>)</li> <li>• Port number/Protocol (Port_number/tcp)</li> </ul>	Values required in the services file. The Connection Service name is an arbitrary name used to represent the Port number ( <i>Port_number</i> ) on the client. The Port number for the client must be the same as the Port number that the <i>svcname</i> parameter maps to in the services file at the server. (The <i>svcname</i> parameter is located in the database manager configuration file on the server.) This value must not be in use by another application and must be unique within the services file.	server1  3700/tcp	
Node name ( <i>Node_name</i> )	A local alias, or nickname, that describes 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 DB2 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 117.

The client workstation 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 17 on page 116 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 17. Location of the Local Hosts and Services Files

Platform	Location
Macintosh	The hosts file is located in the folder called <b>System Folder</b> . <b>Note:</b> This operating system does not use a services file. You must catalog this node using the <i>Port_number</i> parameter. See "Step C. Catalog the TCP/IP Node" on page 117 for more information.
OS/2	Specified by the <i>etc</i> environment variable. Issue the <b>set etc</b> command to determine the location of your local hosts or services files. <b>Note:</b> For DOS and WIN-OS2 sessions, you might need to update the hosts and services files located in the <code>tcpip_product\dos\etc</code> directory.
Windows 3.x	Typically in the <code>tcpip_product\etc</code> directory, but it depends on the products that you have installed. Refer to your TCP/IP documentation for more information.
Windows 95	<code>windows</code> directory
Windows NT	<code>winnt\system32\drivers\etc</code> directory
UNIX	<code>/etc</code> directory

Using a local 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 specified 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 the TCP/IP node using the Port number (*Port\_number*), skip this step and go to “Step C. Catalog the 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 the 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

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 DB2 Server's Host Address” on page 115.

See Table 17 on page 116 for the location of the *services* file for your particular platform.

## Step C. Catalog the 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 *svcname* (or *Port\_number*) that are to be used to access the remote server.

To catalog the 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 133.



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 129 to catalog a node using the Client Setup tool.

- 2 If you are using UNIX, set up the instance environment and invoke the DB2 command line processor as follows:

- a. Run `db2profile` or `db2cshrc` as follows:

```
. INSTHOME/sql1lib/db2profile    (for Bourne or Korn shell)
source INSTHOME/sql1lib/db2cshrc (for C shell)
```

where `INSTHOME` is the home directory of the instance

- b. Start the DB2 command line processor by issuing the **db2** command.

- 3 Catalog the node by issuing the following commands in the command line processor:

```
catalog tcpip node Node_name remote [ hostname | ip_address ] server [ svcname | 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 133.

- 2 Fill in the *Your Value* column in the following worksheet.

<i>Table 18. Parameter Values for Cataloging Databases</i>			
<b>Parameter</b>	<b>Description</b>	<b>Sample Value</b>	<b>Your Value</b>
Database name ( <i>Database_name</i> )	The Database alias ( <i>Database_alias</i> ) of the <i>remote</i> database. When you create a database, it is automatically cataloged on the server with the Database alias name ( <i>Database_alias</i> ) the same as the Database name ( <i>Database_name</i> ).	sample	
Database alias ( <i>Database_alias</i> )	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 ( <i>Database_name</i> ). This is the name that you use when connecting to a database from a client.	tor1	
Node name ( <i>Node_name</i> )	The name of the node directory entry that describes where the database resides. Use the same value for Node name ( <i>Node_name</i> ) that you used to catalog the node in the previous step.	db2node	

- 3 If you are using UNIX, set up the instance environment and invoke the DB2 command line processor as follows:
  - a. Run db2profile or db2cshrc as follows:
 

```
. INSTHOME/sql1lib/db2profile    (for Bourne or Korn shell)
source INSTHOME/sql1lib/db2cshrc (for C shell)
```

 where INSTHOME is the home directory of the instance
  - b. Start the DB2 command line processor by issuing the **db2** command.
- 4 Catalog the database by issuing 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-DB2 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. If you do not have a database on the server, create the sample database on the server to test the connection. See "Creating the Sample Database" on page 134 for more information.

- 1 Start the database manager by issuing the **db2start** command on the server (if it was not automatically started at boot time).
- 2 Issue 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. By default, authentication takes place on the SERVER. If the database manager is configured for CLIENT authentication, the *userid* and *password* must be valid on the client.

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 tablename from syscat.tables"
```

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



You are ready to start using the DB2 server. See Chapter 15, “Getting Started with the DB2 Universal Database” on page 133 for details.

## Troubleshooting the Client-to-DB2 Server Connection

If the connection fails, check the following items:

At the *server*:

- 1 The *DB2COMM* registry parameter includes the value *tcPIP*.



Check the settings for the *DB2COMM* registry value by issuing the **db2set DB2COMM** command. For more information, see Chapter 20, “Controlling Your DB2 Environment” on page 179.

- 2 The services file was updated correctly.
- 3 The Service name (*svcsname*) parameter was updated correctly in the database manager configuration file.
- 4 The database was created and cataloged properly.
- 5 The database manager was stopped and started (issue 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, located in the *\$HOME/sql/lib/db2dump* directory, where *\$HOME* is home directory of the instance owner.

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 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 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 35 for the communication protocol requirements for your platform. See “Possible Client-to-DB2 Server Connectivity Scenarios” on page 42 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 19 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 Server” on page 228.



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 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 19 for a list of client specific IPX/SPX supported addressing methods.

Compare the IPX/SPX parameters in the database manager configuration file on the server machine, with those sample values in Table 20 on page 123, to determine which addressing method the server was configured to support.

*Table 19. IPX/SPX Supported Communication Methods for a DB2 Client*

Client Platform	Direct Addressing	File Server Addressing
Macintosh	no support	
OS/2	√	√
SCO OpenServer	√	
UNIX (except SCO OpenServer)	no support	
Windows 3.x	√	√
Windows 95	√	
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 20 (Page 1 of 2). IPX/SPX Values Required at the Client			
Parameter	Description	Sample Value	Your Value
File server name (FILESERVER)	<p><b>Direct Addressing</b> A * value indicates that you are using Direct Addressing.</p> <p><b>File Server Addressing</b> The name of the NetWare file server where the database server instance is registered. This parameter must be entered in UPPERCASE.</p> <p>Locate this parameter in the database manager configuration file on the server.</p>	<p><b>Direct Addressing</b> *</p> <p><b>File Server Addressing</b> NETWSRV</p>	
DB2 server object name (OBJECTNAME)	<p><b>Direct Addressing</b> The DB2 server's IPX/SPX internetwork address of the form: <i>netid (8 byte).</i> <i>nodeid (12 byte).</i> <i>socket # (4 byte)</i></p> <p>To resolve this parameter, issue the <b>db2ipxad</b> command at the server. See "A. Catalog the IPX/SPX Node" on page 124 for more information.</p> <p><b>File Server Addressing</b> The database manager server instance, represented as the object <i>OBJECTNAME</i> on the NetWare file server. The server's IPX/SPX internetwork address is stored and retrieved from this object.</p> <p>This parameter must be entered in UPPERCASE and be unique on the NetWare file server system.</p> <p>Locate this parameter in the database manager configuration file on the server.</p>	<p><b>Direct Addressing</b> 09212700.400011527745.879E</p> <p><b>File Server Addressing</b> DB2INST1</p>	

Table 20 (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 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 are to be used 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 133.



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 129 to catalog a node using the Client Setup tool.

- 2 If you are using UNIX, set up the instance environment and invoke the DB2 command line processor as follows:
  - a. Run db2profile or db2cshrc as follows:
 

```
. INSTHOME/sql1lib/db2profile    (for Bourne or Korn shell)
source INSTHOME/sql1lib/db2cshrc (for C shell)
```

 where INSTHOME is the home directory of the instance
  - b. Start the DB2 command line processor by issuing the **db2** command.

- 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, issue the **db2ipxad** command on the server. (This command is located in the *sqlib/misc/* directory.)

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*, under a DB2 server object named *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 133.

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

*Table 21. Parameter Values for Cataloging Databases*

Parameter	Description	Sample Value	Your Value
Database name ( <i>Database_name</i> )	The Database alias ( <i>Database_alias</i> ) of the <i>remote</i> database. When you create a database, it is automatically cataloged on the server with the Database alias name ( <i>Database_alias</i> ) the same as the Database name ( <i>Database_name</i> ).	sample	
Database alias ( <i>Database_alias</i> )	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 ( <i>Database_name</i> ). This is the name that you use when connecting to a database from a client.	tor1	
Node name ( <i>Node_name</i> )	The name of the node directory entry that describes where the database resides. Use the same value for Node name ( <i>Node_name</i> ) 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 129 to catalog a database node using the Client Setup tool.

**3** If you are using UNIX, set up the instance environment and invoke the DB2 command line processor as follows:

a. Run db2profile or db2cshrc as follows:

```
. INSTHOME/sql1lib/db2profile    (for Bourne or Korn shell)
source INSTHOME/sql1lib/db2cshrc (for C shell)
```

where INSTHOME is the home directory of the instance

b. Start the DB2 command line processor by issuing the **db2** command.

**4** Catalog the database by issuing 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. If you do not have a database on the server, create the sample database on the server to test the connection. See "Creating the Sample Database" on page 134 for more information.

- 1 Start the database manager by issuing the **db2start** command on the server (if it was not automatically started at boot time).
- 2 Issue 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. By default, authentication takes place on the SERVER. If the database manager is configured for CLIENT authentication, the *userid* and *password* must be valid on the client.

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 tablename from syscat.tables"
```

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



You are ready to start using the DB2 server. See Chapter 15, "Getting Started with the DB2 Universal Database" on page 133 for details.

## Troubleshooting the Client-to-Server Connection

If the connection fails, check the following items:

At the *server*:

- 1 The *DB2COMM* registry parameter includes the value *ipxspx*.



Check the settings for the *DB2COMM* registry value by issuing the **db2set DB2COMM** command. For more information, see Chapter 20, "Controlling Your DB2 Environment" on page 179.

- 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 (issue 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 Server" on page 228.
- 6 The database manager was stopped and started (issue 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, located in the *\$HOME/sqlib/db2dump* directory, where *\$HOME* is home directory of the instance owner.

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 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 APPC on the Client

This section assumes that APPC is functional on the client and server workstations. See “Software Requirements” on page 35 for the communication protocol requirements for your platform. See “Possible Client-to-DB2 Server Connectivity Scenarios” on page 42 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 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 databases instructions in Chapter 14, “Configuring Client-to-Server Communications Using the Command Line Processor” on page 113. 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 14, “Configuring Client-to-Server Communications Using the Command Line Processor” on page 113, 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.

### Catalog the Node

- 1 Select **Node->NewNode**, 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**.

### Catalog 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 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 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 14, "Configuring Client-to-Server Communications Using the Command Line Processor" on page 113, 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 Server Connection", for the protocol that you trying to configure, for more information.

---

## ***Part 5. Using DB2 Universal Database***



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# Chapter 15. Getting Started with the DB2 Universal Database

This section describes how to use the 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.”
  - “Creating the Sample Database” on page 134.
  - “Connecting to a Database” on page 135.
  - “Changing Default Privileges for Users” on page 136.
  - “Counting Concurrent Users” on page 137.
  - “Upgrading from a Try-and-Buy License” on page 139.
- 

---

## Logging on to the System

To use DB2, log on with a valid 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, starting the database manager, or creating the sample database) must belong to the System Administrative group. The *SYSADM\_GROUP* parameter is not set when DB2 is first installed; therefore, the following criteria are used to determine SYSADM authority:

- |                   |  |
|-------------------|--|
| <b>OS/2</b>       | A valid DB2 user ID which belongs to the UPM Administrator or Local Administrator group. |
| <b>UNIX</b>       | A valid DB2 username that belongs to the primary group of the instance owner's user ID.  |
| <b>Windows 95</b> | Any Windows 95 user.   |
| <b>Windows NT</b> | A valid DB2 username which belongs to Administrators group.                              |



You can override this default case by explicitly providing a group name for the *SYSADM\_GROUP* parameter. If you do this, the only way to assign SYSADM authority is by membership to this group.

See “Changing Default Privileges for Users” on page 136 for more information

See Appendix D, “Naming Rules” on page 287 for a list of restrictions on valid username or user IDs.

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.

---

## Creating the Sample Database

If you did not create the sample database during installation, you might want to create the sample database, called `SAMPLE`, that is provided with DB2 Universal Database. It contains tables, views, and fictitious data that you can use to verify that DB2 is correctly installed. For a detailed description of the sample database, refer to the *Administration Guide*.

The `SAMPLE` database requires approximately 9 MB of disk space and by default is created in the instance's home directory. It is automatically cataloged as the database alias `SAMPLE` when it is created.

To create the sample database, perform the following steps:

- 1 Log in as the instance owner.
- 2 Set up the instance environment.
- 3 Set up the instance environment and invoke the DB2 command line processor as follows:
  - a. Run `db2profile` or `db2cshrc` as follows:

```
. INSTHOME/sql1lib/db2profile    (for Bourne or Korn shell)
source INSTHOME/sql1lib/db2cshrc (for C shell)
```

where `INSTHOME` is the home directory of the instance
  - b. Start the DB2 command line processor by issuing the **db2** command.
- 4 Create a sample database with the following command:

```
db2samp1
```

This command may take a few minutes to process. There is no completion message, when the command prompt returns the process is complete.

To remove the `SAMPLE` database, enter the following command as the instance owner in the command line processor:

```
drop database sample
```



---

# Connecting to a Database

You need to connect to the 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. You connect to a database differently depending on the authentication type and where the database resides.

## Connecting to a local database

To connect to a local database called `SAMPLE`, type 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 database called `SAMPLE`, using `SERVER` authentication, type the following command in 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.)

- To connect a client to a database called `SAMPLE`, using `CLIENT` authentication, type the following command in the command line processor:

```
connect to sample
```



If you are connecting to the database from an OS/2 system, 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 are providing 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 as a Windows NT service; however, it is not started automatically.

To start the DB2 Security Service, double-click on the **Services** icon in the **Control Panel** folder. Select the **DB2 Security Server** option and click on the **Start** push button.

When a successful connection is made, a message similar to the following is displayed:

```
Database product      = DB2/6000 5.0.0
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.

For more information on authentication, refer to the *Administration Guide*.

---

## Changing Default Privileges for Users

By default, System Administrative (SYSADM) privileges are granted to the following:

- |                   |  |
|-------------------|--|
| <b>OS/2</b>       | A valid DB2 user ID which belongs to the UPM Administrator or Local Administrator group. |
| <b>UNIX</b>       | A valid DB2 username that belongs to the primary group of the instance owner's user ID.  |
| <b>Windows 95</b> | Any Windows 95 user.   |
| <b>Windows NT</b> | A valid DB2 username which belongs to Administrators group.                              |

To use another group as the System Administrative group (SYSADM\_GROUP), update the database manager configuration file.



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:
  - 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 System Administration Authority Group parameter 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:
  - 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.

---

## Counting Concurrent Users

DB2 Enterprise Edition allows an unlimited number of users to connect to the server.

DB2 Workgroup Edition and DB2 Connect Enterprise Edition products are 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 a DB2 Workgroup Edition server or a 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, use the Nodelock Administration Tool (NAT):



This tool is available only on AIX operating systems.

- 1 Log in as root.
- 2 If you are using NAT Version 3.0, append directory `"/var/ifor"` to the PATH environment variable:  
**For Bourne or Korn shell:**  
`PATH=$PATH:/var/ifor ; export PATH`  
**For C shell:**  
`setenv PATH "${PATH}:/var/ifor"`
- 3 Use the `/var/ifor/i4net` 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 INSTHOME/sqlib/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 updated the number of concurrent users allowed.

---

## Upgrading from a Try-and-Buy License

To upgrade your DB2 product from a demonstration license to a product license, you simply need to copy the license file from the DB2 CD-ROM to the system where DB2 is installed; you do not need to reinstall the product.

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

The following steps describe how to upgrade the license:



If you have purchased a product, other than the one that you have installed from the Try-and-Buy CD-ROM, you must first uninstall this product and install the one you have purchased. The program will automatically install the required license.

- 1 Log in as root.
- 2 Mount the CD-ROM, if required. See “Step 3. Mounting the CD-ROM” on page 53 for information on how to mount the CD-ROM.
- 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 or Solaris

and `license_filename` is the license file that corresponds to the product you have purchased:

**db2work.lic**     DB2 Universal Database Workgroup Edition  
**db2entr.lic**    DB2 Universal Database Enterprise Edition

**Note:** The DB2 product license key can be found in the **node.lock** file located as follows:

- For AIX:  
    /usr/lib/netls/conf/node.lock
- For HP-UX:  
    /usr/netls/node.lock
- For Solaris:  
    /var/netls/node.lock



---

## ***Chapter 16. Working with DB2 Instances***

The information in this chapter describes DB2 server instances and how to work with them.

A DB2 instance is a logical database manager environment where you catalog databases and set configuration parameters. On UNIX systems, a user ID is used as a DB2 instance. Depending on your needs, you can create more than one instance. On UNIX systems, a separate user ID is needed for every DB2 instance. You can use multiple DB2 instances to do the following:

- Use one instance for a development environment and another instance for a production environment.
- Tune a database instance for a particular environment.
- Restrict access to sensitive information.
- Control the assignment of SYSADM, SYSCTRL, and SYSMANT authority for each instance.
- Optimize the database manager configuration for each database instance.
- Limit the impact of an instance crash. In the unlikely event of an instance crash, only one instance is impacted. The other instance may continue to function normally.

However, multiple instances have some minor disadvantages:

- Additional system resources (virtual memory and disk space) are required for each instance.
- More administration is required because you have additional instances to manage.

---

### ***Creating Instances***

The user ID of the instance owner, and a group that is the system administration group are associated with every instance. These are assigned during the process of creating the instance. One user ID can be used for only one DB2 Instance. That user ID is also referred to as the instance owner.

Also, each instance owner must have a unique home directory. All of the files necessary to run the database 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 your data stored in the 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 user ID is also important. The primary group of the instance owner user ID automatically becomes the system administration group for the database instance and gains administration authority. (Administration authority allows users to start, stop, or change the database instance.) Other user IDs, that are members of the primary group of the Instance user ID, also gain this level of authority. For this reason, you may want to assign the instance owner ID to a primary group that is reserved for the administration of database instances. (Also make sure that you assign a primary group to the instance owner user ID; otherwise, the system default primary group will be used.)

If you already have a group that you want to make the system administration 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 administration authority on the database instance, add them to the group that is assigned as the system administration 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** or the **db2icrt** command to create an instance. See “Installing Additional Products and Creating Additional Instances” on page 60 to create DB2 Instances using the **DB2 Installer**. The **DB2 Installer** is available for AIX, HP-UX and Solaris operating systems.

You can also create additional DB2 instances using the **db2icrt** command as follows:

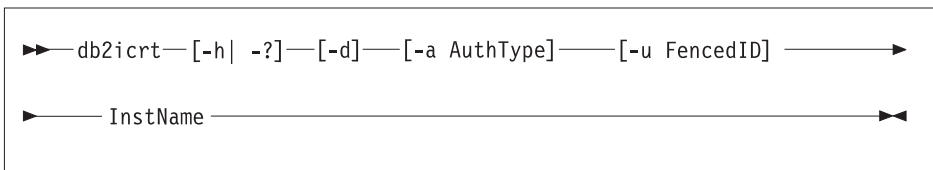
```
DB2DIR/instance/db2icrt -u FencedID InstName
```

where *Instname* is a string up to eight alphanumeric characters long (refer to the Appendix D, “Naming Rules” on page 287 for more information about naming rules) and

where	DB2DIR	= /usr/lpp/db2_05_00	on AIX
		= /opt/IBMcdb2/V5.0	on HP-UX or Solaris

**Note:** To create instances on SINIX, SCO OpenServer and Silicon Graphics IRIX operating systems, see “Creating an Instance of the Product” on page 102.

The syntax of the **db2icrt** command is:





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 server product 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. Authentication type, DCE, is valid. However, it is not valid to choose DCE as an *AuthType* for this command. To enable DCE authentication for a DB2 instance, refer to the *Administration Guide*.

- 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.

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

If a server product is installed, the syntax is:

```
db2icrt -u FencedID InstName
```

Examples:

- If you install the DB2 Universal Database Workgroup Edition or the DB2 Universal Database Enterprise Edition, you can use the following command to create an instance:

```
db2icrt -u db2fenc1 db2inst1
```

- If you installed the DB2 Connect Enterprise Edition only, you can use the instance name as the Fenced ID also:

```
db2icrt -u db2inst1 db2inst1
```

- 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 of the instance owner.



You should not create files or directories under *INSTHOME/sqllib* directory other than those created by DB2 products. This avoids a potential loss of data if an instance is deleted. There is one exception. If your system supports fenced User Defined Functions and fenced Stored Procedures, put the fenced User Defined Functions and the fenced Stored Procedures applications in the *INSTHOME/sqllib/function* directory.

---

## Listing Instances

To get a list of all the database instances that are available on a system, run the **db2ilist** command.

The **db2ilist** command is located in:

```
DB2DIR/bin/db2ilist
```

where	DB2DIR	= /usr/lpp/db2_05_00	on AIX
		= /opt/IBMd2/V5.0	on HP-UX or Solaris
		= /usr/IBMd2/V2.1	on SCO OpenServer
		= /opt/IBMd2/V2.1	on SINIX or SGI

To determine which database instance applies in the current session, enter:

```
echo $DB2INSTANCE
```

---

## Starting and Stopping a DB2 Server Instance

You must start a DB2 server instance before you can perform the following tasks:

- Connect to a database on the instance.
- Precompile an application.
- Bind a package to a database.
- Use DB2 Connect Enterprise Edition.

To start a database instance:

- 1 Log in as the instance owner.

- 2 Set up the instance owner environment by executing the **db2profile** or **db2cshrc** file for the DB2 Instance as follows:

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

where INSTHOME is the home directory of the DB2 instance.

- 3 Start the DB2 database manager by entering the **db2start** command from a command line.

To stop a database instance:

- 1 Log in as the instance owner.

- 2 Set up the instance owner environment by executing the **db2profile** or **db2cshrc** file for the DB2 Instance as follows:

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

where INSTHOME is the home directory of the DB2 instance.

- 3 Stop the DB2 database manager by entering the **db2stop** command from a command line.

---

## ***Auto-Starting Instances***

To enable an instance to auto-start after each system reboot, perform the following steps:

- 1 Log in as the instance owner.
- 2 Set up the instance owner environment. See “Setting the Operating Environment for Each DB2 Instance User” on page 146 for information on how to initialize the instance owner environment.

- 3 Turn on the auto-start flag in the instance's registry with the command:

```
db2set -i InstName DB2AUTOSTART=YES
```

where InstName is the login name of the instance.

To prevent an instance from auto-starting after each system reboot, perform the following steps:

- 1 Log in as the instance owner.
- 2 Set up the instance owner environment. See “Setting the Operating Environment for Each DB2 Instance User” on page 146 for information on how to initialize the instance owner environment.

- 3 Turn off the auto-start flag in the instance's registry with the command:

```
db2set -i InstName DB2AUTOSTART=
```

where InstName is the login name of the instance.

---

## Setting the Operating Environment for Each DB2 Instance User

Before a user can use DB2, the database environment for each user must be updated so that it can access a DB2 instance and run the DB2 programs. This applies to all users (including administrative users).

Two sample scripts **db2profile** (for Bourne or Korn shell) and **db2cshrc** (for C shell) are provided to help you set the environment. These scripts are available in the INSTHOME/sqllib directory. The scripts are copied and customized when an instance is created.

The instance owner (or any user that belongs to the same primary group as the instance owner) can customize the scripts for all users of an instance. Alternatively, these scripts can be copied and customized for each user.



The sample scripts contain 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.

The sample scripts can be invoked in two ways:

- Automatically. This sets the environment at logon time without requiring the users to type anything. The users can only access one instance.
- Manually. This requires the users to run the sample script for each instance that they want to use. In this way, the users can select which they want to use.

## 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.

Add one of the following statements to the `.profile` or `.login` file.

- For users that share one version of the script, add:

```
. INSTHOME/sql1lib/db2profile      (in Bourne or Korn Shell)
source INSTHOME/sql1lib/db2cshrc  (in 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:

```
. $HOME/db2profile                (in Bourne or Korn Shell)
source $HOME/db2cshrc             (in C Shell)
```

where `$HOME` is the home directory of user.

## Setting the DB2 Environment Manually

To choose which instance that you want to use, type one of the following statements at a command prompt. The period (`.`) and the space are required.

- For users that share one version of the script, add:

```
. INSTHOME/sql1lib/db2profile      (in Bourne or Korn Shell)
source INSTHOME/sql1lib/db2cshrc  (in 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:

```
. $HOME/db2profile                (in Bourne or Korn Shell)
source $HOME/db2cshrc             (in C Shell)
```

where `$HOME` is the home directory of user.

If you want to work with more than DB2 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 DB2 instances called `test` and `prod`, and their home directories are `/u/test` and `/u/prod`. In window 1, you would type:

```
. /u/test/sql1lib/db2profile      (in Bourne or Korn Shell)
source /u/test/sql1lib/db2cshrc  (in C Shell)
```

and in window 2, you would type:

```
. /u/prod/sql1lib/db2profile      (in Bourne or Korn Shell)
source /u/prod/sql1lib/db2cshrc  (in C Shell)
```

You would use window 1 to work with the test instance and window 2 for the prod instance.



To ensure that you are using the correct instance, use the following command:

```
which db2
```

It will show you the full path name for the DB2 command. This path should include the home directory of the instance.

---

## Updating Instances

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 will 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 a DB2 product is updated by installing a PTF or a patch, all the existing DB2 instances should be updated using the **db2iupdt** command.

Running the **db2iupdt** script will update the specified instance by performing the following processing:

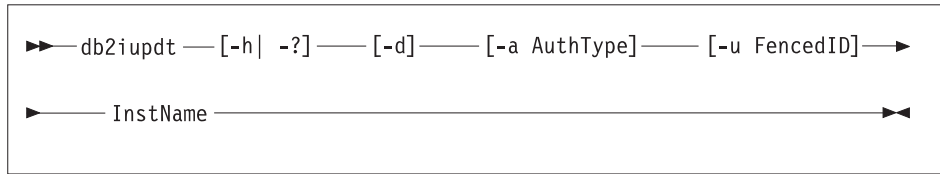
- 1 Replace the files in `INSTHOME/sql1lib` directory, where `INSTHOME` is the home directory of the instance.
- 2 If the node type is changed, then a new database manager configuration file is created. This is done by merging relevant values from the existing database manager configuration file with 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/sql1lib/backup/db2system.old
```

The **db2iupdt** command is available in the `DB2DIR/instance` directory, where:

where	DB2DIR	= /usr/lpp/db2_05_00	on AIX
		= /opt/IBMd2/V5.0	on HP-UX or Solaris

The syntax of the **db2iupdt** command is:



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 server product 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. Authentication type, DCE, is valid. However, it is not valid to choose DCE as an *AuthType* for this command. To enable DCE authentication for a DB2 instance, refer to the *Administration Guide*.

- u *FencedID*** Is the user under which the fenced UDFs and Stored Procedures will execute. This is not required if you install the DB2 Software Developer's Kit or the DB2 Client Application Enabler. For other products, this is an required parameter.

**Note:** *FencedID* may not be root or bin.

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

If a server product is installed, the syntax is:

```
db2iupdt -u FencedID InstName
```

Examples:

- If you installed the DB2 Universal Database Workgroup Edition or the DB2 Universal Database Enterprise Edition after the instance was created, you can use the following command to update that instance:

```
db2iupdt -u db2fenc1 db2inst1
```

- If you installed the DB2 Connect Enterprise Edition after creating the instance, you can use following command to update that instance:

```
db2iupdt -u db2inst1 db2inst1
```

- To update all other 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

To remove a DB2 instance, perform the following steps:

- 1 Log in as the instance owner.
- 2 Make sure the database manager instance is stopped (if DB2 server is installed).
- 3 Back up files in the `INSTHOME/sqllib` directory, if needed. For example, you might want to save the database manager configuration file, **db2system**, or user-defined function or fenced stored procedures applications in `INSTHOME/sqllib/function`, where `INSTHOME` is the home directory of the instance owner.
- 4 Log out as the instance owner.
- 5 Log in as root.
- 6 Remove the DB2 instance by executing the **db2idrop** command:

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

where	DB2DIR	= /usr/lpp/db2_05_00	on AIX
		= /opt/IBMd2/V5.0	on HP-UX or Solaris
		= /usr/IBMd2/V2.1	on SCO OpenServer
		= /opt/IBMd2/V2.1	on SINIX or SGI

and `InstName` is the login name of the instance.

- 7 As *root*, 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 17. Using the Administration Server

This chapter shows you how to manually create the Administration Server. It also describes how to start, stop, list and remove the Administration Server.

**Note:** You can only have one Administration Server for each operating system.

---

### Creating the Administration Server

To create the Administration Server, you must have root authority to run the **dasicrt** command at a command prompt. The syntax of the **dasicrt** command is as follows:

```
DB2DIR/instance/dasicrt ASName
```

where           DB2DIR       = /usr/lpp/db2\_05\_00       on AIX  
                              = /opt/IBMd2/V5.0           on HP-UX or Solaris

and where *ASName* is the name of the Administration Server, which is composed of a string of up to eight alphanumeric characters long. Refer to Appendix D, "Naming Rules" on page 287 for further information.

You use the name of the Administration Server to set up the directory structure and access permissions.



To start the newly-created Administration Server:

- Use the **db2admin** command for a manual start (refer to "Starting the Administration Server" on page 152).
- Reboot the system and it will be automatically started during the boot up.

---

## Starting the Administration Server

To start the Administration Server, you must perform the following steps:

- 1 Log in as the Administration Server owner.
- 2 Set up the instance owner environment by executing the **db2profile** or **db2cshrc** file for the DB2 Instance as follows:

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

where INSTHOME is the home directory of the DB2 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 Set up the instance owner environment by executing the **db2profile** or **db2cshrc** file for the DB2 Instance as follows:

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

where INSTHOME is the home directory of the DB2 instance.

- 3 Stop the Administration Server using the **db2admin** command as follows:

```
db2admin stop
```

---

## Listing the Administration Server

To obtain the name of the Administration Server on your system, you must have root authority to run the **db2set** command at a command prompt. The syntax of the command is as follows:

```
DB2DIR/bin/db2set -g DB2ADMINSERVER
```

where            DB2DIR        = /usr/lpp/db2\_05\_00        on AIX  
                              = /opt/IBMd2/V5.0        on HP-UX or Solaris

---

## Removing the Administration Server

To remove the Administration Server, you must perform the following steps:

- 1 Log in as the Administration Server owner.
- 2 Set up the instance owner environment by executing the **db2profile** or **db2cshrc** file for the DB2 Instance as follows:

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

where INSTHOME is the home directory of the DB2 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 out as the Administration Server owner.
- 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/IBMd2/V5.0        on HP-UX 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 18. Running Your Own Applications

Various types of applications can access DB2 databases:

- Applications developed using the DB2 SDK 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) 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 of DB2, you must bind the utilities once for each operating system/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 . Each file is specific to a server.

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

- On OS/2, Windows 95, and Windows NT operating systems, you can use the Client Configuration Assistant:
  - 1 Start the Client Configuration Assistant (CCA).
  - 2 Select the database to which you want to bind the utilities.
  - 3 Click on the **Bind** push button.
  - 4 Select the **Bind DB2 Utilities** radio button.
  - 5 Click on the **Continue** push button.
  - 6 Enter a user ID and password to connect to the database. The user ID must have the authority to bind new packages against the database.
  - 7 Select the utilities you want to bind and click on **OK**.
- On all operating systems, you can use the command line processor:
  - 1 Change to the bnd directory in the install path. For example:  
INSTHOME/sqllib/bnd
  - 2 Connect to the database using the command:  

```
connect to database_alias
```

where `database_alias` is the name of the database to which you want to connect.
  - 3 Issue the following commands in the Command Center or the command line processor:  

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

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

```
connect reset
```

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

**Notes:**

1. The db2ubind.lst file contains the list of bind (.bnd) files required to create the packages for the database utilities. The db2cli.lst file contains the list of bind (.bnd) files required to create packages for the DB2 CLI and the DB2 ODBC driver.
2. Binding may take a few minutes to complete.
3. To bind to databases that reside on OS/390, MVS, VM, or AS/400, refer to the *DB2 Connect User's Guide* for instructions.



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

---

## Running CLI/ODBC Programs

The DB2 Call Level Interface (CLI) run-time environment and the ODBC driver are included with the DB2 Client Application Enabler. This is contained on the DB2 Client Pack 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 155 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 remote system (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 the icon labelled **Local**.) 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 3.1, 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 3.1 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. Create a unique index 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 click on 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 168
- “How to Set CLI/ODBC Configuration Keywords” on page 168
- “Configuring db2cli.ini” on page 169

## ***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 3.1, Windows 95 and Windows NT Client Access to DB2 using CLI/ODBC” on page 159
  - “OS/2 Client Access to DB2 using CLI/ODBC” on page 161
  - “UNIX Client Access to DB2 using CLI/ODBC” on page 163
-



## **Windows 3.1, Windows 95 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 3.1, Windows 95, or Windows NT 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 237 for more details.

For more information refer to the on-line help in the CCA (or the **catalog** command in the *Command Reference*).

- 2** Verify that the Microsoft ODBC Driver Manager and the DB2 CLI/ODBC driver are installed. On Windows 95 and Windows NT they are both installed with DB2 unless the ODBC component is manually unselected during the install. On Windows 3.1 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 95 or Windows NT operating systems, **odbcadm.exe** on Windows 3.1.
- 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 in Windows 95 or Windows NT, or double-click on the **Install ODBC Driver** icon in the DB2 program group in Windows 3.1.

- 3** Register the DB2 database with the ODBC driver manager as a *data source*. On Windows 95 and Windows NT 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 95 and Windows NT you can use the radio buttons to add the data source as either a user or system data source.

- Using the Microsoft **32bit 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 95 and Windows NT 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 95 and Windows NT 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.

See the

```
CATALOG [ user | system ] ODBC DATA SOURCE
```

command in the *Command Reference* for more information.

- 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 169.

- 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 95 or Windows NT.

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 167:

- “How to Bind the DB2 CLI/ODBC Driver to the Database” on page 168
  - “How to Set CLI/ODBC Configuration Keywords” on page 168
  - “Configuring `db2cli.ini`” on page 169
- 

## ***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 237.

- 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 169.

**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 167:

- “How to Bind the DB2 CLI/ODBC Driver to the Database” on page 168
- “How to Set CLI/ODBC Configuration Keywords” on page 168
- “Configuring db2cli.ini” on page 169

## ***UNIX Client Access to DB2 using CLI/ODBC***

Before DB2 CLI and ODBC applications can successfully access a DB2 database from a UNIX client, perform the following steps on the client system:

- 1** The DB2 database (and node if the database is remote) must be cataloged. To do so, use the command line processor.

For more information see Chapter 14, “Configuring Client-to-Server Communications Using the Command Line Processor” on page 113 or the **catalog** command 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 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/odbclic` subdirectory.
- If the Driver Manager was installed by another program, the file `.odbc.ini` (begins with a period) would be located in the root directory of the user ID that runs the ODBC application.

- b** The Driver Manager uses two initialization files:

- odbcinst.ini** ODBC Driver Manager's configuration file indicating which database drivers are installed. Each user that will use ODBC must have access to this file.
- .odbc.ini** End-user's data source configuration. Each user has a separate copy of this file.

A sample template of these files are provided in the `sqllib/odbclic` subdirectory.

### 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/odbclic 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/odbclic
```

Indicates that /u/thisuser/sqllib/odbclic 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/odbc/lib subdirectory for an example. You can also see “How to Configure ODBC.INI” on page 169 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 169. 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 167:

- “How to Bind the DB2 CLI/ODBC Driver to the Database” on page 168
  - “How to Set CLI/ODBC Configuration Keywords” on page 168
  - “Configuring db2cli.ini” on page 169
- 

## ***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 237.
- 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=app1: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 158 should provide you with all of the information you require. The following additional information is useful where DB2 tool support is not available, and for administrators who require more detailed information.



---

The following topics are covered in this section:

- “How to Bind the DB2 CLI/ODBC Driver to the Database” on page 168
  - “How to Set CLI/ODBC Configuration Keywords” on page 168
  - “Configuring db2cli.ini” on page 169
- 

## ***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 155 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:

<b>Platform:</b>	<b>Location:</b>
<b>OS/2</b>	sqllib directory
<b>Windows NT</b>	sqllib directory
<b>Windows 95</b>	sqllib directory
<b>Windows 3.1</b>	sqllib\win directory
<b>UNIX</b>	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 158 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 odbccinst.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 odbccinst.ini where required) are located:

**Platform: Location:**

**Windows** *drive*:\windows (where *drive* is the drive where Windows is installed)

**Win-OS/2** *drive*:\os2\mdos\winos2 (where *drive* is the drive where OS/2 is installed)

**UNIX** Home directory of user ID running ODBC application

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=drive:\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.
- *drive* 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 163 contains detailed steps on how to update both the `odbc.ini` and `odbcinst.ini` files.

---

## Running Java Programs

You can use DB2 Java Database Connectivity (JDBC) support to run the following types of Java programs:

- Java applications, which rely on the DB2 Client Application Enabler to connect to DB2.
- Java applets, that do not require any other DB2 component code on the client.

Java can also be used on the server to write user-defined functions, stored procedures, and table functions.

For further information on developing Java applications that access DB2 databases refer to the Web page located at <http://www.software.ibm.com/data/db2/java/> and the *Road Map to DB2 Programming*.

## Configuring the Environment

The following environment variables must be set to run Java programs:

### OS/2, Windows 95 and Windows NT

- CLASSPATH includes "." and the file `sqllib\java\db2java.zip`
- PATH includes the directory `sqllib\bin`
- LIBPATH includes the directory `sqllib\dll` (OS/2 only)

### UNIX (AIX, Solaris and HP-UX)

In the following settings *instance\_name* is the home directory of the DB2 instance owner.

- CLASSPATH includes "." and the file `instance_name/sqllib/java/db2java.zip`
- PATH includes the directory `instance_name/sqllib/bin`
- LD\_LIBRARY\_PATH includes the directory `instance_name/sqllib/lib`
- SHLIB\_PATH include the the directory `instance_name/sqllib/lib` (HP-UX only)

## Java Applications

Start your application from the desktop or command line, like any other application. The DB2 JDBC driver handles the JDBC API calls from your application and uses the DB2 Client Application Enabler to communicate the requests to the server and receive the results.

## Java Applets

Because Java applets are delivered over the Web, you treat them a bit differently than Java applications. You must install DB2 (server or client) on the same machine as your Web server, then install the Java Development Kit (JDK) Version 1.1 from Sun Microsystems on the server as well (refer to <http://www.software.ibm.com/data/db2/java> for details).

To run your applet, you need only a Java-enabled Web browser on the client machine. When you load your HTML page, the applet tag downloads the Java applet to your machine, which then downloads the Java class files, including the `COM.ibm.db2.java.sql` and `COM.ibm.db2.jdbc.net` classes and DB2's JDBC driver. 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.

To run your applets, do the following:

- 1 Start the DB2 JDBC applet server on your Web server by entering:  

```
db2jstrt portno
```

where *portno* is the number of the unused TCP/IP port that you specified in the `DB2Applt.java` file.
- 2 On your client system, start your Web browser and load the HTML file that imbeds your applet.

---

## Chapter 19. 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 an OS/2, Windows 95, or Windows NT workstation. Otherwise, you can issue commands in the command line processor or a system command prompt.

Task: Entering DB2 commands, SQL statements, and operating system commands	
Operating System	Tools
OS/2	<ul style="list-style-type: none"><li>• Command Center</li><li>• command line processor</li><li>• command prompt</li></ul>
Windows 95 or Windows NT	<ul style="list-style-type: none"><li>• Command Center</li><li>• command line processor</li><li>• command window</li></ul>
Windows 3.1	<ul style="list-style-type: none"><li>• command line processor</li></ul>
UNIX	<ul style="list-style-type: none"><li>• command line processor</li><li>• command-line prompt</li></ul>
Macintosh	<ul style="list-style-type: none"><li>• command line processor</li></ul>

---

### Using the Command Center

On OS/2, Windows 95 and Windows NT 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 one or many SQL statements and DB2 commands in a result 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 operating systems:

- 1 Double-click the **DB2 for OS/2** folder.
- 2 Double-click on the **Command Center** icon.

To invoke the Command Center on Windows 95 and Windows NT:

- 1 Click on **Start**.
- 2 Select **Programs->DB2 for Windows->Command Center**.

The Command Center contains a large input area in which you type your commands. To start a command on a new line use the Enter key. To run the commands you have entered, select the **Start or stop execution** icon from the menu bar, or use CTRL+Enter.

Do not type the commands with a db2 prefix; instead, enter the command as follows:

```
list node directory;
```

If you want to run multiple commands, you must end each command with a semicolon, then press Enter to start the next command on a new line.

**Note:** The semicolon is optional at the end of a single quick command, and at the end of the final command in a series.

After you run a command, the Command Center displays the Results window, which informs you how the commands are proceeding.

To recall commands that you have typed in interactive mode, click on the arrow beside the narrow input window. To save commands entered in interactive mode as scripts, select **Script->Save as** from the menu bar.



If you want to store commonly-used SQL statements or DB2 commands as scripts, select the **Script** icon from the main tool bar.



---

# Using the Command Line Processor

You can use the command line processor to enter SQL statements and DB2 commands. It operates in the following modes:

<b>Interactive Input Mode</b>	You can enter DB2 commands or SQL statements and view their output.
<b>Command Line Mode</b>	The DB2 command line processor behaves like a command window from your operating system. You can enter DB2 commands or SQL statements and view their output.
<b>File Input Mode</b>	Refer to the <i>Command Reference</i> 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 the **DB2 for OS/2** folder.
  - 2 Double-click on the **Command Line Processor** icon.
- On Windows 95 and Windows NT operating systems:
  - 1 Click on **Start**.
  - 2 Select **Programs->DB2 for Windows->Command Line Processor**.
- On Windows 3.1, use one of the following methods:
  - From a DOS full screen, enter the **win db2clpw** command.
  - From Windows:
    - 1 Double-click the **DB2** folder.
    - 2 Double-click on the **Command Line Processor** icon.
- On Macintosh:
  - 1 Double-click 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 following command at a command prompt:

- On OS/2 and UNIX, enter **db2**.

- On Windows 95 and Windows NT, enter **db2cmd**, then enter **db2**.

In interactive input mode, the prompt looks like this:

```
db2 =>
```

This prompt indicates that you do not type DB2 commands with a db2 prefix; instead, you just type the DB2 command. For example:

```
list node directory
```

To run operating system commands in interactive mode, precede the operating-system command with an exclamation mark (!). For example:

```
!dir db2*.log
```

**Note:** Windows 3.1x 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 firstname, lastname, dateofbirth, from \  
db2 (cont.) => staff where height=123, order by \  
db2 (cont.) => lastname
```

**Note:** You do not need to use a line continuation character when entering long commands in interactive input mode on Windows 3.1 workstations.

To end interactive input mode, type **terminate**.

## ***Command Line Mode***

On UNIX, you can issue 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 95 and Windows NT 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 meanings 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 information from the *employee* table, even if the \* character has a special meaning on the operating system:

```
db2 "select * from employee"
```

2. Command line mode is not available on Windows 3.1x systems.



For further information on using the command line processor, refer to the *Command Reference*.

---



---

## Chapter 20. 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 180.
  - To set DB2 environment variables, see:
    - “Setting Your Environment on OS/2” on page 181.
    - “Setting Your Environment on Windows 95 and Windows NT” on page 182.
    - “Setting Your Environment on UNIX Systems” on page 183.
    - “Setting Your Environment on Windows 3.1” on page 184.
  - To set database manager configuration parameters on a client instance, see “Configuration Parameters” on page 189.
- 

Prior to the introduction of the DB2 profile registry in Version 5, changing your DB2 environment on OS/2, Windows 95 or Windows NT workstations required you to change your system's environment variables and reboot. On UNIX platforms, changing your DB2 environment required you to change the `sqllib/db2profile` file or the `sqllib/db2cshrc` file 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:** The concept of the DB2 profile registry is not supported on Windows 3.1. See “Setting Your Environment on Windows 3.1” on page 184 for more information.

DB2 configures its operating parameters by checking for variable values according to the following search order:

- The environment variable settings.
- 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 185 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 system-wide variable settings. Any variable not defined in the node or instance levels will be evaluated at this level.

To modify registry variable values, use the **db2set** command. The syntax of the **db2set** command is as follows:

- To set a parameter for the current instance, type:

```
db2set parameter=value
```

- To set a parameter's value for a specific instance, type:

```
db2set parameter=value -i instance-name
```

- To set a parameter at the global profile level, type:

```
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. Examples of this are 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 node level, type:

```
db2set parameter= -i instance-name node-number
```

- To explicitly unset a parameter's value at a specified level and prevent evaluating the parameter at the next level, use the `-null` option. To use the parameter's setting at the instance level, type:

```
db2set parameter= -null -i instance-name
```

The `-null` option allows you to set the value of a parameter globally, but unset the value for a specific instance. For example, you can set *DB2COMM* to *TCP/IP* at the global level, and if you have four instances on your system, you can set three of the instances to default to the global setting, but use the `-null` option to unset *DB2COMM* on the fourth instance.

- To evaluate the current session's parameter's value, type:  
`db2set parameter`
- To evaluate the parameter's value at all levels, type:  
`db2set parameter -all`
- To view a list of all values defined in the profile registry, type:  
`db2set -all`

For more information on the **db2set** command and remote administering 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 operating systems there are three system environment variables, DB2INSTANCE, DB2PATH, and DB2INSTPROF, that are not stored in the DB2 profile registry. DB2INSTANCE and DB2PATH are set when DB2 is installed; DB2INSTPROF can be set after installation. On OS/2, the environment variable DB2PATH must be set; normally it 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 change the setting of an environment variable, enter the following command:

```
set parameter = value
```

To determine the setting of an environment variable, enter:

```
echo %variable-name%
```

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 95 and Windows NT

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 95 and Windows NT 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:

```
echo %variable-name%
```

To set system environment variables, do the following:

**On Windows 95:**

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** panel, 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 instance name, 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 append, for example DB2INSTANCE.
    - 2 Change the **Value** field to the instance name, for example, db2inst.
  - c Click on the **Set** push button.



**d** Click on **OK**.

**e** You may have to reboot your system for these changes to take effect.

**Note:** The environment variable `DB2INSTANCE` can also be set at the session (process) level. For example, if you want to start a second DB2 instance called `TEST`, issue the following commands in a command window.

```
set db2instance=TEST
db2start
```

---

## 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 scripts **db2profile** (for Bourne shell or Korn shell) and **db2cshrc** (for C shell) are provided as examples to help you set up the database environment. You can find these files in `INSTHOME/sqllib`, 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 `db2profile` or `db2cshrc` file.

An instance owner or `SYSADM` user may customize these scripts for all users of an instance. Alternatively, you can copy and customize a script, 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** (for Bourne shell or Korn shell) or the **db2cshrc** (for C shell) in the `sqllib` directory of the instance's home directory.

**Note:** To ensure that your search path has been set up correctly, execute the following command:

```
which db2
```

This command returns the absolute path of the DB2 CLP executable. Verify that it is located under the instance's `sqllib` directory.

---

# Setting Your Environment on Windows 3.1

The DB2 environment on Windows 3.1 is not controlled by profile registries. Instead, Windows 3.1 clients define environment keywords in the file db2.ini (typically found in c:\windows directory).



On Windows 3.1, the parameters that control the DB2 environment are called environment keywords. However, because many Windows 3.1 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 3.1 client environment keywords. Within the 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*

## 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 semi-colon 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).

The following is a sample db2.ini file:

```
[DB2 Client Application Enabler]
DB2PATH=C:\SQLLIB\WIN
DB2INSTANCE=DB2
DB2INSTPROF=C:\SQLLIB
DB2TRACEON=N
```

This file is located in the Windows product directory. For example, it would typically be found in c:\windows directory in a native Windows environment.

On Windows 3.1, Client Application Enabler for DB2 Version 2.1 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 3.1, enter the following db2set command:

```
db2set -lr
```

**Note:** Windows 3.1 clients define environment variables in the file db2.ini. See “Setting Your Environment on Windows 3.1” on page 184 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 <i>DB2 Connect User's Guide</i> 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 <i>db2codepage</i> unless explicitly stated in DB2 documents, or asked to do so by DB2 service. Setting <i>db2codepage</i> to a value not supported by the operating system can produce unexpected results. Normally, you do not need to set <i>db2codepage</i> 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 application, 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 set.
DB2DISCOVERYTIME	OS/2, Windows 95, and Windows NT	Default=40 seconds, minimum=20 seconds	Specifies the amount of time that SEARCH discovery will search for DB2 systems.

Parameter	Operating System	Values	Description
DB2INCLUDE	All	Default=current directory	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 <i>Embedded SQL Programming Guide</i> for descriptions of how <i>db2include</i> is used in the different precompiled languages.
DB2INSTDEF	OS/2, Windows 95 and Windows NT	Default=DB2 (on OS/2, Windows 95 and Windows NT)	Sets the value to be used if <i>DB2INSTANCE</i> is not defined.
DB2OPTIONS	All except Windows 3.1 and Macintosh	Default=null	Sets command line processor options.
DB2SLOGON	Windows 3.1	Default: NO	Enables a secure logon in DB2 for Windows 3.1. If <i>db2slogon=YES</i> DB2 does not write user IDs and passwords to a file, but instead uses a segment of memory to maintain them. When <i>db2slogon</i> is enabled, the user must logon each time Windows 3.1 is started.
DB2TIMEOUT	Windows 3.1 and Macintosh	Default: (not set)	Used to control the timeout period for Windows 3.1 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 <i>db2timeout</i> is set to a value between 1 and 30, the default minimum value will be used. If <i>db2timeout</i> is set to a value of 0, or a negative value, the timeout feature is disabled. This feature is disabled by default.
DB2TRACENAME	Windows 3.1 and Macintosh	Default=DB2WIN.TRC	On Windows 3.1 and Macintosh, specifies the name of the file where trace information is stored. The default is <i>db2tracename=DB2WIN.TRC</i> , and is saved in your current instance directory (for example, \sqlib\db2). We strongly recommend that you specify the full path name when naming the trace file.

Parameter	Operating System	Values	Description
DB2TRACEON	Windows 3.1 and Macintosh	Default=N, values: Y, N	On Windows 3.1 and Macintosh, turns 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 <i>Troubleshooting Guide</i> for information on using the trace facility with DB2 Client Application Enabler.
DB2TRCFLUSH	Windows 3.1 and Macintosh	Default=N, values: Y, N	On Windows 3.1 and Macintosh, <i>db2trcflush</i> can be used in conjunction with <i>db2traceon</i> = Y. <i>db2trcflush</i> = 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 <i>db2trcflush</i> = 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		Default=1, values: 1 - 32767	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 3.1	Default=N, values: Y, N	Specifies the behavior of the Windows 3.1 client while communicating with a remote server. When N is set, the client will not yield the CPU to other Windows 3.1 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 <i>db2yield</i> =YES. If your system crashes, you will need to set <i>db2yield</i> =N0. For application development, ensure your application is written to accept and handle Windows messages while waiting for a communications operation to complete.

Parameter	Operating System	Values	Description
System Environment			
DB2INSTANCE	All	Default= <i>db2instdef</i> on OS/2, Windows 95, and Windows NT	The environment variable used to specify the instance that is active by default. On UNIX, users must set the environment variable <i>DB2INSTANCE</i> .
DB2INSTPROF	OS/2, Windows 95, and Windows NT		The environment variable used to specify the location of the instance directory on OS/2, Windows 95 and Windows NT operating systems, if different than <i>DB2PATH</i> .
DB2PATH	OS/2, Windows 95 and Windows NT		The environment variable used to specify the directory where the product is installed on OS/2, Windows 95 and Windows NT operating systems.
Communications			
DB2COMM	All, server only	Default= null, values: any combination of APPC,IPXSPX, NETBIOS, 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		Specifies a temporary override of the <i>DIR_PATH_NAME</i> parameter value in the database manager configuration file. If a directory server is used and the target of a <i>CONNECT</i> statement or <i>ATTACH</i> command is not explicitly cataloged, then the target is concatenated with <i>DB2DIRPATHNAME</i> (if specified) to form the fully qualified DCE name.  <b>Note:</b> The <i>db2dirpathname</i> value has no effect on the instance's global name, which is always identified by the database manager configuration parameters <i>DIR_PATH_NAME</i> and <i>DIR_OBJ_NAME</i> .

Parameter	Operating System	Values	Description
DB2CLIENTCOMM	OS/2 and UNIX		Specifies a temporary override of the DFT_CLIENT_COMM parameter value in the database manager configuration file. If both DFT_CLIENT_COMM and <i>db2clientcomm</i> 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.
DB2ROUTE	OS/2 and UNIX	Default	Specifies the name of the Routing Information Object the client uses when it connects to a database with a different database protocol. The <i>db2route</i> 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 management configuration parameters exist on servers and clients. However, only certain database management 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.



For information on setting server database or database management 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, Windows 95, or Windows NT, 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 95 and Windows NT:
  - 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.

Follow the hints and online help to modify configuration parameter values.

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 26, “Administering Clients Using the CCA” on page 237.
  - For information on using the command line processor, see “Using the Command Line Processor” on page 175.
-



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## ***Part 6. Advanced Installation and Configuration***



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## Chapter 21. Other Methods to Install DB2 for AIX

This chapter 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 chapter. The DB2 Installer can perform all of the steps described in this section.

We recommend that you use the DB2 Installer when installing DB2, but if you prefer not to use the DB2 Installer, you can use any one of the methods described in this chapter. See Chapter 5, "Installing and Configuring DB2" on page 47 for information on how to use the DB2 Installer to install the DB2 product. See Chapter 7, "Installing DB2 Clients" on page 77 for information on how to install the DB2 clients.

---

### Installation Steps

To install the DB2 products, perform the following steps:

- 1 Install DB2 products. As part of this installation step, the following installation activities are optional:
  - a Install on-line documentation.
  - b Install translated messages.
- 2 Create or assign groups and user IDs.
- 3 Create a DB2 instance.
- 4 Create the Administration Server.
- 5 Create links for DB2 files (optional).

You can install the DB2 products on Version 4.1.4 or later of the AIX operating system using any of the following methods.

- SMIT interface with *Software bundles* contains a list of software products that are suited for a particular use. Installation is easier with software bundles. Refer to "Installing Software Bundles Using SMIT" on page 194.
- SMIT also allows you to install a subset of products and filesets in software bundle. If you prefer to install only a selected set of DB2 products and filesets, see "Installing Products or Filesets Using SMIT" on page 195.

- If you prefer to use the **installp** command, you must first mount the DB2 product CD-ROM. You also need to mount the CD-ROM if you want to view the CD-ROM readme file or print the Postscript manuals prior to installation.

---

## Step 1. Installing DB2 Products

This step describes how to install the DB2 products on Version 4.1.4 or later versions of the AIX operating system using the **SMIT** interface, and *software bundles*.

**Note:** This 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.

### Installing Software Bundles Using SMIT

The following procedure shows how to install the DB2 products on Version 4.1.4 or later versions of the AIX operating system, using the **software bundles** feature. A software bundle is a collection of products and filesets. When you install a software bundle, every product and fileset in that bundle is installed.

- 1 Log in as root.
- 2 Insert the DB2 CD-ROM in the drive.
- 3 Enter: `smit easy_install_bundle` to proceed directly to the automatic bundle processing application.
- 4 Specify the installation device or directory for the installation media by pressing F4 to display a list. Select the CD-ROM drive in which you placed the DB2 CD-ROM, then press Enter.
- 5 From the displayed menu, select one of the following software bundles:
  - DB2-UDB-Workgroup
  - DB2-UDB-Enterprise
  - DB2-Connect-Enterprise
  - DB2-Client

**Note:** For a list of the components included in the DB2 CD-ROM, see Table 7 on page 45.

- 6 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.
- 7 Repeat the steps in this section if you want to install additional bundles.

## ***Installing Products or Filesets Using SMIT***

To install the DB2 Universal Database products on AIX Version 4.1.4 or later versions of the AIX operating system using SMIT, perform the following steps:

- 1** Log in as root.
- 2** Insert the DB2 CD-ROM in the drive.
- 3** Enter: `smit install_latest`. The Software Installation and Maintenance menu appears.
- 4** Specify the INPUT device/directory for software and press Enter. 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 the software to install.  
**Note:** For a detailed description of the software packages, refer to Appendix B, "Contents of the DB2 Products" on page 279 for more information.
- 6** Press F7 to mark one or more packages and filesets for installation.
- 7** Press Enter to install the software.
- 8** Press F10 to exit when the command displays **OK**.

After the installation is complete, the DB2 products will be installed in the `/usr/lpp/db2_05_00` directory.

## ***Installing the DB2 Product Library (Optional)***

When you install DB2 products using the SMIT, the DB2 Product Library (HTML) is not automatically installed.

To install the DB2 Product Library, do the following:

- 1** From the Install/Update Selectable Software (Custom Install) menu, select **Install/Update From All Available Software**.
- 2** Enter the directory, where you want to install the DB2 Product Library, 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`
- 3** Select the DB2 Product Library (HTML) - locale option.



The DB2 Product Library (HTML) option is listed as follows:

DB2 Product Library (HTML) - *locale*

where *locale* is the desired locale; for example, locale=Fr\_FR for French in France with the IBM-850 code set.

- 4 Run the following command to uncompress and un-tar the HTML files:

```
/usr/lpp/db2_05_00/doc/db2insthtml locale
```

where *locale* is the desired locale; for example, locale=en\_US for English.

- 5 From your Web browser, open the following 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 for DB2 books in HTML format. 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 DB2 Product Messages (Optional)

When you install DB2 products using the SMIT, DB2 Product messages for locales, other than En\_US (English or United States code page IBM-850) are not automatically installed.

To install messages for non-English locales, do the following:

- 1 From the Install/Update Selectable Software (Custom Install) menu, select **Install/Update From All Available Software**.
- 2 Enter the directory, where you want to install the translated messages, 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
```
- 3 List the software products to be installed using the **SOFTWARE to install** option.
- 4 Select the messages options for the locales you want to install.



The message options are listed as follows:

DB2 Product Messages - *locale*

where *locale* is the desired local; for example, locale=Fr\_FR for French in France with the IBM-850 code set.

---

## Step 2. Creating or Assigning 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 perform this step as **root**.

- 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 created above. 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 **mkgroup** to create groups, and **mkuser** to create users. For example, to create a user ID called `db2inst1` which will use `dbadmin1` as its primary group and use `/home/db2inst1` as its home directory:

```
mkgroup dbadmin1
mkuser 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 db2fadm1
mkuser 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. If you are planning to create the Administration Server, you have to repeat Steps 1 and 2 above to create a user name and group name for the Administration Server. However, for security reasons, we recommend that you do not use the DB2 Instance user name as the user name for the Administration Server.
2. If existing users and groups have been identified for these purposes, you do not have to create new ones.
3. 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 D, “Naming Rules” on page 287.

---

## Step 3. Creating a DB2 Instance

A DB2 instance is an environment where you store data and run applications. Use the **db2icrt** command to create an instance of the product. If you are not familiar with the concepts of a database instance, see Chapter 16, “Working with DB2 Instances” on page 141.

The **db2icrt** command is located 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] ▶▶
▶▶ 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 server product 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. Authentication type, DCE, is valid. However, it is not valid to choose DCE as an *AuthType* for this command. To enable DCE authentication for a DB2 instance, refer to the *Administration Guide*.

**-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.

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

If a server product is installed, the syntax is:

```
db2icrt -u FencedID InstName
```

Examples:

- If you install the DB2 Universal Database Workgroup Edition or the DB2 Universal Database Enterprise Edition, you can use the following command to create an instance:

```
db2icrt -u db2fenc1 db2inst1
```

- If you installed the DB2 Connect Enterprise Edition only, you can use the instance name as the Fenced ID also:

```
db2icrt -u db2inst1 db2inst1
```

- 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 of the instance owner.



You should not create files or directories under *INSTHOME*/sqllib directory other than those created by DB2 products. This avoids a potential loss of data if an instance is deleted. There is one exception. If your system supports fenced User Defined Functions and fenced Stored Procedures, put the fenced User Defined Functions and the fenced Stored Procedures applications in the *INSTHOME*/sqllib/function directory.

---

## Step 4. Creating 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 Control Center.

To create an Administration Server, see the procedures described in “Creating the Administration Server” on page 151.

---

## Step 5. Creating Links for DB2 Files (Optional)

This step is optional and can be used to create links for DB2 files to `/usr/lib`, and for include files to `/usr/include` 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.

You invoke the **db2ln** command as follows:

```
/usr/lpp/db2_05_00/cfg/db2ln
```

If there are existing links to `/usr/lib` and `/usr/include` from previous versions of DB2 products, they will automatically be removed by executing **db2ln** to create links for this version of DB2. If you want to reestablish 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 version.



Links can be established for only one version of DB2 on a given system.



Now that you have installed DB2 Universal Database, see Chapter 25, “Setting up Communications on the Server Using the Command Line Processor” on page 223 for information on how to set up your server to accept in-bound client connections.

---

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## **Chapter 22. Other Methods to Install DB2 for HP-UX**

This chapter 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 chapter. The DB2 Installer can perform all of the steps described in this section.

We recommend that you use the DB2 Installer when installing DB2, but if you prefer not to use the DB2 Installer, you can use any one of the methods described in this chapter. See Chapter 5, "Installing and Configuring DB2" on page 47 for information on how to use the DB2 Installer to install the DB2 product. See Chapter 7, "Installing DB2 Clients" on page 77 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 DB2 product messages.
  - b** Install 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** Create links for DB2 files (optional).

---

# Step 1. Installing DB2 Products

Use the **swinstall** program to install DB2 for HP-UX. To install, perform the following steps:

- 1 Log in as root.
- 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 /cdrom/db2 as the value for the **Source Depot Path** field, where /cdrom is the CD-ROM mount directory.
- 6 To return to the Software Selection window, select the **OK** button.
- 7 The Software Selection window contains a list of available software to install. Highlight one or more of the following products to install:

<b>DB2V5CAE</b>	DB2 Universal Database Client Application Enabler for HP-UX
<b>DB2V5CONN</b>	DB2 Connect Enterprise Edition for HP-UX
<b>DB2V5ENTP</b>	DB2 Universal Database Enterprise Edition for HP-UX
<b>DB2V5HTML</b>	DB2 Universal Database Product Library in HTML (all locales)
<b>DB2V5MSG</b>	DB2 Universal Database Product Messages (all locales)
<b>DB2V5WGRP</b>	DB2 Universal Database Workgroup Edition for HP-UX

**Notes:**

- a. This CD-ROM contains several DB2 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.
  - b. Do not select products DB2V5MSG and DB2V5HTML. These products are collections of DB2 product messages and documentations in several languages. The procedure to install DB2 product messages and documentation (HTML) is described later in this section.
- 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
```

## ***Installing the DB2 Product Library (Optional)***

To view DB2 product documents on-line, 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.

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 DB2V5HTML product, see Appendix B, "Contents of the DB2 Products" on page 279.

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

**1** Log in as root and mount the DB2 product CD-ROM as described in "Step 1. Installing DB2 Products" on page 202.

- 2 Run the **swinstall** command as follows:

```
swinstall -s /cdrom/db2
```

where /cdrom is the CD-ROM mount directory.

- 3 From the list of products displayed, highlight the **DB2V5HTML** product and press Enter.

This will display a list of all the filesets in the **DB2V5HTML** product.

- 4 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
```

- 5 Follow the remaining installation procedure, starting at Step 9 on page 203 in “Step 1. Installing DB2 Products” on page 202.

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.

- 6 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 32 on page 281.

- 7 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 for DB2 books in HTML format. 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 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 B, “Contents of the DB2 Products” on page 279.

To install DB2 Product Message filesets, do the following:

- 1 Log in as root and mount the DB2 product CD-ROM as described in “Installation Steps” on page 201.

- 2 Run the **swinstall** command as follows:

```
swinstall -s /cdrom/db2
```

where /cdrom is the CD-ROM mount directory.

- 3 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.

- 4 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 the fr\_FR.iso88591 locale, highlight the following fileset:

```
fr_FR    DB2 Product Library (HTML) - fr_FR
```

- 5 Follow the remaining installation procedure, starting at Step 9 on page 203 in “Step 1. Installing DB2 Products” on page 202.

---

## ***Step 2. Updating HP-UX Kernel Configuration Parameters***

To run DB2 for HP-UX, you may have to update some kernel configuration parameters; the following values are recommended:

Table 22. 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	128	256	256
msgmap	130	258	258
msgmni	128	256	256
msgssz	16	16	16
semnmi	128	256	512
semmap	130	258	514
semnms	256	512	1024
semnmu	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).

To change the values, do the following:

- 1 Use **SAM** and select **Kernel Configuration**.
- 2 Select **Configurable Parameters**.
- 3 Highlight the parameter to be changed.
- 4 Select **Modify Configurable Parameter** from the **Actions** menu and make the appropriate changes.
- 5 Repeat the previous two steps for every kernel parameter which needs to be updated.
- 6 Create a new kernel by selecting **Create a New Kernel** from the **Actions** menu.



- 7 Reboot the system so that the changes can take effect.

---

## Step 3. Creating or Assigning 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 perform the following as **root**.

- 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 created above. 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/inst1 -m db2inst1
passwd db2inst1
```

- 3 Create a group and user for Fenced User Defined Functions and Stored Procedures.

For example:

```
groupadd db2fadm1
useradd -g db2fadm1 -d /home/db2fenc1 -m 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. If you are planning to create the Administration Server, you have to repeat Steps 1 and 2 above to create a user name and group name for the Administration Server. However, for security reasons, we recommend that you do not use the DB2 Instance user name as the user name for the Administration Server.
2. If existing users and groups have been identified for these purposes, you do not have to create new ones.
3. 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 D, “Naming Rules” on page 287.

---

## Step 4. Creating a DB2 Instance

A DB2 instance is an environment where you store data and run applications. Use the **db2icrt** command to create an instance of the product. If you are not familiar with the concepts of a database instance, see Chapter 16, “Working with DB2 Instances” on page 141.

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] ▶▶
▶▶ 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 server product 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. Authentication type, DCE, is valid. However, it is not valid to choose DCE as an *AuthType* for this command. To enable DCE authentication for a DB2 instance, refer to the *Administration Guide*.

**-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.

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

If a server product is installed, the syntax is:

```
db2icrt -u FencedID InstName
```

Examples:

- If you install the DB2 Universal Database Workgroup Edition or the DB2 Universal Database Enterprise Edition, you can use the following command to create an instance:

```
db2icrt -u db2fenc1 db2inst1
```

- If you installed the DB2 Connect Enterprise Edition only, you can use the instance name as the Fenced ID also:

```
db2icrt -u db2inst1 db2inst1
```

- 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 of the instance owner.



You should not create files or directories under *INSTHOME*/sqllib directory other than those created by DB2 products. This avoids a potential loss of data if an instance is deleted. There is one exception. If your system supports fenced User Defined Functions and fenced Stored Procedures, put the fenced User Defined Functions and the fenced Stored Procedures applications in the *INSTHOME*/sqllib/function directory.

---

## Step 5. Creating 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 Control Center.

To create an Administration Server, see the procedures described in “Creating the Administration Server” on page 151.

---

## Step 6. Creating Links for DB2 Files (Optional)

This step is optional and can be used to create links for DB2 files to `/usr/lib`, and for include files to `/usr/include` 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.

You invoke the **db2ln** command as follows:

```
/opt/IBMdb2/V5.0/db2ln
```

If there are existing links to `/usr/lib` and `/usr/include` from previous versions of DB2 products, they will automatically be removed by executing **db2ln** to create links for this version of DB2. If you want to reestablish 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 version.



Links can be established for only one version of DB2 on a given system.



Now that you have installed DB2 Universal Database, see Chapter 25, “Setting up Communications on the Server Using the Command Line Processor” on page 223 for information on how to set up your server to accept in-bound client connections.

---

---

## ***Chapter 23. Other Methods to Install DB2 for Solaris***

This chapter 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 chapter. The DB2 Installer can perform all of the steps described in this section.

We recommend that you use the DB2 Installer when installing DB2, but if you prefer not to use the DB2 Installer, you can use any one of the methods described in this chapter. See Chapter 5, "Installing and Configuring DB2" on page 47 for information on how to use the DB2 Installer to install the DB2 product. See Chapter 7, "Installing DB2 Clients" on page 77 for information on how to install the DB2 clients.

---

### ***Installation Steps***

To install DB2 for Solaris 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 DB2 product messages.
  - b** Install 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** Create links for DB2 files (optional).

---

# Step 1. Installing DB2 Products

Use the **db2\_install** command, that is available on the DB2 CD-ROM to install DB2 products. 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 for Solaris and its prerequisites from the DB2 CD-ROM, you will perform the following steps:

- 1 Log in as root.
- 2 Insert the DB2 CD-ROM into the CD-ROM drive.
- 3 If the Volume Manager (vold) is installed on your system, the CD-ROM is automatically mounted as:

```
/cdrom/unnamed_cdrom
```

If the Volume Manager is not installed on your system, enter the commands to mount the CD-ROM, as shown in the following example:

```
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 file system must be exported with the **root** access.

- 4 Run the **db2\_install** command:

```
/cdrom/unnamed_cdrom/db2/db2_install
```

The **db2\_install** command prompts for one or more of the following products to be installed and for the base directory where the product files are to be installed. The products are listed by keyword and product description.

<b>DB2.CAE</b>	DB2 Universal Database Client Application Enabler for Solaris
<b>DB2.WKGP</b>	DB2 Universal Database Workgroup Edition for Solaris
<b>DB2.ENTP</b>	DB2 Universal Database Enterprise Edition for Solaris
<b>DB2.CONN</b>	DB2 Connect Enterprise Edition for Solaris

The **db2\_install** command creates the sub-directory `IBMdb2/V5.0` under the base directory, `/opt`, by default.

**Note:** The command displays the following prompt:

```
Specify one or more of the keywords followed
by spaces.
```

5 Type the keyword of the product to be installed when prompted.

**Note:** This CD-ROM contains several DB2 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.

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 on-line, 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.

A separate package exists for every language in which DB2 product documents are translated. Packages for DB2 product documentation are given names such as db2ht%L50, where %L represents two letters for the language name. 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 B, "Contents of the DB2 Products" on page 279.

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

1 Log in as root and mount the DB2 product CD-ROM as described in "Step 1. Installing DB2 Products" on page 212.

2 Run the **pkgadd** command as follows:

```
pkgadd -d <cdrom-dir>/db2/db2 <pkgname>
```

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

```
pkgadd -d /cdrom/unnamed_cdrom/db2/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/locale identifier.

3 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 for DB2 books in HTML format. 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 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 B, “Contents of the DB2 Products” on page 279.

To install DB2 Product Message packages, do the following:

- 1** Log in as root and mount the DB2 product CD-ROM as described in “Step 1. Installing DB2 Products” on page 212.
- 2** Run the **pkgadd** command as follows:

```
pkgadd -d <cdrom-dir>/db2/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/db2 db2msde50
```

---

## ***Step 2. Updating Solaris Kernel Configuration Parameters***

To run DB2 for Solaris, you may have to update some kernel configuration parameters; the following minimum values are recommended:



Table 23. Solaris Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Physical Memory		
	64MB - 128MB	128MB - 256MB	256MB+
<code>msgsys:msginfo_msgmax</code>	65535 (1)	65535 (1)	65535 (1)
<code>msgsys:msginfo_msgmnb</code>	65535 (1)	65535 (1)	65535 (1)
<code>msgsys:msginfo_msgmap</code>	130	258	258
<code>msgsys:msginfo_msgmni</code>	128	256	256
<code>msgsys:msginfo_msgssz</code>	16	16	16
<code>msgsys:msginfo_msgtql</code>	128	256	256
<code>msgsys:msginfo_msgseg</code>	8192	16384	32768
<code>shmsys:shminfo_shmmax</code>	67108864	134217728 (2)	268435456 (2)
<code>shmsys:shminfo_shmseg</code>	16	16	16
<code>shmsys:shminfo_shmmni</code>	300	300	300
<code>semsys:seminfo_semmni</code>	128	256	512
<code>semsys:seminfo_semmap</code>	130	258	514
<code>semsys:seminfo_semmns</code>	256	512	1024
<code>semsys:seminfo_semmnu</code>	256	512	1024

**Notes:**

1. Parameters `msgsys:msginfo_msgmnb` and `msgsys:msginfo_msgmax` must be set to 65535.
2. Parameters `shmsys:shminfo_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 the `shmsys:shminfo_shmmax` 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 parameter `msgsys:msginfo_msgmax`, 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 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 `shmsys:shminfo_shmmax` as described in Note 2 above.

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

---

## Step 3. Creating or Assigning 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 perform the following as **root**:

- 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 created above. 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 dbadmin1
useradd -g dbadmin1 -d /export/home/db2inst1 -m db2inst1
passwd db2inst1
```

- 3 Create a group and user for Fenced User Defined Functions and Stored Procedures.

For example:

```
groupadd db2fadm1
useradd -g db2fadm1 -d /export/home/db2fenc1 -m 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. If you are planning to create the Administration Server, you have to repeat Steps 1 and 2 above to create a user name and group name for the Administration Server. However, for security reasons, we recommend that you do not use the DB2 Instance user name as the user name for the Administration Server.
2. If existing users and groups have been identified for these purposes, you do not have to create new ones.
3. 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 D, "Naming Rules" on page 287.

---

## Step 4. Creating a DB2 Instance

A DB2 instance is an environment where you store data and run applications. Use the **db2icrt** command to create an instance of the product. If you are not familiar with the concepts of a database instance, see Chapter 16, "Working with DB2 Instances" on page 141.

The syntax of the **db2icrt** command is:

```
▶▶ db2icrt [-h | -?] [-d] [-a AuthType] [-u FencedID] ▶▶
▶ InstName ▶▶
```

where:

- |                    |  |
|--------------------|--|
| <b>-h   -?</b>     | Display a help menu for this command.  |
| <b>-d</b>          | Sets the debug mode that you can use for problem determination   |
| <b>-a AuthType</b> | 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 <i>AuthType</i> is set to CLIENT. |

**Notes:**

1. The authentication type of the instance applies to all databases owned by the instance.
2. Authentication type, DCE, is valid. However, it is not valid to choose DCE as an *AuthType* for this command. To enable DCE authentication for a DB2 instance, refer to the *Administration Guide*.

**-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.

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

If a server product is installed, the syntax is:

```
db2icrt -u FencedID InstName
```

Examples:

- If you install the DB2 Universal Database Workgroup Edition or the DB2 Universal Database Enterprise Edition, you can use the following command to create an instance:

```
db2icrt -u db2fenc1 db2inst1
```

- If you installed the DB2 Connect Enterprise Edition only, you can use the instance name as the Fenced ID also:

```
db2icrt -u db2inst1 db2inst1
```

- 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 of the instance owner.



You should not create files or directories under *INSTHOME*/sqllib directory other than those created by DB2 products. This avoids a potential loss of data if an instance is deleted. There is one exception. If your system supports fenced User Defined Functions and fenced Stored Procedures, put the fenced User Defined Functions and the fenced Stored Procedures applications in the *INSTHOME*/sqllib/function directory.

---

## Step 5. Creating 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 Control Center.

To create an Administration Server, see the procedures described in “Creating the Administration Server” on page 151.

---

## Step 6. Creating Links for DB2 Files (Optional)

This step is optional and can be used to create links for DB2 files to `/usr/lib`, and for include files to `/usr/include` 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.

You invoke the **db2ln** command as follows:

```
/opt/IBMdb2/V5.0/db2ln
```

If there are existing links to `/usr/lib` and `/usr/include` from previous versions of DB2 products, they will automatically be removed by executing **db2ln** to create links for this version of DB2. If you want to reestablish 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 version.



Links can be established for only one version of DB2 on a given system.



Now that you have installed DB2 Universal Database, see Chapter 25, “Setting up Communications on the Server Using the Command Line Processor” on page 223 for information on how to set up your server to accept in-bound client connections.

---



---

## ***Chapter 24. Configuring DB2 Server Communications Using the Control Center***

---



To configure the Administration Server for communications, go to Chapter 25, "Setting up Communications on the Server Using the Command Line Processor" on page 223.

---

The Control Center is a graphical tool available on OS/2, Windows 95, and Windows NT 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 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 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.

---

## ***Modifying the DB2 Communication Configuration of DB2 Server Instances***

- 1 To start the Control Center 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.) To start the Control Center on a Windows NT system, click on the **Start** button 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 list. 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 and click with the right mouse button on the instance and select the **Stop** option from the pop-up menu.
  - b To start the database manager instance, select the instance and click with the right mouse button on the instance and select the **Start** option from the pop-up menu.



Modifying an instance's communications settings may require you to update the database connection configuration on the client.



---

## **Chapter 25. Setting up Communications on the Server Using the Command Line Processor**

This section describes how to configure your DB2 server 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 install program.



If you have installed the Control Center, you can use the Setup Communications function to configure the instance for communications; however, it cannot be used to set up communications for the Administration Server. The Control Center can be installed on OS/2 and Windows NT servers, or on OS/2, Windows 95, and Windows NT clients.

The Setup Communications function cannot update the APPC communications subsystem; however, it will update the required instance parameters on the server.

Go to Chapter 24, "Configuring DB2 Server Communications Using the Control Center" on page 221 for more information.

---

For instructions on using the command line processor, see Chapter 19, "Entering DB2 Commands and SQL Statements" on page 173.

---

## **Setting the DB2COMM Registry Value**

Your DB2 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, 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  
**tcPIP** starts TCP/IP support

To set the *DB2COMM* registry value for the current instance, issue 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 instance name, issue the following command to resolve 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, located in the *\$HOME/sql/lib/db2dump* directory, where *\$HOME* is home directory of the instance owner.

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 180.



You are now ready to configure the server workstation to use any of the following communication protocols:

- TCP/IP - see “Configuring TCP/IP on the Server” on page 225
  - IPX/SPX - see “Configuring IPX/SPX on the Server” on page 228
  - APPC - see “Configuring APPC on the Server” on page 233
- 

---

## ***Configuring TCP/IP on the Server***

To access a remote server through TCP/IP, you must first have installed and configured communication software for both the client and DB2 server workstations. See “Software Requirements” on page 35 for the communication protocol requirements for your platform. See “Possible Client-to-DB2 Server Connectivity Scenarios” on page 42 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 223.

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.

Parameter	Explanation	Sample Value	Your Value
Connection Port <ul style="list-style-type: none"><li>• Connection Service name (<i>svcename</i>)</li><li>• Port number/Protocol (Port_number/tcp)</li></ul>	Values required in the services file. The Connection and Interrupt Service names are arbitrary, but each must be unique within the services file.	server1  3700/tcp	
Interrupt Port <ul style="list-style-type: none"><li>• Interrupt Service name</li><li>• Port number/Protocol (Port_number + 1/tcp)</li></ul>	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.	server1i  3701/tcp	
Service name ( <i>svcename</i> )	The name used to update the Service name ( <i>svcename</i> ) 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 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 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 server to listen on for incoming client requests. The first entry describes the Connection Port, and the second entry describes the Interrupt Port.

The services file is located in the */etc* directory.



If you are using Network Information Services (NIS) on your network, 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.

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 as a user with System Administrative (SYSADM) authority.



If you have trouble logging on to the system, see “Logging on to the System” on page 133.

- 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 issuing 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 svcname svcname
db2stop
db2start
```

For example, if the Connection Service name in the services file was entered as *server1*, use:

```
update database manager configuration using svcname server1
db2stop
db2start
```



The *svcname* used must match the Connection Service name specified in the services file.

View the database manager configuration file, to ensure that these changes have taken effect, by issuing 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 7, “Installing DB2 Clients” on page 77 for more information.

---

## Configuring IPX/SPX on the 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 server workstations. See “Software Requirements” on page 35 for the communication protocol requirements for your platform. See “Possible Client-to-DB2 Server Connectivity Scenarios” on page 42 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 223.

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 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 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 servers using this addressing method if they will be accessed solely by clients using Direct Addressing.

**File Server Addressing:**

The DB2 server instance registers its address at the NetWare file server. The client connects to the DB2 server instance through an address stored at a NetWare file server. Configure DB2 servers using this addressing method if they will be accessed by clients using both File Server and Direct Addressing, or just File Server Addressing.

See Table 25 for a list of the supported IPX/SPX addressing methods for your server.

Server Platform	Direct Addressing	File Server Addressing
AIX	√	√
HP-UX	√	√
Solaris	√	

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.

Parameter	Explanation	Our Example	Your Value
File server name (FILESERVER)	<p><b>Direct Addressing</b> A * value indicates that you are using Direct Addressing.</p> <p><b>File Server Addressing</b> The name of the NetWare file server where the database server instance is registered. This parameter must be entered in UPPERCASE.</p>	<p><b>Direct Addressing</b> *</p> <p><b>File Server Addressing</b> NETWSRV</p>	

Table 26 (Page 2 of 2). IPX/SPX Values Required at the Server

Parameter	Explanation	Our Example	Your Value
DB2 server object name ( <i>OBJECTNAME</i> )	<p><b>Direct Addressing</b> A * value indicates that you are using Direct Addressing.</p> <p><b>File Server Addressing</b> The database manager server instance, represented as the object <i>OBJECTNAME</i> on the NetWare file server. The server's IPX/SPX internetwork address is stored and retrieved from this object.</p> <p>This parameter must be entered in UPPERCASE and be unique on the NetWare file server system.</p>	<p><b>Direct Addressing</b> *</p> <p><b>File Server Addressing</b> DB2INST1</p>	
Socket number ( <i>IPX_SOCKET</i> )	<p>Represents the connection end point in a DB2 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.</p> <p>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.</p>	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 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 as a user with System Administrative (SYSADM) authority.



If you have trouble logging on to the system, see “Logging on to the System” on page 133.

- 2 Set up the instance environment and invoke the DB2 command line processor as follows:

- a. Run `db2profile` or `db2cshrc` as follows:

```
. INSTHOME/sql1lib/db2profile    (for Bourne or Korn shell)
source INSTHOME/sql1lib/db2cshrc (for C shell)
```

where `INSTHOME` is the home directory of the instance

- b. Start the DB2 command line processor by issuing 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
```

View the database manager configuration file, to ensure that these changes have taken effect, by issuing 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 issuing the **db2ipxad** command on the server. This command is located in the `sqllib/misc/` directory.

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 7, "Installing DB2 Clients" on page 77 for more information.

## ***B. Register the DB2 Server Instance on the NetWare File Server (for File Server Addressing Only)***

The DB2 server must be registered *after* the database manager configuration file has been updated with the IPX/SPX parameters. To register the DB2 server instance at the NetWare File server, issue 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 7, "Installing DB2 Clients" on page 77 for more information.

---

# Configuring APPC on the Server

To access a remote server through APPC, you must first have installed and configured communication software for both the client and DB2 server workstations. See “Software Requirements” on page 35 for the communication protocol requirements for your platform. See “Possible Client-to-DB2 Server Connectivity Scenarios” on page 42 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 223.

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.

Parameter	Description	Sample Value	Your Value
Transaction program name ( <i>tpname</i> )	The Transaction program that the server listens on for client requests.	nyserver	

## Step 2. Configure the 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 as a user with System Administrative (SYSADM) authority.



If you have trouble logging on to the system, see "Logging on to the System" on page 133.

- 2 Set up the instance environment and invoke the DB2 command line processor as follows:

- a. Run `db2profile` or `db2cshrc` as follows:

```
. INSTHOME/sql1lib/db2profile    (for Bourne or Korn shell)
source INSTHOME/sql1lib/db2cshrc (for C shell)
```

where `INSTHOME` is the home directory of the instance

- b. Start the DB2 command line processor by issuing 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:

```
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.



Refer to the *DB2 Connect Enterprise Edition Quick Beginnings* manual for detailed instructions on how to configure your APPC communications subsystem to support communications from the Transaction program that you specified for the server.

If you are using the DB2 Universal Database Workgroup Edition, this manual was not installed on your workstation. Go to the DB2 Product and Service Technical Library located at <http://www.software.ibm.com/data/db2/library/> to view this manual.

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## **Chapter 26. Administering Clients Using the CCA**

Use the information in this section to use the Client Configuration Assistant to perform administration tasks on OS/2, Windows 95, and Windows NT workstations.

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, Windows 95, and Windows NT workstations. If it is not installed on your system, you can install it by reinstalling the DB2 product and choosing 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 database connections to be configured as CLI/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.

---

## **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 238.
- Searching the network for databases, see “Searching the Network for Databases” on page 241.
- Adding database connections manually, see “Manually Configure a Connection to a DB2 Database” on page 246.

Each of these is covered in more detail in the material that follows.

---

## 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 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 a DB2 server system, it includes server instances that have the *discover\_inst* configuration parameter set to ENABLE, and databases with the *discover\_db* configuration parameter set to ENABLE. The *discover* parameter, in the Administration Server, 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 244.

**Generating a Server Profile:** To generate an access profile, perform the following steps:

- 1 Start the 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 the 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 Start the Client Configuration Assistant (CCA).
- 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 to select the server profile that you want to access, or enter the path and filename in the **File** field.
- 5 Select a database to be added.
- 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 the client through the following:

- Using the Add function, which allows you to selectively process the database connection data in the client profile and add it to the client. (This function invokes the Add Database SmartGuide.)
- Using the Import function, which allows you to selectively process database connection data, client configuration settings, and CLI/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/ODBC settings).
- Client settings (including database manager configuration parameters).
- CLI/ODBC common parameters.
- Configuration data for the local APPC communications subsystem.

Export can be used to generate a customized profile that can be imported on another client to set it up initially, or to update it.

To export a profile from the client, configure the client for communications and do the following:

- 1 Enter **db2cca admin** at a command prompt to start the Client Configuration Assistant in administrator mode. (You must be an administrator on the local system 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 in administrator mode by modifying the **Client Configuration Assistant** icon to add the parameter *admin* to the startup of the CCA, or by issuing the **db2cca admin** command.

- 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:
  - **Client Settings**
  - **CLI/ODBC Common parameters**
  - **APPC local stack configuration**

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:**



The Import function can be used to easily set up new client systems. The Import function works as follows:

##### **Client Settings**

Configuration parameters found in the export file replace existing ones on the client; all other parameters are set to default.

##### **CLI/ODBC Common Parameters**

Values found in the exported file replace those on the client.

##### **Local Configuration Data for the APPC Communications Subsystem**

If it is not already configured, this information is used to configure the APPC communications subsystem.

Perform these steps at the client that you want to set up. You can use this process to initially set up a new client, or to update an existing one.

- 1 Start the Client Configuration Assistant (CCA).
- 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 the installation defaults on the client and the server have not been changed, and that messages used by the *Search* method of discovery are not filtered by your network.

- 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 client.
  - a Click on the **[+]** sign beside the 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 the 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. 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; however, it does not support searching the network for servers.

Click on the **[+]** sign beside the **Known Systems** icon to get a list of known DB2 server systems. Click on the **[+]** sign beside the system to get a list of the instances and databases on it. Select the database that you want to add and complete the other panels in the Add Database SmartGuide.

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 servers.

Searching does not require information about the Administration Server. When you click on the **[+]** sign beside the **Other Systems (Search the network)** icon, a list of DB2 server systems is displayed. Click on the **[+]** beside the system to get a list of the instances and databases on it. Select the database that you want to add and complete the other panels in the Add Database SmartGuide.



*Search* may appear to be a simpler discovery method. However, in larger networks, network routers and bridges can filter the messages 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 to KNOWN. To have it support Search discovery, set this parameter to SEARCH. To prevent discovery of the 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** button. When *discover* is set to KNOWN, the CCA will not be able to search the network.
- SEARCH** Enables all the facilities of the KNOWN setting, and enables network searching.
- DISABLE** Disables discovery. In this case, the **Search the network** option is not available in the Add Database SmartGuide.



Servers configured with *discover* set to KNOWN, will not respond to search requests from clients. It is important that you consider this when changing the *discover* parameter, which was set to SEARCH during the installation.

## ***Additional Settings for SEARCH Discovery***

Search discovery requires that the configuration parameter *discover\_comm* 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 on 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 server, the values specified by *discover\_comm* must be equal to, or a subset, of the values set by *db2comm* for the Administration Server.



Check the settings for the *DB2COMM* registry value by issuing the **db2set DB2COMM** command. For more information, see Chapter 20, “Controlling Your DB2 Environment” on page 179.

On the server, *discover\_comm* is set in the Administration Server. On the client (or a server acting as a client), *discover\_comm* is set in the instance.

**Note:** When using discovery search mode, at least one protocol specified by the *discover\_comm* parameter on the client must match those specified by *discover\_comm* on the Administration Server. If there is no match, the server will not respond to the client's requests.

In addition, there are two DB2 profile registry values that can be used to tune search discovery 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 on the server system, and in the client instance. Set these parameters as follows:

- On the Administration Server:

Update the Administration Server's configuration file, in the command line processor, as follows:

```
update admin cfg using discover [ DISABLE | KNOWN | SEARCH ]
update admin cfg using discover_comm [ NETBIOS | TCPIP ]
db2admin stop
db2admin start
```

**Note:** Search Discovery will only operate on TCP/IP and NetBIOS.

- 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 and change the parameters that you want to modify in the **Parameters** window.



If the *discover\_comm* includes *netbios*, you must ensure that the Workstation name (*nname*) parameter is set for both the client and the Administration Server. Also, you must ensure that the *db2nbadapters* registry value is set to the Adapter number that you want to use. For more information, refer to the *Administration Guide*.

#### **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 Select the instance that you want to configure and click on the right mouse button.
- 3 Select the **Configure** option from the pop-up menu. The Configuration window opens.
- 4 Select the **Environment** tab and select the *discover\_inst* parameter.
- 5 Enter the desired value in the **Value** box and click on **OK**.
- 6 Select the database that you want to configure and click on the right mouse button.
- 7 Select the **Configure** option from the pop-up menu. The Configuration window opens.
- 8 Select the **Environment** tab and select the *discover\_db* parameter.
- 9 Enter the desired value in the **Value** box and click on **OK**.

#### **discoverytime 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 35 seconds, enter the following command:

```
db2set db2discoverytime=35
```

This specifies that the searched discovery should wait 35 seconds for a response from servers.

- To set the `db2nbdiscoverrcvbufs` registry value to 10, enter the following command:

```
db2set db2nbdiscoverrcvbufs=10
```

This specifies the number of NetBIOS buffers that will be allocated for 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. Click on the **Next** push button.
- 5** Type in the required protocol parameters. Click on the **Next** push button.
- 6** Type in the name of the database in the **Target database** field.
- 7** 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.
- 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.



---

## Chapter 27. Using the DB2 Workstation as a Server for Host Applications

You can set up DB2 on the workstation to be a database server for clients or applications that use Distributed Relational Database Architecture (DRDA). The DRDA Application Server (AS) feature enables DB2 to function as a database server for DRDA Application Requesters (DRDA ARs).

DRDA AS is installed automatically with your DB2 server. However, there are some steps required to set up the connection with a DRDA AR. These steps are described in this chapter.

For more information about DRDA concepts and a detailed description of DRDA commands and bind options, refer to the following publications:

- *Distributed Relational Database Architecture Reference* (SC26-4651)
- *DDM Architecture Reference Manual Level 4* (SC21-9526)

**Note:** DRDA-AS support is available on the HP-UX platform only if you connect to the host using the TCP/IP communications protocol.

---

## DRDA Application Requesters Supported

DB2 Universal Database servers support the following IBM Application Requesters:

- DB2 for MVS/ESA or DB2 for OS/390 Version 3.1 (or higher), DB2 for MVS Version 4 (or higher), and DB2 for VM Version 5 (or higher) AR

For information on setting up the connection to a DB2 server via the DRDA-AS feature, see the instructions in “Setting Up DRDA-AS Functionality” on page 249.

- DB2 for OS/390 Version 5 (or higher) AR

For information on setting up the connection to a DB2 server via the DRDA-AS feature, refer to the *DB2 Connectivity Supplement*.

- DB2/400 AR

For information on setting up the connection to a DB2 server via the DRDA-AS feature, refer to the *DB2 Connectivity Supplement*.

- DB2 for VM & VSE (SQL/DS) Version 3.3 and 3.4 (or higher) AR

For information on setting up the connection to a DB2 server via the DRDA-AS feature, refer to the *DB2 Connectivity Supplement*.

For information about non-IBM ARs, contact the software support for those products.

## ***PTFs Required for DRDA Application Servers***

**Note:** At the time of publication of this manual, there were no PTFs for DB2 for MVS V4 or DB2 for OS/390 V5.

The PTF numbers for DB2 for MVS APAR PN60988, which allows DB2 for MVS to work with the DB2 DRDA-AS, are:

UN75959 for DB2 for MVS 3.1  
UN73393 for DB2 for MVS 3.1

For DB2 for MVS Version 3 Release 1 to use two-phase commit with CICS for AIX, the following PTF needs to be applied:

UN62361 for DB2 for MVS 3.1

For DB2 for VSE to use two-phase commit with CICS for AIX, the following PTFs need to be applied:

PQ01680 for DB2 for VSE  
PQ03829 for DB2 for VSE

For DB2 for VM/ESA to use two-phase commit, the following PTFs need to be applied:

VM60922 for DB2 for VM/ESA  
VM61072 for DB2 for VM/ESA

For OS/400 DRDA ARs to work against the DB2 DRDA-AS, PTFs need to be applied on the OS/400 as follows:

*Table 28. OS/400 PTFs Required for DRDA-AS*

<b>OS/400 PTR#</b>	<b>OS/400 V2R3 PTF</b>	<b>OS/400 V3R0.5 PTF</b>	<b>OS/400 V3R1 PTF</b>
SA42461	SF23100	SF23950	SF23270
SA43024	SF23205	SF23950	SF23277
3989448	SF23101	SF23994	SF23271
3993315	SF23722	SF23988	SF23721
3994088	SF23987	SF23986	SF23985
3994297	SF23990	SF23989	SF23960

---

# ***DRDA-AS Setup for the DRDA Application Requester***

This section describes the steps and conditions required to set up a connection between a DB2 Universal Database DRDA Application Server and a DRDA application requester.

Before you begin, you must determine whether your connection will use the APPC communication protocol, or the TCP/IP communication protocol.

<b>Platform</b>	<b>Supported Protocols</b>
<b>AIX</b>	APPC or TCP/IP
<b>HP-UX</b>	TCP/IP
<b>SCO</b>	None: no support for DRDA-AS
<b>SINIX</b>	None: no support for DRDA-AS
<b>Solaris</b>	APPC or TCP/IP

## **Notes:**

1. The protocol you choose may depend on the application requester:
  - APPC is supported by all application requesters
  - TCP/IP is supported by only DB2 for OS/390 V5.1 and DB Connect V5.0.
2. APPC supports both one-phase and two-phase commit; TCP/IP currently supports only one-phase commit.
3. To use APPC on AIX, the optional communication support component for SNA (db2\_05\_00.cs.sna) must also be installed.
4. To use APPC on Solaris, the optional communication support component for SNA (db2cssna) must also be installed.
5. TCP/IP is supported only for Version 5.1 of DB2 for OS/390.

## ***Setting Up DRDA-AS Functionality***

This section gives an overview of the steps required to set up DRDA-AS functionality. The example shows how to set up a connection between the DRDA AS on your DB2 server and a DB2 for MVS/ESA or DB2 for OS/390 AR:

- 1** Ensure DB2 for MVS/ESA or DB2 for OS/390 is installed and operational on the host.  
  
Refer to the *DB2 Connectivity Supplement* for information on the configuration required for the DB2 for MVS/ESA or DB2 for OS/390 AR.
- 2** If you use APPC, ensure VTAM is installed and operational on the host.

Refer to the *DB2 Connect Enterprise Edition Quick Beginnings* and the *DB2 for OS/390 V5 Installation Guide* (GC26-8970) manual for information on configuring the DB2 for DB2 for MVS/ESA or DB2 for OS/390 AR.

- 3 Set up the DB2 server communications, if required. (Typically, DB2 server communication are set up as part of the DB2 installation. However, complete details are provided in Chapter 25, “Setting up Communications on the Server Using the Command Line Processor” on page 223. If you want to use two-phase commit, refer to the online *DB2 Connect Enterprise Edition Quick Beginnings* manual.)
- 4 Update the tables at the DB2 for MVS/ESA or DB2 for OS/390 host.  
Refer to the *DB2 Connectivity Supplement* for more information.
- 5 Stop and restart the DB2 Universal Database instance named in DB2SERVICETPINSTANCE (that is, the instance you updated TPName in). Enter the following commands:  

```
db2stop  
db2start
```
- 6 Test the host-server DRDA connection by logging onto TSO and using DB2I/SPUFI.

For information on setting up two-phase commit, refer to the online *DB2 Connect Enterprise Edition Quick Beginnings* manual.

---

## ***Using the DRDA Application Server***

DRDA-AS connections over TCP/IP or APPC are treated like any other connection to the DB2 server to ensure consistency in the way the maximum number of concurrent connections to a server is measured, from both DRDA and non-DRDA clients.

When using APPC, a DRDA-AR connects to the DRDA AS by specifying the Transaction Program Name (TPN) for the server. The TPN can correspond to the *tpname* parameter value in the instance's database manager configuration file. The TPN used by the DRDA-AS can also be the service transaction program X'07'6DB. When using this TPN, each separate instance of the DRDA-AS must specify a different local LU name. The local LU name is configured by the SPM-NAME parameter in the server's database manager configuration file.

## Authentication

If you choose APPC as your communication protocol, the communications subsystem may restrict the types of database manager configuration authentication setting you can use at the DB2 Universal Database server. Not all communications subsystems expose the application requester's password to the application server when security (program) is used. When this is the case, the database manager configuration authentication must not be set to SERVER.

The following communications subsystems have this restriction:

- On AIX: Bull SNA
- On Solaris: all

To overcome the restriction that prevents you from using authentication SERVER, you can set the database manager authentication to DCS. This allows DRDA APPC connections that have been authenticated by the communication subsystem to succeed. However, with this setting the DB2 Universal Database will act as if authentication SERVER is being used for all other types of connections.

## Troubleshooting

The DB2 DRDA Trace utility (**db2drdat**) is provided for tracing the DRDA data flow between a DRDA AR and the DB2 DRDA AS. For more information on setting up this trace, refer to the *Troubleshooting Guide*.

## DRDA Functions Supported

DRDA functions are categorized as required or optional. Table 29 identifies which functions are implemented in the AS on the DB2 Universal Database server. The subsequent table lists the supported bind options.

Table 29. Supported DRDA Functions

Description	Required (R) Optional (O)	Supported	Not Supported
DRDA level 1 required function	R	X*	
Rebind	O	X	
Describe user privileges	O		X
Describe RDB table	O		X
Interrupt RDB request	O		X

**Note:** \* Certain required functions are not supported.

## ***Bind Options Supported by the DB2 DRDA AS***

Table 30 (Page 1 of 5). Bind Options Supported by the DB2 DRDA AS

Bind Option	Value	Supported	Not Supported	DB2 for iMVS/ESA Precompile Option (Note 1)	DB2/VM Preprocessing Option	OS/400 Precompile Option	DB2 Prep or Bind Option
Package Version Name	<u>Null</u>	X		VERSION			VERSION
	Any other value		X				
Bind Existence Checking	<u>Object existence optional</u>		X	VALIDATE (RUN) <sup>b</sup>	<u>NOEXIST</u>	GENLV(L(10, 11-40)	VALIDATE <u>RUN</u>
	Object existence required	X		VALIDATE (BIND) <sup>b</sup>	EXIST	GENLV(L(00-09)	VALIDATE BIND
Package Replacement Option	<u>Replacement allowed</u>	X		ACTION (REPLACE)	<u>REPLACE</u>	REPLACE(*YES)	ACTION <u>REPLACE</u>
	Replacement not allowed		X	ACTION(ADD)	NEW	REPLACE(*NO)	ACTION ADD
Package Authorization Option	<u>Keep authorizations</u>	X			<u>KEEP</u>		RETAIN <u>YES</u>
	Revoke authorizations		X		REVOKE		RETAIN NO
Statement String Delimiter (Note 2)	Apostrophe	X		<u>APOSTSQL</u>	<u>SQLAPOST</u>	OPTION([...] *APOSTSQL) (Note 3)	STRDEL APOSTROPHE
	Double quote		X	QUOTESQL	SQLQUOTE	OPTION([...] *QUOTESQL) (Note 4)	STRDEL QUOTE
Statement Decimal Delimiter (Note 5)	Period	X		<u>PERIOD</u>	<u>PERIOD</u>	OPTION([...] *PERIOD) or OPTION([...] *SYSVAL) (Note 6)	DECDEL PERIOD
	Comma		X	COMMA	COMMA	OPTION([...] *COMMA) or OPTION([...] *SYSVAL) (Note 6)	DECDEL COMMA
Date Format (Note 7)	<u>ISO</u>	X		DATE(ISO) (Note 8)	DATE(ISO)	DATEFMT(ISO) (Note 8)	DATE TIME <u>ISO</u> (Note 9)

Table 30 (Page 2 of 5). Bind Options Supported by the DB2 DRDA AS

Bind Option	Value	Sup-ported	Not Sup-ported	DB2 for MVS/ESA Precompile Option (Note 1)	DB2/VM Preprocessing Option	OS/400 Precompile Option	DB2 Prep or Bind Option
	USA	X		DATE(USA)	DATE(USA)	DATEFMT(*USA)	DATE TIME USA
	EUR	X		DATE(EUR)	DATE(EUR)	DATEFMT(*EUR)	DATE TIME EUR
	JIS	X		DATE(JIS)	DATE(JIS)	DATEFMT(*JIS)	DATE TIME JIS
Time Format (Note 7)	<u>ISO</u>	X		TIME(SO) (Note 8)	TIME(SO)	TIMFMT(*ISO) (Note 8)	DATE TIME <u>ISO</u> (Note 9)
	USA	X		TIME(USA)	TIME(USA)	TIMFMT(*USA)	DATE TIME USA
	EUR	X		TIME(EUR)	TIME(EUR)	TIMFMT(*EUR)	DATE TIME EUR
	JIS	X		TIME(JIS)	TIME(JIS)	TIMFMT(*JIS)	DATE TIME JIS
Package Isolation Level (Note 10)	Repeatable read	X		ISOLATION( <u>RR</u> ) <sup>b</sup>	ISOLATION( <u>RR</u> )		ISOLATION RR
	Read Stability (All)	X			ISOLATION(RS)	COMMIT(*ALL)	ISOLATION RS
	Cursor stability	X		ISOLATION(CS) <sup>b</sup>	ISOLATION(CS)	COMMIT(*CS)	ISOLATION <u>CS</u>
	Uncommitted Read (Change)	X			ISOLATION(UR)	COMMIT(* <u>CHG</u> )	ISOLATION UR
	No commit		X (Note 11)			COMMIT(*NONE)	ISOLATION NC
Bind Creation Control	<u>No errors allowed</u>	X		SQLERROR ( <u>NOPACKAGE</u> ) <sup>b</sup>	<u>NOCHECK</u>	OPTION([...] *GEN) GENLVL(00-09, <u>10</u> , 11-20)	SQLERROR <u>NOPACKAGE</u>
	Check only	X			CHECK	OPTION([...] *NOGEN)	SQLERROR CHECK



Table 30 (Page 3 of 5). Bind Options Supported by the DB2 DRDA AS

Bind Option	Value	Supported	Not Supported	DB2 for IMS/ESA Precompile Option (Note 1)	DB2/VM Preprocessing Option	OS/400 Precompile Option	DB2 Prep or Bind Option
	Errors allowed	X	X	SQLERROR (CONTINUE) <sup>b</sup>	ERROR	OPTION([...] *GEN) GENLVL(21-40)	SQLERROR CONTINUE
Bind Explain Option	<u>No SQL statements</u>	X		EXPLAIN(NO) <sup>b</sup>	EXPLAIN(NO)		EXPLAIN <u>NO</u>
	All explainable SQL statements		X	EXPLAIN(YES) <sup>b</sup>	EXPLAIN(YES)		EXPLAIN YES
Package Owner Identifier	< <u>Authorization ID</u> >	X		OWNER <sup>b</sup>	OWNER		OWNER
	Any other value		X				
RDB Release Option	<u>Release at commit</u>	X		RELEASE (COMMIT) <sup>b</sup>	RELEASE (COMMIT)		RELEASE <u>COMMIT</u>
	Release at conversation deallocation		X	RELEASE (DEALLOCATE) <sup>b</sup>	RELEASE (DEALLOCATE)		RELEASE DEALLOCATE
Default RDB Collection ID	< <u>Authorization ID</u> >	X		QUALIFIER <sup>b</sup>	QUALIFIER	DFTRBCOL	QUALIFIER
	Any other value		X				
Title (Package Description)	Any value (ignored by DB2)	X			LABEL	TEXT	TEXT
Query Block Protocol Control	<u>Fixed row</u>	X		CURRENTDATA (YES) <sup>b</sup>	SBLOCK	ALWBLK(*READ)	BLOCKING <u>UNAMBIG</u>
	Limited block		X	CURRENTDATA (NO) <sup>b</sup>	BLOCK	ALWBLK (*ALLREAD)	BLOCKING ALL
	Forced fixed row		X		<u>NOBLOCK</u>	ALWBLK(*NONE)	BLOCKING NO
Package Default Char. Subtype							
	<u>Use system default</u>	X					CHARSUB <u>DEFAULT</u>

Table 30 (Page 4 of 5). Bind Options Supported by the DB2 DRDA AS

Bind Option	Value	Sup-ported	Not Sup-ported	DB2 for MVS/ESA Precompile Option (Note 1)	DB2/VM Preprocessing Option	OS/400 Precompile Option	DB2 Prep or Bind Option
If Default CCSID is SBCS	BIT		X		CHARSUB(BIT)		CHARSUB BIT
If Default CCSID is SBCS	SBCS	X			CHARSUB(SBCS)		CHARSUB SBCS
If Default CCSID is SBCS	MBCS		X		CHARSUB(MBCS)		CHARSUB MBCS
If Default CCSID is MBCS	BIT		X		CHARSUB(BIT)		CHARSUB BIT
If Default CCSID is MBCS	SBCS		X		CHARSUB(SBCS)		CHARSUB SBCS
If Default CCSID is MBCS	MBCS	X			CHARSUB(MBCS)		CHARSUB MBCS
	Any other value		X				
Package Default CCSID	<u>Value specified when DB2 database was created</u>	X			CCSID(SBCS) CCSIDGRAPHIC() CCSIDMIXED()		CCSID SBCSIDG CCSIDM
	Any other value		X				
Decimal Precision (Note 12)	31	X		DEC(31)			DEC 31
	Any other value		X	DEC(15)			DEC 15
Replaced Package Version Name	<u>Null</u>	X		REPLVERb			REPLVER
	Any other value		X				

**Table 30 (Page 5 of 5). Bind Options Supported by the DB2 DRDA AS**

Bind Option	Value	Supported	Not Supported	DB2 for MVS/ESA Precompile Option (Note 1)	DB2/VM Preprocessing Option	OS/400 Precompile Option	DB2 Prep or Bind Option
<p><b>Note:</b></p> <p>(*) Default values are in <b>bold</b>.</p> <p>(1) Most are precompile options. Bind options are indicated by <b>b</b>.</p> <p>(2) Defaults to what the target database supports. For DB2 the default is apostrophe.</p> <p>(3) Default for non-COBOL applications.</p> <p>(4) Default for COBOL applications.</p> <p>(5) Defaults to what the target database supports. For DB2 the default is period.</p> <p>(6) Depending on the installation, *SYVAL is equivalent to *PERIOD or *COMMA.</p> <p>(7) Date and time formats must be the same for the DB2 DRDA AS.</p> <p>(8) Default is dependent on the installation.</p> <p>(9) Format applies to both date and time. If not specified, it defaults based on the country code. This default is mapped to ISO in DRDA flow.</p> <p>(10) Package isolation level has no default because an explicit value is always present in the DRDA datastream.</p> <p>(11) The isolation level will be escalated to Uncommitted Read (Change).</p> <p>(12) Defaults to what the target database supports. For DB2 the default is 31.</p>							

## ***Special Considerations for DB2 for VM (SQL/DS)***

Additional steps are needed to ensure the following DB2 for VM utilities work properly against a DB2 database through the DRDA Application Server.

- SQLDBSU
  - 1 Make sure a PTF for DB2 for VM APAR PN69073 is installed on your DB2 for VM system, either PTF UN91171 or PTF UN91172. (At the time of publication of this manual, there were no PTFs for DB2 for VM V4 or V5.)
  - 2 Set up dummy tables in your DB2 database by executing the **sqldbsu** utility provided with DB2 as `sqldbsu database_name`.
  - 3 Bind SQLDBSU from DB2 for VM. Refer to the “Using a DRDA Environment” in the *SQL/DS System Administration for IBM VM Systems* manual for details. (You can skip the step on creating and populating the SQLDBA.DBSOPTIONS table because this is done by the **sqldbsu** utility in the previous step.)
- ISQL
  - 1 Complete the steps described above for SQLDBSU.
  - 2 Set up dummy tables in your DB2 database by executing the **isql** utility provided with DB2 as `isql database_name`.
  - 3 Bind ISQL from DB2 for VM. Refer to the “Using a DRDA Environment” in the *SQL/DS System Administration for IBM VM Systems* manual for details.

**Note:** The **sqldbsu** and **isql** utilities are in `INSTHOME/sqllib/misc` where *INSTHOME* is the home directory of the instance owner.

If you installed DB2 on drive C, using the default directory `sqllib`, then no special setup is required for RXSQL; see the *SQL/DS Procedures Language Interface Installation* manual for details.

## ***Security and Auditability***

Under CPIC, DB2 system security (authentication CLIENT, SERVER, or DCS) must be used with CPIC security SAME or PROGRAM. When these combinations are used, the user ID and password sent in the AR's APPC ALLOCATE is used to CONNECT to the requested database. CPIC security level NONE is allowed only with DCE authentication. In this case, the encrypted dce ticket is flown as part of the CONNECT attempt.

Under TCP/IP, all security information is flown in the CONNECT attempt.

User ID translation is not supported by this AS.

## ***Configuration Considerations***

You configure the DRDA AS using regular DB2 database manager configuration parameters and specifically DRDA Heap Size. You may need to change the setting for some parameters because of the additional resources required for the DRDA AS.

### ***DRDA Heap Size (drda\_heap\_sz)***

DRDA heap size specifies the amount of memory, in pages, that is allocated for use by the DRDA AS.

See the *Administration Guide* for more information about database manager configuration.



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## **Chapter 28. Removing DB2 Products**

This chapter shows you how to remove DB2 products. You need to perform the following steps:

- 1** Stop the Administration Server.
- 2** Stop all DB2 Instances.
- 3** Remove the Administration Server.
- 4** Remove DB2 Instances - this step is optional.
- 5** Remove the DB2 products.

---

### **Step 1. Stopping the Administration Server**

You must stop the Administration Server before you remove DB2 products. To stop the Administration Server, you need to perform the following steps:

- 1** Log in as root.
- 2** Obtain the name of the Administration Server using the following command:

```
DB2DIR/bin/db2set -g DB2ADMINSERVER
```

where            DB2DIR        = /usr/lpp/db2\_05\_00        on AIX  
                                  = /opt/IBMcdb2/V5.0        on HP-UX or Solaris

- 3** Stop the Administration Server. See “Stopping the Administration Server” on page 152 for information on how to stop the Administration Server.

---

## ***Step 2. Stopping All DB2 Instances***

You must stop all DB2 Instances before you remove DB2 products. To stop DB2 Instances, you need to perform the following steps:

- 1 Obtain a list of the names of all DB2 instances on your system using the following command:

```
DB2DIR/bin/db2ilist
```

where            DB2DIR        = /usr/lpp/db2\_05\_00        on AIX  
                              = /opt/IBMd2/V5.0        on HP-UX or Solaris

- 2 Stop the instance. See “Starting and Stopping a DB2 Server Instance” on page 144 for information on how to stop a DB2 Instance.
- 3 Repeat steps 2 and 3 for each instance.

---

## ***Step 3. Removing the Administration Server***

You must remove the Administration Server before you remove DB2 products. To remove the Administration Server, you need to perform the following steps:

- 1 Log in as root.
- 2 Obtain the name of the Administration Server using the following command:

```
DB2DIR/bin/db2set -g DB2ADMINSERVER
```

where            DB2DIR        = /usr/lpp/db2\_05\_00        on AIX  
                              = /opt/IBMd2/V5.0        on HP-UX or Solaris

- 3 Stop the Administration Server. See “Removing the Administration Server” on page 153 for information on how to stop the Administration Server.



---

## Step 4. Removing DB2 Instances

You can optionally remove some or all of the DB2 Version 5 Instances on your system. Once an instance is removed, all the DB2 databases owned by the instance, if any, will not be usable. Remove DB2 Instances only if you are not planning to use DB2 Version 5 products, or if you do not want to migrate existing instances to a later version of DB2. See Chapter 6, “Migrating from Previous Versions” on page 63 for more information on how to migrate or upgrade to higher versions of DB2.

To remove DB2 Instances, you need to perform the following steps:

- 1 Log in as root.
- 2 Obtain a list of the names of all DB2 instances on your system using the following command:

```
DB2DIR/bin/db2ilist
```

where            DB2DIR        = /usr/lpp/db2\_05\_00        on AIX  
                              = /opt/IBMd2/V5.0            on HP-UX or Solaris

- 3 Remove the instance. See “Removing Instances” on page 150 for information on how to remove a DB2 instance.

---

## Step 5. Removing DB2 Products



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

The following steps describe how you can remove DB2 products on UNIX operating systems.

### Removing DB2 Products on AIX Systems

You can remove the DB2 products on Version 4.1 or later of the AIX operating system using **SMIT** interface as follows:

- 1 Log in as root.
- 2 Type `smit install_remove` to proceed directly to the Remove Software Products screen.

- 3 Press F4 to display a list of the software to remove. Press F7 at some or all of the entries that have a prefix of **db2\_05\_00**.

**Note:** For a detailed description of the software packages, see Appendix B, “Contents of the DB2 Products” on page 279.

- 4 Press Enter to start removing the DB2 products.



You can also remove all DB2 Version 5 products on Version 4.1 or later of the AIX operating system, using the **installp** command with the de-install option:

```
installp -u db2_05_00
```

## Removing DB2 Products on HP-UX Systems

You can remove the DB2 products on the HP-UX operating system using the **swremove** program as follows:

- 1 Log in as root.
- 2 Use **swremove** to remove some or all of the DB2 Version 5 products.

## Removing DB2 Products on Solaris Systems

You can remove the DB2 products on the Solaris operating system using the **pkgrm** program as follows:

- 1 Log in as root.
- 2 Determine the packages for all DB2 for Solaris related products you have installed on your system by typing:

```
pkginfo | grep -i db2 | grep 50
```

- 3 Remove all packages listed in step 2 with the **pkgrm** command.
- 4 Select **Yes** at the prompt for each package to be removed.

Before removing a package, all its dependent packages must be removed first. You must remove packages in the following order:

- a. db2ht%L50
- b. db2ms%L50
- c. db2adts50
- d. db2adt50
- e. db2cent50
- f. db2entp50
- g. db2wkgp50

- h. db2cnvt50
- i. db2cnvc50
- j. db2cnvk50
- k. db2cnvj50
- l. db2smp150
- m. db2repl50
- n. db2conn50
- o. db2das50
- p. db2cipx50
- q. db2cdrd50
- r. db2csna50
- s. db2crte50
- t. db2engn50
- u. db2rte50
- v. db2jdbc50
- w. db2odbc50
- x. db2cliv50

**Note:** See Appendix B, “Contents of the DB2 Products” on page 279 for a list of packages for Solaris.



---

## ***Part 7. Appendixes***



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## Appendix A. Obtaining Information

Information on the DB2 product is available in several different formats:

- Online Help
- PostScript (.ps)
- HTML (.htm)

All books described in this section are also available in printed form. 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.

---

## 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 help you access product information online, DB2 provides the Information Center on OS/2, Windows 95, and the Windows NT operating systems. You can view task information, DB2 books, troubleshooting information, sample programs, and DB2 information on the Web. "About the Information Center" on page 276 has more details.

## SmartGuides

SmartGuides help you complete some administration tasks by taking you through each task one step at a time. SmartGuides are available on OS/2, Windows 95, and the Windows NT operating systems. The following table lists the SmartGuides.

SmartGuide	Helps you to...	How to Access...
<i>Add Database</i>	Catalog a database on a client workstation.	From the Client Configuration Assistant, click on <b>Add</b> .
<i>Create Database</i>	Create a database, and to perform some basic configuration tasks.	From the Control Center, click with the right mouse button on the <b>Databases</b> icon and select <b>Create-&gt;New</b> .
<i>Performance Configuration</i>	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 <b>Configure performance</b> .

<b>SmartGuide</b>	<b>Helps you to...</b>	<b>How to Access...</b>
<i>Backup Database</i>	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 <b>Backup-&gt;Database using SmartGuide</b> .
<i>Restore Database</i>	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 <b>Restore-&gt;Database using SmartGuide</b> .
<i>Create Table</i>	Select basic data types, and create a primary key for the table.	From the Control Center, click with the right mouse button on the <b>Tables</b> icon and select <b>Create-&gt;Table using SmartGuide</b> .
<i>Create Table Space</i>	Create a new table space.	From the Control Center, click with the right mouse button on the <b>Table spaces</b> icon and select <b>Create-&gt;Table space using SmartGuide</b> .

## Online Help

Online help is available with all DB2 components. The following table describes the various types of help.

<b>Type of Help</b>	<b>Contents</b>	<b>How to Access...</b>
<i>Command Help</i>	Explains the syntax of commands in the command line processor.	From the command line processor in interactive mode, enter:  <i>? command</i>  where <i>command</i> is a keyword or the entire command.  For example, <i>? catalog</i> displays help for all the CATALOG commands, whereas <i>? catalog database</i> displays help for the CATALOG DATABASE command.
<i>Control Center Help</i>	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 <b>Help</b> push button or press the F1 key.



Type of Help	Contents	How to Access...
<i>Message Help</i>	Describes the cause of a message number, and any action you should take.	<p>From the command line processor in interactive mode, enter:</p> <p><b>? <i>message number</i></b></p> <p>where <i>message number</i> is a valid message number.</p> <p>For example, <b>? SQL30081</b> displays help about the SQL30081 message.</p> <p>To view message help one screen at a time, enter:</p> <p><b>? <i>XXXnnnnn</i>   more</b></p> <p>where <i>XXX</i> is the message prefix, such as SQL, and <i>nnnnn</i> is the message number, such as 30081.</p> <p>To save message help in a file, enter:</p> <p><b>? <i>XXXnnnnn</i> &gt; <i>filename.ext</i></b></p> <p>where <i>filename.ext</i> is the file where you want to save the message help.</p> <p><b>Note:</b> On UNIX-based systems, enter:</p> <p><b>\? <i>XXXnnnnn</i>   more</b> or</p> <p><b>\? <i>XXXnnnnn</i> &gt; <i>filename.ext</i></b></p>
<i>SQL Help</i>	Explains the syntax of SQL statements.	<p>From the command line processor in interactive mode, enter:</p> <p><b>help <i>statement</i></b></p> <p>where <i>statement</i> is an SQL statement.</p> <p>For example, <b>help SELECT</b> displays help about the SELECT statement.</p>
<i>SQLSTATE Help</i>	Explains SQL states and class codes.	<p>From the command line processor in interactive mode, enter:</p> <p><b>? <i>sqlstate</i> or ? <i>class-code</i></b></p> <p>where <i>sqlstate</i> is a valid five digit SQL state and <i>class-code</i> is a valid two digit class code.</p> <p>For example, <b>? 08003</b> displays help for the 08003 SQL state, whereas <b>? 08</b> displays help for the 08 class code.</p>

# DB2 Books

The table in this section lists the DB2 books. They are divided into two groups:

- Cross-platform books: These books are for DB2 on any of the supported platforms.
- Platform-specific books: These books are for DB2 on a specific platform. For example, there is a separate *Quick Beginnings* book for DB2 on OS/2, Windows NT, and UNIX-based operating systems.

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.

You can obtain DB2 books and access information in a variety of different ways:

- View** To view an HTML book, you can do the following:
- If you are running DB2 administration tools on OS/2, Windows 95, or the Windows NT operating systems, you can use the Information Center. “About the Information Center” on page 276 has more details.
  - Use the open file function of the Web browser supplied by DB2 (or one of your own) to open the following page:  
`sqllib/doc/html/index.htm`  
The page contains descriptions of and links to the DB2 books. 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.
- Search** 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. “About the Information Center” on page 276 has more details.
- Print** To print a book on a PostScript printer, look for the file name shown in the table.
- Order** To order a hardcopy book from IBM, use the form number.

<b>Book Name</b>	<b>Book Description</b>	<b>Form Number</b> <b>File Name</b>
<b>Cross-Platform Books</b>		
<i>Administration Getting Started</i>	Introduces basic DB2 database administration concepts and tasks, and walks you through the primary administrative tasks.	S10J-8154 db2k0x50
<i>Administration Guide</i>	Contains information required to design, implement, and maintain a database to be accessed either locally or in a client/server environment.	S10J-8157 db2d0x50
<i>API Reference</i>	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 db2b0x50
<i>CLI Guide and Reference</i>	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
<i>Command Reference</i>	Explains how to use the command line processor, and describes the DB2 commands you can use to manage your database.	S10J-8166 db2n0x50
<i>DB2 Connect Enterprise Edition Quick Beginnings</i>	Provides planning, installing, configuring, and using information for DB2 Connect Enterprise Edition. Also contains installation and setup information for all supported clients.	S10J-7888 db2cyx50
<i>DB2 Connect Personal Edition Quick Beginnings</i>	Provides planning, installing, configuring, and using information for DB2 Connect Personal Edition.	S10J-8162 db2c1x50
<i>DB2 Connect User's Guide</i>	Provides concepts, programming and general using information about the DB2 Connect products.	S10J-8163 db2c0x50
<i>DB2 Connectivity Supplement</i>	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.  <b>Note:</b> Available in HTML and PostScript formats only.	No form number db2h1x50
<i>Embedded SQL Programming Guide</i>	Explains how to develop applications that access DB2 databases using embedded SQL, and includes discussions about programming techniques and performance considerations.	S10J-8158 db2a0x50
<i>Glossary</i>	Provides a comprehensive list of all DB2 terms and definitions.  <b>Note:</b> Available in HTML format only.	No form number db2t0x50

<b>Book Name</b>	<b>Book Description</b>	<b>Form Number</b> <b>File Name</b>
<i>Installing and Configuring DB2 Clients</i>	Provides installation and setup information for all DB2 Client Application Enablers and DB2 Software Developer's Kits.  <b>Note:</b> Available in HTML and PostScript formats only.	No form number db2iyx50
<i>Master Index</i>	Contains a cross reference to the major topics covered in the DB2 library.  <b>Note:</b> Available in PostScript format and hardcopy only.	S10J-8170 db2w0x50
<i>Message Reference</i>	Lists messages and codes issued by DB2, and describes the actions you should take.	S10J-8168 db2m0x50
<i>Replication Guide and Reference</i>	Provides planning, configuring, administering, and using information for the IBM Replication tools supplied with DB2.	S95H-0999 db2e0x50
<i>Road Map to DB2 Programming</i>	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
<i>SQL Getting Started</i>	Introduces SQL concepts, and provides examples for many constructs and tasks.	S10J-8156 db2y0x50
<i>SQL Reference</i>	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 db2s0x50
<i>System Monitor Guide and Reference</i>	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
<i>Troubleshooting Guide</i>	Helps you determine the source of errors, recover from problems, and use diagnostic tools in consultation with DB2 Customer Service.	S10J-8169 db2p0x50
<i>What's New</i>	Describes the new features, functions, and enhancements in DB2 Universal Database.  <b>Note:</b> Available in HTML and PostScript formats only.	No form number db2q0x50
<b>Platform-Specific Books</b>		
<i>Building Applications for UNIX Environments</i>	Provides environment setup information and step-by-step instructions to compile, link, and run DB2 applications on a UNIX system.	S10J-8161 db2axx50
<i>Building Applications for Windows and OS/2 Environments</i>	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

<b>Book Name</b>	<b>Book Description</b>	<b>Form Number</b> <b>File Name</b>
<i>DB2 Extended Enterprise Edition Quick Beginnings</i>	Provides planning, installing, configuring, and using information for DB2 Universal Database Extended Enterprise Edition for AIX.	S72H-9620 db2v3x50
<i>DB2 Personal Edition Quick Beginnings</i>	Provides planning, installing, configuring, and using information for DB2 Universal Database Personal Edition on OS/2, Windows 95, and the Windows NT operating systems.	S10J-8150 db2i1x50
<i>DB2 SDK for Macintosh Building Your Applications</i>	Provides environment setup information and step-by-step instructions to compile, link, and run DB2 applications on a Macintosh system.  <b>Note:</b> Available in PostScript format and hardcopy for DB2 Version 2.1.2 only.	S50H-0528 sqla7x02
<i>DB2 SDK for SCO OpenServer Building Your Applications</i>	Provides environment setup information and step-by-step instructions to compile, link, and run DB2 applications on a SCO OpenServer system.  <b>Note:</b> Available for DB2 Version 2.1.2 only.	S89H-3242 sqla9x02
<i>DB2 SDK for Silicon Graphics IRIX Building Your Applications</i>	Provides environment setup information and step-by-step instructions to compile, link, and run DB2 applications on a Silicon Graphics system.  <b>Note:</b> Available in PostScript format and hardcopy for DB2 Version 2.1.2 only.	S89H-4032 sqlaax02
<i>DB2 SDK for SINIX Building Your Applications</i>	Provides environment setup information and step-by-step instructions to compile, link, and run DB2 applications on a SINIX system.  <b>Note:</b> Available in PostScript format and hardcopy for DB2 Version 2.1.2 only.	S50H-0530 sqla8x00
<i>Quick Beginnings for OS/2</i>	Provides planning, installing, configuring, and using information for DB2 Universal Database on OS/2. Also contains installing and setup information for all supported clients.	S10J-8147 db2i2x50
<i>Quick Beginnings for UNIX</i>	Provides planning, installing, configuring, and using information for DB2 Universal Database on UNIX-based platforms. Also contains installing and setup information for all supported clients.	S10J-8148 db2ixx50
<i>Quick Beginnings for Windows NT</i>	Provides planning, installing, configuring, 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

**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:

<b>Language</b>	<b>Identifier</b>	<b>Language</b>	<b>Identifier</b>
Brazilian Portuguese	B	Hungarian	H
Bulgarian	U	Italian	I
Czech	X	Norwegian	N
Danish	D	Polish	P
English	E	Russian	R
Finnish	Y	Slovenian	L
French	F	Spanish	Z
German	G	Swedish	S

2. For late breaking information that could not be included in the DB2 books, see the README file. Each DB2 product includes a README file which you can find in the directory where the product is installed.

## ***About the Information Center***

The Information Center provides quick access to DB2 product information. The Information Center is available on OS/2, Windows 95, and the Windows NT operating systems. You must install the DB2 administration tools to see 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.

The Information Center provides the following kinds of information. Click on the appropriate tab to look at the information:

<b>Tasks</b>	Lists tasks you can perform using DB2.
<b>Reference</b>	Lists DB2 reference information, such as keywords, commands, and APIs.
<b>Books</b>	Lists DB2 books.
<b>Troubleshooting</b>	Lists categories of error messages and their recovery actions.
<b>Sample Programs</b>	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.
<b>Web</b>	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 search capabilities so you can look for specific topics, and filter capabilities to limit the scope of your searches.

---

## Ordering the Printed DB2 Books

You can also order the printed DB2 manuals. There are two sets of books available. The form number for the entire set of DB2 books is SB0F-8915-00. The form number for the books listed under the heading "Cross-Platform Books" is SB0F-8914-00.

---

## Printing the PostScript Books

If you prefer to have printed copies of the manuals, you can uncompress and print PostScript versions as follows.

On UNIX systems:

- 1 Use the instructions in "Step 3. Mounting the CD-ROM" on page 53 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 Uncompress and print the manual you require using the command for UNIX platforms:

- For AIX:

```
zcat filename | qprt -P PSprinter_queue
```

- For HP-UX or Solaris:

```
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
```



Specify the full-path name for the file you intend to print.

---

## 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 more easily, using hypertext links for related information. It also makes it easier to share the library across your site.

Although you can use any HTML Version 3.2-compliant browser to view the online books, a copy of the Netscape browser is available on the Portfolio CD-ROM provided with DB2 Universal Database Version 5; you can optionally install it on your system.

## Installing the Netscape Browser

If you do not have an HTML Version 3.2-compliant browser installed on your system, you can install the Netscape browser from the Portfolio CD-ROM.

To install Netscape, use the following instructions:

- 1 Mount the Portfolio CD-ROM.
- 2 Refer to the README.TXT file located at the root directory the CD-ROM for installation instructions.

The README.TXT file also contains information about the products.



## Appendix B. Contents of the DB2 Products

This appendix lists the contents of various DB2 Universal Database products.

### Packaging

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

*Table 31 (Page 1 of 2). DB2 Components, Packages or Filesets*

Description	Fileset Name		
	DB2 for AIX	DB2 for HP-UX	DB2 for Solaris
DB2 Client	db2_05_00.client	DB2V5CAE.client	db2cliv50
Open Database Connectivity (ODBC)	db2_05_00.odbc	DB2V5CAE.odbc	db2odbc50
Java Database Connectivity (JDBC)	db2_05_00.jdbc	DB2V5CAE.jdbc	db2jdbc50
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 Workgroup Edition	db2_05_00.wsrv	DB2V5WGRP.wsrv	db2wkgp50
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
DB2 ADT Sample Programs	db2_05_00.adt.samples	DB2V5SDK.adtsamp	db2adts50

Table 31 (Page 2 of 2). DB2 Components, Packages or Filesets

Description	Fileset Name		
	DB2 for AIX	DB2 for HP-UX	DB2 for Solaris
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 <sup>1, 2</sup>	db2_05_00.msg.%L <sup>4</sup>	DB2V5MSG.%L	db2ms%L50
DB2 Product Document (HTML) - %L <sup>1</sup>	db2_05_00.html.%L <sup>4</sup>	DB2V5HTML.%L	db2ht%L50
<p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>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. See Table 32 on page 281 for the abbreviated locale names.</li> <li>2. English messages are always installed.</li> <li>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 <i>Administration Guide</i>.</li> <li>4. On AIX, DB2 Product Messages and Documentation are translated in several locales. However, not every message catalog or book is translated in every locale. The DB2 Product Messages and Documentation are translated into the following locales: bg_BG, cs_CZ, Da_DK, da_DK, De_DE, de_DE, EN_US, en_US, ES_ES, es_ES, Fi_FI, fi_FI, Fr_FR, fr_FR, hu_HU, Ja_JP, ja_JP, ko_KR, No_NO, no_NO, pl_PL, Pt_BR, pt_BR, ru_RU, sl_SI, Sv_SE, sv_SE, zh_CN, zh_TW.</li> </ol>			

Abbreviated names for locale names are given in the following table. %L represents the abbreviated locale name.

*Table 32. Abbreviated Names for Locales*

DB2 for HP-UX		DB2 for Solaris	
Locale	%L	Locale	%L
bg_BG.iso88595	bg_BG	-	-
da_DK.iso88591	da_DK	da	da
da_DK.roman8	da_DK	-	-
de_DE.iso88591	de_DE	de	de
de_DE.roman8	de_DE	-	-
en_US.iso88591	en_US	en_US	en
en_US.roman8	en_US	-	-
es_ES.iso88591	es_ES	es	es
es_ES.roman8	es_ES	-	-
fi_FI.iso88591	fi_FI	fi	fi
fi_FI.roman8	fi_FI	-	-
fr_FR.iso88591	fr_FR	fr	fr
fr_FR.roman8	fr_FR	-	-
ja_JP.eucJP	ja_JP	ja	ja
ko_KR.eucKR	ko_KR	ko	ko
no_NO.iso88591	no_NO	no	no
no_NO.roman8	no_NO	-	-
pt_BR.iso88591	pt_BR	pt	pt
pt_BR.roman8	pt_BR	-	-
sl_SI.iso88592	sl_SI	sl	sl
sv_SV.iso88591	sv_SV	sv	sv
sv_SV.roman8	sv_SV	-	-
zh_CN.eucCN	zh_CN	zh	zh
zh_TW.eucTW	zh_TW	tw	tw

---

## ***Products and Selectable Components***

Table 33 on page 282 lists the DB2 Universal Database products and selectable components that you can install on a DB2 Server.

Table 33. Components for DB2 Products

Product / Component Description	DB2 CAE	DB2 Universal Database Enterprise Edition	DB2 UDB Workgroup Edition	DB2 Connect
DB2 Client Application Enabler	√√	√√	√√	√√
Open Database Connectivity (ODBC) support	√	√	√	√
Java Database Connectivity (JDBC) support	√	√	√	√
Administration Server		√	√	√
DB2 Run-time Environment		√√	√√	√√
DB2 Engine		√√	√√	√√
DB2 Connect Support		√√		√√
Communication Support for TCP/IP		√√	√√	√√
Communication Support for IPX/SPX		√√	√√	√√
Communication Support for SNA		√√	√√	√√
Communication Support for DRDA Application Server		√√	√√	√√
Code Page Conversion Tables - Japanese		√	√	√
Code Page Conversion Tables - Korean		√	√	√
Code Page Conversion Tables - Simplified Chinese		√	√	√
Code Page Conversion Tables - Traditional Chinese		√	√	√
Licensed Support for DB2 Universal Database Workgroup Edition			√√	
Licensed Support for DB2 Universal Database Enterprise Edition		√√		
Licensed Support for DB2 Connect				√√
DB2 Replication	o	o	o	o
DB2 Product Messages (non-English) <sup>1</sup>	o	o	o	o
DB2 Product Library (HTML) <sup>1</sup>	o	o	o	o
√√	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.			
<b>Notes:</b>				
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 17.			

# Prerequisites

The DB2 filesets are listed below with their corresponding prerequisites.

<i>Table 34. Prerequisites for DB2 Filesets</i>	
<b>Fileset Description</b>	<b>Prerequisite Fileset</b>
DB2 Client Application Enabler	Appropriate version of the operating system
Open Database Connectivity (ODBC) support	DB2 Client Application Enabler
Java Database Connectivity (JDBC) 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 Workgroup Edition	DB2 Engine
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 C. National Language Support (NLS)**

This appendix contains information about the National Language Support (NLS) provided by DB2, including information about supported locales and code sets. For more detailed information on developing applications, refer to the *Embedded SQL Programming Guide*.

---

### **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:

<b>DB2 for AIX</b>	/usr/lpp/db2_05_00/msg/%L
<b>DB2 for HP-UX</b>	/opt/IBMdb2/V5.0/msg/%L
<b>DB2 for Solaris</b>	/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 you install the DBCS (double-byte character set) version of DB2 on the corresponding DBCS version of the operating system. Also, note that DB2 national language support may not produce the expected results if the country, code page and regional settings are incorrect for the intended language.

Table 35 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\win16\install* would be *x:\EN\win16\install* for English.

*Table 35. Languages and Code Pages*

Country Code	Language	Country Code	Language
BG	Bulgaria	IL	Hebrew
BR	Brazilian Portuguese	IT	Italian
CN	Simplified Chinese (PRC)	JP	Japanese
CZ	Czech	KR	Korean
DE	German	NO	Norwegian
DK	Danish	PL	Polish
ES	Spain	RU	Russian
FI	Finnish	SE	Sweden
FR	French	SI	Slovenian
GR	Greece	TW	Traditional Chinese (Taiwan)
HU	Hungary	EN	English



---

## Appendix D. Naming Rules

---



Use the following to find the naming rules you need:

- “General Naming Rules”
  - “Database and Database Alias Names” on page 288
  - “Object Names” on page 288
  - “User IDs, Group Names, and Instance Names” on page 289
  - “DB2SYSTEM Naming Rules” on page 290
  - “Workstation Names (nname)” on page 290
  - “Password Naming Rules” on page 290
- 

---

### 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*.

---

## Database and Database Alias 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 287.

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.

---

## 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 287.

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 the above rules.

---

## ***User IDs, Group Names, and Instance Names***

User IDs are the identifiers assigned to individual users. When naming users, groups, or instances, see “General Naming Rules” on page 287.

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 95 and Windows NT, use any case
  - On UNIX, use lowercase names

---

## ***Workstation Names (nname)***

Workstation names are 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 *nname*. When naming workstations, see “General Naming Rules” on page 287.

In addition, the name you specify:

- Must be unique within a network
- Can contain 1 to 8 characters
- Cannot include &

---

## ***DB2SYSTEM Naming Rules***

*DB2SYSTEM* names are used by DB2 to identify a physical DB2 machine, system, server, or workstation with a network. On UNIX and OS/2, you must specify a *DB2SYSTEM* name during or after install. On Windows 95 and Windows NT, you do not need to specify a *DB2SYSTEM* name; the DB2 install program detects the NT Computer name and assigns it to *DB2SYSTEM*.

When creating a *DB2SYSTEM* name, see “General Naming Rules” on page 287.

In addition, the name you specify:

- Must be unique within a network
- Can contain a maximum of 21 characters

---

## ***Password Naming Rules***

When determining passwords on OS/2 and Windows 3.x, the word or name 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.

---

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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.

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## World Wide Web

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## Internet Newsgroups

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To find out about the IBM Professional Certification Program for DB2 Universal Database, go to <a href="http://www.software.ibm.com/data/db2/db2tech/db2cert.html">http://www.software.ibm.com/data/db2/db2tech/db2cert.html</a>
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