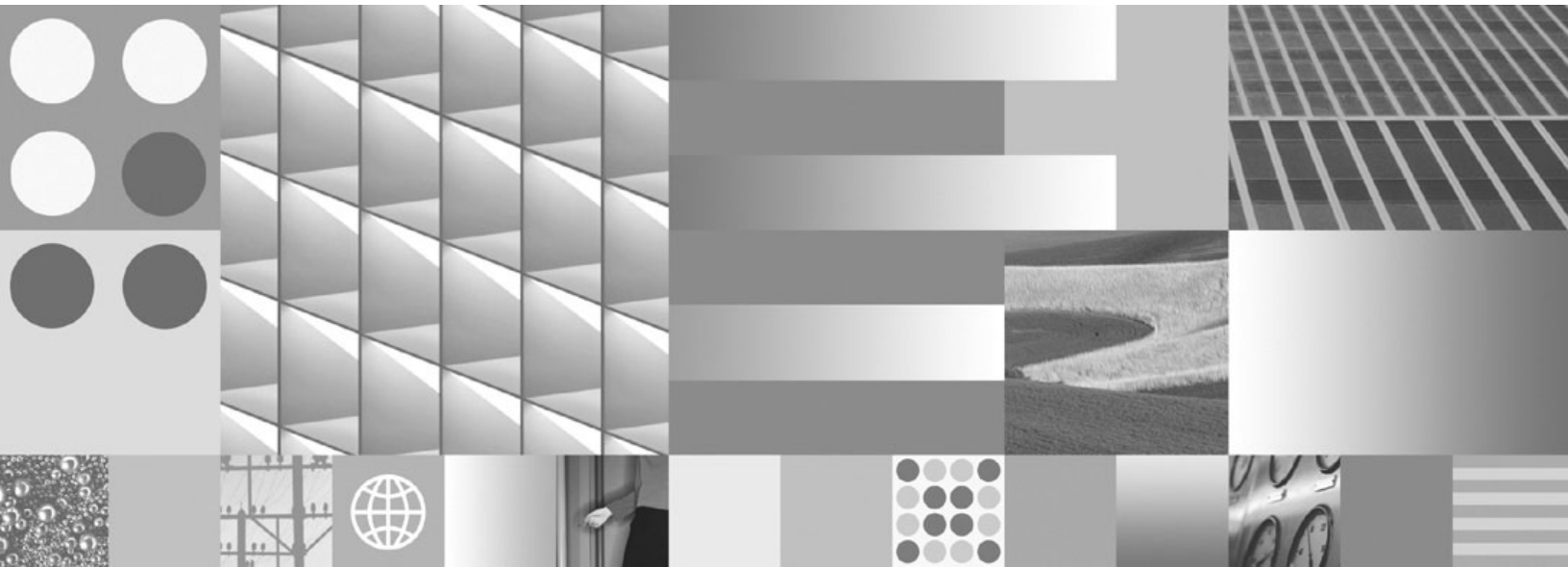




**Common Criteria Certification: Installing IBM DB2 Version 9.7 Enterprise
Server Edition for Linux, UNIX, and Windows - Revision 7**



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Server Edition for Linux, UNIX, and Windows - Revision 7**

Note

Before using this information and the product it supports, read the general information under Appendix B, "Notices," on page 141.

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Common Criteria certification of DB2 products

For Version 9.7, IBM® DB2® products are certified according to the Common Criteria evaluation assurance level 4 (EAL4), augmented with Flaw remediation ALC_FLR.1.

The following product is certified on the following operating systems:

Table 1.

	Windows® Server 2003	Red Hat Enterprise Linux® 5	SuSE Linux Enterprise Server 10	AIX® 6	Solaris 10
IBM DB2 Version 9.7 Enterprise Server Edition for Linux, UNIX®, and Windows	Yes	Yes	Yes	Yes	Yes

Note:

1. For a Common Criteria certified DB2 environment, DB2 requires 64-bit Windows Server 2003 x64, Red Hat Enterprise Linux 5, or SuSE Linux Enterprise Server 10 operating systems for Intel® EM64T- and AMD64-based systems.
2. In a Common Criteria certified DB2 environment, DB2 clients are supported on the following operating systems:
 - Windows 2003
 - Red Hat Enterprise Linux 5
 - SuSE Linux Enterprise Server 10
 - AIX 6
 - Solaris 10

For more information about Common Criteria, see the Common Criteria web site at: <http://www.commoncriteriaportal.org>.

For information about installing and configuring a DB2 system that conforms to the Common Criteria EAL4, see the following books:

- *Installing IBM DB2 Enterprise Server Edition*
- *IBM DB2 Administration and User Documentation*

These books are available in PDF format from the *DB2 Information Management Library*.

Supported interfaces for a Common Criteria evaluated configuration

The set of DB2 interfaces that are used in the Common Criteria evaluation of DB2 are as follows:

- The DB2 install program
- The command line processor
- DB2 commands
- DB2 application programming interfaces (APIs)
- SQL statements

You can use these interfaces when installing and configuring a Common Criteria compliant DB2 system.

Other interfaces that are provided by DB2, such as the Control Center or Command Editor were not used during the Common Criteria evaluation of DB2, **and must not be used in the Common Criteria evaluation configuration.**

The **Workload management** feature, introduced in Version 9.7, **must also not be used in the Common Criteria evaluated configuration.** This feature is designed for complex, multi-layered environments, and its secure operation is intricately linked to the correct functionality of components well outside the boundary of the target of evaluation. The associated statements require SYSADM or DBADM administrative privileges, and are therefore not available to regular users.

Administrative users should not use the following statements to create workload management objects:

- CREATE WORKLOAD statement
- CREATE SERVICE CLASS statement
- CREATE THRESHOLD statement
- CREATE HISTOGRAM statement
- CREATE WORK CLASS SET statement
- CREATE WORK ACTION SET statement

Note:

- NOT FENCED routines are also not supported
- Data encryption functions ENCRYPT, DECRYPT_BIN, DECRYPT_CHAR and GETHINT must not be used.
- The user-written security plugins must not be used.
- Like table privileges (SELECT, INSERT, UPDATE, DELETE), Label-Based Access Control (LBAC) has no control over access to physical files such as database files and transaction logs. Given that these files contain database data including data protected with LBAC and given that DB2 administrators have direct access to these physical files, DB2 administrators should be treated as having the highest level of access even though this is an indirect access and is outside the scope of the LBAC model.

In the Common Criteria evaluation configuration, the installation procedures as documented in the following sections must be followed and the configuration options selected must not be modified while in the evaluation configuration:

- “Installing DB2 Enterprise 9.7 for a single-partition Common Criteria compliant installation” on page 63
- “Installing DB2 Enterprise 9.7 on Windows Server 2003 for a single partition Common Criteria compliant installation” on page 70
- “Installing DB2 Enterprise 9.7 for a multi-partition Common Criteria compliant installation” on page 83
- “Installing DB2 Enterprise 9.7 on Windows Server 2003 for a multi-partition Common Criteria compliant installation” on page 93

When using the DB2 Database Partition Feature (DPF), the external security information that is used by the DB2 database manager to perform authentication and authorization must be configured consistently on each partition. This information depends on the authentication type in use. For operating system security, this information is the username, password and group membership of each user that can connect to the database. Identical usernames, passwords and groups must be created at each partition. For LDAP authentication, this information is stored in the LDAP configuration file for the LDAP-based authentication plugin. The LDAP configuration file must have the same contents on each partition. For Kerberos, in order to ensure that the same Key Distribution Center (KDC) is used for each partition, this information is stored in the Kerberos configuration file on the server where the DB2 product is installed. Failure to provide consistent configuration information at each partition could result in users being unable to authenticate, and hence connect to the DB2 database, or users having reduced privileges, if incomplete group membership information is obtained from the local operating system, or from LDAP, or from Kerberos.

About this book

This book describes how to install IBM DB2 Version 9.7 Enterprise Server Edition for Linux, UNIX, and Windows (DB2 Enterprise 9) for a Common Criteria evaluation.

It includes detailed instructions on installing this product on the following operating systems in a single-partition or a multiple-partition environment:

- Windows 2003
- Red Hat Enterprise Linux 5
- SuSE Linux Enterprise Server 10
- Solaris 10
- AIX Version 6

For information about security in a DB2 environment, and for information on configuring DB2 for the Common Criteria evaluation, refer to the following book:

- *IBM DB2: Administration and User Documentation*

Some topics in this book may refer to topics in the two *IBM DB2: Administration and User Documentation* volumes. Topics that are referenced outside of the Common Criteria certification documentation are for informational purposes only, and are not required for either installing or configuring a Common Criteria compliant environment.

Part 1. Installing DB2 servers

Chapter 1. Installation overview

DB2 database product and packaging information

DB2 database products are available in several different editions. There are also optional DB2 features. Some DB2 database products and features are only available on specific operating systems.

For information about DB2 database product and packaging information, see <http://www-1.ibm.com/support/docview.wss?rs=73&uid=swg21219983>.

DB2 installation methods

This topic provides information about DB2 installation methods. The following table shows the installation methods that are available by operating system.

Table 2. Installation method by operating system.

Installation method	Windows	Linux or UNIX
DB2 Setup wizard	Yes	Yes
Response file installation	Yes	Yes
db2_install command	No	Yes
Payload file deployment	No	Yes

The following list describes DB2 installation methods.

DB2 Setup wizard

The DB2 Setup wizard is a GUI installer available on Linux, UNIX, and Windows operating systems. The DB2 Setup wizard provides an easy-to-use interface for installing DB2 products and for performing initial setup and configuration tasks.

The DB2 Setup wizard can also create DB2 instances and response files that can be used to duplicate this installation on other machines.

Note: For non-root installations on Linux and UNIX platforms, only one DB2 instance can exist. The DB2 Setup wizard automatically creates the non-root instance.

On Linux and UNIX platforms, an X server is required to display the DB2 Setup wizard.

Response file installation

A response file is a text file that contains setup and configuration values. The file is read by the DB2 setup program and the installation is performed according to the values that have been specified.

A response file installation is also referred to as a silent installation.

Another advantage to response files is that they provide access to parameters that cannot be set using the DB2 Setup wizard.

On Linux and UNIX operating systems, if you embed the DB2 installation image in your own application, it is possible for your application to receive

installation progress information and prompts from the installer in computer-readable form. This behavior is controlled by the INTERACTIVE response file keyword.

There are a number of ways to create a response file:

Using the response file generator

You can use the response file generator to create a response file that replicates an existing installation. For example, you might install an IBM data server client, fully configure the client, then generate a response file to replicate the installation and configuration of the client to other computers.

Using the DB2 Setup wizard

The DB2 Setup wizard can create a response file based on the selections you make as you proceed through the DB2 Setup wizard. Your selections are recorded in a response file that you can save to a location on your system. If you select a partitioned database installation, two response files will be generated, one for the instance-owning computer and one for participating computers.

One benefit of this installation method is that you can create a response file without performing an installation. This feature can be useful to capture the options required to install the DB2 product. The response file can be used at a later time to install the DB2 product according to the exact options you specified.

You can export a client or server profile with the `db2cfexp` command to save your client or server configuration, and then easily import the profile using the `db2cfimp` command. A client or server profile exported with the `db2cfexp` command can also be imported during a response file installation using the `CLIENT_IMPORT_PROFILE` keyword.

You should export the client or server profile after performing the installation and cataloging any data sources.

Customizing the sample response files that are provided for each DB2 product

An alternative to using the response file generator or the DB2 Setup wizard to create a response file is to manually modify a sample response file. Sample response files are provided on the DB2 product DVD. The sample response files provide details about all the valid keywords for each product.

db2_install command (Linux and UNIX platforms only)

The `db2_install` command installs *all* components for the DB2 product you specify with the English interface support. You can select additional languages to support with the `-L` parameter. You cannot select or deselect components.

Although the `db2_install` command installs all components for the DB2 product you specify, it does not perform user and group creation, instance creation, or configuration. This method of installation might be preferred in cases where configuration is to be done after installation. To configure your DB2 product while installing it, consider using the DB2 Setup wizard.

On Linux and UNIX operating systems, if you embed the DB2 installation image in your own application, it is possible for your application to receive installation progress information and prompts from the installer in computer-readable form.

This installation methods requires manual configuration after the product files are deployed.

Payload file deployment (Linux and UNIX only)

This method is an advanced installation method that is not recommended for most users. It requires the user to physically install payload files. A payload file is a compressed tarball that contains all of the files and metadata for an installable component.

This installation methods requires manual configuration after the product files are deployed.

Note: DB2 product installations are no longer operating system packages on Linux and UNIX platforms. As a result, you can no longer use operating system commands for installation. Any existing scripts that you use to interface and query with DB2 installations must change.

An overview of installing your DB2 server product (Windows)

This topic outlines the steps for installing your DB2 server product on Windows.

To install your DB2 server product:

1. Review your DB2 product prerequisites.
2. Review DB2 upgrade information if applicable.
3. Prepare the installation media:

Product DVD

Insert the DB2 product DVD into your DVD-ROM drive.

Installation image

If you downloaded an installation image, extract the file.

4. Install your DB2 product using:
 - the DB2 Setup wizard.
 - a silent installation with a response file.

You can use the DB2 Setup wizard to perform installation and configuration tasks, such as:

- Selecting DB2 installation type (typical, compact, or custom).
- Selecting DB2 product installation location.
- Installing the languages that you can specify later as the default language for the product interface and messages.
- Setting up DB2 Extended Security.
- Setting up a DB2 instance (including instance user setup. By default, it is same as the DAS user).
- Setting up the DB2 Administration Server (including DAS user setup).
- Setting up the DB2 Text Search server.
- Setting up Administration contact and health monitor notification.
- Setting up and configuring your instance setup and configuration (including instance user setup).
- Preparing the DB2 tools catalog.
- Specifying the DB2 Information Center port.
- Creating response files.
- Installing additional products.

An overview of installing your DB2 server product (Linux and UNIX)

This topic outlines the steps for installing your DB2 server product on AIX, HP-UX, Linux, and Solaris.

To install your DB2 server product:

1. Review your DB2 product prerequisites.
2. Review DB2 upgrade information if applicable.
3. Modify kernel parameters on HP-UX, Linux, and Solaris. On all platforms, except for Linux on x86_32, you must install a 64-bit kernel before proceeding with the installation, otherwise the installation will fail.
4. Prepare the installation media:

Product DVD

If the DB2 product DVD does not automount, mount your DB2 product DVD.

Installation image

If you downloaded an installation image, untar the file.

5. Install your DB2 product using one of the available methods:

- The DB2 Setup wizard
- The `db2_install` command
- A silent installation using a response file
- Payload file deployment

For DB2 servers, you can use the DB2 Setup wizard to perform installation and configuration tasks, such as:

- Selecting DB2 installation type (typical, compact, or custom).
 - Selecting DB2 product installation location.
 - Install the languages that you can specify later as the default language for the product interface and messages.
 - Install or upgrade the IBM Tivoli System Automation for Multiplatforms (Linux and AIX).
 - Setting up a DB2 instance.
 - Setting up the DB2 Administration Server (including DAS user setup).
 - Setting up the DB2 Text Search server.
 - Setting up Administration contact and health monitor notification.
 - Setting up and configuring your instance setup and configuration (including instance user setup).
 - Setting up Informix data source support.
 - Preparing the DB2 tools catalog.
 - Specify the DB2 Information Center port.
 - Creating response files.
6. If you installed a DB2 server using a method other than the DB2 Setup wizard, post-installation configuration steps are required.

Chapter 2. Installation prerequisites

Disk and memory requirements

Disk requirements

The disk space required for your product depends on the type of installation you choose and the type of file system you have. The DB2 Setup wizard provides dynamic size estimates based on the components selected during a typical, compact, or custom installation.

Remember to include disk space for required databases, software and communication products.

On Linux and UNIX operating systems, 2 GB of free space in the /tmp directory is recommended.

Memory requirements

At a minimum, a DB2 database system requires 256 MB of RAM. For a system running just a DB2 product and the DB2 GUI tools, a minimum of 512 MB of RAM is required. However, 1 GB of RAM is recommended for improved performance. These requirements do not include any additional memory requirements for other software that is running on your system.

When determining memory requirements, be aware of the following:

- DB2 products that run on HP-UX Version 11i for Itanium-based systems require 512 MB of RAM at a minimum.
- For IBM data server client support, these memory requirements are for a base of five concurrent client connections. You will need an additional 16 MB of RAM per five client connections.
- Memory requirements are affected by the size and complexity of your database system, and the extent of database activity and the number of clients accessing your system.

For DB2 server products, the self-tuning memory feature simplifies the task of memory configuration by automatically setting values for several memory configuration parameters. When enabled, the memory tuner dynamically distributes available memory resources among several memory consumers including sort, the package cache, the lock list and buffer pools.

- On Linux and UNIX operating systems, SWAP space at least twice as large as RAM is recommended.

DB2 server installation (Windows)

Installation requirements for DB2 servers and IBM data server clients (Windows)

Before you install a DB2 database product on Windows operating systems, ensure that the system you choose meets the necessary operating system, hardware, and software requirements.

Table 3. Windows workstation platforms

Operating System	Prerequisites	Hardware
Windows XP Professional (32-bit and 64-bit)	Windows XP Service Pack 2 or later	All Intel and AMD processors capable of running the supported Windows operating systems (32-bit and 64-bit based systems)
Windows Vista Business (32-bit and 64-bit)	IBM Data Server Provider for .NET client applications and CLR server-side procedures require .NET 2.0 framework runtime.	
Windows Vista Enterprise (32-bit and 64-bit)		
Windows Vista Ultimate (32-bit and 64-bit)	64-bit IBM data server provider for .NET applications are supported. All Windows Vista service packs are supported.	

Table 4. Windows server platforms

Operating System	Prerequisites	Hardware
Windows 2003 Datacenter Edition (32-bit and 64-bit)	Service Pack 2 or later. R2 is also supported	All Intel and AMD processors capable of running the supported Windows operating systems (32-bit and 64-bit based systems).
Windows 2003 Enterprise Edition (32-bit and 64-bit)	IBM data server provider for .NET client applications and CLR server-side procedures require .NET 2.0 framework runtime.	
Windows 2003 Standard Edition (32-bit and 64-bit)		
Windows Server 2008 Datacenter Edition (32-bit and 64-bit)	IBM data server provider for .NET client applications and CLR server-side procedures require .NET 2.0 framework runtime.	All Intel and AMD processors capable of running the supported Windows operating systems (32-bit and 64-bit based systems).
Windows Server 2008 Enterprise Edition (32-bit and 64-bit)		
Windows Server 2008 Standard Edition (32-bit and 64-bit)	64-bit IBM data server provider for .NET applications are supported. All Windows Server 2008 service packs are supported.	

Note: DB2 database products support the hardware-enforced Data Execution Prevention (DEP) feature that is built into some Windows operating systems.

Additional software considerations

- Windows Installer 3.0 is required. It will be installed by the installer if it is not detected.
- IBM Data Server Provider for .NET client applications and CLR server-side procedures require .NET 2.0 framework runtime. In an x64

environment, 32-bit IBM data server provider for .NET applications will run in the WOW64 emulation mode.

- MDAC 2.8 is required. The DB2 Setup wizard will install MDAC 2.8 if it is not already installed.

Note: If a previous version of MDAC (for example, 2.7) is already installed, DB2 install will upgrade MDAC to 2.8. For a typical install, MDAC 2.8 is installed. For a custom install, MDAC 2.8 is installed but only if you have not deselected the default which is to install it. If you deselect MDAC as part of a custom install, it will not be installed.

- If you plan to use LDAP (Lightweight Directory Access Protocol), you should use either a Microsoft LDAP client or the IBM Tivoli Directory Server v6 client (also known as the IBM LDAP client which is included with DB2 database products). Before installation of the Microsoft Active Directory, you will need to extend your directory schema using the db2schex utility, which can be found on the installation media under the db2\Windows\utilities directory.

The Microsoft LDAP client is included with Windows operating systems.

- One of the following browsers is required to view online help, run the DB2 install launchpad (setup.exe), and to run First Steps (db2fs):
 - Firefox 2.0 and later
 - Internet Explorer 6.0 and later
 - Mozilla-based browsers 1.7 and later
 - Safari 3.0 and later

DB2 services running on your system (Windows)

The following table lists the DB2 services that run on your system when a DB2 product is installed:

Table 5. DB2 Services

Service Display Name	Service Name	Description
DB2 - (DB2 copy name) - <instance name> [<-nodenum>] where <-nodenum> is added for DB2 ESE instances.	<instance name>[<-nodenum>]	Allows applications to create, update, control, and manage DB2 databases.
DB2 Governor (DB2 copy name)	DB2GOVERNOR_db2copyname	Collects statistics for applications connected to DB2 databases.
DB2 Information Center Server	DB2ICSERVER_Vxx (where xx is the DB2 version you are running, for example, V95 is Version 9.5)	Provides documentation for DB2 products.
DB2 License Server (DB2 copy name)	DB2LICD_db2copyname	Monitors DB2 license compliance.
DB2 Management Service (DB2 copy name)	DB2MGMTSVC_db2copyname	Manages DB2 registry entries for backward compatibility purposes for the DB2 copy.
DB2 Query Patroller (DB2 copy name)	DB2QP_db2copyname	DB2 Query Patroller

Table 5. DB2 Services (continued)

Service Display Name	Service Name	Description
DB2 Remote Command Server (DB2 copy name)	DB2REMOTECMD_db2copyname	Supports remote DB2 command execution.
DB2DAS - DB2DASXX	DB2DASXX (where XX is 00-99)	Supports local and remote database administrative requests.
Monitoring Agent for DB2 - <instance name>	kudcma_<instance name>	Monitors the DB2 server and database for availability.
DB2TS - (DB2 copy name) - <instance name> [<-nodenum>]	<instance name>[<-nodenum>]	Indexes and searches text documents in DB2 databases.
DB2EXT - (DB2 copy name) - <instance name> [<-nodenum>]	<instance name>[<-nodenum>]	

Required user accounts for installation of DB2 server products (Windows)

If you are installing a DB2 server product on Windows, you require the following user accounts:

- An installation user account and
- Optional - one or more setup user accounts. You can create these accounts during the installation.
 - A DB2 Administration Server (DAS) user account
 - A DB2 instance user account. You can also use the LocalSystem account for products other than DB2 Enterprise Server Edition.

The installation user account is the account of the user performing the installation. The installation user account must be defined before running the DB2 Setup wizard. The setup user accounts can be defined before installation or you can have the DB2 Setup wizard create them for you.

All user account names must adhere to your system naming rules and to DB2 User, user ID and group naming rules.

Extended security on Windows

DB2 products offer extended Windows security. If the extended security feature is selected, you must add the users who will administer or use the DB2 product to either the DB2ADMNS or DB2USERS group as appropriate.

The DB2 installer creates these two new groups. You can either specify a new name or accept the default names during installation.

To enable this security feature, select the **Enable operating system security** checkbox on the **Enable operating system security for DB2 objects** panel during the DB2 installation. Accept the default values for the DB2 Administrators Group field, and the DB2 Users Group field. The default group names are DB2ADMNS and DB2USERS. If there is a conflict with existing group names, you will be prompted to change the group names. If required, you can specify your own group names.

DB2 server user accounts

Installation user account

A local or domain user account is required to perform the installation. Normally, the user account must belong to the *Administrators* group on the computer where you will perform the installation.

Alternatively, a non-Administrator user account can be used. This alternative requires that a member of the Windows Administrators group first configure the Windows elevated privileges settings to allow a non-Administrator user account to perform an installation.

On Windows 2008 and Windows Vista or higher, a non-administrator can perform an installation, but will be prompted for administrative credentials by the DB2 Setup wizard.

The user right "Access this computer from the network" is required for the installation user account.

The installation user ID must belong to the Domain Administrators group on the domain if the installation requires a domain account to be created or verified.

You may also use the built-in LocalSystem account as your Service Logon account for all products, except DB2 Enterprise Server Edition

User rights granted by the DB2 installer

The DB2 installation program does not grant the Debug Programs user right. The DB2 installer grants the following user rights:

- Act as part of the operating system
- Create token object
- Lock pages in memory
- Log on as a service
- Increase quotas
- Replace a process level token

DB2 Administration Server (DAS) user account

A local or domain user account is required for the DB2 Administration Server (DAS).

If you are performing a response file installation, you can also specify the Local System account in the response file. For more details, refer to the sample response files in the `db2\windows\samples` directory.

The LocalSystem account is available for all products, except DB2 Enterprise Server Edition and can be selected through the DB2 Setup wizard.

The DAS is a special DB2 administration service used to support the GUI tools and assist with administration tasks on local and remote DB2 servers. The DAS has an assigned user account that is used to log the DAS service on to the computer when the DAS service is started.

You can create the DAS user account before installing DB2 or you can have the DB2 Setup wizard create it for you. If you want to have the DB2 Setup wizard create a new domain user account, the user account you use to perform the installation must have authority to create domain user accounts. The user account must belong to the *Administrators* group on the computer where you will perform the installation. This account will be granted the following user rights:

- Act as part of the operating system
- Debug programs
- Create token object
- Lock pages in memory
- Log on as a service
- Increase quotas (adjust memory quotas for a process on Windows XP and Windows Server 2003 operating systems)
- Replace a process level token

If extended security is enabled, the DB2ADMNS group will have all these privileges. You can add users to that group and you do not need to add these privileges explicitly. However, the user still needs to be a member of the Local Administrators group.

The "Debug programs" privilege is only needed when DB2 group lookup is explicitly specified to use the access token.

If the user account is created by the install program, the user account will be granted these privileges and if the user account already exists, this account will also be granted these privileges. If the install grants the privileges, some of them will only be effective on first log on by the account that was granted the privileges or upon reboot.

It is recommended that the DAS user have SYSADM authority on each of the DB2 systems within your environment so that it can start or stop other instances if required. By default, any user that is part of the *Administrators* group has SYSADM authority.

DB2 instance user account

The user account must belong to the *Administrators* group on the computer where you will perform the installation.

A local or domain user account is required for the DB2 instance. Every DB2 instance has one user that is assigned when the instance is created. DB2 logs on with this user name when the instance is started. An error will occur if you use a domain user account to perform a database operation (such as, creating a database) against a DB2 instance created with either a Local user account or the LocalSystem account. If you know you will be using a domain user account, you should create the instance using a domain user account.

You may also use the built-in LocalSystem account to run the installation for all products, except for DB2 Enterprise Server Edition.

You can create the DB2 instance user account before installing DB2 or you can have the DB2 Setup wizard create it for you. If you want to have the DB2 Setup wizard create a new domain user account, the user account you use to perform the installation must have authority to create domain user accounts. This account will be granted the following user rights:

- Act as part of the operating system
- Debug programs
- Create token object
- Increase quotas
- Lock pages in memory
- Log on as a service
- Replace a process level token

If extended security is enabled, then the DB2ADMNS group will have all these privileges. You can add users to that group and you do not need to add these privileges explicitly. However, the user still needs to be a member of the Local Administrators group.

The "Debug programs" privilege is only needed when DB2 group lookup is explicitly specified to use the access token.

If the user account is created by the install program, the user account will be granted these privileges and if the user account already exists, this account will also be granted these privileges. If the install grants the privileges, some of them will only be effective on first log on by the account that was granted the privileges or upon reboot.

Preparing the environment for a partitioned DB2 server (Windows)

This topic describes the steps required to prepare your Windows environment for a partitioned installation of the DB2 product.

Each participating computer must have the same operating system.

To prepare your Windows environment for installation:

1. Ensure that the primary computer and participating computers belong to the same Windows domain. Check the domain to which the computer belongs by using the System Properties dialog, accessible through the Control Panel.
2. Ensure that time and date settings on the primary computer and participating computers are consistent. To be considered consistent, the difference in GMT time between all computers must be no greater than one hour.

System date and time can be modified using the Date/Time Properties dialog, accessible through the Control Panel. You can use the `max_time_diff` configuration parameter to change this restriction. The default is `max_time_diff = 60`, which allows a difference of less than 60 minutes.

3. Ensure that each computer object that participates in the partitioned database environment has the "Trust computer for delegation" privilege flagged. You can verify that the "Trust computer for delegation" checkbox on the General tab of each computer's account Properties dialog box in the Active Directory Users and Computers console is checked.
4. Ensure that all participating computers can communicate with each other using TCP/IP:
 - a. On one participating computer, enter the `hostname` command, which will return the hostname of the computer.
 - b. On another participating computer, enter the following command:

```
ping hostname
```

where *hostname* represents the hostname of the primary computer. If the test is successful, you will receive output similar to the following:

```
Pinging ServerA.ibm.com [9.21.27.230] with 32 bytes of data:
```

```
Reply from 9.21.27.230: bytes=32 time<10ms TTL=128
Reply from 9.21.27.230: bytes=32 time<10ms TTL=128
Reply from 9.21.27.230: bytes=32 time<10ms TTL=128
```

Repeat these steps until you are sure that all participating computers can communicate with each other using TCP/IP. Each computer must have a static IP address.

If you are planning to use multiple network adapters, you can specify which adapter to use to communicate between database partition servers. Use the `thedb2nchg` command to specify the `netname` field in the `db2nodes.cfg` file after the installation is complete.

5. During the installation you will be asked to provide a DB2 Administration Server user account. This is a local or domain user account that will be used by the DB2 Administration Server (DAS). The DAS is an administration service used to support the GUI tools and assist with administration tasks. You can define a user now or have the DB2 Setup wizard create one for you. If you want to create a new domain user using the DB2 Setup wizard, the account used to perform the installation must have authority to create domain users.
6. On the primary computer, where you will install the instance-owning partition, you must have a domain user account that belongs to the local *Administrators* group. You will log on as this user when you install DB2. You must add the same user account to the local *Administrators* group on each participating computer. This user must have the *Act as part of the operating system* user right.
7. Ensure that all computers in the instance have the database directory on the same local drive letter. You can check this condition by running the `GET DATABASE CONFIGURATION` command and verifying the value of the `DFTDBPATH` DBM configuration parameter.
8. During the installation you will be asked to provide a domain user account to be associated with the DB2 instance. Every DB2 instance has one user assigned. DB2 logs on with this user name when the instance is started. You can define a user now, or you can have the DB2 Setup wizard create a new domain user for you.

When adding a new node to a partitioned environment the DB2 copy name must be the same on all computers.

If you want to create a new domain user using the DB2 Setup wizard, the account used to perform the installation must have authority to create domain users. The instance user domain account must belong to the local *Administrators* group on all the participating computers and will be granted the following user rights:

- Act as part of the operating system
- Create token object
- Lock pages in memory
- Log on as a service
- Increase quotas
- Replace a process level token

If extended security was selected, the account must also be a member of the `DB2ADMNS` group. The `DB2ADMNS` group already has these privileges so the privileges are already explicitly added to the account.

Granting user rights (Windows)

This topic describes the steps required to grant user rights on Windows operating systems. Specific user rights are recommended for user accounts required to install and set up DB2.

To grant advanced user rights on Windows you must be logged on as a local Administrator.

1. Click **Start** -> **Run** and type `secpol.msc`. On Windows 2008 and Windows Vista (or higher), click **Start** and type `secpol.msc` in the search bar. Click **OK**.
2. Select **Local Security Policy**.

3. In the left window pane, expand the **Local Policies** object, then select **User Rights Assignment**.
4. In the right window pane, select the user right that you want to assign.
5. From the menu, select **Action** —> **Security...**
6. Click **Add**, then select a user or group to assign the right to, and click **Add**.
7. Click **OK**.

If your computer belongs to a Windows domain, the domain user rights can override your local settings. In this case, your Network Administrator must make the changes to the user rights.

DB2 system administrator group considerations (Windows)

By default, system administrative (SYSADM) authority is granted to any valid DB2 user account that belongs to the Administrators group on the computer where the account is defined. If the account is a local account, then it must belong to the local Administrators group. If the account is a domain account, then it must belong to the Administrators group at the domain controller or the local Administrators group. You can force the DB2 database server to always perform group lookup on the local computer by setting the registry variable `DB2_GRP_LOOKUP=local` and adding the domain accounts (or global groups) to the local group.

For example, if a user logs on to a domain account and tries to access a DB2 database, the DB2 database server goes to a domain controller to enumerate groups (including the Administrators group).

For a domain user to have SYSADM authority, they must belong to the local Administrators group or the Administrators group at the domain controller. Since the DB2 database server always performs authorization at the machine where the account is defined, adding a domain user to the local Administrators group on the server does not grant the domain user SYSADM authority to this group, unless `DB2_GRP_LOOKUP=local` is set.

To avoid adding a domain user to the Administrators group at the domain controller, create a global group and add the domain users to which you want to grant SYSADM authority to it. Then update the DB2 configuration parameter `SYSADM_GROUP` with the name of the global group.

To update the DB2 configuration parameter, enter the following commands:

```
db2 update dbm cfg using sysadm_group global_group
db2stop
db2start
```

Fast communications manager (Windows)

The fast communications manager (FCM) provides communications support for DB2 server products belonging to the same instance. Each database partition server has one FCM sender, and one FCM receiver daemon to provide communications between database partition servers to handle agent requests and to deliver message buffers. The FCM daemon is started when you start the instance.

If communications fail between database partition servers, or if they re-establish communications, the FCM thread updates information. You can query this information with the database system monitor. The FCM daemons also trigger the

appropriate action. An example of an appropriate action is the rollback of an affected transaction. You can use the database system monitor to help you set the FCM configuration parameters.

You can specify the number of FCM message buffers with the *fcnum_buffers* database manager configuration parameter and the number of FCM channels with the *fcnum_channels* database manager configuration parameter. The *fcnum_buffers* and *fcnum_channels* database manager configuration parameter are set to AUTOMATIC as the default value. FCM monitors resource usage when any of these parameters are set to automatic, and incrementally releases resources. It is recommended to leave these parameters set to AUTOMATIC.

DB2 server installation (Linux and UNIX)

Installation requirements for DB2 servers and IBM data server clients (AIX)

Before you install DB2 database products on AIX operating systems, ensure that the system you choose meets the necessary operating system, hardware, software, and communications requirements.

To install a DB2 database product, the following requirements must be met:

Table 6. AIX installation requirements

Operating System	Hardware
AIX Version 5.3 <ul style="list-style-type: none"> • 64-bit AIX kernel is required • AIX 5.3 Technology Level (TL) 9 and Service Pack (SP) 2 • Minimum C++ runtime level requires the xlc.rte 9.0.0.8 and xlc.aix50.rte 9.0.0.8 (or later) filesets. These filesets are included in the June 2008 IBM C++ Runtime Environment Components for AIX package. 	64-bit Common Hardware Reference Platform (CHRP) architecture ¹ All processors that are capable of running the supported AIX operating systems.
AIX Version 6.1 ² <ul style="list-style-type: none"> • 64-bit AIX kernel is required • AIX 6.1 TL 2 • Minimum C++ runtime level requires the xlc.rte 9.0.0.8 and xlc.aix61.rte 9.0.0.8 (or later) filesets. These filesets are included in the June 2008 IBM C++ Runtime Environment Components for AIX package. 	

- ¹To verify that it is a CHRP architecture system, issue the command `lscfg` and look for the following output: `Model Architecture: chrp`
- ²In AIX 6.1 there are two types of Workload Partitions (WPARs): system WPARs and application WPARs. DB2 installation is supported only on a system WPAR. AIX 6.1 also supports the ability to encrypt a JFS2 file system or set of files.

Note: If the minimum operating system requirements were applied using an operating system upgrade rather than using a new operating system installation, you must install I/O completion ports (IOCP) separately. You can obtain the IOCP

libraries from the AIX installation CD. Then, configure IOCP on the DB2 server or data server client. For more information, see .

Software considerations

- For application development and runtime considerations, see the topics in Supported programming languages and compilers for database application development.
- You can download the latest IBM C++ Runtime Environment Components for AIX at the IBM AIX XL C and C++ support Web site.
- (Clients only) If you plan to use Kerberos Authentication, you require IBM Network Authentication Service client v1.4 or later. The NAS client can be downloaded from <https://www6.software.ibm.com/dl/dm/dm-nas-p>.
- Use the `bosboot` command to switch to the 64-bit kernel.

To switch to a 64-bit kernel, you require root authority and enter the following commands:

```
ln -sf /usr/lib/boot/unix_64 /unix
ln -sf /usr/lib/boot/unix_64 /usr/lib/boot/unix
bosboot -a
shutdown -Fr
```

- One of the following browsers is required to view online help and to run First Steps (db2fs):
 - Firefox 2.0 and later
 - Mozilla-based browsers 1.7 and later
- An X Window System software capable of rendering a graphical user interface is required if:
 - you want to use the DB2 Setup wizard to install a DB2 product on Linux or UNIX operating systems
- For details regarding known AIX issues, see www.ibm.com/support/docview.wss?&uid=swg21165448

Installation requirements for DB2 servers and IBM data server clients (Linux)

Before you install DB2 database products on Linux operating systems, ensure that the system you choose meets the necessary operating system, hardware, software, and communications requirements.

DB2 database products are supported on the following hardware:

- x86 (Intel Pentium, Intel Xeon, and AMD) 32-bit Intel and AMD processors
- x64 (64-bit AMD64 and Intel EM64T processors)
- POWER (IBM eServer OpenPower, iSeries, pSeries, System i, System p, and POWER Systems that support Linux)
- eServer System z or System z9

The minimum supported operating systems for Linux include:

- Red Hat Enterprise Linux (RHEL) 5 Update 2
- SUSE Linux Enterprise Server (SLES) 10 Service Pack 2
- SUSE Linux Enterprise Server (SLES) 11
- Ubuntu 8.0.4.1

For the latest information about supported Linux distributions, point your browser to <http://www.ibm.com/software/data/db2/linux/validate/>.

Multithreaded architecture limitations

If you are installing a DB2 32-bit database product on a Linux operating system, consider upgrading to a 64-bit operating system and installing the DB2 64-bit database product instead. The multithreaded architecture generally simplifies memory configuration. However, this could affect the memory configuration of 32-bit DB2 database servers. For example:

- Private memory for agent threads is allocated within a single process. The aggregate of all private memory allocations for database agents might not fit in a single process memory space.
- Support for multiple databases is limited because all database shared memory segments for all databases are allocated in a single process. You might need to reduce the memory usage for some databases in order to activate all databases successfully at the same time. However, the database manager performance might be impacted. Another alternative is to create multiple instances and catalog the databases across the instances. However, sufficient system resources is required to support this configuration.

Distribution Requirements

You should update your kernel configuration parameters before installing a DB2 database product. The default values for particular kernel parameters might not be sufficient when running a DB2 database system.

You might also have other products or applications that require Linux system resources. You should modify the kernel configuration parameters based on the needs of your Linux system working environment.

The kernel configuration parameters are set in `/etc/sysctl.conf`.

Refer to your operating system manual for information about setting and activating these parameters using the `sysctl` command.

Package requirements

The following tables list the package requirements for SLES and RHEL distributions:

- `libaio.so.1` is required for DB2 database servers using asynchronous i/o.
- `libstdc++so.6` is required for DB2 database servers and clients. However, if IBM Tivoli System Automation for Multiplatforms, or, IBM Tivoli Monitoring for Databases: DB2 Agent is used, `libstdc++so.5` is needed.

Package requirements for SLES and RHEL

Package name	Description
<code>libaio</code>	Contains the asynchronous library required for DB2 database servers.
<code>compat-libstdc++</code>	Contains <code>libstdc++so.6</code> (not required for Linux on POWER)

The following tables list the package requirements for SUSE Linux and Red Hat distributions for DB2 partitioned database servers.

- The `ksh93` Korn shell is required for SUSE10 and RHEL5 systems. The `pdksh` Korn Shell package is required for all other DB2 database systems.

- A remote shell utility is required for partitioned database systems. DB2 database systems support the following remote shell utilities:
 - rsh
 - ssh

By default, DB2 database systems use rsh when executing commands on remote DB2 nodes, for example, when starting a remote DB2 database partition. To use the DB2 database system default, the rsh-server package must be installed (see table below). More information about rsh and ssh is available in the DB2 Information Center.

If you choose to use the rsh remote shell utility, inetd (or xinetd) must be installed and running as well. If you choose to use the ssh remote shell utility, you need to set the **DB2RSHCMD** communication variable immediately after the DB2 installation is complete. If this registry variable is not set, rsh is used.

- The nfs-utils Network File System support package is required for partitioned database systems.

All required packages should be installed and configured before continuing with the DB2 database system setup. For general Linux information, see your Linux distribution documentation.

Package requirements for SUSE Linux

Package name	Description
pdksh or ksh93	Korn Shell. This package is required for partitioned database environments.
openssh	This package contains a set of server programs which allow users to run commands on (and from) remote computers via a secure shell. This package is not required if you use the default configuration of DB2 database systems with rsh.
rsh-server	This package contains a set of server programs which allow users to run commands on remote computers, login in to other computers, and copy files between computers (rsh, rexec, rlogin, and rcp). This package is not required if you configure DB2 database systems to use ssh.
nfs-utils	Network File System support package. It allows access to local files from remote computers.

Package requirements for Red Hat

Directory	Package name	Description
/System Environment/Shell	pdksh or ksh93	Korn Shell. This package is required for partitioned database environments.
/Applications/Internet	openssh	This package contains a set of client programs which allow users to run commands on a remote computer via a secure shell. This package is not required if you use the default configuration of DB2 database systems with rsh.

Package requirements for Red Hat

Directory	Package name	Description
/System Environment/ Daemons	openssh-server	This package contains a set of server programs which allow users to run commands from a remote computer via a secure shell. This package is not required if you use the default configuration of DB2 database systems with rsh.
/System Environment/ Daemons	rsh-server	This package contains a set of programs which allow users to run commands on a remote computer. Required for partitioned database environments. This package is not required if you configure DB2 database systems to use ssh.
/System Environment/ Daemons	nfs-utils	Network File System support package. It allows access to local files from remote computers.

Software considerations

- (Clients only) If you plan to use Kerberos Authentication, you require IBM Network Authentication Service client v1.4 or later. The NAS client can be downloaded from <https://www6.software.ibm.com/dl/dm/dm-nas-p>.
- One of the following browsers is required to view online help and to run First Steps (db2fs):
 - Firefox 2.0 and later
 - Mozilla-based browsers 1.7 and later
- An X Window System software capable of rendering a graphical user interface is required if:
 - you want to use the DB2 Setup wizard to install a DB2 database product on Linux or UNIX operating systems, or
 - you want to use any DB2 graphical tools on Linux for x86 and Linux on AMD 64/EM64T.
- Micro Focus does not offer support for any of its COBOL compiler products on SLES 11.

Security-enhanced Linux considerations

On RHEL 5 systems, if Security-enhanced Linux (SELinux) is enabled and in enforcing mode, the installer might fail due to SELinux restrictions.

To determine if SELinux is installed and in enforcing mode, you can do one of the following:

- check the `/etc/sysconfig/selinux` file
- run the `sestatus` command
- check the `/var/log/messages` file for SELinux notices.

To disable SELinux, you can do one of the following:

- set it in permissive mode and run the `setenforce 0` command as a superuser
- modify `/etc/sysconfig/selinux` and reboot the machine.

If your DB2 database product installs successfully on a RHEL 5 system, DB2 processes will run in the unconfined domain. To assign DB2 processes to their own domains, modify the policy. A sample SELinux policy is provided in the `sqlib/samples` directory.

Installation requirements for DB2 servers and IBM data server clients (Solaris)

Before you install a DB2 database product on Solaris, ensure that your system meets the operating system, hardware and software requirements.

Table 7. Solaris installation requirements

Operating System	Hardware
Solaris 9 <ul style="list-style-type: none"> • 64-bit kernel • Patches 111711-12 and 111712-12 • If raw devices are used, patch 122300-11 • 64-bit Fujitsu PRIMEPOWER and Solaris 9 Kernel Update Patch 112233-01 or later to get the fix for patch 912041-01 	UltraSPARC or SPARC64 processors
Solaris 10 Update 5 <ul style="list-style-type: none"> • 64-bit kernel • If raw devices are used, patch 125100-07 	
Solaris 10 Update 5 <ul style="list-style-type: none"> • 64-bit kernel • Patch 127128-11 	Solaris x64 (Intel 64 or AMD64)

Kernel configuration considerations

The kernel configuration parameters are set in `/etc/system`. If the kernel parameter being modified is not listed as dynamic, a system reboot is required to make the changes to `/etc/system` take effect. These parameters must be set before you install an IBM data server client.

Software considerations

- (Clients only) If you plan to use Kerberos Authentication, you require Solaris 9 or higher with IBM Network Authentication Service (NAS) client v1.4 or later. The NAS client can be downloaded from Web site: www6.software.ibm.com/dl/dm/dm-nas-p.
- One of the following browsers is required to view online help and to run First Steps (db2fs):
 - Firefox 2.0 and later
 - Mozilla-based browsers 1.7 and later
- An X Window System software capable of rendering a graphical user interface is required if you want to use the DB2 Setup wizard to install a DB2 database product
- For details regarding known Solaris issues, see www.ibm.com/support/docview.wss?&uid=swg21257606

Security patches can be obtained from the <http://sunsolve.sun.com> Web site. From the SunSolve Online Web site, click **Patches** in the left panel.

The Java2 Standard Edition (J2SE) Solaris Operating System Patch Clusters and the SUNWlibC software are also required and can be obtained from the <http://sunsolve.sun.com> Web site.

For DB2 database products on 64-bit Fujitsu PRIMEPOWER systems, you require the following:

- Solaris 9 Kernel Update Patch 112233-01 or later to get the fix for patch 912041-01.

The Fujitsu PRIMEPOWER patches for the Solaris Operating System can be downloaded from FTSI at: <http://download.ftsi.fujitsu.com/>.

DB2 database products support the following Solaris concepts:

- Solaris Logical Domains (LDoms)
- Solaris Zones
- ZFS filesystems

Listing DB2 database products installed on your system (Linux and UNIX)

On supported Linux and UNIX operating systems, the `db2ls` command lists the DB2 database products and features installed on your system, including the DB2 Version 9.7 HTML documentation.

Before you begin

At least one DB2 Version 9 (or later) database product must already be installed by a root user for a symbolic link to the `db2ls` command to be available in the `/usr/local/bin` directory.

About this task

With the ability to install multiple copies of DB2 database products on your system and the flexibility to install DB2 database products and features in the path of your choice, you need a tool to help you keep track of what is installed and where it is installed. On supported Linux and UNIX operating systems, the `db2ls` command lists the DB2 products and features installed on your system, including the DB2 HTML documentation.

The `db2ls` command can be found both in the installation media and in a DB2 install copy on the system. The `db2ls` command can be run from either location. The `db2ls` command can be run from the installation media for all products except IBM Data Server Driver Package.

The `db2ls` command can be used to list:

- Where DB2 database products are installed on your system and list the DB2 database product level
- All or specific DB2 database products and features in a particular installation path

Restrictions

The output that the `db2ls` command lists is different depending on the ID used:

- When the `db2ls` command is run with root authority, only root DB2 installations are queried.

- When the `db2ls` command is run with a non-root ID, root DB2 installations and the non-root installation owned by matching non-root ID are queried. DB2 installations owned by other non-root IDs are not queried.

The `db2ls` command is the only method to query a DB2 database product. You *cannot* query DB2 database products using Linux or UNIX operating system native utilities, such as `pkginfo`, `rpm`, `SMIT`, or `swlist`. Any existing scripts containing a native installation utility that you use to query and interface with DB2 installations must change.

You *cannot* use the `db2ls` command on Windows operating systems.

Procedure

- To list the path where DB2 database products are installed on your system and list the DB2 database product level, enter:

```
db2ls
```

The command lists the following information for each DB2 database product installed on your system:

- Installation path
- Level
- Fix pack
- Special Install Number. This column is used by IBM DB2 Support.
- Installation date. This column shows when the DB2 database product was last modified.
- Installer UID. This column shows the UID with which the DB2 database product was installed.
- To list information about DB2 database products or features in a particular installation path the `q` parameter must be specified:

```
db2ls -q -p -b baseInstallDirectory
```

where:

- `q` specifies that you are querying a product or feature. This parameter is mandatory. If a DB2 Version 8 product is queried, a blank value is returned.
- `p` specifies that the listing displays products rather than listing the features.
- `b` specifies the installation directory of the product or feature. This parameter is mandatory if you are not running the command from the installation directory.

Results

Depending on the parameters provided, the command lists the following information:

- Installation path. This is specified only once, not for each feature.
- The following information is displayed:
 - Response file ID for the installed feature, or if the `p` option is specified, the response file ID for the installed product. For example, `ENTERPRISE_SERVER_EDITION`.
 - Feature name, or if the `p` option is specified, product name.
 - Product version, release, modification level, fix pack level (VRMF). For example, `9.5.0.0`

- Fix pack, if applicable. For example, if Fix Pack 1 is installed, the value displayed is 1. This includes interim fix packs, such as Fix Pack 1a.
- If any of the product’s VRMF information do not match, a warning message displays at the end of the output listing. The message suggests the fix pack to apply.

Fast communications manager (Linux and UNIX)

The fast communications manager (FCM) provides communications support for DB2 server products that use the Database Partitioning Feature (DPF).

For multiple partition instances, each database partition server has one FCM sender daemon and one FCM receiver daemon to provide communications between database partition servers to handle agent requests and to deliver message buffers. The FCM daemon is started when you start the multiple partition instance.

If communications fail between database partition servers or if they re-establish communications, the FCM daemons update information. You can query this information with the database system monitor. The FCM daemons also trigger the appropriate action. An example of an appropriate action is the rollback of an affected transaction. You can use the database system monitor to help you set the FCM configuration parameters.

You can specify the number of FCM message buffers with the *fcm_num_buffers* database manager configuration parameter. You can also specify the number of FCM channels with the *fcm_num_channels* database manager configuration parameter. The *fcm_num_buffers* and *fcm_num_channels* database manager configuration parameters are set to AUTOMATIC as the default value. The FCM monitors resource usage when any of these parameters are set to automatic, and incrementally releases resources. It is recommended to leave these parameters set to AUTOMATIC.

DB2 users and groups (Linux and UNIX)

The DB2 Setup wizard creates the users and groups automatically (if needed) during the installation of your DB2 product.

Note: This topic does not apply to non-root installations.

If you are using the DB2 Setup wizard, you can create the following users and groups during installation. To manually create the following users and groups, see “Creating group and user IDs for a DB2 database installation (Linux and UNIX)” on page 29. Three users and three groups are used to operate DB2 on Linux and UNIX platforms.

Instance owner

The DB2 instance is created in the instance owner home directory. This user ID controls all DB2 processes and owns all filesystems and devices used by the databases contained within the instance. The default user is `db2inst1` and the default group is `db2iadm1`.

When using the DB2 Setup wizard, the default action is to create a new user for your DB2 instance. The default name is `db2inst1`. If that user name already exists, the DB2 Setup wizard searches through user names (`db2inst2`, `db2inst3`, and so on). The search continues until a user name is identified that is not already an existing user on the system as the default

instance owner ID. If you choose to proceed this user is created by the DB2 Setup wizard. However, you also have a choice to specify any existing user as the instance owner.

This method for user name creation also applies to the creation of fenced users and DB2 administration server users.

Fenced user

The fenced user is used to run user defined functions (UDFs) and stored procedures outside of the address space used by the DB2 database. The default user is db2fenc1 and the default group is db2fadm1. If you do not need this level of security, for example in a test environment, you can use your instance owner as your fenced user.

DB2 administration server user

The user ID for the DB2 administration server user is used to run the DB2 administration server (DAS) on your system. The default user is dasusr1 and the default group is dasadm1. This user ID is also used by the DB2 GUI tools to perform administration tasks against the local server database instances and databases.

There is only one DAS per computer. One DAS services one or more database instances, including database instances that belong to different installations. The DAS can service database instances whose release level is lower than the release level of the DAS. However, for database instances whose release level is higher than the release level of the DAS, the DAS must be migrated to a higher level. The DAS release level must be as high (or higher) than the release level of any of the database instances it services.

User ID restrictions

User IDs have the following restrictions and requirements:

- Must have a primary group other than guests, admins, users, and local
- Can include lowercase letters (a–z), numbers (0–9), and the underscore character (_)
- Cannot be longer than eight characters
- Cannot begin with IBM, SYS, SQL, or a number
- Cannot be a DB2 reserved word (USERS, ADMINS, GUESTS, PUBLIC, or LOCAL), or an SQL reserved word
- Cannot use any User IDs with root privilege for the DB2 instance ID, DAS ID or fenced ID.
- Cannot include accented characters
- If existing user IDs are specified instead of creating new user IDs, make sure that the user IDs:
 - Are not locked
 - Do not have expired passwords

Centralized user-management considerations (Linux and UNIX)

In environments that include security software, there are some installation considerations.

Note: The DB2 installation cannot update or create users and groups if they are controlled outside of the operating system. For example, LDAP can be used to control users and groups outside of the operating system.

Note: Network Information Services (NIS) and Network Information Services Plus (NIS+) features are deprecated starting with DB2 Version 9.1 Fix Pack 2. Support for these features might be removed in a future release. Lightweight Directory Access Protocol (LDAP) is the recommended solution for centralized user-management services.

At instance creation, without a security component present, the instance owner's group list is modified to include that of the database administrative server (DAS) user's primary group, if the DAS is created. If the instance creation program is unable to modify these properties, it reports that it could not. The warning message provides the necessary information to manually make the changes.

These considerations hold true for any environment in which an external security program does not allow the DB2 installation or instance creation programs to modify user characteristics.

Chapter 3. Before you install

Java software support for DB2 products

You require the appropriate level of IBM Software Development Kit (SDK) for Java, listed later in this section, to use Java-based tools and to create and run Java applications, including stored procedures and user-defined functions.

If the IBM SDK for Java is required by a component being installed and the SDK for Java is not already installed in that path, the SDK for Java will be installed if you use either the DB2 Setup wizard or a response file to install the product.

The SDK for Java is not installed with IBM Data Server Runtime Client or IBM Data Server Driver Package.

The following table lists the installed SDK for Java levels for DB2 products according to operating system platform:

Operating System Platform	SDK for Java level
AIX	SDK 6
HP-UX for Itanium-based systems	HP SDK for J2SE HP-UX 11i platform, adapted by IBM for IBM Software, Version 6 Service Release 3
Linux on x86	SDK 6 Service Release 3
Linux on AMD64/EM64T	SDK 6 Service Release 3
Linux on zSeries	SDK 6 Service Release 3
Linux on POWER	SDK 6 Service Release 3
Solaris Operating System	SDK 6 Service Release 3
Windows x86	SDK 6 Service Release 3
Windows x64	SDK 6 Service Release 3

Note:

1. The SDK for Java software can be downloaded from the developerWorks Web page at: <http://www.ibm.com/developerworks/java/jdk/index.html> . For a list of the supported levels of the SDK for Java, see the table later in this section entitled DB2 Database for Linux, UNIX, and Windows support for SDKs for Java.

Note: For Windows operating system platforms, use the IBM Development Package for Eclipse downloads.

2. DB2 GUI tools only run on Linux on x86, Linux on AMD64/EM64T, Windows x86, and Windows x64.
3. On Windows x86 and Linux on x86:
 - the 32-bit SDK is installed
 - 32-bit applications and Java external routines are supported
4. On all supported platforms (except Windows x86, and Linux on x86):
 - 32-bit applications are supported
 - 32-bit Java external routines are not supported

- 64-bit applications and Java external routines are supported

Supported Java application development software

The following table lists the supported levels of the SDK for Java. The listed levels and forward-compatible later versions of the same levels are supported.

Because there are frequent SDK for Java fixes and updates, not all levels and versions have been tested. If your database application has problems that are related to the SDK for Java, try the next available version of your SDK for Java at the given level.

Non-IBM versions of the SDK for Java are supported only for building and running stand-alone Java applications. For building and running new Java stored procedures and user-defined functions, only the IBM SDK for Java that is included with the DB2 Database for Linux, UNIX, and Windows product is supported. For running Java stored procedures and user-defined functions that were built by prior DB2 releases, refer to Table 1, column “Java Stored Procedures and User Defined Functions” for details.

Table 8. DB2 Database for Linux, UNIX, and Windows supported levels of SDKs for Java

	Java applications using JDBC driver db2java.zip or db2jcc.jar	Java applications using JDBC driver db2jcc4.jar	Java Stored Procedures and User Defined Functions	DB2 Graphical Tools
AIX	1.4.2 to 6	6	1.4.26 on page 29 to 6 ⁵	N/A
HP-UX for Itanium-based systems	1.4.2 to 6 ¹	6 ¹	1.4.26 on page 29 to 6	N/A
Linux on POWER	1.4.2 to 6 ^{3,4}	6 ^{3,4}	1.4.26 on page 29 to 6	N/A
Linux on x86	1.4.2 to 6 ^{2,3,4}	6 ^{2,3,4}	1.4.26 on page 29 to 6	5 to 6
Linux on AMD64 and Intel EM64T processors	1.4.2 to 6 ^{2,3,4}	6 ^{2,3,4}	1.4.26 on page 29 to 6	N/A
Linux on zSeries	1.4.2 to 6 ^{3,4}	6 ^{3,4}	1.4.26 on page 29 to 6	N/A
Solaris operating system	1.4.2 to 6 ²	6 ²	1.4.26 on page 29 to 6	N/A
Windows on x86	1.4.2 to 6 ²	6 ²	1.4.6 on page 292 to 6	5 to 6
Windows on x64, for AMD64 and Intel EM64T processors	1.4.2 to 6 ²	6 ²	1.4.26 on page 29 to 6	5 to 6

Note:

1. The same levels of the SDK for Java that are available from Hewlett-Packard are supported for building and running stand-alone client applications that run under the IBM Data Server Driver for JDBC and SQLJ.
2. The same levels of the SDK for Java that are available from Sun Microsystems are supported for building and running stand-alone client applications that run under the IBM Data Server Driver for JDBC and SQLJ.
3. A minimum level of SDK for Java 1.4.2 SR6 is required for SUSE Linux Enterprise Server (SLES) 10. A minimum level of SDK for Java 1.4.2 SR7 is required for Red Hat Enterprise Linux (RHEL) 5.

4. SDK for Java 6 support on Linux requires SDK for Java 6 SR3 or later.
5. If SDK for Java 6 SR2 or later is used, set `DB2LIBPATH=java_home/jre/lib/ppc64`.
6. Support for Java stored procedures and user-defined functions built by IBM SDK for Java 1.4.2 has been deprecated in Version 9.7 and might be removed in a future release. IBM SDK for Java 1.4.2 has an End of Service date of September 2011. It is recommended to remove SDK for Java 1.4.2 dependency well before this date. Removing this dependency can be done by rebuilding Java stored procedures and user-defined functions with the SDK for Java included in DB2 Version 9.1, DB2 Version 9.5, or DB2 Version 9.7.

The following table lists the versions of the IBM Data Server Driver for JDBC and SQLJ that are available with DB2 database products.

Table 9. Versions of IBM Data Server Driver for JDBC and SQLJ and DB2 Database for Linux, UNIX, and Windows fix pack levels

DB2 version and fix pack level	IBM Data Server Driver for JDBC and SQLJ version ¹
DB2 Version 9.1	3.1.xx
DB2 Version 9.1 Fix Pack 1	3.2.xx
DB2 Version 9.1 Fix Pack 2	3.3.xx
DB2 Version 9.1 Fix Pack 3	3.4.xx
DB2 Version 9.1 Fix Pack 4	3.6.xx
DB2 Version 9.1 Fix Pack 5	3.7.xx
DB2 Version 9.5	3.50.xx, 4.0.xx
DB2 Version 9.5 Fix Pack 1	3.51.xx, 4.1.xx
DB2 Version 9.5 Fix Pack 2	3.52.xx, 4.2.xx
DB2 Version 9.5 Fix Pack 3	3.53.xx, 4.3.xx
DB2 Version 9.7	3.57.xx, 4.7.xx

Note: All driver versions are of the form *n.m.xx*. *n.m* stays the same within a GA level or a fix pack level. *xx* changes when a new version of the IBM Data Server Driver for JDBC and SQLJ is introduced through an APAR fix.

Creating group and user IDs for a DB2 database installation (Linux and UNIX)

The DB2 Setup wizard will create these users and groups for you during the installation process. If you want, you can create them ahead of time.

To perform this task, you must have root authority to create users and groups.

Three users and groups are required.

The user and group names used in the following instructions are documented in the following table. You can specify your own user and group names if they adhere to system naming rules and DB2 naming rules.

The user IDs you create will be required to complete subsequent setup tasks.

Table 10. Default users and groups

User	Example user name	Example group name
Instance owner	db2inst1	db2iadm1
Fenced user	db2fenc1	db2fadm1
DB2 administration server user	dasusr1	dasadm1

- The instance owner home directory is where the DB2 instance will be created.
- The fenced user is used to run user defined functions (UDFs) and stored procedures outside of the address space used by the DB2 database.
- The user ID for the *DB2 administration server user* is used to run the DB2 administration server on your system.

To create the required groups and user IDs for DB2:

1. Log in as a user with root authority.
2. Enter the appropriate commands for your operating system.

Note: These command line examples do not contain passwords. They are examples only. You can use the *passwd username* command from the command line to set the password.

AIX operating systems

To create groups on AIX, enter the following commands:

```
mkgroup id=999 db2iadm1
mkgroup id=998 db2fadm1
mkgroup id=997 dasadm1
```

Create users for each group:

```
mkuser id=1004 pgrp=db2iadm1 groups=db2iadm1
  home=/home/db2inst1 db2inst1
mkuser id=1003 pgrp=db2fadm1 groups=db2fadm1
  home=/home/db2fenc1 db2fenc1
mkuser id=1002 pgrp=dasadm1 groups=dasadm1
  home=/home/dasusr1 dasusr1
```

Set initial password:

```
passwd db2inst1
passwd db2fenc1
passwd dasusr1
```

HP-UX operating systems

To create groups on HP-UX, enter the following commands:

```
groupadd -g 999 db2iadm1
groupadd -g 998 db2fadm1
groupadd -g 997 dasadm1
```

Create users for each group:

```
useradd -g db2iadm1 -d /home/db2inst1 -m db2inst1
useradd -g db2fadm1 -d /home/db2fenc1 -m db2fenc1
useradd -g dbasgrp -d /home/dasusr1 -m dasusr1
```

Set initial password:

```
passwd db2inst1
passwd db2fenc1
passwd dasusr1
```

Linux operating systems

To create groups on Linux operating systems, enter the following commands:

```
groupadd -g 999 db2iadm1
groupadd -g 998 db2fadm1
groupadd -g 997 dasadm1
```

Create users for each group:

```
useradd -u 1004 -g db2iadm1 -m -d /home/db2inst1 db2inst1
useradd -u 1003 -g db2fadm1 -m -d /home/db2fenc1 db2fenc1
useradd -u 1002 -g dasadm1 -m -d /home/dasusr1 dasusr1
```

Set initial password:

```
passwd db2inst1
passwd db2fenc1
passwd dasusr1
```

Solaris operating systems

To create groups on Solaris, enter the following commands:

```
groupadd -g 999 db2iadm1
groupadd -g 998 db2fadm1
groupadd -g 997 dasadm1
```

Create users for each group:

```
useradd -g db2iadm1 -u 1004 -d /export/home/db2inst1 -m db2inst1
useradd -g db2fadm1 -u 1003 -d /export/home/db2fenc1 -m db2fenc1
useradd -g dasadm1 -u 1002 -d /export/home/dasusr1 -m dasusr1
```

Set initial password:

```
passwd db2inst1
passwd db2fenc1
passwd dasusr1
```

Verifying port range availability on participating computers (Windows)

This task describes the steps required to verify port range availability on participating computers. The port range is used by the Fast Communications Manager (FCM). FCM is a feature of DB2 that handles communications between database partition servers.

When you install the instance-owning database partition server on the primary machine, DB2 reserves a port range according to the specified number of database partition servers participating in partitioned database environment. The default port range is four ports. The DB2 Setup wizard must be able to reserve an identical port range when database partition servers are installed on participating computers; the port range needs to be free on each of the database partition servers.

This task should be done after you install the instance-owning database partition server and before you install any participating database partition servers.

To verify the port range availability on participating computers:

1. Open the services file. The default location of the services file is in the %SystemRoot%\system32\drivers\etc directory, where %SystemRoot% is your Windows root directory.

2. Locate the ports reserved for the DB2 Fast Communications Manager (FCM). The entries should appear similar to the following:

```
DB2_DB2          60000/tcp
DB2_DB2_1       60001/tcp
DB2_DB2_2       60002/tcp
DB2_DB2_END     60003/tcp
```

DB2 reserves the first four available ports after 60000.

3. On each participating computer, open the services file and verify that the ports reserved for DB2 FCM in the services file of the primary computer are not being used.
4. In the event that the required ports are in use on a participating computer, identify an available port range for all computers and update each service file, including the services file on the primary computer.

Kernel parameters (Linux and UNIX)

Modifying kernel parameters (Linux)

Before installing a DB2 database system, update your Linux kernel parameters. The default values for particular kernel parameters on Linux are not sufficient when running a DB2 database system.

You must have root authority to modify kernel parameters.

To update kernel parameters on Red Hat and SUSE Linux:

1. Run the `ipcs -l` command
2. Analyze the output to determine if there are any necessary changes required for your system. Comments have been added following the `//` to show what the parameter names are.

```
# ipcs -l

----- Shared Memory Limits -----
max number of segments = 4096           // SHMMNI
max seg size (kbytes) = 32768          // SHMMAX
max total shared memory (kbytes) = 8388608 // SHMALL
min seg size (bytes) = 1

----- Semaphore Limits -----
max number of arrays = 1024            // SEMMNI
max semaphores per array = 250         // SEMMSL
max semaphores system wide = 256000    // SEMMNS
max ops per semop call = 32            // SEMOPM
semaphore max value = 32767

----- Messages: Limits -----
max queues system wide = 1024          // MSGMNI
max size of message (bytes) = 65536    // MSGMAX
default max size of queue (bytes) = 65536 // MSGMNB
```

- Beginning with the first section on Shared Memory Limits, SHMMAX and SHMALL are the parameters that need to be looked at. SHMMAX is the maximum size of a shared memory segment on a Linux system whereas SHMALL is the maximum allocation of shared memory pages on a system.
 - It is recommended to set the SHMMAX value to be equal to the amount of physical memory on your system. However, the minimum required on x86 systems is 268435456 (256 MB) and for 64-bit systems, it is 1073741824 (1 GB).

|
|
|
|
|

- SHMALL is set to 8 GB by default (8388608 KB = 8 GB). If you have more physical memory than this, and it is to be used for DB2, then this parameter increases to approximately 90% of your computer's physical memory. For instance, if you have a computer system with 16 GB of memory to be used primarily for DB2, then SHMALL should be set to 3774873 (90% of 16 GB is 14.4 GB; 14.4 GB is then divided by 4 KB, which is the base page size). The ipcs output has converted SHMALL into kilobytes. The kernel requires this value as a number of pages. If you are upgrading to DB2 Version 9.7 and you are not using the default SHMALL setting, you must increase the SHMALL setting by an additional 4 GB. This increase in memory is required by the fast communication manager (FCM) for additional buffers or channels.
 - The next section covers the amount of semaphores available to the operating system. The kernel parameter sem consists of 4 tokens, SEMMSL, SEMMNS, SEMOPM and SEMMNI. SEMMNS is the result of SEMMSL multiplied by SEMMNI. The database manager requires that the number of arrays (SEMMNI) be increased as necessary. Typically, SEMMNI should be twice the maximum number of agents expected on the system multiplied by the number of logical partitions on the database server computer plus the number of local application connections on the database server computer.
 - The third section covers messages on the system.
 - MSGMNI affects the number of agents that can be started, MSGMAX affects the size of the message that can be sent in a queue, and MSGMNB affects the size of the queue.
 - MSGMAX should be change to 64 KB (that is, 65535 bytes), and MSGMNB should be increased to 65535.
3. To modify these kernel parameters, edit the /etc/sysctl.conf file. If this file does not exist, create it. The following lines are examples of what should be placed into the file:
- ```
kernel.sem=250 256000 32 1024
#Example shmmax for a 64-bit system
kernel.shmmax=1073741824
#Example shmall for 90 percent of 16 GB memory
kernel.shmall=3774873
kernel.msgmax=65535
kernel.msgmnb=65535
```
4. Run sysctl with `-p` parameter to load in sysctl settings from the default file /etc/sysctl.conf:
- ```
sysctl -p
```
5. To make the changes effective after every reboot:
- (SUSE Linux) Make boot.sysctl active
 - (Red Hat) The rc.sysinit initialization script will read the /etc/sysctl.conf file automatically

Modifying kernel parameters (Solaris Operating System)

For the DB2 database system to operate properly, it is recommended that you update your system's kernel configuration parameters. You can use the db2osconf utility to suggest recommended kernel parameters. If you want to take advantage of project resource controls (/etc/project), consult your Solaris documentation.

You must have root authority to modify kernel parameters.

To use the `db2osconf` command, you must first install the DB2 database system. The `db2osconf` utility can only be run from `$DB2DIR/bin`, where `$DB2DIR` is the directory where you installed your DB2 product.

You must restart your system after modifying kernel parameters.

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
```

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

Additional partitioned database environment preinstallation tasks (Linux and UNIX)

Updating environment settings for a partitioned DB2 installation (AIX)

This task describes the environment settings that you need to update on each computer that will participate in your partitioned database system.

To update AIX environment settings:

1. Log on to the computer as a user with root authority.
2. Set the AIX `maxuproc` (maximum number of processes per user) device attribute to `4096` by entering the following command:

```
chdev -l sys0 -a maxuproc='4096'
```

Note: A `bosboot/reboot` may be required to switch to the 64-bit kernel if a different image is being run.

3. Set the TCP/IP network parameters on all the workstations that are participating in your partitioned database system to the following values. These values are the minimum values for these parameters. If any of the network-related parameters are already set to a higher value, do not change it.

```
thewall      = 65536
sb_max       = 1310720
rfc1323      = 1
tcp_sendspace = 221184
tcp_recvspace = 221184
udp_sendspace = 65536
udp_recvspace = 65536
ipqmaxlen    = 250
somaxconn    = 1024
```

To list the current settings of all network-related parameters, enter the following command:

```
no -a | more
```

To set a parameter, enter the follow command:

```
no -o parameter_name=value
```

where:

- *parameter_name* represents the parameter you want to set.
- *value* represents the value that you want to set for this parameter.

For example, to set the `tcp_sendspace` parameter to 221184, enter the following command:

```
no -o tcp_sendspace=221184
```

4. If you are using a high speed interconnect, you must set the *spoolsize* and *rpoolsize* for *css0* to the following values:

```
spoolsize    16777216
rpoolsize    16777216
```

To list the current settings of these parameters, enter the following command:

```
lsattr -l css0 -E
```

To set these parameters, enter the following commands:

```
/usr/lpp/ssp/css/chgcss -l css0 -a spoolsize=16777216
/usr/lpp/ssp/css/chgcss -l css0 -a rpoolsize=16777216
```

If you are not using the `/tftpboot/tuning.cst` file to tune your system, you can use the `DB2DIR/misc/rc.local.sample` sample script file, where `DB2DIR` is path where the DB2 product has been installed to, to update the network-related parameters after installation. To update the network-related parameters using the sample script file after installation, perform the following steps:

- a. Copy this script file to the `/etc` directory and make it executable by root by entering the following commands:

```
cp /usr/opt/db2_09_01/misc/rc.local.sample /etc/rc.local
chown root:sys /etc/rc.local
chmod 744 /etc/rc.local
```

- b. Review the `/etc/rc.local` file and update it if necessary.
- c. Add an entry to the `/etc/inittab` file so that the `/etc/rc.local` script is executed whenever the machine is rebooted. You can use the `mkitab` command to add an entry to the `/etc/inittab` file. To add this entry, enter the following command:

```
mkitab "rclocal:2:wait:/etc/rc.local > /dev/console 2>&1"
```

- d. Ensure that `/etc/rc.nfs` entry is included in the `/etc/inittab` file by entering the following command:

```
lsitab rcnfs
```

- e. Update the network parameters without rebooting your system by entering the following command:

```
/etc/rc.local
```

5. Ensure that you have enough paging space for a partitioned installation of DB2 ESE to run. If you do not have sufficient paging space, the operating system will kill the process that is using the most virtual memory (this is likely to be one of the DB2 processes). To check for available paging space, enter the following command:

```
lsps -a
```

This command will return output similar to the following:

Page Space	Physical Volume	Volume Group	Size	%Used	Active	Auto	Type
paging00	hdisk1	rootvg	60MB	19	yes	yes	lv
hd6	hdisk0	rootvg	60MB	21	yes	yes	lv
hd6	hdisk2	rootvg	64MB	21	yes	yes	lv

The paging space available should be equal to twice the amount of physical memory installed on your computer.

6. If you are creating a small to intermediate size partitioned database system, the number of network file system daemons (NFSDs) on the instance-owning computer should be close to:

of biod on a computer × # of computers in the instance

Ideally, you should run 10 biod processes on every computer. According to the above formula, on a four computer system with 10 biod processes, you use 40 NFSDs.

If you are installing a larger system, you can have up to 120 NFSDs on the computer.

For additional information about NFS, refer to your NFS documentation.

Setting up a working collective to distribute commands to ESE workstations (AIX)

In a partitioned database environment on AIX, you can set up a working collective to distribute commands to the set of workstations that participate in your partitioned database system. Commands can be distributed to the workstations by the dsh command.

This can be useful when installing or administering a partitioned database system on AIX, to enable you to quickly execute the same commands on all the computers in your environment with less opportunity for error.

You must know the hostname of each computer that you want to include in the working collective.

You must be logged on to the Control workstation as a user with root authority.

Have a file that lists the hostnames for all of the workstations that will participate in your partitioned database system. To set up the working collective to distribute commands to this list of workstations:

1. Create a file called *eeelist.txt* that will list the *hostnames* for all of the workstations that will participate in the working collective.

For example, assume that you wanted to create a working collective with two workstations called *workstation1* and *workstation2*. The contents of *eeelist.txt* would be:

```
workstation1
workstation2
```

2. Update the working collective environment variable. To update this list, enter the following command:

```
export WCOLL=path/eeelist.txt
```

where *path* is the location where *eeelist.txt* was created, and *eeelist.txt* is the name of the file that you created that lists the workstations in the working collective.

3. Verify that the names in the working collective are indeed the workstations that you want, by entering the following command:

```
dsh -q
```

You will receive output similar to the following:


```
Working collective file /eeelist.txt:
workstation1
workstation2
Fanout: 64
```

Verifying that NFS is running (Linux and UNIX)

Before setting up a database partitioned environment, you should verify that Network File System (NFS) is running on each computer that will participate in your partitioned database system.

NFS must be running on each computer.

To verify that NFS is running on each computer:

AIX operating systems

Type the following command on each computer:

```
lssrc -g nfs
```

The Status field for NFS processes should indicate active.

After you have verified that NFS is running on each system, you should check for the specific NFS processes required by DB2 products. The required processes are:

```
rpc.lockd
rpc.statd
```

HP-UX and Solaris operating systems

Type the following command on each computer:

```
showmount -e hostname
```

Enter the showmount command without the *hostname* parameter to check the local system.

If NFS is not active you will receive a message similar to the following:

```
showmount: ServerA: RPC: Program not registered
```

After you have verified that NFS is running on each system, you should check for the specific NFS processes required by DB2 products:

```
rpc.lockd
rpc.statd
```

You can use the following commands to check for these processes:

```
ps -ef | grep rpc.lockd
ps -ef | grep rpc.statd
```

Linux operating systems

Type the following command on each computer:

```
showmount -e hostname
```

Enter the showmount command without the *hostname* parameter to check the local system.

If NFS is not active you will receive a message similar to the following:

```
showmount: ServerA: RPC: Program not registered
```

After you have verified that NFS is running on each system, you should check for the specific NFS processes required by DB2 products. The required process is `rpc.statd`.

You can use the `ps -ef | grep rpc.statd` commands to check for this process.

If these processes are not running, consult your operating system documentation.

Verifying port range availability on participating computers (Linux and UNIX)

This task describes the steps required to verify port range availability on participating computers. The port range is used by the Fast Communications Manager (FCM). FCM is a feature of DB2 that handles communications between database partition servers.

Verifying the port range availability on participating computers should be done after you install the instance-owning database partition server and before you install any participating database partition servers.

When you install the instance-owning database partition server on the primary computer, DB2 reserves a port range according to the specified number of logical database partition servers participating in partitioned database environment. The default range is four ports. For each server that participates in the partitioned database environment, you must manually configure the `/etc/services` file for the FCM ports. The range of the FCM ports depends on how many logical partitions you want to use on the participating computer. A minimum of two entries are required, `DB2_<instance>` and `DB2_<instance>_END`. Other requirements for the FCM ports specified on participating computers are:

- The starting port number must match the starting port number of the primary computer
- Subsequent ports must be sequentially numbered
- Specified port numbers must be free

To make changes to the services file, you require root authority.

To verify the port range availability on participating computers:

1. Open the services file located in the `/etc/services` directory.
2. Locate the ports reserved for the DB2 Fast Communications Manager (FCM). The entries should appear similar to the following:

```
DB2_db2inst1      60000/tcp
DB2_db2inst1_1   60001/tcp
DB2_db2inst1_2   60002/tcp
DB2_db2inst1_END 60003/tcp
```

DB2 reserves the first four available ports after 60000.

3. On each participating computer, open the services file and verify that the ports reserved for DB2 FCM in the services file of the primary computer are not being used.
4. In the event that the required ports are in use on a participating computer, identify an available port range for all computers and update each service file, including the services file on the primary computer.

After you install the instance-owning database partition server on the primary computer, you must install your DB2 product on the participating database

partition servers. You can use the response file generated for the partitioning servers (default name is db2ese_addpart.rsp), you need to manually configure the /etc/services files for the FCM ports. The range of the FCM ports depend on how many logical partitions you want to use on the current machine. The minimum entries are for DB2_ and DB2__END two entries with consecutive free port numbers. The FCM port numbers used on each participating machines must have the same starting port number, and subsequent ports must be sequentially numbered.

Creating file system for a partitioned database environment (Linux and UNIX)

Creating a DB2 home file system for a partitioned database system (AIX)

This task is part of setting up your partitioned database system. This task describes how to:

- create a DB2 home file system
- NFS export the home file system
- NFS mount the home file system from each participating computer

It is recommended that you create a home file system that is as large as the content on the DB2 product DVD. You can use the following command to check the size, shown in KB:

```
du -sk <DVD mounting point>
```

A DB2 instance will require at least 200 MB of space. If you do not have enough free space, you can mount the DB2 product DVD from each participating computer as an alternative to copying the contents to disk.

You must have:

- root authority to create a file system
- Created a volume group where your file system is to be physically located.

To create, NFS export, and NFS mount the DB2 home file system, perform the following steps:

Creating the DB2 home file system

Log on to the primary computer (ServerA) in your partitioned database system as a user with root authority and create a home file system for your partitioned database system called /db2home.

1. Enter the **smit jfs** command.
2. Click on the **Add a Journaled File System** icon.
3. Click on the **Add a Standard Journaled File System** icon.
4. Select an existing volume group from the **Volume Group Name** list where you want this file system to be physically located.
5. Set the **SIZE** of file system (**SIZE of file system (in 512-byte blocks) (Num.)** field). This sizing is enumerated in 512-byte blocks, so if you only need to create a file system for the instance home directory, you can use 180 000, which is about 90 MB. If you need to copy the product DVD image over to run the installation, you can create it with a value of 2 000 000, which is about 1 GB.

6. Enter the mount point for this file system in the **MOUNT POINT** field. In this example, the mount point is /db2home.
7. Set the **Mount AUTOMATICALLY at system restart** field to yes. The remaining fields can be left to the default settings.
8. Click **OK**.

Exporting the DB2 home file system

1. NFS export the /db2home file system so that it is available to all of the computers that will participate in your partitioned database system:
 - a. Enter the **smit nfs** command.
 - b. Click on the **Network File System (NFS)** icon.
 - c. Click on the **Add a Directory to Exports List** icon.
 - d. Enter the pathname and directory to export (for example, /db2home) in the **PATHNAME of directory to export** field.
 - e. Enter the name of each workstation that will participate in your partitioned database system in the **HOSTS allowed root access** field. Use a comma (,) as the delimiter between each name. For example, ServerA, ServerB, ServerC. If you are using a high speed interconnect, it is recommended that you specify the high speed interconnect names for each workstation in this field as well. The remaining fields can be left to the default settings.
 - f. Click **OK**.
2. Log out.

Mounting the DB2 home file system from each participating computer

Log on to *each* participating computer (ServerB, ServerC, ServerD) and NFS mount the file system that you exported by performing the following steps:

1. Enter the **smit nfs** command.
2. Click on the **Network File System (NFS)** icon.
3. Click on the **Add a File System for Mounting** icon.
4. Enter the pathname of the mount point in the **PATHNAME of the mount point (Path)** field.

The path name of the mount point is where you should create the DB2 home directory. For this example, use /db2home.

5. Enter the pathname of the remote directory in the **PATHNAME of the remote directory** field.

For our example, you should enter the same value that you entered in the **PATHNAME of the mount point (Path)** field.

6. Enter the *hostname* of the machine where you exported the file system in the **HOST where the remote directory resides** field.

This value is the hostname of the machine where the file system that you are mounting was created.

To improve performance, you may want to NFS mount the file system that you created over a high speed interconnect. If you want to mount this file system using a high speed interconnect, you must enter its name in the **HOST where remote directory resides** field.

You should be aware that if the high speed interconnect ever becomes unavailable for some reason, every workstation that participates in your partitioned database system will lose access to the DB2 home directory.

7. Set the **MOUNT now, add entry to /etc/filesystems or both?** field to both.
8. Set the **/etc/filesystems entry will mount the directory on system RESTART** field to yes.
9. Set the **MODE for this NFS file system** field to read-write.
10. Set the **Mount file system soft or hard** field to soft.
 A soft mount means that the computer *will not* try for an infinite period of time to remotely mount the directory. A hard mount means that your machine will infinitely try to mount the directory. This can cause problems in the event of a system crash. It is recommended that you set this field to soft.
 The remaining fields can be left to the default settings.
11. Ensure that this file system is mounted with the **Allow execution of SUID and sgid programs in this file system?** field set to Yes. This is the default setting.
12. Click **OK**.
13. Log out.

Creating a file system for a partitioned DB2 server (Linux)

This task is part of setting up your partitioned database system. This task describes how to:

- create a DB2 home file system
- NFS export the home file system
- NFS mount the home file system from each participating computer

You must have a file system that is available to all machines that will participate in your partitioned database system. This file system will be used as the instance home directory.

For configurations that use more than one machine for a single database instance, NFS (Network File System) is used to share this file system. Typically, one machine in a cluster is used to export the file system using NFS, and the remaining machines in the cluster mount the NFS file system from this machine. The machine that exports the file system has the file system mounted locally.

For more command information, see your Linux distribution documentation.

To create this file system:

1. On one machine, select a disk partition or create one using `fdisk`.
2. Using a utility like `mkfs`, create a file system on this partition. The file system should be large enough to contain the necessary DB2 program files as well as enough space for your database needs.
3. Locally mount the file system you have just created and add an entry to the `/etc/fstab` file so that this file system is mounted each time the system is rebooted. For example:


```
/dev/hda1 /db2home ext3 defaults 1 2
```
4. To automatically export an NFS file system on Linux at boot time, add an entry to the `/etc/exports` file. Be sure to include all of the host names participating in the cluster as well as all of the names that a machine might be known as. Also, ensure that each machine in the cluster has root authority on the exported file system by using the "root" option.

The `/etc/exports` file is an ASCII file which contains the following type of information:

```
/db2home machine1_name(rw) machine2_name(rw)
```

To export the NFS directory, run

```
/usr/sbin/exports -r
```

5. On each of the remaining machines in the cluster, add an entry to the `/etc/fstab` file to NFS mount the file system automatically at boot time. As in the following example, when you specify the mount point options, ensure that the file system is mounted at boot time, is read-write, is mounted hard, includes the `bg` (background) option, and that `setuid` programs can be run properly.

```
fusion-en:/db2home /db2home nfs rw,timeo=7,  
hard,intr,bg,suid,lock
```

where `fusion-en` represents the machine name.

6. NFS mount the exported file system on each of the remaining machines in the cluster by entering the following command:

```
mount /db2home
```

If the `mount` command fails, use the `showmount` command to check the status of the NFS server. For example:

```
showmount -e fusion-en
```

where `fusion-en` represents the machine name.

This `showmount` command should list the file systems which are exported from the machine named `fusion-en`. If this command fails, the NFS server may not have been started. Run the following command as root on the NFS server to start the server manually:

```
/etc/rc.d/init.d/nfs restart
```

Assuming the present run level is 3, you can have this command run automatically at boot time by renaming `K20nfs` to `S20nfs` under the following directory: `/etc/rc.d/rc3.d`.

7. Ensure that the following steps were successful:
 - a. On a single machine in the cluster, you have created a file system to be used as the instance and home directory.
 - b. If you have a configuration that uses more than one machine for a single database instance, you have exported this file system using NFS.
 - c. You have mounted the exported file system on each of the remaining machines in the cluster.

Creating a file system for a partitioned DB2 server (Solaris Operating System)

This task is part of setting up your partitioned database system. This task describes how to:

- create a DB2 home file system
- NFS export the home file system
- NFS mount the home file system from each participating computer

It is recommended that you create a home file system that is as large as the content on the DB2 product DVD. You can use the following command to check the size, shown in KB:

```
du -sk <DVD mounting point>
```

A DB2 instance will require at least 50 MB of space. If you do not have enough free space, you can mount the DB2 product DVD from each participating computer as an alternative to copying the contents to disk.

There are a number of ways to create a local file system on Solaris Operating Systems. If you want to use a product, such as Veritas, to create the file system, refer to the product's documentation.

You must have root authority to create a file system.

To create, NFS export, and NFS mount the DB2 home file system, perform the following steps:

Creating the DB2 home file system

1. On the primary computer (ServerA), select a disk partition or configure one using the format command. When using the format command, ensure that the disk partitions being used do not overlap. Overlapping partitions can cause data corruption or file system failures. Ensure you have correctly entered the command, as mistakes can cause serious problems.
2. Using a utility like newfs or mkfs, create a file system on this partition. The file system should be large enough to contain the necessary DB2 files as well as other non-DB2 files. A minimum of 300 MB is recommended.
3. Locally mount the file system you have just created and add an entry to the /etc/vfstab file so that this file system is mounted each time the system is rebooted. For example:

```
/dev/dsk/c1t0d2s2 /dev/rdisk/c1t0d2s2 /db2home ufs 2 yes -
```

Exporting the DB2 home file system

1. To automatically export an NFS file system on Solaris at boot time, add an entry to the /etc/dfs/dfstab file. Be sure to include all of the host names of the participating computers as well as all of the names that a given computer might be known as. Also, ensure that each computer has root authority on the exported file system by using the "root" option.

In the following example, an entry for a four computer partitioned database system is added to the /etc/dfs/dfstab file. The participating computers, ServerB, ServerC, and ServerD, are given permission to mount the file system /db2home, which will be used as the DB2 home file system.

```
share -F nfs -o \  
rw=ServerB.torolab.ibm.com,\  
root=ServerB.torolab.ibm.com \  
  
rw=ServerC.torolab.ibm.com, \  
root=ServerC.torolab.ibm.com\  
  
rw=ServerD.torolab.ibm.com,\  
root=ServerD.torolab.ibm.com \  
-d "homes" /db2home
```

If a computer is known by more than one hostname, all aliases must be included in the /etc/dfs/dfstab file. For example, if ServerB was also known by the name ServerB-tokenring, the entry in the /etc/dfs/dfstab for ServerB appears as follows:

```
rw=ServerB.torolab.ibm.com:ServerB-tokenring.torolab.ibm.com,\
root=ServerB.torolab.ibm.com:ServerB-tokenring.torolab.ibm.com \
```

2. On each of the participating computers, add an entry to the `/etc/vfstab` file to NFS mount the file system automatically at boot time. As in the following example, when you specify the mount point options, ensure that the file system is mounted at boot time, is read-write, is mounted hard, includes the `bg` (background) option, and that `suid` programs can be run properly:

```
ServerA:/db2home - /db2home nfs - yes rw,hard,intr,bg,suid
```

Mounting the DB2 home file system from each participating computer

1. Create and NFS mount the exported file system on each of the participating computers in the partitioned database environment by entering the following commands:

```
mkdir /db2home
mount /db2home
```

If the `mount` command fails, use the `showmount` command to check the status of the NFS server. For example:

```
showmount -e ServerA
```

This `showmount` command should list the file systems which are exported from the computer named `ServerA`. If this command fails, the NFS server may not have been started. To start the server manually, run the following commands as root on the NFS server:

```
/usr/lib/nfs/mountd
/usr/lib/nfs/nfsd -a 16
```

These commands are run automatically at boot time if there are any entries in the `/etc/dfs/dfstab` file. After starting the NFS server, export the NFS file system again by running the following command:

```
sh /etc/dfs/dfstab
```

Ensure that you have completed the following steps:

1. On a single computer in the partitioned database environment, you have created a file system to be used as the instance and home directory.
2. You have exported this file system via NFS.
3. You have mounted the exported file system on each participating computer.

Creating required users (Linux and UNIX)

Creating required users for a DB2 server installation in a partitioned database environment (AIX)

Three users and groups are required to operate a DB2 database. The user and group names used in the following instructions are documented in the following table. You can specify your own user and group names if they adhere to your system naming rules and DB2 naming rules.

If you are planning to use the DB2 Setup wizard to install your DB2 product, the DB2 Setup wizard will create these users for you.

Note: For a **multi partition** install do not use the Setup wizard to create these users and groups. Follow the prerequisites and create the users and groups before running the Setup wizard.

Table 11. Required users and groups

Required user	User name	Group name
Instance owner	db2inst1	db2iadm1
Fenced user	db2fenc1	db2fadm1
DB2 administration server user	dasusr1	dasadm1

If the DB2 administration server user is an existing user, this user must exist on all the participating computers before the installation. If the user already exists on the participating computers, the user must have the same primary group.

Prerequisites

- You must have root authority to create users and groups.
- If you manage users and groups with security software, additional steps might be required when defining DB2 users and groups.

Restriction

The user names you create must conform to both your operating system's naming rules, and those of DB2.

To create all three of these users, perform the following steps:

1. Log on to the primary computer.
2. Create a group for the instance owner (for example, db2iadm1), the group that will run UDFs or stored procedures (for example, db2fadm1), and the group that will own the DB2 administration server (for example, dasadm1) by entering the following commands:

```
mkgroup id=999 db2iadm1
mkgroup id=998 db2fadm1
mkgroup id=997 dasadm1
```

3. Create a user that belongs to each group that you created in the previous step using the following commands. The home directory for each user will be the DB2 home directory that you previously created and shared (db2home).

```
mkuser id=1004 pgrp=db2iadm1 groups=db2iadm1 home=/db2home/db2inst1
core=-1 data=491519 stack=32767 rss=-1 fsize=-1 db2inst1
mkuser id=1003 pgrp=db2fadm1 groups=db2fadm1 home=/db2home/db2fenc1
db2fenc1
mkuser id=1002 pgrp=dasadm1 groups=dasadm1 home=/home/dasusr1
dasusr1
```

4. Set an initial password for each user that you created by entering the following commands:

```
passwd db2inst1
passwd db2fenc1
passwd dasusr1
```

5. Log out.
6. Log on to the primary computer as each user that you created (db2inst1, db2fenc1, and dasusr1). You might be prompted to change each user's password because this is the first time that these users have logged onto the system.
7. Log out.
8. Create the exact same user and group accounts on each computer that will participate in your partitioned database environment.

Creating required users for a DB2 server installation in a partitioned database environment (Linux)

Three users and groups are required to operate a DB2 database. The user and group names used in the following instructions are documented in the following table. You can specify your own user and group names if they adhere to your system naming rules and DB2 naming rules.

If you are planning to use the DB2 Setup wizard to install your DB2 product, the DB2 Setup wizard will create these users for you.

Note: For a **multi partition** install do not use the Setup wizard to create these users and groups. Follow the prerequisites and create the users and groups before running the Setup wizard.

Table 12. Required users and groups

Required user	User name	Group name
Instance owner	db2inst1	db2iadm1
Fenced user	db2fenc1	db2fadm1
DB2 administration server user	dasusr1	dasadm1

If the DB2 administration server user is an existing user, this user must exist on all the participating computers before the installation. If the user already exists on the participating computers, the user must have the same primary group.

Prerequisites

- You must have root authority to create users and groups.
- If you manage users and groups with security software, additional steps might be required when defining DB2 users and groups.

Restriction

The user names you create must conform to both your operating system's naming rules, and those of DB2.

To create all three of these users, perform the following steps:

1. Log on to the primary computer.
2. Create a group for the instance owner (for example, db2iadm1), the group that will run UDFs or stored procedures (for example, db2fadm1), and the group that will own the DB2 administration server (for example, dasadm1) by entering the following commands:

```
groupadd -g 999 db2iadm1
groupadd -g 998 db2fadm1
groupadd -g 997 dasadm1
```

Ensure that the specific numbers you are using do not currently exist on any of the machines.

3. Create a user that belongs to each group that you created in the previous step using the following commands. The home directory for each user will be the DB2 home directory that you previously created and shared (db2home).

```
useradd -u 1004 -g db2iadm1 -m -d /db2home/db2inst1 db2inst1
useradd -u 1003 -g db2fadm1 -m -d /db2home/db2fenc1 db2fenc1
useradd -u 1002 -g dasadm1 -m -d /home/dasusr1 dasusr1
```

4. Set an initial password for each user that you created by entering the following commands:


```
passwd db2inst1    passwd db2fenc1    passwd dasusr1
```
5. Log out.
6. Log on to the primary computer as each user that you created (db2inst1, db2fenc1, and dasusr1). You might be prompted to change each user's password because this is the first time that these users have logged onto the system.
7. Log out.
8. Create the exact same user and group accounts on each computer that will participate in your partitioned database environment.

Creating required users for a DB2 server installation in a partitioned database environment (Solaris Operating System)

Three users and groups are required to operate a DB2 database. The user and group names used in the following instructions are documented in the following table. You can specify your own user and group names if they adhere to your system naming rules and DB2 naming rules.

If you are planning to use the DB2 Setup wizard to install your DB2 product, the DB2 Setup wizard will create these users for you.

Note: For a **multi partition** install do not use the Setup wizard to create these users and groups. Follow the prerequisites and create the users and groups before running the Setup wizard.

Table 13. Required users and groups

Required user	User name	Group name
Instance owner	db2inst1	db2iadm1
Fenced user	db2fenc1	db2fadm1
DB2 administration server user	dasusr1	dasadm1

If the DB2 administration server user is an existing user, this user must exist on all the participating computers before the installation. If the user already exists on the participating computers, the user must have the same primary group.

Prerequisites

- You must have root authority to create users and groups.
- If you manage users and groups with security software, additional steps might be required when defining DB2 users and groups.

Restriction

The user names you create must conform to both your operating system's naming rules, and those of DB2.

To create all three of these users, perform the following steps:

1. Log on to the primary computer.
2. Create a group for the instance owner (for example, db2iadm1), the group that will run UDFs or stored procedures (for example, db2fadm1), and the group that will own the DB2 administration server (for example, dasadm1) by entering the following commands:

```
groupadd id=999 db2iadm1
groupadd id=998 db2fadm1
groupadd id=997 dasadm1
```

3. Create a user for each group using the following commands. The home directory for each user will be the DB2 home directory that you previously created and shared (/db2home).

```
useradd -u 1004 -g db2iadm1 -d /db2home/db2inst1 -m db2inst1
useradd -u 1003 -g db2fadm1 -d /db2home/db2fenc1 -m db2fenc1
useradd -u 1002 -g dasadm1 -d /export/home/dasusr1 -m dasusr1
```

4. Set an initial password for each user that you created by entering the following commands:

```
passwd db2inst1    passwd db2fenc1    passwd dasusr1
```

5. Log out.
6. Log on to the primary computer as each user that you created (db2inst1, db2fenc1, and dasusr1). You might be prompted to change each user's password because this is the first time that these users have logged onto the system.
7. Log out.
8. Create the exact same user and group accounts on each computer that will participate in your partitioned database environment.

Chapter 4. Installing your DB2 server product

Installing DB2 servers (Windows)

This task describes how to start the DB2 Setup wizard on Windows. You will use the DB2 Setup wizard to define your installation and install your DB2 database product on your system.

Before you begin

Before you start the DB2 Setup wizard:

- If you are planning on setting up a partitioned database environment, refer to "Setting up a partitioned database environment".
- Ensure that your system meets installation, memory, and disk requirements.
- If you are planning to use LDAP on Windows to register the DB2 server in Active Directory, you should extend the directory schema before you install.
- If you are planning to use the IBM Tivoli Monitoring for Databases: DB2 Agent, before installing your DB2 product see topic "Installing IBM Tivoli Monitoring for Databases: DB2 Agent with the DB2 installer" for details, limitations and restrictions.
- You must have a local Administrator user account with the recommended user rights to perform the installation. In DB2 database servers where LocalSystem can be used as the DAS and DB2 instance user and you are not using the database partitioning feature, a non-administrator user with elevated privileges can perform the installation.

Note: If a non-Administrator user account is going to do the product installation, then the VS2005 runtime library must be installed before attempting to install a DB2 database product. The VS2005 runtime library is needed on the operating system before the DB2 database product can be installed. The VS2005 runtime library is available from the Microsoft runtime library download web site. There are two choices: choose `vcredist_x86.exe` for 32-bit systems or `vcredist_x64.exe` for 64-bit systems.

- Although not mandatory, it is recommended that you close all programs so that the installation program can update any files on the computer without requiring a reboot.
- Installing DB2 products from a virtual drive or an unmapped network drive (such as `\\hostname\sharename` in Windows Explorer) is not supported. Before attempting to install DB2 products, you must map the network drive to a Windows drive letter (for example, Z:).

Restrictions

- You cannot have more than one instance of the DB2 Setup wizard running in any user account.
- The DB2 copy name and the instance name cannot start with a numeric value. The DB2 copy name is limited to 64 English characters consisting of the characters A-Z, a-z and 0-9.
- The DB2 copy name and the instance name must be unique among all DB2 copies.

- The use of XML features is restricted to a database that has only one database partition.
- No other DB2 database product can be installed in the same path if one of the following is already installed:
 - IBM Data Server Runtime Client
 - IBM Data Server Driver Package
 - *DB2 Information Center*
- The DB2 Setup wizard fields do not accept non-English characters.
- If you enable extended security on Windows Vista or Windows 2008, or higher, users must belong to the DB2ADMNS or DB2USERS group to run local DB2 commands and applications because of an extra security feature (User Access Control) that limits the privileges that local administrators have by default. If users do not belong to one of these groups, they will not have read access to local DB2 configuration or application data.

Procedure

To start the DB2 Setup wizard:

1. Log on to the system with the local Administrator account that you have defined for the DB2 installation.
2. If you have the DB2 database product DVD, insert it into the drive. If enabled, the autorun feature automatically starts the DB2 Setup Launchpad. If the autorun does not work, use Windows Explorer to browse the DB2 database product DVD and double-click on the setup icon to start the DB2 Setup Launchpad.
3. If you downloaded the DB2 database product from passport advantage, run the executable file to extract the DB2 database product installation files. Use Windows Explorer to browse the DB2 installation files and double-click on the setup icon to start the DB2 Setup Launchpad.
4. From the DB2 Setup launchpad, you can view installation prerequisites and the release notes, or you can proceed directly to the installation. You may want to review the installation prerequisites and release notes for late-breaking information.
5. Click **Install a Product** and the Install a Product window will display the products available for installation.

If you have no existing DB2 database products installed on your computer, launch the installation by clicking **Install New**. Proceed through the installation following the DB2 Setup wizard's prompts.

If you have at least one existing DB2 database product installed on your computer, you can:

- Click **Install New** to create a new DB2 copy.
 - Click **Work with Existing** to update an existing DB2 copy, to add function to an existing DB2 copy, upgrade an existing DB2 Version 8, Version 9.1, or Version 9.5 copy, or to install an add-on product.
6. The DB2 Setup wizard will determine the system language, and launch the setup program for that language. Online help is available to guide you through the remaining steps. To invoke the online help, click **Help** or press **F1**. You can click **Cancel** at any time to end the installation.

Results

Your DB2 database product will be installed, by default, in the *Program_Files\IBM\sqlib* directory, where *Program_Files* represents the location of the Program Files directory.

If you are installing on a system where this directory is already being used, the DB2 database product installation path will have *_xx* added to it, where *xx* are digits, starting at 01 and increasing depending on how many DB2 copies you have installed.

You can also specify your own DB2 database product installation path.

What to do next

- Verify your installation.
- Perform the necessary post-installation tasks.

For information on errors encountered during installation, review the installation log file located in the *My Documents\DB2LOG* directory. The log file uses the following format: *DB2-ProductAbbrrev-DateTime.log*, for example, *DB2-ESE-Tue Apr 04 17_04_45 2008.log*.

If this is a new DB2 product installation on Vista 64-bit, and you will use a 32-bit OLE DB provider, you must manually register the *IBMDADB2* DLL. To register this DLL, run the following command:

```
c:\windows\SysWOW64\regsvr32 /s c:\Program_Files\IBM\SQLLIB\bin\ibmdadb2.dll
```

where *Program_Files* represents the location of the Program Files directory.

If you want your DB2 database product to have access to DB2 documentation either on your local computer or on another computer on your network, then you must install the *DB2 Information Center*. The *DB2 Information Center* contains documentation for the DB2 database system and DB2 related products. By default, DB2 information will be accessed from the web if the *DB2 Information Center* is not locally installed.

DB2 Express Edition and DB2 Workgroup Server Edition memory limits

If you are installing DB2 Express Edition, the maximum allowed memory for the instance is 4 GB.

If you are installing DB2 Workgroup Server Edition, the maximum allowed memory for the instance is 16 GB.

The amount of memory allocated to the instance is determined by the **INSTANCE_MEMORY** database manager configuration parameter.

Important notes when upgrading from Versions 9.1 or 9.5:

- If the memory configuration for your Version 9.1 DB2 database product exceeds the allowed limit, the DB2 database product might not start after upgrading to the current version.
- The self tuning memory manager will not increase your overall instance memory limit beyond the license limits.

Installing DB2 servers using the DB2 Setup wizard (Linux and UNIX)

This task describes how to start the DB2 Setup wizard on Linux and UNIX operating systems. The DB2 Setup wizard is used to define your installation preferences and to install your DB2 database product on your system.

Before you begin

Before you start the DB2 Setup wizard:

- If you are planning on setting up a partitioned database environment, see how to do this by following the related link at the bottom of this topic.
- Ensure that your system meets installation, memory, and disk requirements.
- Ensure you have a supported browser installed (Firefox 2.0+, Mozilla 1.7+, or SeaMonkey 1.1.4).
- You can install a DB2 server using either root or non-root authority. For more information on non-root installation, see the related links.
- The DB2 database product image must be available. You can obtain a DB2 installation image either by purchasing a physical DB2 database product DVD, or by downloading an installation image from Passport Advantage.
- If you are installing a non-English version of a DB2 database product, you must have the appropriate National Language Packages.
- The DB2 Setup wizard is a graphical installer. You must have X windows software capable of rendering a graphical user interface for the DB2 Setup wizard to run on your machine. Ensure that the X windows server is running. Ensure that you have properly exported your display. For example, export `DISPLAY=9.26.163.144:0`.

| **Note:** This step only applies if you are exporting the display of the Setup
| wizard from another machine onto your local computer. Depending how both
| machines are connected, the example use of `export` above may require that you
| modify the command as follows: `export DISPLAY=9.26.163.144:0:0`.

- If you are using security software in your environment, you must manually create required DB2 users before you start the DB2 Setup wizard.
- If you are planning to use the IBM Tivoli Monitoring for Databases: DB2 Agent, before installing your DB2 product see topic “Installing IBM Tivoli Monitoring for Databases: DB2 Agent with the DB2 installer” for details, limitations and restrictions.

Restrictions

- You cannot have more than one instance of the DB2 Setup wizard running in any user account.
- The use of XML features is restricted to a database that is defined with the code set UTF-8 and has only one database partition.
- The DB2 Setup wizard fields do not accept non-English characters.

Procedure

To start the DB2 Setup wizard:

1. If you have a physical DB2 database product DVD, change to the directory where the DB2 database product DVD is mounted by entering the following command:

```
cd /dvdrom
```


where */dodrom* represents the mount point of the DB2 database product DVD.

2. If you downloaded the DB2 database product image, you must extract and untar the product file.
 - a. Extract the product file:

```
gzip -d product.tar.gz
```

where *product* is the name of the product that you downloaded.

- b. Untar the product file:

On Linux operating systems

```
tar -xvf product.tar
```

On AIX, HP-UX, and Solaris operating systems

```
guntar -xvf product.tar
```

where *product* is the name of the product that you downloaded.

- c. Change directory:

```
cd ./product
```

where *product* is the name of the product that you downloaded.

Note: If you downloaded a National Language Package, untar it into the same directory. This will create the subdirectories (for example *./nlpack*) in the same directory, and allows the installer to automatically find the installation images without prompting.

3. Enter the *./db2setup* command from the directory where the database product image resides to start the DB2 Setup wizard.
4. The IBM DB2 Setup Launchpad opens. From this window, you can view installation prerequisites and the release notes, or you can proceed directly to the installation. You can also review the installation prerequisites and release notes for late-breaking information.
5. Click **Install a Product** and the **Install a Product** window will display the products available for installation.

Launch the installation by clicking **Install New**. Proceed through the installation following the DB2 Setup wizard's prompts.

Once you have initiated the installation, proceed through the DB2 Setup wizard installation panels and make your selections. Installation help is available to guide you through the remaining steps. To invoke the installation help, click **Help** or press F1. You can click **Cancel** at any time to end the installation.

Results

For non-root installations, DB2 database products are always installed in the *\$HOME/sqllib* directory, where *\$HOME* represents the non-root user's home directory.

For root installations, DB2 database products are installed, by default, in one of the following directories:

AIX, HP-UX, and Solaris

```
/opt/IBM/db2/V9.7
```

Linux /opt/ibm/db2/V9.7

If you are installing on a system where this directory is already being used, the DB2 database product installation path will have `_xx` added to it, where `_xx` are digits, starting at 01 and increasing depending on how many DB2 copies you have installed.

You can also specify your own DB2 database product installation path.

DB2 installation paths have the following rules:

- Can include lowercase letters (a–z), uppercase letters (A–Z), and the underscore character (`_`)
- Cannot exceed 128 characters
- Cannot contain spaces
- Cannot contain non-English characters

The installation log files are:

- The DB2 setup log file. This file captures all DB2 installation information including errors.
 - For root installations, the DB2 setup log file name is `db2setup.log`.
 - For non-root installations, the DB2 setup log file name is `db2setup_username.log`, where *username* is the non-root user ID under which the installation was performed.
- The DB2 error log file. This file captures any error output that is returned by Java (for example, exceptions and trap information).
 - For root installations, the DB2 error log file name is `db2setup.err`.
 - For non-root installations, the DB2 error log file name is `db2setup_username.err`, where *username* is the non-root user ID under which the installation was performed.

By default, these log files are located in the `/tmp` directory. You can specify the location of the log files.

There is no longer a `db2setup.his` file. Instead, the DB2 installer saves a copy of the DB2 setup log file in the `DB2_DIR/install/logs/` directory, and renames it `db2install.history`. If the name already exists, then the DB2 installer renames it `db2install.history.xxxx`, where `xxxx` is 0000-9999, depending on the number of installations you have on that machine.

Each installation copy has a separate list of history files. If an installation copy is removed, the history files under this install path will be removed as well. This copying action is done near the end of the installation and if the program is stopped or aborted before completion, then the history file will not be created.

What to do next

- Verify your installation.
- Perform the necessary post-installation tasks.

National Language Packs can also be installed by running the `./db2setup` command from the directory where the National Language Pack resides, after a DB2 database product has been installed.

On Linux x86, if you want your DB2 database product to have access to DB2 documentation either on your local computer or on another computer on your

network, then you must install the *DB2 Information Center*. The *DB2 Information Center* contains documentation for the DB2 database system and DB2 related products.

DB2 Express Edition and DB2 Workgroup Server Edition memory limits

If you are installing DB2 Express Edition, the maximum allowed memory for the instance is 4 GB.

If you are installing DB2 Workgroup Server Edition, the maximum allowed memory for the instance is 16 GB.

The amount of memory allocated to the instance is determined by the `INSTANCE_MEMORY` database manager configuration parameter.

Important notes when upgrading from Versions 9.1 or 9.5:

- If the memory configuration for your Versions 9.1 or 9.5 DB2 database product exceeds the allowed limit, the DB2 database product might not start after upgrading to the current version.
- The self tuning memory manager will not increase your overall instance memory limit beyond the license limits.

Setting up a partitioned database environment

This topic describes how to set up a partitioned database environment. You will use the DB2 Setup wizard to install your instance-owning database server and to create the response files that will in turn be used to create your participating database servers.

Note: A partitioned database environment is not supported in non-root installations.

A database partition is part of a database that consists of its own data, indexes, configuration files, and transaction logs. A partitioned database is a database with two or more partitions.

Prerequisites

- Ensure that you have the InfoSphere Warehouse Activation CD license key that will need to be copied over to all participating computers.
- The same number of consecutive ports must be free on each computer that is to participate in the partitioned database environment. For example, if the partitioned database environment will be comprised of four computers, then each of the four computers must have the same four consecutive ports free. During instance creation, a number of ports equal to the number of logical partitions on the current server will be reserved in the `/etc/services` on Linux and UNIX and in the `%SystemRoot%\system32\drivers\etc\services` on Windows. These ports will be used by the Fast Communication Manager. The reserved ports will be in the following format:

```
DB2_InstanceName
DB2_InstanceName_1
DB2_InstanceName_2
DB2_InstanceName_END
```

The only mandatory entries are the beginning (`DB2_InstanceName`) and ending (`DB2_InstanceName_END`) ports. The other entries are reserved in the services file so that other applications do not use these ports

- To support multiple participating DB2 database servers, the computer on which you want to install DB2 must belong to an accessible domain.

However, you can add local partitions to this computer even though the computer doesn't belong to a domain.

- On Linux and UNIX systems, a remote shell utility is required for partitioned database systems. DB2 supports the following remote shell utilities:
 - rsh
 - ssh

By default, DB2 uses rsh when executing commands on remote DB2 nodes, for example, when starting a remote DB2 database partition. To use the DB2 default, the rsh-server package must be installed. For more information about security issues when installing DB2 products, see the Related Links.

If you choose to use the rsh remote shell utility, inetd (or xinetd) must be installed and running as well. If you choose to use the ssh remote shell utility, you need to set the DB2RSHCMD registry variable immediately after the DB2 installation is complete. If this registry variable is not set, rsh is used.

- On Linux and UNIX operating systems, ensure the hosts file under the etc directory does not contain an entry for “127.0.0.2” if that IP address maps to the fully qualified hostname of the machine.

To set up a partitioned database environment:

1. Install your instance-owning database server using the DB2 Setup wizard. For detailed instructions, see the appropriate “Installing DB2 servers” topic for your platform.
 - On the **Select installation, response files creation, or both** window, ensure that you select the **Save my installation settings in a response files** option. After the installation has completed, two files will be copied to the directory specified in the DB2 Setup wizard: PROD_ESE.rsp and PROD_ESE_addpart.rsp. The PROD_ESE.rsp file is the response file for instance-owning database servers. The PROD_ESE_addpart.rsp file is the response file for participating database servers.
 - On the **Set up partitioning options for the DB2 instance** window, ensure that you select **Multiple partition instance**, and enter the maximum number of logical partitions.
2. Make the DB2 install image available to all participating computers in the partitioned database environment.
3. Distribute the participating database servers response file (PROD_ESE_addpart.rsp).
4. Install a DB2 database server on each of the participating computers using the db2setup command on Linux and UNIX, or the setup command on Windows:

Linux and UNIX

Go to the directory where the DB2 product code is available and run:

```
./db2setup -r /responsefile_directory/response_file_name
```

Windows

```
setup -u x:\responsefile_directory\response_file_name
```

For example, here is the command using the PROD_ESE_addpart.rsp as the response file:

Linux and UNIX

Go to the directory where the DB2 product code is available and run:

```
./db2setup -r /db2home/PROD_ESE_addpart.rsp
```

where /db2home is the directory where you have copied the response file.

Windows

```
setup -u c:\resp_files\PROD_ESE_addpart.rsp
```

where c:\resp_files\ is the directory where you have copied the response file.

5. (Linux and UNIX only) Configure the db2nodes.cfg file. The DB2 installation only reserves the maximum number of logical partitions you want to use for the current computer, but does not configure the db2nodes.cfg file. If you do not configure the db2nodes.cfg file, the instance is still a single partitioned instance.
6. Update the services file on the participating servers to define the corresponding FCM port for the DB2 instance. The services file is in the following location:
 - /etc/services on Linux and UNIX
 - %SystemRoot%\system32\drivers\etc\services on Windows
7. For partitioned database environments on Windows 2000 or later, start the DB2 Remote Command Service security feature to protect your data and resources. To be fully secure, start either the computer (if the service is running under the context of the LocalSystem account) or a user for delegation (if the service is being run under the logon context of a user). To start the DB2 Remote Command Service security feature:
 - a. Open the Active Directory Users and Computers window on the domain controller, click **Start** and select **Programs** → **Administrative tools** → **Active Directory Users and Computers**
 - b. In the right window panel, right-click the computer or user to start, select **Properties**
 - c. Click the **General** tab and select the **Trust computer for delegation** check box. For user setting, click the **Account** tab and select the **Account is trusted for delegation** check box in the **Account option** group. Ensure that the **Account is sensitive and cannot be delegated** box has not been checked.
 - d. Click **OK** to start the computer or user for delegation.Repeat these steps for each computer or user that needs to be started. You must restart your computer for the security change to take effect.

Creating a response file using the DB2 Setup wizard

You can create a response file using the DB2 Setup wizard based on the installation you are performing. This response file will be generated based on your DB2 Setup wizard selections. You can then use the response file to perform an unattended installation using the same settings.

To create a response file using the DB2 Setup wizard:

1. From the DB2 Setup launchpad, select **Install New** for the product you want to install, or, select **Work with Existing** to select the DB2 copy you want to work with.
2. Select the product or DB2 copy you want to install and click **Next** to start the DB2 Setup wizard.
3. Click **Next** on the Welcome page and accept the license agreement terms.

4. In the **Select the installation type** window, select from Typical, Compact or Custom installation.
5. In the **Select the installation, response file creation, or both** window, select either the **Save my installation setting in a response file** option or the **Install product on this computer and save my settings in a response file** option. Then, in the **Response file name** field type the path where you want the DB2 Setup wizard to place the generated response file. By default, the response file name is *Prod_<abbrev>.rsp*, and is saved in *directory1*.

Note:

- a. If you select the **Save my installation setting in a response file** option, no software is installed on the computer, only the response file is created with the name specified in the **Response file name** field.
 - b. If you select a partitioned database installation, two response files will be generated, one for the instance-owning computer and one for the participating computers. The participating computer response file name is generated based on the name of the instance-owning computer. By default, the partition response file name is *Prod_<abbrev>_addpart.rsp*, and is saved in *directory2*.
6. Proceed through the rest of the installation panels selecting the options you want.
 7. In the **Start copying files and create response file** window, review the settings you selected.
 8. To install the product, click **Finish**.
 9. When the installation has completed, the DB2 Setup wizard will have placed the generated response file in the path you specified. When the DB2 Setup wizard is used to create the response file, a special keyword ENCRYPTED is added to the response file. For example:

```
DAS_PASSWORD = 07774020164457377565346654170244883126985535505156353
ENCRYPTED = DAS_PASSWORD
```

The keyword ENCRYPTED indicates the actual value of the password is not the sequence of numbers shown.

Installing database partition servers on participating computers using a response file (Linux and UNIX)

In this task you will use the response file you created using the DB2 Setup wizard to install database partition servers on participating computers.

Prerequisites

- You have installed DB2 on the primary computer using the DB2 Setup wizard and have created a response file for installing on participating computers.
- You must have root authority on participating computers.

To install additional database partition servers using a response file:

1. As root, log on to a computer that will participate in the partitioned database environment.
2. Change to the directory where you copied the contents of the DB2 product DVD. For example:

```
cd /db2home/db2dvd
```
3. Enter the db2setup command as follows:

```
./db2setup -r /responsefile_directory/response_file_name
```

In our example, the response file, `AddPartitionResponse.file`, was saved to the `/db2home` directory. The command for our example, is:

```
./db2setup -r /db2home/AddPartitionResponse.file
```

4. Check the messages in the log file when the installation finishes.

You must log onto each participating computer and perform a response file installation.

If you want your DB2 product to have access to DB2 documentation either on your local computer or on another computer on your network, then you must install the DB2 Information Center. The DB2 Information Center contains documentation for the DB2 database system and DB2 related products.

Applying DB2 licenses

To license your product, register the appropriate license key with your DB2 database product.

If you want the license key added automatically during product installation, copy the license key to the `/db2/license` directory of the installation image before launching the DB2 Setup wizard.

To use DB2 features or to be in compliance with your current product entitlement, you might be required to register additional license keys.

For example, ensure you add the `db2ese_c.lic` or `db2ese_u.lic` licence files to the `/db2/license` directory of the installation image before installing DB2 Enterprise Server Edition. If you do not add any license files to the `/db2/license` directory, you will see a “License not registered” message in the output from the `db2licm -l` command or in the License Center. You can apply the licenses manually after the installation by running the `db2licm -a` command.

If you register a valid license key, the `db2licm -l` command will successfully list all the products with available license information.

Part 2. Installing a Common Criteria compliant environment

Chapter 5. Installing single-partition Common Criteria compliant environments

The following topics describe how to install single-partition Common Criteria compliant environments.

The following platforms are supported:

- AIX 6
- SuSe Linux Enterprise Server 10
- Solaris 10
- Red Hat Enterprise Linux 5

Installing DB2 Enterprise 9.7 for a single-partition Common Criteria compliant installation

This task provides detailed instructions on installing DB2 Enterprise 9.7 for a Common Criteria compliant installation.

Prerequisites

- The prerequisites listed in “Installation requirements for DB2 servers and IBM data server clients” must be met. Instructional pages for each platform are listed in the table below:

Table 14.

Platform	Page
AIX 6	“Installation requirements for DB2 servers and IBM data server clients (AIX)” on page 16
SuSe Linux Enterprise Server 10	“Installation requirements for DB2 servers and IBM data server clients (Linux)” on page 17
Solaris 10	“Installation requirements for DB2 servers and IBM data server clients (Solaris)” on page 21
Red Hat Enterprise Linux 5	“Installation requirements for DB2 servers and IBM data server clients (Linux)” on page 17

- The computer on which you install DB2 must be physically protected from untrusted users.
- One of the following must be installed on the computer:
 - AIX 6
 - SuSe Linux Enterprise Server 10
 - Solaris 10
 - Red Hat Enterprise Linux 5
- You must have the user names to be used for the following:
 - The DB2 instance owner
 - The DB2 Administration Server

If you do not have these user names, obtain them from your system administrator. For information about creating these users, see “Creating group and user IDs for a DB2 database installation (Linux and UNIX)” on page 29. For more information about these users, see “DB2 users and groups (Linux and UNIX)” on page 24.

The topic “Installing DB2 servers using the DB2 Setup wizard (Linux and UNIX)” on page 52 provides an overview of installing on Linux and UNIX-based platforms.

Procedure

Use the following steps to install DB2 Enterprise 9.7 for a Common Criteria compliant environment.

1. Log on to the system as a user with root authority.
2. Insert the DB2 Enterprise Server Edition 9.7 DVD.
3. Change to the media directory where the DB2 Enterprise Server Edition 9.7 DVD resides. The ese directory contains the `./db2setup` command. Change to this directory.
4. Issue the `./db2setup` command to open the IBM DB2 Setup Launchpad at the Welcome page:

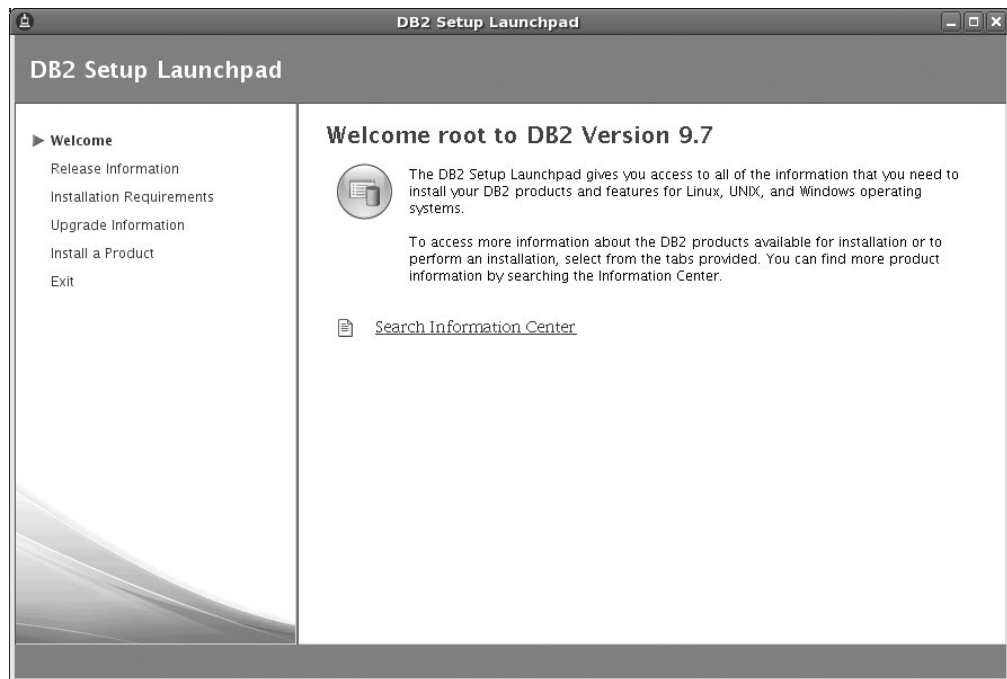


Figure 1. Welcome page of the DB2 Setup Launchpad

5. On the “Welcome page of the IBM DB2 Setup Launchpad”, click **Install a Product** to open the “Install a Product” page.

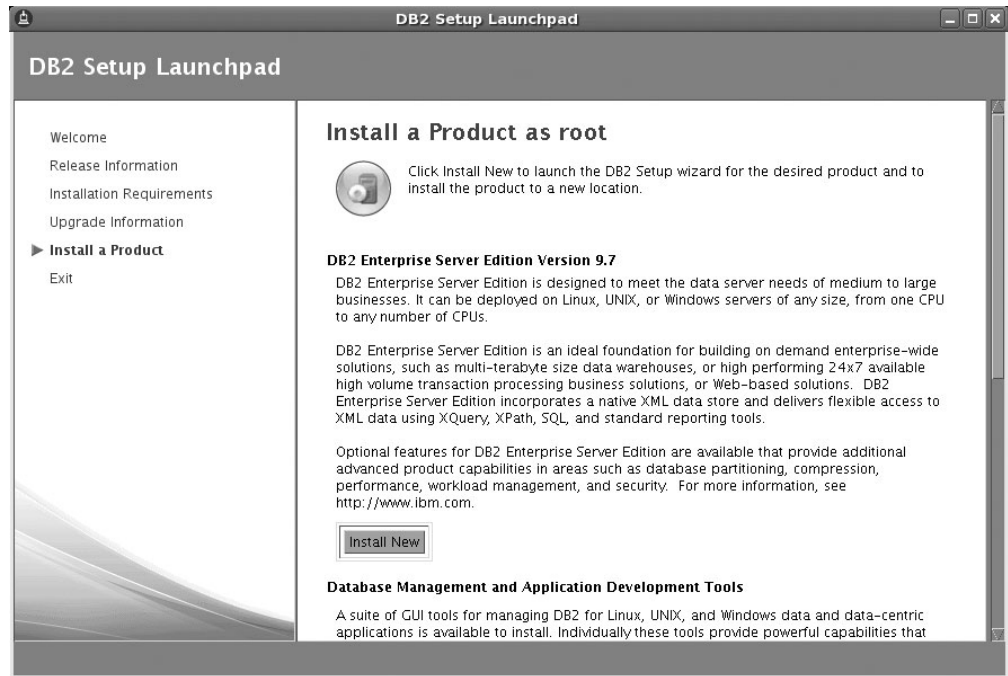


Figure 2. Install a Product page of the DB2 Setup Launchpad

Note: Ensure that there are no previous copies of DB2 installed. If the **Work with existing** button appears then you must remove your existing copy of DB2 before proceeding with the installation.

- On the “Install a Product” page of the IBM DB2 Setup Launchpad, click the **Install New** button for **DB2 Enterprise Server Edition Version 9.7**. The DB2 Setup wizard opens.



Figure 3. DB2 Setup wizard

7. Click **Next**. The “Software License Agreement” page opens.
8. On the “Software License Agreement” page:
 - a. After reviewing and agreeing to the license text, select the **Accept** radio button.
 - b. Click **Next**. The “Select the installation type” page opens.
9. On the “Select the installation type” page:
 - a. Select the **Custom** radio button.
 - b. Click **Next**. The “Select installation, response file creation, or both page” opens.
10. On the “Select installation, response file creation, or both” page:
 - a. Select the **Install DB2 Enterprise Server Edition on this computer** radio button.
 - b. Click **Next**. The “Select the features to install” page opens.
11. On the “Select the features to install” page:
 - a. Open the + beside the **Client support** feature.
 - b. Deselect the **DB2 LDAP support** feature to remove the check mark.

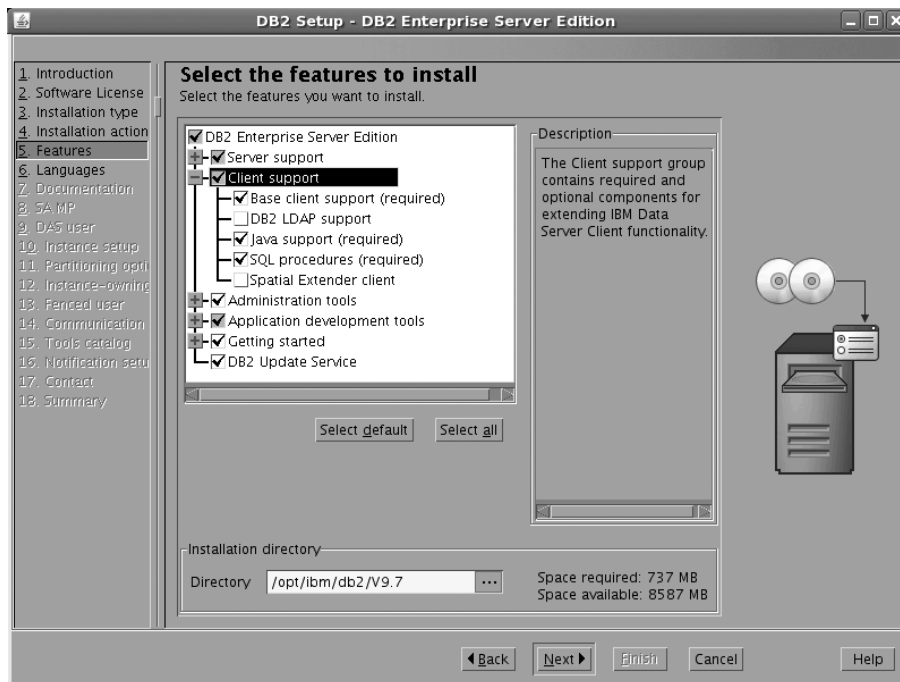


Figure 4. DB2 Setup wizard - Select the features to install page; DB2 LDAP support feature deselected for installation

- c. Open the + beside **Administration tools**
- d. Ensure that the **DB2 Instance Setup wizard** features is deselected for installation.

Note: For **SuSe users** and **Red Hat users**, the following additional step is required:

- Deselect the **Control Center** feature under **Administration tools**.
- e. Open the + beside **Application development tools**.
 - f. Select **Base application development tools**.
 - g. Open the + beside **Getting started**.

- h. Ensure that the **First Steps** feature is deselected for installation.

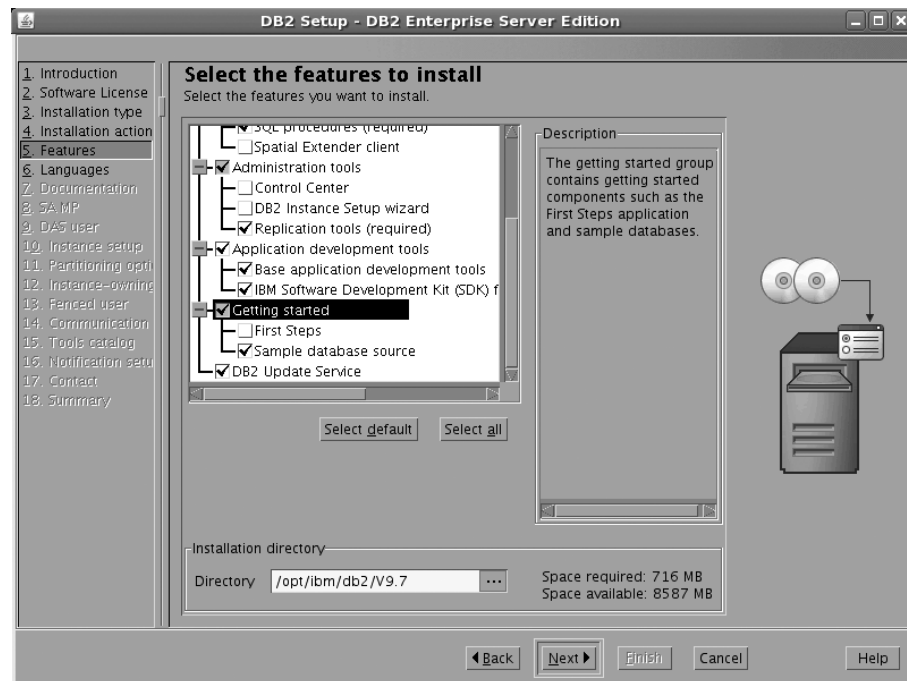


Figure 5. DB2 Setup wizard - Select the features to install page; First steps feature deselected for installation

- i. Click **Next**. The “Select the languages to install” page opens.
 - 12. On the “Select the languages to install” page, English is the only language support that is installed by default.
 - a. Click **Next**. The “Specify the location of the DB2 Information Center” page opens.
 - 13. On the “Specify the location of the DB2 Information Center” page:
 - a. Ensure that the **On the IBM Web site** radio button is selected.
 - b. Click **Next**. The “Install the IBM Tivoli® System Automation for Multiplatforms (SA MP)” page opens.
 - 14. On the “Install the IBM Tivoli System Automation for Multiplatforms (SA MP)” page:
 - a. Ensure that the **Do not install SA MP** radio button is selected.
 - b. Click **Next**. The “Set user information for the DB2 Administration Server” page opens.
 - 15. On the “Set user information for the DB2 Administration Server” page:
 - a. Select the **Existing user** radio button.
 - b. Use the Ellipsis button (...) to select the group and user previously defined for the DB2 Administration Server.
- Note:** If you did not already create the required users and groups outlined in “Creating group and user IDs for a DB2 database installation (Linux and UNIX)” on page 29 then select the **New User** radio button. Default user and group IDs have been defined. Set and confirm a new password for the user.
- c. Click **Next**. The “Set up a DB2 instance” page opens.
 - 16. On the “Set up a DB2 instance” page:

- a. Ensure that the **Create a DB2 instance** radio button is selected.
 - b. Click **Next**. The “Set up partitioning options for the DB2 instance” page opens.
17. On the “Set up partitioning options for the DB2 instance” page:
- a. Ensure that the **Single partition instance** radio button is selected.
 - b. Click **Next**. The “Set user information for the DB2 instance owner” page opens.
18. On the “Set user information for the DB2 instance owner” page:
- a. Select the **Existing user** radio button.
 - b. Use the Ellipsis button (...) to select the group and user previously defined for the DB2 instance owner.

Note: If you did not already create the required users and groups outlined in “Creating group and user IDs for a DB2 database installation (Linux and UNIX)” on page 29 then select the **New User** radio button. Default user and group IDs have been defined. Set and confirm a new password for the user.

- c. Click **Next**. The “Set user information for the fenced user” page opens.
19. On the “Set user information for the fenced user” page:
- a. Select the **Existing user** radio button.
 - b. Use the Ellipsis button (...) to select the group and user previously defined for the fenced user.

Note: If you did not already create the required users and groups outlined in “Creating group and user IDs for a DB2 database installation (Linux and UNIX)” on page 29 then select the **New User** radio button. Default user and group IDs have been defined. Set and confirm a new password for the user.

- c. Click **Next**. The “Configure instance communication and startup” page opens.
20. On the “Configure instance communication and startup” page:
- a. Click the **Configure** radio button.
 - b. Ensure that the **Autostart the instance at system startup** check box is deselected.
 - c. Click **Next**. The “Prepare the DB2 tools catalog” page opens.
21. On the “Prepare the DB2 tools catalog” page:
- a. Ensure the **Do not prepare the DB2 tools catalog** radio button is selected.
 - b. Click **Next**. The “Set up notifications” page opens.
22. On the “Set up notifications” page:
- a. Ensure that the **Do not set up your DB2 server to send notifications at this time** radio button is selected.
 - b. Click **Next**. The “Start copying files” page opens.
23. On the “Start copying files” page:
- a. Review the current settings.

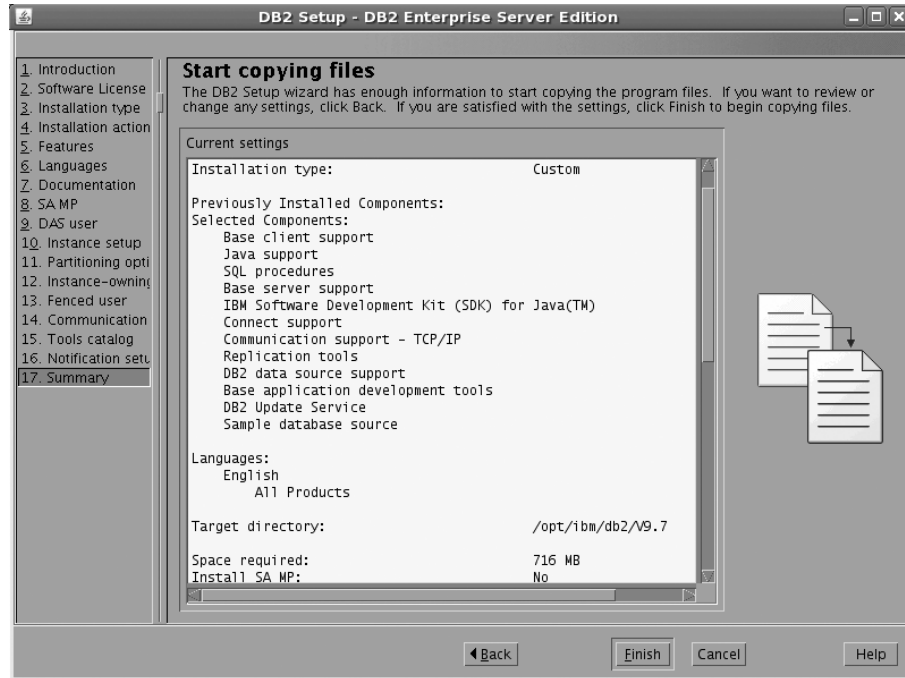


Figure 6. DB2 Setup wizard - Start copying files (top)

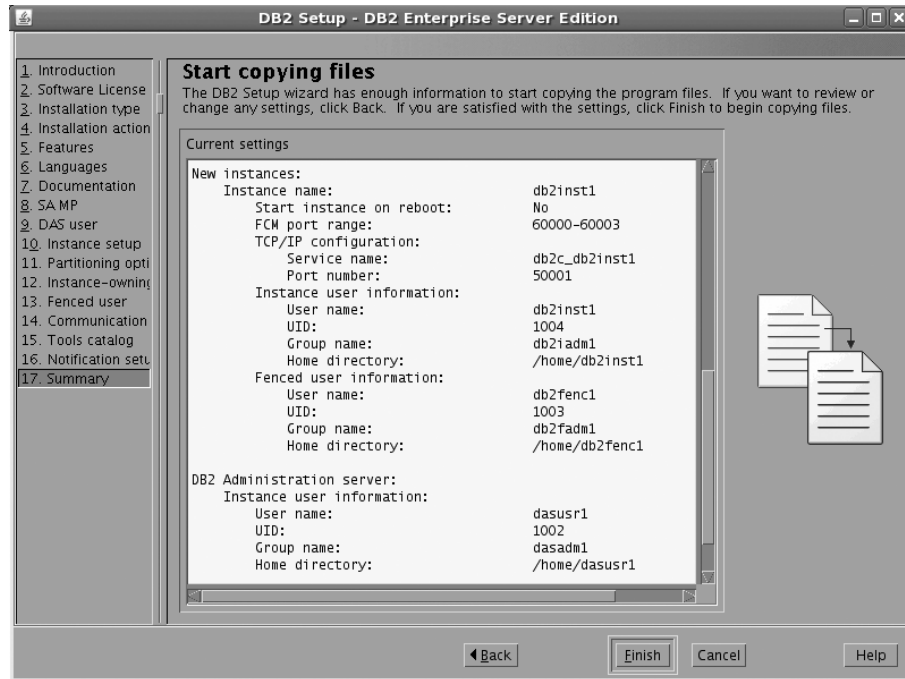


Figure 7. DB2 Setup wizard - Start copying files (bottom)

- b. Click **Finish** to begin installing DB2 on your computer. The “Installing DB2 Enterprise Server Edition Version 9.7” page opens. Installation time may take up to a few minutes depending on your computer.
- c. When the installation completes, the “Setup Complete” page opens. Scroll to review the Post-install steps.

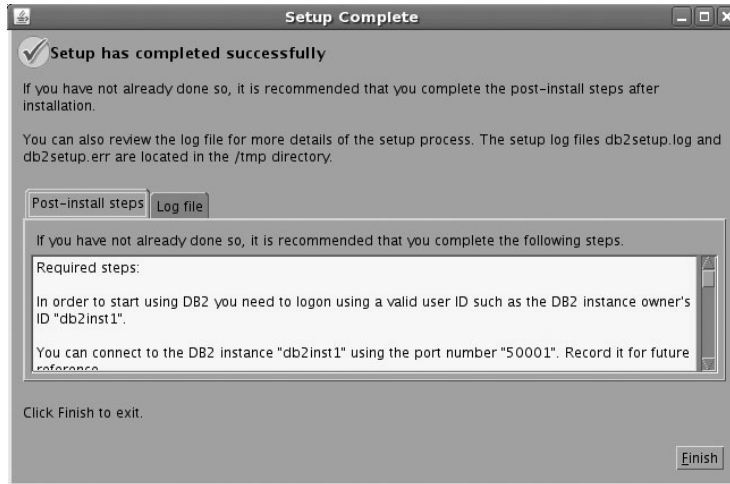


Figure 8. Setup complete page (top)

Note: Be sure to record the port number that you use to connect to the DB2 instance.

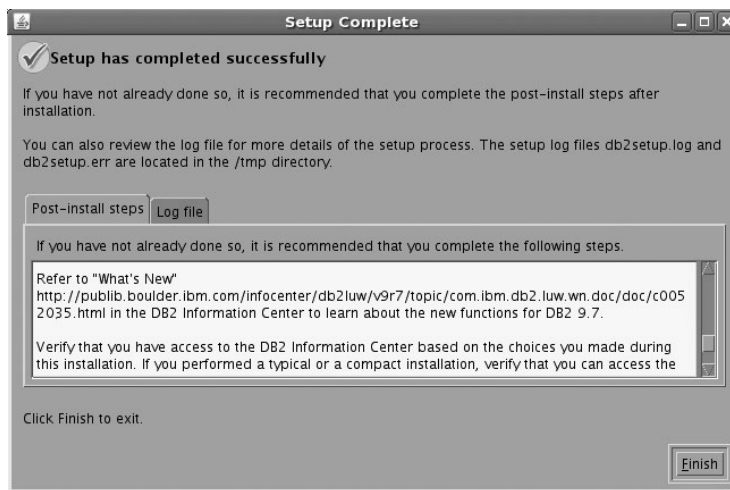


Figure 9. Setup complete page (bottom)

- d. Click **Finish** to exit from the installation GUI.
24. Activate the license files. See the topic “Registering a DB2 product or feature license key using the db2licm command” on page 114.

After DB2 Enterprise 9.7 is installed, see the topic on configuring DB2 to be Common Criteria compliant in the *IBM DB2 Common Criteria Certification: Administration and User Documentation* book.

Installing DB2 Enterprise 9.7 on Windows Server 2003 for a single partition Common Criteria compliant installation

This task provides detailed instructions on installing DB2 Enterprise 9.7 on Windows Server 2003 for a Common Criteria compliant installation.

Prerequisites

- The prerequisites listed in “Installation requirements for DB2 servers and IBM data server clients (Windows)” on page 7 must be met.
- Windows Server 2003 must be installed on your computer.
- Windows Server 2003 must be configured to disable remote access services (such as terminal server and file system shares) before DB2 is installed. For information on performing this task, refer to the operating system documentation
- The computer on which you install DB2 must be physically protected from untrusted users.
- The domain name.
- You must have the user names to be used for the following:
 - The DB2 instance owner
 - The DB2 Administration Server

If you do not have these user names, obtain them from your system administrator. For more information about these users, see “Required user accounts for installation of DB2 server products (Windows)” on page 10.

The topic “Installing DB2 servers (Windows)” on page 49 provides an overview of installing on Windows.

Procedure

To install DB2 Enterprise Server Edition on Windows Server 2003 for a Common Criteria compliant installation.

1. Insert the IBM DB2 Enterprise Server Edition 9.7 DVD. If enabled, an auto-run feature automatically starts the IBM DB2 Setup Launchpad at the Welcome page:

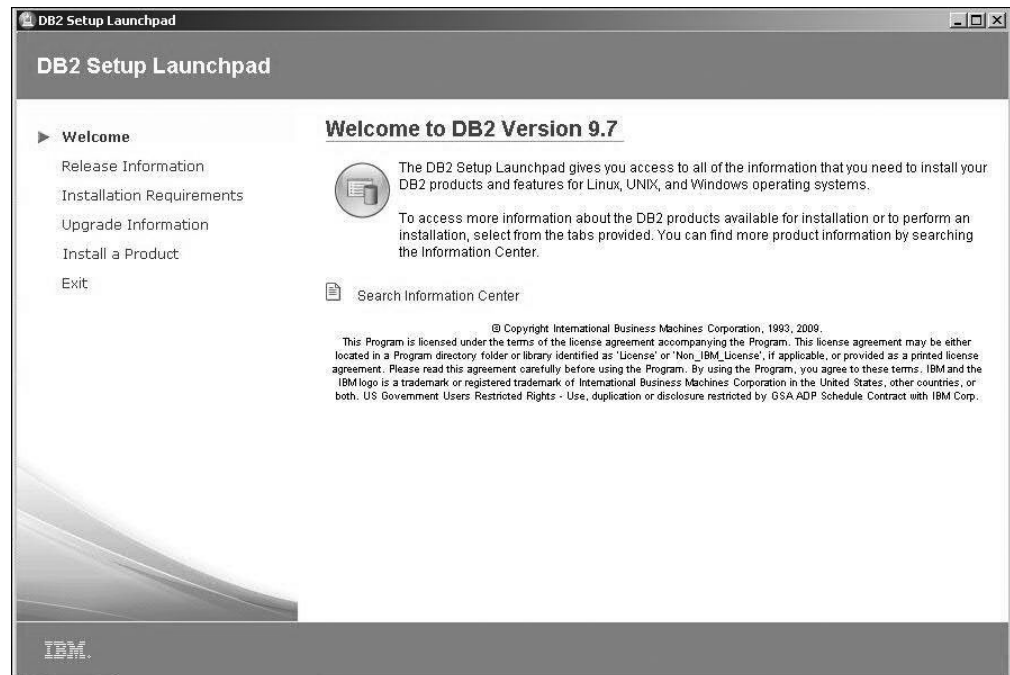


Figure 10. Welcome page of the DB2 Setup Launchpad

If the setup program failed to auto-start, you can start the DB2 Setup wizard manually.

To start the DB2 Setup wizard manually:

- Change to the media directory where the DB2 Enterprise Server Edition 9.7 DVD resides. To do this, click **Start**, open “My Computer”, and double-click on the icon with type “DVD Drive” to access the DVD directory
 - Double-click the **setup.exe** file to open the IBM DB2 Setup Launchpad at the Welcome page.
2. On the “Welcome page of the IBM DB2 Setup Launchpad”, click **Install a Product** to open the “Install a Product” page.

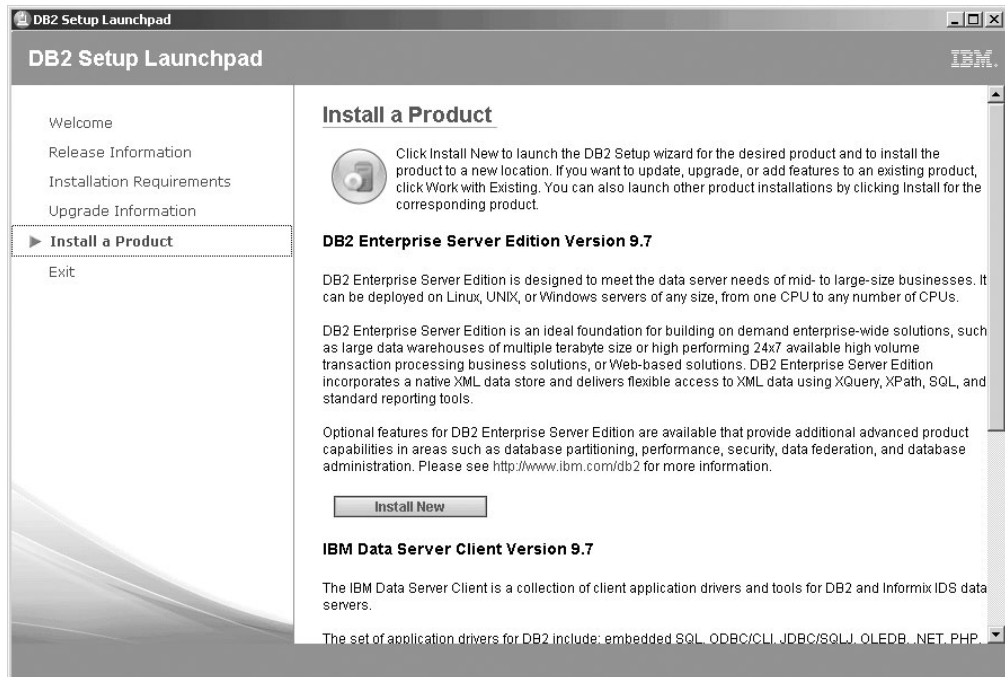


Figure 11. Install a Product page of the DB2 Setup Launchpad

Note: Ensure that there are no previous copies of DB2 installed. If the **Work with existing** button appears then you must remove your existing copy of DB2 before proceeding with the installation.

3. On the “Install a Product” page of the IBM DB2 Setup Launchpad, click the **Install New** button for **DB2 Enterprise Server Edition Version 9.7**. The DB2 Setup wizard opens.

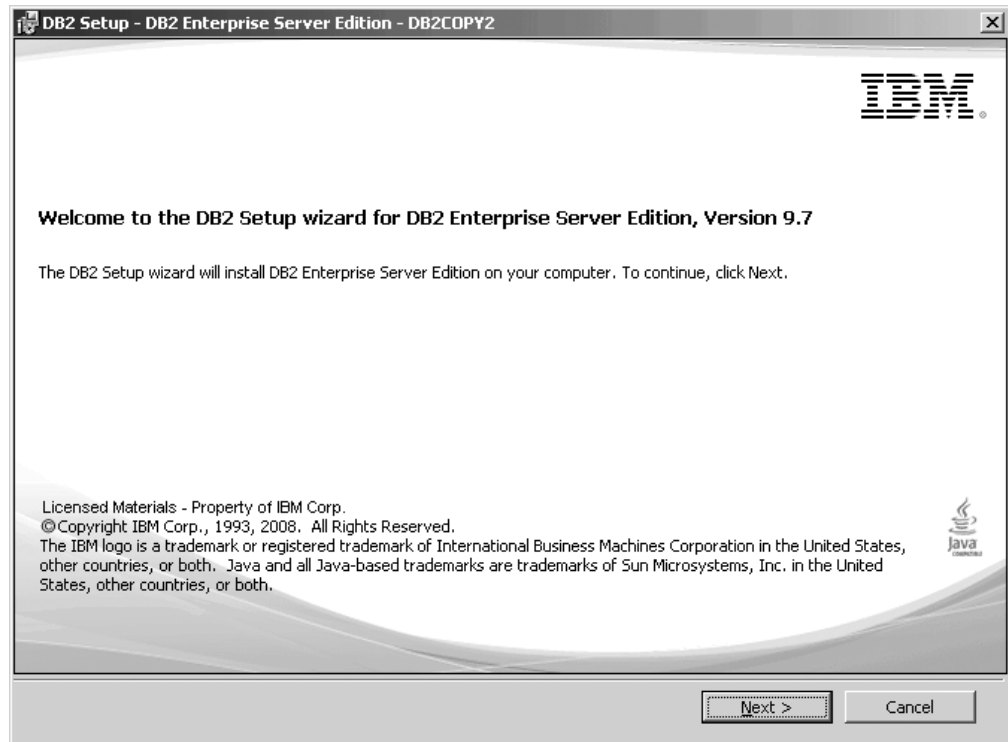


Figure 12. DB2 Setup wizard

4. Click **Next**. The “Software License Agreement” page opens.
5. On the “Software License Agreement” page:
 - a. After reviewing and agreeing to the license text, select the **I accept the terms in the license agreement** radio button.
 - b. Click **Next**. The “Select the installation type” page opens.
6. On the “Select the installation type” page:
 - a. Select the **Custom** radio button.
 - b. Click **Next**. The “Select the installation, response file creation, or both” page opens.
7. On the “Select the installation, response file creation, or both” page:
 - a. Select the **Install DB2 Enterprise Server Edition on this computer** radio button.
 - b. Click **Next**. The “Select the features to install” page opens.
8. On the “Select the features to install” page:
 - a. Open the + beside the **Server support** feature.
 - b. Deselect the **Connect support** feature by left clicking on **Connect support** and selecting **This feature will not be available** from the pop-up menu.

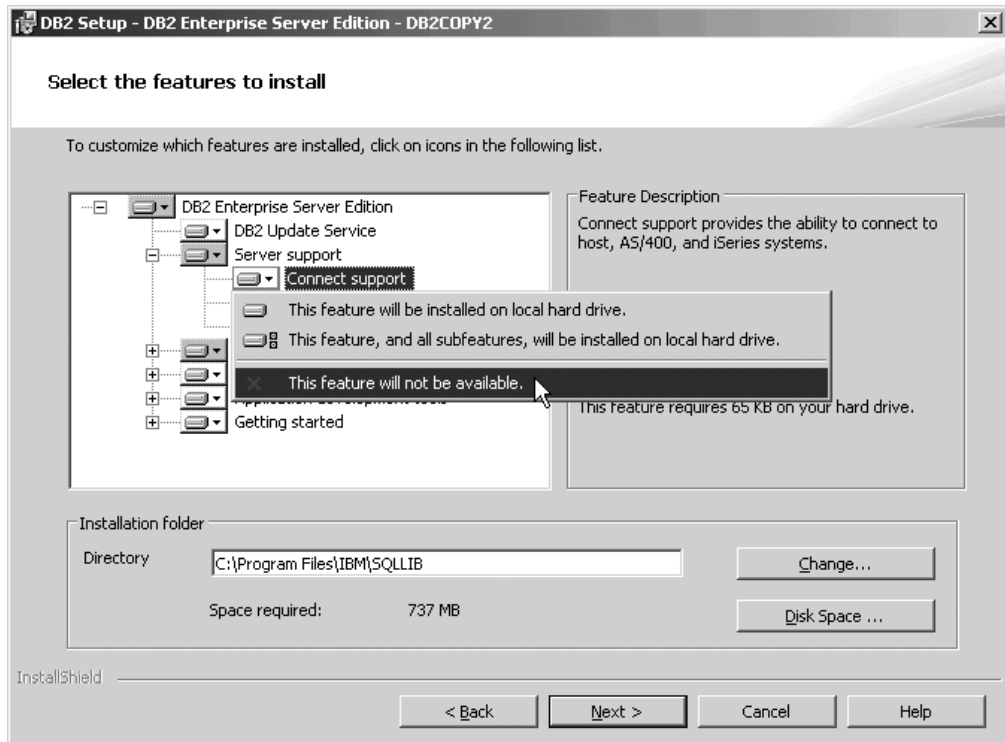


Figure 13. DB2 Setup wizard - Select the features to install page; Server support feature deselected for installation; Connect support deselection

- c. Open the + beside **Client support**.
- d. Ensure that the **DB2 LDAP support** feature is deselected for installation.
- e. Deselect **Administration tools** to ensure that all the sub-features are also deselected.
- f. Open the + beside **Application development tools** to ensure that all of the sub-features are selected for installation.
- g. Open the + beside **Getting started**.
- h. Ensure that the **First Steps** feature is deselected for installation.

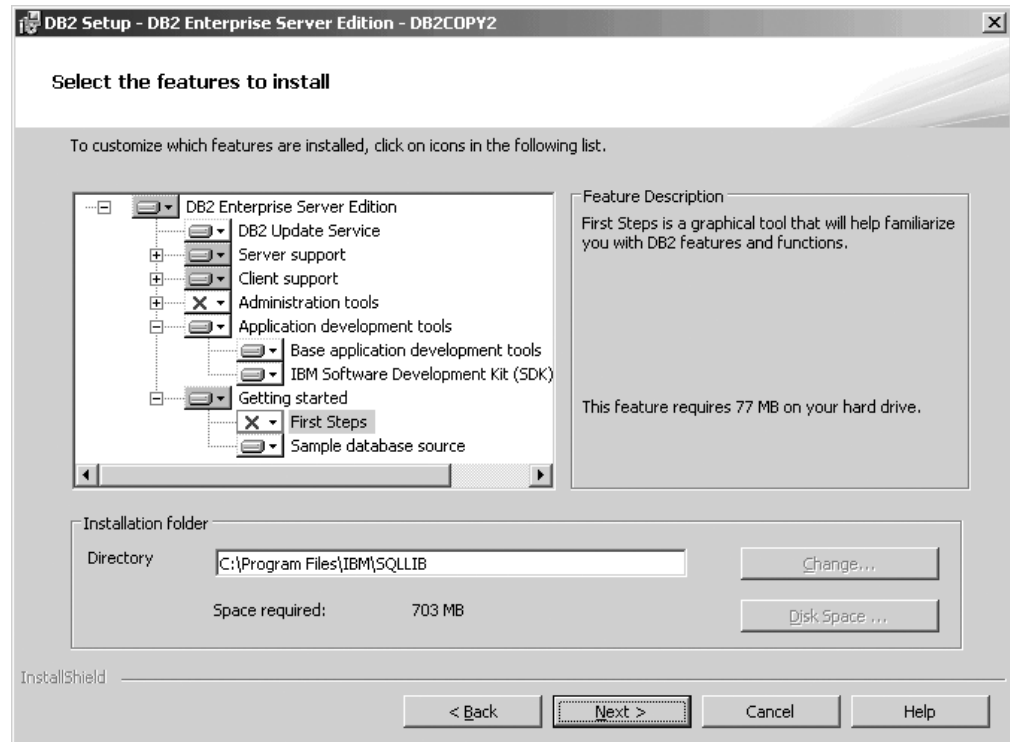


Figure 14. DB2 Setup wizard - Set up a DB2 instance page; First Steps features deselected for installation

- i. Click **Next**. The “Select the languages to install” page opens.
9. On the “Select the languages to install” page, English is the only language support that is installed by default.
10. Click **Next**. The “Set the DB2 Copy name” page opens.
11. Click **Next** The “Specify the location of the DB2 Information Center” page opens.
12. On the “Specify the location of the DB2 Information Center” page:
 - a. Ensure that the **On the IBM Web site** radio button is selected.
 - b. Click **Next**. The “Set user information for the DB2 Administration Server” page opens.
13. On the “Set user information for the DB2 Administration Server” page:
 - a. Select the domain of the user from the **Domain** drop-down list.
 - b. Type the user name for the DB2 Administration Server in the **User name** field.
 - c. Type the password for the user in the **Password** field.
 - d. Type the password again in the **Confirm password** field.
 - e. Deselect the **Use the same user name and password for the remaining DB2 services** check box.

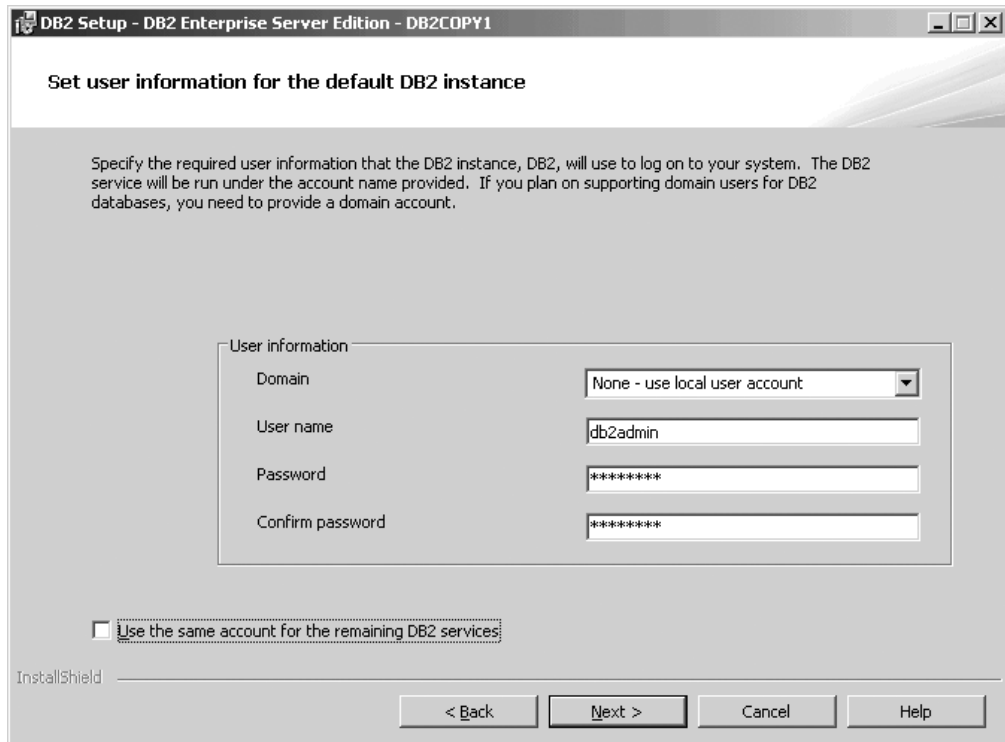


Figure 15. DB2 Setup wizard - Set user information for the DB2 Administration Server page

- f. Click **Next**. The “Set up a DB2 instance” page opens.

Note: A warning message appears if the DAS user has already been created. If you have verified the correct **User name** and **Password** continue to the next step by clicking **OK**, otherwise click **Cancel** and obtain this information from the domain administrator.

14. On the “Set up a DB2 instance” page:
 - a. Ensure that the **Create the default DB2 instance** radio button is selected.
 - b. Click **Next**. The “Set up partitioning options for the DB2 instance” page opens.
15. On the “Set up partitioning options for the default DB2 instance” page:
 - a. Select the **Single partition instance** radio button.
 - b. Click **Next**. The “Configure DB2 instances” page opens.
16. On the “Configure DB2 instances” page:
 - a. Click **Configure**. The “DB2 instance configuration” notebook opens.

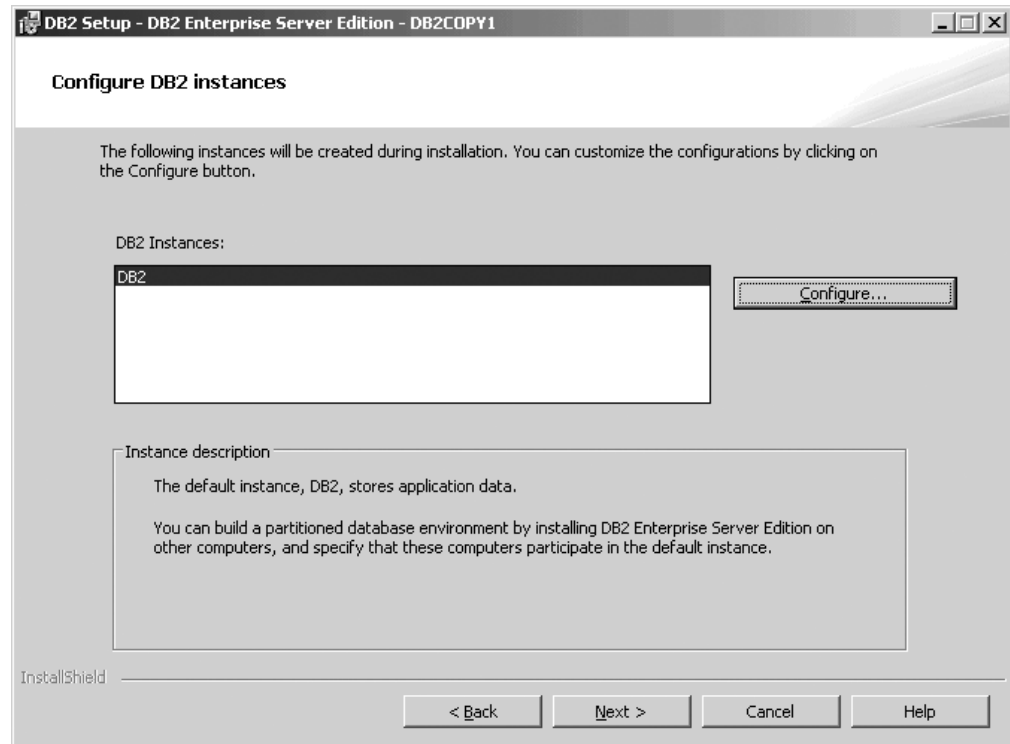


Figure 16. DB2 Setup wizard - DB2 instance configuration notebook

- b. On the Startup tab, ensure that the **Do not autostart the instance. The instance must be started manually** radio button is selected.

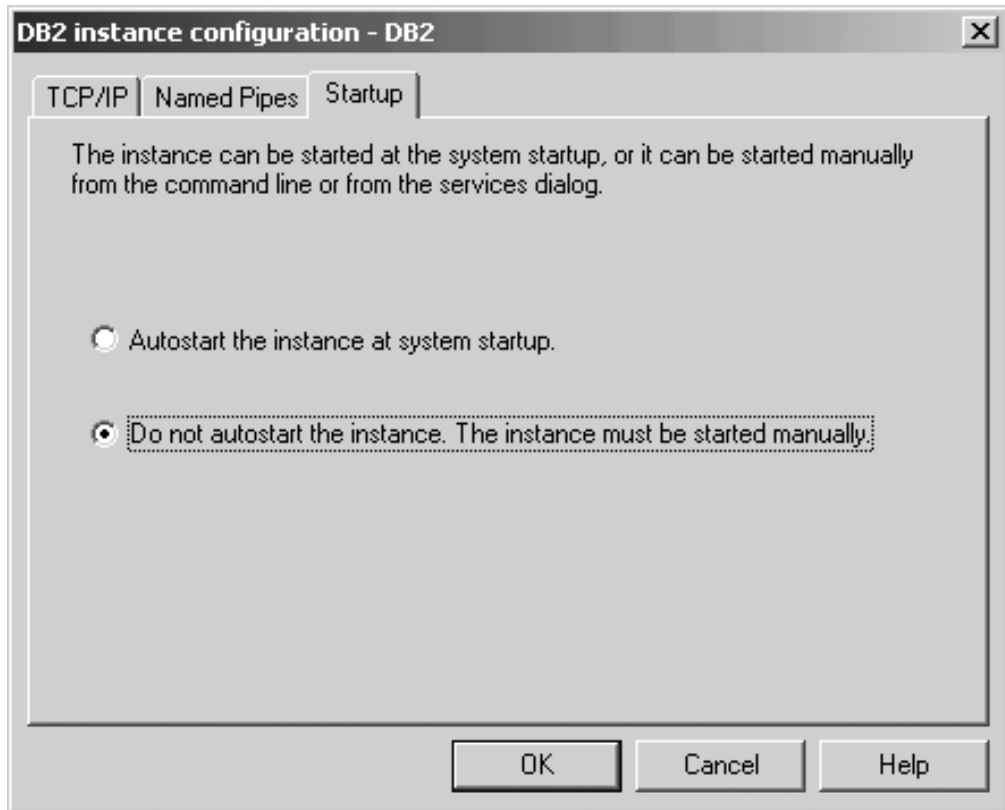


Figure 17. DB2 Setup wizard - DB2 instance configuration notebook

- c. Click **OK**. The “DB2 instance configuration” window closes.
 - d. Click **Next** on the Configure DB2 instances window. The “Set user information for the default DB2 instance” page opens.
17. On the “Set user information for the default DB2 instance” page:
- a. Select the domain of the user from the **Domain** drop-down list.

Note: Ensure for the domain you choose you have the appropriate domain administrator privileges, otherwise you may be prompted to return to the current panel.
 - b. Type the user name for the instance user in the **User name** field.
 - c. Type the password for the user in the **Password** field.
 - d. Type the password again in the **Confirm password** field.
 - e. Deselect the **Use same user name and password for the remaining DB2 services** check box.

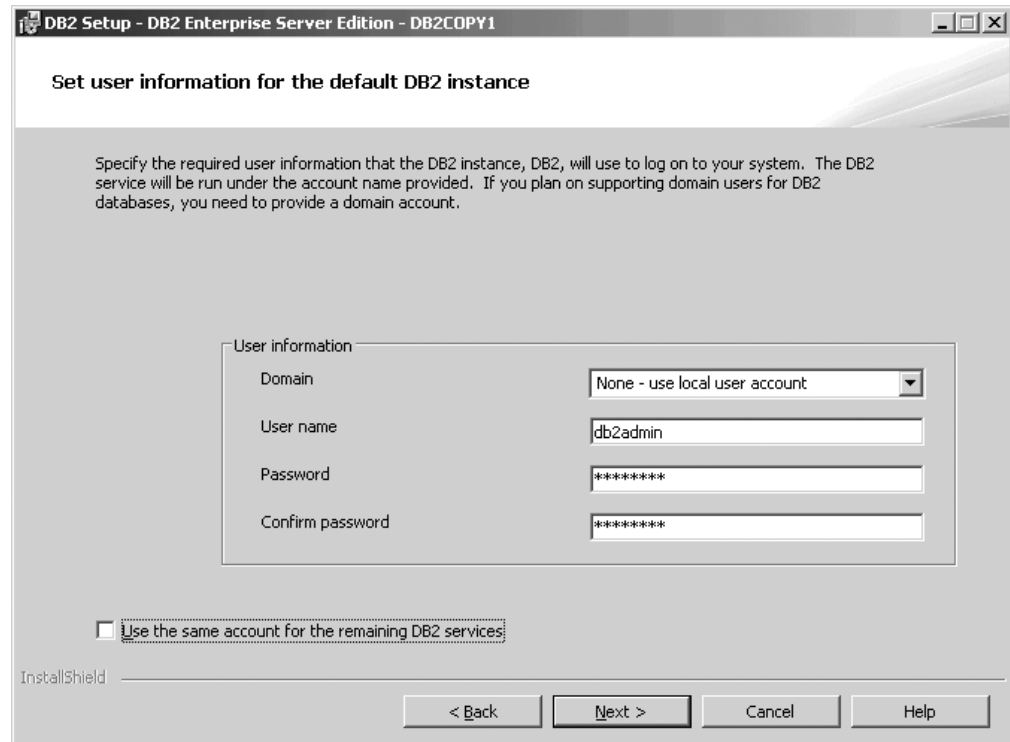


Figure 18. DB2 Setup wizard - Set user information for the default DB2 instance page

- f. Click **Next**. The “Prepare the DB2 tools catalog” page opens.

Note: A warning message appears if the DAS user has already been created. If you have verified the correct **User name** and **Password** continue to the next step by clicking **OK**, otherwise click **Cancel** and obtain this information from the domain administrator.

18. On the “Prepare the DB2 tools catalog” page:
 - a. Ensure that the **Prepare the DB2 tools catalog** check box is deselected.
 - b. Click **Next**. The “Set up notifications page” opens.
19. On the “Set up notifications” page:
 - a. Ensure that the **Set up your DB2 server to send notifications** check box is deselected.
 - b. Click **Next**. The “Enable operating system security for DB2 objects” page opens.
20. On the “Enable operating system security for DB2 objects” page:
 - a. Ensure that the **Enable operating system security** check box is deselected.
 - b. Click **Next**. The “Start copying files” page opens.
21. On the “Start copying files” page:
 - a. Review the current settings.

l

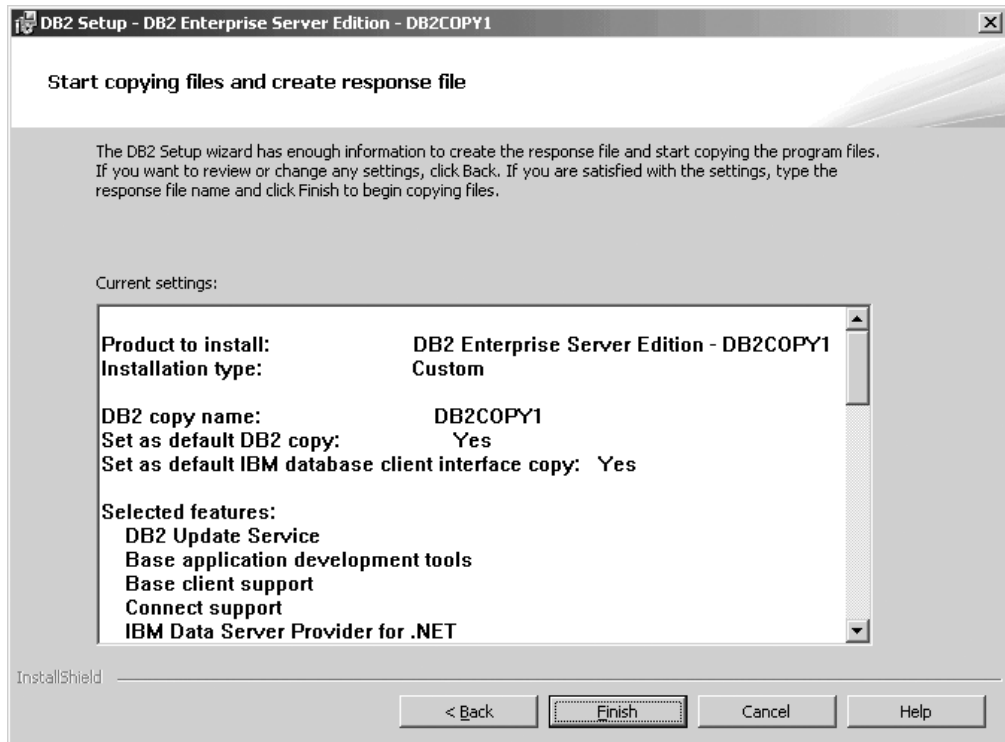


Figure 19. Start copying files page

- b. Click **Finish** to begin installing DB2 on your computer. The Installing DB2 Enterprise Server Edition page opens.
- c. When the installation completes, the “Setup Complete” page opens. Scroll to review the Post-install steps.

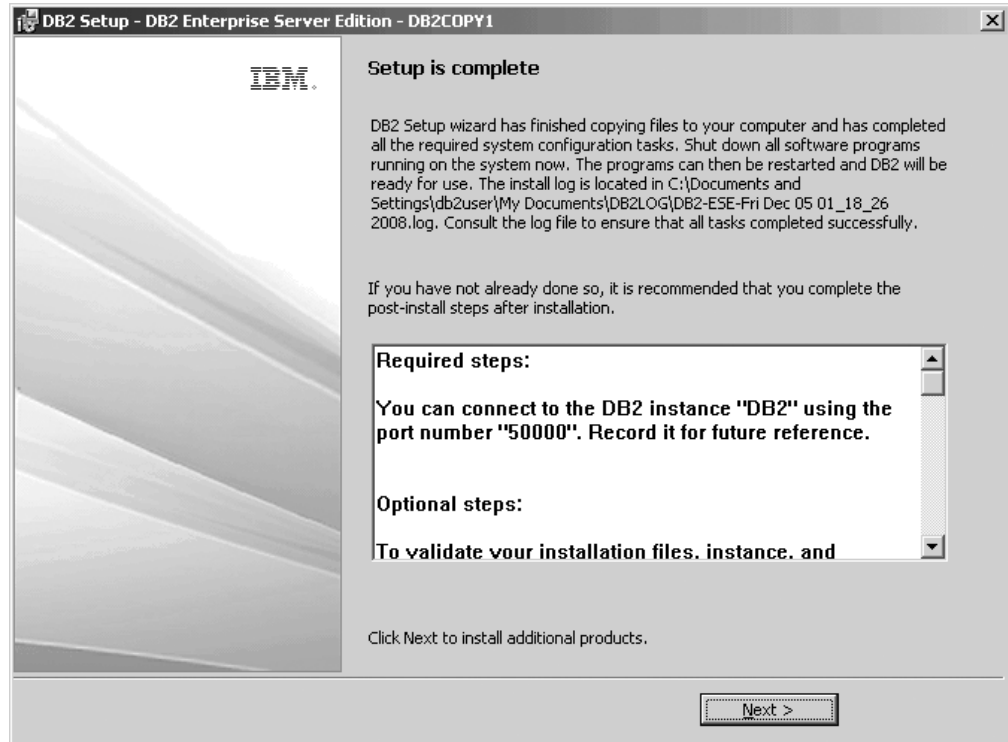


Figure 20. Setup complete page (top)

Note: Be sure to record the port number that you use to connect to the DB2 instance.



Figure 21. Setup complete page (bottom)

- d. Click **Finish** to exit from the installation GUI.
- 22. Activate the license files. See the topic “Registering a DB2 product or feature license key using the db2licm command” on page 114.

After DB2 Enterprise 9.7 is installed, see the topic on configuring DB2 to be Common Criteria compliant in the *IBM DB2 Common Criteria Certification: Administration and User Documentation* book.

Chapter 6. Installing multi-partition Common Criteria compliant environments

The following topics describe how to install multi-partition Common Criteria compliant environments.

The following platforms are supported:

- AIX 6
- SuSe Linux Enterprise Server 10
- Solaris 10
- Red Hat Enterprise Linux 5

Installing DB2 Enterprise 9.7 for a multi-partition Common Criteria compliant installation

This task provides detailed instructions on installing DB2 Enterprise 9.7 for a Common Criteria compliant installation.

Prerequisites

- The prerequisites listed in “Installation requirements for DB2 servers and IBM data server clients” must be met. Instructional pages for each platform are listed in the table below:

Table 15.

Platform	Page
AIX 6	“Installation requirements for DB2 servers and IBM data server clients (AIX)” on page 16
SuSe Linux Enterprise Server 10	“Installation requirements for DB2 servers and IBM data server clients (Linux)” on page 17
Solaris 10	“Installation requirements for DB2 servers and IBM data server clients (Solaris)” on page 21
Red Hat Enterprise Linux 5	“Installation requirements for DB2 servers and IBM data server clients (Linux)” on page 17

- The prerequisites listed in “Updating environment settings for a partitioned DB2 installation” must be met. Instructional pages for each platform are listed in the table below:

Table 16.

Platform	Page
AIX 6	“Updating environment settings for a partitioned DB2 installation (AIX)” on page 34
SuSe Linux Enterprise Server 10	“Verifying that NFS is running (Linux and UNIX)” on page 37

Table 16. (continued)

Platform	Page
Solaris 10	"Verifying that NFS is running (Linux and UNIX)" on page 37
Red Hat Enterprise Linux 5	"Verifying that NFS is running (Linux and UNIX)" on page 37

- The prerequisites listed in "Verifying that NFS is running" must be met. Instructional pages for each platform are listed in the table below:

Table 17.

Platform	Page
AIX 6	"Creating a DB2 home file system for a partitioned database system (AIX)" on page 39
SuSe Linux Enterprise Server 10	"Creating a file system for a partitioned DB2 server (Linux)" on page 41
Solaris 10	"Creating a file system for a partitioned DB2 server (Solaris Operating System)" on page 42
Red Hat Enterprise Linux 5	"Creating a file system for a partitioned DB2 server (Linux)" on page 41

- The computer on which you install DB2 must be physically protected from untrusted users.
- One of the following must be installed on the computer:
 - AIX 6
 - SuSe Linux Enterprise Server 10
 - Solaris 10
 - Red Hat Enterprise Linux 5

Note: For **SuSe users** only:

- The instructions that follow assume that the rsh-server package has been installed as part of the SuSe Linux Enterprise Server 10 installation. See "Installation requirements for DB2 servers and IBM data server clients (Linux)" on page 17 for more information.
- You must have the user names to be used for the following:
 - The DB2 instance owner
 - The DB2 Administration Server

If you do not have these user names, obtain them from your system administrator. For information about creating these users, see "Creating required users for a DB2 server installation in a partitioned database environment (Linux)" on page 46. For more information about these users, see "DB2 users and groups (Linux and UNIX)" on page 24.

The topic "Installing DB2 servers using the DB2 Setup wizard (Linux and UNIX)" on page 52 provides an overview of installing on Linux and UNIX-based platforms.

Procedure

Use the following steps to install DB2 Enterprise 9.7 for a Common Criteria compliant environment.

1. Log on to the system as a user with root authority.
2. Insert the IBM DB2 Enterprise Server Edition 9.7 DVD.
3. Change to the media directory where the DB2 Enterprise Server Edition 9.7 DVD resides. The ese directory contains the `./db2setup` command. Change to this directory.

Note: Every computer that will participate in the partitioned database environment requires the DB2 Enterprise Server Edition 9.7 to be installed. The instructions in 1 on page 92 show an abbreviated method to install DB2 on all subsequent machines participating in the multi-partition installation.

4. On the computer that you want to use as the instance owning node, issue the `./db2setup` command to open the IBM DB2 Setup Launchpad at the Welcome page:

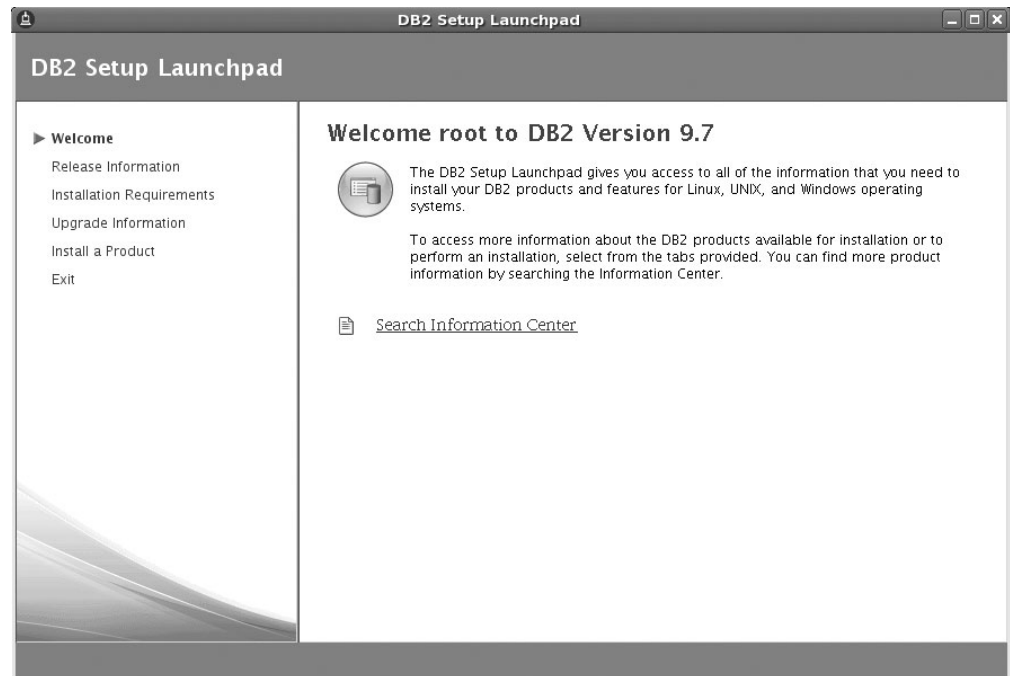


Figure 22. Welcome page of the DB2 Setup Launchpad

5. On the "Welcome page of the IBM DB2 Setup Launchpad", click **Install a Product** to open the "Install a Product" page.

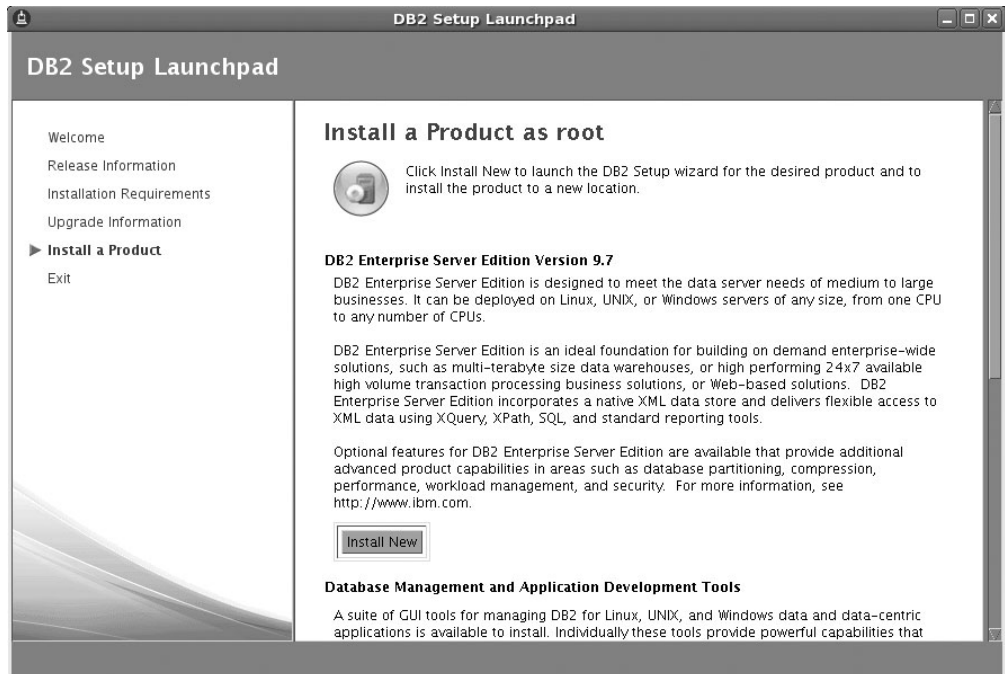


Figure 23. Install a Product page of the DB2 Setup Launchpad

Note: Ensure that there are no previous copies of DB2 installed. If the **Work with existing** button appears then you must remove your existing copy of DB2 before proceeding with the installation.

6. On the “Install a Product” page of the IBM DB2 Setup Launchpad, click the **Install New** button for **DB2 Enterprise Server Edition Version 9.7**. The DB2 Setup wizard opens.



Figure 24. DB2 Setup wizard

7. Click **Next**. The “Software License Agreement” page opens.
8. On the “Software License Agreement” page:
 - a. After reviewing and agreeing to the license text, select the **Accept** radio button.
 - b. Click **Next**. The “Select the installation type” page opens.
9. On the “Select the installation type” page:
 - a. Select the **Custom** radio button.
 - b. Click **Next**. The “Select the installation, response file creation, or both” page opens.
10. On the “Select the installation, response file creation, or both” page:
 - a. Select the **Install DB2 Enterprise Server Edition Version 9.7 on this computer and save my settings in a response file** radio button.
 - b. Use the default value listed in the **Response file name** field. Subsequent installs for the partitioned database environment are performed using the response file db2ese.rsp. Using the response file guarantees a consistent setup of the database environment on all participating computers.
 - c. Click **Next**. The “Select the features to install” page opens.
11. On the “Select the features to install” page:
 - a. Open the + beside the **Client support** feature.
 - b. Deselect the **DB2 LDAP support** feature to remove the check mark.

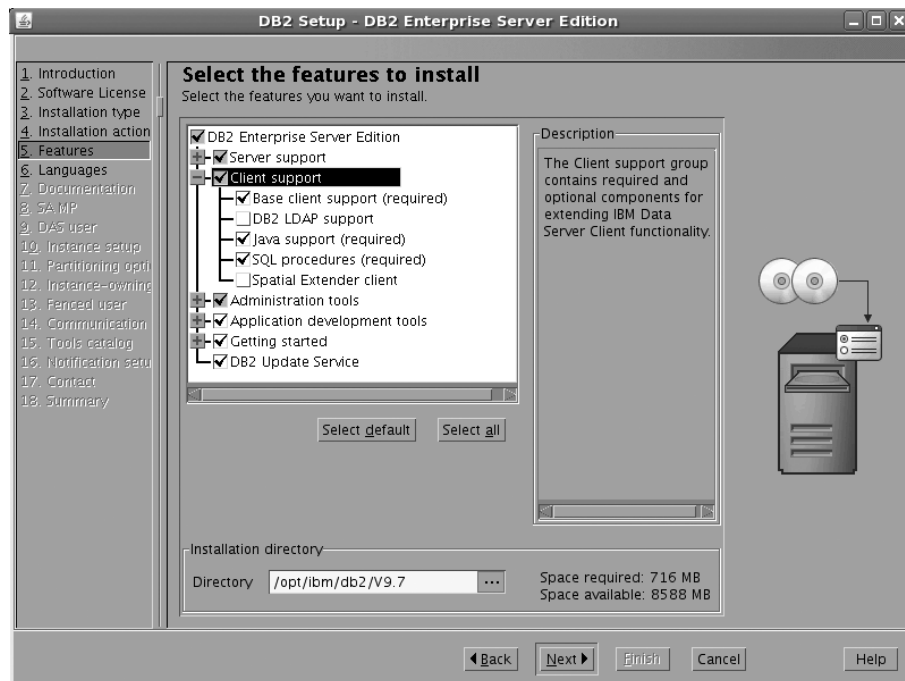


Figure 25. DB2 Setup wizard - Select the features to install page; DB2 LDAP support feature deselected for installation

- c. Open the + beside **Administration tools**
- d. Ensure that the **DB2 Instance Setup wizard** feature is deselected for installation.

Note: For **SuSe users** and **Red Hat users**, the following additional step is required:

- Deselect the **Control Center** feature under **Administration tools**.
- e. Open the + beside **Application development tools**.
- f. Select **Base application development tools** for installation.
- g. Open the + beside **Getting started**.
- h. Ensure that the **First Steps** feature is deselected for installation.

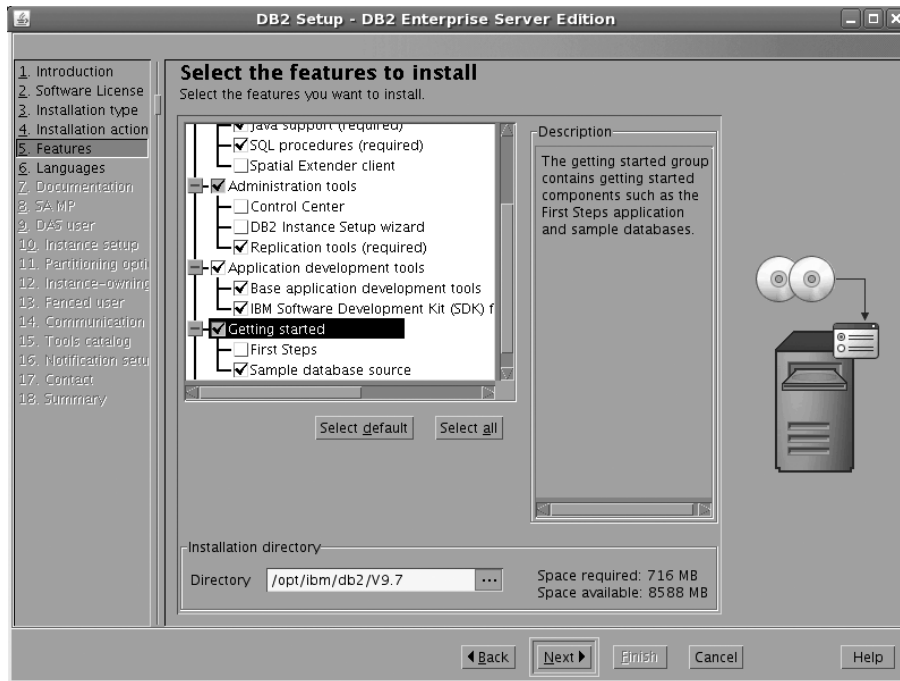


Figure 26. DB2 Setup wizard - Select the features to install page; First Steps feature deselected for installation

- i. Click **Next**. The “Select the languages to install” page opens.
- 12. On the “Select the languages to install” page, English is the only language support that is installed by default.
 - a. Click **Next**. The “Specify the location of the DB2 Information Center” page opens.
- 13. On the “Specify the location of the DB2 Information Center” page:
 - a. Ensure that the **On the IBM Web site** radio button is selected.
 - b. Click **Next**. The “Install the IBM Tivoli System Automation for Multiplatforms (SA MP)” page opens.
- 14. On the “Install the IBM Tivoli System Automation for Multiplatforms (SA MP)” page:
 - a. Select the **Do not install SA MP** radio button.
 - b. Click **Next**. The “Set user information for the DB2 Administration Server” page opens.
- 15. On the “Set user information for the DB2 Administration Server” page:
 - a. Select the **Existing user** radio button.
 - b. Use the Ellipsis button (...) to select the group and user previously defined for the DB2 Administration Server.
 - c. Click **Next**. The “Set up a DB2 instance” page opens.
- 16. On the “Set up a DB2 instance” page:

- a. Ensure that the **Create a DB2 instance** radio button is selected.
 - b. Click **Next**. The “Set up partitioning options for the DB2 instance” page opens.
17. On the “Set up partitioning options for the DB2 instance” page:
- a. Select the **Multiple partition instance** radio button.
 - b. Type 2 for the **Maximum logical partitions** field.

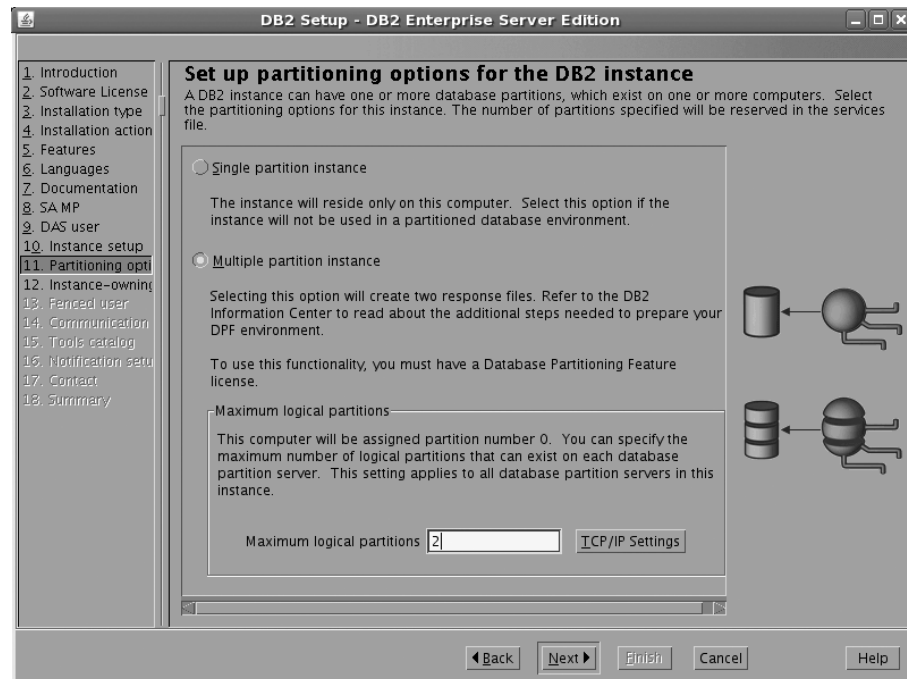


Figure 27. DB2 Setup wizard - Set up partitioning options for the DB2 instance page

- Note:** For the Common Criteria certification, a Symmetric Multi-Processor (SMP) configuration of two logical partitions on two computers is demonstrated. Depending on your requirements, it is possible to install one logical partition per computer, or more than two logical partitions per computer. Because a response file is used to install DB2 Enterprise Server Edition on all subsequent computers, the environment will be consistent across all computers that participate in the partitioned database environment.
- c. Click **Next**. The “Set user information for the DB2 instance owner” page opens.
18. On the “Set user information for the DB2 instance owner” page:
- a. Select the **Existing user** radio button.
 - b. Use the Ellipsis button (...) to select the group and user previously defined for the DB2 instance owner.
 - c. Click **Next**. The “Set user information for the fenced user” page opens.
19. On the “Set user information for the fenced user” page:
- a. Select the **Existing user** radio button.
 - b. Use the Ellipsis button (...) to select the group and user previously defined for the fenced user.
 - c. Click **Next**. The “Configure instance communication and startup” page opens.

20. On the “Configure instance communication and startup” page:
 - a. Click the **Configure** radio button.
 - b. Ensure that the **Autostart the instance at system startup** check box is deselected.

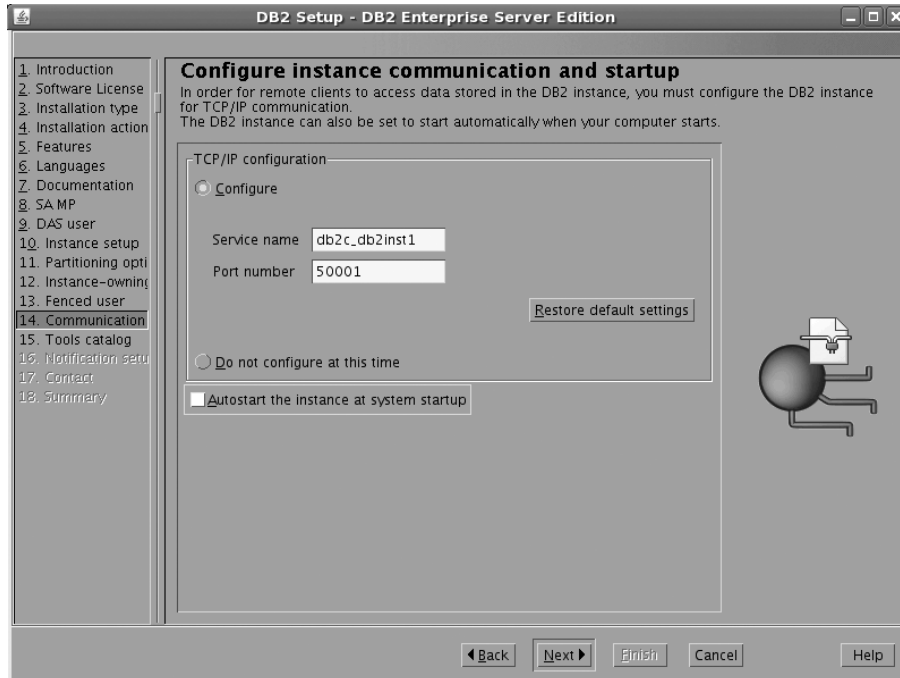


Figure 28. DB2 Setup wizard - Configure instance communication and startup page

- c. Click **Next**. The “Prepare the DB2 tools catalog” page opens.
21. On the “Prepare the DB2 tools catalog” page:
 - a. Ensure the **Do not prepare the DB2 tools catalog** radio button is selected.
 - b. Click **Next**. The “Set up notifications” page opens.
22. On the “Set up notifications” page:
 - a. Ensure that the **Do not set up your DB2 server to send notifications at this time** radio button is selected.
 - b. Click **Next**. The “Start copying files and create response files” page opens.
23. On the “Start copying files and create response files” page:
 - a. Review the current settings.

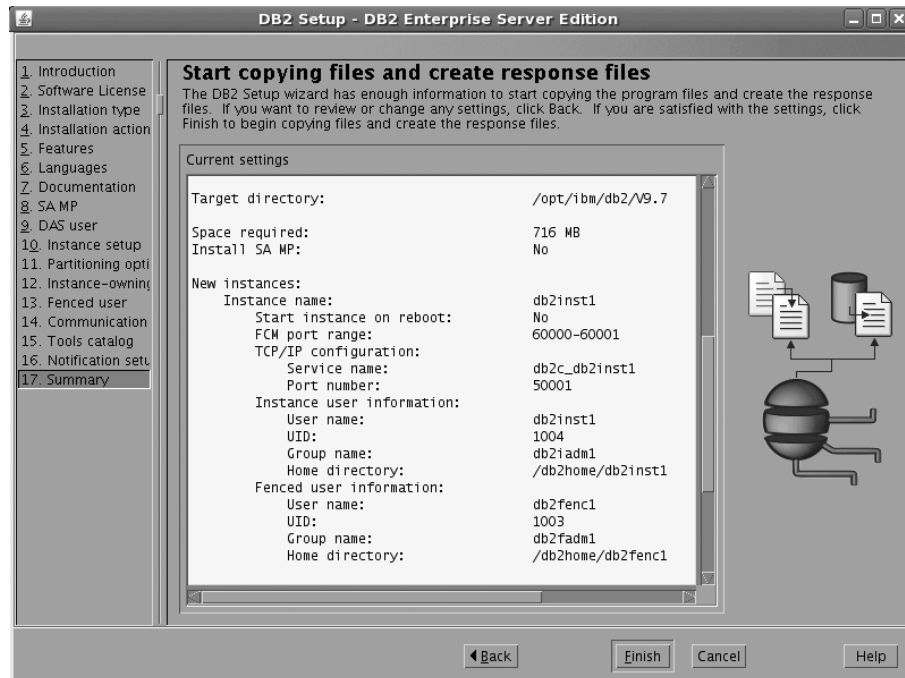


Figure 29. DB2 Setup wizard - Start copying files and create response files page (top)

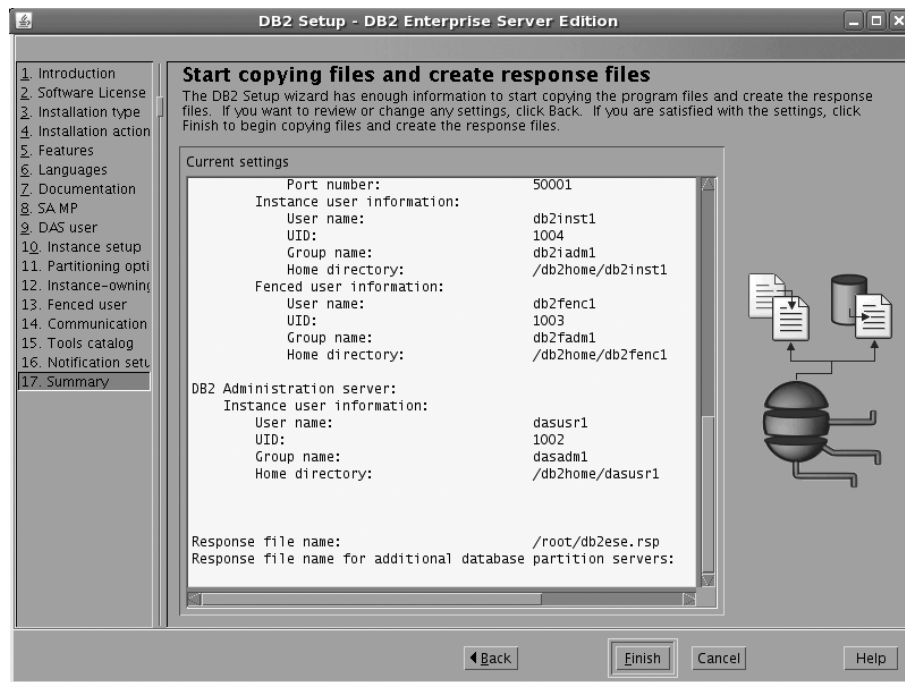


Figure 30. DB2 Setup wizard - Start copying files and create response files page

- b. Click **Finish** to begin installing DB2 on your computer. The “Installing DB2 Enterprise Server Edition Version 9.7” page opens. Installation time may take up to a few minutes depending on your computer.
- c. When the installation completes, the “Setup Complete” page opens. Scroll to review the Post-install steps.

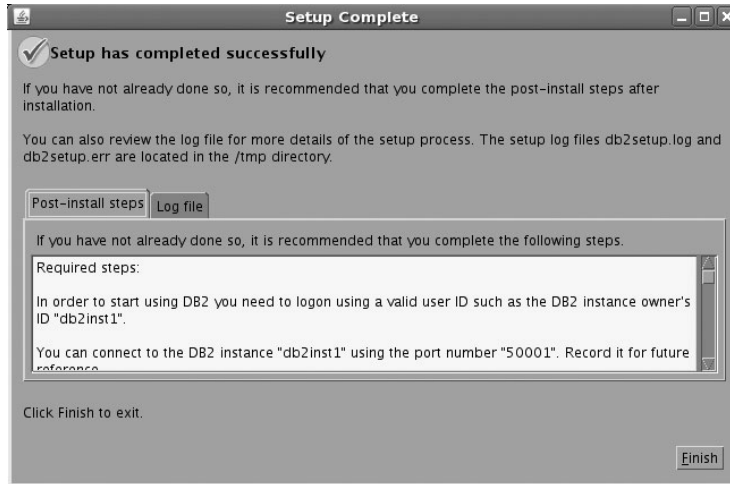


Figure 31. Setup complete page (top)

Note: Be sure to record the port number that you use to connect to the DB2 instance.

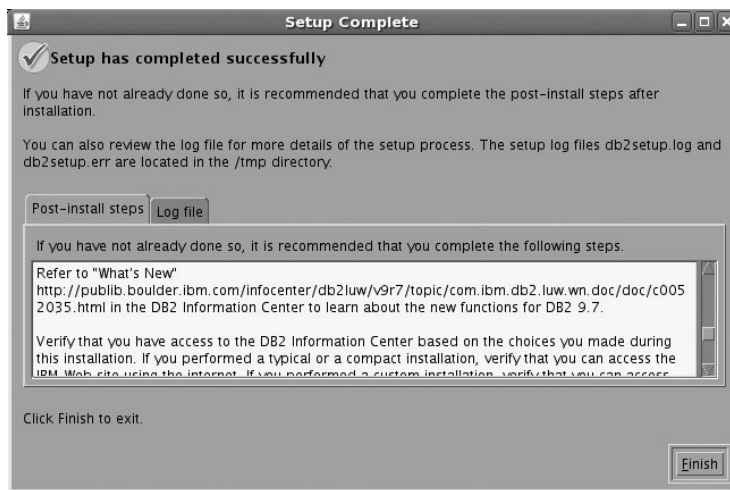


Figure 32. Setup complete page (bottom)

- d. On the Post-install steps tab, note that the installation results in two response files being created in the /root or /tmp directory: db2ese.rsp and db2ese_addpart.rsp. The response file db2ese_addpart.rsp is used to finish installing the partitioned database environment. Click **Finish** to exit from the installation GUI.

After you finish using the DB2 Setup wizard to install DB2 on the instance owning computer, you need to verify port range availability, install DB2 on the remaining machines that you want to participate in the instance, create or modify a few files, and finally activate the license files that you downloaded before installing DB2.

1. Perform the steps described in “Verifying port range availability on participating computers (Linux and UNIX)” on page 38.
2. Copy the db2ese_addpart.rsp file to the same directory as the db2setup file on the second computer that you want to participate in the partitioned database environment. You can use FTP to accomplish this task, or any other tool that permits you to transfer files between computers. For a DVD installation, this

may require you to mount the DVD content onto a virtual drive or to create a disk image. Repeat this step for every computer that you want to participate in the environment.

3. Run the response file on the second computer using the `./db2setup -r` command as described in the topic “Installing database partition servers on participating computers using a response file (Linux and UNIX)” on page 58. Repeat this step for every computer that you want to participate in the environment.
4. Update the `db2nodes.cfg` file in the `InstanceHome/sqllib/` directory. For details, see the topic “Updating the node configuration file (Linux and UNIX)” on page 123
5. Create the `.rhosts` file. See the topic “Enabling the execution of remote commands (Linux and UNIX)” on page 126 for details.
6. Update the `/etc/services` file. For more information, see the topic “Enabling communications between database partition servers (Linux and UNIX)” on page 124.
7. Activate the license files on every computer that you want to participate in the partitioned database environment. See the topic “Registering a DB2 product or feature license key using the `db2licm` command” on page 114.

After DB2 Enterprise 9.7 is installed, see the topic on configuring DB2 to be Common Criteria compliant in the *IBM DB2 Common Criteria Certification: Administration and User Documentation* book.

Installing DB2 Enterprise 9.7 on Windows Server 2003 for a multi-partition Common Criteria compliant installation

This task provides detailed instructions on installing DB2 Enterprise 9.7 on Windows Server 2003 for a Common Criteria compliant installation.

Prerequisites

- The prerequisites listed in “An overview of installing your DB2 server product (Windows)” on page 5 must be met.
- The prerequisites listed in “Preparing the environment for a partitioned DB2 server (Windows)” on page 13 must be met.
- The computer on which you install DB2 must be physically protected from untrusted users.
- Windows Server 2003 must be configured to disable remote access services (such as terminal server and file system shares) before DB2 is installed. For information on performing this task, refer to the operating system documentation. Also, verify on the **System Properties** remote tab that the “Enable Remote Desktop on this Computer” is deselected.
- You must have the user names to be used for the following:
 - The DB2 instance owner
 - The DB2 Administration Server

If you do not have these user names, obtain them from your system administrator. For more information about these users, see “Required user accounts for installation of DB2 server products (Windows)” on page 10.

The topic “Installing DB2 servers (Windows)” on page 49 provides an overview of installing on Windows.

Procedure

Use the following steps to install DB2 Enterprise 9.7 on Windows Server 2003 for a Common Criteria compliant environment.

1. On the computer that you want to use as the instance owning node, insert the IBM DB2 Enterprise Server Edition 9.7 DVD. If enabled, an auto-run feature automatically starts the IBM DB2 Setup Launchpad at the Welcome page:

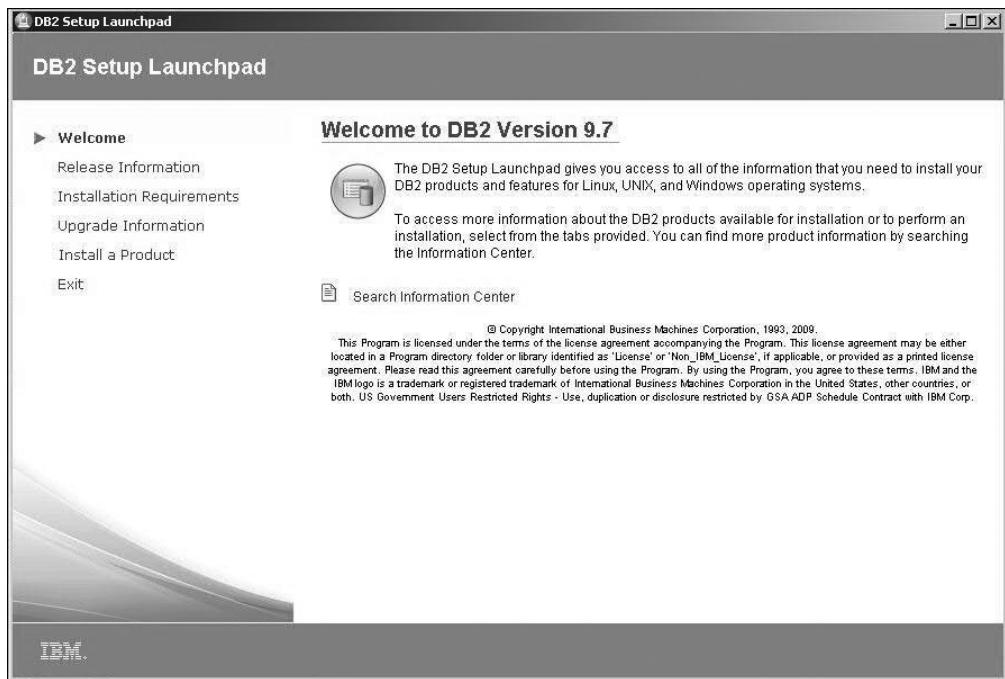


Figure 33. Welcome page of the DB2 Setup Launchpad

Note: Every computer that will participate in the partitioned database environment requires the DB2 Enterprise Server Edition 9.7 to be installed. The instructions on step 22 on page 105 show an abbreviated method to install DB2 on all subsequent machines participating in the multi-partition installation.

If the setup program failed to auto-start, you can start the DB2 Setup wizard manually.

To start the DB2 Setup wizard manually:

- Change to the media directory where the DB2 Enterprise Server Edition 9.7 DVD resides. To do this, click **Start**, open "My Computer", and double-click on the icon with type "DVD Drive" to access the DVD directory.
 - Double-click the **setup.exe** file to open the IBM DB2 Setup Launchpad at the Welcome page.
2. On the "Welcome page of the IBM DB2 Setup Launchpad", click **Install a Product** to open the "Install a Product" page.

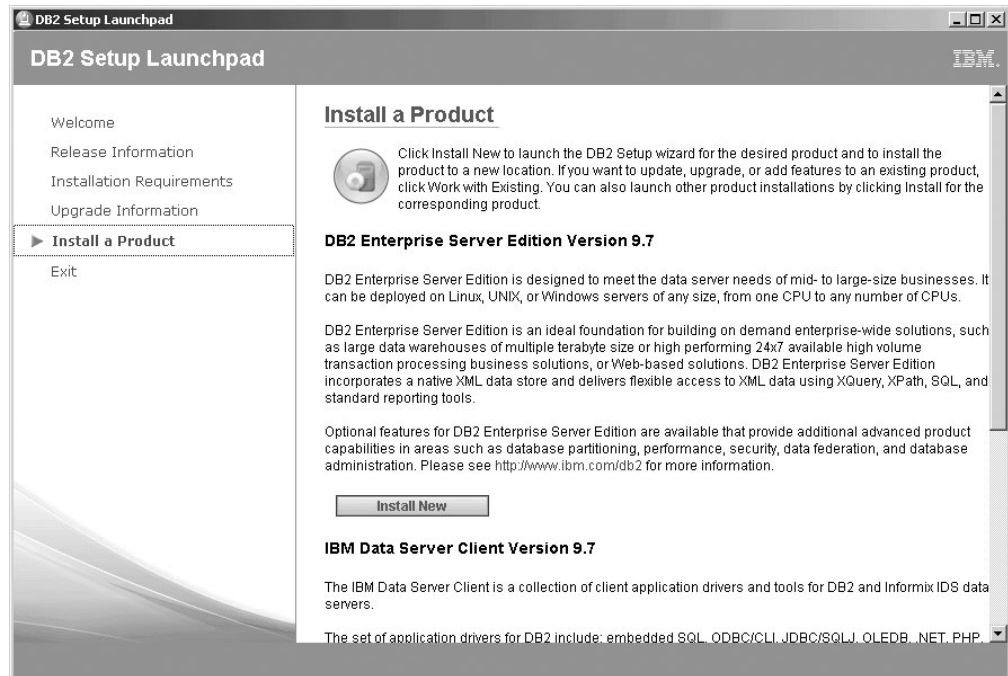


Figure 34. Install a Product page of the DB2 Setup Launchpad

Note: Ensure that there are no previous copies of DB2 installed. If the **Work with existing** button appears then you must remove your existing copy of DB2 before proceeding with the installation.

3. On the “Install a Product” page of the IBM DB2 Setup Launchpad, click the **Install New** button for **DB2 Enterprise Server Edition Version 9.7**. The DB2 Setup wizard opens.

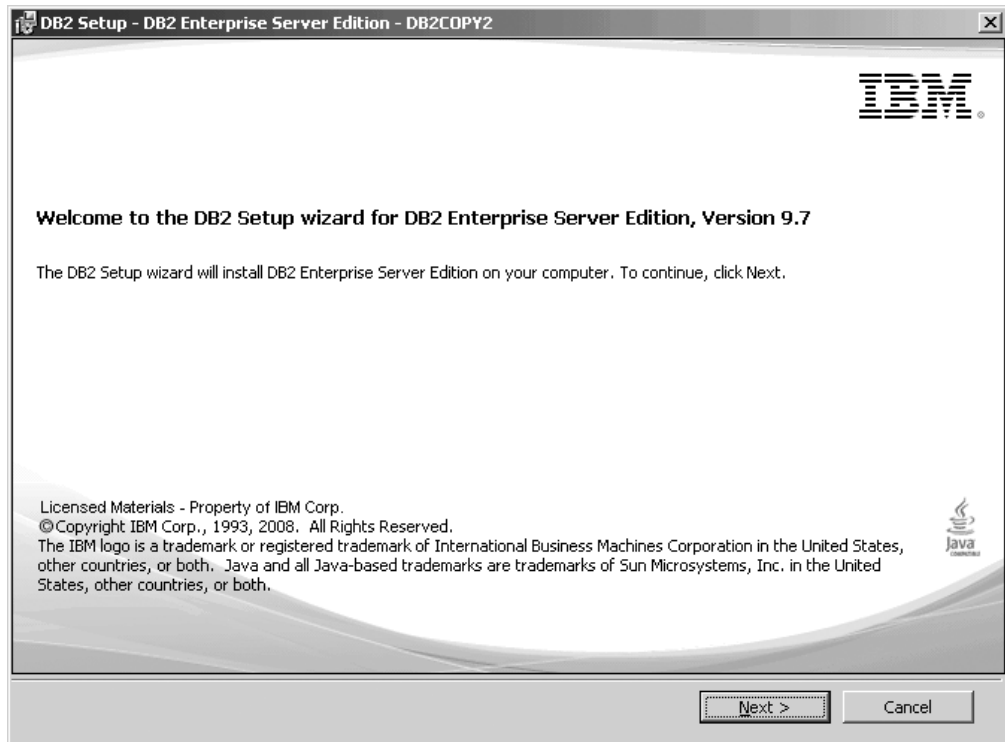


Figure 35. DB2 Setup wizard

4. Click **Next**. The “Software License Agreement” page opens.
5. On the “Software License Agreement” page:
 - a. After reviewing and agreeing to the license text, select the **I accept the terms in the license agreement** radio button.
 - b. Click **Next**. The “Select the installation type” page opens.
6. On the “Select the installation type” page:
 - a. Select the **Custom** radio button.
 - b. Click **Next**. The “Select the installation, response file creation, or both” page opens.
7. On the “Select the installation, response file creation, or both” page:
 - a. Select the **Install DB2 Enterprise Server Edition on this computer and save my settings in a response file** radio button.
 - b. Use the default value listed in the **Response file name** field. Subsequent installs for the partitioned database environment are performed using the response file PROD_ESE.rsp in the installing user’s My Documents directory. Use PROD_ESE_addpart.rsp on the computers joining an existing partitioned database environment. Using the response file guarantees a consistent setup of the database environment on all participating computers.
 - c. Click **Next**. The “Select the features to install” page opens.
8. On the “Select the features to install” page:
 - a. Open the + beside the **Server support** feature.
 - b. Deselect the **Connect support** feature by left clicking on **Connect support** and selecting **This feature will not be available** from the pop-up menu.

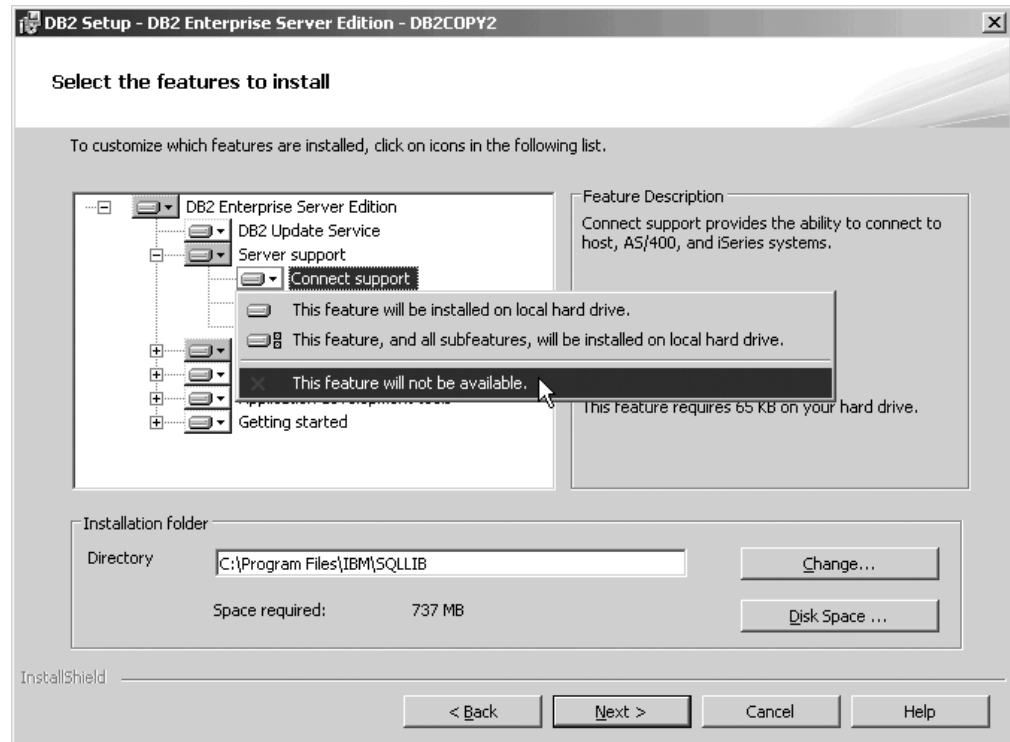


Figure 36. DB2 Setup wizard - Select the features to install page; Server support feature deselected for installation; Connect support deselected

- c. Open the + beside **Client support**.
- d. Ensure that the **DB2 LDAP support** feature is deselected for installation.
- e. Deselect **Administration tools** to ensure that all the sub-features are also deselected.
- f. Open the + beside **Application development tools** to ensure that all of the sub-features are selected for installation.
- g. Open the + beside **Getting started**.
- h. Ensure that the **First Steps** feature is deselected for installation.

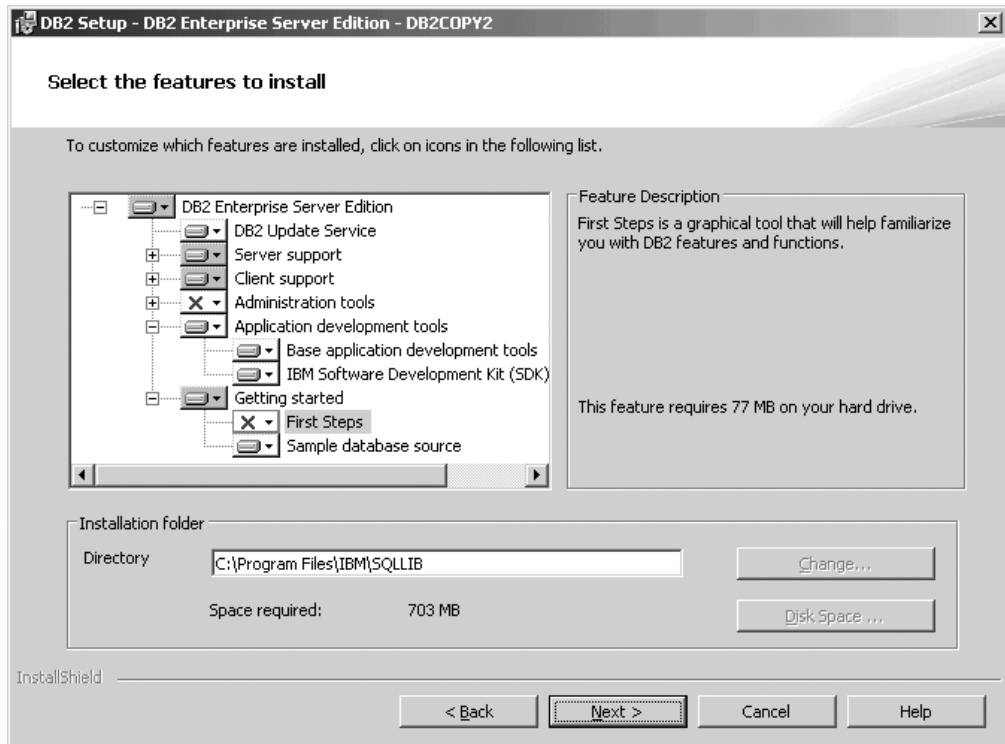


Figure 37. DB2 Setup wizard - Select the features to install page; First Steps features deselected for installation

- i. Click **Next**. The “Select the languages to install” page opens.
9. On the “Select the languages to install” page, English is the only language support that is installed by default.
10. Click **Next**. The “Set the DB2 Copy name” page opens.
11. Click **Next**. The “Specify the location of the DB2 Information Center” page opens.
12. On the “Specify the location of the DB2 Information Center” page:
 - a. Ensure that the **On the IBM Web site** radio button is selected.
 - b. Click **Next**. The “Set user information for the DB2 Administration Server” page opens.
13. On the “Set user information for the DB2 Administration Server” page:
 - a. Select the domain of the user from the **Domain** drop-down list.
 - b. Type the user name for the DB2 Administration Server in the **User name** field.
 - c. Type the password for the user in the **Password** field.
 - d. Type the password again in the **Confirm password** field.
 - e. Ensure that the **Use the same user name and password for the remaining DB2 services** check box is not selected.

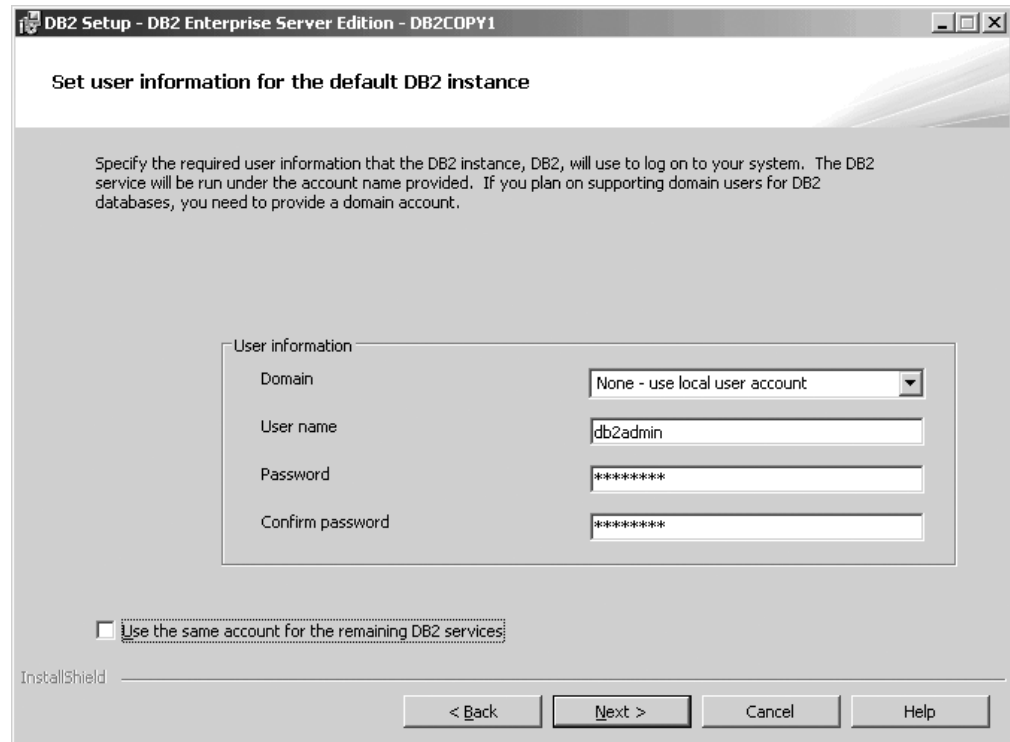


Figure 38. DB2 Setup wizard - Set user information for the DB2 Administration Server page

- f. Click **Next**. The “Set up a DB2 instance” page opens.

Note: A warning message appears if the DAS user has already been created. If you have verified the correct **User name** and **Password** continue to the next step by clicking **OK**, otherwise click **Cancel** and obtain this information from the domain administrator.

14. On the “Set up a DB2 instance” page:
 - a. Ensure that the **Create the default DB2 instance** radio button is selected.
 - b. Click **Next**. The “Set up partitioning options for the DB2 instance” page opens.
15. On the “Set up partitioning options for the default DB2 instance” page:
 - a. Select the **Multiple partition instance** radio button.
 - b. Type 2 for the **Maximum logical partitions** field.

Note: For the Common Criteria certification, a Symmetric Multi-Processor (SMP) configuration of two logical partitions on two computers is demonstrated. Depending on your requirements, it is possible to install one logical partition per computer, or more than two logical partitions per computer. Because a response file is used to install DB2 Enterprise Server Edition on all subsequent computers, the environment will be consistent across all computers that participate in the partitioned database environment.

- c. Click **Next**. The “Configure DB2 instances” page opens.
16. On the “Configure DB2 instances” page:
 - a. Click **Configure**. The “DB2 instance configuration” notebook opens.

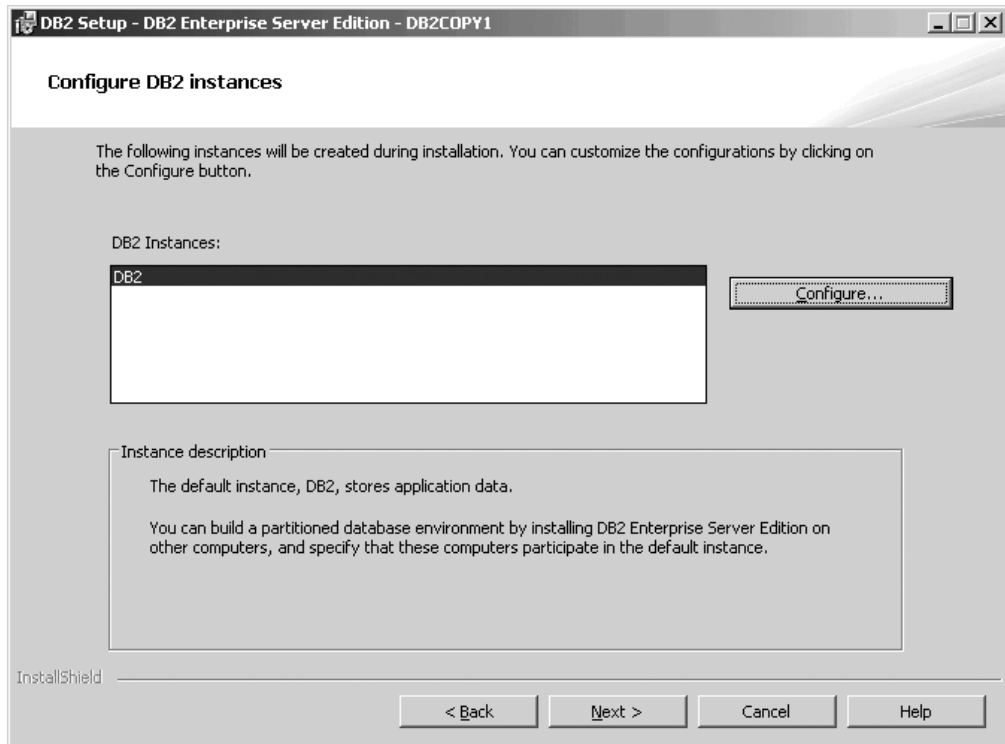


Figure 39. DB2 Setup wizard - DB2 instance configuration notebook

- b. On the Startup tab, ensure that the **Do not autostart the instance. The instance must be started manually** radio button is selected.

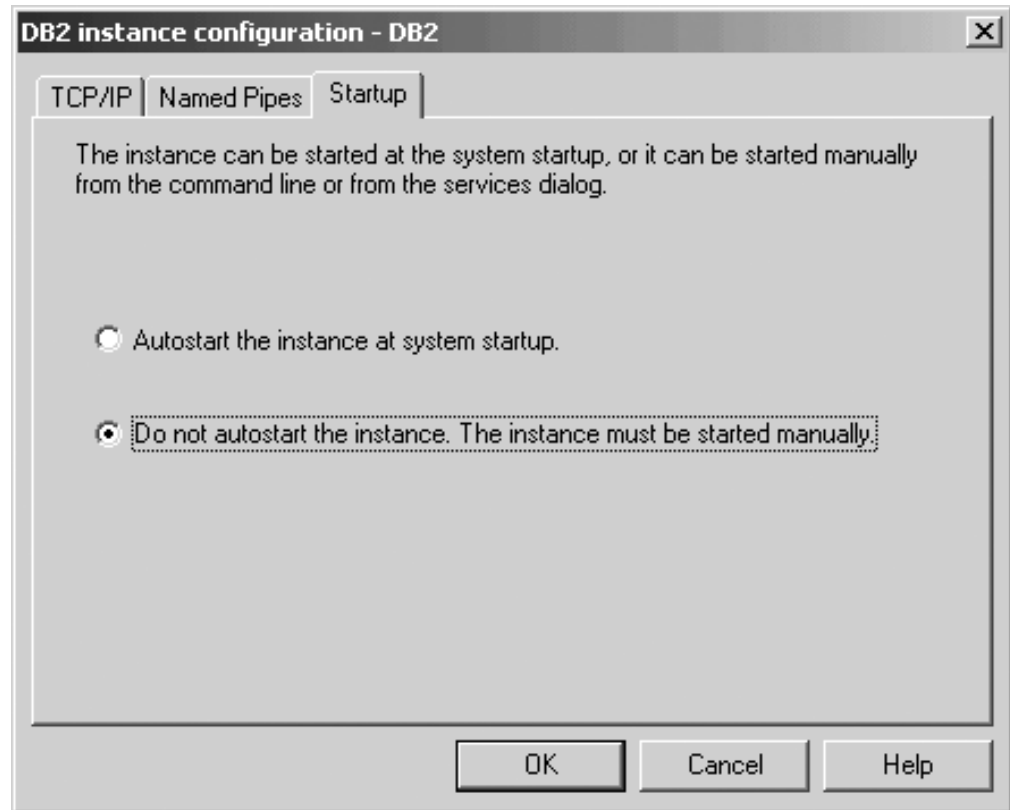


Figure 40. DB2 Setup wizard - DB2 instance configuration notebook

- c. Click **OK**. The “DB2 instance configuration” window closes.
 - d. Click **Next** on the Configure DB2 instances window. The “Set user information for the default DB2 instance” page opens.
17. On the “Set user information for the default DB2 instance” page:
- a. Select the domain of the user from the **Domain** drop-down list.

Note: Ensure for the domain you choose you have the appropriate domain administrator privileges, otherwise you may be prompted to return to the current panel.

- b. Type the user name for the instance user in the **User name** field.
- c. Type the password for the user in the **Password** field.
- d. Type the password again in the **Confirm password** field.

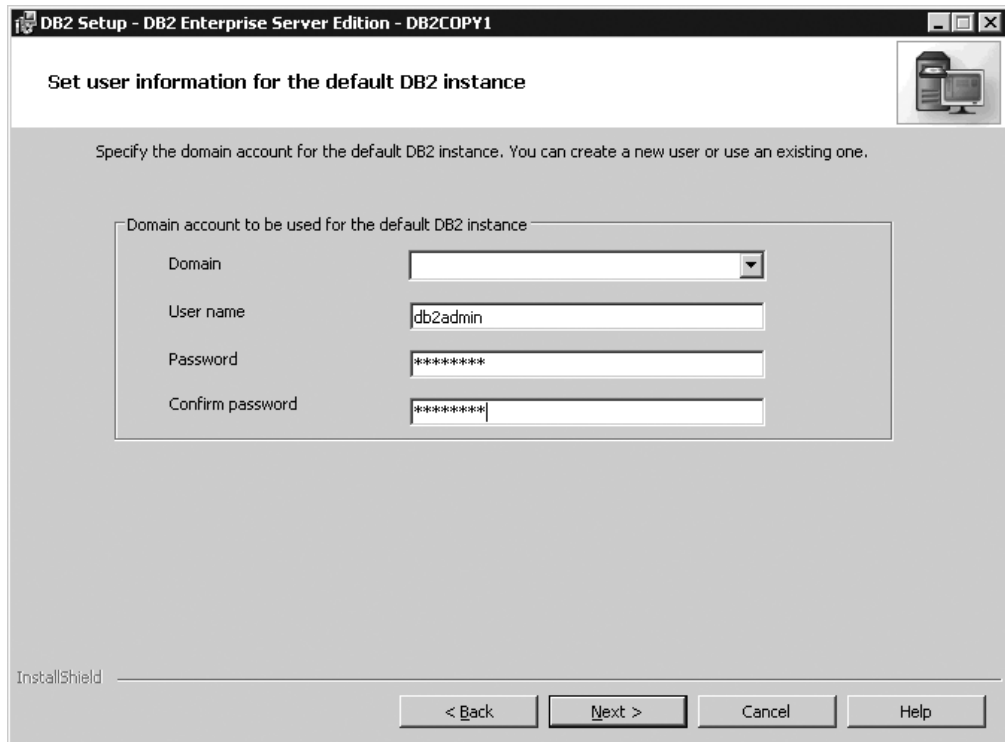


Figure 41. DB2 Setup wizard - Set user information for the default DB2 instance page

- e. Click **Next**. The “Prepare the DB2 tools catalog” page opens.

Note: A warning message appears if the DAS user has already been created. If you have verified the correct **User name** and **Password** continue to the next step by clicking **OK**, otherwise click **Cancel** and obtain this information from the domain administrator.

18. On the “Prepare the DB2 tools catalog” page:
 - a. Ensure that the **Prepare the DB2 tools catalog** check box is deselected.
 - b. Click **Next**. The “Set up notifications” page opens.
19. On the “Set up notifications” page:
 - a. Ensure that the **Set up your DB2 server to send notifications** check box is deselected.
 - b. Click **Next**. The “Enable operating system security for DB2 objects” page opens.
20. On the “Enable operating system security for DB2 objects” page:
 - a. Ensure that the **Enable operating system security** check box is deselected.
 - b. Click **Next**. The “Start copying files and create response files” page opens.
21. On the “Start copying files and create response files” page:
 - a. Review the current settings.

|

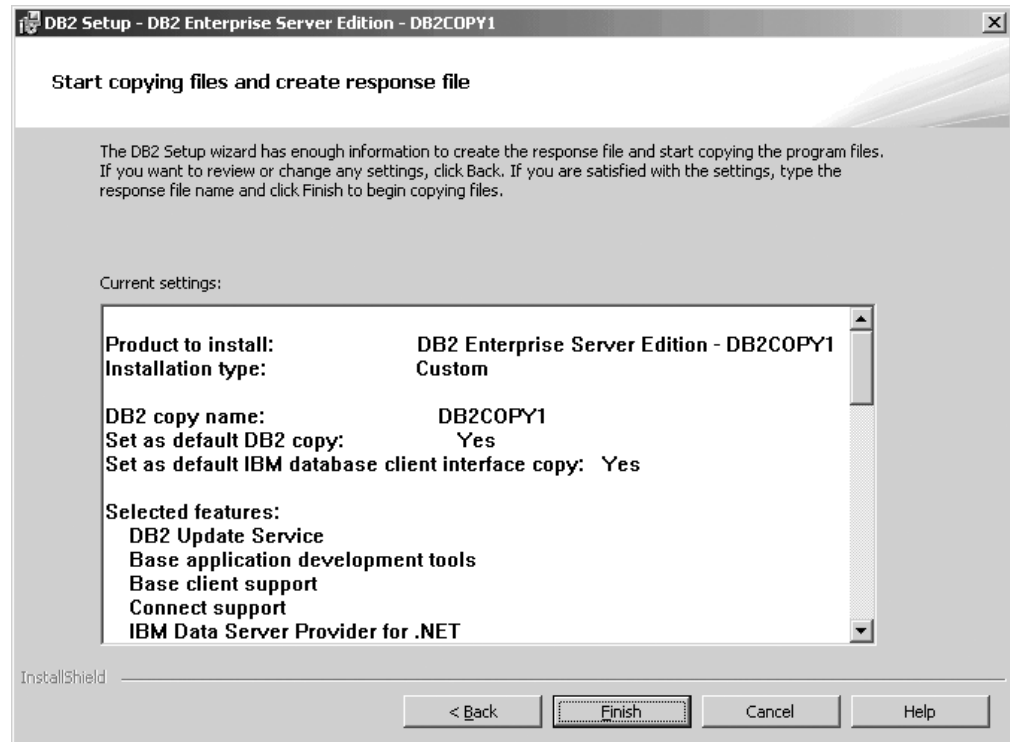


Figure 42. Installing DB2 Enterprise Server Edition page

- b. Click **Finish** to begin installing DB2 on your computer. The Installing DB2 Enterprise Server Edition page opens.
- c. When the installation completes, the “Setup Complete” page opens. Scroll to review the Post-install steps.



Figure 43. Setup complete page (top)

Note: Be sure to record the port number that you use to connect to the DB2 instance.



Figure 44. Setup complete page (bottom)

- d. Click **Finish** to exit from the installation GUI.
22. **Continue with Post-install steps:** Note that the installation results in two response files being created in the installing user's My Documents directory: PROD_ESE.rsp and PROD_ESE_addpart.rsp. The response file PROD_ESE_addpart.rsp is used to finish installing the partitioned database environment.
23. Copy the PROD_ESE_addpart.rsp file to the same directory as the setup.exe file on the second computer that you want to participate in the partitioned database environment. You can use FTP to accomplish this task, or any other tool that permits you to transfer files. For a DVD installation, this may require you to mount the DVD content onto a virtual drive or to create a disk image. Edit the response file to specify a unique partition number as the value for the keyword NODE.NODE_NUMBER:

```
*NODE.NODE_NUMBER=1-999
```

Since partition 0 was created on the instance-owning machine, you can use 1 for the first new partition. Note that the statement is commented out, that is, starting with an asterisk, "*"; uncomment it by removing the asterisk. For example, for partition 1, you would specify:

```
NODE.NODE_NUMBER=1
```

Repeat this step for every computer that you want to participate in the environment.

24. On the second computer that you want to participate in the environment:
- Change directories to where the DB2 Enterprise Server Edition DVD image resides. Ensure the setup.exe and PROD_ESE_addpart.rsp are in the same directory as outlined in step 23
 - Run the response file using the **setup -u** command as described in the topic "Setting up a partitioned database environment" on page 55.
25. If you are installing the DB2 product on more than two computers, repeat steps in 24 on every other computer that you want to participate in the environment.

Note: To avoid repeating these steps, you can also net use to the machine and drive where the DB2 install image was mounted, and installed. Using this method, you only have to unzip the install image once, instead of downloading and unzipping the image on every computer.

26. During DB2 installation, the DB2 Setup wizard or response file installation creates one partition on each computer that participates the partitioned database environment. If you want to set up additional logical partitions on a computer, you need to run the db2ncrt command to create each new partition. In this example, two logical partitions are to be created on each of the two computers used in the environment. Therefore, the db2ncrt must be run once on each computer. On the instance-owning computer, open **START-> Program Files->IBM DB2->DBCOPY1-> Command line tools->Command window** , then issue the following command: `db2ncrt /n:2 /u:domain_name\username, password /p:1` Where:
- The *n* parameter indicates a unique partition number. The value 2 is used for the new logical partition on the instance-owning computer because partitions 0 and 1 were previously created (partition 0 was created by the DB2 Setup wizard on the instance-owning computer, while partition 1 was created by the response file installation on the second computer).

- b. The *domain_name\username* and *password* parameters are the domain, user ID, and password for the DB2 instance.
 - c. The *p* parameter indicates the logical port number. Available logical ports on a computer usually begin at 0, and increase by 1. The value 0 would have been assigned to the partition created by the DB2 Setup wizard on the instance-owning computer; therefore the next available logical port is 1.
27. On the second computer that you want to participate in the environment, open **START-> Program Files->IBM DB2->DBCOPY1-> Command line tools->Command window** , then issue the following command: `db2nrcrt /n:3 /u:domain_name\username,password /p:1 /o:instance_owning_computer` When running `db2nrcrt` on the second computer:
- a. Because the partition number must be unique, the next available value for the *n* parameter is 3.
 - b. *username* and *password* are the user ID and password of a local administrator on the computer.
 - c. *instance_owning_computer* is the computer on which you performed the DB2 installation using the DB2 setup wizard.
- (For more information about the `db2nrcrt` command, see the *IBM DB2 Common Criteria Certification: Administration and User Documentation* book.)
28. Activate the license files. See the topic “Registering a DB2 product or feature license key using the `db2licm` command” on page 114.

After DB2 Enterprise 9.7 is installed, see the topic on configuring DB2 to be Common Criteria compliant in the *IBM DB2 Common Criteria Certification: Administration and User Documentation* book.

Part 3. After DB2 server installation

Chapter 7. After you install

Verifying the installation

Verifying the installation using the command line processor (CLP)

You can verify the installation by creating the SAMPLE database and running SQL commands to retrieve sample data.

Prerequisites

- The SAMPLE database component, found in the features selection, must be installed on your system and is included in a typical installation.
- You require a user with SYSADM authority.

To verify the installation:

1. Log on to the system as a user with SYSADM authority.
2. Start the database manager by entering the db2start command.
3. Enter the db2sampl command to create the SAMPLE database.

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

The SAMPLE database is automatically cataloged with the database alias SAMPLE when it is created.

4. Connect to the SAMPLE database, retrieve a list of all the employees that work in department 20, and reset the database connection. Enter the following commands from the command line processor (CLP):

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

The output should be similar to the following:

ID	NAME	DEPT	JOB	YEARS	SALARY	COMM
10	Sanders	20	Mgr	7	98357.50	-
20	Pernal	20	Sales	8	78171.25	612.45
80	James	20	Clerk	-	43504.60	128.20
190	Sneider	20	Clerk	8	34252.75	126.50

4 record(s) selected.

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.

Verifying access to the registry on the instance-owning computer (Windows)

This step is only required if you are setting up a partitioned database environment.

After installing DB2 on a participating computer, verify that you have access to the registry on the instance-owning computer. This verification step must be run from all participating computers.

You must have DB2 installed.

To verify access to the registry on the instance-owning computer:

1. From a command prompt, type the **regedit** command. The Registry Editor window opens.
2. Click the **Registry** menu item.
3. Select **Connect Network Registry**.
4. Type the name of the instance-owning computer in the **Computer name** field.

If the information is returned, then you have successfully verified that you have access to the registry on the instance-owning computer.

Verifying a partitioned database server installation (Linux and UNIX)

Use the db2val tool to verify the core functions of a DB2 copy by validating installation files, instances, database creation, connections to that database, and the state of DPF environments. For details, see “Validating your DB2 copy”. The state of a DPF environment is only verified if there are at least 2 nodes. In addition, to verify that your DB2 server installation was successful, you will create a sample database and run SQL commands to retrieve sample data and to verify that the data has been distributed to all participating database partition servers.

Before following these steps, make sure you have completed all of the installation steps.

To create the SAMPLE database:

1. Log on to the primary computer (ServerA) as the instance-owning user. For this example, db2inst1 is the instance-owning user.
2. Enter the db2sampl command to create the SAMPLE database. By default, the sample database will be created in the instance-owner’s home directory. In our example /db2home/db2inst1/ is the instance owner’s home directory. The instance owner’s home directory is the default database path.

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

The SAMPLE database is automatically cataloged with the database alias SAMPLE when it is created.

3. Start the database manager by entering the db2start command.
4. Enter the following DB2 commands from a DB2 command window to connect to the SAMPLE database, retrieve a list of all the employees that work in department 20:

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

5. To verify that data has been distributed across database partition servers, enter the following commands from a DB2 command window:

```
db2 "select distinct dbpartitionnum(empno) from employee"
```

The output will list the database partitions used by the employee table. The specific output will depend on:

- The number of database partitions in the database
- The number of database partitions in the database partition group that is used by the table space where the employee table was created

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.

Verifying a partitioned database environment installation (Windows)

To verify that your DB2 server installation was successful, you will create a sample database and run SQL commands to retrieve sample data and to verify that the data has been distributed to all participating database partition servers.

You have completed all of the installation steps.

To create the SAMPLE database:

1. Log on to the primary computer (ServerA) as user with SYSADM authority.
2. Enter the db2sampl command to create the SAMPLE database.

This command can take a few minutes to process. When the command prompt returns, the process is complete.

The SAMPLE database is automatically cataloged with the database alias SAMPLE when it is created.

3. Start the database manager by entering the db2start command.
4. Enter the following DB2 commands from a DB2 command window to connect to the SAMPLE database, retrieve a list of all the employees that work in department 20:

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

5. To verify that data has been distributed across database partition servers, enter the following commands from a DB2 command window:

```
db2 "select distinct dbpartitionnum(empno) from employee"
```

The output will list the database partitions used by the employee table. The specific output will depend on the number of database partitions in the database and the number of database partitions in the database partition group that is used by the table space where the employee table was created.

After you have verified the installation, you can remove the SAMPLE database to free up disk space. However, it is useful to keep the sample database, if you plan to make use of the sample applications.

Enter the db2 drop database sample command to drop the SAMPLE database.

DB2 product licensing

DB2 license files

There are two types of license files associated with DB2 database products: *base license keys* and *full license keys*. These license keys are stored in plaintext files, which are generally referred to as *license files* or *license entitlement certificates*.

A "base" license does not confer any usage rights. It is included in the DB2 database product installation media and is applied automatically during the installation process. For example, db2ese.lic is a base license file for DB2 Enterprise Server Edition .

License keys are required for all DB2 database products (including DB2[®] Connect[™]) and for each optional database feature. The license key is found in the /db2/license directory of the Activation CD, which is supplied as a part of the product installation media. For example, db2ese_u.lic is a license key and can be found on the *DB2 Enterprise Server Edition for Linux, UNIX, and Windows - Authorized User Option Activation* CD. By default, license keys are not applied during the DB2 database product installation. However, the following products do not have an Activation CD, therefore their license is automatically applied during the installation process: DB2 Express-C and DB2 Connect Personal Edition. In addition, DB2 Personal Edition is also a special case. Although DB2 Personal Edition has an Activation CD, its license is also automatically applied during installation.

For a list of license files, refer to Table 18 on page 113.

In general, licenses for DB2 database products can be purchased either per processor (priced by processor value unit (PVU)) or by authorized user. DB2 Express Edition can be purchased per server. IBM Database Enterprise Developer Edition is licensed per developer. The DB2 Storage Optimization feature is an exception. Since it can only be purchased by PVU (and only if the underlying database system is also licensed by PVU).

If you purchased a DB2 database product as well as separately priced features, you will need to apply more than one license key. Each DB2 database product and DB2 feature has its own license key. All of the features must be acquired under the same charge metric as the underlying DB2 database product. For example, if you purchase DB2 Enterprise Server Edition with a per processor license, you would need to purchase the DB2 Performance Optimization Feature by processor as well.

If you downloaded a DB2 database product or feature from one of the following Web sites and you do not have an Activation CD, you can obtain license keys as follows:

- Passport Advantage: You can obtain an Activation CD image from the Passport Advantage Web site: <http://www.ibm.com/software/lotus/passportadvantage/>. When using Passport Advantage, you must download the Activation CD image for each product and feature separately.
- PartnerWorld: Contact PartnerWorld for the appropriate license key. Refer to the PartnerWorld Web site: http://www.ibm.com/partnerworld/pwhome.nsf/weblook/index_pub.html
- The DB2 support or fix central Web sites: If you have not purchased a license key, contact an IBM Sales representative.

Once you have obtained the appropriate license keys, you should apply them before you use the DB2 database product. This is also referred to as registering the license key or adding a license. As a mechanism for you to keep track of, and differentiate, the DB2 database products and features you have installed on your system, it is recommended that you register the license key for your DB2 database products. You can find the DB2 database product license terms at: <http://www.ibm.com/software/sla>.

The management of licenses for DB2 database products or features is done through either:

- the db2licm license management tool command, or,
- the License Center within the Control Center.

Table 18. DB2 license files

License file name	DB2 database product or feature
db2aac.lic	DB2 Advanced Access Control feature
db2conpe.lic	DB2 Connect Personal Edition
db2consv.lic	DB2 Connect Server (Unlicensed base)
db2consv_as.lic	DB2 Connect Application Server Edition
db2consv_ee.lic	DB2 Connect Enterprise Edition
db2consv_is.lic	DB2 Connect Unlimited Edition for System i
db2consv_zs.lic	DB2 Connect Unlimited Edition for System z
db2dede.lic	IBM Database Enterprise Developer Edition
db2dpf.lic	DB2 Database Partitioning feature
db2ese.lic	DB2 Enterprise Server Edition (Unlicensed base)
db2ese_c.lic	DB2 Enterprise Server Edition (CPU option)
db2ese_u.lic	DB2 Enterprise Server Edition (Authorized User option)
db2exp.lic	DB2 Express Edition (Unlicensed base)
db2exp_c.lic	DB2 Express Edition (CPU option)
db2exp_s.lic	DB2 Express Edition (Server option)
db2exp_sftl.lic	DB2 Express Edition (Server option Fixed Term License)
db2exp_u.lic	DB2 Express Edition (Authorized User option)
db2exp_uftl.lic	DB2 Express Edition (Authorized User Option Fixed Term License)
db2expc_uw.lic	DB2 Express-C (Unwarranted)
db2geo.lic	DB2 Geodetic Data Management Feature
db2hrese.lic	Homogeneous Replication Feature for DB2 Enterprise Server Edition
db2haexp.lic	DB2 High Availability feature for DB2 Express Edition
db2pe.lic	DB2 Personal Edition
db2poese.lic	DB2 Performance Optimization Feature for DB2 Enterprise Server Edition
db2so.lic	DB2 Storage Optimization feature
db2wse.lic	DB2 Workgroup Server Edition (Unlicensed base)
db2wse_c.lic	DB2 Workgroup Server Edition (CPU option)
db2wse_u.lic	DB2 Workgroup Server Edition (Authorized User option)
bwdb2.lic	Base Warehouse Feature for DB2
ewdb2.lic	Enterprise Warehouse Feature for DB2
iwebe.lic	InfoSphere Warehouse Enterprise Base Edition
iwde.lic	InfoSphere Warehouse Developer Edition

Table 18. DB2 license files (continued)

License file name	DB2 database product or feature
iwdpb_c.lic	InfoSphere Warehouse Departmental Base Edition – CPU Option
iwdpb_u.lic	InfoSphere Warehouse Departmental Base Edition – Authorized User Option
iwdp_c.lic	InfoSphere Warehouse Departmental Edition – CPU Option
iwdp_u.lic	InfoSphere Warehouse Departmental Edition – Authorized User Option
iwee.lic	InfoSphere Warehouse Enterprise Edition
sam31.lic	IBM Tivoli System Automation for Multiplatforms (SA MP)

If you have license files that end in `_t.lic`, they are trial licenses.

Registering a DB2 product or feature license key using the `db2licm` command

Use the `db2licm` command to apply the license entitlement certificate (also referred to as registering a license key).

To complete this task, you must have the appropriate license file (`*.lic`). Refer to “DB2 license files” on page 111.

On Windows operating systems, you must belong to the local Administrators or Power Users group to use the `db2licm` command with the `-a` command parameter.

- On Windows operating systems, register a DB2 license key by entering the following command:

```
db2instance_path\bin\db2licm -a filename
```

where *db2instance_path* is where the DB2 instance was created and *filename* is the full path name and file name for the license file that corresponds to the product or feature you have purchased.

- On Linux or UNIX operating systems, register a DB2 license key by entering the following command:

```
INSTHOME/sql11b/adm/db2licm -a filename
```

where *INSTHOME* represents the home directory of the instance owner and *filename* is the full path name and file name for the license file that corresponds to the product or feature you have purchased. The `db2licm` command can also be found in the path where the DB2 database product is installed. For example, `/opt/IBM/db2/V9.7/adm` on AIX, HP-UX or Solaris operating systems or `/opt/ibm/db2/V9.7/adm` on Linux operating systems, if you use the default installation directory.

Checking DB2 license compliance

Each DB2 database product and feature has a license key associated with it. The license key should be registered before using the DB2 database product or feature. To verify license compliance, run the `db2licm` command and generate a compliance report.

Note: If you installed a DB2 database product trial image, the image includes access to all features available in the edition you are using.

1. Verify that you have registered the license keys for your DB2 database products.
 - a. Open the License Center or issue the command `db2licm -l`.
 - b. Examine the License Type information.
 - If you see License Type: "Developer", it means that your DB2 database product was obtained as part of Database Enterprise Developer Edition for Linux, UNIX, and Windows. In this case, the IBM Database Enterprise Developer Edition license terms take precedence over the typical DB2 product license terms.
 - If you see License Type: "Restricted use", it means that your DB2 database product was obtained as part of another IBM product. In this case, the license terms of the bundling product take precedence over the typical DB2 product license terms.
 - If you see License Type: "License not registered", it means that only a base license key has been registered. You should register the appropriate full license key for the DB2 database product.
2. Verify that you have registered the license keys for your DB2 features.
 - a. Generate a compliance report using the `db2licm` command or the License Center or query the `ENV_FEATURE_INFO` administrative view.
 - To generate compliance report using the `db2licm` command, issue the command:

```
db2licm -g filename
```

where *filename* is the path and file name where output is to be stored.
 - To generate the compliance report from the License Center, select **License** → **Generate Compliance Report**.
 - To see the compliance information in the `ENV_FEATURE_INFO` administrative view, connect to a database and issue the following query:

```
SELECT * FROM SYSIBMADM.ENV_FEATURE_INFO
```
 - b. Analyze the compliance report. If you have not registered the license key for a used DB2 feature, the compliance report will list the feature as a "In Violation".
3. Resolve the compliance issues by registering the appropriate license keys or by removing the sources of the violation.

Updating a Trial license

If you installed a DB2 product with a trial license and now want to update to a full license, you must update the product license key.

You cannot use this method to update from one DB2 product to another.

If a previously licensed copy of a DB2 server product does not already exist, a single server fix pack image can be used to install any of the DB2 database server products. In this case, the license installed is a trial license.

To update your DB2 license:

1. Get the license key. The license key is available from either:
 - the activation key that you downloaded from Passport Advantage, or
 - the Activation CD that you received in the physical media pack from IBM.

2. Register the license key using the License Center or the db2licm command.

Note: The trial license for DB2 Enterprise Server Edition on 32-bit Linux cannot be updated to a production license.

Password rules

When choosing a password, be aware that your password length can be up to the maximum number of characters supported by your operating system.

Some operating systems might have more password rules, such as minimum length and simplicity, and some operating systems can be configured to use different password encryption algorithms. See the appropriate operating system documentation for more information.

Note: To enable long password support on the AIX operating system, Version 6.1, or later, install APAR IZ35001 on the DB2 client and server machines.

Adding your user ID to the DB2ADMNS and DB2USERS user groups (Windows)

After successfully completing a DB2 installation, you now have to add users to the DB2ADMNS or the DB2USERS groups for users that need to run local DB2 applications and tools on the machine. The DB2 installer creates two new groups. You can either use a new name or accept the default names. The default group names are DB2ADMNS and DB2USERS.

Prerequisites

- You must have installed a DB2 product.
- You must have selected the Enable operating system security check box on the Enable operating system security for DB2 object panel during the installation of your DB2 product.

To add users to the appropriate group:

1. Click **Start** and select **Run**.
2. Type `lusrmgr.msc` and click **OK**.
3. Select **Local Users and Groups**.
4. Select **Users**.
5. Select the user you want to add.
6. Click **Properties**.
7. Click the **Member Of** tab.
8. Click **Add**.
9. Select the appropriate group.
10. Click **OK**.

If you did the install and chose not to enable the new security feature you can still do so post-install by running the `db2extsec.exe` command. Adding a user to a group takes effect the first time the user logs on after the user has been added. For example, if you add you user ID to the DB2ADMNS group, you need to log out and then log in again for this change to take effect.

Format of the DB2 node configuration file

The `db2nodes.cfg` file is used to define the database partition servers that participate in a DB2 instance. The `db2nodes.cfg` file is also used to specify the IP address or host name of a high-speed interconnect, if you want to use a high-speed interconnect for database partition server communication.

The format of the `db2nodes.cfg` file on Linux and UNIX operating systems is as follows:

```
dbpartitionnum hostname logicalport netname resourcesetname
```

dbpartitionnum, *hostname*, *logicalport*, *netname*, and *resourcesetname* are defined in the following section.

The format of the `db2nodes.cfg` file on Windows operating systems is as follows:

```
dbpartitionnum hostname computername logicalport netname resourcesetname
```

On Windows operating systems, these entries to the `db2nodes.cfg` are added by the `db2nrcrt` or `START DBM ADD DBPARTITIONNUM` commands. The entries can also be modified by the `db2nchg` command. You should not add these lines directly or edit this file.

dbpartitionnum

A unique number, between 0 and 999, that identifies a database partition server in a partitioned database system.

To scale your partitioned database system, you add an entry for each database partition server to the `db2nodes.cfg` file. The *dbpartitionnum* value that you select for additional database partition servers must be in ascending order, however, gaps can exist in this sequence. You can choose to put a gap between the *dbpartitionnum* values if you plan to add logical partition servers and wish to keep the nodes logically grouped in this file.

This entry is required.

hostname

The TCP/IP host name of the database partition server for use by the FCM. This entry is required. Canonical hostname is recommended.

If host names are supplied in the `db2nodes.cfg` file, instead of IP addresses, the database manager will dynamically try to resolve the host names. Resolution can be either local or through lookup at registered Domain Name Servers (DNS), as determined by the OS settings on the machine.

Starting with DB2 Version 9.1, both TCP/IPv4 and TCP/IPv6 protocols are supported. The method to resolve host names has changed.

While the method used in pre-Version 9.1 releases resolves the string as defined in the `db2nodes.cfg` file, the method in Version 9.1 or later tries to resolve the Fully Qualified Domain Names (FQDN) when short names are defined in the `db2nodes.cfg` file. Specifying short configured for fully qualified host names, this may lead to unnecessary delays in processes that resolve host names.

To avoid any delays in DB2 commands that require host name resolution, use any of the following work arounds:

1. If short names are specified in the `db2nodes.cfg` files and the operating system host name file, specify the short name and the fully qualified domain name for host name in the operating system host files.

2. To use only IPv4 addresses when you know that the DB2 server listens on an IPv4 port, issue the following command:

```
db2 catalog tcpip4
node db2tcp2 remote 192.0.32.67
server db2inst1 with "Look up IPv4 address from 192.0.32.67"
```

3. To use only IPv6 addresses when you know that the DB2 server listens on an IPv6 port, issue the following command:

```
db2 catalog tcpip6
node db2tcp3 1080:0:0:0:8:800:200C:417A
server 50000
with "Look up IPv6 address from 1080:0:0:0:8:800:200C:417A"
```

logicalport

Specifies the logical port number for the database partition server. This field is used to specify a particular database partition server on a workstation that is running logical database partition servers.

DB2 reserves a port range (for example, 60000 - 60003) in the `/etc/services` file for inter-partition communications at the time of installation. This *logicalport* field in `db2nodes.cfg` specifies which port in that range you want to assign to a particular logical partition server.

If there is no entry for this field, the default is 0. However, if you add an entry for the *netname* field, you must enter a number for the *logicalport* field.

If you are using logical database partitions, the *logicalport* value you specify *must* start at 0 and continue in ascending order (for example, 0,1,2).

Furthermore, if you specify a *logicalport* entry for one database partition server, you must specify a *logicalport* for each database partition server listed in your `db2nodes.cfg` file.

This field is optional only if you are *not* using logical database partitions or a high speed interconnect.

netname

Specifies the host name or the IP address of the high speed interconnect for FCM communication.

If an entry is specified for this field, all communication between database partition servers (except for communications as a result of the `db2start`, `db2stop`, and `db2_all` commands) is handled through the high speed interconnect.

This parameter is required only if you are using a high speed interconnect for database partition communications.

resourcesetname

The *resourcesetname* defines the operating system resource that the node should be started in. The *resourcesetname* is for process affinity support, used for Multiple Logical Nodes (MLNs). This support is provided with a string type field formerly known as `quadname`.

This parameter is only supported on AIX, HP-UX, and Solaris Operating System.

On AIX, this concept is known as "resource sets" and on Solaris Operating System it is called "projects". Refer to your operating systems documentation for more information on resource management.

On HP-UX, the *resourcesetname* parameter is the name of a PRM group. Refer to "HP-UX Process Resource Manager. User Guide. (B8733-90007)" documentation from HP for more information.

On Windows operating systems, process affinity for a logical node can be defined through the **DB2PROCESSORS** registry variable.

On Linux operating systems, the *resourcesetname* column defines a number that corresponds to a Non-Uniform Memory Access (NUMA) node on the system. The system utility numactl must be available as well as a 2.6 Kernel with NUMA policy support.

The *netname* parameter must be specified if the *resourcesetname* parameter is used.

Example configurations

Use the following example configurations to determine the appropriate configuration for your environment.

One computer, four database partitions servers

If you are not using a clustered environment and want to have four database partition servers on one physical workstation called ServerA, update the db2nodes.cfg file as follows:

```
0          ServerA      0
1          ServerA      1
2          ServerA      2
3          ServerA      3
```

Two computers, one database partition server per computer

If you want your partitioned database system to contain two physical workstations, called ServerA and ServerB, update the db2nodes.cfg file as follows:

```
0          ServerA      0
1          ServerB      0
```

Two computers, three database partition server on one computer

If you want your partitioned database system to contain two physical workstations, called ServerA and ServerB, and ServerA is running 3 database partition servers, update the db2nodes.cfg file as follows:

```
4          ServerA      0
6          ServerA      1
8          ServerA      2
9          ServerB      0
```

Two computers, three database partition servers with high speed switches

If you want your partitioned database system to contain two computers, called ServerA and ServerB (with ServerB running two database partition servers), and use a high speed interconnect called switch1 and switch2, update the db2nodes.cfg file as follows:

```
0          ServerA      0          switch1
1          ServerB      0          switch2
2          ServerB      1          switch2
```

Examples using resourcesetname

These restrictions apply to the following examples:

- This example shows the usage of *resourcesetname* when there is no high speed interconnect in the configuration.

- The *netname* is the fourth column and a *hostname* also can be specified on that column where there is no switch name and you want to use *resourcesetname*. The fifth parameter is *resourcesetname* if it is defined. The resource group specification can only show as the fifth column in the *db2nodes.cfg* file. This means that for you to specify a resource group, you must also enter a fourth column. The fourth column is intended for a high speed switch.
- If you do not have a high speed switch or you do not want to use it, you must then enter the *hostname* (same as the second column). In other words, the DB2 database management system does not support column gaps (or interchanging them) in the *db2nodes.cfg* files. This restriction already applies to the first three columns, and now it applies to all five columns.

AIX example

Here is an example of how to set up the resource set for AIX operating systems.

In this example, there is one physical node with 32 processors and 8 logical database partitions (MLNs). This example shows how to provide process affinity to each MLN.

1. Define resource sets in */etc/rset*:

```
DB2/MLN1:
  owner      = db2inst1
  group      = system
  perm       = rwr-r-
  resources  = sys/cpu.00000,sys/cpu.00001,sys/cpu.00002,sys/cpu.00003
```

```
DB2/MLN2:
  owner      = db2inst1
  group      = system
  perm       = rwr-r-
  resources  = sys/cpu.00004,sys/cpu.00005,sys/cpu.00006,sys/cpu.00007
```

```
DB2/MLN3:
  owner      = db2inst1
  group      = system
  perm       = rwr-r-
  resources  = sys/cpu.00008,sys/cpu.00009,sys/cpu.00010,sys/cpu.00011
```

```
DB2/MLN4:
  owner      = db2inst1
  group      = system
  perm       = rwr-r-
  resources  = sys/cpu.00012,sys/cpu.00013,sys/cpu.00014,sys/cpu.00015
```

```
DB2/MLN5:
  owner      = db2inst1
  group      = system
  perm       = rwr-r-
  resources  = sys/cpu.00016,sys/cpu.00017,sys/cpu.00018,sys/cpu.00019
```

```
DB2/MLN6:
  owner      = db2inst1
  group      = system
  perm       = rwr-r-
  resources  = sys/cpu.00020,sys/cpu.00021,sys/cpu.00022,sys/cpu.00023
```

```
DB2/MLN7:
  owner      = db2inst1
  group      = system
  perm       = rwr-r-
  resources  = sys/cpu.00024,sys/cpu.00025,sys/cpu.00026,sys/cpu.00027
```

```

DB2/MLN8:
  owner      = db2inst1
  group      = system
  perm       = rwr-r-
  resources  = sys/cpu.00028,sys/cpu.00029,sys/cpu.00030,sys/cpu.00031

```

2. Enable memory affinity by typing the following command:

```
vmo -p -o memory_affinity=1
```

3. Give instance permissions to use resource sets:

```

chuser capabilities=
  CAP_BYPASS_RAC_VMM,CAP_PROPAGATE,CAP_NUMA_ATTACH db2inst1

```

4. Add the resource set name as the fifth column in db2nodes.cfg:

```

1 regatta 0 regatta DB2/MLN1
2 regatta 1 regatta DB2/MLN2
3 regatta 2 regatta DB2/MLN3
4 regatta 3 regatta DB2/MLN4
5 regatta 4 regatta DB2/MLN5
6 regatta 5 regatta DB2/MLN6
7 regatta 6 regatta DB2/MLN7
8 regatta 7 regatta DB2/MLN8

```

HP-UX example

This example shows how to use PRM groups for CPU shares on a machine with 4 CPUs and 4 MLNs and 24% of CPU share per MLN, leaving 4% for other applications. The DB2 instance name is db2inst1.

1. Edit GROUP section of /etc/prmconf:

```

OTHERS:1:4::
db2prm1:50:24::
db2prm2:51:24::
db2prm3:52:24::
db2prm4:53:24::

```

2. Add instance owner entry to /etc/prmconf:

```
db2inst1:::OTHERS,db2prm1,db2prm2,db2prm3,db2prm4
```

3. Initialize groups and enable CPU manager by entering the following command:

```

prmconfig -i
prmconfig -e CPU

```

4. Add PRM group names as a fifth column to db2nodes.cfg:

```

1 voyager 0 voyager db2prm1
2 voyager 1 voyager db2prm2
3 voyager 2 voyager db2prm3
4 voyager 3 voyager db2prm4

```

PRM configuration (steps 1-3) may be done using interactive GUI tool xprm.

Linux example

On Linux operating systems, the *resourcesetname* column defines a number that corresponds to a Non-Uniform Memory Access (NUMA) node on the system. The numactl system utility must be available in addition to a 2.6 kernel with NUMA policy support. Refer to the man page for numactl for more information about NUMA support on Linux operating systems.

This example shows how to set up a four node NUMA computer with each logical node associated with a NUMA node.

1. Ensure that NUMA capabilities exist on your system.
2. Issue the following command:

```
$ numactl --hardware
```

Output similar to the following displays:

```
available: 4 nodes (0-3)
node 0 size: 1901 MB
node 0 free: 1457 MB
node 1 size: 1910 MB
node 1 free: 1841 MB
node 2 size: 1910 MB
node 2 free: 1851 MB
node 3 size: 1905 MB
node 3 free: 1796 MB
```

3. In this example, there are four NUMA nodes on the system. Edit the db2nodes.cfg file as follows to associate each MLN with a NUMA node on the system:

```
0 hostname 0 hostname 0
1 hostname 1 hostname 1
2 hostname 2 hostname 2
3 hostname 3 hostname 3
```

Solaris example

Here is an example of how to set up the project for Solaris Version 9.

In this example, there is 1 physical node with 8 processors: one CPU will be used for the default project, three (3) CPUs will be used by the Application Server, and four (4) CPUs for DB2. The instance name is db2inst1.

1. Create a resource pool configuration file using an editor. For this example, the file will be called pool.db2. Here's the content:

```
create system hostname
create pset pset_default (uint pset.min = 1)
create pset db0_pset (uint pset.min = 1; uint pset.max = 1)
create pset db1_pset (uint pset.min = 1; uint pset.max = 1)
create pset db2_pset (uint pset.min = 1; uint pset.max = 1)
create pset db3_pset (uint pset.min = 1; uint pset.max = 1)
create pset appsrv_pset (uint pset.min = 3; uint pset.max = 3)
create pool pool_default (string pool.scheduler="TS";
    boolean pool.default = true)
create pool db0_pool (string pool.scheduler="TS")
create pool db1_pool (string pool.scheduler="TS")
create pool db2_pool (string pool.scheduler="TS")
create pool db3_pool (string pool.scheduler="TS")
create pool appsrv_pool (string pool.scheduler="TS")
associate pool pool_default (pset pset_default)
associate pool db0_pool (pset db0_pset)
associate pool db1_pool (pset db1_pset)
associate pool db2_pool (pset db2_pset)
associate pool db3_pool (pset db3_pset)
associate pool appsrv_pool (pset appsrv_pset)
```

2. Edit the /etc/project file to add the DB2 projects and appsrv project as follows:

```
system:0::::
user.root:1::::
noproject:2::::
default:3::::
group.staff:10::::
appsrv:4000:App Serv project:root::project.pool=appsrv_pool
db2proj0:5000:DB2 Node 0 project:db2inst1,root::project.pool=db0_pool
db2proj1:5001:DB2 Node 1 project:db2inst1,root::project.pool=db1_pool
db2proj2:5002:DB2 Node 2 project:db2inst1,root::project.pool=db2_pool
db2proj3:5003:DB2 Node 3 project:db2inst1,root::project.pool=db3_pool
```

3. Create the resource pool: # poolcfg -f pool.db2.

4. Activate the resource pool: # pooladm -c
5. Add the project name as the fifth column in db2nodes.cfg file:

```
0 hostname 0 hostname db2proj0
1 hostname 1 hostname db2proj1
2 hostname 2 hostname db2proj2
3 hostname 3 hostname db2proj3
```

Updating the node configuration file (Linux and UNIX)

This task provides steps for updating the db2nodes.cfg file to include entries for participating computers.

The node configuration file (db2nodes.cfg), located in the instance owner's home directory, contains configuration information that tells DB2 which servers participate in an instance of the partitioned database environment. A db2nodes.cfg file exists for each instance in a partitioned database environment.

The db2nodes.cfg file must contain one entry for each server participating in the instance. When you create an instance, the db2nodes.cfg file is automatically created and an entry for the instance-owning server is added.

For example, when you created the DB2 instance using the DB2 Setup wizard, on the instance-owning server ServerA, the db2nodes.cfg file is updated as follows:

```
0 ServerA 0
```

Prerequisites

- The DB2 application must be installed on all participating computers.
- A DB2 instance must exist on the primary computer.
- You must be a user with SYSADM authority.
- Review the configuration examples and file format information provided in the Format of the DB2 node configuration file topic if either of the following conditions apply:
 - You plan to use a high speed switch for communication between database partition servers
 - Your partitioned configuration will have multiple logical partitions

Restriction

The hostnames used in the steps of the Procedure section must be fully qualified hostnames.

To update the db2nodes.cfg file:

1. Log on as the instance owner (in our example, db2inst1 is the instance owner).
2. Ensure that the DB2 instance is stopped by entering:

```
INSTHOME/sqllib/adm/db2stop
```

where *INSTHOME* is the home directory of the instance owner (the db2nodes.cfg file is locked when the instance is running and can only be edited when the instance is stopped).

For example, if your instance home directory is /db2home/db2inst1, enter the following command:

```
/db2home/db2inst1/sqllib/adm/db2stop
```

3. Add an entry to the .rhosts file for each DB2 instance. Update the file by adding the following:

```
<hostname> <db2instance>
```

where <hostname> is the TCP/IP host name of the database server and <db2instance> is the name of the instance you use to access the database server.

4. Add an entry to the db2nodes.cfg file of each participating server. When you first view the db2nodes.cfg file, it should contain an entry similar to the following:

```
0 ServerA 0
```

This entry includes the database partition server number (node number), the TCP/IP host name of the server where the database partition server resides, and a logical port number for the database partition server.

For example, if you are installing a partitioned configuration with four computers and a database partition server on each computer, the updated db2nodes.cfg should appear similar to the following:

```
0 ServerA 0
1 ServerB 0
2 ServerC 0
3 ServerD 0
```

5. When you have finished updating the db2nodes.cfg file, enter the `INSTHOME/sqllib/adm/db2start` command, where *INSTHOME* is the home directory of the instance owner. For example, if your instance home directory is `/db2home/db2inst1`, enter the following command:

```
/db2home/db2inst1/sqllib/adm/db2start
```

6. Log out.

Enabling communications between database partition servers (Linux and UNIX)

This task describes how to enable communication between the database partition servers that participate in your partitioned database system. Communication between database partition servers is handled by the Fast Communications Manager (FCM). To enable FCM, a port or port range must be reserved in the `/etc/services` file on each computer in your partitioned database system.

You must have a user ID with root authority.

You must perform this task on all computers that participate in the instance.

The number of ports to reserve for FCM is equal to the maximum number of database partitions hosted, or potentially hosted, by any computer in the instance.

In the following example, the db2nodes.cfg file contains these entries:

```
0 server1 0
1 server1 1
2 server2 0
3 server2 1
4 server2 2
5 server3 0
6 server3 1
7 server3 2
8 server3 3
```

Assume that the FCM ports are numbered starting at 60000. In this situation:

- server1 uses two ports (60000, 60001) for its two database partitions
- server2 uses three ports (60000, 60001, 60002) for its three database partitions

- server3 uses four ports (60000, 60001, 60002, 60003) for its four database partitions

All computers must reserve 60000, 60001, 60002, and 60003, since this is the largest port range required by any computer in the instance.

If you use a high availability solution such as High Availability Cluster Multi-Processing (HACMP) or Tivoli System Automation to fail over database partitions from one computer to another, you must account for potential port requirements. For example, if a computer normally hosts four database partitions, but another computer's two database partitions could potentially fail over to it, six ports must be planned for that computer.

When you create an instance, a port range is reserved on the primary computer. The primary computer is also known as the instance-owning computer. However, if the port range originally added to the `/etc/services` file is not sufficient for your needs, you will need to extend the range of reserved ports by manually adding additional entries.

To enable communications between servers in a partitioned database environment using `/etc/services`:

1. Log on to the primary computer (instance owning computer) as a user with root authority.
2. Create an instance.
3. View the default port range that has been reserved in the `/etc/services` file. In addition to the base configuration, the FCM ports should appear similar to the following:

```
db2c_db2inst1      50000/tcp
#Add FCM port information
DB2_db2inst1      60000/tcp
DB2_db2inst1_1    60001/tcp
DB2_db2inst1_2    60002/tcp
DB2_db2inst1_END  60003/tcp
```

By default, the first port (50000) is reserved for connection requests, and the first available four ports above 60000 are reserved for FCM communication. One port is for the instance-owning database partition server and three ports are for logical database partition servers that you might choose to add to the computer after installation is complete.

The port range must include a start and an END entry. Intermediate entries are optional. Explicitly including intermediate values can be useful for preventing other applications from using these ports, but these entries are not verified by the database manager.

DB2 port entries use the following format:

```
DB2_instance_name_suffix port_number/tcp # comment
```

where:

- *instance_name* is the name of the partitioned instance.
- *suffix* is not used for the first FCM port. Intermediate entries are those between the lowest and highest port. If you include the intermediate entries between the first and ending FCM port, the *suffix* consists of an integer that you increment by one for each additional port. For example, the second port is numbered 1, and third is numbered 2, and so on to ensure uniqueness. The word END must be used as the *suffix* for the last entry.

- *port_number* is the port number that you reserve for database partition server communications.
 - *comment* is an optional comment describing an entry.
4. Ensure that there are sufficient ports reserved for FCM communication. If the range of reserved ports is insufficient, add new entries to the file.
 5. Log on as a root user to each computer participating in the instance and add identical entries to the `/etc/services` file.

Enabling the execution of remote commands (Linux and UNIX)

You must update your `.rhosts` file to execute remote commands using `rsh`.

In a partitioned database system, each database partition server must have the authority to perform remote commands on all the other database partition servers participating in an instance. This authority can be granted by updating the `.rhosts` file in the home directory for the instance. Because the home directory for the instance is on the shared DB2 home file system, only one `.rhosts` file is required.

Prerequisites

- You must have root authority.
- You must know the host name of each participating computer.
- You must know the instance owner's user name.

This topic describes how to enable execution of remote commands using `rsh`.

You can also use `ssh` to enable execution of remote commands. To use `ssh` without being prompted for passwords or pass phrases, refer to:

- "Setting up a partitioned database environment" on page 55
- <http://www-128.ibm.com/developerworks/db2/library/techarticle/dm-0506finnie/index.html>

To update your `.rhosts` file to execute remote commands using `rsh`:

1. Log onto the primary computer as a user with root authority.
2. Create a `.rhosts` file in the instance home directory. For example, if your instance home directory is `/db2home/db2inst1`, you can use a text editor to create the `.rhosts` file by entering the following command:

```
vi /db2home/db2inst1/.rhosts
```

3. Add entries to the `.rhosts` file for each computer including the primary computer. The `.rhosts` file has the following format:

```
hostname instance_owner_user_name
```

Some systems might require a long host name to be specified, for example: `ServerA.yourdomain.com`. Before you add host name entries to the `.rhosts` file, make sure the host names in the `/etc/hosts` and the `/etc/resolv.conf` files can be resolved.

The `INSTHOME/.rhosts` file should contain entries similar to the following:

```
ServerA.yourdomain.com db2inst1
ServerB.yourdomain.com db2inst1
ServerC.yourdomain.com db2inst1
ServerD.yourdomain.com db2inst1
```

Rather than specifying each host name individually, you can specify the following entry in the `.rhosts` file, but this action may pose a security risk and should only be done in a test environment.

```
+ db2inst1
```

If you have specified a high speed switch (netname) in the db2nodes.cfg file, you should also add netname entries for each computer to the .rhosts file. The netname values are specified in the fourth column of the db2nodes.cfg file. A .rhosts file with high speed switch (netname) entries may look similar to the following:

```
ServerA.yourdomain.com db2inst1
ServerB.yourdomain.com db2inst1
ServerC.yourdomain.com db2inst1
ServerD.yourdomain.com db2inst1
Switch1.yourdomain.com db2inst1
Switch2.yourdomain.com db2inst1
Switch3.yourdomain.com db2inst1
Switch4.yourdomain.com db2inst1
```

An alternative to using a .rhosts file is to use /etc/hosts.equiv file. The /etc/hosts.equiv file would contain the exact same entries as the .rhosts file, but must be created on each computer.

For more information about the .rhosts file or the /etc/hosts.equiv file, see your operating system documentation.

Installing a DB2 product as a non-root user

Most DB2 database products can be installed as a non-root user.

Before you begin

Before you install any DB2 database product as a non-root user, be aware of the differences between root installations and non-root installations, and the limitations of non-root installations. For more information on non-root installation, see “Non-root installation overview (Linux and UNIX)”.

Prerequisites for installing a DB2 database product as a non-root user are:

- You must be able to mount the installation DVD, or have it mounted for you.
- You must have a valid user ID that can be used as the owner of a DB2 instance.
User IDs have the following restrictions and requirements:
 - Must have a primary group other than guests, admins, users, and local
 - Can include lowercase letters (a–z), numbers (0–9), and the underscore character (_)
 - Cannot be longer than eight characters
 - Cannot begin with IBM, SYS, SQL, or a number
 - Cannot be a DB2 reserved word (USERS, ADMINS, GUESTS, PUBLIC, or LOCAL), or an SQL reserved word
 - Cannot use any User IDs with root privilege for the DB2 instance ID, DAS ID or fenced ID.
 - Cannot include accented characters
 - If existing user IDs are specified instead of creating new user IDs, make sure that the user IDs:
 - Are not locked
 - Do not have expired passwords
- The hardware and software prerequisites that exist for the product you are installing apply to the non-root user just as they do for root users.

- On AIX Version 5.3, Asynchronous I/O (AIO) must be enabled. It is strongly recommended the system has I/O Completion Ports (IOCP) enabled.
- Your home directory must be a valid DB2 path.
DB2 installation paths have the following rules:
 - Can include lowercase letters (a–z), uppercase letters (A–Z), and the underscore character (_)
 - Cannot exceed 128 characters
 - Cannot contain spaces
 - Cannot contain non-English characters

About this task

Installing DB2 database products as a non-root user is transparent to the non-root user. In other words, there is nothing special a non-root user needs to do to install a DB2 database product, other than being logged in as a non-root user.

Procedure

To perform a non-root installation:

1. Log in as a non-root user
2. Install your DB2 database product using any of the methods available to you.
Options include:
 - The DB2 Setup wizard (GUI install)
 - The `db2_install` command
 - The `db2setup` command with a response file (silent install)

Note: Since non-root users cannot choose the directory where DB2 database products are installed, any **FILE** keyword in your response file is ignored.

3. After the DB2 database product is installed, you must open a new login session to use the non-root DB2 instance. Alternatively, you can use the same login session if you set up the DB2 instance environment with `$HOME/sqllib/db2profile` (for Bourne shell and Korn shell users) or `$HOME/sqllib/db2chsrc` (for C shell users), where `$HOME` is the non-root user's home directory.

What to do next

After the DB2 database product is installed, verify your operating system user process resource limits (ulimits). If the minimum ulimit values are not met, the DB2 engine can encounter unexpected operating resource shortage errors. These errors can lead to a DB2 database system outage.

Part 4. Appendixes

Appendix A. Overview of the DB2 technical information

DB2 technical information is available through the following tools and methods:

- DB2 Information Center
 - Topics (Task, concept and reference topics)
 - Help for DB2 tools
 - Sample programs
 - Tutorials
- DB2 books
 - PDF files (downloadable)
 - PDF files (from the DB2 PDF DVD)
 - printed books
- Command line help
 - Command help
 - Message help

Note: The DB2 Information Center topics are updated more frequently than either the PDF or the hardcopy books. To get the most current information, install the documentation updates as they become available, or refer to the DB2 Information Center at ibm.com.

You can access additional DB2 technical information such as technotes, white papers, and IBM Redbooks publications online at ibm.com. Access the DB2 Information Management software library site at <http://www.ibm.com/software/data/sw-library/>.

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Do not use this e-mail address to contact DB2 Customer Support. If you have a DB2 technical issue that the documentation does not resolve, contact your local IBM service center for assistance.

DB2 technical library in hardcopy or PDF format

The following tables describe the DB2 library available from the IBM Publications Center at www.ibm.com/shop/publications/order. English and translated DB2 Version 9.7 manuals in PDF format can be downloaded from www.ibm.com/support/docview.wss?rs=71&uid=swg2700947.

Although the tables identify books available in print, the books might not be available in your country or region.

The form number increases each time a manual is updated. Ensure that you are reading the most recent version of the manuals, as listed below.

Note: The *DB2 Information Center* is updated more frequently than either the PDF or the hard-copy books.

Table 19. DB2 technical information

Name	Form Number	Available in print	Last updated
<i>Administrative API Reference</i>	SC27-2435-00	Yes	August, 2009
<i>Administrative Routines and Views</i>	SC27-2436-00	No	August, 2009
<i>Call Level Interface Guide and Reference, Volume 1</i>	SC27-2437-00	Yes	August, 2009
<i>Call Level Interface Guide and Reference, Volume 2</i>	SC27-2438-00	Yes	August, 2009
<i>Command Reference</i>	SC27-2439-00	Yes	August, 2009
<i>Data Movement Utilities Guide and Reference</i>	SC27-2440-00	Yes	August, 2009
<i>Data Recovery and High Availability Guide and Reference</i>	SC27-2441-00	Yes	August, 2009
<i>Database Administration Concepts and Configuration Reference</i>	SC27-2442-00	Yes	August, 2009
<i>Database Monitoring Guide and Reference</i>	SC27-2458-00	Yes	August, 2009
<i>Database Security Guide</i>	SC27-2443-00	Yes	August, 2009
<i>DB2 Text Search Guide</i>	SC27-2459-00	Yes	August, 2009
<i>Developing ADO.NET and OLE DB Applications</i>	SC27-2444-00	Yes	August, 2009
<i>Developing Embedded SQL Applications</i>	SC27-2445-00	Yes	August, 2009
<i>Developing Java Applications</i>	SC27-2446-00	Yes	August, 2009
<i>Developing Perl, PHP, Python, and Ruby on Rails Applications</i>	SC27-2447-00	No	August, 2009
<i>Developing User-defined Routines (SQL and External)</i>	SC27-2448-00	Yes	August, 2009
<i>Getting Started with Database Application Development</i>	GI11-9410-00	Yes	August, 2009
<i>Getting Started with DB2 Installation and Administration on Linux and Windows</i>	GI11-9411-00	Yes	August, 2009

Table 19. DB2 technical information (continued)

Name	Form Number	Available in print	Last updated
<i>Globalization Guide</i>	SC27-2449-00	Yes	August, 2009
<i>Installing DB2 Servers</i>	GC27-2455-00	Yes	August, 2009
<i>Installing IBM Data Server Clients</i>	GC27-2454-00	No	August, 2009
<i>Message Reference Volume 1</i>	SC27-2450-00	No	August, 2009
<i>Message Reference Volume 2</i>	SC27-2451-00	No	August, 2009
<i>Net Search Extender Administration and User's Guide</i>	SC27-2469-00	No	August, 2009
<i>SQL Procedural Languages: Application Enablement and Support</i>	SC23-9838-00	Yes	August, 2009
<i>Partitioning and Clustering Guide</i>	SC27-2453-00	Yes	August, 2009
<i>pureXML Guide</i>	SC27-2465-00	Yes	August, 2009
<i>Query Patroller Administration and User's Guide</i>	SC27-2467-00	No	August, 2009
<i>Spatial Extender and Geodetic Data Management Feature User's Guide and Reference</i>	SC27-2468-00	No	August, 2009
<i>SQL Procedural Language Guide</i>	SC27-2470-00	Yes	August, 2009
<i>SQL Reference, Volume 1</i>	SC27-2456-00	Yes	August, 2009
<i>SQL Reference, Volume 2</i>	SC27-2457-00	Yes	August, 2009
<i>Troubleshooting and Tuning Database Performance</i>	SC27-2461-00	Yes	August, 2009
<i>Upgrading to DB2 Version 9.7</i>	SC27-2452-00	Yes	August, 2009
<i>Visual Explain Tutorial</i>	SC27-2462-00	No	August, 2009
<i>What's New for DB2 Version 9.7</i>	SC27-2463-00	Yes	August, 2009
<i>Workload Manager Guide and Reference</i>	SC27-2464-00	Yes	August, 2009
<i>XQuery Reference</i>	SC27-2466-00	No	August, 2009

Table 20. DB2 Connect-specific technical information

Name	Form Number	Available in print	Last updated
<i>Installing and Configuring DB2 Connect Personal Edition</i>	SC27-2432-00	Yes	August, 2009

Table 20. DB2 Connect-specific technical information (continued)

Name	Form Number	Available in print	Last updated
<i>Installing and Configuring DB2 Connect Servers</i>	SC27-2433-00	Yes	August, 2009
<i>DB2 Connect User's Guide</i>	SC27-2434-00	Yes	August, 2009

Table 21. Information Integration technical information

Name	Form Number	Available in print	Last updated
<i>Information Integration: Administration Guide for Federated Systems</i>	SC19-1020-02	Yes	August, 2009
<i>Information Integration: ASNCLP Program Reference for Replication and Event Publishing</i>	SC19-1018-04	Yes	August, 2009
<i>Information Integration: Configuration Guide for Federated Data Sources</i>	SC19-1034-02	No	August, 2009
<i>Information Integration: SQL Replication Guide and Reference</i>	SC19-1030-02	Yes	August, 2009
<i>Information Integration: Introduction to Replication and Event Publishing</i>	GC19-1028-02	Yes	August, 2009

Ordering printed DB2 books

If you require printed DB2 books, you can buy them online in many but not all countries or regions. You can always order printed DB2 books from your local IBM representative. Keep in mind that some softcopy books on the *DB2 PDF Documentation DVD* are unavailable in print. For example, neither volume of the *DB2 Message Reference* is available as a printed book.

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Note: The most up-to-date and complete DB2 documentation is maintained in the DB2 Information Center at <http://publib.boulder.ibm.com/infocenter/db2luw/v9r7>.

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 - The IBM directory of world wide contacts at www.ibm.com/planetwide
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 2. When you call, specify that you want to order a DB2 publication.
 3. Provide your representative with the titles and form numbers of the books that you want to order. For titles and form numbers, see "DB2 technical library in hardcopy or PDF format" on page 131.

Displaying SQL state help from the command line processor

DB2 products return an SQLSTATE value for conditions that can be the result of an SQL statement. SQLSTATE help explains the meanings of SQL states and SQL state class codes.

To start SQL state help, open the command line processor and 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, and ? 08 displays help for the 08 class code.

Accessing different versions of the DB2 Information Center

For DB2 Version 9.7 topics, the DB2 Information Center URL is <http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/>

For DB2 Version 9.5 topics, the DB2 Information Center URL is <http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/>

For DB2 Version 9 topics, the DB2 Information Center URL is <http://publib.boulder.ibm.com/infocenter/db2luw/v9/>

For DB2 Version 8 topics, go to the Version 8 Information Center URL at: <http://publib.boulder.ibm.com/infocenter/db2luw/v8/>

Displaying topics in your preferred language in the DB2 Information Center

The DB2 Information Center attempts to display topics in the language specified in your browser preferences. If a topic has not been translated into your preferred language, the DB2 Information Center displays the topic in English.

- To display topics in your preferred language in the Internet Explorer browser:

1. In Internet Explorer, click the **Tools** —> **Internet Options** —> **Languages...** button. The Language Preferences window opens.
2. Ensure your preferred language is specified as the first entry in the list of languages.
 - To add a new language to the list, click the **Add...** button.

Note: Adding a language does not guarantee that the computer has the fonts required to display the topics in the preferred language.

- To move a language to the top of the list, select the language and click the **Move Up** button until the language is first in the list of languages.
3. Clear the browser cache and then refresh the page to display the DB2 Information Center in your preferred language.
- To display topics in your preferred language in a Firefox or Mozilla browser:
 1. Select the button in the **Languages** section of the **Tools** —> **Options** —> **Advanced** dialog. The Languages panel is displayed in the Preferences window.
 2. Ensure your preferred language is specified as the first entry in the list of languages.
 - To add a new language to the list, click the **Add...** button to select a language from the Add Languages window.
 - To move a language to the top of the list, select the language and click the **Move Up** button until the language is first in the list of languages.
 3. Clear the browser cache and then refresh the page to display the DB2 Information Center in your preferred language.

On some browser and operating system combinations, you must also change the regional settings of your operating system to the locale and language of your choice.

Updating the DB2 Information Center installed on your computer or intranet server

A locally installed DB2 Information Center must be updated periodically.

Before you begin

A DB2 Version 9.7 Information Center must already be installed. For details, see the “Installing the DB2 Information Center using the DB2 Setup wizard” topic in *Installing DB2 Servers*. All prerequisites and restrictions that applied to installing the Information Center also apply to updating the Information Center.

About this task

An existing DB2 Information Center can be updated automatically or manually:

- Automatic updates - updates existing Information Center features and languages. An additional benefit of automatic updates is that the Information Center is unavailable for a minimal period of time during the update. In addition, automatic updates can be set to run as part of other batch jobs that run periodically.
- Manual updates - should be used when you want to add features or languages during the update process. For example, a local Information Center was originally installed with both English and French languages, and now you want

to also install the German language; a manual update will install German, as well as, update the existing Information Center features and languages. However, a manual update requires you to manually stop, update, and restart the Information Center. The Information Center is unavailable during the entire update process.

Procedure

This topic details the process for automatic updates. For manual update instructions, see the “Manually updating the DB2 Information Center installed on your computer or intranet server” topic.

To automatically update the DB2 Information Center installed on your computer or intranet server:

1. On Linux operating systems,
 - a. Navigate to the path where the Information Center is installed. By default, the DB2 Information Center is installed in the `/opt/ibm/db2ic/V9.7` directory.
 - b. Navigate from the installation directory to the `doc/bin` directory.
 - c. Run the `ic-update` script:

```
ic-update
```
2. On Windows operating systems,
 - a. Open a command window.
 - b. Navigate to the path where the Information Center is installed. By default, the DB2 Information Center is installed in the `<Program Files>\IBM\DB2 Information Center\Version 9.7` directory, where `<Program Files>` represents the location of the Program Files directory.
 - c. Navigate from the installation directory to the `doc\bin` directory.
 - d. Run the `ic-update.bat` file:

```
ic-update.bat
```

Results

The DB2 Information Center restarts automatically. If updates were available, the Information Center displays the new and updated topics. If Information Center updates were not available, a message is added to the log. The log file is located in `doc\eclipse\configuration` directory. The log file name is a randomly generated number. For example, `1239053440785.log`.

Manually updating the DB2 Information Center installed on your computer or intranet server

If you have installed the DB2 Information Center locally, you can obtain and install documentation updates from IBM.

Updating your locally-installed DB2 Information Center manually requires that you:

1. Stop the DB2 Information Center on your computer, and restart the Information Center in stand-alone mode. Running the Information Center in stand-alone mode prevents other users on your network from accessing the Information Center, and allows you to apply updates. The Workstation version of the DB2 Information Center always runs in stand-alone mode. .

2. Use the Update feature to see what updates are available. If there are updates that you must install, you can use the Update feature to obtain and install them

Note: If your environment requires installing the DB2 Information Center updates on a machine that is not connected to the internet, mirror the update site to a local file system using a machine that is connected to the internet and has the DB2 Information Center installed. If many users on your network will be installing the documentation updates, you can reduce the time required for individuals to perform the updates by also mirroring the update site locally and creating a proxy for the update site.

If update packages are available, use the Update feature to get the packages. However, the Update feature is only available in stand-alone mode.

3. Stop the stand-alone Information Center, and restart the DB2 Information Center on your computer.

Note: On Windows 2008, Windows Vista (and higher), the commands listed later in this section must be run as an administrator. To open a command prompt or graphical tool with full administrator privileges, right-click the shortcut and then select **Run as administrator**.

To update the DB2 Information Center installed on your computer or intranet server:

1. Stop the DB2 Information Center.
 - On Windows, click **Start** → **Control Panel** → **Administrative Tools** → **Services**. Then right-click **DB2 Information Center** service and select **Stop**.

- On Linux, enter the following command:

```
/etc/init.d/db2icdv97 stop
```

2. Start the Information Center in stand-alone mode.


- On Windows:
 - a. Open a command window.
 - b. Navigate to the path where the Information Center is installed. By default, the DB2 Information Center is installed in the <Program Files>\IBM\DB2 Information Center\Version 9.7 directory, where <Program Files> represents the location of the Program Files directory.
 - c. Navigate from the installation directory to the doc\bin directory.
 - d. Run the help_start.bat file:

```
help_start.bat
```

- On Linux:
 - a. Navigate to the path where the Information Center is installed. By default, the DB2 Information Center is installed in the /opt/ibm/db2ic/V9.7 directory.
 - b. Navigate from the installation directory to the doc/bin directory.
 - c. Run the help_start script:

```
help_start
```

The systems default Web browser opens to display the stand-alone Information Center.

3. Click the **Update** button (). (JavaScript must be enabled in your browser.) On the right panel of the Information Center, click **Find Updates**. A list of updates for existing documentation displays.
4. To initiate the installation process, check the selections you want to install, then click **Install Updates**.

5. After the installation process has completed, click **Finish**.
6. Stop the stand-alone Information Center:
 - On Windows, navigate to the installation directory's doc\bin directory, and run the help_end.bat file:
help_end.bat

Note: The help_end batch file contains the commands required to safely stop the processes that were started with the help_start batch file. Do not use Ctrl-C or any other method to stop help_start.bat.
 - On Linux, navigate to the installation directory's doc/bin directory, and run the help_end script:
help_end

Note: The help_end script contains the commands required to safely stop the processes that were started with the help_start script.
7. Restart the DB2 Information Center.
 - On Windows, click **Start** → **Control Panel** → **Administrative Tools** → **Services**. Then right-click **DB2 Information Center** service and select **Start**.
 - On Linux, enter the following command:
/etc/init.d/db2icdv97 start

The updated DB2 Information Center displays the new and updated topics.

DB2 tutorials

The DB2 tutorials help you learn about various aspects of DB2 products. Lessons provide step-by-step instructions.

Before you begin

You can view the XHTML version of the tutorial from the Information Center at <http://publib.boulder.ibm.com/infocenter/db2help/>.

Some lessons use sample data or code. See the tutorial for a description of any prerequisites for its specific tasks.

DB2 tutorials

To view the tutorial, click the title.

"pureXML" in *pureXML Guide*

Set up a DB2 database to store XML data and to perform basic operations with the native XML data store.

"Visual Explain" in *Visual Explain Tutorial*

Analyze, optimize, and tune SQL statements for better performance using Visual Explain.

DB2 troubleshooting information

A wide variety of troubleshooting and problem determination information is available to assist you in using DB2 database products.

DB2 documentation

Troubleshooting information can be found in the *DB2 Troubleshooting Guide* or the Database fundamentals section of the *DB2 Information Center*. There you will find information about how to isolate and identify problems using DB2 diagnostic tools and utilities, solutions to some of the most common problems, and other advice on how to solve problems you might encounter with your DB2 database products.

DB2 Technical Support Web site

Refer to the DB2 Technical Support Web site if you are experiencing problems and want help finding possible causes and solutions. The Technical Support site has links to the latest DB2 publications, TechNotes, Authorized Program Analysis Reports (APARs or bug fixes), fix packs, and other resources. You can search through this knowledge base to find possible solutions to your problems.

Access the DB2 Technical Support Web site at http://www.ibm.com/software/data/db2/support/db2_9/

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