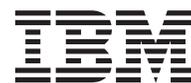IBM® DB2® Universal Database
for UNIX®

Quick Beginnings

Version 7

IBM® DB2® Universal Database
for UNIX®

Quick Beginnings

Version 7

Before using this information and the product it supports, be sure to read the general information under "Appendix F. Notices" on page 219.

Contents

Welcome to DB2 Universal Database!

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

This *Quick Beginnings* book will guide you through the planning, installation, migration (if necessary), and setup of a DB2 server on a UNIX workstation. Once the DB2 server has been installed, you will install a DB2 client. You will then configure a connection between the client and server, using the Command Line Processor or DB2 GUI tools.

Conventions

This book uses the following highlighting conventions:

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

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

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

For a complete description of the DB2 library, see "Appendix C. Using the DB2 Library" on page 193.

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

Part 1. Planning for Installation

Chapter 1. Planning for Installation

Before you install DB2, you should make sure that your system meets DB2's hardware and software requirements. If you are migrating from a previous version of DB2, there are also pre-installation migration tasks you should perform to prepare your databases.

This chapter describes the following requirements you should take into consideration before installing DB2:

- "Memory Requirements".
- "Disk Requirements" on page 4.
- "Software Requirements" on page 5.
- "Possible Client-to-Server Connectivity Scenarios" on page 12.
- "Migrating from Previous Versions of DB2" on page 13.

If you know that your system meets all the hardware and software requirements, and if you are not planning to migrate from a previous version of DB2, skip this section and go to "Part 2. Installing DB2 Servers" on page 17.

Note: If you are installing DB2 Universal Database Enterprise Edition with the DB2 Connect Support feature, see the DB2 Connect publications for additional requirements.

Memory Requirements

The amount of random-access memory (RAM) that you require to run your DB2 server depends on the size of your databases and on the administration tools you will use. For example, if you plan to use the DB2 GUI tools to administer and configure your DB2 databases, the minimum amount of RAM we recommend is 128 MB.

The DB2 GUI tools are a set of administration and configuration tools that include the Command Center, Control Center, and the Data Warehouse Center. Additional GUI tools are available on Windows 32-bit and OS/2 operating systems. These include the Client Configuration Assistant, Event Monitor and Event Analyzer. For more information about DB2 GUI tools and the platforms on which they are available, refer to the *Administration Guide*.

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

Disk Requirements

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

DB2 Servers

A default installation of DB2 requires a minimum of 250 to 300 MB of disk space. This amount includes the online production documentation and tools. On NUMA-Q systems, a default installation requires a minimum of 80 MB.

DB2 Clients

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

Table 1. Disk Requirements for Client Components

Client Components	Recommended Minimum Disk (MB)
OS/2	
DB2 Run-Time Client	30 MB
DB2 Application Development Client	125 MB, not including the Java Development Kit (JDK)
DB2 Administration Client	95 MB
UNIX platforms	
DB2 Run-Time Client	30 to 40 MB (70 MB for Silicon Graphics IRIX)
DB2 Application Development Client	90 to 120 MB, not including the JDK (40 MB for NUMA-Q)
DB2 Administration Client	80 to 110 MB
Note: PTX/NUMA-Q and Silicon Graphics IRIX operating systems do not support the DB2 Administration Client.	
Windows 32-bit Operating Systems	
DB2 Run-Time Client	25 MB
DB2 Application Development Client	325 MB, including the JDK
DB2 Administration Client	125 MB

The DB2 Application Development Client and DB2 Administration Client include tools and documentation, except on NUMA-Q systems.

Software Requirements

This section outlines the software required to run DB2 products.

Server Product Requirements

Table 2 lists the operating system and communications software required for DB2 Universal Database.

On all platforms you will need a Java Runtime Environment (JRE) Version 1.1.8 to run DB2's Java-based tools, such as the Control Center. If you intend to run the Control Center as an applet, you will need a Java-enabled browser. See "Chapter 18. Control Center Installation and Configuration" on page 143 for more information.

Table 2. Software Requirements

Hardware/Software Requirements	Communications
	DB2 Universal Database for AIX
RISC System/6000 and AIX Version 4.2 or later	APPC, IPX/SPX, TCP/IP and MPTN (APPC over TCP/IP)
	• For TCP/IP connectivity, no additional software is required.
	• IPX/SPX connectivity is provided by:
	– AIX base operating system 4.2 or later, which supports direct addressing.
	– AIX base operating system 4.3 or later (contains Novell Netware Services for AIX Version 4.1), which supports direct and file server addressing.
	• For SNA (APPC) connectivity, one of the following communication products is required:
	– IBM eNetwork Communications Server for AIX V5.0.3
	– Bull DPX/20 SNA/20
	Notes:
	1. If you plan to use the DB2 OLAP Starter Kit, you require AIX Version 4.3 or later.
	2. For LDAP (Lightweight Directory Access Protocol) support, you require an IBM SecureWay Directory Client V3.1.1 running on AIX V4.3.1 or higher.
	3. For Data Links Manager in DCE-DFS environments, you require DCE Version 3.1.
	4. If you plan to use DCE (Distributed Computing Environment) and you are not using DB2 Data Links Manager, you require a DCE product that is provided with your AIX operating system. For DB2 Connect support, you require DB2/MVS Version 5.1 plus its prerequisite, OS/390 DCE Base Services Version 3 for DCE support.
	With DB2 Connect, you must install DCE Directory Services on the client and the DRDA server. You do not need DCE installed on a DB2 Connect Enterprise Edition server.
	5. If you plan to use the Tivoli Storage Manager facilities back up and restore to your databases, you require the Tivoli Storage Manager Client Version 3 or later.
	6. If you plan to use the Simple Network Management Protocol (SNMP) subagent, you require DPI 2.0 provided by IBM SystemView Agent.

Table 2. Software Requirements (continued)

Hardware/Software Requirements	Communications
DB2 Universal Database for HP-UX	

HP 9000 series 700 or 800 system and the following:
• HP-UX Version 11.00 or later
	APPC or TCP/IP
	• TCP/IP is provided with the HP-UX base operating system.
	• For APPC connectivity, HP-UX Version 11.00 requires the following:
	  – SNAplus2 Link R6.11.00.00
	  – SNAplus2 API R.6.11.00.00
	
	Notes:
	1. HP-UX only supports outbound client APPC requests. It does not provide support for inbound client APPC requests.
	2. If you plan to use DCE (Distributed Computing Environment), you require a DCE product that is provided by the HP-UX Version 11 operating system.
	   With DB2 Connect, you must install DCE Directory Services on the client and the host server. You do not need DCE installed on a DB2 Connect Enterprise Edition server.
	3. If you plan to use the Tivoli Storage Manager facilities to back up and restore your databases, you require the Tivoli Storage Manager Client Version 3 or later.

DB2 Universal Database for Linux	
• Linux kernel 2.2.12 or higher; • *glibc* Version 2.1.2 or higher; • *pdksh* package (required to run the DB2 command line processor); and • *libstdc++* Version 2.9.0. To install DB2, you will need *rpm*.	TCP/IP • For TCP/IP connectivity, no additional software is required. • APPC connectivity is not supported in this version of DB2 UDB for Linux.
DB2 Universal Database for NUMA-Q	
• NUMA-Q system running PTX Version 4.5 or later. • ptx/EFS v1.4.0 with templog is required.	TCP/IP • For TCP/IP connectivity, no additional software is required.
DB2 Universal Database for the Solaris Operating Environment	

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

Client Product Requirements

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

On all platforms you will need a Java Runtime Environment (JRE) Version 1.1.8 to run the DB2 tools, such as the Control Center. If you intend to run the Control Center as an applet on Windows 32-bit or OS/2 systems, you will need a Java-enabled browser. See "Chapter 18. Control Center Installation and Configuration" on page 143 for more information.

Table 3. Software Requirements for Clients

Component	Hardware/Software Requirements	Communications
• DB2 Run-Time Client for AIX • DB2 Administration Client for AIX • DB2 Application Development Client for AIX	RISC System/6000 and the following: • AIX Version 4.2 or later • For OLAP Starter Kit, AIX Version 4.3 or later. • For LDAP (Lightweight Directory Access Protocol) support, you require an IBM SecureWay Directory Client V3.1.1 running on AIX V4.3.1 or later. • For Warehouse Agent, bos.iconv.ucs.com and bos.iconv.ucs.pc at AIX Version 4.2 or later. • For Data Links Manager in DCE-DFS environments, you require DCE Version 3.1. **Note:** When the DB2 Application Development Client is installed, the JDK 1.1.8 is only installed if no other version of the JDK is detected.	APPC or TCP/IP • For APPC connectivity, you require IBM eNetwork Communications Server Version 5.0.3 or later for AIX • The AIX base operating system provides TCP/IP connectivity, if selected during install. **Note:** If you plan to use DCE (Distributed Computing Environment) and you are not using DB2 Data Links Manager, you require a DCE product that is provided by the AIX base operating system.

Table 3. Software Requirements for Clients (continued)

Component	Hardware/Software Requirements	Communications

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

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

Table 3. Software Requirements for Clients (continued)

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

Table 3. Software Requirements for Clients (continued)

Component	Hardware/Software Requirements	Communications

• DB2 Run-Time Client for Silicon Graphics IRIX
• DB2 Application Development Client for Silicon Graphics IRIX
	• Silicon Graphics IRIX, Version 6.x, and the following filesets:
	  – eoe.sw.oampkg
	  – eoe.sw.svr4net
	The following patches are required for Versions 6.2 and 6.3:
	  – 2791.0
	  – 3778.0
	Note: When the DB2 Application Development Client is installed, the JDK is not installed. Contact your operating system vendor for the latest version of the JDK.
		TCP/IP
		• The Silicon Graphics IRIX base operating system provides TCP/IP connectivity.

• DB2 Run-Time Client for Solaris
• DB2 Administration Client for Solaris
• DB2 Application Development Client for Solaris
	Solaris SPARC-based computer and the following:
	• Solaris Version 2.6 or later.
	The following patches are required for Solaris version 2.6:
	• 105568 – 12 or higher
	• 105210 – 25 or higher
	• 105181 – 17 or higher
	Note: When the DB2 Application Development Client is installed, the JDK is not installed. Contact your operating system vendor for the latest version of the JDK.
		APPC or TCP/IP
		• For APPC connectivity, you require SunLink SNA 9.1 or later and the following:
		  – SunLink P2P LU6.2 9.0 or later
		  – SunLink PU2.1 9.0 or later
		  – SunLink P2P CPI–C 9.0 or later
		• The Solaris base operating system provides TCP/IP connectivity.
		• If you plan to use DCE (Distributed Computing Environment), you require Transarc DCE Version 2.0 or later.

Table 3. Software Requirements for Clients (continued)

Component	Hardware/Software Requirements	Communications
• DB2 Run-Time Client for Windows 9x • DB2 Administration Client for Windows 9x • DB2 Application Development Client for Windows 9x	• Windows 95 4.00.950 or later • Windows 98 **Note:** When the DB2 Application Development Client is installed, the JDK 1.1.8 is installed.	IPX/SPX, Named Pipes, NetBIOS, or TCP/IP • The Windows 9x base operating system provides NetBIOS, IPX/SPX, TCP/IP, and Named Pipes connectivity. **Note:** IPX/SPX connectivity is only supported to Windows NT and Windows 2000 servers. • If you plan to use LDAP (Lightweight Directory Access Protocol), you require either a Microsoft LDAP client or an IBM SecureWay LDAP client V3.1.1. For more information, refer to the *Administration Guide*. • If you plan to use the Tivoli Storage Manager facilities for backup and restore of your databases, you require the Tivoli Storage Manager Client Version 3 or later. • If you have the IBM Antivirus program installed on your operating system, it must be disabled or uninstalled to complete a DB2 installation.
• DB2 Run-Time Client for Windows • DB2 Administration Client for Windows • DB2 Application Development Client for Windows	• Windows NT Version 4.0 with Service Pack 3 or later • Windows Terminal Server (can only run the DB2 Run-Time Client) • Windows 2000 **Note:** When the DB2 Application Development Client is installed, the JDK 1.1.8 is installed.	APPC, IPX/SPX, Named Pipes, NetBIOS, or TCP/IP • The Windows NT and Windows 2000 base operating systems provide NetBIOS, IPX/SPX, TCP/IP, and Named Pipes connectivity. • For APPC connectivity, you require one of the following products: – IBM eNetwork Communications Server for Windows V5.01 or later. – Windows 2000: IBM eNetwork Personal Communications for Windows Version 4.3 CSD2 or later – Windows NT: IBM eNetwork Personal Communications for Windows Version 4.2 or later – Microsoft SNA Server Version 3 Service Pack 3 or later – Wall Data Rumba • If you plan to use DCE (Distributed Computing Environment) and connect to a DB2 for OS/390 V5.1 database, that database must be enabled for DCE support using OS/390 DCE Base Services Version 3. • If you plan to use LDAP (Lightweight Directory Access Protocol), you require either a Microsoft LDAP client or an IBM SecureWay LDAP client V3.1.1. For more information, refer to the *Administration Guide*. • If you plan to use the Tivoli Storage Manager facilities for backup and restore of your databases, you require the Tivoli Storage Manager Client Version 3 or later. • If you have the IBM Antivirus program installed on your operating system, it must disabled or uninstalled to complete a DB2 installation.

Possible Client-to-Server Connectivity Scenarios

The following table shows the communication protocols that can be used when connecting a specific DB2 client to a specific DB2 server. DB2 Workgroup, DB2 Enterprise, and DB2 Enterprise - Extended Editions can service requests from host or AS/400 clients (DRDA ARs).

Table 4. Possible Client-to-Server Connectivity Scenarios

Client	Server						
	AIX	HP-UX	Linux	OS/2	PTX/NUMA-Q	Solaris	Windows NT/ Windows 2000
AS/400 V4R1	APPC	N/A	N/A	APPC	N/A	APPC	APPC
AS/400 V4R2	APPC TCP/IP	TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP
AIX	APPC TCP/IP	TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP
HP-UX	APPC TCP/IP	TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP
Linux	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP
MVS	APPC	N/A	N/A	APPC	N/A	APPC	APPC
OS/2	APPC IPX/SPX(1),(2) TCP/IP	TCP/IP	TCP/IP	APPC IPX/SPX(1),(2) NetBIOS TCP/IP	TCP/IP	APPC IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) NetBIOS TCP/IP
OS/390	APPC TCP/IP	TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP
PTX/NUMA-Q	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP
Silicon Graphics IRIX	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP	TCP/IP
SQL/DS	APPC	N/A	N/A	APPC	N/A	APPC	APPC
Solaris	APPC TCP/IP	TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP
VSE & VM V5	APPC	N/A	N/A	APPC	N/A	APPC	APPC
VSE V6	APPC	N/A	N/A	APPC	N/A	APPC	APPC
VM V6	APPC TCP/IP	TCP/IP	TCP/IP	APPC TCP/IP	TCP/IP	APPC TCP/IP	APPC TCP/IP
Windows 9x	TCP/IP	TCP/IP	TCP/IP	NetBIOS TCP/IP	TCP/IP	TCP/IP	IPX/SPX(1) NPIPE NetBIOS TCP/IP
Windows NT/ Windows 2000	APPC IPX/SPX(1) TCP/IP	TCP/IP	TCP/IP	APPC IPX/SPX(1) NetBIOS TCP/IP	TCP/IP	APPC IPX/SPX(1) TCP/IP	APPC IPX/SPX(1) NPIPE NetBIOS TCP/IP
1. Direct Addressing							
2. File Server Addressing							

Migrating from Previous Versions of DB2

If you are migrating from Version 5.0 or Version 5.2 to DB2 Version 7, you must prepare your databases and instances before installing DB2 Version 7. If you are upgrading from Version 6, there is nothing you have to do prior to installing Version 7.

The migration of pre-Version 5.0 databases and instances is not supported in DB2 Version 7.

If you are migrating a DB2 installation on a workstation that is running on a supported Linux distribution, you should be aware of the following:

- The migration of DB2 Version 5.2 Beta is not supported.
- DB2 Version 7 can only run with `glibc version 2.1.2` or higher, as mentioned in "Software Requirements" on page 5. If your Linux distribution has a previous version of this library, you will not be able to use your DB2 product.

  To prepare your workstation for installation, you have to upgrade your existing Linux distribution to a more recent level that includes the required (or later) version of the *glibc* library. You also have the option to update only the local version of the *glibc* library. We recommend that you update your distribution's installation to a more recent version that includes the required level for the *glibc* library. Updating just the *glibc* library without updating your distribution's installation version is not recommended as errors during this process can affect your operating system.

Preparing Databases and Instances for Migration

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

If there are several DB2 instances using previous versions of DB2, you do not need to migrate all of these instances at this time. Instances that are not migrated will continue to use previous versions of DB2.

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

To prepare your databases for migration:

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

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

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

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

```
db2 list database directory
```

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

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

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

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

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

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

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

set DB2INSTANCE=db2inst1  //C shell
```

NetQuestion Search System

If you installed online product documentation with your previous version of DB2 for Windows, OS/2, AIX, HP-UX or Solaris, or if you installed another IBM product like VisualAge C++ or VisualAge for Java, an online search system called NetQuestion was also installed automatically.

If the version of NetQuestion that comes with DB2 Version 7 is later than the version of NetQuestion currently present on your system, the current version will be upgraded and any existing document indices will be re-registered with NetQuestion. This will be done automatically for you during DB2 installation.

For more information on NetQuestion, refer to the *Installation and Configuration Supplement*.

Your next step

After you have determined that your system meets all hardware and software requirements, and after you have prepared any existing databases and instances for migration, you can now install DB2 Version 7 using either the interactive or distributed method. For installation procedures, see the following sections:

- "Part 2. Installing DB2 Servers" on page 17 for interactive installation.
- The *Installation and Configuration Supplement* for distributed installation.

Part 2. Installing DB2 Servers

The following chapters describe how to install a DB2 Universal Database server on supported UNIX-based systems using either the db2setup utility or your operating system's native administration tools. This section also contains a chapter on removing your DB2 product.

If you want to install a DB2 Administration Client, Run-Time Client, or Application Development Client see "Chapter 13. Installing DB2 Clients on UNIX Operating Systems" on page 105. For information on how to deploy this product using a distributed installation, refer to the *Installation and Configuration Supplement*.

Before You Begin

Please read the following information before installing your DB2 product.

System requirements

Ensure that your system meets all of the memory, hardware, and software requirements to install your DB2 product. For more information, see "Chapter 1. Planning for Installation" on page 3.

Product licensing

Your product CD-ROM contains several DB2 products. *Your Proof of Entitlement* and the *License Information* booklet identify the products for which you are licensed. If you are installing this product on an SMP machine, see "Setting the Number of Licensed Processors" on page 190 after installing and configuring DB2 to update the product with the number of processors that you have purchased.

Migrating from previous versions of DB2

DB2 for UNIX Version 7 products can co-exist on the same machine with previous versions of DB2. However, if you want to migrate databases and instances that were created using DB2 Version 5.0 or Version 5.2, you must complete certain tasks before *and* after installing DB2. For pre-installation migration tasks, see "Chapter 1. Planning for Installation" on page 3. For post-installation migration tasks, see "Chapter 8. DB2 Post-installation Migration Tasks" on page 69.

NIS and NIS+ environments

If you are running Network Information Services (NIS) or NIS+, you must create group and user IDs on the master server *before* installing DB2. You also need to set up the user and group names in such a way

that the primary group of the Administration Server must be in the secondary group list of all the instances, and the secondary group list of the Administration Server must contain the primary group of all the instances. If NIS or NIS+ is not running on the system, secondary group lists are modified automatically.

Installation parameters

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

We recommend that you create the following unique usernames and groups:

- A new username and group for the DB2 instance owner.
- A second new username and group for the Administration server.
- A third new username and group for fenced user defined functions (UDFs) and stored procedures.

Usernames for the default DB2 instance and Administration Server should conform to both your operating system's naming rules and those of DB2. For more information on DB2 naming rules, see "Appendix E. Naming Rules" on page 215.

Table 5. Parameter Values Required for Installation

Information Required for Installation	Default Value	Your Value
Product/Component		
DB2 Product Name[1]	None	
DB2 Product Messages[2]	None	
Documentation[2]	None	
DB2 Instance		
User Name	db2inst1	
UID	System-generated UID	
Group Name	db2iadm1	
GID	System-generated GID	
Home Directory	/home/db2inst1	
Fenced User Defined Functions (UDFs)	db2fenc1	
Password	ibmdb2	

Table 5. Parameter Values Required for Installation (continued)

Information Required for Installation	Default Value	Your Value
TCP/IP Service Name	db2cdb2inst1	
TCP/IP Port Number	50000	
IPX/SPX File Server Name	*	
IPX/SPX Object Name	*	
IPX/SPX Socket Number	879E	
IPX/SPX NetWare User ID	None	
IPX/SPX NetWare Password	None	
User Name (UDF)	db2fenc1	
UID (UDF)	System-generated UID	
Group Name (UDF)	db2fadm1	
GID (UDF)	System-generated GID	
Password (UDF)	ibmdb2	
Administration Server		
User Name (DAS)	db2as	
UID (DAS)	System-generated UID	
Group Name (DAS)	db2asgrp	
GID (DAS)	System-generated GID	
Home Directory	/home/db2as	
Password (DAS)	ibmdb2	
TCP/IP Port Number (DAS)	523	523
IPX/SPX File Server Name (DAS)	*	
IPX/SPX Object Name (DAS)	*	
IPX/SPX Socket Number (DAS)	87A2	87A2
IPX/SPX NetWare User ID (DAS)	None	
IPX/SPX NetWare Password (DAS)	None	

Table 5. Parameter Values Required for Installation (continued)

Information Required for Installation	Default Value	Your Value
Notes:		
1. You must select at least one DB2 product to install. See *Installation and Configuration Supplement* for a list of DB2 products available for installation.		
2. You can optionally select one or more filesets in this product. There is a separate fileset for each locale. See *Installation and Configuration Supplement* for the names of filesets for DB2 Product Messages and Documentation.		

About the db2setup utility

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

The db2setup utility can:

- Create or assign groups and user IDs. If you are running NIS or NIS+, you will need to do perform these tasks manually.
- Create a DB2 instance and configure it for communications.
- Create the Administration Server and configure it for communications.
- Install a license key.
- Install additional products, product messages, and documentation.
- Create links for DB2 files.

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

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

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

Your next step

To install DB2, go to the appropriate chapter:

"Chapter 2. Installing DB2 for AIX" on page 23.

"Chapter 3. Installing DB2 for HP-UX" on page 31.

Chapter 2. Installing DB2 for AIX

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

The following instructions assume that you have read "Part 2. Installing DB2 Servers" on page 17.

Installing DB2 for AIX Using the db2setup Utility

The db2setup utility is the recommended method for installing DB2 for AIX. This utility can perform all of the tasks required to install DB2. If you prefer not to use the db2setup utility, see "Manually Installing DB2 for AIX" on page 24.

To install DB2 for AIX using the db2setup utility:

1. Log in as a user with root authority.
2. Insert and mount your DB2 product CD-ROM. For information on how to mount a CD-ROM, see "Mounting CD-ROMs on UNIX Operating Systems" on page 188.
3. Change to the directory where the CD-ROM is mounted by entering the **cd /cdrom** command where **cdrom** is the mount point of your product CD-ROM.
4. Enter the **./db2setup** command. The DB2 Setup Utility window opens.
5. Select **Install** and press Enter. The Install DB2 V7 window opens.
6. Select the products you want and are licensed to install. Press **Tab** to move between available options and fields. Press **Enter** to select or deselect an option. Selected options are denoted by an asterisk.

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

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

If you did not install the DB2 tools you can verify the installation by creating and connecting to the SAMPLE database. For more information, see "Chapter 7. Verifying the Installation" on page 67.

You can use the db2setup utility at any time to set up an existing instance, create another instance, create an Administration Server, or install additional

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

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

Your Next Step

If you are migrating from a previous version of DB2, see "Chapter 8. DB2 Post-installation Migration Tasks" on page 69.

If you are not migrating from a previous version of DB2 and you want to begin installing DB2 clients, go to "Part 4. Installing DB2 Clients" on page 103.

If you want to set up links for your DB2 files, go to "Creating links for DB2 files" on page 29.

Manually Installing DB2 for AIX

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

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

To install DB2 using the SMIT software bundle feature:

1. Log in as a user with root authority.
2. Insert and mount the appropriate CD-ROM.
3. Enter the **smit** command.
4. Select **Software Installation and Maintenance —> Install and Update Software —> Install Software Bundle (Easy Install)**.
5. Specify the input device or directory for the installation media, or click List to display all input devices or directories.
6. Select the CD-ROM drive you mounted, then press Enter.
7. Select the bundle you want to install and press Enter. The Install Software Bundle window opens.

8. Review the bundle installation parameters. In particular, make sure that **COMMIT software updates** and **AUTOMATICALLY install requisite software** are set to **yes**. Click **OK** again to begin installation.

9. If you did not install the DB2 Media-Defined software bundle on this system, use the following procedure to install it:

   a. In the **Bundle to Install** menu, select the **Media-Defined** option, then press Enter.

   b. In the **Install Bundle Contents** menu, press Enter to continue with the installation. Messages may appear to indicate the status of the installation. Press Enter to continue.

   c. Press F3 to return to the **Install Bundle Contents** menu.

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

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

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

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

1. Log in as user with root authority.

2. Insert and mount the appropriate CD-ROM.

3. Enter the **smit install_latest** command.

4. Specify the INPUT device/directory for DB2 and press Enter.

   For example, if /cdrom is the CD-ROM mount directory, enter /cdrom/db2 as the INPUT device.

5. Press F4 to display a list of software to install.

6. Press F7 to mark one or more filesets for installation. If you are installing a non-English DB2 Product Library (HTML) fileset, the English DB2 Product Documentation (HTML) fileset will also be installed automatically.

7. Press Enter to install the selected filesets. DB2 will be installed in /usr/lpp/db2_07_01/.

8. Press F10 to exit when the command displays **OK**.

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

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

If you did not install the DB2 tools you can verify the installation by creating and connecting to the SAMPLE database. For more information, see "Chapter 7. Verifying the Installation" on page 67.

DB2 for AIX Post-installation Tasks

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

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

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

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

In addition to the rules imposed by the operating system for user names and groups, you must also adhere to the rules described in "Appendix E. Naming Rules" on page 215.

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

   ```
   mkgroup id=999 dbadmin1
   ```

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

   ```
   mkuser id=1004 pgrp=dbadmin1 groups=dbadmin1 home=/home/db2inst1 db2inst1
    passwd db2inst1
   ```

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

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

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

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

Creating an instance

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

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

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

where:

* DB2DIR represents your DB2 installation directory

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

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

Creating the Administration Server

The Administration Server provides services to support tools that automate the configuration of connections to DB2 databases. The Administration Server

also supports tools that administer DB2 from your server system or a remote client using the Control Center. For more information on the Administration Server, refer to the *Administration Guide*.

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

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

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

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

To update your DB2 product license key:
1. Log in as a user with root authority.
2. Update your DB2 product license with the following command:
   ```
   /usr/lpp/db2_07_01/adm/db2licm -a filename
   ```

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

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

The names of the license files for these products are:

db2udbee.lic
> DB2 Universal Database Enterprise Edition

db2conee.lic
> DB2 Connect Enterprise Edition

db2udbwe.lic
> DB2 Universal Database Workgroup Edition

db2dlm.lic
> DB2 Universal Database Data Links Manager

db2udbeee.lic
> DB2 Universal Database Enterprise - Extended Edition

db2udbwm.lic
> DB2 Warehouse Manager

db2relc.lic
> DB2 Relational Connect

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

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

Creating links for DB2 files

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

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

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

Your Next Step

After manually installing DB2 you *must* configure your instances and Administration Server to accept inbound client connections. For more information, see "Part 3. Setting Up Server Communications" on page 85.

If you are migrating from a previous version of DB2, you should also see "Chapter 8. DB2 Post-installation Migration Tasks" on page 69.

Chapter 3. Installing DB2 for HP-UX

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

The following instructions assume that you have read "Part 2. Installing DB2 Servers" on page 17.

Updating HP-UX Kernel Configuration Parameters

Before installing your DB2 for HP-UX product using **db2setup** or **swinstall**, you may need to update your system's kernel configuration parameters. The values in Table 6 on page 32 are the recommended HP-UX kernel configuration parameters.

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

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

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

Notes:

1. The msgsem parameter must be set no higher than 32767.

2. The msgmnb and *msgmax* parameters must be set to at least 65 535.

3. The shmmax parameter should be set to 134 217 728 or 90% of the physical memory (in bytes), whichever is higher. For example, if you have 196 MB of physical memory in your system, set *shmmax* to 184968806 (196*1024*1024*0.9).

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

To change a value, perform the following steps:

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

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

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

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

Step 5. Click on **OK**.

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

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

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

Installing DB2 for HP-UX Using the db2setup Utility

After updating your HP-UX kernel configuration parameters, you can begin installing DB2 for HP-UX. The **db2setup** utility is the recommended method for installing DB2 for HP-UX. This utility can perform all of the tasks required to install DB2. If you prefer not to use the **db2setup** utility, see "Manually Installing DB2 for HP-UX" on page 34.

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

1. Log in as a user with root authority.
2. Insert and mount your DB2 product CD-ROM. For information on how to mount a CD-ROM, see "Mounting CD-ROMs on UNIX Operating Systems" on page 188.
3. Change to the directory where the CD-ROM is mounted by entering the **cd /cdrom** command where **cdrom** is the mount point of your product CD-ROM.
4. Enter the **./db2setup** command. The DB2 Setup Utility window opens.
5. Select **Install** and press Enter. The Install DB2 V7 window opens.
6. Select the products you want and are licensed to install. Press **Tab** to move between available options and fields. Press **Enter** to select or deselect an option. Selected options are denoted by an asterisk.

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

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

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

If you did not install the DB2 tools you can verify the installation by creating and connecting to the SAMPLE database. For more information, see "Chapter 7. Verifying the Installation" on page 67.

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

Your Next Step

If you are migrating from a previous version of DB2, see "Chapter 8. DB2 Post-installation Migration Tasks" on page 69.

If you are not migrating from a previous version of DB2 and you want to begin installing DB2 clients, go to "Part 4. Installing DB2 Clients" on page 103.

If you want to set up links for your DB2 files, go to "Creating links for DB2 files" on page 39.

Manually Installing DB2 for HP-UX

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

Before you install DB2 you should update your system's kernel configuration parameters. For more information see "Updating HP-UX Kernel Configuration Parameters" on page 31.

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

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

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

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

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

DB2V7CONN

> DB2 Connect Enterprise Edition for HP-UX

DB2V7ENTP

> DB2 Universal Database Enterprise Edition for HP-UX

DB2V7WGRP

> DB2 Universal Database Workgroup Edition for HP-UX

DB2V7WCC

> DB2 Universal Database Control Center and Online Help (all locales)

DB2V7SDK

> DB2 Application Development Client

DB2V7HTML

> DB2 Universal Database Product Library in HTML (all locales).

> The DB2V7HTML product includes filesets for all the DB2 product documentation. A separate fileset exists for each language. For example, the fileset name for the DB2 product library in English is DB2V7HTML.en_US. Whenever you install a non-English DB2V7HTML fileset the English version is also installed. For a complete list of filesets in the DB2V7HTML product, see "Chapter 9. Contents of the DB2 Products for UNIX platforms" on page 75.

> After installing a DB2V7HTML fileset you must uncompress and untar it before you can view the HTML files. See "DBV7HTML fileset post-installation tasks" on page 36 for instructions.

DB2V7MSG

> DB2 Universal Database Product Messages (all locales).

> The DB2V7MSG product includes a separate fileset for every locale in which DB2 Product Messages are available. There is no fileset for the English (en_US.iso88591 or en_US.roman8) locale since these messages are always installed with the base product. For example, to install the DB2 Product messages in the fr_FR.iso88591 locale, you need to install the fileset DB2V7MSG.fr_FR. For a complete list of filesets in the DB2V7MSG product, see "Chapter 9. Contents of the DB2 Products for UNIX platforms" on page 75.

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

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

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

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

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

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

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

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

If you did not install the DB2 tools you can verify the installation by creating and connecting to the SAMPLE database. For more information, see "Chapter 7. Verifying the Installation" on page 67.

DBV7HTML fileset post-installation tasks

After installing any DB2V7HTML fileset you must uncompress and untar it before you can view the HTML files. To uncompress and untar a DB2V7HTML fileset, run the **/opt/IBMdb2/V7.1/doc/db2insthtml** `locale` command where `locale` represents the language of the fileset you installed. To recover disk space, you may want to remove the compressed tar files and product library filesets after installation. You will still be able to view the HTML books after the compressed tar files and filesets have been removed.

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

DB2 for HP-UX Post-installation tasks

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

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

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

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

In addition to the rules imposed by the operating system for user names and groups, you must also adhere to the rules described in "Appendix E. Naming Rules" on page 215.

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

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

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

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

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

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

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

The **db2icrt** command is run with the following parameters:
```
DB2DIR/instance/db2icrt -a AuthType -u FencedID InstName
```

where:

- `DB2DIR` represents your DB2 installation directory

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

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

Creating the Administration Server

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

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

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

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

Updating the License Key

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

To update your DB2 product license key:
1. Log in as a user with root authority.
2. Update your DB2 product license with the following command:
   `/opt/IBMdb2/V7.1/adm/db2licm -a filename`

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

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

   The names of the license files for these products are:

db2udbee.lic
>   DB2 Universal Database Enterprise Edition

db2conee.lic
>   DB2 Connect Enterprise Edition

db2udbwe.lic
>   DB2 Universal Database Workgroup Edition

db2udbeee.lic
>   DB2 Universal Database Enterprise - Extended Edition

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

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

Creating links for DB2 files

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

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

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

Your Next Step

After manually installing DB2 you *must* configure your instances and Administration Server to accept inbound client connections. For more information, see "Part 3. Setting Up Server Communications" on page 85.

If you are migrating from a previous version of DB2, you should also see "Chapter 8. DB2 Post-installation Migration Tasks" on page 69.

Chapter 4. Installing DB2 for Linux

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

The following instructions assume that you have read "Part 2. Installing DB2 Servers" on page 17.

Enabling Your Linux Workstation for a DB2 Installation

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

Installing DB2 on Red Hat Linux

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

Installing DB2 on Caldera Open Linux

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

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

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

Installing DB2 on Turbo Linux

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

Installing DB2 on SuSE Linux

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

Installing DB2 for Linux Using the db2setup Utility

The db2setup utility is the recommended method for installing DB2 for Linux. This utility can perform all of the tasks required to install DB2. If you prefer not to use the db2setup utility, see "Manually Installing DB2 for Linux" on page 43.

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

To install this product using the db2setup utility:

1. Log in as a user with root authority.
2. Insert and mount your DB2 product CD-ROM. For information on how to mount a CD-ROM, see "Mounting CD-ROMs on UNIX Operating Systems" on page 188.

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

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

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

You can verify the installation by creating and connecting to the SAMPLE database. For more information, see "Chapter 7. Verifying the Installation" on page 67.

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

Your Next Step

If you are migrating from a previous version of DB2, see "Chapter 8. DB2 Post-installation Migration Tasks" on page 69.

If you are not migrating from a previous version of DB2 and you want to begin installing DB2 clients, go to "Part 4. Installing DB2 Clients" on page 103.

If you want to create links to DB2 files, go to "Creating Links for DB2 Files" on page 47.

Manually Installing DB2 for Linux

We recommend that you use the db2setup utility to install DB2 for Linux. If you prefer not to use this utility, you can install DB2 manually using the **db2_install** or **rpm** commands. Your DB2 product is made up of different functions and components that are referred to as packages in the Linux environment. When you install your DB2 product using the **rpm** command, you must select to install each package that you require and each associated package for the optional functions that you want to use. For example, if you

want to install the Control Center on your Linux workstation, you would need to install the db2wcc71–7.1.0–0.i386.rpm package by entering the following command:

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

Some packages are required and some are optional. For information on the packages that are required to install a DB2 product, see "Products and Selectable Components" on page 77. For a detailed list of all the package names, see "Chapter 9. Contents of the DB2 Products for UNIX platforms" on page 75.

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

To install DB2 using the **db2_install** script:

1. Log in as a user with root authority.
2. Ensure that your Linux workstation has been enabled for DB2, for more information, see "Enabling Your Linux Workstation for a DB2 Installation" on page 41.
3. Insert and mount the appropriate CD-ROM. For more information on mounting a CD-ROM, see "Mounting CD-ROMs on UNIX Operating Systems" on page 188.
4. Enter the **./db2_install** command. The script will return a list of the products that are available for installation from your CD-ROM, for example:

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

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

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

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

DB2 for Linux Post-Installation Tasks

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

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

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

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

In addition to the rules imposed by the operating system for user names and groups, you must also adhere to the rules described in "Appendix E. Naming Rules" on page 215.

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

       mkgroup -g 999 dbadmin1

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

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

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

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

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

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

Creating an Instance

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

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

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

where:

- DB2DIR represents your DB2 installation directory

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

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

Creating the Administration Server

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

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

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

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

Updating the License Key

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

To update your DB2 product license key:

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

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

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

   db2udbee.lic
   >   DB2 Universal Database Enterprise Edition

   db2conee.lic
   >   DB2 Connect Enterprise Edition

   db2udbwe.lic
   >   DB2 Universal Database Workgroup Edition

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

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

Creating Links for DB2 Files

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

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

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

Your Next Step

After manually installing DB2 you *must* configure your instances and Administration Server to accept inbound client connections. For more information, see "Part 3. Setting Up Server Communications" on page 85.

If you are migrating from a previous version of DB2, you should also see "Chapter 8. DB2 Post-installation Migration Tasks" on page 69.

Chapter 5. Installing DB2 for NUMA-Q

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

The following instructions assume that you have read "Part 2. Installing DB2 Servers" on page 17.

Updating NUMA-Q/PTX Kernel Configuration Parameters

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

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

Table 7. PTX Kernel Configuration Parameters (Recommended Values)

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

Notes:

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

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

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

Step 2. Enter the menu command.

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

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

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

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

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

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

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

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

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

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

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

Step 14. Compile the kernel.

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

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

Installing DB2 for NUMA-Q Using the db2setup Utility

After updating your PTX kernel configuration parameters, you can begin installing DB2. The db2setup utility is the recommended method for installing DB2 for NUMA-Q. This utility can perform all of the tasks required to install DB2. If you prefer not to use the db2setup utility, see "Manually Installing DB2 for NUMA-Q" on page 51.

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

1. Log in as a user with root authority.

2. Insert and mount your DB2 product CD-ROM. For information on how to mount a CD-ROM, see "Mounting CD-ROMs on UNIX Operating Systems" on page 188.

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

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

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

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

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

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

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

If you did not install the DB2 tools you can verify the installation by creating and connecting to the SAMPLE database. For more information, see "Chapter 7. Verifying the Installation" on page 67.

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

Your Next Step

If you are migrating from a previous version of DB2, see "Chapter 8. DB2 Post-installation Migration Tasks" on page 69.

If you are not migrating from a previous version of DB2 and you want to begin installing DB2 clients, go to "Part 4. Installing DB2 Clients" on page 103.

If you want to set up links for your DB2 files, go to "Creating links for DB2 files" on page 56.

Manually Installing DB2 for NUMA-Q

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

Before you install DB2 you should update your system's kernel configuration parameters. For more information see "Updating NUMA-Q/PTX Kernel Configuration Parameters" on page 49.

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

1. Log in as a user with root authority.
2. Insert and mount the appropriate CD-ROM.
3. Run the **db2_install** command as follows:

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

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

   DB2.EENT
   > DB2 Universal Database Enterprise - Extended Edition for NUMA-Q

   DB2.ENTP
   > DB2 Universal Database Enterprise Edition for NUMA-Q

   DB2.CENT
   > DB2 Connect Enterprise Edition for NUMA-Q

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

   DB2.SDK
   > DB2 Application Development Client NUMA-Q

   The command displays the following prompt: Specify one or more of the keywords separated by spaces.
4. Type the keyword of the products to be installed when prompted.
5. Type the name of the base directory when prompted. The default base directory is /opt.

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

If you did not install the DB2 tools you can verify the installation by creating and connecting to the SAMPLE database. For more information, see "Chapter 7. Verifying the Installation" on page 67.

Installing DB2 for NUMA-Q Product Messages

A separate package exists for every locale in which DB2 Product Messages are translated. Packages for DB2 Product Messages are given names such as db2ms%L71, where %L represents two letters for the language name. For

example, the package name for the DB2 Product Messages in the de (German) locale is db2msde71. For a complete list of DB2 Product Messages, see "Chapter 9. Contents of the DB2 Products for UNIX platforms" on page 75.

To install DB2 Product Message packages using the **pkgadd** command:
1. Log in as a user with root authority.
2. Insert and mount the appropriate CD-ROM.
3. Run the **pkgadd** command as follows:

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

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

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

   ```
   pkgadd -d /cdrom/unnamed_cdrom/db2 db2msde71
   ```

DB2 for NUMA-Q Post-installation tasks

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

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

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

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

In addition to the rules imposed by the operating system for user names and groups, you must also adhere to the rules described in "Appendix E. Naming Rules" on page 215.

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

   ```
   groupadd -g 999 dbadmin1
   ```

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

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

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

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

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

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

Creating an instance

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

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

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

where:

- DB2DIR represents your DB2 installation directory

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

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

Creating the Administration Server

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

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

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

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

Updating the License Key

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

To update your DB2 product license key:

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

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

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

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

   The names of the license files for these products are:

   db2udbee.lic
   DB2 Universal Database Enterprise Edition

   db2udbeee.lic
   DB2 Universal Database Enterprise - Extended Edition

   db2conee.lic
   DB2 Connect Enterprise Edition

   db2udbwe.lic
   DB2 Universal Database Workgroup Edition

   db2udbwm.lic
   DB2 Warehouse Manager

db2relc.lic
DB2 Relational Connect

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

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

Creating links for DB2 files

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

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

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

Your Next Step

After manually installing DB2 you *must* configure your instances and Administration Server to accept inbound client connections. For more information, see "Part 3. Setting Up Server Communications" on page 85.

If you are migrating from a previous version of DB2, you should also see "Chapter 8. DB2 Post-installation Migration Tasks" on page 69.

Chapter 6. Installing DB2 for Solaris

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

The following instructions assume that you have read "Part 2. Installing DB2 Servers" on page 17.

Updating Solaris kernel configuration parameters

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

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

Table 8. Solaris Kernel Configuration Parameters (Recommended Values)

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

Notes:

1. The `msgsys:msginfo_msgmnb` and `msgsys:msginfo_msgmax` parameters must be set to 65535 or larger.

2. The `msgsys:msgsem` parameter must be set no higher than 32767.

3. The `shmsys:shminfo_shmmax` parameters should be set to the suggested value in the above table, or 90% of the physical memory (in bytes), whichever is higher. For example, if you have 196 MB of physical memory in your system, set the `shmsys:shminfo_shmmax` parameter to 184968806 (196*1024*1024*0.9).

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

```
set parameter_name = value
```

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

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

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

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

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

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

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

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

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

Installing DB2 for Solaris using the db2setup utility

After updating your Solaris kernel configuration parameters, you can begin installing DB2. The db2setup utility is the recommended method for installing DB2 for Solaris. This utility can perform all of the tasks required to install DB2. If you prefer not to use the db2setup utility, see "Manually installing DB2 for Solaris" on page 60.

To install DB2 for Solaris using the db2setup utility:

1. Log in as a user with root authority.
2. Insert and mount your DB2 product CD-ROM. For information on how to mount a CD-ROM, see "Mounting CD-ROMs on UNIX Operating Systems" on page 188.
3. Change to the directory where the CD-ROM is mounted by entering the **cd /cdrom** command where **cdrom** is the mount point of your product CD-ROM.
4. Enter the **./db2setup** command. The DB2 Setup Utility window opens.
5. Select **Install** and press Enter. The Install DB2 V7 window opens.
6. Select the products you want and are licensed to install. Press Tab to move between available options and fields. Press Enter to select or deselect an option. Selected options are denoted by an asterisk.

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

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

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

If you did not install the DB2 tools you can verify the installation by creating and connecting to the SAMPLE database. For more information, see "Chapter 7. Verifying the Installation" on page 67.

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

Your next step

If you are migrating from a previous version of DB2, see "Chapter 8. DB2 Post-installation Migration Tasks" on page 69.

If you are not migrating from a previous version of DB2 and you want to begin installing DB2 clients, go to "Part 4. Installing DB2 Clients" on page 103.

If you want to set up links for your DB2 files, go to "Creating links for DB2 files" on page 65.

Manually installing DB2 for Solaris

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

Before you install DB2 you should update your system's kernel configuration parameters. For more information see "Updating Solaris kernel configuration parameters" on page 57.

To install your DB2 for Solaris product using the **db2_install** command:
1. Log in as a user with root authority.
2. Insert and mount the appropriate CD-ROM.
3. If the Volume Manager is *not* running on your system, enter the following commands to mount the CD-ROM:

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

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

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

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

   ```
   /cdrom/unnamed_cdrom
   ```
4. Run the **db2_install** command as follows:

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

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

   DB2.EENT
   DB2 Universal Database Enterprise - Extended Edition for Solaris

DB2.ENTP
> DB2 Universal Database Enterprise Edition for Solaris

DB2.CENT
> DB2 Connect Enterprise Edition for Solaris

DB2.WKGP
> DB2 Universal Database Workgroup Edition for Solaris

DB2.CAE
> DB2 Universal Database Administration Client

DB2.RCAE
> DB2 Universal Database Run-Time Client

DB2.SDK
> DB2 Application Development Client

DB2.DQP
> DB2 Universal Database Query Patroller

NETQ IBM NetQuestion HTML Search System

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

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

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

If you did not install the DB2 tools you can verify the installation by creating and connecting to the SAMPLE database. For more information, see "Chapter 7. Verifying the Installation" on page 67.

Installing the DB2 for Solaris Product Library

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

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

For example, the package name for the DB2 Product Library in English is
db2hten71. For a complete list of packages for the DB2 Product Library, see
"Chapter 9. Contents of the DB2 Products for UNIX platforms" on page 75.

To install the DB2 Product Library (HTML) package, do the following:
1. Log in as a user with root authority.
2. Insert and mount the appropriate CD-ROM.
3. Run the **pkgadd** command:

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

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

   ```
   pkgadd -d /cdrom/unnamed_cdrom/db2 db2hten71
   ```

   This command installs the compressed-tar files for the DB2 documents in
   the /opt/IBMdb2/V7.1/doc/*locale*/html directory, where *locale* is the
   language language identifier.
4. Run the following command to uncompress and untar the HTML files:

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

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

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

Installing DB2 for Solaris Product Messages

A separate package exists for every locale in which DB2 Product Messages are
translated. Packages for DB2 Product Messages are given names such as
db2ms%L71, where %L represents two letters for the language name. For
example, the package name for the DB2 Product Messages in the de (German)
locale is db2msde71. For a complete list of DB2 Product Messages, see
"Chapter 9. Contents of the DB2 Products for UNIX platforms" on page 75.

To install DB2 Product Message packages using the **pkgadd** command:
1. Log in as a user with root authority.
2. Insert and mount the appropriate CD-ROM.
3. Run the **pkgadd** command as follows:

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

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

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

```
pkgadd -d /cdrom/unnamed_cdrom/db2 db2msde71
```

DB2 for Solaris post-installation tasks

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

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

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

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

In addition to the rules imposed by the operating system for user names and groups, you must also adhere to the rules described in "Appendix E. Naming Rules" on page 215.

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

   ```
   groupadd -g 999 dbadmin1
   ```

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

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

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

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

To create group and user IDs for the Administration Server follow the same steps you used to create IDs for the instance owner. You must use different

user IDs for the Administration Server and instance owner. For security reasons, we recommend you use a different group ID for the Administration Server and instance owner.

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

Creating an instance

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

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

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

where:

- DB2DIR represents your DB2 installation directory

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

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

Creating the Administration Server

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

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

    where DB2DIR = /usr/lpp/db2_07_01 on AIX

= /opt/IBMdb2/V7.1 HP-UX, PTX, SGI IRIX, or Solaris
= /usr/IBMdb2/V7.1 on Linux

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

Updating the License Key

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

To update your DB2 product license key:

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

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

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

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

   The names of the license files for these products are:

   db2udbee.lic
   > DB2 Universal Database Enterprise Edition

   db2udbeee.lic
   > DB2 Universal Database Enterprise - Extended Edition

   db2conee.lic
   > DB2 Connect Enterprise Edition

   db2udbwe.lic
   > DB2 Universal Database Workgroup Edition

   db2udbwm.lic
   > DB2 Warehouse Manager

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

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

Creating links for DB2 files

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

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

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

Your next step

After manually installing DB2 you *must* configure your instances and Administration Server to accept inbound client connections. For more information, see "Part 3. Setting Up Server Communications" on page 85.

If you are migrating from a previous version of DB2, you should also see "Chapter 8. DB2 Post-installation Migration Tasks" on page 69.

Chapter 7. Verifying the Installation

If you did not install the DB2 Control Center, but did install the sample database source (either by selecting the sample database component using the db2setup utility, or by selecting the appropriate sample database fileset if you are installing DB2 manually) you can verify the installation by creating the DB2 UDB SAMPLE database and connecting to it using the command line processor as follows:

1. Log on to the system as a user with system administrative (SYSADM) authority.
2. Enter the **db2sampl** command to create the DB2 UDB SAMPLE database.

   The DB2 UDB SAMPLE database is automatically catalogued with the database alias SAMPLE when it is created.
3. Start the database manager by entering the **db2start** command.
4. Enter the following commands in a DB2 command window to connect to the SAMPLE database, retrieve a list of all the employees that work in department 20, and reset the database connection:

   ```
   db2 connect to sample
   db2 "select * from staff where dept = 20"
   db2 connect reset
   ```

   For information about entering DB2 commands, see "Entering Commands Using the Command Center" on page 184 or "Entering Commands Using the Command Line Processor" on page 185.

After you have verified the installation, you can remove the SAMPLE database to free up disk space. Enter the **db2 drop database sample** command to drop the SAMPLE database. You can also uninstall the sample database source component to free up more disk space.

Chapter 8. DB2 Post-installation Migration Tasks

After verifying your DB2 installation, you should migrate your instances by running the **db2imigr** command. The **db2imgr** command checks that your instance can be migrated. It also calls the **db2ckmig** command which checks that the databases in the instance can be migrated. After migrating your instances, you must migrate each database in an instance by running the **migrate database** command.

You can skip this chapter if you are not migrating instances and databases.

The procedures in this chapter assume that you have performed the pre-installation migration tasks described in "Chapter 1. Planning for Installation" on page 3.

Migrating Instances

To migrate instances, including your Administration Server instance, to a format usable by DB2 Version 7, you must run the **db2imigr** command:

1. Log in as user with root authority.
2. Run the **db2imigr** command as follows:

   `DB2DIR/instance/db2imigr [-d] [-u fencedID] InstName`

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

   and where:

   -d   Sets the debug mode that you can use for problem determination. This parameter is optional.

   -u *fencedID*
            Is the user under which the fenced user-defined functions (UDFs) and stored procedures will execute. This parameter is optional only when a DB2 Run-Time Client is installed. It is required for all other DB2 products.

   InstName
            Is the login name of the instance owner.

3. If there are any errors in verifying that all databases can be migrated, see "Possible Migration Error Messages and User Responses" and take the suggested corrective actions. Then, reenter the **db2imigr** command.

Note: If you are migrating a DB2 for AIX instance and the it uses the environment variable *DB2SORT* set to the keyword *SMARTSORT*, you must set the registry value *db2sort* after the instance is migrated to Version 7. Set the *db2sort* registry value to the run time library for the sort command as follows:

```
db2set DB2SORT="/usr/lib/libsort.a"
```

Possible Migration Error Messages and User Responses

If the **db2imigr** command fails, check the following list of error messages and take the appropriate 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 logs and stop.

Table space ID is 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 an inconsistent state

Restart the database to return it to a consistent state.

Structured type and function have the same name

A structured type and function (with no arguments) belonging to the same schema cannot have the same name. The type or function, and objects using the type or function, must be dropped and recreated using another name. To correct this error:

1. Back up the database.
2. Export the data from any tables that are dependent on the structured types or functions.
3. Drop any tables dependent on the structured types or functions, and then drop the structured types or functions. These drops may drop other objects such as views, indexes, triggers, or functions.
4. Create structured types or functions with different type or function names and recreate the tables using the new structured type or function names. Recreate any dropped views, indexes, triggers, or functions.

5. Import or load the data into the object.

The database contains user-defined distinct types (UDTs) that use the type name BIGINT, DATALINK, or REFERENCE.

These data type names are reserved for the Version 7 database manager. To correct this error:

1. Back up the database.
2. Export the data from any tables that are dependent on these data types.
3. Drop any tables dependent on these data types, and then drop the data types. These drops may drop other objects such as views, indexes, triggers, or functions.
4. Create data types with different type or function names and recreate the tables using the new data type names. Recreate any dropped views, indexes, triggers, or functions.
5. Import or load the data into the object.

Migrating Databases

This section applies only if you are migrating databases from Version 5.x to the Version 7.1 format. If you are migrating from Version 6.1 to Version 7.1, you can skip this section.

Note: If you have run **db2imigr** on your Administration Server instance, you can skip this section. The Administration Server instance does not contain any databases.

To migrate Version 5.x databases owned by an instance:

1. Log in with a user account that has SYSADM authority. See "Working with the System Administrative Group" on page 187 for more information.
2. Ensure that the databases you want to migrate are cataloged. To retrieve a list of all catalogued databases on your system, enter the **db2 list database directory** command. The syntax of this command is as follows:

DB2 LIST DATABASE DIRECTORY command

```
►►──LIST──┬─DATABASE─┬──DIRECTORY──┬──────────────────┬──►◄
          └─DB───────┘             └─ON──┬─path──┬────┘
                                         └─drive─┘
```

The `ON path/drive` parameter specifies the local database directory from which to list information. If it is not specified, the contents of the system database directory are listed. For more information and examples, refer to the *Command Reference*.

3. Migrate the database using the **db2 migrate database** command. The syntax of this command is as follows:

DB2 MIGRATE DATABASE command

```
►►──MIGRATE──┬─DATABASE─┬──database-alias──────────────────────►
             └─DB───────┘

►──┬──────────────────────────────────────┬────────────────────►◄
   └─USER──username──┬──────────────────┬─┘
                     └─USING──password──┘
```
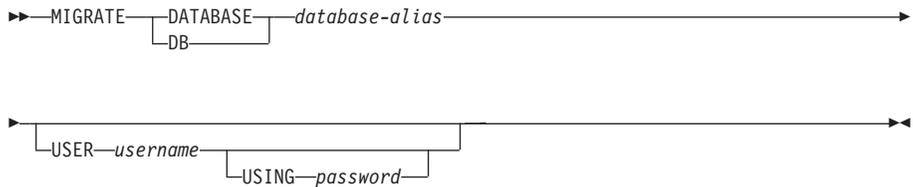
For more information and examples, refer to the *Command Reference*.

Migrating Version 5 databases containing SYSCAT DMS tablespaces

If you are migrating Version 5 databases that contain a SYSCAT Database Managed Space (DMS) tablespace, you should ensure that you have approximately 70 percent free space in the tablespace before migrating the database. You can check the size of your tablespaces by entering the **db2 list tablespaces show detail** command.

If your tablespace does *not* have enough free space, you may receive the following error:

```
SQL1704N Database migration failed. Reason code 17.
```

In this case, you should restore your Version 5 database under a Version 5 instance, add more containers using the ALTER TABLESPACE statement, and migrate the database again. For more information about tablespaces and the ALTER TABLESPACE statement, refer to the *Administration Guide* and the *SQL Reference*.

Optional Post-Migration Tasks

There are optional activities you may want to undertake following database migration. You can also apply these optional activities to a down-level database backup which is restored to Version 7, because at the end of the restore, the database is migrated to Version 7.

• **Migration of Unique Indexes**

Note: This section applies only to migration scenarios involving Version 5.x databases, or to Version 6 databases that were previously migrated from the Version 5.x format but whose unique indexes were *not* migrated using the **db2uiddl** command.

Version 5.x unique indexes are not automatically migrated to Version 7 semantics for several 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, using the **db2uiddl** command.

All existing applications will continue to work even if the unique indexes are not converted to Version 7 semantics. You have to convert unique indexes to Version 7 semantics only if support for deferred uniqueness checking is required.

To convert unique indexes:

1. Log in with a user account that has SYSADM authority. See "Working with the System Administrative Group" on page 187 for more information.
2. Start the database manager by entering the **db2start** command.
3. Run the **db2uiddl** command against your migrated database. Refer to the *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. We recommend that you remove any unwanted indexes from the output file to reduce the time needed to execute it. Comments in the output will flag other situations that require your attention.
5. Connect to the database by entering the **db2 connect to** *database_alias* command, where *database_alias* is the alias of the database you are migrating.
6. Execute the commands in the output file, generated by the **db2uiddl** command, using a command similar to the following:

   ```
   db2 -tvf filename
   ```

   where *filename* is the name of the file generated by the **db2uiddl** command.

- **Update Statistics**

  When database migration is completed, the old statistics that are used to optimize query performance are retained in the catalogs. However, DB2 Version 7 has statistics that are modified or do not exist in Version 5.x. To take advantage of these statistics, you may want to execute the **runstats** command on tables, particularly those tables that are critical to the performance of your SQL queries.

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

- **Rebind Packages**

  During database migration, all existing packages are invalidated. After the migration process, each package is rebuilt when it is used for the first time by the Version 7 database manager.

  For better performance we recommend that you run the **db2rbind** command to rebuild all packages stored in the database. Refer to the *Command Reference* for the syntax of this command.

- **Update database and database manager configuration**

  Some of the database configuration parameters are changed to Version 7 defaults or to other values during database migration. Refer to the *Administration Guide* for more information about configuration parameters.

  We recommend that you run the DB2 Performance Monitor for suggestions in choosing appropriate configuration parameters. For more information, refer to the *Administration Guide*.

- **Migrate Explain Tables**

  To migrate the explain tables in a database that has been migrated to Version 7, run the following command:

  ```
  db2exmig -d dbname -e explain_schema [-u userid password]
  ```

  where:

  – *dbname* represents the database name. This parameter is required.
  – *explain_schema* represents the schema name of the explain tables to be migrated. This parameter is required.
  – *userid* and *password* represent the current user's ID and password. These parameters are optional.

  The explain tables belonging to the user ID that is running **db2exmig**, or that is used to connect to the database, will be migrated. The explain tables migration tool will rename the Version 5.x and Version 6 tables, create a new set of tables using the **EXPLAIN.DDL**, and copy the contents of the old tables to the new tables. Finally, it will drop the old tables. The **db2exmig** migration utility will preserve any user added columns on the explain tables.

Chapter 9. Contents of the DB2 Products for UNIX platforms

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

Packaging

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

Table 9. DB2 Components, Packages or Filesets

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

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

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

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

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

Notes:

1. %L in the fileset name represents the locale name. There is a separate fileset for each locale. While DB2 Product Messages and Documentation are translated in several locales, not every message catalog or book is translated in every locale. For a complete list of DB2-supported locales, refer to the *Administration Guide*.
2. English messages are always installed.
3. All Linux component, package, and fileset names are the same as Solaris but have the extension `-7.1.0-0.i386.rpm`. For example, the Linux DB2 Client component name is `db2cliv71-7.1.0-0.i386.rpm`.
4. Not available on DB2 for Linux or DB2 for NUMA-Q.
5. Not available on DB2 for Linux.
6. Only available on DB2 for Linux.

Products and Selectable Components

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

Table 10. Components for DB2 Products

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

Table 10. Components for DB2 Products (continued)

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

Table 10. Components for DB2 Products (continued)

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

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

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

Chapter 10. Removing DB2 Products

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

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

Stop the Administration Server

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

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

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

Stop all DB2 instances

You must stop all DB2 instances before you remove DB2.

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

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

3. Log out.
4. Stop the instance.

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

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

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

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

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

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

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

5. Repeat these steps for each instance.

Remove the Administration Server

You must remove the Administration Server before you remove DB2.

To remove the Administration Server:

1. Log in as the Administration Server owner.

2. Run the start up script:
```
. INSTHOME/ sqllib/db2profile      (bash, Bourne, or Korn shells)
source INSTHOME/sqllib/db2cshrc   (C shell)
```

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

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

4. Log off.

5. Log in as *root* and remove the Administration Server by entering the following command:
      DB2DIR/instance/dasidrop *ASName*

where

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

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

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

Remove DB2 instances (Optional)

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

To remove an instance:

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

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

   where

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

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

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

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

Remove DB2 Products

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

To remove DB2 Products on AIX Systems

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

To remove DB2 products on AIX systems using SMIT:

1. Log in as user with root authority.
2. Type **smit install_remove** to proceed directly to the Remove Software Products screen.
3. Press F4 to display a list of the software to remove. Press F7 at some or all of the entries that have a prefix of db2_07_01.
4. Press Enter to start removing DB2 products.

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

To remove DB2 Products on HP-UX Systems

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

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

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

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

Part 3. Setting Up Server Communications

The following chapters describe how to set up server communications using the command line processor (CLP) and the Control Center. Refer to these chapters if you installed DB2 manually, if you want to update a communications protocol after installing DB2, or if you want to add support for a new protocol.

If you used the db2setup utility to install DB2, all detected communications protocols were set up automatically during installation.

Go to the appropriate chapter to set up server communications:
- "Chapter 11. Using the Command Line Processor to Configure Server Communications" on page 87.
- "Chapter 12. Using the Control Center to Configure Server Communications" on page 99.

Chapter 11. Using the Command Line Processor to Configure Server Communications

This section describes how to configure your server to accept inbound requests from remote client workstations. Also described in this section are considerations when configuring the DB2 Administration Server for communications.

Follow the instructions in this section if:

- You deselected a detected communication protocol when you installed DB2.
- You have added a communication protocol to your network since running the DB2 setup program.
- You are using a communications protocol that could not be detected by the DB2 setup program.
- You installed a UNIX-based DB2 product using your operating system's native installation tools.

You can use the Control Center's Setup Communications function to configure an instance for communications; however, it cannot be used to set up communications for an Administration Server or a DB2 Enterprise - Extended Edition server. For information on how to set up communications using the Control Center, see "Chapter 12. Using the Control Center to Configure Server Communications" on page 99.

For instructions on entering DB2 commands, see "Entering Commands Using the Command Center" on page 184 or "Entering Commands Using the Command Line Processor" on page 185.

Setting the DB2COMM Registry Parameter

Your server can support multiple communication protocols concurrently; however, you only need to enable the protocols that you want to use.

You must update the *db2comm* registry variable with the protocol that you now want to support.

The *db2comm* registry variable determines which protocol's connection managers will be enabled when the database manager is started. You can set this variable for multiple communication protocols by separating the keywords with commas.

For your DB2 server, *DB2COMM* can be any combination of the following keywords, separated by commas:

appc   starts APPC support

ipxspx   starts IPX/SPX support

tcpip   starts TCP/IP support

To avoid problems with the Control Center and the Client Configuration Assistant, ensure that the *DB2COMM* parameter is set in the DB2 registry using the db2set command using the **-i** option. It is not recommended that you use any other mechanism to set the *DB2COMM* value. For more information on the DB2 registry, refer to the *Administration Guide*.

To set the *db2comm* registry variable for the current instance, enter the **db2set DB2COMM=***protocol_names* command. Change the *protocol_names* parameter to reflect those protocols that you want to start when the database manager is started.

For example, to set the database manager to start connection managers for the APPC and TCP/IP communication protocols, enter the following command:

```
db2set DB2COMM=appc,tcpip
db2stop
db2start
```

When the **db2start** command is reissued, connection managers for the protocols specified by the *db2comm* registry parameter are started.

If you are setting up communications for the Administration Server, enter the **db2set** command:

```
db2set DB2COMM=appc,tcpip -i DB2DAS00
db2admin stop
db2admin start
```

where **DB2DAS00** represents the name of the Administration Server. If you are not sure of the Administration Server name, enter the following command:

```
db2set DB2ADMINSERVER
```

If the *db2comm* registry variable is undefined or set to null, no protocol connection managers are started when the database manager is started.

If there are problems starting a protocol's connection managers, a warning message appears and the error messages are logged in the db2diag.log file located in the INSTHOME/sqllib/db2dump directory.

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

> 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".
> - IPX/SPX - see "Configuring IPX/SPX on the Server" on page 92.

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 server workstations. See "Software Requirements" on page 5 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 12 for the supported communication protocols for your particular client and server.

Before you complete the steps in this section, ensure that you have completed the instructions in "Setting the DB2COMM Registry Parameter" on page 87.

> If you are setting up communications for the Administration Server, it was configured for TCP/IP (using the DB2 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:

Step 1. Identify and record parameter values.

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

1. Identify and Record Parameter Values

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

Table 11. TCP/IP Values Required at the Server

Parameter	Explanation	Sample Value	Your Value
Connection Port • Connection Service name (*svcename*) • Port number/Protocol (port_number/tcp)	Values required in the `services` file. The Connection Service name is arbitrary, but must be unique within the `services` file. If you are using DB2 Enterprise - Extended Edition, ensure that these numbers do not conflict with the port numbers used by the Fast Communication Manager (FCM). The Connection Port must be unique within the `services` file.	server1 3700/tcp	
Service name (*svcename*)	The name used to update the Service name (*svcename*) parameter in the database manager configuration file at the server. This value must be the same as the Connection Service name specified in the `services` file, if a service name is specified. You don't have to specify a service name in the `svcename` field, if you have directly specified a port number.	server1	

2. Configure the Server

The following steps describe how to set up your workstation to accept inbound client requests using this protocol. Replace the sample values with your values and record them on your worksheet.

A. Update the Services File

The TCP/IP `services` file specifies the ports that server applications can listen on for client requests. To update the services file, you can either:

• Update the /etc/services file and specify the ports that you want the server to listen on for incoming client requests, or

• Update the services file if you directly specified a port number in the `svcename` field.

> If you are using Network Information Services (NIS) on your network (for UNIX servers only) you must update the `services` file located on your master server.

Using a text editor, add the Connection entry to the `services` file for TCP/IP support. For example:

```
server1  3700/tcp # DB2 connection service port
```

where:

server1 represents the connection service name

3700 represents the connection port number

tcp represents the communication protocol that you are using

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:

Step 1. Log on to the system as a user with System Administrative (SYSADM) authority. For more information, see "Working with the System Administrative Group" on page 187.

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

a. Run the start up script as follows:

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

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

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

Step 3. Update the database manager configuration file with the Service name (*svcename*) parameter by entering the following commands:

```
update database manager configuration using svcename svcename
db2stop
db2start
```

For example, if the Connection Service name in the `services` file was entered as *server1*, enter the following commands:

```
update database manager configuration using svcename server1
db2stop
db2start
```

> The *svcename* used must match the Connection Service name specified in the `services` file.

After the database manager is stopped and started again, view the database manager configuration file to ensure that these changes have taken effect. View the database manager configuration file by entering the following command:

```
get database manager configuration
```

Configuring IPX/SPX on the Server

To access a remote database server through the IPX/SPX communications software, you must first have installed and configured communication software for both the client and server workstations. See "Software Requirements" on page 5 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 12 for the supported communication protocols for your particular client and server.

Before you complete the steps in this section, ensure that you have completed the instructions in "Setting the DB2COMM Registry Parameter" on page 87. Depending on the platform of your server, you can support IPX/SPX client communications via Direct Addressing or File Server Addressing.

Direct Addressing:
The client connects to the server instance by directly specifying the IPX/SPX internetwork address of the server instance (bypassing the NetWare file server). Using this method, a NetWare file server is not required on the network. Configure a server using this addressing method if it will be accessed solely by clients using Direct Addressing.

File Server Addressing:
The server instance registers its address at the NetWare file server. The client connects to the server instance using the address stored at a NetWare file server. Configure a server using this addressing method if it will be accessed by clients using File Server and/or Direct Addressing.

For a list of the supported IPX/SPX addressing methods for your server, see Table 12. For a list of the supported IPX/SPX addressing methods for DB2 clients, see the *Installation and Configuration Supplement*.

Table 12. IPX/SPX Supported Communication Methods for a Server

Server	Direct Addressing	File Server Addressing
AIX	*	*
HP-UX	Not Supported	
Linux	Not supported	

Table 12. IPX/SPX Supported Communication Methods for a Server (continued)

OS/2	*	*
Solaris	*	
Windows NT	*	
Windows 2000	*	

The following steps are required to set up IPX/SPX communications:

Step 1. Identify and record parameter values.

Step 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).

1. Identify and Record Parameter Values

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

Table 13. IPX/SPX Values Required at the Server

Parameter	Explanation	Our Example	Your Value
File server name (*FILESERVER*)	**Direct Addressing:** A * value indicates that you are using Direct Addressing. **File Server Addressing:** The name of the NetWare file server where the database server instance is registered. This parameter must be entered in uppercase.	**Direct Addressing** * **File Server Addressing** `DB2INST1`	
DB2 server object name (*OBJECTNAME*)	**Direct Addressing:** A * value indicates that you are using Direct Addressing. **File Server Addressing:** The database manager server instance represented as the object *OBJECTNAME* on the NetWare file server. The server's IPX/SPX internetwork address is stored and retrieved from this object. This parameter must be entered in uppercase and be unique on the NetWare file server system.	**Direct Addressing** * **File Server Addressing** `NETWSRV`	

Table 13. IPX/SPX Values Required at the Server (continued)

Parameter	Explanation	Our Example	Your Value
Socket number (*IPX_SOCKET*)	Represents the connection end point in a server's internetwork address. It must be unique for all server instances, and all IPX/SPX applications running on the workstation. It is entered in hexadecimal format. DB2 has registered well known sockets with Novell in the range 0x879E to 0x87A1. If you run more than 4 instances on the server machine, you must prevent socket collisions for instances 5 and up by choosing a socket number that is not *0x0000*, in the dynamic socket range *0x4000* to *0x7FFF*, or in the range *0x8000* to *0x9100* (these are well known sockets that are registered to various applications). The maximum value for this parameter is *0xFFFF*.	879E (default)	
IPX/SPX Internetwork Address	The internetwork address required when configuring a client to communicate with a server using Direct Addressing.	09212700.400011527745.879E	

	The following characters are not valid in the File server (*FILESERVER*) or the DB2 server object name (*OBJECTNAME*) parameters: / \ : ; , * ?

2. Configure the Server

The following steps describe how to set up your workstation to accept inbound client requests using this protocol. 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:

Step 1. Log on to the system as a user with System Administrative (SYSADM) authority. For more information, see "Working with the System Administrative Group" on page 187.

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

    a. Run the start up script as follows:

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

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

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

Step 3. In the database manager configuration file, update the File server (*FILESERVER*), DB2 server object name (*OBJECTNAME*), and Socket number (*IPX_SOCKET*) parameters by entering the following commands:

```
update dbm cfg using fileserver FILESERVER objectname OBJECTNAME \
ipx_socket IPX_SOCKET
db2stop
db2start
```

Note: If you are configuring the Administration Server instance (DAS) for communications, you need to update the Administration Server's configuration file by entering the **db2 update adm cfg** command. The Administration Server has a reserved IPX socket, *879A*, that should be used when you update this configuration file.

Direct Addressing

    For example, if you have chosen a value of *87A2* for the Socket number (*IPX_SOCKET*) parameter, use:

```
update dbm cfg using fileserver * objectname * ipx_socket 879F
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 879F for the Socket number (*IPX_SOCKET*) parameter, use:

```
update dbm cfg using fileserver NETWSRV objectname DB2INST1 \
ipx_socket 879F
db2stop
db2start
```

After the database manager is stopped and started again, view the database manager configuration file to ensure that these changes have taken effect. View the database manager configuration file by entering the following command:

```
get database manager configuration
```

> If you are planning to only support clients that use Direct Addressing, you will be required to enter the server's IPX/SPX internetwork address as the DB2 server object name when cataloging the node on the client.
>
> Determine the value for the *OBJECTNAME* parameter by entering the **db2ipxad** command on the server. This command is located in the `sqllib/bin/` directory for UNIX platforms, or the `sqllib\bin\` directory for non-UNIX platforms.
>
> Make note of this output on your worksheet for use when you configure an IPX/SPX client.

If you are planning to support clients using only Direct Addressing, you are now finished configuring your server for inbound IPX/SPX communications.

B. Register the Server Instance on the NetWare File Server (for File Server Addressing Only)

The server must be registered *after* the database manager configuration file has been updated with the IPX/SPX parameters. To register the server instance at the NetWare File server, enter the following command in the command line processor:

```
register db2 server in nwbindery user USERNAME password PASSWORD
```

> If you want to modify the IPX/SPX configuration parameters or change the DB2 IPX/SPX internetwork address, you need to deregister your server instance, before making the changes, and reregister the server instance after the changes are made.

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.

Chapter 12. Using the Control Center to Configure Server Communications

When DB2 is installed, most communications protocols on your system are automatically detected and configured. This chapter describes how to use the Control Center to update your DB2 server's communication configuration settings after installation. It also describes how to add support for a new communications protocol. Note that when you add a new protocol to your network, you must configure the appropriate support on the DB2 server.

Note: You cannot use the Control Center to set up communications on a DB2 Universal Database Enterprise - Extended Edition server.

Before You Begin

To complete the steps in this section, you should know how to start the Control Center. For more information, see "Appendix B. Basic Task Knowledge" on page 183.

Before you can use the Control Center, ensure that you have a running Administration Server. If you used the db2setup utility to install DB2, the default settings created and configured an Administration Server for you. If you installed DB2 manually, or if you selected *not* to create the Administration Server in the db2setup utility, you will have to create an Administration Server using the **dasicrt** command before continuing. For more information about Administration Servers, see the *Administration Guide*.

About the Control Center and Communications Protocols

The Control Center is a graphical tool used to administer DB2 databases. The Control Center's setup communications function allows you to display the protocols and configuration parameters that a server instance is configured to use. It also allows you to modify the parameter values of a configured protocol, as well as add or delete protocols.

When you add support for a new protocol to the server system, the setup communications function detects and generates server instance parameter values for the new protocol. You can accept or modify these values before use. When you remove support for an existing protocol from the server system, the setup communications function detects the protocol that has been removed and disables its use by the server instance.

You can add a protocol that has not been detected, however, you must supply all of the parameter values required before you proceed.

The setup communications function can be used to maintain communications for both local and remote server instances, provided that an Administration Server is running on the server system.

> Modifying an instance's communications settings may require you to update the database connection catalogs on the client.
>
> You can do this by:
> - Using the command line processor on the client to uncatalog and recatalog the node, depending on the values changed on the server. For more information, see "Chapter 16. Configuring Client-to-Server Communications Using the Command Line Processor" on page 121

Configuring DB2 Communications for Local Instances

To configure communications for local instances, perform the following steps:

Step 1. Start the Control Center. For more information, see "Starting the DB2 Control Center" on page 183.

Step 2. Click on the [+] beside a system's name to get the instances folder.

Step 3. Select either the Databases or Gateway Connections folder and click on the [+] beside the **Instances** folder to get a list of instances on a particular system.

Step 4. Select the instance that you want to configure and click on the right mouse button.

Step 5. Select the **Setup communications** option from the pop-up menu. The Setup communications window opens.

Step 6. Use the Setup communications window to configure communication protocols for the instance that you selected. Invoke the online help by clicking on the **Help** push button or by pressing the **F1** key.

Step 7. You must stop and start the instance for these changes to take effect.

    a. To stop the database manager instance, select the instance, click with the right mouse button and select the **Stop** option from the pop-up menu.

    b. To start the database manager instance, select the instance, click with the right mouse button and select the **Start** option from the pop-up menu.

Configuring DB2 Communications for Remote Instances

To configure DB2 communications for remote instances, perform the following steps:

Step 1. Start the Control Center. For more information, see "Starting the DB2 Control Center" on page 183.

Step 2. If the system containing the remote instance you want is listed, click on the [+] sign beside the system name to get the Instances folder. Click on the [+] beside the Instances folder to get a list of the system's instances, then go to step 13. If the system containing the remote instance you want is listed, but the instance you want does not appear under that system, go to step 8.

Step 3. If the system containing the remote instance that you want to configure is not listed, select the **Systems** folder, click on the right mouse button and select the **Add** option. The Add System window opens.

Step 4. To add a system to the Control Center, you can do one of the following:
  - Search the network for known systems.
    a. Click on the **Refresh** push button.
    b. Select the system you want to add from the **System name** drop-down list.
    a. Fill in the appropriate protocol specific information
    b. Click on the **Retrieve** push button.

Step 5. Click on the **Apply** push button to add the system to the Control Center window.

Step 6. Click on the **Close** push button.

Step 7. Click on the [+] sign beside the system name you just added to get the Instances folder.

Step 8. Select the **Instances** folder for the new system and click on the right mouse button.

Step 9. Select the **Add** option. The Add Instance window opens.

Step 10. Click on the **Refresh** push button to obtain a list of available instances.

Step 11. Select the instance that you want to add from the **Remote instance** drop-down list and click on the **Apply** push button.

Step 12. Click on the **Close** push button.

Step 13. Select the instance you want to configure and click on the right mouse button.

Step 14. Select the **Setup communications** option from the pop-up menu. The Setup Communications window opens.

Step 15. Use the Setup Communications window to configure communication protocols for the instance. Click on the **Help** push button for more information.

Step 16. You must stop and start the instance for these changes to take effect:

a. To stop an instance, select the instance, click on the right mouse button, and select the **Stop** option.

b. To start an instance, select the instance, click on the right mouse button, and select the **Start** option.

Part 4. Installing DB2 Clients

This section describes how to install a DB2 client on your workstation. For information on how to deploy a DB2 client using a distributed installation, refer to the *Installation and Configuration Supplement*.

A DB2 Run-Time Client provides the ability for workstations from a variety of platforms to access DB2 databases.

DB2 Run-Time Clients and DB2 Application Development Client are available for the following platforms: AIX, HP-UX, Linux, OS/2, NUMA-Q, Silicon Graphics IRIX, the Solaris Operating Environment, Windows 9x, Windows NT, and Windows 2000.

A DB2 Administration Client provides the ability for workstations from a variety of platforms to access and administer DB2 databases. These workstations are known as DB2 Administration Clients. The DB2 Administration Client has all the features of the DB2 Run-Time Client and also includes all the DB2 Administration tools, documentation, and support for Thin Clients.

DB2 Administration Clients are available for the following platforms: AIX, HP-UX, Linux, OS/2, Solaris, Windows 9x, Windows NT, and Windows 2000.

The DB2 Application Development Client was known as the DB2 Software Development Kit (DB2 SDK) Client in previous versions of DB2. The DB2 Application Development Client provides the tools and environment you need to develop applications that access DB2 servers and application servers that implement the Distributed Relational Database Architecture (DRDA). You can build and run DB2 applications with a DB2 Application Development Client installed. You can also run DB2 applications on the DB2 Administration Client and the DB2 Run-Time Client.

The applicable DB2 Application Development Client can be found on the server product CD-ROM and the DB2 Application Development Client for all platforms can be found on the set of DB2 Application Development Client CD-ROMs.

You cannot create a database on a DB2 client, only connect to databases that reside on a DB2 server.

Note: DB2 clients can connect to DB2 servers *two* releases later or *one* release earlier than the client's release level, as well as to servers at the same

release level. For example, a DB2 Version 5.2 client can connect to DB2 Version 5.0, 5.2, 6.1, and 7.1 servers, while a DB2 Version 7.1 client can connect to DB2 Version 6.1 and 7.1 servers.

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

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

- "Chapter 13. Installing DB2 Clients on UNIX Operating Systems" on page 105
- "Chapter 14. Installing DB2 Clients on Windows 32-Bit Operating Systems" on page 111
- "Chapter 15. Installing DB2 Clients on OS/2 Operating Systems" on page 115

To download installation packages for all supported DB2 clients, which include all the pre-Version 7 clients, connect to the IBM DB2 Client Application Enabler Web site at
`http://www.ibm.com/software/data/db2/db2tech/clientpak`

Chapter 13. Installing DB2 Clients on UNIX Operating Systems

This section contains the information that you will need to install a DB2 client on a UNIX-based workstation.

Before You Begin

Before you begin installing a DB2 client using the db2setup utility, you need to ensure that your system meets all of the memory, hardware, and software requirements to install your DB2 product. For more information, see "Chapter 1. Planning for Installation" on page 3.

About the db2setup utility

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

The db2setup utility can:
- Create or assign groups and user IDs.
- Create a DB2 instance.
- Install product messages.

> **Note:** Documentation is available in HTML format on the product CD-ROM.

If you choose to install DB2 using another method, such as using your operating system's native administration tools, you will have to perform these tasks manually. For more information on installing DB2 manually, see your server platform's installation chapter.

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

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

Updating Kernel Configuration Parameters

This section applies only to DB2 clients running on HP-UX and NUMA-Q/PTX systems, and the Solaris** Operating Environment.

If you are installing a DB2 client on AIX, Linux, or SGI IRIX systems, go to "Installing Your DB2 Client" on page 109.

Before installing your DB2 client on a HP-UX, PTX or Solaris system, you may need to update your system's kernel configuration parameters. We recommend that you set your system's kernel configuration parameters to the values in the following sections:

- "HP-UX Kernel Configuration Parameters"
- "NUMA-Q/PTX Kernel Configuration Parameters" on page 107
- "Solaris Kernel Configuration Parameters" on page 108

HP-UX Kernel Configuration Parameters

Table 14 lists the recommended values for HP-UX kernel configuration parameters. These values are valid for DB2 clients running on HP-UX Version 11.

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

Table 14. HP-UX Kernel Configuration Parameters (Recommended Values)

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

Notes:

1. Parameters msgmnb and msgmax must be set to 65535 or higher.
2. To maintain the interdependency among kernel parameters, change parameters in the same sequence in which they appear in Table 14.

To change a value, perform the following steps:

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

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

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

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

Step 5. Click on **OK**.

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

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

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

After you have updated your kernel parameters, go to "Installing Your DB2 Client" on page 109 to continue with the installation.

NUMA-Q/PTX Kernel Configuration Parameters

Table 15 lists the recommended values for NUMA-Q/PTX kernel configuration parameters for DB2 clients.

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

Table 15. NUMA-Q/PTX Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Recommended Value
msgmax	65535
msgmnb	65535
msgseg	8192
msgssz	16

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

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

Step 2. Enter the `menu` command.

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

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

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

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

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

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

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

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

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

Step 12. Repeat steps 9 through 11 on page 50 to change the values of all other parameters that you want to change.

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

Step 14. Compile the kernel.

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

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

Notes:

1. The `msgmax` and `msgmnb` must be set to 65535 or larger.

2. The `msgsem` parameter must be set no higher than 32767.

3. The `shmmax` must be set to 2147483647 or larger.

After you have updated your kernel parameters, go to "Installing Your DB2 Client" on page 109 to continue with the installation.

Solaris Kernel Configuration Parameters

Table 16 lists the recommended values for Solaris kernel configuration parameters.

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

Table 16. Solaris Kernel Configuration Parameters (Recommended Values)

Kernel Parameter	Recommended Value

`msgsys:msginfo_msgmax`
`msgsys:msginfo_msgmnb`
`msgsys:msginfo_msgseg`
`msgsys:msginfo_msgssz`
	65535 (1)
	65535 (1)
	8192
	16

Notes:

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

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

```
set parameter_name = value
```

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

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

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

After you have updated your kernel parameters, go to "Installing Your DB2 Client" to continue with the installation.

Installing Your DB2 Client

After updating your kernel configuration parameters and rebooting your system (if necessary), you can install your DB2 client.

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

To install a DB2 client:

1. Log in as user with root authority.
2. Insert and mount the appropriate CD-ROM. For information on mounting CD-ROMs, see "Mounting CD-ROMs on UNIX Operating Systems" on page 188.
3. Change to the directory where the CD-ROM is mounted by entering the **cd /cdrom** command where **/cdrom** is the CD-ROM mount point.
4. Change to one of the following directories:

    AIX   /cdrom/db2/aix

    HP-UX Version 11   /cdrom/db2/hpux11

    Linux   /cdrom/db2/linux

    NUMA-Q/PTX   /cdrom/db2/numaq

    SGI/IRIX   /cdrom/db2/sgi

    Solaris   /cdrom/unnamed_cdrom/db2/solaris

5. Enter the **./db2setup** command. After a few moments the Install DB2 V7 window opens.
6. Select the product that you want to install and select **OK**.

    Press **Tab** to move between available options and fields. Press **Enter** to select or deselect an option. Selected options are denoted by an asterisk.

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

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

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

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

You can use the **db2setup** program add additional products or components after your initial installation. To create or add additional DB2 products and components, enter the following command:

On AIX

        `/usr/lpp/db2_07_01/install/db2setup`

On HP-UX, PTX, SGI IRIX, or Solaris

        `/opt/IBMdb2/V7.1/install/db2setup`

On Linux

        `/usr/IBMdb2/V7.1/install/db2setup`

Your next step

After installing your DB2 client, you should configure it to access a remote DB2 server. For more information see "Chapter 16. Configuring Client-to-Server Communications Using the Command Line Processor" on page 121.

Chapter 14. Installing DB2 Clients on Windows 32-Bit Operating Systems

This section contains the information you need to install a DB2 client on Windows 32-bit operating systems.

Before You Begin Installing

1. Ensure that your system meets all of the memory, hardware, and software requirements to install your DB2 client. For more information, see "Chapter 1. Planning for Installation" on page 3.

2. You require a user account to perform the installation.

   Windows 9x

   > Any valid Windows 9x user.

   Windows NT or Windows 2000

   > A user account that belongs to a group with more authority than the Guests group. For example, the Users group or the Power Users group. For information about installing on Windows NT or Windows 2000 without administrator authority, see "Installing Without Administrator Authority".

Installing Without Administrator Authority

When installing a DB2 client without administrator authority on Windows NT and Windows 2000, you will not be able to install these components:

- Control Center
- NetQuestion
- Integrated SNA Support

The following are some specific installation scenarios:

- *A user has installed a DB2 product without having administrator authority, and then an administrator installs a DB2 product on the same machine.* In this scenario, the installation performed by the administrator will remove the previous installation performed by the user without administrator authority, resulting in a clean installation of the DB2 product. The installation performed by the administrator will overwrite all of the user's services, shortcuts, and environment variables from the previous installation of DB2.

- *A user without administrator authority has installed a DB2 product, and then a second user without administrator authority attempts to install a DB2 product on*

the same machine. In this scenario, the installation by the second user will fail, and return an error message that the user must be an administrator to install the product.

- *An administrator has installed a DB2 product, and then a user without administrator authority attempts to install a DB2 single-user product on the same machine.* In this scenario, the installation being attempted by the user without administrator authority will fail, and return an error message saying that the user must be an administrator to install the product.

Installation Steps

To install a DB2 client, perform the following steps:

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

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

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

> To manually invoke the setup program, perform the following steps:
>
> a. Click **Start** and select the **Run** option.
>
> b. In the **Open** field, enter the following command:
>
>   *x:*\setup /i *language*
>
>   where:
>
>   - *x:* represents your CD-ROM drive
>   - *language* represents the country code for your language (for example, EN for English). Table 25 on page 212 lists the code for each available language.
>
> c. Click **OK**.

Step 4. The DB2 Launchpad opens. It looks similar to the following:
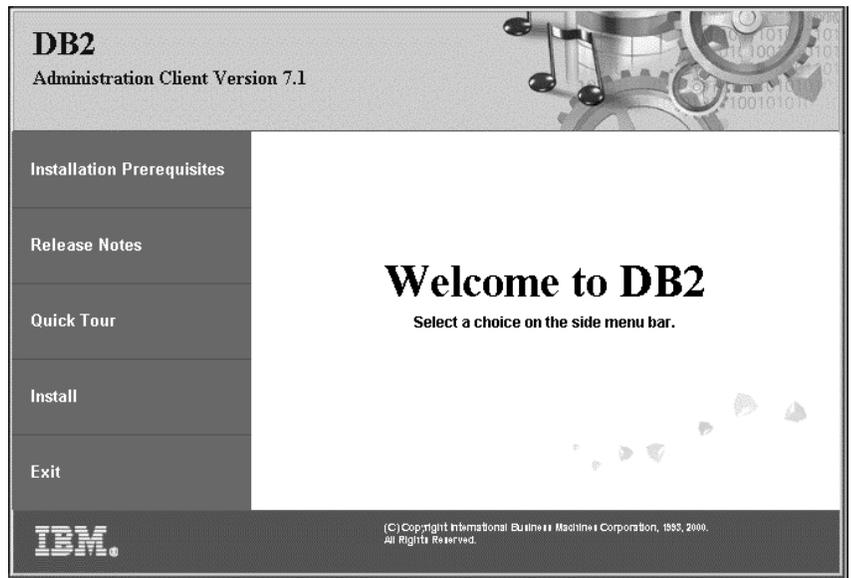
Step 5. From this window, you can view the Installation Prerequisites and the Release Notes, you can take a Quick Tour to explore the features, capabilities, and benefits of DB2 Universal Database Version 7, or you can proceed directly to the installation.

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

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

The setup program performs the following actions:
- Create DB2 program groups and items (or shortcuts).
- Update the Windows registry.
- Create a default client instance called DB2.

To configure your client to access remote servers, go to "Chapter 17. Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 131.

Chapter 15. Installing DB2 Clients on OS/2 Operating Systems

This section contains the information that you need to install a DB2 client on OS/2 operating systems. If you have a pre-Version 7 DB2 client for OS/2, the WIN-OS/2 support installed will be kept at its current level.

If you want to run Windows 3.x applications on your OS/2 system, you must also install the DB2 Client Application Enabler for Windows 3.x on your system. For more information, connect to the IBM DB2 Client Application Enabler Web site at http://www.ibm.com/software/data/db2/db2tech/clientpak.html

Before You Begin Installing

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

1. Ensure that your system meets all of the memory, hardware, and software requirements to install your DB2 product. For more information, see "Chapter 1. Planning for Installation" on page 3.

2. A user ID to perform the installation.

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

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

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

   By default, any user that belongs to the *Local Administrators* group, on the local machine where the account is defined, has SYSADM authority on the instance. For more information, see "Working with the System Administrative Group" on page 187. For more information on valid DB2 usernames, see "Appendix E. Naming Rules" on page 215.

Installation Steps

To install a DB2 client for OS/2, perform the following steps:

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

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

```
x:\install
```

where *x* represents your CD-ROM drive.

Step 3. The DB2 Launchpad opens. It looks similar to the following:
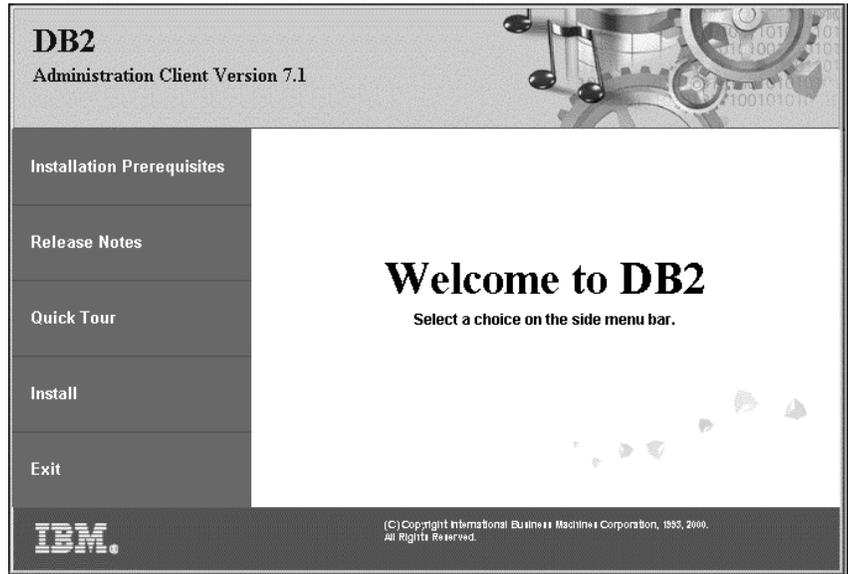
Step 4. From this window, you can view the installation prerequisites and the release notes, you can take a Quick Tour to explore the features, capabilities, and benefits of DB2 Universal Database Version 7, or you can proceed directly to the installation.

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

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

> To configure your client to access remote servers, go to "Chapter 17. Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 131.

If you want to use ODBC applications with OS/2, you must ensure that the \sqllib\dll\odbc.dll file appears as the first odbc.dll in the LIBPATH parameter of the config.sys file. The Install program does not automatically position the dynamic link library (dll) as of Version 7. If odbc.dll is not the first ODBC dll listed, you may have problems connecting to DB2 through ODBC applications.

Part 5. Setting up Client-to-Server Communications

The following chapters describe how to configure DB2 clients to access remote servers, as well as how to install and configure the DB2 Control Center.

All DB2 clients can be configured to access remote servers using the command line processor (CLP). OS/2 and Windows-32 bit DB2 clients can also be configured to access remote servers using the Client Configuration Assistant (CCA).

If you are planning to use the CLP to configure client-to-server communications using NetBIOS, IPX/SPX, APPC or Named Pipes, refer to the *Installation and Configuration Supplement*.

See the following chapters for information on setting up client-to-server communications:

- "Chapter 16. Configuring Client-to-Server Communications Using the Command Line Processor" on page 121 for all clients.
- "Chapter 17. Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 131 for OS/2 and Windows-32 bit clients.

Chapter 16. Configuring Client-to-Server Communications Using the Command Line Processor

This section describes how to configure a client to communicate with a server using the command line processor (CLP).

If you plan to use an OS/2 or Windows 32-bit client to communicate with a server, the Client Configuration Assistant (CCA) makes it easy to automate configuration and administration tasks. If you have installed the CCA, it is recommended that you use this tool to configure your OS/2 or Windows 32-bit client for communications. For more information see "Chapter 17. Configuring Client-to-Server Communications Using the Client Configuration Assistant" on page 131.

To configure a client to communicate with a server, the remote server must be configured to accept in-bound requests for the communications protocols that you want to use. By default, the installation program automatically detects and configures most protocols running on your server.

If you have added a new protocol to your network, or wish to change any of the default settings on your DB2 server, see "Part 3. Setting Up Server Communications" on page 85.

For instructions on entering DB2 commands, see "Entering Commands Using the Command Center" on page 184 or "Entering Commands Using the Command Line Processor" on page 185.

Go to the section that describes how to configure communications to access a remote server using the communication protocol of your choice:

- For TCP/IP, see "Configuring TCP/IP on the Client".
- For all other protocols, refer to the *Installation and Configuration Supplement*.

Configuring TCP/IP on the Client

This section assumes that TCP/IP is functional on the client and server workstations. See "Software Requirements" on page 5 for the communication protocol requirements for your platform. See "Possible Client-to-Server Connectivity Scenarios" on page 12 for the supported communication protocols for your particular client and server.

To set up TCP/IP communications on a DB2 client, perform the following steps:

Step 1. Identify and record parameter values.

Step 2. Configure the client:

    a. Resolve the server's host address.

    b. Update the services file.

    c. Catalog a TCP/IP node.

    d. Catalog the database.

Step 3. Test the connection between the client and server.

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

Step 1. Identify and Record Parameter Values

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

Table 17. TCP/IP Values Required at the Client

Parameter	Description	Sample Value	Your Value
Host Name • Hostname (*hostname*) or • IP address (*ip_address*)	Use the *hostname* or *ip_address* of the remote server workstation. To resolve this parameter: • Enter the **hostname** command at the server to obtain the *hostname*. • Contact your network administrator to obtain the *ip_address* or enter the **ping** *hostname* command. • On UNIX systems, you can also use the *DB2*/**bin/hostlookup** *hostname* command. where *DB2* is the directory where DB2 is installed.	serverhost or 9.21.15.235	

Table 17. TCP/IP Values Required at the Client (continued)

Parameter	Description	Sample Value	Your Value
Service Name • Connection Service name (*svcename*) or • Port number/Protocol (*port_number/tcp*)	Values required in the `services` file. The Connection Service name is an arbitrary local name that represents the connection port number (*port_number*) on the server. The port number must be the same as the port number that the *svcename* parameter maps to in the `services` file at the server. (The *svcename* parameter is located in the database manager configuration file on the server.) This value must not be in use by any other applications, and must be unique within the `services` file. Contact your database administrator for the values used to configure the server.	server1 3700/tcp	
Node name (*node_name*)	A local alias, or nickname, that describes the node to which you are trying to connect. You can choose any name you want; however, all node name values within your local node directory must be unique.	db2node	

Step 2. Configure the Client

The following steps configure the client to communicate with the server using TCP/IP. Replace the sample values with your worksheet values.

A. Resolve the Server's Host Address

> If your network has a name server, or you are planning to directly specify the IP address (*ip_address*) of the server, skip this step and proceed to "Step B. Update the Services File" on page 124.

The client must know the IP address of the server to which it is attempting to establish communications. If a name server does not exist on your network, you may directly specify a hostname that maps to the IP address (*ip_address*)

of the server in the local hosts file. See Table 18 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 18. Location of the Local Hosts and Services Files

Platform	Location
OS/2	Specified by the *etc* environment variable. Enter the **set etc** command to determine the location of your local hosts or services files.
Windows NT or Windows 2000	Located in the winnt\system32\drivers\etc directory.
Windows 9x	Located in the windows directory.
UNIX	Located in the /etc directory.

Edit the client's hosts file and add an entry for the server's hostname. For
example:

```
9.21.15.235     serverhost   # host address for serverhost
```

where:

9.21.15.235   represents the *ip_address*

serverhost   represents the *hostname*

represents a comment describing the entry

If the server is not in the same domain as the client, you must provide a fully
qualified domain name such as serverhost.vnet.ibm.com, where
vnet.ibm.com is the domain name.

Step B. Update the Services File

> If you are planning to catalog a TCP/IP node using a port number
> (*port_number*), skip this step and go to "Step C. Catalog a TCP/IP Node"
> on page 125.

Using a local text editor, add the Connection Service name and port number
to the client's services file for TCP/IP support. For example:

```
server1  3700/tcp  # DB2 connection service port
```

where:

server1 represents the Connection Service name

3700 represents the connection port number. The port number specified on the client must match the port number used on the server.

tcp represents the communication protocol that you are using

represents a comment describing the entry

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

The services file is located in the same directory as the local hosts file that you may have edited in "A. Resolve the Server's Host Address" on page 123.

See Table 18 on page 124 for the location of the services file for your particular platform.

Step C. Catalog a TCP/IP Node

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

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

Step 1. Log on to the system with a valid DB2 user ID. For more information, see "Appendix E. Naming Rules" on page 215.

> If you are adding a database to a system that has a DB2 server or DB2 Connect server product installed, log on to this system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority on the instance. For more information, see "Working with the System Administrative Group" on page 187.
>
> This restriction is controlled by the *catalog_noauth* database manager configuration parameter. For more information, refer to the *Administration Guide*.

Step 2. If you are using a UNIX client, run the start-up script as follows:

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

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

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

```
db2 "catalog tcpip node node_name remote [hostname|ip_address]
  server [svcename|port_number]"
db2 terminate
```

For example, to catalog the remote server *serverhost* on the node called *db2node*, using the service name *server1*, enter the following:

```
db2 catalog tcpip node db2node remote serverhost server server1
db2 terminate
```

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

```
db2 catalog tcpip node db2node remote 9.21.15.235 server 3700
db2 terminate
```

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

Step D. Catalog the Database

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

To catalog a database on the client, perform the following steps:

Step 1. Log on to the system with a valid DB2 user ID. For more information, see "Appendix E. Naming Rules" on page 215.

> If you are adding a database to a system that has a DB2 server or DB2 Connect server product installed, log on to this system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority on the instance. For more information, see "Working with the System Administrative Group" on page 187.
>
> This restriction is controlled by the *catalog_noauth* database manager configuration parameter. For more information, refer to the *Administration Guide*.

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

Table 19. Worksheet: Parameter Values for Cataloging Databases

Parameter	Description	Sample Value	Your Value
Database name (*database_name*)	The database alias (*database_alias*) of the *remote* database. When you create a database, it is automatically cataloged on the server with the database alias (*database_alias*) the same as the database name (*database_name*), unless specified otherwise.	`sample`	
Database alias (*database_alias*)	An arbitrary local nickname for the remote database, on the client. If you do not provide one, the default is the same as the database name (*database_name*). The database alias the name that you use when connecting to a database from a client.	`tor1`	
Authentication (*auth_value*)	The value of the authentication required by your enterprise. Please refer to the *DB2 Connect User's Guide* for more information on this parameter.	`DCS` This means that the userid and password supplied are validated at the host or AS/400 only.	
Node name (*node_name*)	The name of the node directory entry that describes where the database resides. Use the same value for node name (*node_name*) that you used to catalog the node in the previous step.	`db2node`	

Step 3. If you are using a UNIX client, run the start-up script as follows:

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

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

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

```
db2 catalog database database_name as database_alias at node node_name
db2 terminate
```

For example, to catalog a remote database called *sample* so that it has the alias *tor1*, on the node *db2node*, enter the following commands:

```
db2 catalog database sample as tor1 at node db2node
db2 terminate
```

> If you need to change values that were set with the **catalog** *database* command, perform the following steps:
>
> Step a. Run the **uncatalog database** command as follows:
>
> ```
> db2 uncatalog database database_alias
> ```
>
> Step b. Recatalog the database with the value that you want to use.

Step 3. Test the Client-to-Server Connection

After configuring the client for communications, you will need to connect to a remote database to test the connection.

Step 1. Start the database manager by entering the **db2start** command on the server (if it was not automatically started at boot time).

Step 2. If you are using a UNIX client, run the start-up script as follows:

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

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

Step 3. Enter the following command on the client to connect the client to the remote database:

```
db2 connect to database_alias user userid using password
```

The values for userid and password must be valid for the system on which they are authenticated. By default, authentication takes place on the server for a DB2 server and on the host or AS/400 machine for a DB2 Connect server.

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

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

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

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

Troubleshooting the Client-to-Server Connection

If the connection fails, check the following items:

At the *server*:

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

> Check the settings for the *db2comm* registry value by entering the **db2set DB2COMM** command. For more information, refer to the *Administration Guide*.

2. The services file was updated correctly.
3. The service name (*svcename*) parameter was updated correctly in the database manager configuration file.
4. The database was created and cataloged properly.
5. The database manager was stopped and started again (enter the **db2stop** and **db2start** commands on the server).

> If there are problems starting a protocol's connection managers, a warning message appears and the error messages are logged in the `db2diag.log` file located in the `INSTHOME/sqllib/db2dump` directory.
>
> For more information on the `db2diag.log` file, refer to the *Troubleshooting Guide*.

At the *client*:

1. If used, the `services` and `hosts` files were updated correctly.
2. The node was cataloged with the correct hostname (*hostname*) or IP address (*ip_address*).
3. The port number matches, or the sevices name maps to, the port number used on the server.
4. The node name (*node_name*) that was specified in the database directory points to the correct entry in the node directory.
5. The database was cataloged properly, using the *server's* database alias (the *database_alias* that was cataloged when the database was created on the server), as the database name (*database_name*) on the client.

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

Chapter 17. Configuring Client-to-Server Communications Using the Client Configuration Assistant

This chapter describes how to configure client-to-server communications using the Client Configuration Assistant (CCA). In an LDAP-enabled environment, you may not need to perform the tasks described in this chapter.

Notes:

1. The CCA is available for DB2 clients running on OS/2 and Windows 32–bit systems.
2. LDAP support is available for Windows, AIX, and the Solaris operating environment.

LDAP Directory Support Considerations

In an LDAP-enabled environment, the directory information about DB2 servers and databases is kept in the LDAP directory. When a new database is created, the database is automatically registered in the LDAP directory. During a database connection, the DB2 client goes to the LDAP directory to retrieve the required database and protocol information and uses this information to connect to the database. There is no need to run the CCA to configure LDAP protocol information.

You may still want to use the CCA in the LDAP environment to:

- Manually catalog a database in the LDAP directory
- Register a database as an ODBC data source
- Configure CLI/ODBC information
- Remove a database cataloged in the LDAP directory

For more information about the LDAP Directory Support, refer to the *Installation and Configuration Supplement*.

Before You Begin

If you want to configure a DB2 client running on a UNIX-based workstation to access a remote server, see "Chapter 16. Configuring Client-to-Server Communications Using the Command Line Processor" on page 121.

When you add a database using this configuration method, the CCA will generate a default node name for the server where the database resides.

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To complete the steps in this section, you should be familiar with how to start the CCA. For more information, see "Starting the Client Configuration Assistant" on page 183.

Note: To configure communications from a DB2 client to a server, the remote server must be configured to accept inbound client requests. By default, the server installation program automatically detects and configures most protocols on the server for inbound client connections. It is recommended that you install and configure the communications protocols desired on the server before installing DB2.If you need to configure, update or add a communications protocol on your server, see "Part 3. Setting Up Server Communications" on page 85.

If you have added a new protocol to your network, or want to modify any of the default settings, go to "Chapter 16. Configuring Client-to-Server Communications Using the Command Line Processor" on page 121.

If you are adding a host or AS/400 database, refer to the "Configuring DB2 Connect to Host or AS/400 Communications Using the Client Configuration Assistant" section in your *DB2 Connect Quick Beginnings* manual.

Configuration Steps

To configure your workstation to access a database on a remote server, perform the following steps:

Step 1. Log on to the system with a valid DB2 user ID. For more information, see "Appendix E. Naming Rules" on page 215.

> If you are adding a database to a system that has a DB2 server or DB2 Connect server product installed, log on to this system as a user with System Administrative (SYSADM) or System Controller (SYSCTRL) authority on the instance. For more information, see "Working with the System Administrative Group" on page 187.
>
> This restriction is controlled by the *catalog_noauth* database manager configuration parameter. For more information, refer to the *Administration Guide*.

Step 2. Start the CCA. For more information, see "Starting the Client Configuration Assistant" on page 183.

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

Step 3. Click on the **Add** push button to configure a connection.

You can use one of the following configuration methods:

- "Adding a Database Using a Profile" on page 133.

- "Adding a Database Using Discovery" on page 134.
- "Adding a Database Manually" on page 136.

Adding a Database Using a Profile

A server profile contains information about server instances on a system, and databases within each server instance. For information on profiles, see "Creating and Using Profiles" on page 138.

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

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

Step 2. Click the **...** push button and select a profile. Select a remote database from the object tree that is displayed from the profile, and if the database selected is a gateway connection, select a connection route to the database. Click the **Next** push button.

Step 3. Enter a local database alias name in the **Database alias** field and optionally enter a comment that describes this database in the **Comment** field. Click **Next**.

Step 4. If you are planning to use ODBC, register this database as an ODBC data source.

   Note: ODBC must be installed to perform this operation.

   a. Ensure that the **Register this database for ODBC** check box is selected.

   b. Select the radio button that describes how you would like to register this database:
      - If you would like all users on your system to have access to this data source, select the **As a system data source** radio button.
      - If you would like only the current user to have access to this data source, select the **As a user data source** radio button.
      - If you would like to create an ODBC data source file to share database access, select the **As a file data source** radio button and enter the path and file name for this file in the **File data source name** field.

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

   d. Click **Finish** to add the database that you selected. The Confirmation window opens.

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

Step 6. In the Connect To DB2 Database window, enter a valid user ID and password for the remote database and click **OK**. If the connection is successful, a message confirming the connection appears.

If the connection test failed, you will receive a help message. To change any settings you may have incorrectly specified, click the **Change** push button in the Confirmation window to return to the Add Database Wizard. If problems persist, refer to the *Troubleshooting Guide* for more information.

Step 7. You are now able to use this database. Click **Add** to add more databases, or click **Close** to exit the Add Database Wizard. Click **Close** again to exit the CCA.

Adding a Database Using Discovery

This option cannot return information about DB2 systems earlier than Version 5 or any systems where an Administration Server is not running. For more information, refer to the *Administration Guide*.

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

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

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

Step 3. Click the **[+]** sign beside a system to get a list of the instances and databases on it. Select the database that you want to add, click the **Next** push button, and proceed to Step 4.

If the system that contains the database that you want to add is not listed, perform the following steps:

   a. Click on the **[+]** sign beside the **Other Systems (Search the network)** icon to search the network for additional systems.

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

   c. Select the database that you want to add, click **Next**, and proceed to Step 4.

> The Client Configuration Assistant may be unable to detect a remote system if:
>
> - The Administration Server is not running on the remote system.
> - The Discovery function times out. By default, the Discovery function will search the network for 40 seconds; this may not be long enough to detect the remote system. You can set the *DB2DISCOVERYTIME* registry variable to specify a longer period of time.
> - The network that the Discovery request is running on is configured so that the Discovery request does not reach the remote system desired.
> - You are using NetBIOS as the Discovery protocol. You may need to set the *DB2NBDISCOVERRCVBUFS* registry variable to a larger value to enable the client to receive more concurrent Discovery replies.
>
> For more information, refer to the *Administration Guide*.

If the system that you want to add is still not listed, it can be added to the list of systems by performing the following steps:

a. Click **Add System**. The Add System window opens.

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

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

Step 4. Enter a local database alias name in the **Database alias** field and optionally enter a comment that describes this database in the **Comment** field. Click **Next**.

Step 5. If you are planning to use ODBC, register this database as an ODBC data source.

Note: ODBC must be installed to perform this operation.

a. Ensure that the **Register this database for ODBC** check box is selected.

b. Select the radio button that describes how you would like to register this database:

- If you would like all users on your system to have access to this data source, select the **As a system data source** radio button.
- If you would like only the current user to have access to this data source, select the **As a user data source** radio button.

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- If you would like to create an ODBC data source file to share database access, select the **As a file data source** radio button and enter the path and file name for this file in the **File data source name** field.

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

d. Click **Finish** to add the database that you selected. The Confirmation window opens.

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

Step 7. In the Connect To DB2 Database window, enter a valid user ID and password for the remote database and click **OK**. If the connection is successful, a message confirming the connection appears.

If the connection test failed, you will receive a help message. To change any settings you may have incorrectly specified, click the **Change** push button in the Confirmation window to return to the Add Database Wizard. If problems persist, refer to the *Troubleshooting Guide* for more information.

Step 8. You are now able to use this database. Click **Add** to add more databases, or click **Close** to exit the Add Database Wizard. Click **Close** again to exit the CCA.

Adding a Database Manually

If you have the information for the database you want to connect to and the server upon which it resides, you can manually enter all of the configuration information. This method is analogous to entering commands via the command line processor, however, the parameters are presented graphically for you.

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

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

Step 2. If you are using Lightweight Directory Access Protocol (LDAP), select the radio button that corresponds to the location where you would like your DB2 directories to be maintained:

- If you would like to maintain the DB2 directories locally, select the **Add database to your local machine** radio button and click **Next**.
- If you would like to maintain the DB2 directories globally at an LDAP server, select the **Add database using LDAP** radio button and click **Next**.

Step 3. Select the radio button that corresponds to the protocol that you want to use from the **Protocol** list.

If DB2 Connect (or the DB2 Connect Support Feature) is installed on your machine and you select TCP/IP or APPC, you can select **The database physically resides on a host or AS/400 system**. If you select this check box, you will have the option of selecting the type of connection that you want to make to the host or AS/400 database:

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

Click **Next**.

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

Step 5. Enter the database alias name of the remote database that you want to add in the **Database name** field and a local database alias name in the **Database alias** field.

If this is a host or AS/400 database, type the Location name for an OS/390 database, the RDB name for an AS/400 database, or the DBNAME for a VSE or VM database in the **Database name** field, and optionally add a comment that describes this database in the **Comment** field.

Click **Next**.

Step 6. Register this database as an ODBC data source.

Note: ODBC must be installed to perform this operation.

a. Ensure that the **Register this database for ODBC** check box is selected.

b. Select the radio button that describes how you would like to register this database:

- If you would like all users on your system to have access to this data source, select the **As a system data source** radio button.
- If you would like only the current user to have access to this data source, select the **As a user data source** radio button.
- If you would like to create an ODBC data source file to share database access, select the **As a file data source** radio button and enter the path and file name for this file in the **File data source name** field.

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

d. Click **Finish** to add the database that you selected. The Confirmation window opens.

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

Step 8. In the Connect To DB2 Database window, enter a valid user ID and password for the remote database and click **OK**. If the connection is successful, a message confirming the connection appears.

If the connection test failed, you will receive a help message. To change any settings you may have incorrectly specified, click the **Change** push button in the Confirmation window to return to the Add Database Wizard. If problems persist, refer to the *Troubleshooting Guide* for more information.

Step 9. You are now able to use this database. Click **Add** to add more databases, or click **Close** to exit the Add Database Wizard. Click **Close** again to exit the CCA.

You can use the Export function of the CCA to create a client profile for an existing client configuration and use it to create identical target clients across your network. A client profile contains database connection, ODBC/CLI, and configuration information for an existing client. Use the CCA Import function to set up multiple clients across your network. Each target client will have the same configuration and settings as the existing client. For more information on creating and using client profiles, see "Creating and Using Profiles".

> You have now completed all the tasks that are involved in *Quick Beginnings* and are ready to start using DB2 Universal Database.
>
> If you want to deploy this product using a distributed installation, refer to the *Installation and Configuration Supplement*.

Creating and Using Profiles

The information in this section describes how to create and use profiles to set up connections between DB2 clients and servers. To configure database connections on a DB2 client, you can use either a server profile or client profile.

Server Profiles

A server profile contains information about instances on a server system, and databases within each instance. The information for each instance includes the protocol information required to set up a client to connect to databases in that instance.

> We recommend that you create a server profile only after you have created the DB2 databases that you want your remote clients to access.

To create a server profile, perform the following steps:

Step 1. Start the Control Center. For more information, refer to "Starting the DB2 Control Center" on page 183.

Step 2. Select the system that you want to create a profile for and right click.

If the system that you want to create a profile for is not shown, select the **Systems** icon, click the right mouse button, and select the **Add** option. Click the **Help** push button and follow the online help.

Step 3. Select the **Export Server Profile** option.

Step 4. Enter a path and filename for this profile and select **OK**.

> You are ready to use this profile on your system. For more information on how to add a database to your system using a server profile, go to "Configuration Steps" on page 132.

Client Profiles

Information in a client profile can be used to configure clients using the Import function in the Client Configuration Assistant (CCA). Clients can import all or a subset of the configuration information in a profile. The following scenario assumes that the database connections configured on one client will be exported and used to set up one or more clients.

Note: Configuration profiles can also be imported using the **db2cfimp** command. Refer to the *Command Reference* for more information.

A client profile is generated from a client using the Export function of the CCA. The information contained in a client profile is determined during the export process. Depending on the settings chosen, it can contain the existing client's:

- Database connection information (including CLI or ODBC settings).
- Client settings (including database manager configuration parameters and DB2 registry variables).
- CLI or ODBC common parameters.
- Configuration data for the local APPC or NetBIOS communications subsystem.

To create a client profile, perform the following steps:

Step 1. Start the CCA. For more information, see "Starting the Client Configuration Assistant" on page 183.

Step 2. Click **Export**. The Select Export Option window opens.

Step 3. Select one of the following export options:

- If you want to create a profile that contains all of the databases cataloged on your system, and all of the configuration information for this client, select the **All** radio button, click **OK**, and go to Step 8.
- If you want to create a profile that contains all of the databases cataloged on your system *without* any of the configuration information for this client, select the **Database connection information** radio button, click **OK**, and go to Step 8.
- If you want to select a subset of the databases that are cataloged on your system, or a subset of the configuration information for this client, select the **Customize** radio button, click **OK**, and go to the next step.

Step 4. Select the databases to be exported from the **Available databases** box and add them to the **Selected databases** box by clicking on the push button.

> To add all of the available databases to the **Databases to be exported** box, click the **>>** button.

Step 5. Select the check boxes from the **Select custom export option** box that correspond to the options that you want to set up for the target client.

To customize settings, click on the appropriate **Customize** push button. The settings that you customize will only affect the profile to be exported, no changes will be made to your workstation. For more information, click **Help**.

Step 6. Click **OK**. The Export Client Profile window opens.

Step 7. Enter a path and file name for this client profile and click **OK**. The DB2 Message window appears.

Step 8. Click **OK**.

To import a client profile, perform the following steps:

Step 1. Start the CCA. For more information, see "Starting the Client Configuration Assistant" on page 183.

Step 2. Click **Import**. The Select Profile window opens.

Step 3. Select a client profile to import and click **OK**. The Import Profile window opens.

Step 4. You can select to import all or a subset of the information in a Client Profile. Select one of the following import options:

- To import everything in a client profile, select the **All** radio button.

- To import a specific database, or settings, that are defined in a Client Profile, select the **Customize** radio button. Select the check boxes that correspond to the options that you want to customize.

Step 5. Click **OK**.

> If you selected the **All** radio button, you are now ready to start using your DB2 product. For more advanced topics, refer to the *Administration Guide* and the *Installation and Configuration Supplement*.

Step 6. You are presented with a list of systems, instances, and databases. Select the database that you want to add and click **Next**.

Step 7. Enter a local database alias name in the **Database alias** field and optionally enter a comment that describes this database in the **Comment** field. Click **Next**.

Step 8. If you are planning to use ODBC, register this database as an ODBC data source.

   Note: ODBC must be installed to perform this operation.

   a. Ensure that the **Register this database for ODBC** check box is selected.

   b. Select the radio button that describes how you would like to register this database:
      - If you would like all users on your system to have access to this data source, select the **As a system data source** radio button.
      - If you would like only the current user to have access to this data source, select the **As a user data source** radio button.
      - If you would like to create an ODBC data source file to share database access, select the **As a file data source** radio button and enter the path and file name for this file in the **File data source name** field.

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

   d. Click **Finish** to add the database that you selected. The Confirmation window opens.

Step 9. Click the **Test Connection** push button to test the connection. The Connect to DB2 Database window opens.

Step 10. In the Connect To DB2 Database window, enter a valid user ID and password for the remote database and click **OK**. If the connection is successful, a message confirming the connection appears.

   If the connection test failed, you will receive a help message. To change any settings you may have incorrectly specified, click the **Change** push button in the Confirmation window to return to the

Add Database Wizard. If problems persist, refer to the *Troubleshooting Guide* for more information.

Step 11. You are now able to use this database. Click **Add** to add more databases, or click **Close** to exit the Add Database Wizard. Click **Close** again to exit the CCA.

Chapter 18. Control Center Installation and Configuration

This chapter describes how to install and configure the DB2 Control Center.

The Control Center is the main DB2 graphical tool for administering your database. It is available on Windows 32-bit, OS/2, and UNIX operating systems.

The Control Center provides a clear overview of all the systems and database objects being managed. You can also access other administration tools from the Control Center by selecting icons on the Control Center toolbar or from the Tools pop-up menu.

Application versus Applet

You can run the Control Center either as a Java application or as a Java applet through a web server. In both cases you need a supported Java Virtual Machine (JVM) installed on your machine to run the Control Center. A JVM can be a Java Runtime Environment (JRE) for running applications, or a Java-enabled browser for running applets.

- Java *applications* run just like other applications on your machine, provided you have the correct JRE installed.

  On Windows 32-bit operating systems, the correct JRE level was installed or upgraded for you during DB2 installation.

  On AIX systems, the correct JRE was installed for you during DB2 installation only if another JRE was not detected on your system. If another JRE was detected on your AIX system during DB2 installation, the JRE that comes with DB2 was not installed. In this case, you must install the correct JRE level before running the Control Center.

  On all other operating systems you must install the correct JRE level before running the Control Center. See Table 21 on page 145 for a list of correct JRE levels.

  Note: Some operating systems, including OS/2 Warp Server for e-business and AIX 4.3, have built-in Java support. For more information, check with your administrator.

- Java *applets* are programs that run within Java-enabled browsers. The Control Center applet code can reside on a remote machine and is served to the client's browser through a web server. This type of client is often called a *thin client* because a minimal amount of resources (a Java-enabled browser) is required to run the Java applet.

You must use a supported Java-enabled browser to run the Control Center as a Java applet. See Table 21 on page 145 for a list of supported browsers.

Machine Configurations

You can set up your Control Center in a number of different ways. The following table identifies four scenarios, each showing a different way of installing the required components. These scenarios are referenced throughout the Control Center Services Setup (Applet Mode only) section that follows the table.

Table 20. Control Center Machine Configuration Scenarios

Scenario	Machine A	Machine B	Machine C
1 - Stand-alone, Application	JRE Control Center application DB2 server		
2 - Two Tier, Application	JRE Control Center application DB2 client		DB2 server
3 - Two Tier, Browser	Supported Browser (Windows and OS/2 only) Control Center applet	Web server JDBC Applet Server DB2 server	
4 - Three Tier, Browser	Supported Browser (Windows and OS/2 only) Control Center applet	JDBC Applet Server DB2 client	DB2 server

Figure 1 on page 145 summarizes the four basic Control Center machine configurations:
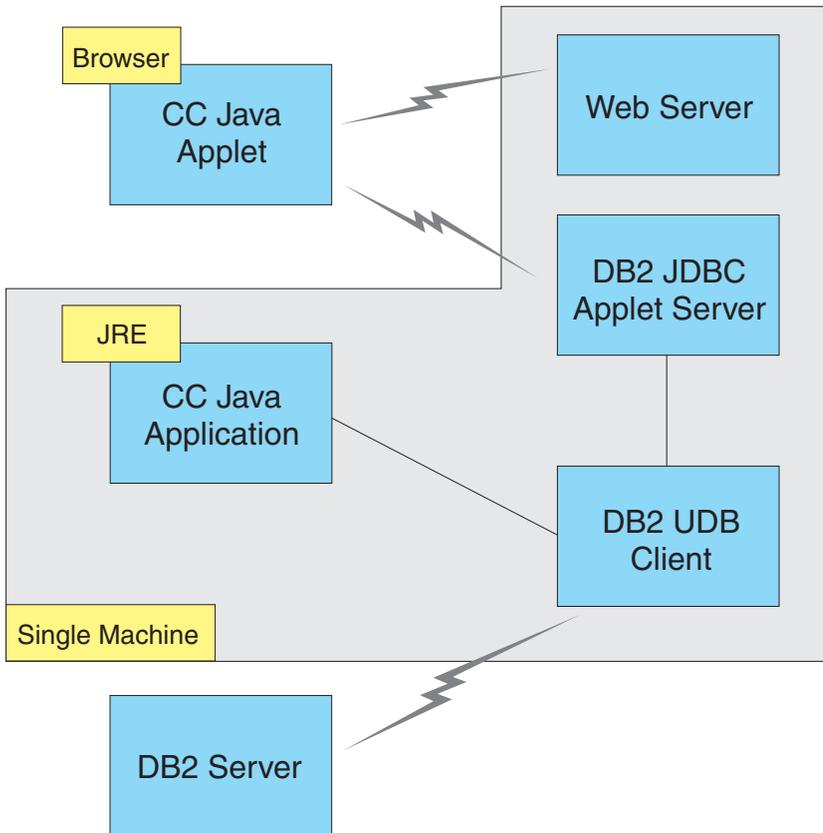
Figure 1. DB2 Control Center machine configurations

Supported Java Virtual Machines for the Control Center

The following table lists supported Java Virtual Machines (JREs and browsers) required to run the Control Center as an application or applet:

Table 21. Supported Java Virtual Machines (JVMs) for the Control Center

Operating System	Correct Java Runtime Environments	Supported Browsers
Windows 32-bit	JRE 1.1.8 (automatically installed or updated by DB2, if necessary)	Netscape 4.5 or higher (shipped), or IE 4.0 Service Pack 1 or higher
AIX	JRE 1.1.8.4 (automatically installed if no other JREs detected)	None
OS/2	JRE 1.1.8	Netscape 4.6 (shipped)
Linux	JRE 1.1.8	None

Table 21. Supported Java Virtual Machines (JVMs) for the Control Center (continued)

Operating System	Correct Java Runtime Environments	Supported Browsers
Solaris	JRE 1.1.8	None
HP-UX 11	JRE 1.1.8	None
IRIX	JRE 1.1.8 (3.1.1 SGI) + Cosmo code 2.3.1	None
PTX	JRE 1.1.8	None

For the latest information on supported JREs and browsers, go to http://www.ibm.com/software/data/db2/udb/db2cc

Setting Up and Working with the Control Center

This section describes how to set up and customize the Control Center for your environment.

Control Center Services Setup (Applet Mode only)

If you will run the Control Center as an application, skip this section and go to "Running the Control Center as a Java Application" on page 148.

To set up the Control Center to run as an applet:

1. Start the Control Center JDBC Applet Server.
2. On Windows NT or Windows 2000, start the security server.

1. Start the Control Center JDBC Applet Server
To start the Control Center JDBC Applet Server, enter the **db2jstrt** *6790* command, where *6790* represents any 4-digit port number that is not already in use.

We recommend that you start the Control Center JDBC Applet Server with a user account that has SYSADM authority.

The first time you start the Control Center JDBC Applet Server, it will create several node directory entries, together with various files for administration purposes. In Scenarios 1 and 3 in "Machine Configurations" on page 144, all of these administration files and directory entries will be created in the current DB2 instance.

Most DB2 resources are accessed over **database connect** or **instance attach**. In both cases the user must supply valid user ID and password combinations to gain access. However, some resources are accessed directly by the Control Center JDBC Applet Server, including the database and node directories (catalogs), and the Command Line Processor. Access to these resources is

performed by the Control Center JDBC Applet Server on behalf of the logged in Control Center user. Both the user and the server are required to have the proper authorization before access will be granted. For example, to update the database directory, a minimum of SYSCTRL authority is required.

It is possible to run an instance of the Control Center JDBC Applet Server with any level of security, but you will be unable to update certain resources such as database and node directories. In particular, you may encounter a **SQL1092N** message informing you of the lack of authorization for a request. The user specified in the message can be either the user signed into Control Center, or the user account running the Control Center JDBC Applet Server.

On Windows NT, you can start the Control Center JDBC Applet Server by clicking **Start** and selecting **Settings —> Control Panel —> Services**. Select the **DB2 JDBC Applet Server - Control Center** service and click **Start**.

On Windows 2000, you can start the Control Center JDBC Applet Server by clicking **Start** and selecting **Settings —> Control Panel —> Administrative Tools —> Services**. Select the **DB2 JDBC Applet Server - Control Center** service, click the **Action** menu and then select **Start**.

On any system, you can start the Control Center JDBC Applet Server by entering:

```
net start DB2ControlCenterServer
```

This step is not required if your Control Center JDBC Applet Server is autostarted.

If you start the Control Center JDBC Applet Server as a Windows NT or Windows 2000 service, you must configure the startup in the services dialog to change the account information.

2. Start the Windows NT or Windows 2000 Security Server

To work with the Control Center on Windows NT or Windows 2000, the security server must be running. During DB2 installs, the Security Server is usually set up to autostart.

You can check if the Security Server is running on Windows NT by clicking **Start** and selecting **Settings —> Control Panel —> Services**.

On Windows 2000, click **Start** and select **Settings —> Control Panel —> Administrative Tools —> Services**.

If the **DB2 Security Server** is not started on Windows NT, select it and click **Start**. On Windows 2000, select the **Action** menu and click **Start**.

After you have started the Control Center JDBC Applet Server and started the Windows NT or Windows 2000 security server (if necessary), go to "Running the Control Center as a Java Applet".

Working with the Control Center

You can run the Control Center as a Java application or as a Java applet. If your environment is configured similar to Scenarios 1 or 2 in Table 20 on page 144, you must run the Control Center as an application. If your environment is configured like Scenarios 3 or 4, you must run it as an applet.

Running the Control Center as a Java Application

To run the Control Center as a Java application, you must have the correct Java Runtime Environment (JRE) installed. See Table 21 on page 145 for the correct JRE level for your operating system.

1. To start the Control Center as an application:

   On Windows 32-bit operating systems:
   Click **Start** and select **Programs —> IBM DB2 —> Control Center**.

   On OS/2:
   Open the **IBM DB2** folder and double-click on the **Control Center** icon.

   On all supported platforms:
   Start the Control Center from a command prompt by entering the **db2cc** command.

2. The DB2 Control Center window opens.

3. You can start working with the Control Center without an existing database by creating a sample database. Enter the **db2sampl** command on the DB2 Universal Database server. On UNIX operating systems, ensure that you are logged in to the DB2 instance before you enter the **db2sampl** command.

Running the Control Center as a Java Applet

To run the Control Center as a Java applet, you must have a Web server set up on the machine that contains the Control Center applet code and the Control Center JDBC Applet Server. The Web server must allow access to the sqllib directory.

If you choose to use a virtual directory, substitute this directory for the home directory. For example, if you map sqllib to a virtual directory called temp on a server named yourserver, a client would use the URL:
http://yourserver/temp

If you do not have the DB2 documentation installed and you would like to configure your web server to work with DB2's online documentation, refer to the *Installation and Configuration Supplement*.

To run Control Center as an applet on Windows 32-bit or OS/2 operating systems, you must run **db2classes.exe** on the machine where the DB2 JDBC Applet Server resides to unzip the required Java class files. On UNIX-based systems, you must uncompress and untar **db2classes.tar.Z** to make the required Java class files available.

To load the Control Center HTML page, perform the following steps:

1. Start the **Control Center Launch** page through your web server. In your browser, select **File –> Open Page**. The **Open Page** dialog box appears. Enter the URL of your Web server and the main Control Center page and click on the **Open** push button. For example, if your server is named yourserver, you would open http://yourserver/cc/prime/db2cc.htm

2. In the **Server port** field, enter a value for the Control Center JDBC Applet Server port. The default server port value is 6790.

3. Click on the **Start Control Center** push button.

4. The Control Center Sign On window opens. Enter your user ID and password. This user ID must have an account on the machine that is running the Control Center JDBC Applet Server. Your initial logon will be used for all database connections. It can be changed from the Control Center pull-down menu. A unique user profile will be assigned to each user ID. Click **OK**.

5. The DB2 Control Center window opens.

6. You can start working with the Control Center without an existing database by creating a sample database. Enter the **db2sampl** command on the DB2 Universal Database server. On UNIX operating systems, ensure that you are logged in to the DB2 instance before you enter the **db2sampl** command.

Customizing Your Control Center HTML File

To automatically start the Control Center the next time you open db2cc.htm, perform the following steps:

- For Scenarios 1 or 2, modify the autoStartCC parameter tag in db2cc.htm from

  ```
  param name="autoStartCC" value="false"
  ```

  to

  ```
  param name="autoStartCC" value="true"
  ```

- For Scenarios 3 or 4, modify the autoStartCC, hostNameText, and portNumberText parameter tags in db2cc.htm to

  ```
  param name="autoStartCC" value="true"
  param name="hostNameText" value="yourserver"
  param name="portNumberText" value="6790"
  ```

where yourserver represents the Server name or IP address and 6790 represents the server port value of the machine to which you want to connect.

Configuring Your Web Server to Work with the Control Center
For general web server configuration information, consult the setup documentation that came with your web server.

For more information on serving DB2 online documentation through a web server, refer to the *Installation and Configuration Supplement*.

Functional Considerations

If you are using the Control Center over the Internet, be aware that there is no encryption of the data flow between the Control Center JDBC Applet Server and the browser.

To use the color options of Visual Explain on Netscape, you must set your operating system to support more than 256 colors.

On OS/2 systems, you must install the Control Center on an HPFS-formatted drive. DB2 does not support the installation of the Control Center on an OS/2 FAT drive, because an OS/2 FAT drive does not support long filenames required by Java.

Every activity will be associated with an explicit DB2 connection or attachment. For security purposes, every DB2 activity will be validated.

When you are using the Control Center under Scenarios 3 or 4, the local system is Machine B. The local system is the system name as it appears in the DB2 Control Center window.

Installation Tips for Control Center Help on UNIX Operating Systems

When installing the Control Center online help on UNIX operating systems you should keep the following in mind:
- You should install the Control Center help and the product documentation at the same time. If you install the Control Center help and the DB2 online product documentation separately, you can expect the second installation to take some time. This is true regardless of which package is installed first.
- You must select the Control Center help for any non-English language explicitly. Installing the product messages for a particular language does not mean that the Control Center help for that language is automatically installed. However, if you install the Control Center help for a particular language, the product messages for that language are installed automatically.

- If you manually install the Control Center on UNIX-based workstations rather than using the db2setup utility, you must run the **db2insthtml** command to install the online documentation. For more information, see your server's installation chapter.

Configuring TCP/IP on OS/2

To run the Control Center on OS/2 Warp 4 while disconnected from a LAN, you will need to configure TCP/IP to enable local loopback and localhost. If you are running OS/2 Warp Server for e-business, local loopback is enabled by default.

Enabling Local Loopback

To enable local loopback on your system:
1. Open the **System Setup** folder.
2. Open the **TCP/IP Configuration** notebook.
3. View the **Network** page.
4. In the **Interface to Configure** list box, highlight **loopback interface**.
5. If the **Enable interface** check box is not selected, select it now.
6. Verify that the **IP address** is 127.0.0.1 and **Subnet Mask** is empty.

Enabling Localhost

To enable localhost on your system:
1. To check if localhost is enabled, enter the **ping localhost** command.
   - If data is returned and localhost is enabled, you can skip steps 2 and 3 below and go directly to step 4.
   - If localhost unknown is returned, or if the command hangs, localhost is not enabled. Go to step 2.
2. If you are on a network, make sure that loopback is enabled. To enable local loopback see "Enabling Local Loopback".
3. If you are *not* on a network, enable localhost by performing these steps:
   a. Add the following line after other ifconfig lines in the MPTN\BIN\SETUP.CMD command file:

      ifconfig lo 127.0.0.1
   b. In the TCP/IP configuration folder, perform the following steps:
      1) Go to the **Configure Name Resolution Services** page.
      2) In the **Hostname configuration without a Nameserver** table, add an entry with *IP Address* set to 127.0.0.1 and *Hostname* set to localhost.

      Note: If you have a hostname for your machine on the **Configure LAN Name Resolution Services** page, you must add this name as an alias when you set the *IP Address 127.0.0.1* to localhost.

c. Select the **Look through HOSTS list before going to the nameserver** list box. This step tells your OS/2 system that when it is looking for a host, such as `localhost`, it should use the host address found on your machine rather than checking the nameserver. If the host is not defined on your machine, OS/2 continues looking for the host by using the nameserver you configured.

d. Close **TCP/IP Configuration** and reboot the system.

e. You should be able to ping `localhost` without being connected to any network.

4. Verify that your hostname is correct. On an OS/2 command line, enter the **hostname** command. The hostname returned should match the one listed in the **TCP/IP Configuration** notebook on the **Hostnames** page and it must be less than 32 characters. If the hostname deviates from these conditions, correct it on the **Hostnames** page.

5. Verify that your hostname is set properly in CONFIG.SYS. You should see a line similar to the following:

```
SET HOSTNAME=<correct_name>
```

where <*correct_name*> represents the value returned by the **hostname** command. If this is not the case, make the necessary changes and reboot your system when you are finished.

Verifying TCP/IP Configuration on OS/2

If you are having trouble running the Control Center on OS/2 while disconnected from a LAN, try running the **sniffle /P** command to diagnose the problem.

Troubleshooting Information

For the latest service information on the Control Center, point your browser to http://www.ibm.com/software/data/db2/udb/db2cc

If you are having problems running the Control Center, check the following:

- Ensure the Control Center JDBC Applet Server (db2jd) is running.
- Verify that the server port number is correct.
- Check that the Control Center JDBC Applet Server is running under a user account that has SYSADM authority.
- Ensure that the Database Administration Server (DAS) is running on any DB2 Universal Database systems you are trying to administer by entering the **db2admin start** command. On UNIX-based systems, ensure that you are logged in as the DAS instance owner when you issue this command.

If you are having problems running the Control Center as an *application*, also check the following:

- Verify that the correct JRE is installed. See Table 21 on page 145 for more information.

If you are having problems running the Control Center as an *applet*, also check the following:
- Verify that you are running a supported browser. See Table 21 on page 145 for more information.
- Check your browser's Java console window for diagnostic and trace information for the Control Center.
- Make sure that the client browser does not have CLASSPATH set. To make sure CLASSPATH is not set, open a command window and enter **SET CLASSPATH=** then start your client browser from this command window. Also, note that if CLASSPATH is not set in a Windows NT or Windows 2000 environment, it may still get picked up from autoexec.bat from a Windows 9x installation on the same machine.
- Ensure that you are using the db2cc.htm file from the machine running the Control Center JDBC Applet Server.
- Remember that the Control Center works within the DB2 client's locale, and that the DB2 client is located at the Control Center JDBC Applet Server's location.

Administering DB2 for OS/390 and DB2 Connect Enterprise Edition servers with the Control Center

The Control Center has been greatly enhanced to deliver new management functions to database administrators who need to manage DB2 for OS/390 V5.1 and later database servers.

The Control Center has also been enhanced to manage operational and performance characteristics of DB2 Connect Enterprise Edition connectivity servers. The combination of DB2 for OS/390 server management and new DB2 Connect monitoring support provide complete end-to-end administration and monitoring for desktop and web applications that work with DB2 for OS/390 servers.

The DB2 Control Center uses the familiar "explorer" interface to allow database administrators to easily navigate between different database servers and the database objects they manage. Context sensitive right-mouse activated menus provide administrators with the ability to change attributes of database objects and to launch commands and utilities.

Database objects are presented in a consistent fashion for all DB2 family servers. This greatly reduces the amount of learning that is required for administrators who need to manage both DB2 for OS/390 and DB2 Universal Databases on Windows NT, Windows 2000, UNIX and OS/2 servers. While

the Control Center preserves consistency across servers it does not hide capabilities that are unique to each DB2 server. This gives database administrators the power to perform all aspects of their tasks.

The ability to manage DB2 Connect connectivity servers is delivered through management of user connections and by keeping vital statistics on various performance aspects of the connectivity server. For example, database administrators can easily view all of the users connected through a particular DB2 Connect server, and their connection characteristics.

Administrators can also collect load and performance information such as the number of SQL statements and transactions executed, number of bytes sent and received, statement and transaction execution times and much more. Collected data can be displayed using easy to understand live graphs.

Preparing DB2 for OS/390 Servers for the Control Center

The DB2 Control Center uses stored procedures to deliver many of its management functions. Therefore, for the Control Center to function properly each DB2 for OS/390 server that will be managed from the Control Center needs to have stored procedures enabled and the proper stored procedures installed on that server.

For more information on applying service and required Function Modification Identifiers, refer to the *DB2 for OS/390 Program Directory*.

Working with the Control Center

Before you can work with a server and its databases you will need to catalog information about the server on the Control Center workstation. The DB2 Control Center only works with servers and databases that are cataloged on the workstation where the Control Center is running. The easiest way to accomplish this on Windows and OS/2 workstations is to use the DB2 Client Configuration Assistant (CCA).

Once the Control Center is running, start by clicking on the plus sign next to the server you want to administer. Select the database or connectivity server objects that you want to administer and right click on the object to work with object properties or to execute actions on the object. You can invoke the online help by clicking **Help**, or by pressing **F1** at any time.

Other Sources of Information

For more information about using the Control Center to administer DB2 for OS/390, refer to the following online resource:
http://www.ibm.com/software/data/db2/os390/v6facts/db2cc.html

For complete information about DB2 for OS/390 Version 6, refer to the online library: http://www.ibm.com/software/data/db2/os390/v6books.html

For more information about stored procedures and the Control Center for OS/390, go to: http://www.ibm.com/software/data/db2/os390/cc390/

Part 6. Appendixes

Appendix A. About DB2 Universal Database for UNIX, Windows, and OS/2

The DB2 Product Family provides relational database solutions for a wide range of computing devices, from small handheld devices up to the largest IBM mainframe.
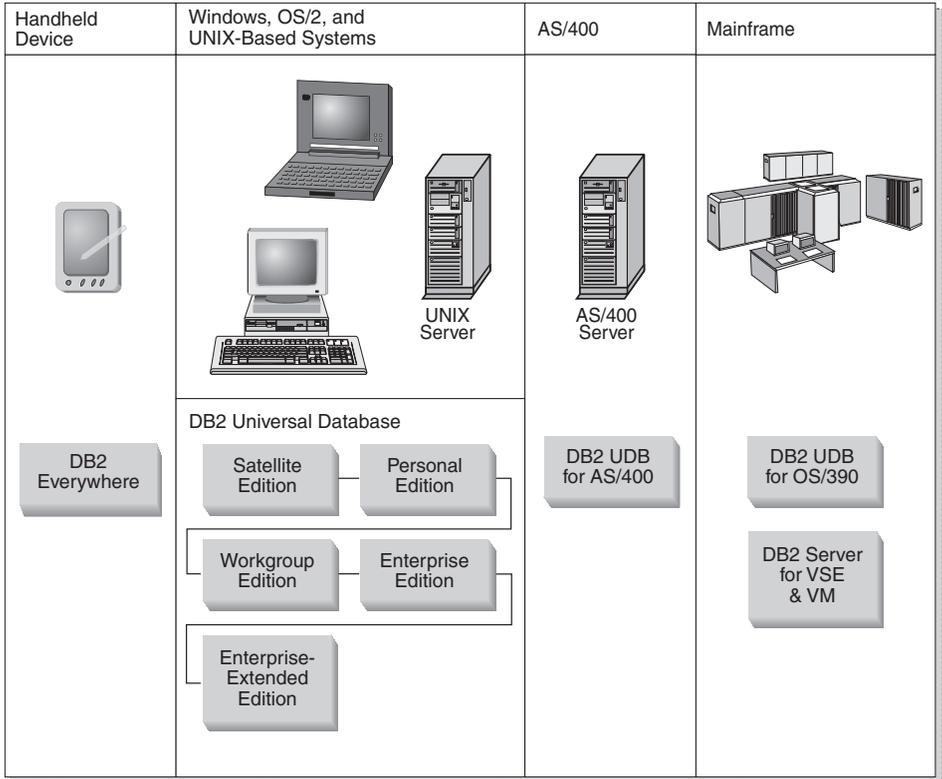
DB2 Products

The name DB2 is used for relational database products that run on a variety of platforms.

DB2 Everywhere

DB2 Everywhere is a very small footprint database that runs on mobile devices, such as personal digital assistants (PDAs), smart phones, and

handheld personal computers (HPCs). Each mobile device stores a subset of the data from an enterprise database, which it can use without the need for a continuous database connection.

DB2 Everywhere Sync Server, running on a mid-tier server, replicates the data in both directions between mobile devices and the enterprise database. For example, each worker in a loading dock might carry a PDA that is periodically synchronized with an inventory database on OS/390.

DB2 Universal Database

The following table shows which products are available on each platform:

Table 22. DB2 Universal Database Platforms

Edition	Windows 95/98	Windows NT/ Windows 2000	OS/2	Linux	AIX	HP-UX	Solaris	PTX/NUMA-Q
Satellite	✔	✔						
Personal	✔	✔	✔	✔				
Workgroup		✔	✔	✔	✔	✔	✔	
Enterprise		✔	✔	✔	✔	✔	✔	✔
Enterprise - Extended		✔			✔	✔	✔	✔

Note: DB2 UDB Workgroup Edition, DB2 UDB Enterprise Edition, and DB2 UDB Enterprise - Extended Edition are commonly referred to as "servers" or "DB2 servers". Various clients are provided with each server product.

Satellite Edition
DB2 UDB Satellite Edition is a single-user, small footprint version of DB2 available for Windows 32-bit operating systems. It is designed for occasionally connected remote systems, such as laptop computers.

Typically, many instances of DB2 UDB Satellite Edition are managed centrally by the same server.

Personal Edition
DB2 UDB Personal Edition is a single-user version of the full DB2 product. It contains:

- An object-relational database engine
- Business intelligence support, through the OLAP Starter Kit
- Data warehouse support, through the Data Warehouse Center
- Multimedia support, through DB2 Extenders
- Access to a variety of IBM data sources, through DB2 DataJoiner
- Replication support, through DataPropagator
- Extended GUI administration tools, through DB2 Control Center

- An application development client
- An administration client

Workgroup Edition

DB2 UDB Workgroup Edition is a multi-user version of the DB2 product, designed for a small business or departmental environment. It contains all the functionality of the Personal Edition, plus:

- The ability for remote clients to access data and perform administration on a DB2 workgroup server
- Web access, through Net.Data
- IBM WebSphere Application Server

Enterprise Edition

DB2 UDB Enterprise Edition is designed for large databases with many users. It contains all the functionality of the Workgroup Edition, plus:

- A license for an unlimited number of client connections
- A license for an unlimited number of web client connections
- DB2 Connect support, with DRDA access to host DB2 systems

Enterprise - Extended Edition

DB2 UDB Enterprise - Extended Edition is designed for the largest databases. It is ideal for scaling to very large databases for warehousing, data mining, and large-scale OLTP applications. It contains all the functionality of the Enterprise Edition, plus:

- Support for clusters of servers

Developer Editions

Two special editions of DB2 are available for people who develop DB2 applications:

- DB2 Personal Developer's Edition
- DB2 Universal Developer's Edition

DB2 Personal Developer's Edition provides tools to help a software developer create applications for a DB2 Personal Edition database. DB2 Personal Developer's Edition contains all the functionality of DB2 UDB Personal Edition, plus:

- The functionality of DB2 Connect Personal Edition
- VisualAge for Java, Entry Edition

DB2 Universal Developer's Edition provides the tools for developing client/server applications. DB2 Universal Developer's Edition contains all the functionality of DB2 UDB Enterprise Edition, plus:

- VisualAge for Java, Professional Edition

Host Databases

The following DB2 products are available for IBM midrange and mainframe systems:

- DB2 UDB for AS/400
- DB2 Server for VSE & VM
- DB2 UDB for OS/390

DB2 Connect

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

DB2 Connect Personal Edition

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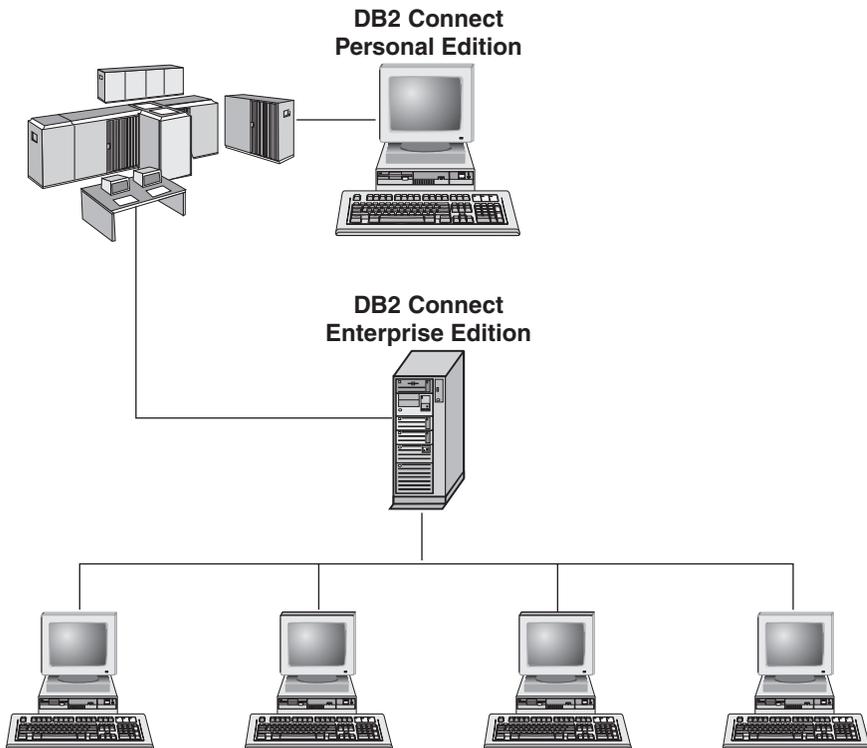
The following DB2 Connect products are available:

- Personal Edition
- Enterprise Edition
- Unlimited Edition

DB2 Connect Personal Edition provides a direct connection from one Windows, OS/2, or Linux operating system to mainframe and midrange databases. It is designed for a two-tier environment, where each client connects directly to the host. DB2 Connect Personal Edition does not accept inbound client requests for data.

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

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

Related Products

The following products work together with DB2 Universal Database.

DB2 Relational Connect

DB2 Relational Connect gives you the ability to access federated data by joining DB2 data with Oracle data within a query. It works under DB2 UDB Enterprise Edition or Enterprise - Extended Edition on Windows NT, Windows 2000, and AIX.

DB2 Warehouse Manager

DB2 Warehouse Manager provides a warehouse or data mart administrator with enhanced management capabilities. It provides the ability to manage the process of moving data as well as manage the ad hoc query workload going against the warehouse or mart. This product includes:

- Warehouse agents, which manage the flow of data between sources and warehouse targets.
- Warehouse transformers, which clean and transform data moving into the warehouse.
- An integrated business information catalog, which guides users to the data that they want.
- Metadata interchange with end-user repositories and CASE tools.
- A sophisticated query management and workload distribution tool, DB2 Query Patroller, which was previously a separate product. In order to use Query Patroller, you must have a Query Patroller server installed. Query Patroller client support is only available with a DB2 Administration Client. For more information, refer to *DB2 Query Patroller Administration Guide*.

This product is available for DB2 UDB Enterprise Edition and Enterprise - Extended Edition systems.

DB2 OLAP Server

DB2 OLAP Server provides fast, intuitive online analytic processing of data to afford users quick access to information. OLAP servers process multidimensional requests that calculate, consolidate, and retrieve information from multidimensional and relational databases.

With DB2 OLAP Server you can:

- Build analytical applications using built-in math, financial and statistical functions to define data in multidimensional cubes.
- View multidimensional data from various perspectives.
- Dynamically add new data dimensions, modify dimensional hierarchies, and change calculations.
- Use spreadsheets and web browsers as clients to analyze data without using separate SQL queries.
- Ensure data security by defining levels of access for individuals.

The OLAP Starter Kit, which supports only three concurrent users, is installed with DB2 Universal Database. You can later upgrade the OLAP Starter Kit to the full DB2 OLAP Server product.

Intelligent Miner

The Intelligent Miner family consists of two products:

- DB2 Intelligent Miner for Data extracts valuable information from a large quantity of data in a relational database.
- Intelligent Miner for Text works with unstructured information, such as text files, email, and web pages.

DB2 Spatial Extender

DB2 Spatial Extender lets you integrate geographical data with your existing business data. It includes:

- Data types such as points, lines, and polygons
- Functions such as area, endpoint, and intersect
- An indexing scheme for spatial data

This product is available for DB2 UDB Enterprise Edition and Enterprise - Extended Edition systems.

DB2 Net Search Extender

DB2 Net Search Extender contains a DB2 stored procedure that adds the power of fast full-text retrieval to Net.Data, Java, or DB2 CLI applications. It offers application programmers a variety of search functions, such as fuzzy

search, stemming, boolean operators, and section search. Searching using DB2 Net Search Extender can be particularly advantageous in the Internet, when search performance on large indexes and scalability according to concurrent queries are important factors.

DB2 Data Links Manager

DB2 Data Links Manager provides referential integrity, access control, and recovery capabilities for files that physically reside on file systems external to a DB2 Universal Database. Data Links technology includes the DATALINK data type, implemented as an SQL data type in DB2 Universal Database, which references an object stored external to a database. Data Links Manager is available on Windows NT and AIX systems. On AIX, it can be used with native (or JFS) filesystems, or in Transarc DCE-DFS file server environments.

Tivoli Enterprise

Tivoli Enterprise is a suite of management applications that let you manage an entire enterprise environment, including the data center, distributed systems, and mobile laptops as a single business unit. DB2 has been certified as Tivoli Ready.

Working with DB2 Data

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

Accessing DB2 Data from Remote Clients

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

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

shows a server that is being accessed by local and remote applications. Remote applications must have the appropriate DB2 client installed to enable applications to access data on the remote server.

DB2 Universal Database - Remote Client Support

DB2 Universal Database

Communication Support for Server

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

Application 1
Application 2
...
Application n

DB2 Run-Time Client

DB2 Administration Client
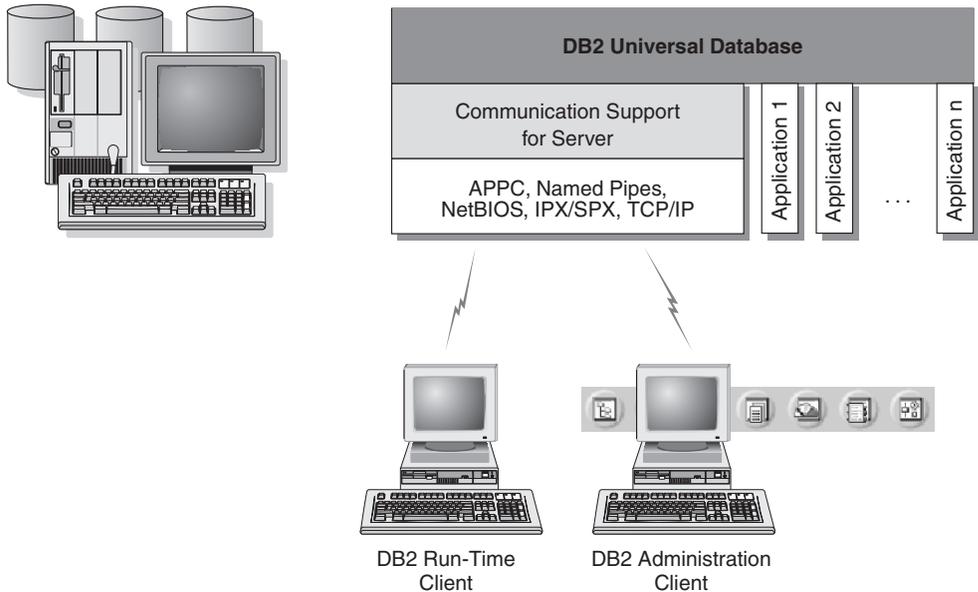
Not all protocols are supported for all platforms.

Figure 2. DB2 Server with Local Applications and Remote Clients

Accessing Multiple DB2 Servers

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

For example, you can have a server on a Windows NT workstation that is connected to a LAN, and another server on a UNIX workstation connected to a LAN. As long as there is a connection between the two LANs, clients on either network can access either server. See Figure 3 on page 167.
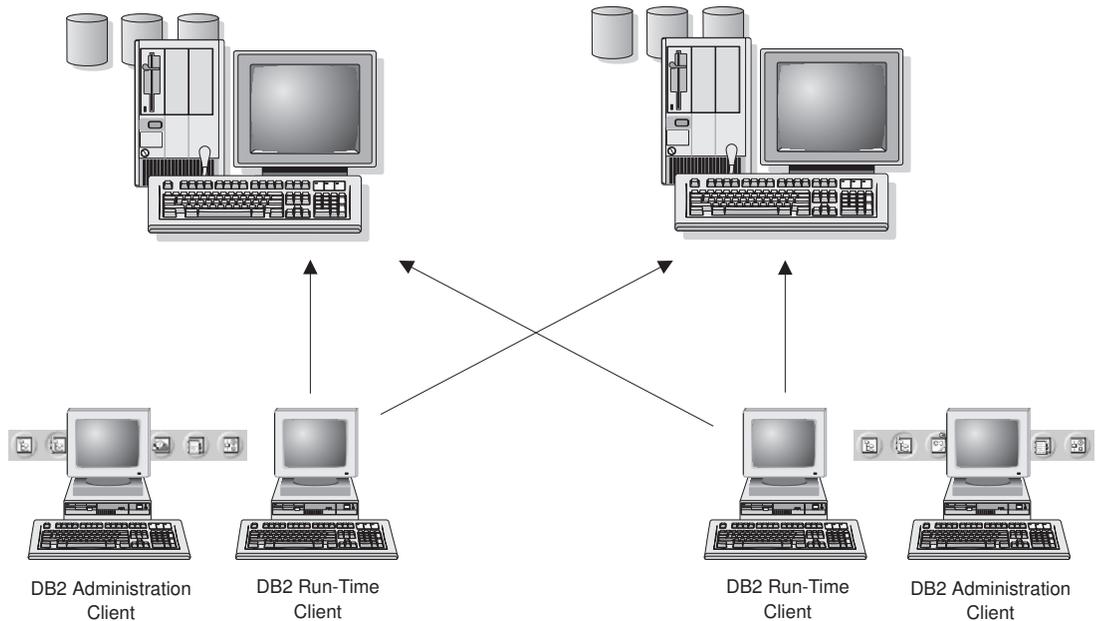
Figure 3. Accessing Data on Multiple Servers

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.

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

A DB2 server with the DB2 Connect Server Support feature installed, or a DB2 Connect server, enables DB2 clients on a LAN access to data that is stored on host or AS/400 systems.

A great deal of the data in many large organizations is managed by DB2 for AS/400, DB2 for MVS/ESA, DB2 for OS/390, or DB2 for VSE & VM. Applications that run on any of the supported platforms can work with this data transparently, as if a local database server managed it. DB2 Connect Enterprise Edition is required for supporting applications which access host or AS/400 data and exploit transaction monitors (for example, IBM TxSeries CICS and Encina Monitor, Microsoft Transaction Server, BEA Tuxedo) as well as applications that are implemented as Java applets.

Appendix A. About DB2 Universal Database for UNIX, Windows, and OS/2 **167**

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

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

DB2 Connect Enterprise Edition is most appropriate for environments where:

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

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

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

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

A DB2 server with the DB2 Connect functionality installed, or a DB2 Connect server, enables multiple clients to connect to host or AS/400 data and can significantly reduce the effort that is required to establish and maintain access

to enterprise data. Figure 4 on page 170 illustrates IBM's solution for environments in which you want to use a DB2 client making an indirect connection to a host or AS/400 database server through DB2 Connect Enterprise Edition.

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

DB2 for
MVS

DB2 for
VSE

DB2 for
VM

OS/390

S/390, S/370

DB2 for
AS/400

AS/400

APPC TCP/IP*** MPTN

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

SNA Communications
Support****

DB2 Connect Enterprise Edition

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

DB2 Run-Time Client
and applications

DB2 Administration Client
and applications

Not all protocols are supported for all platforms.

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

Figure 4. DB2 Connect Enterprise Edition

Accessing DB2 Data from the Web using Java

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

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

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

The DB2 JDBC Applet server and the DB2 client must reside on the same machine as the Web server. The DB2 JDBC Applet server calls the DB2 client to connect to local, remote, host, and AS/400 databases. When the applet requests a connection to a DB2 database, the JDBC client opens a TCP/IP connection to the DB2 JDBC Applet on the machine where the Web server is running. See Figure 5 on page 172 for an example of a Java-enabled browser accessing data from remote DB2 databases.
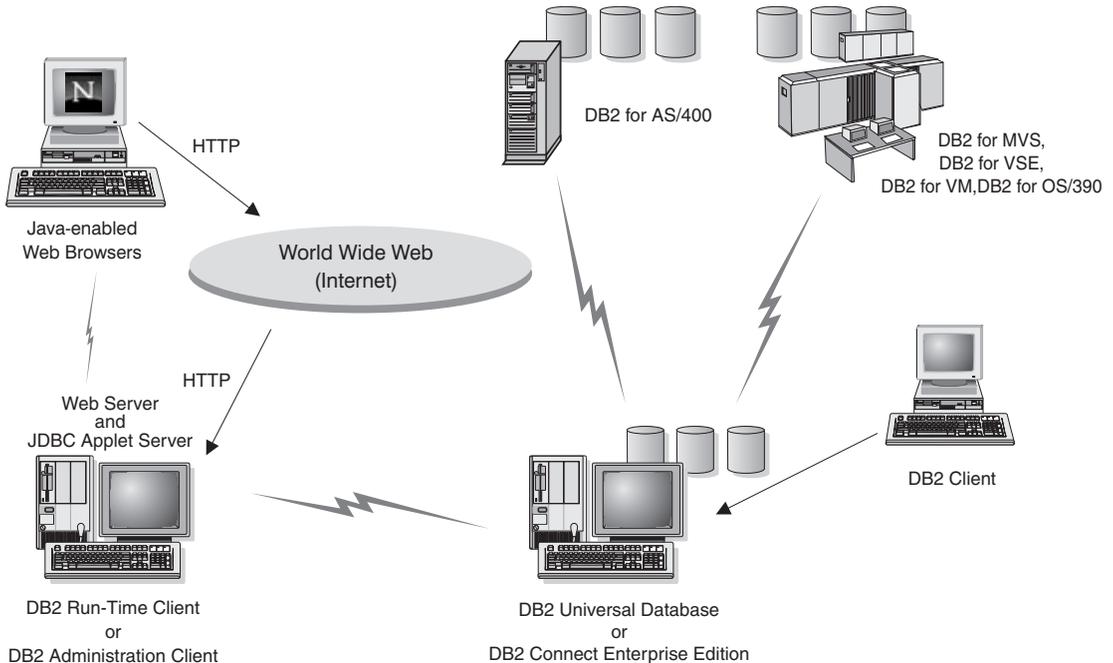
Figure 5. Accessing Data Stored on DB2 using JDBC

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

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

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

Accessing DB2 Data from the Web using Net.Data

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

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

access current DB2 data. Customized queries require user input. Users define the search characteristics on the Web page by selecting options from a list or by entering values in fields. They submit the search by clicking on a push button. Net.Data uses the information that is supplied by the user to dynamically build a complete SQL statement, and it sends the query to the DB2 database.

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

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

In both cases, Net.Data and the Web server must be installed on the same system. See Figure 6 for an example of a workstation with Net.Data that is being used to access data from a remote DB2 database.

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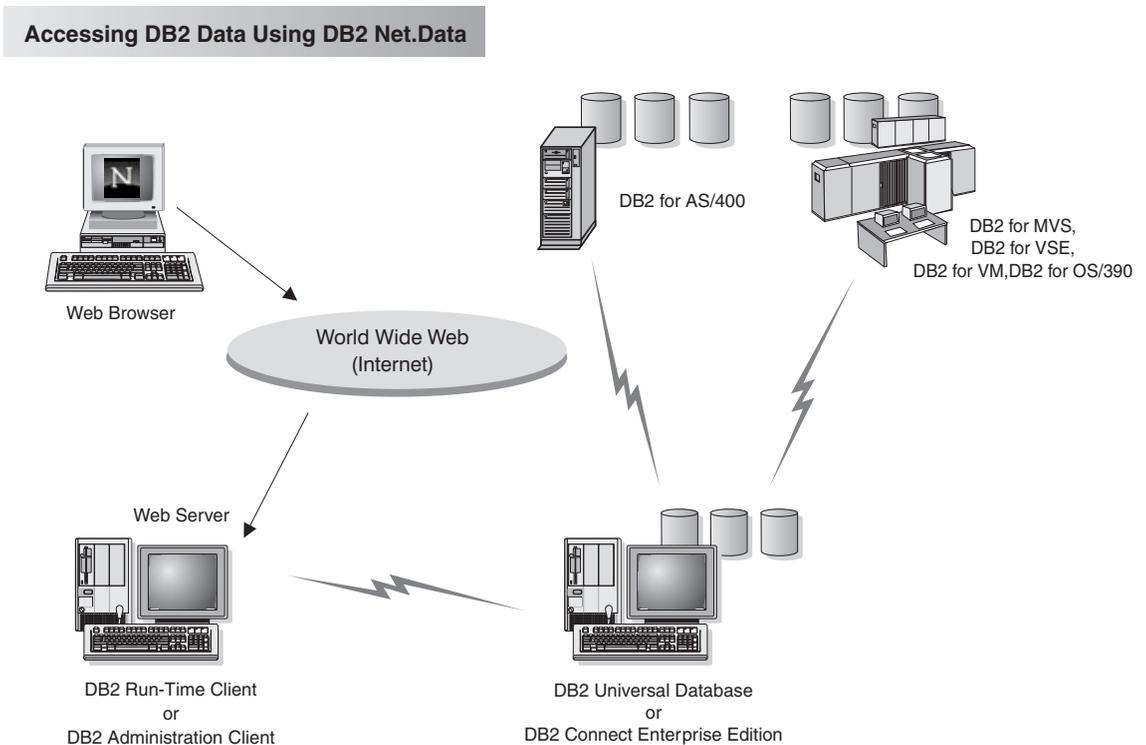
Figure 6. Accessing Internet Data Stored on DB2 using Net.Data

Accessing DB2 Data from Host and AS/400 Client Machines

The DRDA Application Server (DRDA AS) functionality gives clients or applications on host and AS/400 machines transparent access to data stored on a LAN-based DB2 Universal Database server. This access is provided through Distributed Relational Database Architecture (DRDA), a standard architecture for managing data. You can configure your server to act as a DRDA AS for host and AS/400 clients or applications; these clients or applications are known as DRDA Application Requesters (DRDA AR).

> The DRDA AS feature is available for:
> - DB2 Universal Database Enterprise - Extended Edition
> - DB2 Universal Database Enterprise Edition
> - DB2 Universal Database Workgroup Edition

For information on how to set up your DB2 Universal Database server as a DRDA AS, refer to the *Installation and Configuration Supplement*.

Administering Instances and Databases with the DB2 Administration Tools

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

Managing Instances and Database Objects using the Control Center

The Control Center displays instances and database objects (such as table spaces, tables, and packages) and their relationships to each other. Using the Control Center, you can manage local and remote servers from a single point of control. See Figure 7 on page 175 for an example of the main Control Center window.
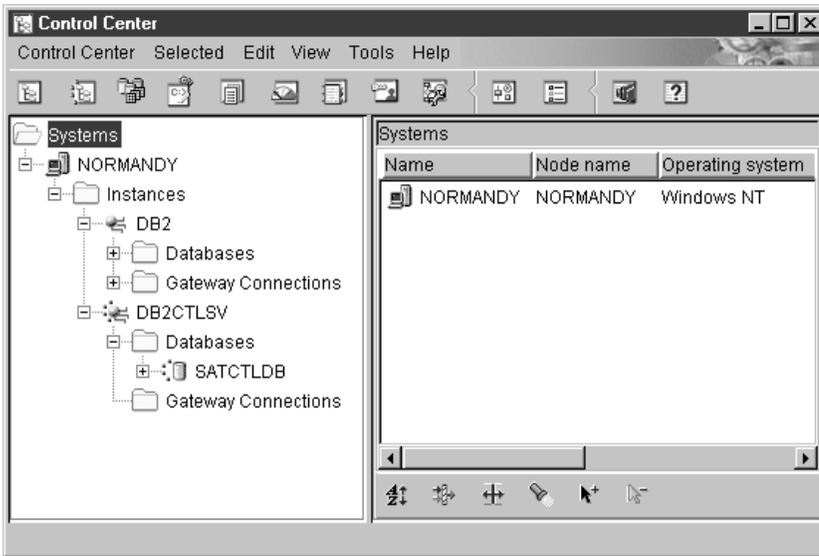
Figure 7. Control Center Main Window

From the Control Center, you can perform operations on database objects. These operations include:

- 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
- Monitor resources and events on a server.

You can also control DB2 instances by:

- Maintaining communication protocols
- Setting database manager and database configuration values that affect performance.

Wizards are provided to help you perform complex tasks. For example, a wizard is available to tune the performance of your system. See "Using DB2 Wizards" on page 208 for descriptions of the various wizards and how to start them.

The Control Center provides additional functionality to assist you in managing your servers:
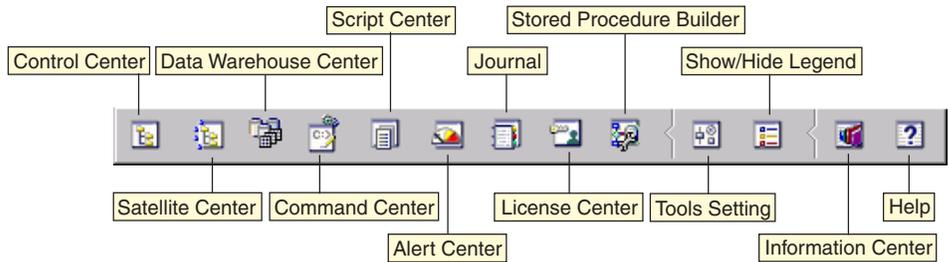
Control Center
>   Use the Control Center to start another session of the Control Center to administer a server.

Satellite Center
>   Use the Satellite Center to manage the Satellites that are served by a particular DB2 Control Server. It provides create, remove, modify, and manage functions for Satellites and Groups. You can also create and manage scripts to administer the Satellites.

Data Warehouse Center
>   Use the Data Warehouse Center to manage warehouses; create and manage warehouse objects, such as sources and targets; define, extract, transform, manipulate, and load steps and processes; and schedule and automate steps.

Command Center
>   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.

Script Center
>   Use the Script Center to create scripts, which you can store and invoke 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 backup.

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

Journal
>   Use the Journal to view all available information about jobs that are

pending execution, executing, or that have completed execution. You can also view the recovery history log, the alerts log, and the messages log; and review the results of jobs that are run unattended.

License Center

Use the License Center to manage licenses and display license status and usage of any DB2 products installed on your system. You can also use the License Center to configure your system for proper license monitoring.

Stored Procedure Builder

Use Stored Procedure Builder to create stored procedures, build stored procedures on local and remote DB2 servers, modify and rebuild existing stored procedures, and run stored procedures for testing and debugging the execution of installed stored procedures.

Tools Setting

Use the Tools Setting to change the settings for the DB2 Administration Tools.

Information Center

The Information Center provides quick access to DB2 product information. This product information includes such items as: database tasks, reference material, DB2 documentation, warehouse administration information, troubleshooting aids, sample programs for application development, and DB2 web-related URLs.

You can also analyze performance using the DB2 Performance Monitor and Visual Explain. These tools are available from the Control Center.

Use the **DB2 Performance Monitor** to monitor the performance of your system. You can monitor activity by sampling data over a period of time or using data for a particular event. See "Monitoring Databases using DB2 Performance Monitor" on page 178 for more information.

Use **Visual Explain** to view the access plan for explained SQL statements as a graph. You can use the information available from the graph to tune your SQL queries for better performance. See "Viewing SQL Access Plans using Visual Explain" on page 178 for more information.

You can find additional information in the *Administration Guide* or in the online help.

Managing Communications on the Server

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

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

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

Monitoring Databases using DB2 Performance Monitor

With the DB2 Performance Monitor, you can:
- Identify and analyze performance problems in database applications or the database manager.
- Use the early warning system to detect potential problems.
- Automate actions to correct problems that are discovered.
- Define your own statistics, in addition to the default set that is provided.

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

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

Viewing SQL Access Plans using Visual Explain

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

- Display access plans for queries on all supported DB2 configurations.

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

Managing Connections to Databases using the Client Configuration Assistant

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

You can use the command line processor to set up DB2 clients on any platform. For more information, see "Chapter 16. Configuring Client-to-Server Communications Using the Command Line Processor" on page 121.

With the CCA, you can:
- Catalog databases so that they can be used by applications. Three methods are available:
  - Use a profile provided by a database administrator to automatically define your connections. Client access is automatically set up for that database.
  - Search the network for available databases and select one. Client access is automatically set up for that database.
  - Manually configure a connection to a database by entering the required connection parameters.
- Remove cataloged databases, or change the properties of a cataloged database.
- Export and import client profiles that contain database and configuration information for a client.
- Test connections to local or remote databases identified on your system.
- Bind applications to a database by selecting utilities or bind files from a list.
- Tune the client configuration parameters on your system. Parameters are logically grouped and suggested settings are provided on the interface as parameters are selected.
- Export client configuration information to a profile.
- Import configuration information from a profile.
- Update the server password.

Managing Warehouses using the Data Warehouse Center

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

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

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

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

Understanding the Administration Server

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

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

Developing Applications using the DB2 Application Development Client

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

A platform-specific version of the DB2 Application Development Client is available on each server CD-ROM. In addition the Developer Edition boxes contain the Application Development Clients for multiple supported operating

systems. The Personal Developer's Edition box contains the Application Development CD-ROMs for OS/2, Windows and Linux. The Universal Developer's Edition box contains the Application Development CD-ROMs for all supported operating systems.

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

The DB2 Application Development Client allows you to develop applications that use the following interfaces:

- Embedded SQL
- Call Level Interface (CLI) development environment (which is compatible with ODBC from Microsoft)
- Java Database Connectivity (JDBC)
- Embedded SQL for Java (SQLJ)
- DB2 Application Programming Interfaces (APIs) that use administrative functions to manage a DB2 database.

The DB2 Application Development Client includes:

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

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

Running Your Own Applications

Various types of applications can access DB2 databases:

- Applications developed using a DB2 Application Development Client that include embedded SQL (including Java SQLJ applications and applets), APIs, stored procedures, user-defined functions, calls to DB2 CLI, or calls to JDBC applications and applets.
- ODBC applications such as Lotus Approach.
- Net.Data macros containing HTML and SQL.

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

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

Appendix B. Basic Task Knowledge

This section describes the basic tasks that you will need to know to use this product effectively.

Go to the task that you want to perform:
- "Starting the Client Configuration Assistant".
- "Starting the DB2 Control Center".
- "Entering Commands Using the Command Center" on page 184.
- "Entering Commands Using the Command Line Processor" on page 185.
- "Working with the System Administrative Group" on page 187.
- "Working with the Business Intelligence Functions" on page 187.
- "Mounting CD-ROMs on UNIX Operating Systems" on page 188.
- "Setting the Number of Licensed Processors" on page 190.
- "Upgrading DB2 from Try and Buy Mode" on page 191.

Starting the Client Configuration Assistant

Start the Client Configuration Assistant (CCA) as follows:

OS/2
Click on **OS/2 Warp**, and select **IBM DB2 —> Client Configuration Assistant**

Windows 32-bit operating systems
Click on **Start** and select **Programs—>IBM DB2—>Client Configuration Assistant**

You can also start the CCA by entering the **db2cca** command at a command prompt.

Starting the DB2 Control Center

You can run the DB2 Control Center as a Java *application* or as a Java *applet*.

To run the Control Center as an application
Enter the **db2cc** command. Your system must have the correct Java Runtime Environment installed in order to run the Control Center as an application.

On Windows 32-bit and OS/2 systems, you can also start the Control Center as an application by invoking the **Control Center** icon in your **IBM DB2** program group.

To run the Control Center as an applet
> You must have a Java-enabled browser and you must perform some
> additional configuration steps to run the Control Center as an applet.
> For detailed instructions on running the Control Center as an applet
> or application, see "Chapter 18. Control Center Installation and
> Configuration" on page 143.

Entering Commands Using the Command Center

This section describes how to enter commands using the Command Center.
There are two versions of the Command Center. This section documents the
Command Center that is accessible from the DB2 Control Center.

Note: If you do not have the Control Center installed, a Command Center
with limited functionality is available through the IBM DB2 program
group, or by entering the **db2cctr** command.

From the Command Center you can:
- Run SQL statements, DB2 commands, and operating system commands.
- See the execution result of SQL statements and DB2 commands in a results
  window. You can scroll through the results and save the output to a file.
- Save a sequence of SQL statements and DB2 commands to a script file. You
  can then schedule the script to run as a job. When a saved script is
  modified, all jobs dependent on the saved script inherit the new modified
  behavior.
- Recall and run a script file.
- See the execution plan and statistics associated with a SQL statement before
  execution.
- Get quick access to database administrative tools from the main tool bar.
- Display all the command scripts known to the system through the Script
  Center, with summary information listed for each.
- Use the SQLAssist tool to build complex queries.
- Display results in an table you can edit.

To start the Command Center, click on the **Command Center** icon in the
Control Center.

The Command Center contains a large input area for entering commands. To
run the commands you have entered, click on the **Execute** icon (the gears
icon).

> In the Command Center, you do not have to enter a command with the db2 prefix; instead you just enter the DB2 command. For example:
>
>   list database directory
>
> To enter operating system commands, precede the operating-system command with an exclamation mark (!). For example:
>
>   !dir

If you want to enter multiple commands, you must end each command with the termination character, then press **Enter** to start the next command on a new line. The default termination character is a semicolon (;).

For example, you could connect to a database called SAMPLE and list all the system tables by entering the following command:

    connect to sample;
    list tables for system

After you have clicked on the **Execute** icon, the results are displayed.

To recall commands that you have entered during your session, select the **Command history** drop down box, and select a command.

To save commands, select **Interactive —> Save Command As** from the menu bar. For more information, click on the **Help** push button or press the **F1** key.

> You can use the **Append to Script** button and the Script page of the Command Center to store commonly used SQL statements or DB2 commands as scripts. For more information, click on the **Help** push button or press the **F1** key.

Entering Commands Using the Command Line Processor

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

DB2 Command Window

The DB2 command line processor behaves like a command window from your operating system. You can enter operating system commands, DB2 commands, or SQL statements and view their output.

Interactive Input Mode

The db2 prefix that you use for DB2 commands (in the DB2 Command Window) is pre-entered for you. You can enter operating systems commands, DB2 commands, or SQL statements and view their output.

File Input Mode
> Processes commands that are stored in a file. For information on the file input mode, refer to the *Command Reference*.

DB2 Command Window

To invoke a DB2 Command Window, do the following:

OS/2   Open any OS/2 command window.

Windows 32-bit operating systems
> Click on **Start** and select **Programs —> IBM DB2 —> Command Window**
>
> You can also invoke the DB2 command window by entering the **db2cmd** command at your operating system's prompt.

UNIX   Open any operating system command window.

If you are entering commands via the Command Window, you must include the db2 prefix. For example:

```
db2 list database directory
```

> If the DB2 command contains characters that have special meaning on the operating system you are using, you will need to enter the command in quotation marks to ensure that it is run properly.
>
> For example, the following command would retrieve all the information from the *employee* table, even if the * character has a special meaning on the operating system:
>
> ```
> db2 "select * from employee"
> ```

To enter a long command that does not fit on a single line, you must use a space followed by the line continuation character ″\″ at the end of one line, then press the **Enter** key to continue the command on to the next. For example:

```
db2 select empno, function, firstname, lastname, birthdate, from \
db2 (cont.) => employee where function='service' and \
db2 (cont.) => firstname='Lily' order by empno desc
```

Interactive Input Mode

To invoke the command line processor in interactive input mode, do the following:

OS/2   Click on **OS/2 Warp** and select **IBM DB2 —> Command Line Processor** or enter the **db2** command.

Windows 32-bit operating systems
> Click on **Start** and select **Programs —> IBM DB2 —> Command Line Processor**.

You can also invoke the command line processor in interactive input mode by entering the **db2cmd** command followed by the **db2** command at your operating system's prompt.

UNIX   Enter the **db2** command from the command line processor

In interactive input mode, the prompt looks like this:

```
db2 =>
```

In interactive input mode, you do not have to enter DB2 commands with a db2 prefix; instead, you just enter the DB2 command. For example:

```
db2 => list database directory
```

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

```
db2 => !dir
```

To enter a long command that does not fit on a single line, you must use a space followed by the line continuation character "\" at the end of one line, then press the **Enter** key to continue the command on to the next. For example:

```
db2 select empno, function, firstname, lastname, birthdate, from \
db2 (cont.) => employee where function='service' and \
db2 (cont.) => firstname='Lily' order by empno desc
```

To end interactive input mode, enter the **quit** command.

For more information on advanced topics using the CLP, refer to the *Command Reference*.

Working with the System Administrative Group

By default, System Administrative (SYSADM) authority is granted to the following:

UNIX   Any valid DB2 user name that belongs to the primary group of the instance owner's user ID.

Working with the Business Intelligence Functions

The Business Intelligence Tutorial walks you through several basic and advanced tasks using the Data Warehouse Center and the OLAP Starter Kit. You can start the Tutorial from the **Help** menu in the Data Warehouse Center or from the **Help** menu in the OLAP Starter Kit desktop. You can also start the Tutorial from the Getting Started item in the Information Center.

Mounting CD-ROMs on UNIX Operating Systems

The following sections describe how to mount your DB2 product CD-ROM on UNIX-based operating systems.

Mounting the CD-ROM on AIX

To mount the CD-ROM on AIX using the System Management Interface Tool (SMIT), perform the following steps:

1. Log in as a user with root authority.
2. Insert the CD-ROM in the drive.
3. Create a CD-ROM mount point by entering the `mkdir -p /cdrom` command, where `cdrom` represents the CD-ROM mount point directory.
4. Allocate a CD-ROM file system using SMIT by entering the **smit storage** command.
5. After SMIT starts, select **File Systems —> Add / Change / Show / Delete File Systems —> CDROM File Systems —> Add CDROM File System**.
6. In the Add a File System window:
   - Enter a device name for your CD-ROM file system in the **DEVICE Name** field. Device names for CD-ROM file systems must be unique. If there is a duplicate device name, you may need to delete a previously-defined CD-ROM file system or use another name for your directory. In our example, we will use `/dev/cd0` as the device name.
   - Enter the CD-ROM mount point directory in the **MOUNT POINT** window. In our example, the mount point directory is `/cdrom`.
   - In the **Mount AUTOMATICALLY at system restart** field, select `yes` to enable automatic mounting of the file system.
   - Click **OK** to close the window, then click **Cancel** three times to exit SMIT.
7. Next, mount the CD-ROM file system by entering the **smit mountfs** command.
8. In the Mount a File System window:
   - Enter the device name for this CD-ROM file system in the **FILE SYSTEM name** field. In our example, the device name is `/dev/cd0`.
   - Enter the CD-ROM mount point in the **Directory over which to mount** field. In our example, the mount point is `/cdrom`.
   - Enter `cdrfs` in the **Type of Filesystem** field. To view the other kinds of file systems you can mount, click **List**.
   - In the **Mount as READ-ONLY system** field, select to `yes`.
   - Accept the remaining default values and click OK to close the window.

Your CD-ROM file system is now mounted. To view the contents of the CD-ROM, place the disk in the drive and enter the **cd /cdrom** command where **cdrom** is the CD-ROM mount point directory.

Mounting the CD-ROM on HP-UX

Because DB2 Version 7.1 for HP-UX contains several files with long file names, the mount command may fail. The following steps will enable you to mount successfully your DB2 for HP-UX product CD-ROM:

1. Log in as a user with root authority.
2. In the /etc directory, add the following line to the pfs_fstab file:

   ```
   /dev/dsk/c0t2d0 mount_point pfs-rrip ro,hard
   ```

   where *mount_point* represents the mount point of the CD-ROM.
3. Start the *pfs* daemon by entering the following commands (if they are not already running):

   ```
   /usr/sbin/pfs_mountd &
   /usr/sbin/pfsd 4 &
   ```
4. Insert the CD-ROM in the drive and enter the following commands:

   ```
   mkdir /cdrom
   /usr/sbin/pfs_mount /cdrom
   ```

   where */cdrom* represents the mount point of the CD-ROM.
5. Log out.

Mounting the CD-ROM on Linux

To mount the CD-ROM on Linux:

1. Log in as a user with root authority.
2. Insert the CD-ROM in the drive and enter the following command:

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

   where */cdrom* represents the mount point of the CD-ROM.
3. Log out.

Note that some window managers may automatically mount your CD-ROM for you. Consult your system documentation for more information.

Mounting the CD-ROM on PTX

To mount the CD-ROM on PTX:

1. Log in as a user with root authority.
2. Insert the CD-ROM in the drive and enter the following commands:

   ```
   mkdir /cdrom
   mount -r -F cdfs /dev/dsk/cd0 /cdrom
   ```

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

3. Log out.

Mounting the CD-ROM on Solaris

To mount the CD-ROM on Solaris:

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

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

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

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

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

   ```
   /cdrom/unnamed_cdrom
   ```

4. Log out.

Setting the Number of Licensed Processors

Note: This section applies only to DB2 Enterprise Edition, DB2 Enterprise-Extended Edition, and DB2 Warehouse Manager.

If you are using an SMP machine and you have purchased additional processor entitlements, you can update this information using the **db2licm** command.

Note: An instance must be created on UNIX-based operating systems before performing these steps.

To update the number of License Processors, perform the following steps:

1. Log in as a user with SYSADM, SYSCTRL or SYSMAINT authority.
2. The **db2licm** utility can be found in the following locations:
   - For Unix-based operating systems, if `INSTHOME/sqllib/adm` is not in your PATH, change your directory.
   - For Windows 32–bit operating systems and OS/2, go to `x:\DB2DIR\bin`, where *x:\DB2DIR* is your DB2 installation drive and path.

3. Obtain the product password by issuing the **db2licm -l** command. The DB2 products are listed as follows:

Enterprise-Extended Edition
> DB2UDBEEE DB

Enterprise Edition
> DB2UDBEE DB2

Warehouse Manager
> DB2UDBWM DB2

Relational Connect
> DB2RELC DB2

Spatial Extenders
> DB2UDBGSE

4. Update the number of processors using:

```
db2licm -n [product password] [number of processors]
```

Upgrading DB2 from Try and Buy Mode

You can upgrade a DB2 product from the Try and Buy mode to a licensed version in two ways. You can use the command line utility called **db2licm** or use the License Center. The License Center is a built-in feature of the Control Center.

On UNIX Operating Systems
> To add a license using the command line:
>
> 1. Log in as a user with root authority.
> 2. The **db2licm** utility can be found in the following locations:
>   * For AIX, /usr/lpp/db2_07_01/adm/
>   * For LINUX, /usr/IBMdb2/V7.1/adm/
>   * For HP-UX, PTX, Solaris, PTX, /opt/IBMdb2/V7.1/adm/
> 3. Issue the following command:
>
>    ```
>    db2licm filename.lic
>    ```
>
>   where *filename.lic* represents the name of the licensing file. For more information about the **db2licm** command, refer to the *Command Reference*.

On OS/2 and Windows 32-bit Operating Systems
> To add a license using the command line:
>
> 1. Go to the *<install directory>*\bin directory, where *<install directory>* represents the directory where you installed the product.

2. To add a license, issue the following command:

```
db2licm path/filename.lic
```

   License files are contained in the db2/license directory of the installation CD.

   For more information about the **db2licm** command, refer to the *Command Reference*.

   Note: You cannot view specific license information using the **db2licm** utility until at least one instance is created.

Adding a license using the License Center

To add a license using the License Center:

1. Launch the Control Center.
2. Select **License Center** from the **Tools** menu list.
3. Refer to the online help for the License Center available from the Control Center.

Appendix C. Using the DB2 Library

The DB2 Universal Database library consists of online help, books (PDF and HTML), and sample programs in HTML format. This section describes the information that is provided, and how you can access it.

To access product information online, you can use the Information Center. For more information, see "Accessing Information with the Information Center" on page 207. You can view task information, DB2 books, troubleshooting information, sample programs, and DB2 information on the Web.

DB2 PDF Files and Printed Books

DB2 Information

The following table divides the DB2 books into four categories:

DB2 Guide and Reference Information
These books contain the common DB2 information for all platforms.

DB2 Installation and Configuration Information
These books are for DB2 on a specific platform. For example, there are separate *Quick Beginnings* books for DB2 on OS/2, Windows, and UNIX-based platforms.

Cross-platform sample programs in HTML
These samples are the HTML version of the sample programs that are installed with the Application Development Client. The samples are for informational purposes and do not replace the actual programs.

Release notes
These files contain late-breaking information that could not be included in the DB2 books.

The installation manuals, release notes, and tutorials are viewable in HTML directly from the product CD-ROM. Most books are available in HTML on the product CD-ROM for viewing and in Adobe Acrobat (PDF) format on the DB2 publications CD-ROM for viewing and printing. You can also order a printed copy from IBM; see "Ordering the Printed Books" on page 203. The following table lists books that can be ordered.

On OS/2 and Windows platforms, you can install the HTML files under the `sqllib\doc\html` directory. DB2 information is translated into different

languages; however, all the information is not translated into every language. Whenever information is not available in a specific language, the English information is provided

On UNIX platforms, you can install multiple language versions of the HTML files under the doc/%L/html directories, where *%L* represents the locale. For more information, refer to the appropriate *Quick Beginnings* book.

You can obtain DB2 books and access information in a variety of ways:
- "Viewing Information Online" on page 206
- "Searching Information Online" on page 210
- "Ordering the Printed Books" on page 203
- "Printing the PDF Books" on page 202

Table 23. DB2 Information

Name	Description	Form Number PDF File Name	HTML Directory
DB2 Guide and Reference Information			
Administration Guide	*Administration Guide: Planning* provides an overview of database concepts, information about design issues (such as logical and physical database design), and a discussion of high availability.	SC09-2946 db2d1x70	db2d0
	Administration Guide: Implementation provides information on implementation issues such as implementing your design, accessing databases, auditing, backup and recovery.	SC09-2944 db2d2x70	
	Administration Guide: Performance provides information on database environment and application performance evaluation and tuning.	SC09-2945 db2d3x70	
	You can order the three volumes of the *Administration Guide* in the English language in North America using the form number SBOF-8934.		
Administrative API Reference	Describes the DB2 application programming interfaces (APIs) and data structures that you can use to manage your databases. This book also explains how to call APIs from your applications.	SC09-2947 db2b0x70	db2b0

Table 23. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
Application Building Guide	Provides environment setup information and step-by-step instructions about how to compile, link, and run DB2 applications on Windows, OS/2, and UNIX-based platforms.	SC09-2948 db2axx70	db2ax
APPC, CPI-C, and SNA Sense Codes	Provides general information about APPC, CPI-C, and SNA sense codes that you may encounter when using DB2 Universal Database products. Available in HTML format only.	No form number db2apx70	db2ap
Application Development Guide	Explains how to develop applications that access DB2 databases using embedded SQL or Java (JDBC and SQLJ). Discussion topics include writing stored procedures, writing user-defined functions, creating user-defined types, using triggers, and developing applications in partitioned environments or with federated systems.	SC09-2949 db2a0x70	db2a0
CLI Guide and Reference	Explains how to develop applications that access DB2 databases using the DB2 Call Level Interface, a callable SQL interface that is compatible with the Microsoft ODBC specification.	SC09-2950 db2l0x70	db2l0
Command Reference	Explains how to use the Command Line Processor and describes the DB2 commands that you can use to manage your database.	SC09-2951 db2n0x70	db2n0
Connectivity Supplement	Provides setup and reference information on how to use DB2 for AS/400, DB2 for OS/390, DB2 for MVS, or DB2 for VM as DRDA application requesters with DB2 Universal Database servers. This book also details how to use DRDA application servers with DB2 Connect application requesters. Available in HTML and PDF only.	No form number db2h1x70	db2h1

Table 23. DB2 Information (continued)

Name	Description	Form Number / PDF File Name	HTML Directory
Data Movement Utilities Guide and Reference	Explains how to use DB2 utilities, such as import, export, load, AutoLoader, and DPROP, that facilitate the movement of data.	SC09-2955 db2dmx70	db2dm
Data Warehouse Center Administration Guide	Provides information on how to build and maintain a data warehouse using the Data Warehouse Center.	SC26-9993 db2ddx70	db2dd
Data Warehouse Center Application Integration Guide	Provides information to help programmers integrate applications with the Data Warehouse Center and with the Information Catalog Manager.	SC26-9994 db2adx70	db2ad
DB2 Connect User's Guide	Provides concepts, programming, and general usage information for the DB2 Connect products.	SC09-2954 db2c0x70	db2c0
DB2 Query Patroller Administration Guide	Provides an operational overview of the DB2 Query Patroller system, specific operational and administrative information, and task information for the administrative graphical user interface utilities.	SC09-2958 db2dwx70	db2dw
DB2 Query Patroller User's Guide	Describes how to use the tools and functions of the DB2 Query Patroller.	SC09-2960 db2wwx70	db2ww
Glossary	Provides definitions for terms used in DB2 and its components. Available in HTML format and in the *SQL Reference*.	No form number db2t0x70	db2t0
Image, Audio, and Video Extenders Administration and Programming	Provides general information about DB2 extenders, and information on the administration and configuration of the image, audio, and video (IAV) extenders and on programming using the IAV extenders. It includes reference information, diagnostic information (with messages), and samples.	SC26-9929 dmbu7x70	dmbu7
Information Catalog Manager Administration Guide	Provides guidance on managing information catalogs.	SC26-9995 db2dix70	db2di

Table 23. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
Information Catalog Manager Programming Guide and Reference	Provides definitions for the architected interfaces for the Information Catalog Manager.	SC26-9997 db2bix70	db2bi
Information Catalog Manager User's Guide	Provides information on using the Information Catalog Manager user interface.	SC26-9996 db2aix70	db2ai
Installation and Configuration Supplement	Guides you through the planning, installation, and setup of platform-specific DB2 clients. This supplement also contains information on binding, setting up client and server communications, DB2 GUI tools, DRDA AS, distributed installation, the configuration of distributed requests, and accessing heterogeneous data sources.	GC09-2957 db2iyx70	db2iy
Message Reference	Lists messages and codes issued by DB2, the Information Catalog Manager, and the Data Warehouse Center, and describes the actions you should take. You can order both volumes of the Message Reference in the English language in North America with the form number SBOF-8932.	Volume 1 GC09-2978 db2m1x70 Volume 2 GC09-2979 db2m2x70	db2m0
OLAP Integration Server Administration Guide	Explains how to use the Administration Manager component of the OLAP Integration Server.	SC27-0787 db2dpx70	n/a
OLAP Integration Server Metaoutline User's Guide	Explains how to create and populate OLAP metaoutlines using the standard OLAP Metaoutline interface (not by using the Metaoutline Assistant).	SC27-0784 db2upx70	n/a
OLAP Integration Server Model User's Guide	Explains how to create OLAP models using the standard OLAP Model Interface (not by using the Model Assistant).	SC27-0783 db2lpx70	n/a
OLAP Setup and User's Guide	Provides configuration and setup information for the OLAP Starter Kit.	SC27-0702 db2ipx70	db2ip
OLAP Spreadsheet Add-in User's Guide for Excel	Describes how to use the Excel spreadsheet program to analyze OLAP data.	SC27-0786 db2epx70	db2ep

Table 23. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
OLAP Spreadsheet Add-in User's Guide for Lotus 1-2-3	Describes how to use the Lotus 1-2-3 spreadsheet program to analyze OLAP data.	SC27-0785 db2tpx70	db2tp
Replication Guide and Reference	Provides planning, configuration, administration, and usage information for the IBM Replication tools supplied with DB2.	SC26-9920 db2e0x70	db2e0
Spatial Extender User's Guide and Reference	Provides information about installing, configuring, administering, programming, and troubleshooting the Spatial Extender. Also provides significant descriptions of spatial data concepts and provides reference information (messages and SQL) specific to the Spatial Extender.	SC27-0701 db2sbx70	db2sb
SQL Getting Started	Introduces SQL concepts and provides examples for many constructs and tasks.	SC09-2973 db2y0x70	db2y0
SQL Reference, Volume 1 and Volume 2	Describes SQL syntax, semantics, and the rules of the language. This book also includes information about release-to-release incompatibilities, product limits, and catalog views. You can order both volumes of the *SQL Reference* in the English language in North America with the form number SBOF-8933.	Volume 1 SC09-2974 db2s1x70 Volume 2 SC09-2975 db2s2x70	db2s0
System Monitor Guide and Reference	Describes how to collect different kinds of information about databases and the database manager. This book explains how to use the information to understand database activity, improve performance, and determine the cause of problems.	SC09-2956 db2f0x70	db2f0
Text Extender Administration and Programming	Provides general information about DB2 extenders and information on the administration and configuring of the text extender and on programming using the text extenders. It includes reference information, diagnostic information (with messages) and samples.	SC26-9930 desu9x70	desu9

Table 23. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
Troubleshooting Guide	Helps you determine the source of errors, recover from problems, and use diagnostic tools in consultation with DB2 Customer Service.	GC09-2850 db2p0x70	db2p0
What's New	Describes the new features, functions, and enhancements in DB2 Universal Database, Version 7.	SC09-2976 db2q0x70	db2q0
DB2 Installation and Configuration Information			
DB2 Connect Enterprise Edition for OS/2 and Windows Quick Beginnings	Provides planning, migration, installation, and configuration information for DB2 Connect Enterprise Edition on the OS/2 and Windows 32-bit operating systems. This book also contains installation and setup information for many supported clients.	GC09-2953 db2c6x70	db2c6
DB2 Connect Enterprise Edition for UNIX Quick Beginnings	Provides planning, migration, installation, configuration, and task information for DB2 Connect Enterprise Edition on UNIX-based platforms. This book also contains installation and setup information for many supported clients.	GC09-2952 db2cyx70	db2cy
DB2 Connect Personal Edition Quick Beginnings	Provides planning, migration, installation, configuration, and task information for DB2 Connect Personal Edition on the OS/2 and Windows 32-bit operating systems. This book also contains installation and setup information for all supported clients.	GC09-2967 db2c1x70	db2c1
DB2 Connect Personal Edition Quick Beginnings for Linux	Provides planning, installation, migration, and configuration information for DB2 Connect Personal Edition on all supported Linux distributions.	GC09-2962 db2c4x70	db2c4
DB2 Data Links Manager Quick Beginnings	Provides planning, installation, configuration, and task information for DB2 Data Links Manager for AIX and Windows 32-bit operating systems.	GC09-2966 db2z6x70	db2z6

Table 23. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
DB2 Enterprise - Extended Edition for UNIX Quick Beginnings	Provides planning, installation, and configuration information for DB2 Enterprise - Extended Edition on UNIX-based platforms. This book also contains installation and setup information for many supported clients.	GC09-2964 db2v3x70	db2v3
DB2 Enterprise - Extended Edition for Windows Quick Beginnings	Provides planning, installation, and configuration information for DB2 Enterprise - Extended Edition for Windows 32-bit operating systems. This book also contains installation and setup information for many supported clients.	GC09-2963 db2v6x70	db2v6
DB2 for OS/2 Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database on the OS/2 operating system. This book also contains installation and setup information for many supported clients.	GC09-2968 db2i2x70	db2i2
DB2 for UNIX Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database on UNIX-based platforms. This book also contains installation and setup information for many supported clients.	GC09-2970 db2ixx70	db2ix
DB2 for Windows Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database on Windows 32-bit operating systems. This book also contains installation and setup information for many supported clients.	GC09-2971 db2i6x70	db2i6
DB2 Personal Edition Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database Personal Edition on the OS/2 and Windows 32-bit operating systems.	GC09-2969 db2i1x70	db2i1
DB2 Personal Edition Quick Beginnings for Linux	Provides planning, installation, migration, and configuration information for DB2 Universal Database Personal Edition on all supported Linux distributions.	GC09-2972 db2i4x70	db2i4

Table 23. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
DB2 Query Patroller Installation Guide	Provides installation information about DB2 Query Patroller.	GC09-2959 db2iwx70	db2iw
DB2 Warehouse Manager Installation Guide	Provides installation information for warehouse agents, warehouse transformers, and the Information Catalog Manager.	GC26-9998 db2idx70	db2id
Cross-Platform Sample Programs in HTML			
Sample programs in HTML	Provides the sample programs in HTML format for the programming languages on all platforms supported by DB2. The sample programs are provided for informational purposes only. Not all samples are available in all programming languages. The HTML samples are only available when the DB2 Application Development Client is installed. For more information on the programs, refer to the *Application Building Guide*.	No form number	db2hs
Release Notes			
DB2 Connect Release Notes	Provides late-breaking information that could not be included in the DB2 Connect books.	See note #2.	db2cr
DB2 Installation Notes	Provides late-breaking installation-specific information that could not be included in the DB2 books.	Available on product CD-ROM only.	
DB2 Release Notes	Provides late-breaking information about all DB2 products and features that could not be included in the DB2 books.	See note #2.	db2ir

Notes:

1. The character *x* in the sixth position of the file name indicates the language version of a book. For example, the file name db2d0e70 identifies the English version of the *Administration Guide* and the file name db2d0f70 identifies the French version of the same book. The following letters are used in the sixth position of the file name to indicate the language version:

Language	Identifier
Brazilian Portuguese	b

Bulgarian	u
Czech	x
Danish	d
Dutch	q
English	e
Finnish	y
French	f
German	g
Greek	a
Hungarian	h
Italian	i
Japanese	j
Korean	k
Norwegian	n
Polish	p
Portuguese	v
Russian	r
Simp. Chinese	c
Slovenian	l
Spanish	z
Swedish	s
Trad. Chinese	t
Turkish	m

2. Late breaking information that could not be included in the DB2 books is available in the Release Notes in HTML format and as an ASCII file. The HTML version is available from the Information Center and on the product CD-ROMs. To view the ASCII file:

- On UNIX-based platforms, see the `Release.Notes` file. This file is located in the `DB2DIR/Readme/%L` directory, where `%L` represents the locale name and `DB2DIR` represents:
    - `/usr/lpp/db2_07_01` on AIX
    - `/opt/IBMdb2/V7.1` on HP-UX, PTX, Solaris, and Silicon Graphics IRIX
    - `/usr/IBMdb2/V7.1` on Linux.
- On other platforms, see the `RELEASE.TXT` file. This file is located in the directory where the product is installed. On OS/2 platforms, you can also double-click the **IBM DB2** folder and then double-click the **Release Notes** icon.

Printing the PDF Books

If you prefer to have printed copies of the books, you can print the PDF files found on the DB2 publications CD-ROM. Using the Adobe Acrobat Reader, you can print either the entire book or a specific range of pages. For the file name of each book in the library, see Table 23 on page 194.

You can obtain the latest version of the Adobe Acrobat Reader from the Adobe Web site at http://www.adobe.com.

The PDF files are included on the DB2 publications CD-ROM with a file extension of PDF. To access the PDF files:

1. Insert the DB2 publications CD-ROM. On UNIX-based platforms, mount the DB2 publications CD-ROM. Refer to your *Quick Beginnings* book for the mounting procedures.
2. Start the Acrobat Reader.
3. Open the desired PDF file from one of the following locations:
   - On OS/2 and Windows platforms:

     `x:\doc\`*language* directory, where *x* represents the CD-ROM drive and *language* represent the two-character country code that represents your language (for example, EN for English).
   - On UNIX-based platforms:

     /cdrom`/doc/%L` directory on the CD-ROM, where */cdrom* represents the mount point of the CD-ROM and *%L* represents the name of the desired locale.

You can also copy the PDF files from the CD-ROM to a local or network drive and read them from there.

Ordering the Printed Books

You can order the printed DB2 books either individually or as a set (in North America only) by using a sold bill of forms (SBOF) number. To order books, contact your IBM authorized dealer or marketing representative, or phone `1-800-879-2755` in the United States or `1-800-IBM-4YOU` in Canada. You can also order the books from the Publications Web page at http://www.elink.ibmlink.ibm.com/pbl/pbl.

Two sets of books are available. SBOF-8935 provides reference and usage information for the DB2 Warehouse Manager. SBOF-8931 provides reference and usage information for all other DB2 Universal Database products and features. The contents of each SBOF are listed in the following table:

Table 24. Ordering the printed books

SBOF Number	Books Included	
SBOF-8931	• Administration Guide: Planning • Administration Guide: Implementation • Administration Guide: Performance • Administrative API Reference • Application Building Guide • Application Development Guide • CLI Guide and Reference • Command Reference • Data Movement Utilities Guide and Reference • Data Warehouse Center Administration Guide • Data Warehouse Center Application Integration Guide • DB2 Connect User's Guide • Installation and Configuration Supplement • Image, Audio, and Video Extenders Administration and Programming • Message Reference, Volumes 1 and 2	• OLAP Integration Server Administration Guide • OLAP Integration Server Metaoutline User's Guide • OLAP Integration Server Model User's Guide • OLAP Integration Server User's Guide • OLAP Setup and User's Guide • OLAP Spreadsheet Add-in User's Guide for Excel • OLAP Spreadsheet Add-in User's Guide for Lotus 1-2-3 • Replication Guide and Reference • Spatial Extender Administration and Programming Guide • SQL Getting Started • SQL Reference, Volumes 1 and 2 • System Monitor Guide and Reference • Text Extender Administration and Programming • Troubleshooting Guide • What's New
SBOF-8935	• Information Catalog Manager Administration Guide • Information Catalog Manager User's Guide • Information Catalog Manager Programming Guide and Reference	• Query Patroller Administration Guide • Query Patroller User's Guide

DB2 Online Documentation

Accessing Online Help

Online help is available with all DB2 components. The following table describes the various types of help.

Type of Help	Contents	How to Access...
Command Help	Explains the syntax of commands in the command line processor.	From the command line processor in interactive mode, enter: `? command` where *command* represents a keyword or the entire command. For example, ? catalog displays help for all the CATALOG commands, while ? `catalog database` displays help for the CATALOG DATABASE command.
Client Configuration Assistant Help *Command Center Help* *Control Center Help* *Data Warehouse Center Help* *Event Analyzer Help* *Information Catalog Manager Help* *Satellite Administration Center Help* *Script Center Help*	Explains the tasks you can perform in a window or notebook. The help includes overview and prerequisite information you need to know, and it describes how to use the window or notebook controls.	From a window or notebook, click the **Help** push button or press the **F1** key.
Message Help	Describes the cause of a message and any action you should take.	From the command line processor in interactive mode, enter: `? XXXnnnnn` where *XXXnnnnn* represents a valid message identifier. For example, ? `SQL30081` displays help about the SQL30081 message. To view message help one screen at a time, enter: `? XXXnnnnn	more`  To save message help in a file, enter:  `? XXXnnnnn > filename.ext` where *filename.ext* represents the file where you want to save the message help.

Type of Help	Contents	How to Access...
SQL Help	Explains the syntax of SQL statements.	From the command line processor in interactive mode, enter: `help statement` where *statement* represents an SQL statement. For example, `help SELECT` displays help about the SELECT statement. **Note:** SQL help is not available on UNIX-based platforms.
SQLSTATE Help	Explains SQL states and class codes.	From the command line processor in interactive mode, enter: `? sqlstate` or `? class code` where *sqlstate* represents a valid five-digit SQL state and *class code* represents the first two digits of the SQL state. For example, `? 08003` displays help for the 08003 SQL state, while `? 08` displays help for the 08 class code.

Viewing Information Online

The books included with this product are in Hypertext Markup Language (HTML) softcopy format. Softcopy format enables you to search or browse the information and provides hypertext links to related information. It also makes it easier to share the library across your site.

You can view the online books or sample programs with any browser that conforms to HTML Version 3.2 specifications.

To view online books or sample programs:
- If you are running DB2 administration tools, use the Information Center.
- From a browser, click **File —>Open Page**. The page you open contains descriptions of and links to DB2 information:
    - On UNIX-based platforms, open the following page:
        ```
        INSTHOME/sqllib/doc/%L/html/index.htm
        ```

    where `%L` represents the locale name.
    - On other platforms, open the following page:
        ```
        sqllib\doc\html\index.htm
        ```

    The path is located on the drive where DB2 is installed.

If you have not installed the Information Center, you can open the page by double-clicking the **DB2 Information** icon. Depending on the system you are using, the icon is in the main product folder or the Windows Start menu.

Installing the Netscape Browser

If you do not already have a Web browser installed, you can install Netscape from the Netscape CD-ROM found in the product boxes. For detailed instructions on how to install it, perform the following:

1. Insert the Netscape CD-ROM.
2. On UNIX-based platforms only, mount the CD-ROM. Refer to your *Quick Beginnings* book for the mounting procedures.
3. For installation instructions, refer to the CDNAV*nn*.txt file, where *nn* represents your two character language identifier. The file is located at the root directory of the CD-ROM.

Accessing Information with the Information Center

The Information Center provides quick access to DB2 product information. The Information Center is available on all platforms on which the DB2 administration tools are available.

You can open the Information Center by double-clicking the Information Center icon. Depending on the system you are using, the icon is in the Information folder in the main product folder or the Windows **Start** menu.

You can also access the Information Center by using the toolbar and the **Help** menu on the DB2 Windows platform.

The Information Center provides six types of information. Click the appropriate tab to look at the topics provided for that type.

Tasks   Key tasks you can perform using DB2.

Reference   DB2 reference information, such as keywords, commands, and APIs.

Books   DB2 books.

Troubleshooting
                   Categories of error messages and their recovery actions.

Sample Programs
                   Sample programs that come with the DB2 Application Development Client. If you did not install the DB2 Application Development Client, this tab is not displayed.

Web   DB2 information on the World Wide Web. To access this information, you must have a connection to the Web from your system.

When you select an item in one of the lists, the Information Center launches a viewer to display the information. The viewer might be the system help viewer, an editor, or a Web browser, depending on the kind of information you select.

The Information Center provides a find feature, so you can look for a specific topic without browsing the lists.

For a full text search, follow the hypertext link in the Information Center to the **Search DB2 Online Information** search form.

The HTML search server is usually started automatically. If a search in the HTML information does not work, you may have to start the search server using one of the following methods:

On Windows
> Click **Start** and select **Programs —> IBM DB2 —> Information —> Start HTML Search Server**.

On OS/2
> Double-click the **DB2 for OS/2** folder, and then double-click the **Start HTML Search Server** icon.

Refer to the release notes if you experience any other problems when searching the HTML information.

Note: The Search function is not available in the Linux, PTX, and Silicon Graphics IRIX environments.

Using DB2 Wizards

Wizards help you complete specific administration tasks by taking you through each task one step at a time. Wizards are available through the Control Center and the Client Configuration Assistant. The following table lists the wizards and describes their purpose.

Note: The Create Database, Create Index, Configure Multisite Update, and Performance Configuration wizards are available for the partitioned database environment.

Wizard	Helps You to...	How to Access...
Add Database	Catalog a database on a client workstation.	From the Client Configuration Assistant, click **Add**.
Backup Database	Determine, create, and schedule a backup plan.	From the Control Center, right-click the database you want to back up and select **Backup —> Database Using Wizard**.

Wizard	Helps You to...	How to Access...
Configure Multisite Update	Configure a multisite update, a distributed transaction, or a two-phase commit.	From the Control Center, right-click the **Databases** folder and select **Multisite Update**.
Create Database	Create a database, and perform some basic configuration tasks.	From the Control Center, right-click the **Databases** folder and select **Create —> Database Using Wizard**.
Create Table	Select basic data types, and create a primary key for the table.	From the Control Center, right-click the **Tables** icon and select **Create —> Table Using Wizard**.
Create Table Space	Create a new table space.	From the Control Center, right-click the **Table Spaces** icon and select **Create —> Table Space Using Wizard**.
Create Index	Advise which indexes to create and drop for all your queries.	From the Control Center, right-click the **Index** icon and select **Create —> Index Using Wizard**.
Performance Configuration	Tune the performance of a database by updating configuration parameters to match your business requirements.	From the Control Center, right-click the database you want to tune and select **Configure Performance Using Wizard**.

For the partitioned database environment, from the Database Partitions view, right-click the first database partition you want to tune and select **Configure Performance Using Wizard**. |
| *Restore Database* | Recover a database after a failure. It helps you understand which backup to use, and which logs to replay. | From the Control Center, right-click the database you want to restore and select **Restore —> Database Using Wizard**. |

Setting Up a Document Server

By default, the DB2 information is installed on your local system. This means that each person who needs access to the DB2 information must install the same files. To have the DB2 information stored in a single location, perform the following steps:

1. Copy all files and subdirectories from \sqllib\doc\html on your local system to a Web server. Each book has its own subdirectory that contains all the necessary HTML and GIF files that make up the book. Ensure that the directory structure remains the same.

2. Configure the Web server to look for the files in the new location. For information, refer to the NetQuestion Appendix in the *Installation and Configuration Supplement*.

3. If you are using the Java version of the Information Center, you can specify a base URL for all HTML files. You should use the URL for the list of books.

4. When you are able to view the book files, you can bookmark commonly viewed topics. You will probably want to bookmark the following pages:
   - List of books
   - Tables of contents of frequently used books
   - Frequently referenced articles, such as the ALTER TABLE topic
   - The Search form

For information about how you can serve the DB2 Universal Database online documentation files from a central machine, refer to the NetQuestion Appendix in the *Installation and Configuration Supplement*.

Searching Information Online

To find information in the HTML files, use one of the following methods:

- Click **Search** in the top frame. Use the search form to find a specific topic. This function is not available in the Linux, PTX, or Silicon Graphics IRIX environments.
- Click **Index** in the top frame. Use the index to find a specific topic in the book.
- Display the table of contents or index of the help or the HTML book, and then use the find function of the Web browser to find a specific topic in the book.
- Use the bookmark function of the Web browser to quickly return to a specific topic.
- Use the search function of the Information Center to find specific topics. See "Accessing Information with the Information Center" on page 207 for details.

Appendix D. National Language Support (NLS)

This section contains information about the National Language Support (NLS) provided by DB2, including information about supported locales and code sets. For information on developing applications that use NLS, refer to the *Application Development 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, perform the following steps:

Step 1. Ensure that the appropriate message option for the desired language has been installed.

Step 2. Set the *LANG* environment variable to the desired locale.

For example, to use fr_FR messages on DB2 for AIX, you must have the fr_FR message option installed and must set *LANG* to fr_FR.

The selected message catalog filesets are placed in the following directories on the target workstation:

DB2 for AIX
/usr/lpp/db2_07_01/msg/%L

DB2 for HP-UX, PTX, and Solaris
/opt/IBMdb2/V7.1/msg/%L

DB2 for Linux
/usr/IBMdb2/V7.1/msg/%L

where *%L* is equal to the locale name of the message catalog.

Code Page and Language Support for OS/2 and Windows Operating Environments

During installation of DB2, the country, codepage, and regional settings are established. However, you can change these settings after installing DB2: including regional settings such as code page, country language (for monetary, date, and numeric formatting), and time zone. When a new connection to a database is made, the database manager uses these new values.

You must ensure that your regional settings are set correctly. DB2 may not produce the expected results if the country, code page, or regional settings are incorrect for the intended language. Table 25 shows the languages into which the DB2 messages are translated. If the setup is run on a machine that is set up using a non-supported language, then English is the default unless the user has specified otherwise.

Table 25. Languages and Code Pages

Country Code	Language
bg	Bulgarian
br	Brazilian Portuguese
cn	Simplified Chinese (PRC)
cz	Czech
de	German
dk	Danish
en	English
es	Spanish
fi	Finnish
fr	French
gr	Greek
hu	Hungarian
il	Hebrew
it	Italian
jp	Japanese
kr	Korean
nl	Dutch
no	Norwegian
pl	Polish
pt	Portuguese
ru	Russian

Table 25. Languages and Code Pages (continued)

Country Code	Language
se	Swedish
si	Slovenian
tr	Turkish
tw	Traditional Chinese (Taiwan)

Appendix E. Naming Rules

Go to the section that describes the naming rules that you require information on:

- "General Naming Rules"
- "Database, Database Alias, and Catalog Node Name Rules"
- "Object Name Rules" on page 216
- "Username, User ID, Group Name, and Instance Name Rules" on page 217
- "DB2SYSTEM Naming Rules" on page 218
- "Password Rules" on page 218

General Naming Rules

Unless otherwise specified, all names can include the following characters:

- A through Z. When used in most names, characters A through Z are converted from lowercase to uppercase.
- 0 through 9
- @, #, $, and _ (underscore)

Unless otherwise specified, all names must begin with one of the following characters:

- A through Z
- @, #, and $

Do not use SQL reserved words to name tables, views, columns, indexes, or authorization IDs. For a list of SQL reserved words, refer to *SQL Reference*.

Database, Database Alias, and Catalog Node Name Rules

Database names are the identifying names assigned to databases in the database manager. *Database alias names* are synonyms given to remote databases. Database aliases must be unique within the System Database Directory in which all aliases are stored. *Catalog node names* are the identifying names that are assigned to entries in the node directory. Each entry in the node directory is an alias name for a computer on your network. To avoid confusions that could arise from multiple names for the same server, we recommend that you use the same catalog node name as the network name for the server.

When naming a database, database alias, or catalog node name, see "General Naming Rules" on page 215. In addition, the name you specify can *only* contain 1 to 8 characters.

> To avoid potential problems, do not use the special characters @, #, and $ in a database name if you intend to have a client remotely connect to a host database. Also, because these characters are not common to all keyboards, do not use them if you plan to use the database in another country.

Object Name Rules

Database objects include:
- Tables
- Views
- Columns
- Indexes
- User-defined functions (UDFs)
- User-defined types (UDTs)
- Triggers
- Aliases
- Table spaces
- Schemas

When naming database objects, see "General Naming Rules" on page 215.

In addition, the name you specify:
- Can contain 1 to 18 characters *except* for the following:
  - Table names (including view names, summary table names, alias names, and correlation names), which can contain up to 128 characters
  - column names, which can contain up to 30 characters
  - schema names, which can contain up to 30 characters
- Cannot be any of the SQL reserved words that are listed in the *SQL Reference*.

Using delimited identifiers, it is possible to create an object that violates these naming rules; however, subsequent use of the object could result in errors.

For example, if you create a column with a + or − sign included in the name and you subsequently use that column in an index, you will experience

problems when you attempt to reorganize the table. To avoid potential problems with the use and operation of your database, *do not* violate these rules.

Username, User ID, Group Name, and Instance Name Rules

Usernames or *User IDs* are the identifiers assigned to individual users. When naming users, groups, or instances, see "General Naming Rules" on page 215.

In addition to the general naming rules:

- User IDs on OS/2 can contain 1 to 8 characters. They cannot start with a numeric digit or end with $.
- Usernames on UNIX can contain 1 to 8 characters.
- Usernames on Windows can contain 1 to 30 characters. The Windows NT and Windows 2000 operating systems currently have a limit of 20 characters.
- Group and instance names can contain 1 to 8 characters.
- Names cannot be any of the following:
  - USERS
  - ADMINS
  - GUESTS
  - PUBLIC
  - LOCAL
- Names cannot begin with:
  - IBM
  - SQL
  - SYS
- Names cannot include accented characters.
- In general, when naming users, groups, or instances:

  OS/2   Use uppercase names.

  UNIX   Use lowercase names.

  Windows 32-bit operating systems
          Use any case.

Workstation Name (nname) Rules

A *workstation* name specifies the NetBIOS name for a database server or client that resides on the local workstation. This name is stored in the database manager configuration file. The workstation name is known as the *workstation nname*. When naming workstations, see "General Naming Rules" on page 215.

In addition, the name you specify:
- Can contain 1 to 8 characters
- Cannot include &, #, and @
- Must be unique within the network

DB2SYSTEM Naming Rules

DB2 uses the *DB2SYSTEM* name to identify a physical DB2 machine, system, or workstation within a network. On UNIX, the DB2SYSTEM name defaults to the TCP/IP hostname. On OS/2, you must specify the *DB2SYSTEM* name during install. On Windows 32-bit operating systems, you do not need to specify a *DB2SYSTEM* name; the DB2 setup program detects the Windows Computer name and assigns it to *DB2SYSTEM*.

When creating a *DB2SYSTEM* name, see "General Naming Rules" on page 215.

In addition, the name you specify:
- Must be unique within a network
- Can contain a maximum of 21 characters

Password Rules

When determining passwords, consider the following rules:

OS/2   A maximum of 14 characters.

UNIX   A maximum of 8 characters.

Windows 32-bit operating systems
                A maximum of 14 characters.

Appendix F. Notices

IBM may not offer the products, services, or features discussed in this document in all countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

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