**DB2**®

**DB2 Version 9**
for Linux, UNIX, and Windows

**Getting started with DB2 installation and administration on Linux and Windows**

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IBM

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Before using this information and the product it supports, be sure to read the general information under *Notices*.

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# Contents

# About this book

This book provides information on how to install your DB2® product. It also introduces DB2 maintenance, administration, and development.

For a complete look at the DB2 documentation library, see the DB2 Information Center at http://publib.boulder.ibm.com/infocenter/db2help/.

# Part 1. Getting started with DB2 installation

# Chapter 1. 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.

On Windows®, you might require significantly more space on FAT (File Allocation Table) drives with large cluster sizes than with NTFS (New Technology File System) drives.

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

**Memory requirements:**

At a minimum, a DB2 database system requires 256 MB of RAM. For a system running just DB2 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:
- For DB2 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, as well as by the extent of database activity and the number of clients accessing your system.

  In DB2 Version 9, the new 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™, SWAP space at least twice as large as RAM is recommended.

**Related concepts:**
- "Self tuning memory" in *Performance Guide*

## Getting started with database authorities

Authorities provide a way both to group privileges and to control maintenance and utility operations for instances, databases, and database objects. Users can have administrative authorities that give full privileges on a set of database objects, or they can have system authorities that give full privileges on managing the system but do not allow access to the data.

SYSADM is the highest level of administrative authority. It includes all privileges on databases within the DB2 instance as well as the authority to grant and revoke all other authorities and privileges.

DBADM provides administrative authority for a specific database. It allows the user to access and modify all objects within that database. A user with DBADM authority can grant and revoke privileges on the database but cannot grant or revoke DBADM authority.

SYSCTRL is the authority for controlling the resources used by the database manager (for example, creating and deleting databases), but it does not allow access to the data within the databases.

SYSMAINT is the authority for performing maintenance operations, such as starting and stopping the DB2 server and backing up and restoring databases. It does not allow access to the data within the databases.

LOAD authority at the database level, combined with INSERT privilege on a table, allows the user to load data into that table.

SECADM (security administrator) level applies at the database level and is the authority required to create, alter and drop security label components, security policies, and security labels, which are used to protect tables. It is also the authority required to grant and revoke security labels and exemptions as well as to grant and revoke the SETSESSIONUSER privilege. A user with the SECADM authority can transfer the ownership of objects that they do not own. The SECADM authority has no inherent privilege to access data stored in tables and has no other additional inherent privilege. It can only be granted by a user with SYSADM authority. The SECADM authority can be granted to a user but cannot be granted to a group or to PUBLIC.

Database-specific authorities are stored in the database catalogs; system authorities are stored in the database manager configuration file for the instance.

You can use the Control Center to grant and revoke database authorities.

**Related concepts:**
- "Database administration authority (DBADM)" in *Administration Guide: Implementation*
- "Extended Windows security using DB2ADMNS and DB2USERS groups" in *Administration Guide: Implementation*
- "LOAD authority" in *Administration Guide: Implementation*
- "Security administration authority (SECADM)" in *Administration Guide: Implementation*
- "System administration authority (SYSADM)" in *Administration Guide: Implementation*
- "System control authority (SYSCTRL)" in *Administration Guide: Implementation*
- "System maintenance authority (SYSMAINT)" in *Administration Guide: Implementation*

# Windows installation prerequisites

## Installation requirements for DB2 clients and servers (Windows)

For the most up-to-date prerequisite information, see
- www.ibm.com/software/data/db2/udb/sysreqs.html.

To install a DB2 client or server product, the following operating system, software, and hardware prerequisites must be met:

*Table 1. Windows installation prerequisites*

| Operating System | Service Pack | Hardware |
|---|---|---|
| Windows XP Professional (32-bit)  Windows XP Professional x64 | Service Pack 2 or later | All Intel® and AMD processors capable of running the supported Windows operating systems (32-bit and 64-bit) |
| Windows 2003 Standard Edition (32-bit and 64-bit)  Windows 2003 Advanced Edition (32-bit and 64-bit)  Windows 2003 Datacenter Edition (32-bit and 64-bit) | Service Pack 1 or later | |

**Additional client considerations**

DB2 products continue to be supported on Windows 98, Windows ME, Windows NT®, and Windows 2000 until DB2 Universal Database Version 8.1 goes out of service. For existing installations and new installations of DB2 products, upgrading to a more current operating system version of Windows (such as Windows 2003) is recommended. Version 9 clients cannot be installed on Windows 98, Windows ME, or Windows NT Server 4 operating systems. If you wish to continue running DB2 products on back level releases of Windows, you require the following maintenance levels:
- Windows NT Version 4 with Service Pack 6a or later
- Windows 2000 with Service Pack 4 or later
- Internet Explorer 4.01 Service Pack 2

Windows XP Service Pack 1 is required for running DB2 applications in either of the following environments:
- Applications that have COM+ objects using ODBC; or
- Applications that use OLE DB Provider for ODBC with OLE DB resource pooling disabled

If you are unsure about whether your application environment qualifies, then it is recommended that you install the appropriate Windows service level.

For more information about this COM+ issue, see the following Microsoft® Knowledge Base article:
- http://support.microsoft.com/default.aspx?scid=KB;EN-US;306414

**Additional software considerations**
- 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 compact install, MDAC 2.8 is not 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). Prior to 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.

  The Microsoft LDAP client is included with the operating system for Windows XP, and Windows Server 2003.
- If you plan to use the Tivoli Storage Manager facilities for the backup and restoration of your databases, you need the Tivoli Storage Manager Client Version 4.2.0 or later.
  - For Windows 64-bit operating systems, you require the TSM client API Version 5.1.
- If you have the IBM Antivirus program installed on your operating system, it must be disabled or uninstalled to complete a DB2 installation.
- TCP/IP support must be enabled to view online help.
- One of the following browsers is required to view online help, run the DB2 install launchpad (setup.exe), and to run First Steps (db2fs):
  - Internet Explorer 5.5 and up
  - Mozilla 1.4 and up
  - Firefox 1.0 and up
  - Netscape 7.0 and up

**Related concepts:**
- "Support changes for 32-bit and 64-bit DB2 servers" in *Migration Guide*

**Related tasks:**
- "An overview of installing your DB2 product (Windows)" in *Quick Beginnings for DB2 Servers*

**Related reference:**
- "IBM Software Development Kit for Java levels for DB2 products" in *Quick Beginnings for DB2 Servers*
- "Communication protocols supported" in *Quick Beginnings for DB2 Clients*

## Security issues when installing the DB2 database manager

Security considerations are important to the DB2 administrator from the moment the product is installed.

To complete the installation of the DB2 database manager, a user ID, a group name, and a password are required. The GUI-based DB2 database manager install

program creates default values for different user IDs and the group. Different defaults are created, depending on whether you are installing on UNIX® or Windows platforms:

- On UNIX and Linux platforms, if you choose to create a DB2 instance in the instance setup window, the DB2 database install program creates, by default, different users for the DAS (dasusr), the instance owner (db2inst), and the fenced user (db2fenc). Optionally, you can specify different user names

  The DB2 database install program appends a number from 1-99 to the default user name, until a user ID that does not already exist can be created. For example, if the users db2inst1 and db2inst2 already exist, the DB2 database install program creates the user db2inst3. If a number greater than 10 is used, the character portion of the name is truncated in the default user ID. For example, if the user ID db2fenc9 already exists, the DB2 database install program truncates the c in the user ID, then appends the 10 (db2fen10). Truncation does not occur when the numeric value is appended to the default DAS user (for example, dasusr24).

- On Windows platforms, the DB2 database install program creates, by default, the user db2admin for the DAS user, the instance owner, and fenced users (you can specify a different user name during setup, if you want). Unlike UNIX platforms, no numeric value is appended to the user ID.

To minimize the risk of a user other than the administrator from learning of the defaults and using them in an improper fashion within databases and instances, change the defaults during the install to a new or existing user ID of your choice.

**Note:** Response file installations do not use default values for user IDs or group names. These values must be specified in the response file.

Passwords are very important when authenticating users. If no authentication requirements are set at the operating system level and the database is using the operating system to authenticate users, users will be allowed to connect. For example on UNIX operating systems, undefined passwords are treated as NULL. In this situation, any user without a defined password will be considered to have a NULL password. From the operating system's perspective, this is a match and the user is validated and able to connect to the database. Use passwords at the operating system level if you want the operating system to do the authentication of users for your database.

When working with DB2 Data Partitioning Feature (DPF) on UNIX operating system environments, the DB2 database manager by default uses the rsh utility to run some commands on remote nodes. The rsh utility transmits passwords in clear text over the network, which can be a security exposure if the DB2 server is not on a secure network. You can use the DB2RSHCMD registry variable to set the remote shell program to a more secure alternative that avoids this exposure. One example of a more secure alternative is ssh. See the DB2RSHCMD registry variable documentation for restrictions on remote shell configurations.

After installing the DB2 database manager, also review, and change (if required), the default privileges that have been granted to users. By default, the installation process grants system administration (SYSADM) privileges to the following users on each operating system:

**Windows environments**         A valid DB2 database user name that belongs to the Administrators group.

**UNIX platforms**        A valid DB2 database user name that belongs to the primary group of the instance owner.

SYSADM privileges are the most powerful set of privileges available within the DB2 database manager. As a result, you might not want all of these users to have SYSADM privileges by default. The DB2 database manager provides the administrator with the ability to grant and revoke privileges to groups and individual user IDs.

By updating the database manager configuration parameter *sysadm_group*, the administrator can control which group of users possesses SYSADM privileges. You must follow the guidelines below to complete the security requirements for both the DB2 database installation and the subsequent instance and database creation.

Any group defined as the system administration group (by updating *sysadm_group*) must exist. The name of this group should allow for easy identification as the group created for instance owners. User IDs and groups that belong to this group have system administrator authority for their respective instances.

The administrator should consider creating an instance owner user ID that is easily recognized as being associated with a particular instance. This user ID should have as one of its groups the name of the SYSADM group created above. Another recommendation is to use this instance-owner user ID only as a member of the instance owner group and not to use it in any other group. This should control the proliferation of user IDs and groups that can modify the instance, or any object within the instance.

The created user ID must be associated with a password to provide authentication before being permitted entry into the data and databases within the instance. The recommendation when creating a password is to follow your organization's password naming guidelines.

**Note:** To avoid accidentally deleting or overwriting instance configuration or other files, administrators should consider using another user account, which does not belong to the same primary group as the instance owner, for day-to-day administration tasks that are performed on the server directly.

**Related concepts:**
- "General naming rules" in *Administration Guide: Implementation*
- "User, user ID and group naming rules" in *Administration Guide: Implementation*
- "Authentication" in *Administration Guide: Planning*
- "Authorization" in *Administration Guide: Planning*
- "Naming rules in a Unicode environment" in *Administration Guide: Implementation*
- "Naming rules in an NLS environment" in *Administration Guide: Implementation*
- "Location of the instance directory" in *Administration Guide: Implementation*
- "UNIX platform security considerations for users" in *Administration Guide: Implementation*
- "Windows platform security considerations for users" in *Administration Guide: Implementation*

**Related reference:**
- "Communications variables" in *Performance Guide*

# 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.

**Prerequisites:**

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

**Procedure:**

1. Click **Start** and select **Run ...**.
2. Type `secpol.msc` and click **OK**.
3. Select **Local Security Policy**.
4. In the left window pane, expand the **Local Policies** object, then select **User Rights Assignment**.
5. In the right window pane, select the user right that you want to assign.
6. From the menu, select **Action** —> **Security...**
7. Click **Add**, then select a user or group to assign the right to, and click **Add**.
8. Click **OK**.

If your computer belongs to a Windows 2000 or Windows Server 2003 domain, the domain user rights may override your local settings. In this case, your Network Administrator will have to make the changes to the user rights.

**Related concepts:**

- "User, user ID and group naming rules" in *Administration Guide: Implementation*

**Related reference:**

- "Required user accounts for installation of DB2 server products (Windows)" in *Quick Beginnings for DB2 Servers*

# 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.

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). 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 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.

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
```

**Related concepts:**
- "System administration authority (SYSADM)" in *Administration Guide: Implementation*

**Related reference:**
- "sysadm_group - System administration authority group name configuration parameter" in *Performance Guide*

## Extending the directory schema (Windows)

If you plan to use the Lightweight Directory Access Protocol (LDAP) directory server feature with Windows 2000 or Windows Server 2003, you should extend the Active Directory schema to contain DB2 object classes and attribute definitions. You should perform this task before you install any DB2 products.

Extending the directory schema ensures that:
- The default DB2 instance, created during the installation, is cataloged as a DB2 node in Active Directory provided the installation user ID had sufficient privileges to write to Active Directory.
- Any databases that the user creates after installation will automatically be cataloged into Active Directory.

If you decide to install your DB2 product and create databases before you extend the directory schema, you will have to manually register the node and catalog the databases.

**Prerequisites:**

Your Windows user account must have Schema Administration authority.

**Procedure:**

To extend the directory schema:
1. Log onto the domain controller.
2. Run the **db2schex.exe** program from the installation CD with a user account that has Schema Administration authority. You can run this program without logging off and logging on again, as follows:

```
runas /user:MyDomain\Administrator x:\db2\Windows\utilities\db2schex.exe
```

where x: represents the CD drive letter.

When **db2schex.exe** completes, you can proceed with the installation of your DB2 product.

**Related reference:**
- "Installation requirements for DB2 clients and servers (Windows)" on page 5
- "CATALOG LDAP DATABASE command" in *Command Reference*
- "REGISTER command" in *Command Reference*

# Linux installation prerequisites

## Installation requirements for DB2 clients and servers (Linux)

For the most up-to-date prerequisite information, see http://www.ibm.com/software/data/db2/udb/sysreqs.html.

For the latest information on supported Linux distributions, point your browser to http://www.ibm.com/db2/linux/validate.

The supported operating systems for Linux include:
- Red Hat Enterprise Linux 4 (RHEL4) Update 2
- SUSE Linux Enterprise Server 9 (SLES9) Service Pack 2

To install a DB2 client or server product, the following distribution requirements, hardware, and communications prerequisites must be met:

*Table 2. Linux prerequisites*

| Distribution Requirements | Hardware |
| --- | --- |
| You should update your kernel configuration parameters in preparation for your Linux distribution. The default values for particular kernel parameters are not sufficient when running a DB2 database system.<br><br>You may also have other products or applications that require Linux system resources. You should set the kernel configuration parameters based on the needs of your Linux system working environment.<br><br>The kernel configuration parameters are set in `/etc/sysctl.conf`. See the Modifying kernel parameters (Linux) section of the DB2 Information Center.<br><br>Refer to your operating system manual for information on setting and activating these parameters using the **sysctl** command. | DB2 server products are supported on:<br>• x86 (Intel Pentium®, Intel Xeon®, and AMD Athlon)<br>• x86–64 (Intel EM64T and AMD64)<br>• IA64 (Intel Itanium® 2 or higher)<br>• POWER™ (any iSeries™ or pSeries® that support Linux)<br>• (Server only)eServer zSeries®.<br>  – The Database Partitioning Feature (DPF) is not supported.<br>• (Client only)64-bit zSeries or System z9™ boxes. |

**Package requirements (server only):**

The following tables list the package requirements for SUSE Linux and Red Hat distributions for DB2 Version 9 partitioned servers.
- The pdksh Korn Shell package is required for all DB2 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 (see table below). For a comparison between rsh and ssh, see the "Security issues when installing DB2" section of the *Administration Guide: Implementation*.

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. For more information on the DB2RSHCMD registry variable, see the *Performance Guide* book.

- 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 setup. For general Linux information, see your Linux distribution documentation.

Package requirements for SUSE Linux

| Package name | Description |
| --- | --- |
| pdksh | 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 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 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 | 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 with rsh. |
| /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 with rsh. |

Package requirements for Red Hat

| Directory | Package name | Description |
| --- | --- | --- |
| /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 to use ssh. |
| /System Environment/ Daemons | nfs-utils | Network File System support package. It allows access to local files from remote computers. |

**Software considerations:**
- One of the following browsers is required to view online help and to run First Steps (db2fs):
  - Mozilla 1.4 and up
  - Firefox 1.0 and up
  - Netscape 7.0 and up
- 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 DB2 or if you want to use any DB2 graphical tools. (Available only on Linux for x86 and Linux on AMD 64/EM64T.)

**DB2 product installation on NFS (Network File System):**

The installation of DB2 products on NFS (Network File System) is not recommended. Running DB2 products on NFS (for example, NFS mounting /opt/IBM/db2/V9.1 and then running off code that was physically installed on a remote system) requires several manual setup steps. There are also a number of potential issues with setting up NFS for DB2. These include possible problems that involve:
- Performance (impacted by network performance)
- Availability (you are allowing a single point of failure)
- Licensing (there is no checking done across machines)
- Diagnosing NFS errors can be difficult

As mentioned, the setup for NFS will require several manual actions including:
- Ensuring that the mount point preserve the install path
- Permission must be controlled (for example, write permission should not be given to the mounting machine)
- DB2 registries have to be set up manually and maintained across all mounting machines
- The list installed DB2 products and features command (db2ls) must be set up and maintained properly if you need to detect DB2 products and features
- More care is required when updating your DB2 product environment
- More steps are required when cleaning up on the exporting machine and the mounting machine

For detailed instructions, look for the "Setting Up DB2 on NFS Mounted File System" white paper which will be available soon after DB2 Version 9 is made available.

**Related concepts:**
- "Security issues when installing the DB2 database manager" on page 6

**Related tasks:**
- "Modifying kernel parameters (Linux)" in *Quick Beginnings for DB2 Servers*
- "Preparing to install DB2 for Linux on zSeries" in *Quick Beginnings for DB2 Servers*

**Related reference:**
- "Communication protocols supported" in *Quick Beginnings for DB2 Clients*
- "IBM Software Development Kit for Java levels for DB2 products" in *Quick Beginnings for DB2 Servers*
- "Communications variables" in *Performance Guide*

# Centralized user-management considerations (Linux)

In environments that include security software, such as NIS (Network Information Services) or NIS+, there are some installation considerations. The DB2 installation scripts attempt to update objects that are under the control of the security packages, such as users and groups, and will not be able to do so if NIS or NIS+ is being used for user management.

At instance creation, without a security component present, 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 will not if NIS/NIS+ is controlling the group), 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.

If the DB2 Setup wizard detects NIS on your computer, you are not given the option of creating new users during the installation. Instead, you must choose existing users.

Consider the following restrictions if you are using NIS or NIS+:
- Groups and users must be created on the NIS server before running the DB2 Setup wizard.
- Secondary groups must be created for the DB2 instance owner and the DB2 Administration Server on the NIS server. You must then add the primary group of the instance owner to the secondary DB2 Administration Server group. Likewise, you must add the primary DB2 Administration Server group to the secondary group for the instance owner.
- On a partitioned DB2 database system, before you create an instance, there must be an entry for the instance in the `etc/services` file. For example, if you want to create an instance for the user `db2inst1`, you require an entry similar to the following:

      DB2_db2inst1    50000/tcp

**Related tasks:**
- "Installing DB2 servers (Linux)" on page 19

**Related reference:**

- "Installation requirements for DB2 clients and servers (AIX)" in *Quick Beginnings for DB2 Servers*
- "Installation requirements for DB2 clients and servers (HP-UX)" in *Quick Beginnings for DB2 Servers*
- "Installation requirements for DB2 clients and servers (Linux)" on page 11
- "Installation requirements for DB2 clients and servers (Solaris Operating System)" in *Quick Beginnings for DB2 Servers*

# Chapter 2. Installation

## 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 product on your system.

**Prerequisites:**

Before you start the DB2 Setup wizard:
- If you are planning on setting up a partitioned database environment, see the "Setting up a partitioned database environment" topic.
- Ensure that your system meets installation, memory, and disk requirements.
- If you are planning to use LDAP on Windows 2000 or Windows Server 2003 to register the DB2 server in Active Directory, you should extend the directory schema before you install.
- You must have a local *Administrator* user account with the recommended user rights to perform the installation.
- 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.

**Restrictions:**
- The DB2 copy name and the instance name cannot start with a numeric value.
- 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 is defined with the code set UTF-8 and that has only one database partition.

**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. Insert your DB2 product CD into the drive. If enabled, the auto-run feature automatically starts the DB2 Setup launchpad. If the auto-run does not work, use Windows Explorer to browse the DB2 product CD and double-click on the setup icon.
3. 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.
4. Click **Install a Product** and the **Install a Product** window will display the products available for installation.

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

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

- Click **Install New** to create a newDB2 copy
- Click **Work with Existing** to upgrade an existing DB2 copy, to add functionality to an existing DB2 copy, or to install an add-on product.
- Click **Migrate** to migrate an existing DB2 Version 8 copy.

5. 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.

Your DB2 product will be installed, by default, in the `x:\Program Files\IBM\sqllib` directory, where `x:` represent the drive letter of the drive where you have installed your DB2 product.

If you are installing on a system where this directory is already being used, the DB2 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 product installation path.

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-ProductAbrrev-DateTime.log, for example, `DB2-ESE-Tue Apr 04 17_04_45 2006.log`.

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. TheDB2 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 memory limits and the `DATABASE_MEMORY` configuration parameter:**

If you are installing DB2 Express Edition or DB2 Express-C Edition on a system that has more memory than the maximum memory limit of 4GB, as outlined in the terms and conditions of the product, you need to explicitly set the `DATABASE_MEMORY` configuration parameter to 4GB or less, so that the Self Tuning Memory Manager will work within your licensed memory limits.

**Note:** If you have more than one database on that server, the sum of all database memory usage cannot exceed 4GB.

You can use the Control Center or the **UPDATE DATABASE CONFIGURATION** command to make this change. For example, to set the `DATABASE_MEMORY` limit to 4GB, enter the following command:

```
DB2 UPDATE DATABASE CONFIGURATION using DATABASE_MEMORY 1000000 IMMEDIATE;
CONNECT RESET;
```

Also, when using the Configuration Advisor to assist you in configuring the performance of your database, you need to set the **Target Memory** on the **Server** page to a percentage of your total system memory that will ensure you stay under the 4GB memory limit.

**Related concepts:**
- "About the Release Notes" in *Release notes*
- "DB2 database object naming rules" in *Administration Guide: Implementation*
- "DB2 Information Center installation options" in *Quick Beginnings for DB2 Servers*

**Related tasks:**
- "Notification and contact list setup and configuration" in *Administration Guide: Implementation*
- "Tools catalog database and DB2 administration server (DAS) scheduler setup and configuration" in *Administration Guide: Implementation*
- "Migrating a DB2 server (Windows)" in *Migration Guide*
- "Setting up a partitioned database environment" in *Quick Beginnings for DB2 Servers*
- "Using the Default DB2 Selection wizard (Windows)" in *Quick Beginnings for DB2 Servers*

**Related reference:**
- "UPDATE ADMIN CONFIGURATION command" in *Command Reference*
- "Multiple DB2 copies roadmap" in *Administration Guide: Implementation*
- "Disk and memory requirements" on page 3
- "Installation requirements for DB2 clients and servers (Windows)" on page 5
- "Language identifiers for running the DB2 Setup wizard in another language" on page 67

# Installing DB2 servers (Linux)

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

**Prerequisites:**

Before you start the DB2 Setup wizard:
- Ensure that your system meets installation, memory, and disk requirements.
- You must have `root` authority to perform the installation.
- The DB2 product image must be available.
- 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.`
- If NIS/NIS+ or similar security software is used in your environment, you must manually create required DB2 users before you start the DB2 Setup wizard. Refer to the referenced Centralized user-management considerations topic before you begin.

**Restrictions:**

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.

**Procedure:**

To start the DB2 Setup wizard:

1. Log on to the system as a user with `root` authority.
2. Change to the directory where the DB2 product CD is mounted by entering the following command:

   ```
   cd /cdrom
   ```

   where */cdrom* represents mount point of the DB2 product CD.
3. If you downloaded the DB2 product image, you must decompress and untar the product file.

   a. Decompress the product file:

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

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

   b. Untar the product file:

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

   c. Change directory:

      ```
      cd ./product/disk1
      ```
4. Enter the **./db2setup** command from the directory where the product image resides to start the DB2 Setup wizard.
5. 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 may want to review the installation prerequisites and release notes for late-breaking information.
6. 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.

   Your DB2 product will be installed, by default, in the following directory:

   **Linux**   /opt/ibm/db2/V9.1

   If you are installing on a system where this directory is already being used, the DB2 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 product installation path.

The installation logs, `db2setup.log` and `db2setup.err` will be located, by default, in the /tmp directory. You can specify the location of the log files.

The db2setup.log file captures all DB2 installation information including errors. The db2setup.err file captures any error output that is returned by Java™ (for example, exceptions and trap information).

There is no longer a `db2setup.his` file. Instead, the DB2 installer saves a copy of the `db2setup.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.

On Linux 32-bit, 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.

**DB2 Express memory limits and the `DATABASE_MEMORY` configuration parameter:**

If you are installing DB2 Express Edition or DB2 Express-C Edition on a system that has more memory than the maximum memory limit of 4GB, as outlined in the terms and conditions of the product, you need to explicitly set the `DATABASE_MEMORY` configuration parameter to 4GB or less, so that the Self Tuning Memory Manager will work within your licensed memory limits.

**Note:** If you have more than one database on that server, the sum of all database memory usage cannot exceed 4GB.

You can use the Control Center or the **UPDATE DATABASE CONFIGURATION** command to make this change. For example, to set the `DATABASE_MEMORY` limit to 4GB, enter the following command:

```
DB2 UPDATE DATABASE CONFIGURATION using DATABASE_MEMORY 1000000 IMMEDIATE;
CONNECT RESET;
```

Also, when using the Configuration Advisor to assist you in configuring the performance of your database, you need to set the **Target Memory** on the **Server** page to a percentage of your total system memory that will ensure you stay under the 4GB memory limit.

**Related concepts:**
- "DB2 Information Center installation options" in *Quick Beginnings for DB2 Servers*
- "DB2 database object naming rules" in *Administration Guide: Implementation*

**Related tasks:**
- "Notification and contact list setup and configuration" in *Administration Guide: Implementation*
- "Tools catalog database and DB2 administration server (DAS) scheduler setup and configuration" in *Administration Guide: Implementation*
- "Migrating a DB2 server (Linux and UNIX)" in *Migration Guide*

**Related reference:**
- "Centralized user-management considerations (Linux)" on page 14
- "UPDATE ADMIN CONFIGURATION command" in *Command Reference*
- "Multiple DB2 copies roadmap" in *Administration Guide: Implementation*

# Chapter 3. Verifying your installation

## Verifying the installation of DB2 servers using First Steps (Linux and Windows)

You should verify that the DB2 server installation has completed successfully by accessing data from the SAMPLE database.

**Prerequisites:**

- You must have the Control Center and the First Steps component installed to perform this task.

  First Steps is listed as a getting started component in the feature selection window in the DB2 Setup wizard. It is installed as part of a Typical installation or may be selected when performing a Custom installation.

  The Control Center component is only available on Linux (x86 and AMD64/EM64T only) and Windows.

**Procedure:**

1. On Linux, log on to the system as the instance owner.
2. On Windows, click **Start** and, select **Programs -> IBM DB2 ->** [*DB2 Copy Name*] **-> Set-up Tools > First Steps**. On Linux and Windows, you can start First Steps by typing the **db2fs** command.
3. Select **Database Creation** in the First Steps launchpad. On the Database Creation page, you will see links to the DB2 Information Center for creating the SAMPLE database and the **Create SAMPLE Database** button. Click **Create SAMPLE Database** to launch the Create SAMPLE Databases window.
4. You have the options to choose the type of database objects to create and the database location. You can choose the drive on which to create the SAMPLE database on Windows, and the directory on which to create the SAMPLE database on Linux.
5. This command may take a few minutes to process. When the SAMPLE database has been created, you will receive a completion message. Click **OK**.
6. Launch the Control Center. On Windows, click **Start** and, select **Programs -> IBM DB2 ->** [*DB2 Copy Name*] **-> General Administration Tools —> Control Center.**. On Linux systems, type the **db2cc** command
7. In the left pane of the Control Center screen, expand the object tree to view the SAMPLE database and SAMPLE database objects. Select the Tables object to view the SAMPLE database tables in the right pane of the Control Center screen. Right-click on the table name staff and select Query. In the command editor window, click the run button to execute the query and see the result set.

After you have verified the installation, you can remove the SAMPLE database to free up disk space. However, you will need 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.

**Related tasks:**

- "Verifying the installation using the command line processor (CLP)" on page 24

**Related reference:**
- "db2fs - First steps command" in *Command Reference*

# Verifying the installation using the command line processor (CLP)

You can verify the installation by creating a 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.

**Procedure:**

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 may 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
   ```

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.

**Related tasks:**
- "Verifying the installation of DB2 servers using First Steps (Linux and Windows)" on page 23

# Chapter 4. DB2 product licensing

## DB2 product license files

Each DB2 product and feature has a license file associated with it. The license file is found on the associated activation CD supplied as a part of the product media. You should register the license file before using the DB2 product.

The management of licenses for DB2 products or features is done through the License Center within the Control Center, or, through the **db2licm** License Management Tool command.

To assist you in managing your licenses, a compliance report lists the compliance or noncompliance of DB2 features with your current product entitlement.

If you installed a DB2 product with a try and buy license and now want to upgrade to a full license, you do not need to reinstall the DB2 product. You simply upgrade your license. This is also true for upgrading from one license type to another, for example upgrading from a User license to a CPU license. For details see Upgrading your DB2 license.

**Related concepts:**
- "License Center overview" in *Administration Guide: Implementation*
- "DB2 installation methods" in *Quick Beginnings for DB2 Servers*

**Related tasks:**
- "Checking DB2 license compliance" on page 26
- "Registering a DB2 product or feature license key using the db2licm command" in *Installation and Configuration Supplement*
- "Registering a DB2 product or feature license key using the License Center" on page 25
- "Upgrading a Try and Buy license" on page 27

**Related reference:**
- "db2licm - License management tool command" in *Command Reference*

## Registering a DB2 product or feature license key using the License Center

You should register a DB2 product or feature license key where the DB2 product or feature is installed. For more information on these product options, see the DB2 Version 9 packaging information on the web.

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

**Procedure:**

To register a DB2 license key:

1. Start the DB2 Control Center and select **License Center** from the **Tools** menu.
2. Select the system for which you are installing a license. Select the instance on your systems. Select the product from installed products. The **Installed Products** field will display the name of the product that you have installed.
3. Select **Add** from the **License** menu.
4. In the Add License window, select the license file:
   - On Windows servers: x:\db2\license\*license_filename*.lic
   - On Linux or UNIX servers: /cd/db2/license/*license_filename*.lic

   where x: or /cd represents the CD drive or mount point containing the DB2 Activation CD for the DB2 product or feature.
5. Click **Apply** to add the license key.

**Related concepts:**
- "License management" in *Administration Guide: Implementation*

**Related tasks:**
- "Checking DB2 license compliance" on page 26
- "Registering a DB2 product or feature license key using the db2licm command" in *Installation and Configuration Supplement*

**Related reference:**
- "DB2 product license files" on page 25

# Checking DB2 license compliance

Each DB2 product and feature has a license file associated with it. The license file should be registered before using the DB2 product or feature. The License Center lists product information on the main panel. DB2 products that do not have the license registered show the License Type as not registered.

To verify license compliance of DB2 features, you can generate a compliance report. The compliance report lists DB2 features out of compliance with your current product entitlement. Each DB2 feature status is listed as either:
- In compliance: indicating no violations are detected
- Violation: indicating the feature is not licensed and has been used.

**Note:** Some DB2 functionality is only available under license when purchased as part of a DB2 feature.

You can generate a compliance report using the License Center or the **db2licm** command.

**Procedure:**

To generate the compliance report from the License Center, select **License→Generate Compliance Report**.

To generate compliance report using the **db2licm** command, enter the following command from the command line:
- For Linux and UNIX operating systems:
      *db2instance_path*/adm/db2licm -g *filename*

- For Windows operating systems:

    *db2instance_path*\adm\db2licm -g *filename*

where
- *db2instance_path* is where the DB2 instance was created.
- *filename* specifies the file name where output is to be stored.

DB2 features showing a violation must have the license key registered using either the License Center or the **db2licm** command. See the related links for details.

**Related concepts:**
- "License Center overview" in *Administration Guide: Implementation*

**Related tasks:**
- "Registering a DB2 product or feature license key using the License Center" on page 25
- "Registering a DB2 product or feature license key using the db2licm command" in *Installation and Configuration Supplement*

**Related reference:**
- "DB2 product license files" on page 25
- "db2licm - License management tool command" in *Command Reference*

## Upgrading a Try and Buy license

If you installed a DB2 product with a try and buy license and now want to upgrade to a full license you need to upgrade the product license key. You can also use this method to upgrade from one license type to another. For example, to upgrade from a User license to a CPU license.

**Restrictions:**

You cannot use this method to upgrade from one DB2 product to another.

**Procedure:**

To upgrade your DB2 license:
1. Download the activation CD from Passport Advantage.
2. Register the license key using the License Center.

**Related concepts:**
- "License Center overview" in *Administration Guide: Implementation*
- "DB2 installation methods" in *Quick Beginnings for DB2 Servers*

**Related tasks:**
- "Checking DB2 license compliance" on page 26
- "Registering a DB2 product or feature license key using the License Center" on page 25

**Related reference:**
- "DB2 product license files" on page 25

# Part 2. Getting started with DB2 administration

# Chapter 5. Basic administration

Now that you have installed your DB2 product and verified its successful installation, you are ready to create your own database. The following sections will guide you through the steps of creating a new database that will take advantage of DB2 automatic maintenance features.

## Creating your own database

### Database basics

A relational database presents data as a collection of tables. A table consists of a defined set of columns and any number of rows. The data in each table is logically related, and relationships can be defined between tables. Data can be viewed and manipulated based on mathematical principles and operations called relations (such as, INSERT, SELECT, and UPDATE).

A database is self-describing in that it contains, in addition to data, a description of its own structure. It includes a set of system catalog tables, which describe the logical and physical structure of the data; a configuration file, which contains the parameter values associated with the database; and a recovery log, which records ongoing transactions and transactions that can be archived.

Databases can be local or remote. A local database is physically located on the workstation in use, while a database on another machine is considered remote.

You can:
- Create a database using the Control Center
- Add a database using the Control Center or Configuration Assistant
- Drop a database from the Control Center
- Backup a database using the Control Center
- Restore a database using the Control Center
- Configure a database using the Control Center
- Connect to a database using the Control Center
- Resolve database health alerts with the Health Center

**Related concepts:**
- "Getting started with the Configuration Assistant" on page 54
- "Getting started with the Control Center" on page 42
- "Getting started with the Health Center" on page 49

**Related tasks:**
- "Verifying your new database" on page 32

### Creating your own database using the Create Database with the Automatic Maintenance wizard

The Create Database with Automatic Maintenance wizard is the quickest way to set up your own database. Based on basic information that you provide, the wizard:

- creates a new database on the disk or directory of your choice
- assigns disk space for your data
- configures the new database for optimal performance
- turns on automatic maintenance
- configures notification by e-mail or pager if the database needs attention

The Create Database with Automatic Maintenance wizard can be started from First Steps or directly from within the Control Center.

**Prerequisites:**
- If you wish to start the wizard from First Steps, you must also have the First Steps component installed. First Steps is part of the Getting started component grouping in the DB2 Setup wizard. It is installed as part of a Typical installation or may be selected when performing a Custom installation.
- You must have SYSADM or SYSCTRL authority to perform this task.
- For Linux, you must have Xwindow software capable of rendering a graphical user interface for First Steps and the Control Center to run on your machine. Ensure that you have properly exported your display. For example, `export DISPLAY=9.26.163.144:0.`
- On Linux, ensure that you are logged on as the instance owner, `db2inst1` by default. An instance is a logical database manager environment where you catalog databases and set configuration parameters.

**Procedure:**
1. Log on to the system with the user account that you want to use to create the database.
2. Start the Create Database with Automatic Maintenance in the one of the following ways:
   - From First Steps: Click **Create Your Own Database**.
   - From the Control Center: Click the **All Databases** folder. Click **Create New Database** in the **All Databases** pane.
3. Follow the steps of the wizard. You will have to provide some details and preferences about your new database, including such things as its name and the contacts who can be notified under various conditions.

If you created your own database from First Steps, you will now want to start the Control Center to begin exploring and working with your database. To do this, click **Work With Databases** in First Steps.

**Related concepts:**
- "Database basics" on page 31

**Related tasks:**
- "Verifying your new database" on page 32

## Verifying your new database

Once you have launched the Control Center, you can verify that your database was created by finding it in the Object Tree that fills the left side of the Control Center window.
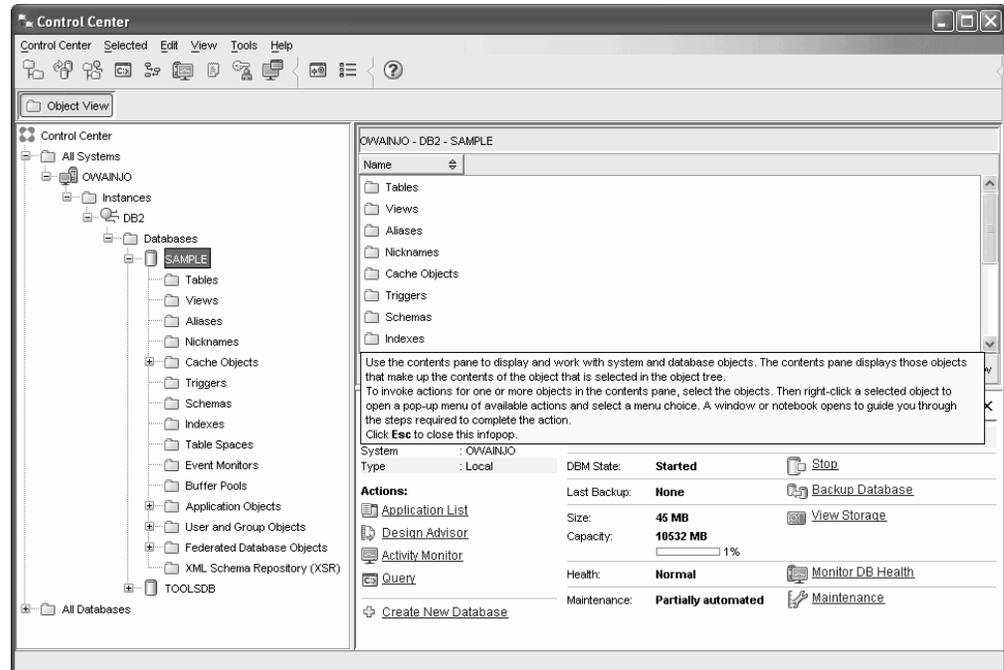
*Figure 1. Control Center with a database selected*

Expand the Object Tree until you can see your database and select it. The right side of the Control Center will fill with details about the database's current operation and links to relevant actions.

When you created your database with the Create Database with Automatic Maintenance, you enabled certain Automatic maintenance features. The features are set up and do not necessarily require any further attention. You may, however, find it useful to know where their settings can be found and further configured.

There are automatic maintenance-related tools available. The first of these is the *Automatic Maintenance wizard*, which you can start by clicking on the **Maintenance** link in the Object Details Pane. As the wizard's name suggests, it will allow you to change the way in which automatic maintenance is carried out for your database.

Another tool is the *Health Center*. You can launch it by clicking on **Monitor DB Health** in the Object Details Pane or by selecting **Health Center** from the **Tools** menu. Under normal circumstances, you should never have to look at the Health Center. If the health of your database needs attention, you will be notified by e-mail. You can then find out more about what needs attention.

**Related concepts:**
- "Database basics" on page 31
- "Control Center overview" in *Administration Guide: Implementation*

**Related tasks:**
- "Creating your own database using the Create Database with the Automatic Maintenance wizard" on page 31

# Chapter 6. Automatic maintenance

Your DB2 product provides automatic maintenance capabilities for performing database backups, and keeping statistics current as necessary.

*Automatic database backup* provides users with a solution to help ensure their database is being backed up both properly and regularly, without either having to worry about when to back up, or having any knowledge of the backup command.

*Automatic statistics collection* attempts to improve the performance of the database by maintaining up-to-date table statistics. The goal is to allow the optimizer to choose an access plan based on accurate statistics. Automatic statistics profiling advises when and how to collect table statistics by detecting outdated, missing, and incorrectly specified statistics and by generating statistical profiles based on query feedback.

Enablement of the automatic maintenance features is controlled using the automatic maintenance database configuration parameters. These are a hierarchical set of switches to allow for simplicity and flexibility in managing the enablement of these features.

The *Configuration Advisor* runs automatically when you create a database in DB2 Version 9. This autonomic computing feature provides significant performance improvement to newly created databases, and causes little overhead to the system.

Also when you create a database in DB2 Version 9, AUTOMATIC STORAGE is enabled by default. Automatic storage simplifies storage management by allowing you to specify storage paths where the database manager can place table space data, and where the database manager allocates space for various uses.

Self tuning memory is enabled by default, this autonomic feature simplifies the task of memory configuration by automatically setting values for memory configuration parameters and sizing buffer pools. When enabled, the memory tuner dynamically distributes available memory resources between several memory consumers including sort, package cache and lock list areas and buffer pools.

## Automatic database backup

A database may become unusable due to a wide variety of hardware or software failures. Automatic database backup simplifies database backup management tasks for the DBA by always ensuring that a recent full backup of the database is performed as needed. It determines the need to perform a backup operation based on one or more of the following measures:

- You have never completed a full database backup
- The time elapsed since the last full backup is more than a specified number of hours
- The transaction log space consumed since the last backup is more than a specified number of 4 KB pages (in archive logging mode only).

Protect your data by planning and implementing a disaster recovery strategy for your system. If suitable to your needs, you may incorporate the automatic database backup feature as part of your backup and recovery strategy.

If the database is enabled for roll-forward recovery (archive logging), then automatic database backup can be enabled for either online or offline backup. Otherwise, only offline backup is available. Automatic database backup supports disk, tape, Tivoli Storage Manager (TSM), and vendor DLL media types.

Through the Configure Automatic Maintenance wizard in the Control Center or Health Center, you can configure:
- The requested time or number of log pages between backups
- The backup media
- Whether it will be an online or offline backup.

If backup to disk is selected, the automatic backup feature will regularly delete backup images from the directory specified in the Configure Automatic Maintenance wizard. Only the most recent backup image is guaranteed to be available at any given time. It is recommended that this directory be kept exclusively for the automatic backup feature and not be used to store other backup images.

The automatic database backup feature can be enabled or disabled by using the **auto_db_backup** and **auto_maint** database configuration parameters. In a partitioned database environment, the automatic database backup runs on each database partition if the database configuration parameters are enabled on that database partition.

**Related concepts:**
- "Developing a backup and recovery strategy" in *Data Recovery and High Availability Guide and Reference*
- "Automatic statistics collection" on page 36
- "Catalog statistics" in *Performance Guide*
- "Table and index management for MDC tables" in *Performance Guide*
- "Table and index management for standard tables" in *Performance Guide*
- "Table reorganization" in *Performance Guide*
- "Health monitor" in *System Monitor Guide and Reference*

**Related reference:**
- "auto_maint - Automatic maintenance configuration parameter" in *Performance Guide*

## Automatic statistics collection

The DB2 optimizer uses catalog statistics to determine the most efficient access plan for any given query. Having out-of-date or incomplete statistics for a table or an index could lead the optimizer to select a plan that is not optimal, slowing down query execution. However, deciding which statistics to collect for a given workload is complex, and keeping these statistics up to date is time-consuming.

With automatic statistics collection, part of DB2's Automated Table Maintenance feature, you can let DB2 determine which statistics are required by your workload and which statistics need to be updated. With automatic statistics collection

enabled, DB2 will automatically run the RUNSTATS utility in the background to ensure the correct statistics are collected and maintained.

Starting in DB2 Version 9, automatic statistics collection is enabled by default when a new database is created.

The performance impact of automatic statistics collection is minimized in several ways:
- Statistic collection is performed using throttled RUNSTATS. Throttling controls the amount of resources consumed by the RUNSTATS utility based on current database activity: as database activity increases, the RUNSTATS utility runs more slowly, reducing its resource demands.
- Only the minimal set of statistics for optimizing performance are collected. This is achieved through the use of statistics profiling which uses information about previous database activity to determine which statistics are required by the database workload, and how quickly those statistics will become out of date given the type of activity in the database.
- Only tables with high levels of activity (measured through the number of updates, deletes and inserts) are considered for statistic collection. Large tables (consisting of more than 4000 pages) are also sampled to determine whether the high table activity has indeed changed the statistics. Statistics for these large tables are only collected if warranted.
- The RUNSTATS utility is automatically scheduled to execute during the optimal maintenance window specified in your maintenance policy definition. This policy also specifies the set of tables that are within the scope of the automatic statistics collection, further minimizing unnecessary resource consumption.
- While automated statistic collection is being performed, the affected tables are still available for regular database activity (updates, inserts, deletes)as if RUNSTATS were not running on the table.

**Related concepts:**
- "Automatic features enabled by default" in *Administration Guide: Planning*
- "Collecting statistics using a statistics profile" in *Performance Guide*

**Related tasks:**
- "Using automatic statistics collection" in *Performance Guide*

**Related reference:**
- "RUNSTATS command using the ADMIN_CMD procedure" in *Administrative SQL Routines and Views*
- "auto_maint - Automatic maintenance configuration parameter" in *Performance Guide*
- "util_impact_lim - Instance impact policy configuration parameter" in *Performance Guide*
- "RUNSTATS command" in *Command Reference*

# Chapter 7. DB2 administration and development tools

This section describes the DB2 administration and development tools. It explains what each tool is used for and why you might want to use it. It tells you how to invoke a tool and presents basic usage information.

- "Basic GUI navigation concepts"
- "Getting started with the Control Center" on page 42
- "Getting started with the Command Editor" on page 46
- "Getting started with the Task Center" on page 50
- "Getting started with the Health Center" on page 49
- "Setting up notification and contact lists" on page 46
- "Getting started with the Journal" on page 52
- "Getting started with the Configuration Assistant" on page 54
- "Getting started with the Replication Center" on page 55
- "Getting started with the Web Command Center" on page 56
- "Getting started with the Web Health Center" on page 57

## Basic GUI navigation concepts

Here are some basic GUI concepts you should be familiar with.

**Start Menu:**

The *Start menu* is the starting point for using the Administration tools on Windows operating environments. From the **Start** menu, select **Programs** —> **IBM DB2**—> **[DB2 copy name]** —>**General Administration Tools** —> **Control Center**. You can also start other centers or tools such as the Journal, the Replication Center, and the Task Center from the Start menu as well as select the command line tools, the development tools, the monitoring tools, and the Information Center.

To start the GUI Administration tools from the Linux desktop environment, open the *IBM DB2* folder on your Gnome or KDE desktop and then select **Control Center**.

**Control Center menu bars:**

The *Menu bar* is a special panel that is displayed at the top of the window. It contains menu options that allow you to access drop-down menus. From the drop-down menus, you can select menu items. Items in the menu bar include actions that affect the objects in the center you are using. For example, menu items under **Control Center** include actions that affect the entire Control Center.

Menu items under **Selected** dynamically change to include only those actions that apply to currently selected objects in the contents pane. Menu items under **Edit** include actions that let you work with objects in the contents pane. Menu items under **View** include actions that let you customize the display of objects in the contents pane. Menu items under **Help** include actions that display help information and allow you to work with the Information Center and Tutorials.

**Toolbars:**

*Toolbars* are panels that contain icons representing functions you can perform. Toolbars are located below the menu bar. To see a brief description of a tool, place your cursor over its icon and hover help will tell you what function each icon represents. Toolbars provide quick access to the functions you can perform. The functions can also be selected in the **View** menu.

A *Contents pane toolbar* is located below the contents pane. It allows you to tailor the information in the contents pane.

**Wizards:**

*Wizards* are integrated into the administration tools. They assist you in completing a single task by stepping you through the task. To select a wizard, from the Control Center window, select **Tools —> Wizards** from the menu bar. The **Wizards** window opens. Select the wizard you want to use. Select the object for which you want help and follow the instructions to complete the task.

The wizard task overview on the first page of the wizard lists any prerequisite steps and briefly describes every page of the wizard. Other pages of the wizard may contain links to conceptual or reference information to help you understand the function of the wizard. From a wizard, you can launch other wizards, windows or notebooks.

**Object trees:**

*Object trees* display the system and database objects graphically in the left navigation pane, enabling you to see the hierarchical relationship between different objects and to work with those objects. You can expand the object tree to expose the content. The exposed content is displayed as folders beneath the object tree. Each folder represents an object type. If the object tree is collapsed, the folders no longer appear in the view of the object tree.

Objects on your local workstation and any remote systems that can be connected to and from your local system are displayed in the object tree. Some objects, such as tables and views, do not contain folders and appear at the bottom of the object tree. Also if you right-click on the object folder there are actions available for the object. For example, if you right-click on a table you can choose to create a table.

When you select an object folder in the object tree, the objects that reside in the folder are displayed in the contents pane. To invoke an action on an object, right-click the object to open a pop-up menu of available actions. You can also invoke an action on the object by selecting the object then clicking the **Selected** menu option from the menu bar.

**Contents Pane (Details view):**

The *Contents pane* allows you to display large amounts of complex tabular data in a flexible manner.

You can filter, sort, and customize Contents pane columns. You can also save your changes as a view, enabling you to quickly switch between different views of the same data. To create and save customized views, select View from the toolbar at the bottom of the Contents pane.
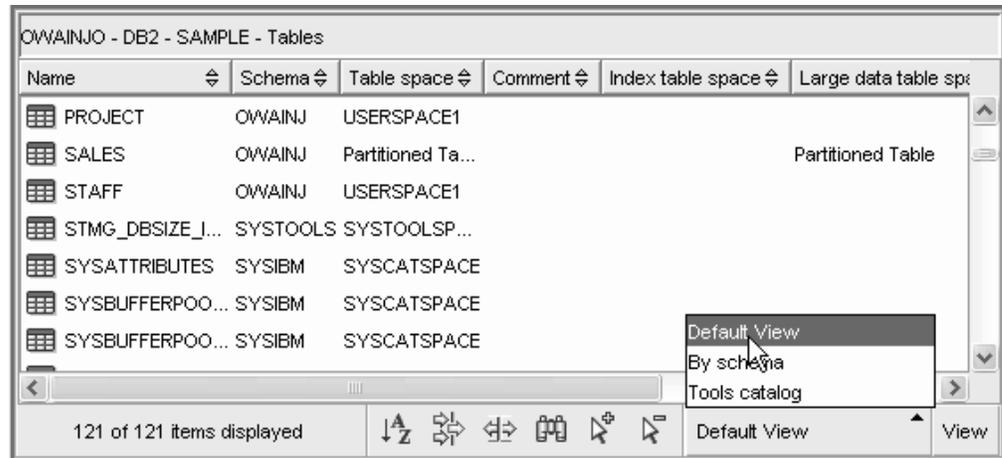
OWAINJO - DB2 - SAMPLE - Tables

| Name | Schema | Table space | Comment | Index table space | Large data table sp: |
|---|---|---|---|---|---|
| PROJECT | OWAINJ | USERSPACE1 | | | |
| SALES | OWAINJ | Partitioned Ta... | | | Partitioned Table |
| STAFF | OWAINJ | USERSPACE1 | | | |
| STMG_DBSIZE_I... | SYSTOOLS | SYSTOOLSP... | | | |
| SYSATTRIBUTES | SYSIBM | SYSCATSPACE | | | |
| SYSBUFFERPOO... | SYSIBM | SYSCATSPACE | | | |
| SYSBUFFERPOO... | SYSIBM | SYSCATSPACE | | | |

Default View
By schema
Tools catalog

121 of 121 items displayed          Default View          View

*Figure 2. Contents Pane view*

Filtering in the Contents pane simply hides data that has already been retrieved from the database. If your database has so many objects that retrieval time is an issue, you may prefer to retrieve only a subset of the objects (for example, tables). This filtering is referred to as Object Filtering and is explained in the next section.

**Object filtering:**

*Object filtering* enables you to work with a subset of all the objects in the database in the Control Center. For example, if you only need to work with your own tables and not those created by someone else, you can set up an object filter so that only those tables will be retrieved from the database. You will not have to wait for data about the other tables to be retrieved.

Right-click on an object folder in the object tree and select **Filter->Create**. The Filter notebook opens allowing you to select which objects you would like to retrieve from the database.

Once you have created a filter, the filter icon will appear beneath the filtered object in the object tree to indicate that a filter has been set. To remove the filter and display all the objects in the Contents pane, right click the object folder and select **Filter->Remove**.

You can further customize your view by selecting the filter icon from the toolbar at the bottom of Contents pane described above. This filtering will only hide data that has already been retrieved from the database.*Filtering* enables you to work with a subset of displayed objects in the Control Center. Two forms of filtering exists. The first form of filtering allows you to create a customized view of objects which you would like to appear in the Contents pane of the Control Center.

**Infopops:**

An *infopop* is a pop-up window that is displayed when a control in a window or notebook has focus and you press F1. Holding the mouse cursor over a control in a window or notebook also causes the infopop to display. Infopops contain a description of the field or control. They may also list restrictions and requirements or provide instructions.

Infopops are disabled or re-enabled from the Documentation tab of the Tools Settings notebook. To disable or enable infopops for the Configuration Assistant, select the Display Infopops checkbox menu in the Help menu from the Configuration Assistant tool.

**Mandatory fields:**

Mandatory fields are fields for which you must supply information. Mandatory fields are displayed with thick red borders around the field. When information is entered in the mandatory field, the red border is no longer displayed.

**Help:**

*Help* is available from icons on the toolbar or by using the Help menu.

 displays help for getting started with the Control Center.

The Help menu displays menu items for displaying the online help index, general information about the Control Center, and keyboard help. The menu also displays the list of tutorials available with the DB2 product.

**Related concepts:**
- "Getting started with the Control Center" on page 42
- "Getting started with the Health Center" on page 49

# Getting started with the Control Center

You can start the Control Center in the following ways:
- Enter the **db2cc** command.
- On Windows systems, click **Start** and select **Programs —> IBM DB2 —> [DB2 copy name]—> General Administration Tools —> Control Center**.
- On Linux systems, open the **IBM DB2** folder on the desktop and select **Control Center**. The first time you invoke the Control Center, you will be prompted to select the view you want to display. The options are basic, advanced, and custom. You can uncheck the Show this window box at startup time so this windows does not appear every time you invoke the Control Center.
- Select Control Center from the Tools menu of another tool.

- Click the Control Center icon  from the toolbar of another tool.
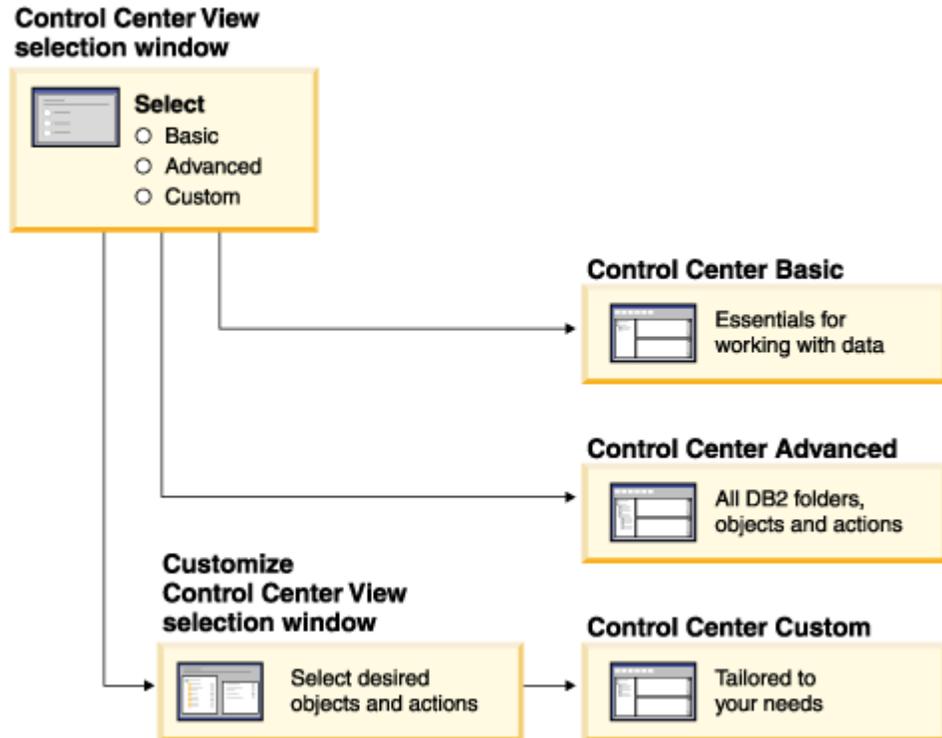
*Figure 3. Control Center views*

Three different Control Center views are available.

**Basic**    From this folder you can work with all the databases to which you have been granted access, including their related objects such as tables and stored procedures. This view does not include the database objects that are at a higher level than the database in the DB2 hierarchy (systems and instances). It provides you with the essentials for working with data.

**Advanced**

This view provides you with all the folders, folder objects, and actions available in the Control Center. You should select this view if you are working in an enterprise environment and want to connect to DB2 for z/OS or IMS.

**Custom**

This view allows you to tailor the Control Center to your needs. You select the folders, folder objects, and object actions that you want to appear in your Control Center view. Click Custom —> Modify. The Customize Control Center View window opens.

In the Control Center, you can administer all of your systems, instances, databases, and database objects. You can also open other centers and tools to help you optimize queries, jobs, and scripts; create stored procedures; and work with DB2 commands.

The following are some of the key tasks that you can perform with the Control Center:

- Add DB2 systems, existing instances, and existing databases.
- Create database objects that will be added to the object trees.

- View the details of database objects. You can look at a table's constituent columns and see the current state of a database.
- Manage database objects. You can create, alter, and drop databases, table spaces, tables, views, indexes, triggers, and schemas. You can also manage users.
- Manage data. You can load, import, export, and reorganize data. You can also gather statistics.
- Perform preventive maintenance by backing up and restoring databases or table spaces.
- Configure and tune instances and databases.
- Manage database connections, such as DB2 Connect™ servers and subsystems.
- Manage applications.
- Launch other tools such as the Command Center and the Health Center.
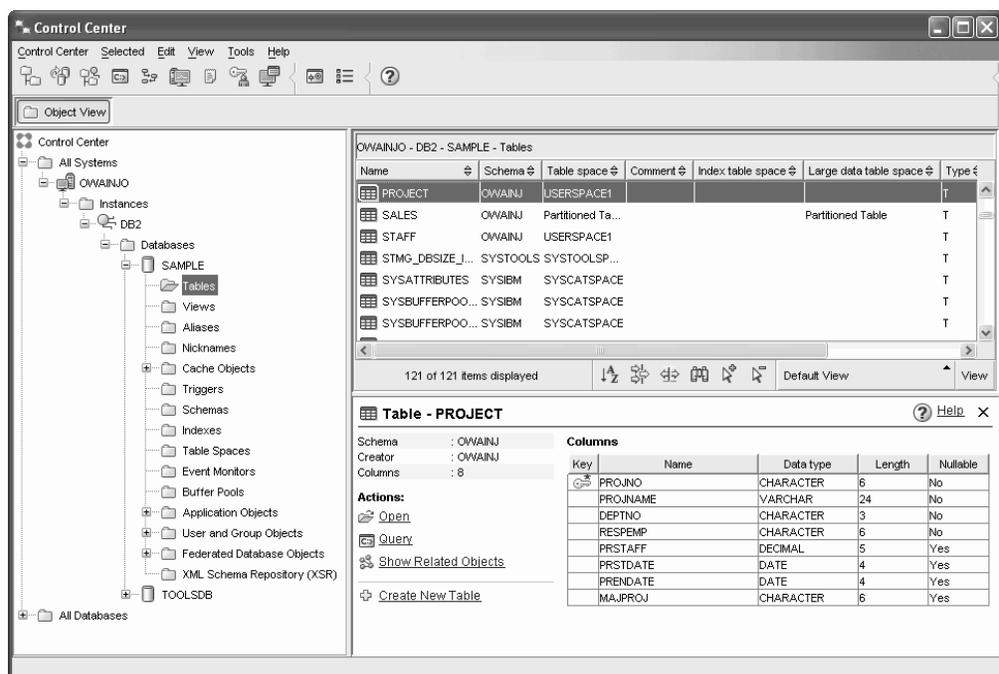


*Figure 4. Control Center advanced view with a table selected*

The main Control Center window is split into three sections, or panes. On the left side, there is an Object Tree. This tree displays all of your databases and their constituent objects (such as tables, views, and indexes).

When you select any one of the available database objects or object folders in the Object Tree, the Contents Pane, occupying the top half of the right side of the Control Center window, fills with a list of the relevant objects. For example, by selecting a database's Table folder in the object tree, you will fill the Contents Pane with all of that database's tables, as well as some information about each.

There is, however, more detail about any given object than will fit in the Contents Pane; the bottom pane on the right side, the Object Details Pane provide the additional information. Clicking on an object in the Contents Pane will bring up detailed information about that object in the Object Details Pane. When you click on a table object in the object list, you will see a listing of that table's columns, as well as other table attributes and some actions that are relevant to tables.

The Maintenance status category in the Object Details pane will tell you whether or not automatic maintenance is enabled for the database in question. Clicking on Maintenance will allow you to enable, configure, and disable automatic maintenance for the database. If you created the database with the Create Database Using Automatic Maintenance wizard, from First Steps or within the Control Center, then Maintenance should be in the "enabled" state.
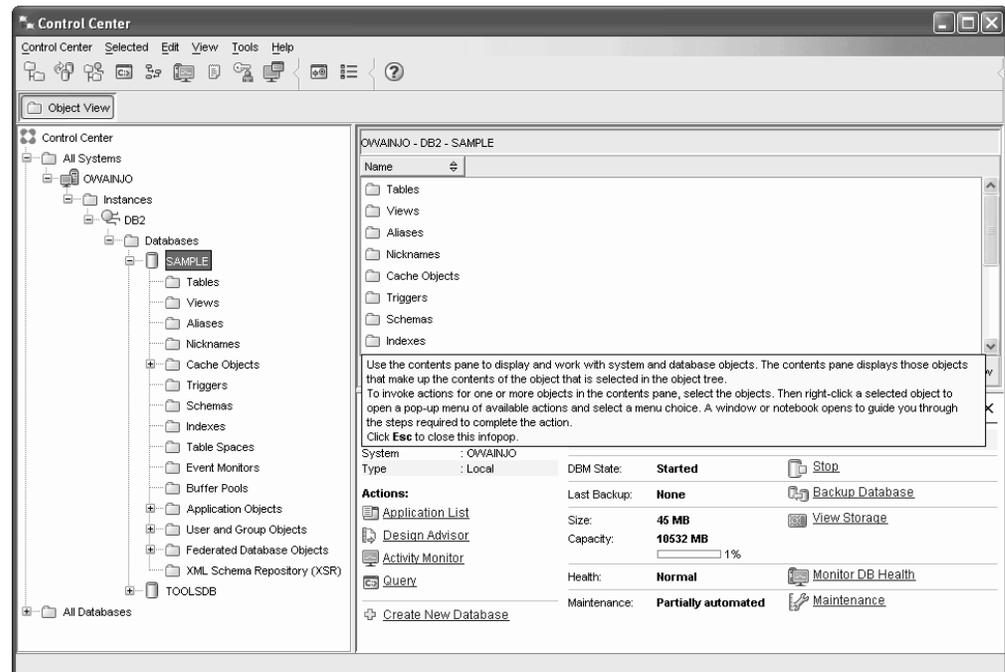


*Figure 5. Control Center advanced view with a database selected*

To schedule tasks through the Control Center, you must first create a tools catalog. If you did not create a tools catalog when you installed your DB2 product, you can select **Tools—> Tools Settings —> Scheduler Settings** and create one now.

**To customize objects and actions:**

Use the Control Center View window to select the view of the Control Center with which you want to work.

Your DB2 product is made up of various components and objects. These objects are used to store and work with data. The database itself is only one of a number of objects that make up a database product's hierarchy of objects. Other components include systems, tables, views, triggers, and indexes. The DB2 database server presents its hierarchy as an object tree in the left pane of the Control Center.

You can choose to have the Control Center View window open whenever you open the Control Center by selecting Show this window at startup time. Your Control Center now displays your view selection.

**Related concepts:**
- "Control Center overview" in *Administration Guide: Implementation*

# Setting up notification and contact lists

For your DB2 product to contact you or others regarding the health of your databases, you will have to set up notification and contact lists. If you did not do this during the DB2 installation, you can manually set up these lists.

**Procedure:**

To set up notification and contact lists:

1. Log on as the instance owner or a user with SYSADM authority.
2. If the SMTP server was not specified during the installation process, you can configure it manually using the following command:

   ```
   db2 update admin cfg using smtp_server host1
   ```

   where `host1` represents the TCP/IP host name for the SMTP server used for e-mail notification. You can also update this information using the Create Database with Automatic Maintenance wizard, or the Troubleshoot Alert Notification wizard in the Health Center.
3. If you want the contact information to be located on a remote DB2 administration server (DAS), you can specify the contact_host parameter using the following command:

   ```
   db2 update admin cfg using contact_host host2
   ```

   where `host2` represents the TCP/IP host name where the DAS is running. If the contact_host parameter is not specified, the DAS assumes the contact information is local.
4. Turn on the scheduler using the following command:

   ```
   db2 update admin cfg using sched_enable on
   ```
5. For these changes to take effect, you need to restart the DAS use the following commands:

   ```
   db2admin stop
   db2admin start
   ```
6. From either the Task Center or the Health Center, click the Contacts icon  in the Task bar. Select System name, then click **Add Contact**. Type in contact information and then click OK.

**Related reference:**

- "db2admin - DB2 administration server command" in *Command Reference*

# Getting started with the Command Editor

You can start the Command Editor in the following ways:

- On Windows systems, click **Start** and select **Programs —> IBM DB2 —> [DB2 copy name]—> Command Line Tools —> Command Editor**.
- Select Command Editor from the Tools menu of another tool.
- Click the Command Editor icon  from the toolbar of another tool.

Use the Command Editor to:

- Run DB2 commands and SQL statements.

- Work with query results.
- View a graphical representation of the access plan for explained SQL statements.
- Run commands in sequence.
- Create and save a script. You can optionally store a saved script in the Task Center, where you can schedule the script to run at a specific time.
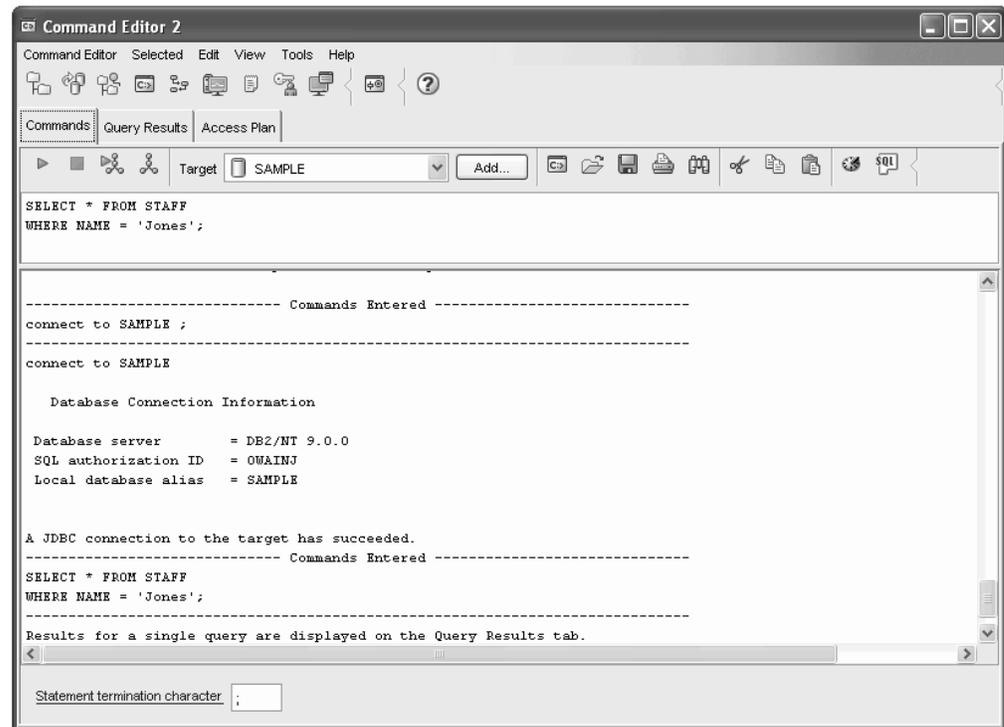


*Figure 6. Command Editor window*

On the **Commands** page, you can execute an SQL statement or DB2 CLP command. You do not need to precede the command by "DB2".

Run and create a visual access plan, by clicking the Execute and Access plan icon (from the left of the toolbar)

Run a command or statement, by clicking the Execute icon (at the left of the toolbar).

On the **Query Results** page, you can see the results of the queries. You can also save the results or edit the contents of the table.

On the **Access Plan** page, you can see the access plan for any explainable statement that you specified on the Interactive page or the Script page when you click on the Access plan or Execute and Access plan icon. DB2 generates the access plan when it compiles the SQL statement. You can use this information to tune your queries for better performance.

If you specify more than one statement on the Script page, an access plan is not created unless you highlight a single statement.

You can get help writing SQL with the SQL Assist tool available from the Selected menu of the Command Editor menu.

**To run commands and SQL statements::**

1. To open an embedded Command Editor, expand the Control Center object tree until you find a DB2 database. Right-click the object and select Query from the pop-up menu. A Command Editor tile opens in the Control Center.

2. To open a stand-alone Command Editor from the Start menu, select **Programs —> IBM DB2 —> [DB2 copy name] —> Command Line Tools —> Command Editor**.

3. Select a target database to connect to. Targets that currently have connections or have had connections during the current session are listed in the Target drop-down list. If your target is not listed, click Add and select a target from those available on the Specify Target window. You can also type the connect to database statement.

4. In the top pane, type the commands or SQL statements that you want to execute.

5. You can select commands and statements previously executed in this session from the History window. Click  to open the History window.

6. You can execute commands and statements stored in a file. Click  to locate the file using the file browser Open window.

7. You can specify the character to be used as the termination character for your statements and commands in the Statement termination character field. This termination character will override the character that you may have specified in the Tool Settings notebook.

8. For scripts containing CREATE PROCEDURE or CREATE TRIGGER statements, it is suggested that a termination character other than a semicolon be used, as the body of these statements might themselves contain one or more semicolons.

9. When stored procedures are using the same character as a delimiter, as this would cause execution problems.

10. Click  to execute the commands or statements.

11. Click  to generate a graphical representation of the access plan for explainable SQL statements (for example, SELECT, INSERT, and UPDATE). An access plan indicates the order of operations for accessing requested data.

12. Click  to execute explainable SQL statements and generate access plans. The availability of push buttons changes depending on the database target for your commands.

13. View the execution results. Command results are displayed in the output area of the Commands page, while SQL results are returned on the Query Results page. The access plan appears in graphical form on the Access Plan page.

14. Optional: The results from the most recently executed SQL statement are displayed on the Query Results page. To change the value in any cell, highlight the value and modify it. If the Automatically commit updates check box is selected, changes made to a cell are committed immediately when focus shifts off its row. If the check box is not selected, then click Commit to commit your changes, or click Rollback to rollback any uncommitted changes.

15. You can also add, modify, and delete rows in the table.

16. Optional: You can save your commands and statements in a file. Click ![save icon] to specify a file using the file browser Save As window.

**Related concepts:**
- "Basic GUI navigation concepts" on page 39
- "Getting started with the Control Center" on page 42

# Getting started with the Health Center

You can start the Health Center in the following ways:
- On Windows systems, click **Start** and select **Programs —> IBM DB2 —> [DB2 copy name]—> Monitoring Tools —> Health Center**.
- Select Health Center from the Tools menu of another tool.

- Click the Health Center icon ![Health Center icon] from the toolbar of another tool.
- Enter the **db2hc** command.
- Click the health center status beacon when it appears on a DB2 window. On the Tools Settings window, you can configure this beacon to appear on every DB2 window whenever an alert occurs.

Use the Health Center to monitor the state of the database environment and make any necessary changes.
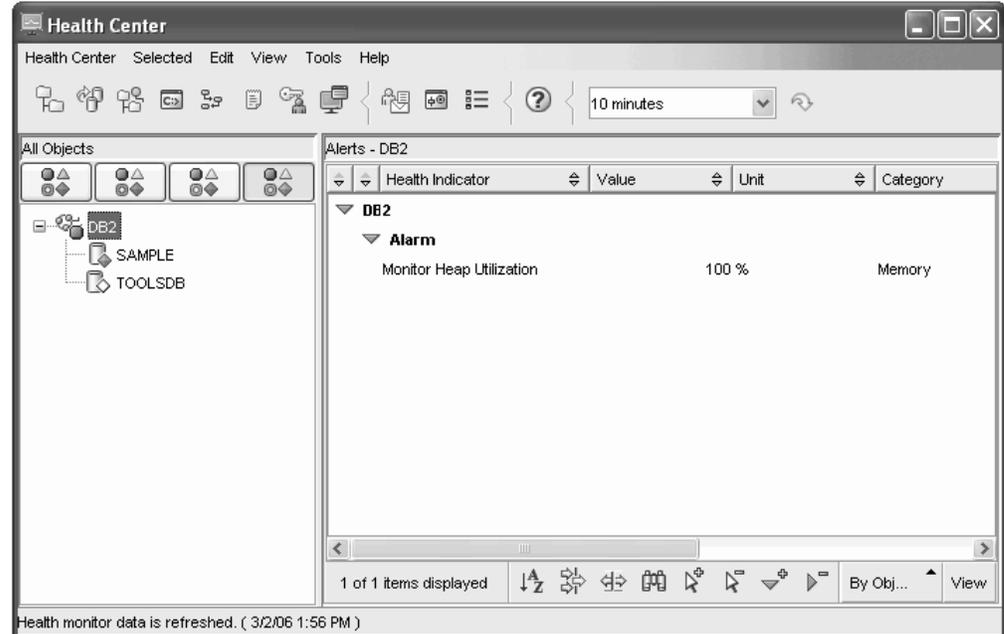


*Figure 7. Health Center window*

When you use DB2, a health monitor continuously monitors a set of health indicators. If the current value of a health indicator is outside the acceptable operating range defined by its warning and alarm thresholds, the health monitor generates a health alert. DB2 comes with a set of predefined threshold values, which you can later customize. For example, you can customize the alarm and warning thresholds for the amount of space used in a table space.

Depending on the configuration of the DB2 instance, the following actions can occur when the health monitor generates an alert:

- An entry is written in the administration notification log, which you can read from the Journal.
- A script or task is executed.
- An e-mail or pager message is sent to the contacts that you specify for this instance.

The following are some of the key tasks that you can perform with the Health Center:

- View the status of the database environment. Beside each object in the navigation tree, an icon indicates the most severe alert for the object (or for any objects contained by that object). For example, a green diamond icon beside an instance means that the instance and the databases contained in the instance do not have any alerts.
- View the alerts for an instance or a database. When you select an object in the navigation tree, the alerts for that object are shown in the pane to the right.
- View detailed information about an alert, and recommended actions. When you double-click an alert, a notebook appears. The first page shows the details for the alert. The second page shows any recommended actions.
- Configure the health monitor settings for a specific object, and the default settings for an object type or for all objects within an instance.
- Select which contacts will be notified of alerts with an e-mail or pager message.
- Review the history of alerts for an instance.

You can use the toggle buttons at the top of the navigation bar to filter the alerts according to their severity:

-  Displays only alarms (the most severe type of alert)
-  Displays alarms and warnings
-  Displays alarms, warnings, and attentions
-  Displays all alerts

The Web version of the Health Center includes a subset of these features.

**Related concepts:**
- "Basic GUI navigation concepts" on page 39
- "Getting started with the Control Center" on page 42

# Getting started with the Task Center

You can start the Task Center in the following ways:
- Select Task Center from the Tools menu of another tool.

- Click the Task Center icon  from the toolbar of another tool.
- Enter the **db2tc** command.
- On Windows systems, click **Start** and select **Programs —> IBM DB2—> [DB2 copy name] —> General Administration Tools —> Task Center**.

To use the Task Center, you must first create a tools catalog. If you did not create a tools catalog when you installed DB2, you can select **Tools —> Tools Settings —> Scheduler Settings** and create one now.
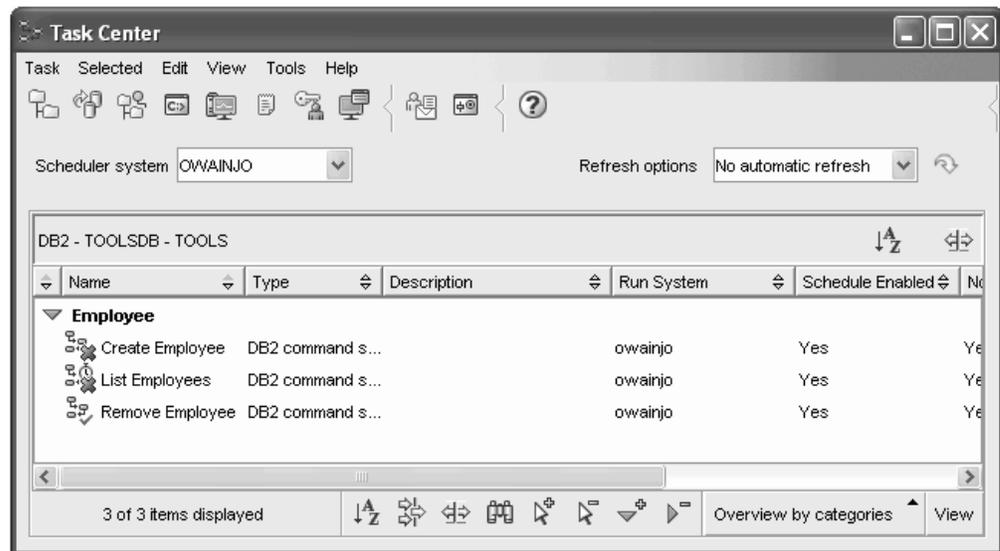


*Figure 8. Task Center window*

Use the Task Center to run tasks, either immediately or according to a schedule, and to notify people about the status of completed tasks. The Task Center includes functionality from the Script Center in previous DB2 versions, plus additional functionality.

A task is a script, together with the associated success conditions, schedules, and notifications. You can create a task within the Task Center, create a script within another tool and save it to the Task Center, import an existing script, or save the options from a DB2 dialog or wizard such as the Load wizard. A script can contain DB2, SQL, or operating system commands.

For each task, you can do the following:
- Schedule the task
- Specify success and failure conditions
- Specify actions that should be performed when this task completes successfully or when it fails
- Specify e-mail addresses (including pagers) that should be notified when this task completes successfully or when it fails

You can specify conditional coding by creating task actions. Each task action consists of a task and the action that should be performed on the task. For example, task 1 could have the following task actions:
- If task 1 is successful, task action A enables the schedule for task 2.
- If task 1 fails, task action B runs task 3.

You can also create a grouping task, which combines several tasks into a single logical unit of work. When the grouping task meets the success or failure conditions that you define, any follow-on tasks are run. For example, you could

combine three backup scripts into a grouping task and then specify a reorganization as a follow-on task that will be executed if all of the backup scripts execute successfully.

To see the most recent information, click the **Refresh** icon  button. You can view the results as follows:

- To see the results from the last time a task was executed, right-click the task and select **Show Results**.
- To see the results from every time a task was executed, open the Journal. In the Journal, you can right-click the task execution that you are interested in and select **Show Results**.

To see help text for a message that appears in the execution results, open the Command Center and enter the error message preceded by a question mark. For example, enter **? SQL0100** to get more information about message SQL0100W.

Several customizable saved views are available via the pull-up menu at the bottom of the Task Center.

**Related concepts:**
- "Getting started with the Command Editor" on page 46
- "Getting started with the Journal" on page 52

## Getting started with the Journal

You can start the Journal in the following ways:
- Select Journal from the Tools menu of another tool.

- Click the Journal icon  from the toolbar of another tool.
- On Windows systems, click **Start** and select **Programs —> IBM DB2 —> [DB2 copy name] —>General Administration Tools —> Journal**.

The Journal displays historical information about tasks, database actions and operations, Control Center actions, messages, and alerts.
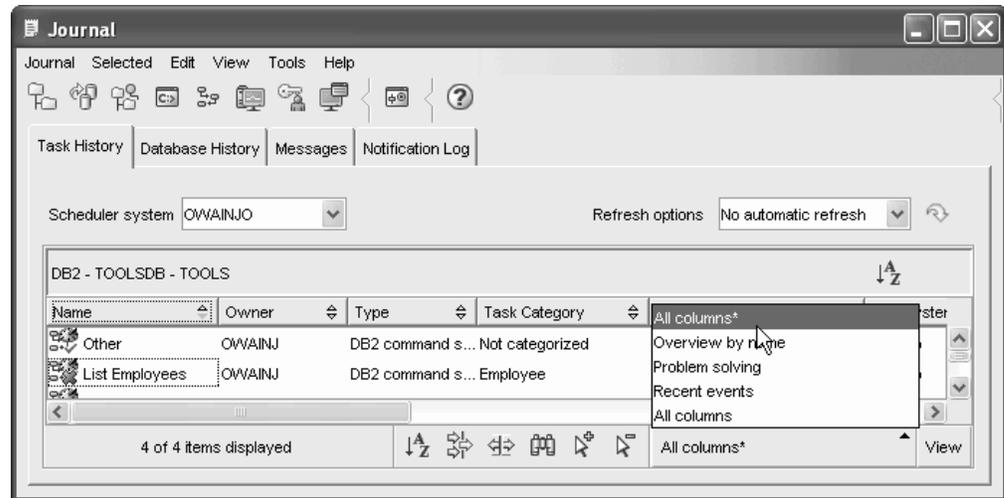
*Figure 9. Journal window*

To see the most recent information, click the **Refresh** icon  button.

The **Task History** page shows the results of tasks that were previously executed. You can use this information to estimate how long future tasks will run.

The Task History page contains one row for each execution of a task. The Task Center contains only one row for each task no matter how many times the task is executed. Each row in the Task Center could be directly related to multiple rows in the Task History page of the Journal.

For each completed execution of a task, you can perform the following actions:
* View the execution results
* View the task that was executed
* Edit the task that was executed
* View the task execution statistics
* Remove the task execution object from the Journal

To perform one of these actions, right-click a completed task execution and select the corresponding action from the pop-up menu that appears.

**Database History:**

You can check the status of key events in the life of your database using the database history. The Database History page in the Journal lists a record of recovery and administrative events:
* A database or table spaces are backed up, restored or rolled forward.
* A table space is created, altered, quiesced, renamed or dropped.
* A table is loaded, dropped, reorganized.
* A database is recovered.
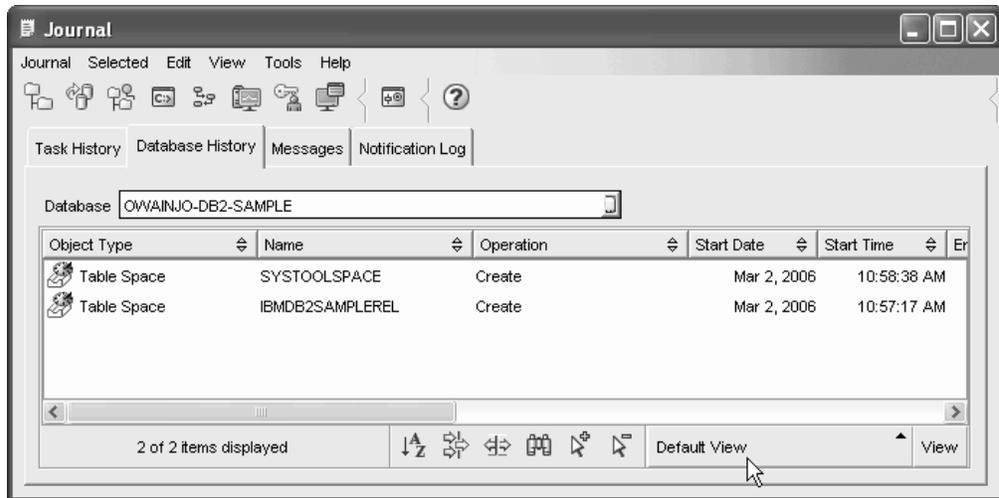
*Figure 10. Database History*

The **Messages** page shows messages that were previously issued from the Control Center and other GUI tools.

The **Notification Log** page shows information from the administration notification log. You can filter the list. For example, you can show only alerts from the health monitor.

Several customizable saved views are available using the pull-up menu at the bottom of the Journal.

**Related concepts:**
- "Getting started with the Health Center" on page 49
- "Getting started with the Task Center" on page 50

# Getting started with the Configuration Assistant

You can start the Configuration Assistant in the following ways:
- Enter the **db2ca** command.
- On Windows systems, click **Start** and select **Programs —> IBM DB2 —> Set-up Tools —> Configuration Assistant**.
- On Linux systems, open the **IBM DB2** folder on the desktop and select **Configuration Assistant**.

Use the Configuration Assistant to configure your clients.

You must configure your DB2 clients so they can work with the available objects, as follows:
- To access an instance or database on another server or system, the DB2 database server must catalog that system in the node directory of the client.
- To access a database, the DB2 database server must catalog database information in the database directory of the client.

From the Configuration Assistant, you can perform various tasks including:
- Add new database objects to access a remote database

- Work with existing database objects
- Bind applications
- Set database manager configuration parameters for DB2 clients
- Import and export configuration information
- Set DB2 registry parameters
- Change passwords
- Test connections
- Configure CLI settings

The graphical interface makes these complex tasks easier through:
- Wizards that help you perform certain tasks
- Dynamic fields that are activated based on your input choices
- Hints that help you make configuration decisions
- Discovery that can retrieve information about selected database objects

The Configuration Assistant displays a list of the databases to which your applications can connect. Each database is identified by its database alias. You can use the Add Database wizard to add databases to the list. You can use the Change Database wizard to alter the information that is associated with databases in the list.

From the View menu, you can select an advanced view, which uses a notebook to organize connection information by object: Systems, Instance Nodes, Databases, Database Connection Services (DCS), and Data Sources. You can use the notebook pages to perform object-specific actions.

**Related concepts:**
- "Getting started with the Control Center" on page 42
- "Basic GUI navigation concepts" on page 39

# Getting started with the Replication Center

You can start the Replication Center in the following ways:
- Select Replication Center from the Tools menu of another tool.
- Click the icon from the toolbar of another tool.
- Enter the **db2rc** command.
- On Windows systems, click **Start** and select **Programs —> IBM DB2 —> General Administration Tools —> Replication Center**.

Use the Replication Center to administer replication between a DB2 database and another relational database (DB2 or non-DB2). From the Replication Center, you can define replication environments, apply designated changes from one location to another, and synchronize the data in both locations.

The first time you invoke the Replication Center, the Replication Center launch pad appears with three views: SQL Replication, Q Replication, and Monitoring and Alarms.
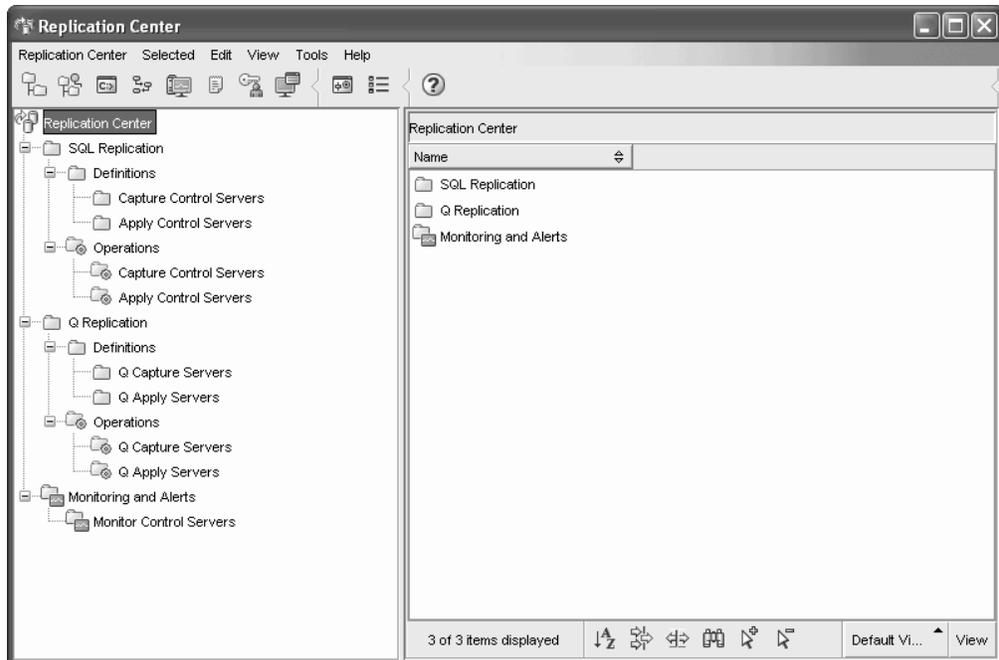
*Figure 11. Replication Center window*

The following are some of the key tasks that you can perform with the Replication Center:

- Create replication control tables
- Register replication sources
- Create subscription sets
- Operate the Capture program
- Operate the Apply program
- Monitor the replication process
- Perform basic troubleshooting for replication

**Related concepts:**

- "Basic GUI navigation concepts" on page 39
- "Getting started with the Control Center" on page 42

# Getting started with the Web Command Center

Use the Web version of the Command Center to execute SQL statements, DB2 commands, and OS commands against a remote DB2 server, either interactively or in scripts. This is particularly useful for database administrators and experienced users who need to be able to work with the database at any time, from any place. The Web version of the Command Center includes most of the features of the full Command Center, but it *does not* currently include Visual Explain or SQL Assist.

To access the DB2 server, you use an HTML 4.0-compliant Web browser that runs on any computing device from a desktop computer to a Personal Digital Assistant (PDA). The browser is a client, which communicates with a middle-tier application server. The application server communicates with the DB2 server. Secure Socket Layer (SSL), the same technology that is used for most Internet banking and secure e-commerce transactions, is used for all communication.

The client can be any computing device that supports an HTML 4.0-compliant Web browser. The browser does not need to support Java, JavaScript™, or cookies. The middle tier must have DB2 Web Tools installed. DB2 Web Tools requires an application server, such as IBM WebSphere® or BEA WebLogic.

If you are the database administrator of a large center, you could use the Web tools as follows:
- While you are away from the office, attending a conference, you receive an urgent message on your PDA about a database problem.
- Using the PDA, you securely log on to a portal where DB2 Web Tools is installed.
- You use the Web versions of the Health Center and the Command Center to investigate the problem.
- You use the Web version of the Command Center to execute SQL, DB2, and OS commands that fix the problem.

**Related concepts:**
- "Getting started with the Command Editor" on page 46
- "Getting started with the Web Health Center" on page 57
- "DB2 Web Command Center" in *Installation and Configuration Supplement*

**Related tasks:**
- "Deploying DB2 Web Tools on WebSphere application servers" in *Installation and Configuration Supplement*

# Getting started with the Web Health Center

Use the Web version of the Health Center to monitor the health of remote databases. This is particularly useful for database administrators and experienced users who need to be able to work with the database at any time, from any place.

The Web version of the Health Center includes a subset of the features of the full Health Center. You can view the active alerts for an instance, view the details, history, and resolution recommendations for an alert, and apply some recommendations through the Web version of the Command Center.

To access the DB2 server, you use an HTML 4.0-compliant Web browser that runs on any computing device from a desktop computer to a Personal Digital Assistant (PDA). The browser is a client, which communicates with a middle-tier application server. The application server communicates with the DB2 server. Secure Socket Layer (SSL), the same technology that is used for most Internet banking and secure e-commerce transactions, is used for all communication.

The client can be any computing device that supports an HTML 4.0-compliant Web browser. The browser does not need to support Java, JavaScript, or cookies. The middle tier must have DB2 Web Tools installed. DB2 Web Tools requires an application server, such as IBM WebSphere or BEA WebLogic.

If you are the database administrator of a large center, you could use the Web tools as follows:
- While you are away from the office, attending a conference, you receive an urgent message on your PDA about a database problem.

- Using the PDA, you securely log on to a portal where DB2 Web Tools is installed.
- You use the Web versions of the Health Center and the Command Center to investigate the problem.
- You use the Web version of the Command Center to execute SQL, DB2, and OS commands that fix the problem.

**Related concepts:**
- "Getting started with the Health Center" on page 49
- "Getting started with the Web Command Center" on page 56
- "DB2 Web Health Center" in *Installation and Configuration Supplement*

**Related tasks:**
- "Deploying DB2 Web Tools on WebSphere application servers" in *Installation and Configuration Supplement*

# Part 3. Appendixes

# Appendix A. Installing DB2 servers using response files

## Response file installation basics

Unlike the DB2 Setup wizard, a DB2 response file installation lets you install DB2 products without any user interaction.

A *response file* is a text file that contain setup and configuration information. A response file specifies configuration and setup parameters and the products and components to install.

This method is useful not only for large-scale deployments of DB2 products, but also for embedding the DB2 installation process transparently inside your customized installation and configuration procedure.

You can create a response file by any of the following methods:
- Modifying one of the sample response files that are provided. Sample response files are located in the DB2 product CD under the directory:

  db2/*platform*/samples

  where *platform* refers to the appropriate hardware platform.
- Using the DB2 Setup wizard to save the setup and configuration data according to the input you provided. If you choose the option to create a response file in the DB2 Setup Wizard, the response files (one for the server, and one for the partition, if you are setting up a multi-partitioned environment) will be saved by default at this location. The default names of the files are *name1* and *name2*.
- Using the response file generator to create a response file from an existing installed and configured DB2 product (Windows only).

A response file installation can also be referred to as a silent installation or an unattended installation.

**Related concepts:**
- "Response file considerations" on page 61
- "The response file generator (Windows)" in *Installation and Configuration Supplement*

**Related tasks:**
- "Creating a response file using the DB2 Setup wizard" on page 62

**Related reference:**
- "Available sample response files" in *Installation and Configuration Supplement*
- "Response file keywords (Windows and UNIX)" in *Installation and Configuration Supplement*

## Response file considerations

You should understand the following considerations before proceeding with a response file installation:

- Although response files in Version 8 and Version 9 have similar formats, there are version limitations as to where response files can be used. For example, any response file generated in DB2 Version 9 can only be used to install DB2 Version 9; it cannot be used to install DB2 Version 8. The opposite is also true, where response files generated in DB2 Version 8 cannot be used to install DB2 Version 9. This is primarily caused by mandatory keywords that are new in Version 9.
- If you are using the DB2 Setup wizard:
  - You can save your settings in a response file during the installation in the **Select the installation action** panel of the DB2 Setup wizard.
  - You are creating a response file based on just the installation you are performing. This method is recommended if you have either a fairly simple configuration or if you want to create a response file that you plan to later customize.
  - A response file is only generated if you allow the installation process to complete, and it completes successfully. If you cancel the installation, or if the installation fails, the response file is not created.
- You can use a response file to install an identical configuration across every workstation on your network or to install multiple configurations of a DB2 product. You can then distribute this file to every workstation where you want this product to be installed.
- If you use the response file generator (Windows only), you are creating the response file based on an existing installation. This method is recommended when you have a more complex configuration, one that you manually configured. If you are using the response file generator after generating the response file, you might need to input user names and passwords

**Related concepts:**
- "Response file installation basics" on page 61

**Related tasks:**
- "Response file installation of DB2 overview (Linux and UNIX)" in *Installation and Configuration Supplement*
- "Response file installation of DB2 overview (Windows)" in *Installation and Configuration Supplement*

## 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.

**Procedure:**

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 launch 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 *name1*, and is saved in *directory1*.

   **Notes:**
   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 *name2*, and is saved in *directory2*.
6. In the **Select the installation folder** window, specify there directory where the DB2 product is to be installed.
7. Proceed through the rest of the installation panels selecting the options you want.
8. In the **Start copying files and create response file** window, review the settings you selected.
9. To install the product, click **Finish**.
10. When the installation has completed, the DB2 Setup wizard will have placed the generated response file in the path you specified. The response file keywords are explained in Response file keywords. However, 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.

**Related tasks:**
- "Response file installation of DB2 overview (Linux and UNIX)" in *Installation and Configuration Supplement*
- "Response file installation of DB2 overview (Windows)" in *Installation and Configuration Supplement*

**Related reference:**
- "Response file keywords (Windows and UNIX)" in *Installation and Configuration Supplement*

# Appendix B. Language support

## Changing the DB2 interface language (Windows)

The interface language of DB2 is the language that appears in messages, help, and graphical tool interfaces. When installing DB2, you have the option of installing support for one or more languages. If, at some time after installation, you want to change the interface language for DB2 to one of the other installed interface languages, use the steps outlined in this task.

Do not confuse languages supported by DB2 with languages supported by the DB2 interface. Languages supported by DB2, that is, languages that *data* can exist in, are a superset of languages supported by the DB2 interface.

**Prerequisites:**

The DB2 interface language you want to use must be installed on your system. DB2 interface languages are selected and installed when you install DB2 using the DB2 Setup wizard. If you change the interface language of DB2 to a supported interface language that has not been installed, the DB2 interface language will default to the operating system language first, and if that is not supported, English.

**Procedure:**

Changing the interface language for DB2 on Windows requires that you change the default language setting for your Windows operating system.

To change the DB2 interface language on Windows:
1. Through the Control Panel on your Windows operating system, select **Regional Options**.
2. In the Regional Options dialog window, change the default language setting for the system to the language in which you want to interface with DB2.

Refer to your operating system help for additional information about changing the default system language.

**Related tasks:**
- "Displaying topics in your preferred language in the DB2 Information Center" on page 84

**Related reference:**
- "Supported DB2 interface languages" on page 67
- "Supported territory codes and code pages" in *Administration Guide: Planning*

# Changing the DB2 interface language (Linux)

The interface language of the DB2 product is the language that appears in messages, help, and graphical tool interfaces. When installing your DB2 product, you have the option of installing support for one or more languages. If, at some time after installation, you want to change the interface language to one of the other installed interface languages, use the steps outlined in this task.

Do not confuse languages supported by the DB2 product with languages supported by the DB2 interface. Languages supported by the DB2 product, that is, languages that *data* can exist in, are a superset of languages supported by the DB2 interface.

**Prerequisites:**

Support for the DB2 interface language you want to use must be installed on your system. DB2 interface language support is selected and installed when you install DB2 using the DB2 Setup wizard. If you change the interface language of the DB2 product to a supported interface language that has not been installed, the DB2 interface language will default to the operating system language first, and if that is not supported, English.

DB2 interface language support is selected and installed when you install your DB2 product using the DB2 Setup wizard or by using the National Language Package.

**Procedure:**

To check which public locales are available in your system, run the **$ locale -a** command.

To change the DB2 interface language, set the LANG environment variable to the desired locale.

For bourne (sh), korn (ksh), and bash shells:

```
LANG=<locale>
export LANG
```

For C shell:

```
setenv LANG <locale>
```

For example, to interface with the DB2 product in French, you must have the French language support installed and you must set the LANG environment variable to a French locale, for example, fr_FR.

**Related tasks:**
- "Displaying topics in your preferred language in the DB2 Information Center" on page 84

**Related reference:**
- "Supported DB2 interface languages" on page 67
- "Supported territory codes and code pages" in *Administration Guide: Planning*

# Supported DB2 interface languages

DB2 language support for DB2 interfaces can be categorized into server group languages and client group languages. Server group languages will translate most messages, help, and DB2 graphical interface elements. Client group languages will translate the DB2 Runtime Client component, which will include most messages and certain help documentation.

Server group languages include: Brazilian Portuguese, Czech, Danish, Finnish, French, German, Italian, Japanese, Korean, Norwegian, Polish, Russian, Simplified Chinese, Spanish, Swedish, and Traditional Chinese.

Client group languages include: Arabic, Bulgarian, Croatian, Dutch, Greek, Hebrew, Hungarian, Portuguese, Romanian, Slovak, Slovenian, and Turkish.

Do not confuse languages supported by the DB2 product with languages supported by the DB2 interface. Languages supported by DB2 product that is, languages that *data* can exist in, are a superset of languages supported by the DB2 interface.

**Related tasks:**
- "Changing the DB2 interface language (Linux)" on page 66
- "Changing the DB2 interface language (Windows)" on page 65
- "Capturing error and diagnostic information during migration" in *Migration Guide*

**Related reference:**
- "Conversion table files for euro-enabled code pages" in *Administration Guide: Planning*
- "Conversion tables for code pages 923 and 924" in *Administration Guide: Planning*
- "National language versions" in *Administration Guide: Planning*
- "Supported territory codes and code pages" in *Administration Guide: Planning*

# Language identifiers for running the DB2 Setup wizard in another language

If you want to run the DB2 Setup wizard in a language different from the default language on your computer, you can start the DB2 Setup wizard manually, specifying a language identifier. The language must be available on the platform where you are running the installation.

*Table 3. Language identifiers*

| Language | Language identifier |
|---|---|
| Arabic (available on Windows only) | ar |
| Brazilian Portuguese | br |
| Bulgarian | bg |
| Chinese, Simplified | cn |
| Chinese, Traditional | tw |
| Croatian | hr |
| Czech | cz |

*Table 3. Language identifiers  (continued)*

| Language | Language identifier |
|----------|---------------------|
| Danish | dk |
| Dutch | nl |
| English | en |
| Finnish | fi |
| French | fr |
| German | de |
| Greek | el |
| Hungarian | hu |
| Italian | it |
| Japanese | jp |
| Korean | kr |
| Norwegian | no |
| Polish | pl |
| Portuguese | pt |
| Romanian | ro |
| Russian | ru |
| Slovak | sk |
| Slovenian | sl |
| Spanish | es |
| Swedish | se |
| Turkish | tr |

**Related reference:**
-

# Displaying the db2setup command in your national language

The **db2setup** command queries the operating system to determine the existing language settings. If the language setting of your operating system is supported by **db2setup**, then that language will be used.

If your system uses the same code pages but different locale names than those supported by the DB2 interface, you can still see the translated **db2setup** by setting your LANG environment variable to the appropriate value by entering the following command:

**bourne (sh), korn (ksh), and bash shells:**
```
LANG=<locale>
export LANG
```

**C shell:**
```
setenv LANG <locale>
```

where *locale* is a locale supported by the DB2 interface.

**Related reference:**

- "Supported DB2 interface languages" on page 67
- "db2setup - Install DB2 command" in *Command Reference*
- "setup - Install DB2 command" in *Command Reference*

# Appendix C. Installing DB2 fix packs

## Applying fix packs

A DB2 fix pack contains updates and fixes for problems (Authorized Program Analysis Reports, or "APARs") found during testing at IBM, as well as fixes for problems reported by customers. Every fix pack is accompanied by a document, called APARLIST.TXT, that describes the fixes it contains.

Each fix pack contains a Readme and a set of Release Notes:
- The fix pack Readme provides instructions for installing and uninstalling the fix pack.
- The Release Notes contain information about changes to the product.

You can access and read both the fix pack Readme and the Release Notes by selecting the link for fix pack downloads at the DB2 Support Web site before installing a DB2 product. The DB2 Support Web site is found at http://www.ibm.com/software/data/db2/udb/support.html.

Fix packs are cumulative. This means that the latest fix pack for any given version of DB2 contains all of the updates from previous fix packs for the same version of DB2. It is recommended that you keep your DB2 environment running at the latest fix pack level to ensure problem-free operation.

There are two types of fix pack images:
- A fix pack for each individual DB2 product. This fix pack can be applied on an existing installation of the product, or can be used to perform a full product installation where there is no existing DB2 installation.
- Universal fix pack (Linux or UNIX only). A universal fix pack services installations where more than one DB2 product has been installed.

If national languages have been installed, you also require a separate national language fix pack. The national language fix pack can only be applied if it is at the same fix pack level as the installed DB2 product. If you are applying a universal fix pack, you must apply both the universal fix pack and the national language fix pack to update the DB2 products.

When installing a fix pack on a multi-partition database system, the system must be offline and all computers participating in the instance must be upgraded to the same fix pack level.

**Prerequisites:**

Each fix pack has specific prerequisites. See the Readme that accompanies the fix pack for details.

**Procedure:**

1. Access and download the latest DB2 fix pack by selecting the link for fix pack downloads from the DB2 Support Web site at http://www.ibm.com/software/data/db2/udb/support.html.

**Related reference:**

- "db2setup - Install DB2 command" in *Command Reference*
- "installFixPack - Update installed DB2 products command" in *Command Reference*
- "setup - Install DB2 command" in *Command Reference*

# Appendix D. Uninstalling your DB2 product

## Uninstalling your DB2 product (Windows)

This task provides steps for completely removing your DB2 product from your Windows operating system. You should only perform this task if you no longer require existing your DB2 instances and databases.

If you are uninstalling the DB2 default copy, and you have other DB2 copies on your system, you should use the **db2swtch** command to choose a new default copy before you proceed with the uninstallation. Also, if your database administration server (DAS) is running under the copy being removed, you should move your DAS to a copy that is not being removed. Otherwise, you will have to recreate the DAS using **db2admin create** command after the uninstall and you might have to reconfigure the DAS for some functionality to work.

**Procedure:**

To remove your DB2 product from Windows:
1. Drop all databases. You can drop databases using the Control Center or **drop database** command. If you drop your databases, all of your data will be gone.
2. Stop all DB2 processes and services. This can be done through the Windows Services panel or by issuing the **db2stop** command. If DB2 services and processes are not stopped before attempting to remove your DB2 product, you will receive a warning containing a list of processes and services that are holding DB2 DLLs in memory.
3. You have two options for removing your DB2 product:

   **Add/Remove Programs**
   > Accessible through the Windows Control Panel, use the Add/Remove Programs window to remove your DB2 product. Refer to your operating system's help for more information about removing software products from your Windows operating system.

   **db2unins command**
   > You can run the **db2unins** command to remove your DB2 product. Using this command, you can uninstall multiple DB2 products at the same time using the **/p** parameter. You can also silently uninstall DB2 products by using **/u** parameter which will remove the DB2 products specified in the response file. For more information, see the **db2unins** command topic.

Unfortunately, your DB2 product cannot always be removed by using the Control Panel - Add/Remove Programs facility or using the **db2unins /p** command or the **db2unins /u** command. The following uninstallation option should ONLY be attempted if the above method fails.

To forcefully remove all DB2 copies from your Windows system, run the **db2unins /f** command. This command will perform a brute force uninstallation of ALL DB2 copies on the system. Everything except user data, such as DB2 databases, will be forcefully deleted.

**Related tasks:**

- "Uninstalling your DB2 product (Linux and UNIX)" in *Quick Beginnings for DB2 Servers*
- "Uninstalling a DB2 product using a response file (Windows)" in *Installation and Configuration Supplement*
- "Changing the Default DB2 copy after installation (Windows)" in *Administration Guide: Implementation*

**Related reference:**
- "db2swtch - Switch default DB2 copy command" in *Command Reference*
- "db2unins - Uninstall DB2 database product command" in *Command Reference*
- "DROP DATABASE command" in *Command Reference*

# Uninstalling your DB2 products (Linux)

## Removing DB2 products using the db2_deinstall or doce_deinstall command (Linux)

This task provides steps for removing DB2 products or DB2 components using the **db2_deinstall** command. The **db2_deinstall** command removes all DB2 products from your system. The **doce_deinstall** command removes the DB2 Information Center that is in the same install path as the **doce_deinstall** tool. This command is only available on the Linux operating systems.

You cannot remove DB2 products using a native operating system utility, such as rpm or SMIT.

**Prerequisites:**

Before you remove DB2 products from your system:
- Ensure that you have performed all steps outlined in *Uninstalling your DB2 product*.
- You must have root authority to remove DB2 products.

**Procedure:**

To remove **ALL** DB2 products from a specific path:
1. Log in as user with root authority.
2. Access the path where the DB2 products are located. To locate the path of the DB2 product to remove, see
3. Run the **db2_deinstall -a** command from the DB2DIR/install directory or the **doce_deinstall -a** command from the DB2DIR/doc/install directory, where DB2DIR is the location that you specified when you installed your DB2 product.

**Related tasks:**
- "Applying fix packs" on page 71
- "Listing DB2 products installed on your system (Linux and UNIX)" in *Quick Beginnings for DB2 Servers*
- "Removing DB2 instances (Linux)" on page 76
- "Uninstalling your DB2 product (Linux and UNIX)" in *Quick Beginnings for DB2 Servers*

**Related reference:**
- "db2_deinstall - Uninstall DB2 products or features command" in *Command Reference*
- "db2_install - Install DB2 product command" in *Command Reference*
- "Multiple DB2 copies roadmap" in *Administration Guide: Implementation*

# Stopping DB2 instances (Linux)

You must stop all DB2 instances associated *with the DB2 copy you are uninstalling*. Instances associated with other DB2 copies should not be affected by uninstalling the current copy.

**Procedure:**

To stop a DB2 instance:
1. Log in as a user with root authority.
2. To obtain a list of the names of all DB2 instances associated with your current DB2 copy, enter the following command:

   `DB2DIR/bin/db2ilist`

   where *DB2DIR* is the location you specified during the DB2 Version 9 installation. The default installation path for Linux is */opt/ibm/db2/V9.1*.
3. Log out.
4. Log back in as the owner of the instance you want to stop.
5. Run the start up script if it is not included in `.profile`.

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

   where *INSTHOME* is the home directory of the instance.
6. You might want to save the database manager configuration file, `db2systm`, the `db2nodes.cfg` file, or user defined function or fenced stored procedure applications in *INSTHOME*`/sqllib/function`.
7. Stop the DB2 database manager by entering the **db2stop force** command.
8. Confirm that the instance is stopped by entering the **db2 terminate** command.
9. Repeat these steps for each instance.

**Related reference:**
- "db2ilist - List instances command" in *Command Reference*
- "db2stop - Stop DB2 command" in *Command Reference*
- "FORCE APPLICATION command" in *Command Reference*

# Stopping the DB2 administration server (Linux)

You must stop the DB2 administration server (DAS) before you remove your DB2 product. You only need to perform this task if the DAS is associated with the DB2 copy you are uninstalling.

**Procedure:**

To stop the DB2 administration server:
1. Log in as the DB2 administration server owner.
2. Stop the DB2 administration server by entering the **db2admin stop** command.

**Related concepts:**
- "DB2 Administration Server" in *Administration Guide: Implementation*

**Related tasks:**
- "Removing DB2 products using the db2_deinstall or doce_deinstall command (Linux)" on page 74

**Related reference:**
- "db2admin - DB2 administration server command" in *Command Reference*

# Removing the DB2 administration server (Linux)

You must remove the DB2 administration server (DAS) before you remove your DB2 product. You only need to remove the DB2 DAS if this is the last DB2 Version 9 copy that you're removing. Otherwise, you should run the **dasupdt** command from the DB2 copy that you would like to have the DB2 DAS associated with.

**Procedure:**

To remove the DB2 administration server:
1. Log in as a user with `root` authority.
2. Stop the DB2 administration server.
3. Remove the DB2 administration server by entering the following command:
   `DB2DIR`**/instance/dasdrop**

   where *DB2DIR* is the location you specified during the DB2 Version 9 installation. The default installation path for Linux is */opt/ibm/db2/V9.1*.

**Related concepts:**
- "DB2 Administration Server" in *Administration Guide: Implementation*

**Related tasks:**
- "Removing DB2 products using the db2_deinstall or doce_deinstall command (Linux)" on page 74
- "Stopping the DB2 administration server (Linux)" on page 75

# Removing DB2 instances (Linux)

You can remove some or all of the DB2 instances on your system. Once an instance is removed, you can use the DB2 databases owned by the instance if you catalog them under another instance of the same release. Even though you remove the instance, the databases are still intact and can be reused unless the database files are expressly deleted.

Remove DB2 instances only if you are not planning to use your DB2 products, or if you do not want to migrate existing instances to a later version of the DB2 product. Migration requires that both the new and old DB2 versions are still installed. You cannot migrate an instance if the DB2 copy it is associated with has been removed.

**Procedure:**

To remove an instance:

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

   `DB2DIR/instance/db2idrop InstName`

   where *DB2DIR* is the location you specified during the DB2 Version 9 installation. The default installation path for Linux is */opt/ibm/db2/V9.1*.

   The **db2idrop** command removes the instance entry from the list of instances and removes the *INSTHOME*/`sqllib` directory, where *INSTHOME* is the home directory of the instance and where *InstName* is the login name of the instance. If you are storing any files in /`sqllib` directory, these files will be removed by this action. If you still need these files, you must make a copy of them before dropping the instance.
3. Optional: As a user with root authority, remove the instance owner's user ID and group (if used only for that instance). Do not remove these if you are planning to re-create the instance.

   Remove the database files from the systems or drop the databases before dropping the instance if you no longer need the databases. After dropping the instance the database files remain intact.

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

**Related tasks:**
- "Removing DB2 products using the db2_deinstall or doce_deinstall command (Linux)" on page 74

**Related reference:**
- "db2idrop - Remove instance command" in *Command Reference*

# Appendix E. DB2 Database technical information

## Overview of the DB2 technical information

DB2 technical information is available through the following tools and methods:
- DB2 Information Center
  - Topics
  - Help for DB2 tools
  - Sample programs
  - Tutorials
- DB2 books
  - PDF files (downloadable)
  - PDF files (from the DB2 PDF CD)
  - printed books
- Command line help
  - Command help
  - Message help
- Sample programs

IBM periodically makes documentation updates available. If you access the online version on the DB2 Information Center at ibm.com®, you do not need to install documentation updates because this version is kept up-to-date by IBM. If you have installed the DB2 Information Center, it is recommended that you install the documentation updates. Documentation updates allow you to update the information that you installed from the *DB2 Information Center CD* or downloaded from Passport Advantage as new information becomes available.

**Note:** The DB2 Information Center topics are updated more frequently than either the PDF or the hard-copy 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 Redbooks™ online at ibm.com. Access the DB2 Information Management software library site at http://www.ibm.com/software/data/sw-library/.

### Documentation feedback

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**Related concepts:**
- "Features of the DB2 Information Center" in *Online DB2 Information Center*
- "Sample files" in *Samples Topics*

**Related tasks:**
- "Invoking command help from the command line processor" in *Command Reference*
- "Invoking message help from the command line processor" in *Command Reference*
- "Updating the DB2 Information Center installed on your computer or intranet server" on page 85

**Related reference:**
- "DB2 technical library in hardcopy or PDF format" on page 80

# 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. DB2 Version 9 manuals in PDF format can be downloaded from www.ibm.com/software/data/db2/udb/support/manualsv9.html.

Although the tables identify books available in print, the books might not be available in your country or region.

The information in these books is fundamental to all DB2 users; you will find this information useful whether you are a programmer, a database administrator, or someone who works with DB2 Connect or other DB2 products.

*Table 4. DB2 technical information*

| Name | Form Number | Available in print |
|------|-------------|--------------------|
| *Administration Guide: Implementation* | SC10-4221 | Yes |
| *Administration Guide: Planning* | SC10-4223 | Yes |
| *Administrative API Reference* | SC10-4231 | Yes |
| *Administrative SQL Routines and Views* | SC10-4293 | No |
| *Call Level Interface Guide and Reference, Volume 1* | SC10-4224 | Yes |
| *Call Level Interface Guide and Reference, Volume 2* | SC10-4225 | Yes |
| *Command Reference* | SC10-4226 | No |
| *Data Movement Utilities Guide and Reference* | SC10-4227 | Yes |
| *Data Recovery and High Availability Guide and Reference* | SC10-4228 | Yes |
| *Developing ADO.NET and OLE DB Applications* | SC10-4230 | Yes |
| *Developing Embedded SQL Applications* | SC10-4232 | Yes |

*Table 4. DB2 technical information  (continued)*

| Name | Form Number | Available in print |
|---|---|---|
| *Developing SQL and External Routines* | SC10-4373 | No |
| *Developing Java Applications* | SC10-4233 | Yes |
| *Developing Perl and PHP Applications* | SC10-4234 | No |
| *Getting Started with Database Application Development* | SC10-4252 | Yes |
| *Getting started with DB2 installation and administration on Linux and Windows* | GC10-4247 | Yes |
| *Message Reference Volume 1* | SC10-4238 | No |
| *Message Reference Volume 2* | SC10-4239 | No |
| *Migration Guide* | GC10-4237 | Yes |
| *Net Search Extender Administration and User's Guide* **Note:** HTML for this document is not installed from the HTML documentation CD. | SH12-6842 | Yes |
| *Performance Guide* | SC10-4222 | Yes |
| *Query Patroller Administration and User's Guide* | GC10-4241 | Yes |
| *Quick Beginnings for DB2 Clients* | GC10-4242 | No |
| *Quick Beginnings for DB2 Servers* | GC10-4246 | Yes |
| *Spatial Extender and Geodetic Data Management Feature User's Guide and Reference* | SC18-9749 | Yes |
| *SQL Guide* | SC10-4248 | Yes |
| *SQL Reference, Volume 1* | SC10-4249 | Yes |
| *SQL Reference, Volume 2* | SC10-4250 | Yes |
| *System Monitor Guide and Reference* | SC10-4251 | Yes |
| *Troubleshooting Guide* | GC10-4240 | No |
| *Visual Explain Tutorial* | SC10-4319 | No |
| *What's New* | SC10-4253 | Yes |
| *XML Extender Administration and Programming* | SC18-9750 | Yes |
| *XML Guide* | SC10-4254 | Yes |
| *XQuery Reference* | SC18-9796 | Yes |

*Table 5. DB2 Connect-specific technical information*

| Name | Form Number | Available in print |
|---|---|---|
| *DB2 Connect User's Guide* | SC10-4229 | Yes |

*Table 5. DB2 Connect-specific technical information  (continued)*

| Name | Form Number | Available in print |
|------|-------------|--------------------|
| *Quick Beginnings for DB2 Connect Personal Edition* | GC10-4244 | Yes |
| *Quick Beginnings for DB2 Connect Servers* | GC10-4243 | Yes |

*Table 6. WebSphere Information Integration technical information*

| Name | Form Number | Available in print |
|------|-------------|--------------------|
| *WebSphere Information Integration: Administration Guide for Federated Systems* | SC19-1020 | Yes |
| *WebSphere Information Integration: ASNCLP Program Reference for Replication and Event Publishing* | SC19-1018 | Yes |
| *WebSphere Information Integration: Configuration Guide for Federated Data Sources* | SC19-1034 | No |
| *WebSphere Information Integration: SQL Replication Guide and Reference* | SC19-1030 | Yes |

**Note:** The DB2 Release Notes provide additional information specific to your product's release and fix pack level. For more information, see the related links.

**Related concepts:**
- "Overview of the DB2 technical information" on page 79
- "About the Release Notes" in *Release notes*

**Related tasks:**
- "Ordering printed DB2 books" on page 82

# 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* CD are unavailable in print. For example, neither volume of the *DB2 Message Reference* is available as a printed book.

Printed versions of many of the DB2 books available on the DB2 PDF Documentation CD can be ordered for a fee from IBM. Depending on where you are placing your order from, you may be able to order books online, from the IBM Publications Center. If online ordering is not available in your country or region, you can always order printed DB2 books from your local IBM representative. Note that not all books on the DB2 PDF Documentation CD are available in print.

**Note:** The most up-to-date and complete DB2 documentation is maintained in the DB2 Information Center at http://publib.boulder.ibm.com/infocenter/db2help/.

**Procedure:**

To order printed DB2 books:
- To find out whether you can order printed DB2 books online in your country or region, check the IBM Publications Center at http://www.ibm.com/shop/publications/order. You must select a country, region, or language to access publication ordering information and then follow the ordering instructions for your location.
- To order printed DB2 books from your local IBM representative:
  – Locate the contact information for your local representative from one of the following Web sites:
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  – Provide your representative with the titles and form numbers of the books that you want to order.

**Related concepts:**
- "Overview of the DB2 technical information" on page 79

**Related reference:**
- "DB2 technical library in hardcopy or PDF format" on page 80

# Displaying SQL state help from the command line processor

DB2 returns an SQLSTATE value for conditions that could be the result of an SQL statement. SQLSTATE help explains the meanings of SQL states and SQL state class codes.

**Procedure:**

To invoke 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.

**Related tasks:**
- "Invoking command help from the command line processor" in *Command Reference*
- "Invoking message help from the command line processor" in *Command Reference*

# Accessing different versions of the DB2 Information Center

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/.

**Related tasks:**
- "Setting up access to DB2 contextual help and documentation" in *Administration Guide: Implementation*

# 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.

**Procedure:**

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 **Tools** —> **Options** —> **Languages** button. 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 might have to 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

If you have a locally-installed DB2 Information Center, updated topics can be available for download. The 'Last updated' value found at the bottom of most topics indicates the current level for that topic.

To determine if there is an update available for the entire DB2 Information Center, look for the 'Last updated' value on the Information Center home page. Compare the value in your locally installed home page to the date of the most recent downloadable update at http://www.ibm.com/software/data/db2/udb/support/icupdate.html. You can then update your locally-installed Information Center if a more recent downloadable update is available.

Updating your locally-installed DB2 Information Center 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 download and apply updates.
2. Use the Update feature to determine if update packages are available from IBM.

   **Note:** Updates are also available on CD. For details on how to configure your Information Center to install updates from CD, see the related links.
   If update packages are available, use the Update feature to download the packages. (The Update feature is only available in stand-alone mode.)
3. Stop the stand-alone Information Center, and restart the DB2 Information Center service on your computer.

**Procedure:**

To update the DB2 Information Center installed on your computer or intranet server:
1. Stop the DB2 Information Center service.
   - On Windows, click **Start → Control Panel → Administrative Tools → Services**. Then right-click on **DB2 Information Center** service and select **Stop**.
   - On Linux, enter the following command:
     ```
     /etc/init.d/db2icdv9 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 `C:\Program Files\IBM\DB2 Information Center\Version 9` directory.
     c. Run the `help_start.bat` file using the fully qualified path for the DB2 Information Center:
        ```
        <DB2 Information Center dir>\doc\bin\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` directory.

b. Run the `help_start` script using the fully qualified path for the DB2 Information Center:

```
<DB2 Information Center dir>/doc/bin/help_start
```

The systems default Web browser launches to display the stand-alone Information Center.

3. Click the Update button ( ). On the right hand panel of the Information Center, click **Find Updates**. A list of updates for existing documentation displays.

4. To initiate the download process, check the selections you want to download, then click **Install Updates**.

5. After the download and installation process has completed, click **Finish**.

6. Stop the stand-alone Information Center.
   - On Windows, run the `help_end.bat` file using the fully qualified path for the DB2 Information Center:

   ```
   <DB2 Information Center dir>\doc\bin\help_end.bat
   ```

   **Note:** The help_end batch file contains the commands required to safely terminate the processes that were started with the help_start batch file. Do not use `Ctrl-C` or any other method to terminate `help_start.bat`.

   - On Linux, run the `help_end` script using the fully qualified path for the DB2 Information Center:

   ```
   <DB2 Information Center dir>/doc/bin/help_end
   ```

   **Note:** The help_end script contains the commands required to safely terminate the processes that were started with the help_start script. Do not use any other method to terminate the `help_start` script.

7. Restart the DB2 Information Center service.
   - On Windows, click **Start → Control Panel → Administrative Tools → Services**. Then right-click on **DB2 Information Center** service and select **Start**.
   - On Linux, enter the following command:

   ```
   /etc/init.d/db2icdv9 start
   ```

The updated DB2 Information Center displays the new and updated topics.

**Related concepts:**
- "DB2 Information Center installation options" in *Quick Beginnings for DB2 Servers*

**Related tasks:**
- "Installing the DB2 Information Center using the DB2 Setup wizard (Linux)" in *Quick Beginnings for DB2 Servers*
- "Installing the DB2 Information Center using the DB2 Setup wizard (Windows)" in *Quick Beginnings for DB2 Servers*

# 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 on the title.

*Native XML data store*
> Set up a DB2 database to store XML data and to perform basic operations with the native XML data store.

*Visual Explain Tutorial*
> Analyze, optimize, and tune SQL statements for better performance using Visual Explain.

**Related concepts:**
- "Visual Explain overview" in *Administration Guide: Implementation*

# DB2 troubleshooting information

A wide variety of troubleshooting and problem determination information is available to assist you in using DB2 products.

**DB2 documentation**
> Troubleshooting information can be found in the DB2 Troubleshooting Guide or the Support and Troubleshooting section of the DB2 Information Center. There you will find information on 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 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/udb/support.html

**Related concepts:**
- "Introduction to problem determination" in *Troubleshooting Guide*
- "Overview of the DB2 technical information" on page 79

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To learn more about DB2 products, go to http://www.ibm.com/software/data/db2/.

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IBM DB2    DB2 Version 9

Getting started with DB2 installation and administration

IBM