

DB2 User Guide

DB2 is a relation database manage system developed by IBM company.

DB2 is mainly used in large application systems and it supports the user environment from mainframe to single. It provides high-level data usability, integrity, security, recoverability, and the application executive capacity from small to large scale. It has the basic functions and SQL commands that has nothing with platform. DB2 uses the data classification technology and enables mainframe data easily be downloaded to the LAN database server. And make the database localization and remote connections transparency. Its external connections change the query performance and support the parallel query for multiple tasks. The DB2 database can be assessed by any applications through using the Microsoft open database to connect the ODBC interface, Java interface or CORBA interface agency.

Based on the DB2 features above, more and more users start to use the DB2 to manage the vast amount spatial data in GIS applications. In order to support the DB2 database, SuperMap providers a series of supports for DB2 datasource. This guide introduces how to install DB2, catalog DB2 and import and export DB2.

Main Contents:

Install DB2

This section introduces the installation of DB2 program. Please refer to the help for the supported platform. This help mainly introduce the installation on Window. It is suggested that install DB2 9.7 version based on the optimal performance of DB2 database

1. Double click **setup.exe** program and pop up the **DB2 Setup Launchpad**, as shown below.

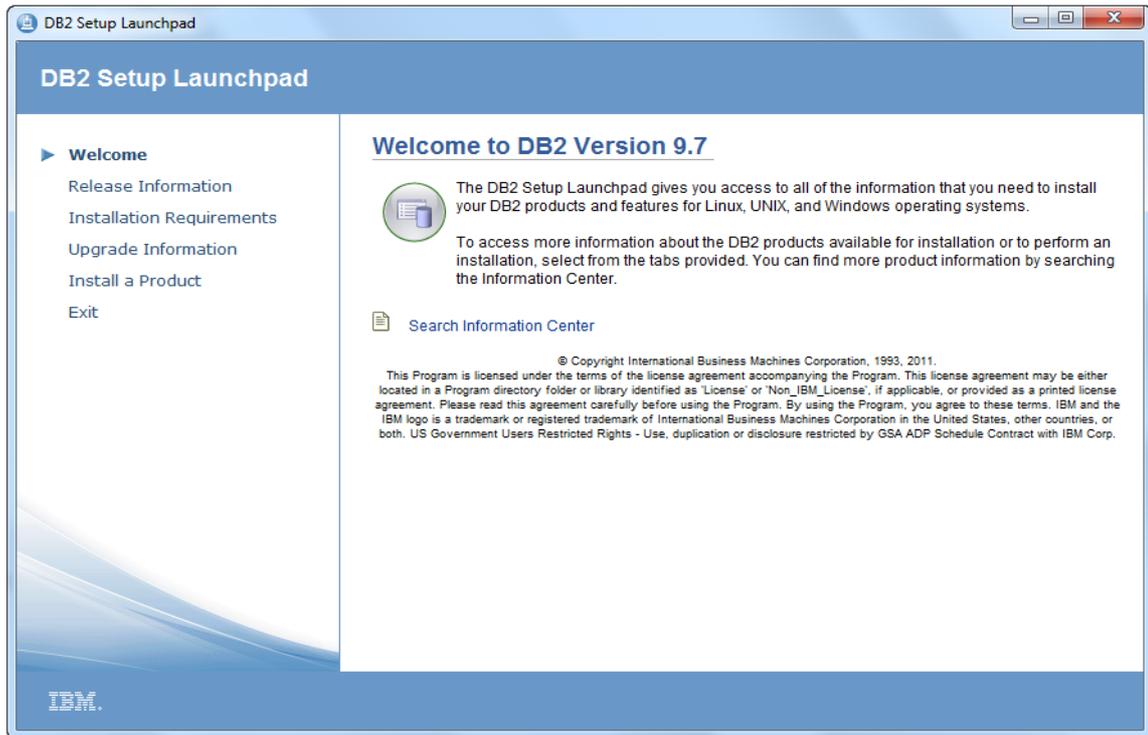


Figure: The DB2 Setup Launchpad

2. Click the **Install a Product** link on the window left to enter the page of **Install a Product**. This page lists all the DB2 products that are available. Select **DB2 Advanced Enterprise Server Edition Version 9.7 Fix Pack 4** and click the **Install New** button.

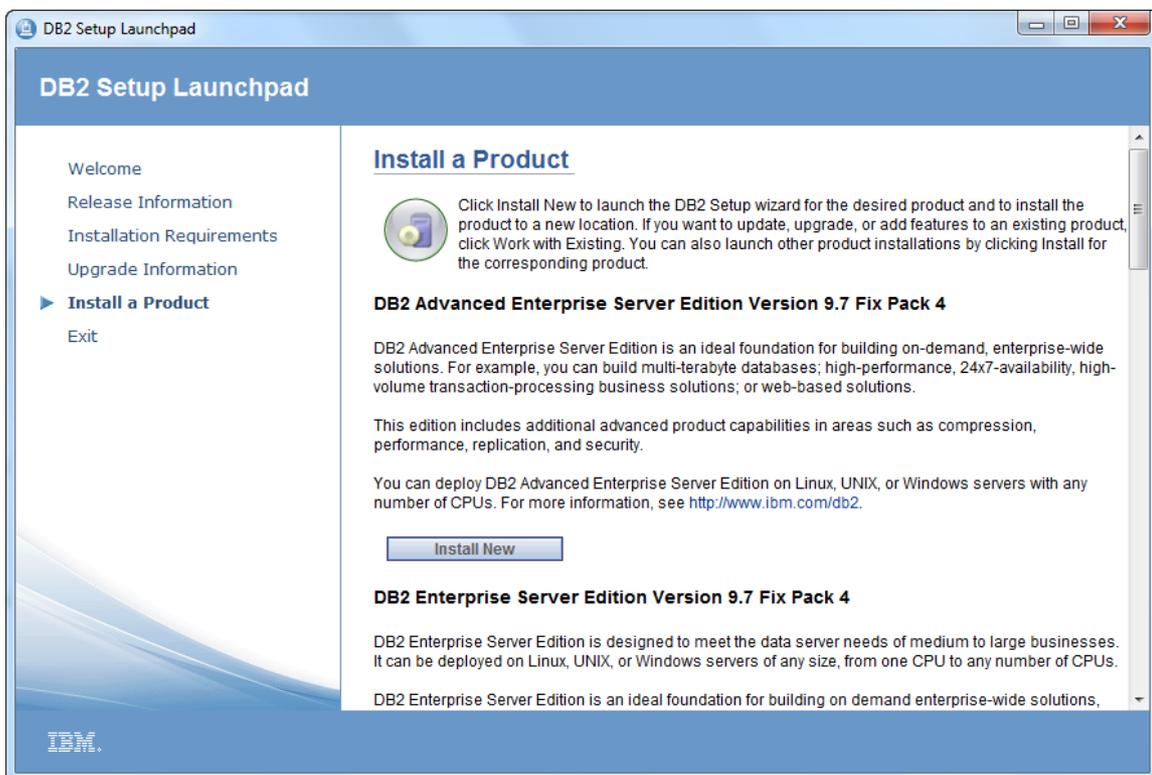


Figure: Select the DB2 products

3. Pop up the following **Welcome** dialog box and click **Next** button.

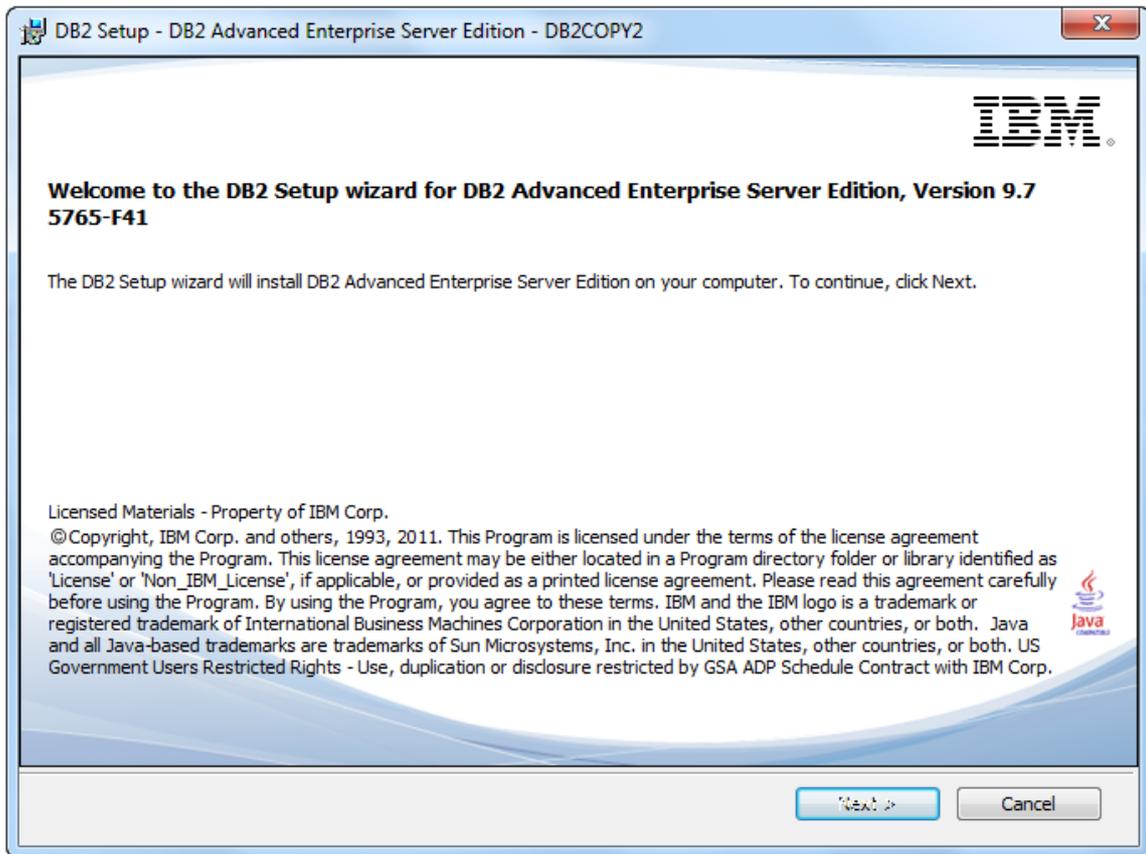


Figure: The Welcome dialog box

4. Pop up the **Software License Agreement** dialog box. Please read the following license agreement carefully. If you accept this license, please select **I accept the terms in the license agreement** and click the **Next** button; If you don't accept this license, please select the **I do not accept the terms in the license agreement** and click the **Cancel** button to exit the installation.

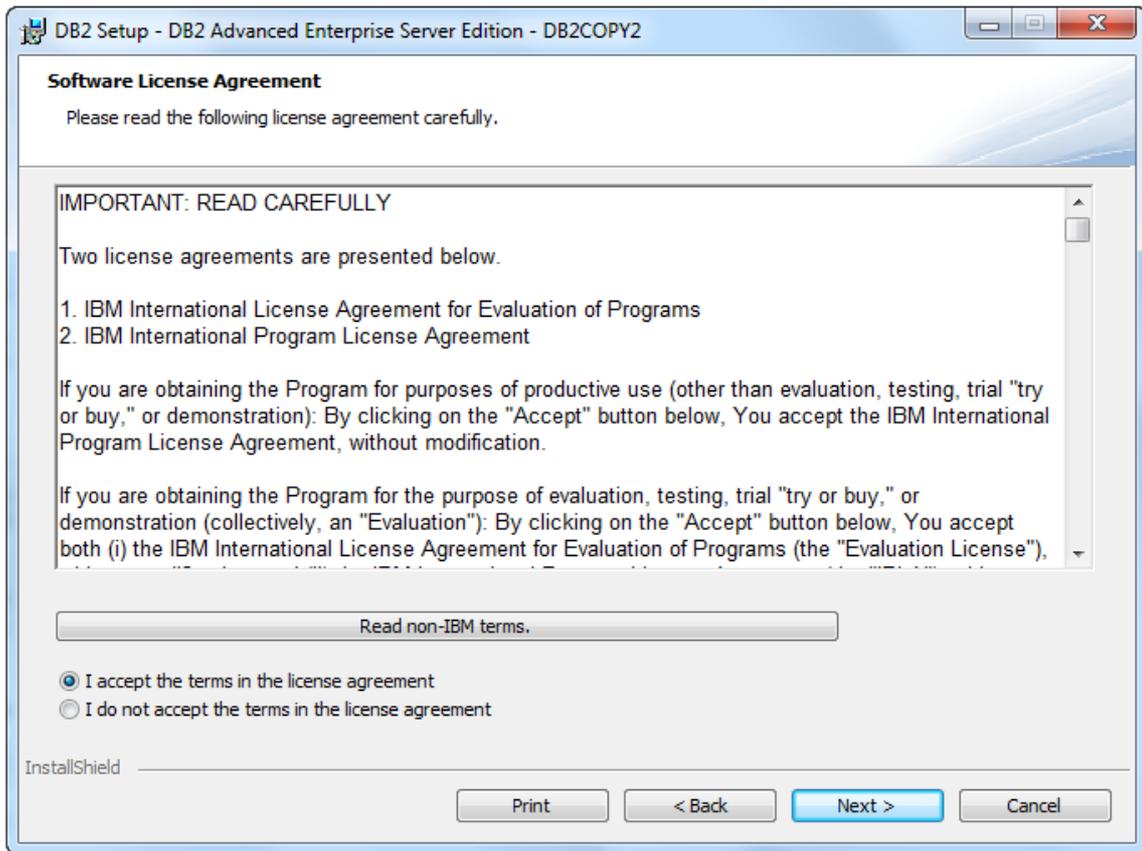


Figure: The Software License Agreement dialog box

5. Continue installing and pop up the **Select the installation type** dialog box.

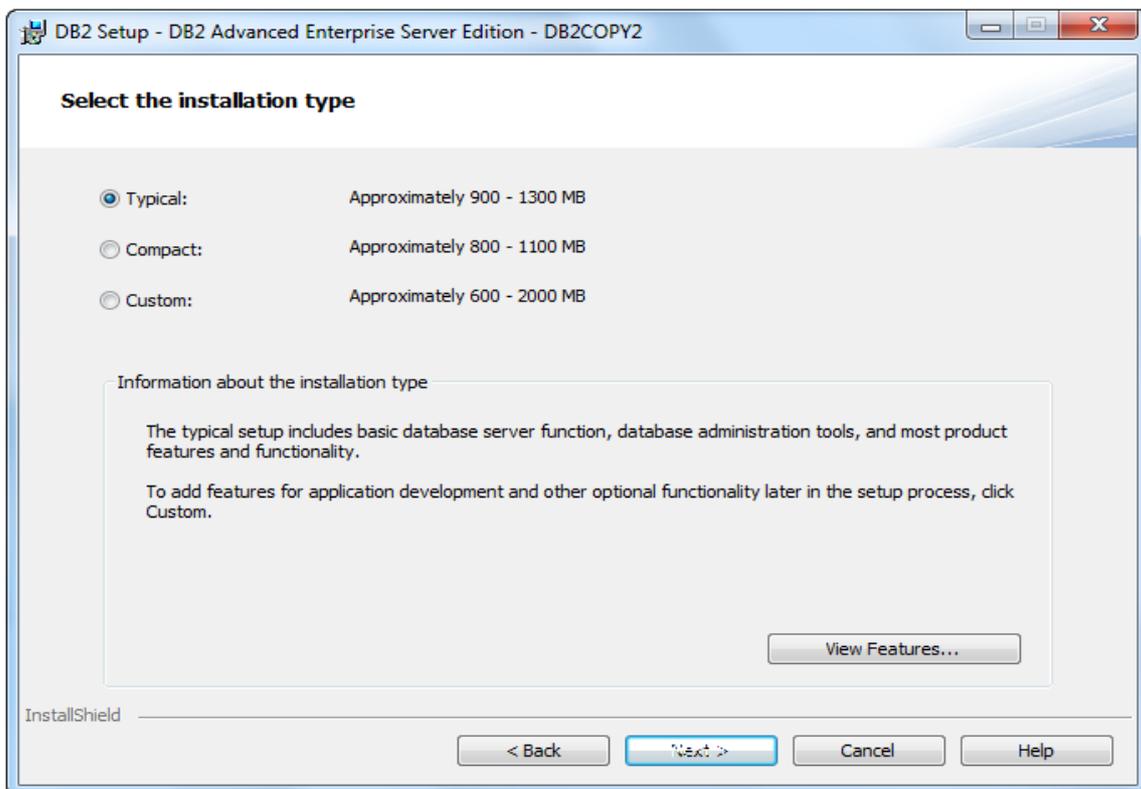


Figure: The Select Installation Type dialog box.

Select the installation as the **Typical Installation**. You can view all the functional units by clicking the **View Features...** button.

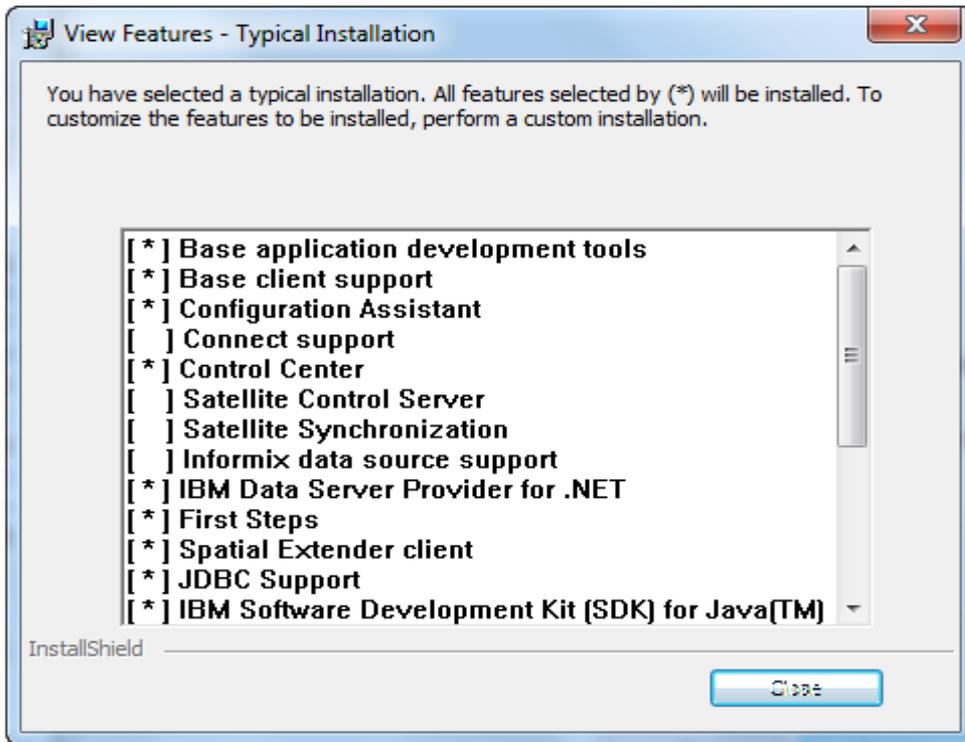


Figure: The View Features dialog box

6. Continue installing and pop up the **Select the installation, response file creation, or both** dialog box. Click the **Next** button.

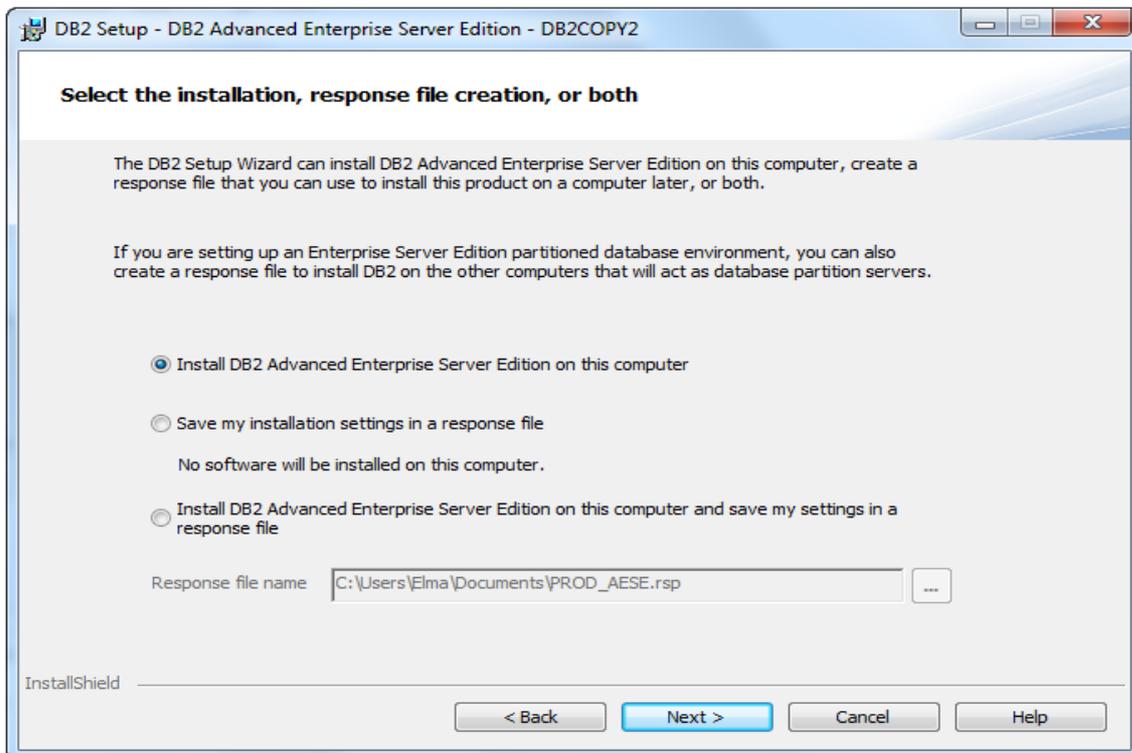


Figure: The Select the installation, response file creation, or both dialog box

The response file is a text file containing the settings and configuration. The DB2 installation can read this file and execute the installation according to the specified value. The installation with response file is also called **Silent Installation**. It provides the access for the parameters of **DB2 Installation Wizard Settings**.

7. Continue installing and pop up the **Select the installation folder** dialog box. If the system install it by default, click the **Next** button directly; If click the **Changes...** button to specify the installation path, click the **Next** button.

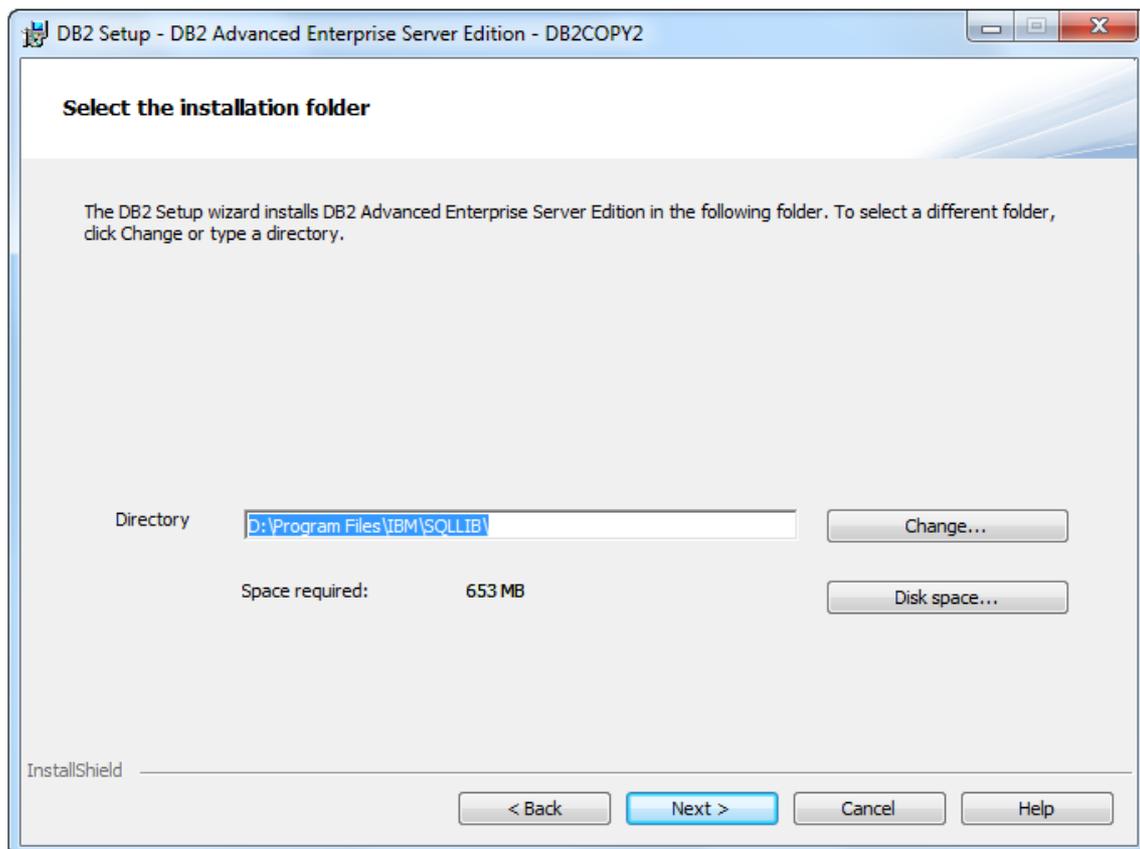


Figure: The Select the installation folder dialog box

If users select the **Custom** mode, pop up the **Select the features to install** dialog box. Users can select the features according to their needs. You also need to specify the installation folder, as shown below.

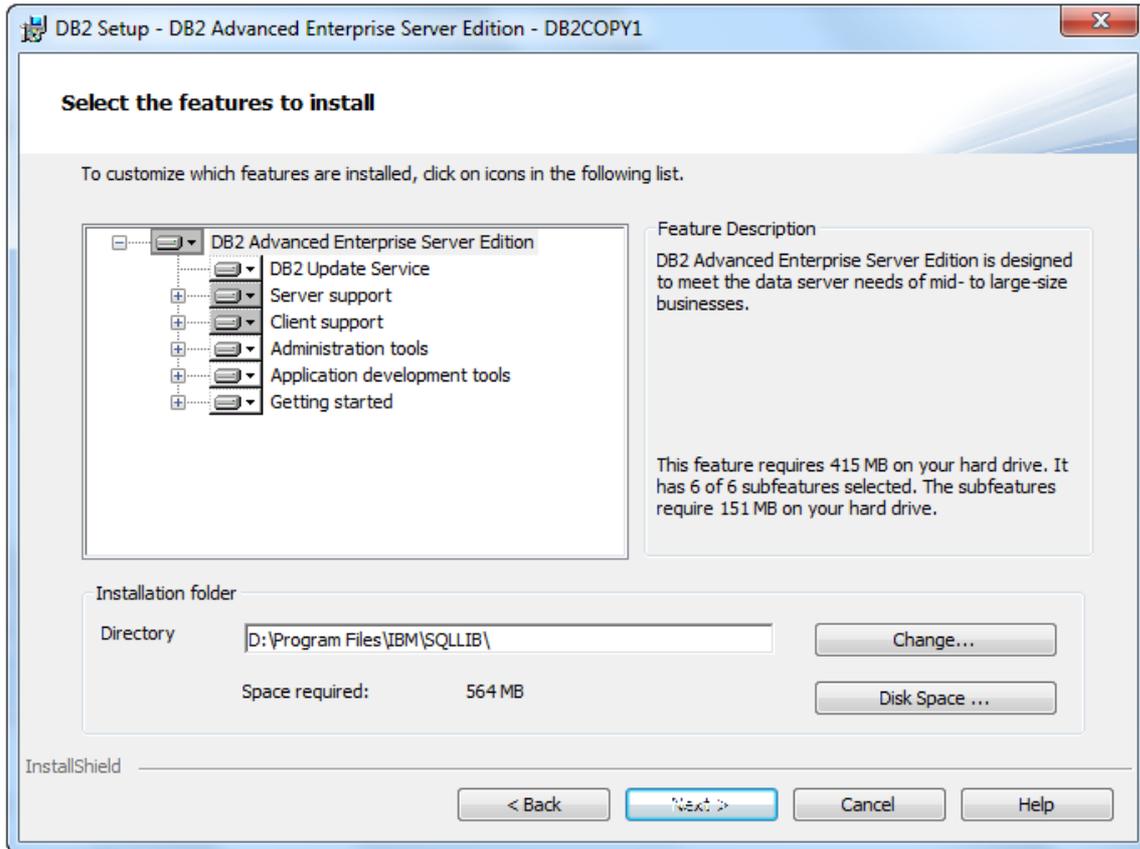


Figure: The Select the features to install dialog box

8. Continue installing, and pop up the **Set user information for the DB2 Administration Server** dialog box. Here you need to set the password for the DB2 administration server and click the **Next** button.

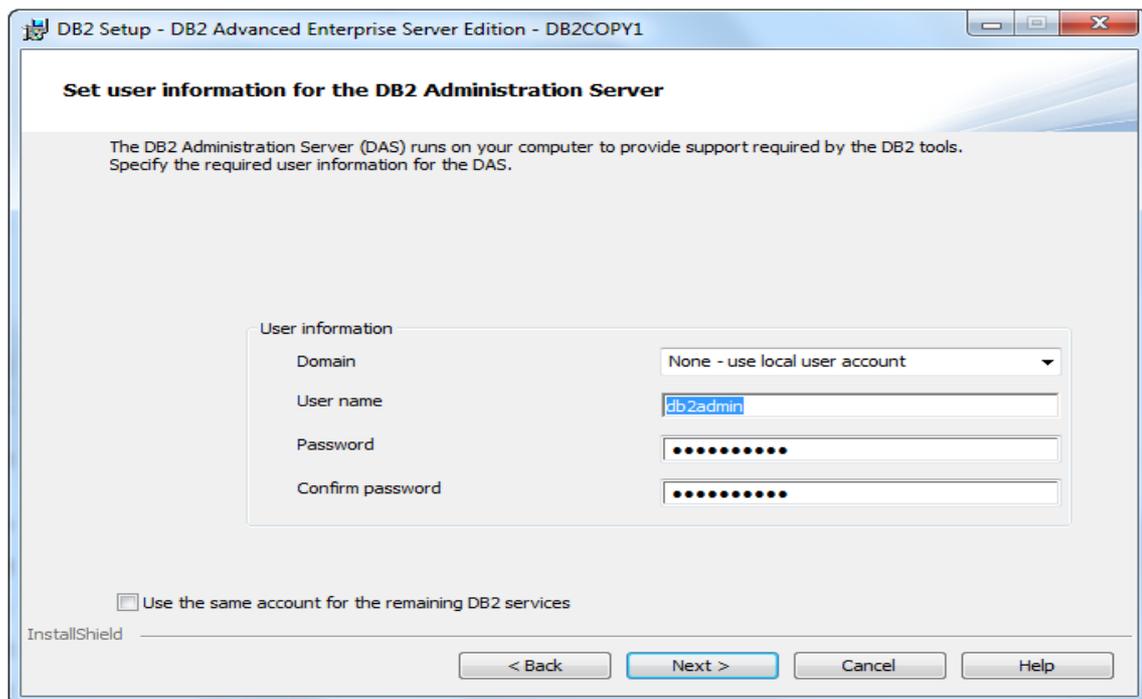


Figure: The DB2 Administration Server dialog box

“DB2 Administration Server” (DAS) is a kind of special DB2 administration service, which is used to support GUI tools and help manage the tasks on the local and remote DB2 server. DAS has a specified user account. When start the DAS server, it uses this user account to make the DAS service log in the computer.

DAS user has the SYSTEM permissions for every DB2 system in your environment, so that it can start and stop other instances when you need to.

9. Continue installing, and pop up the **Configure DB2 instances** dialog box. If you use the default configuration, click the **Next** button directly; If you change the configuration of DB2 instance, click the **Configure...** button.

Instance is also called database administration program. It is the DB2 code to admin the data. It can control the implementations for the data and manage them to their child systems. Each instance has the following features:

- Every instance is a complete environment, including all the database partitions defined by the given parallel database system.
- Every instance has its own database (Other instances can't access), and all its database partitions share the same mother system.
- It has the independent safety and other instances in the same system don't influence it.

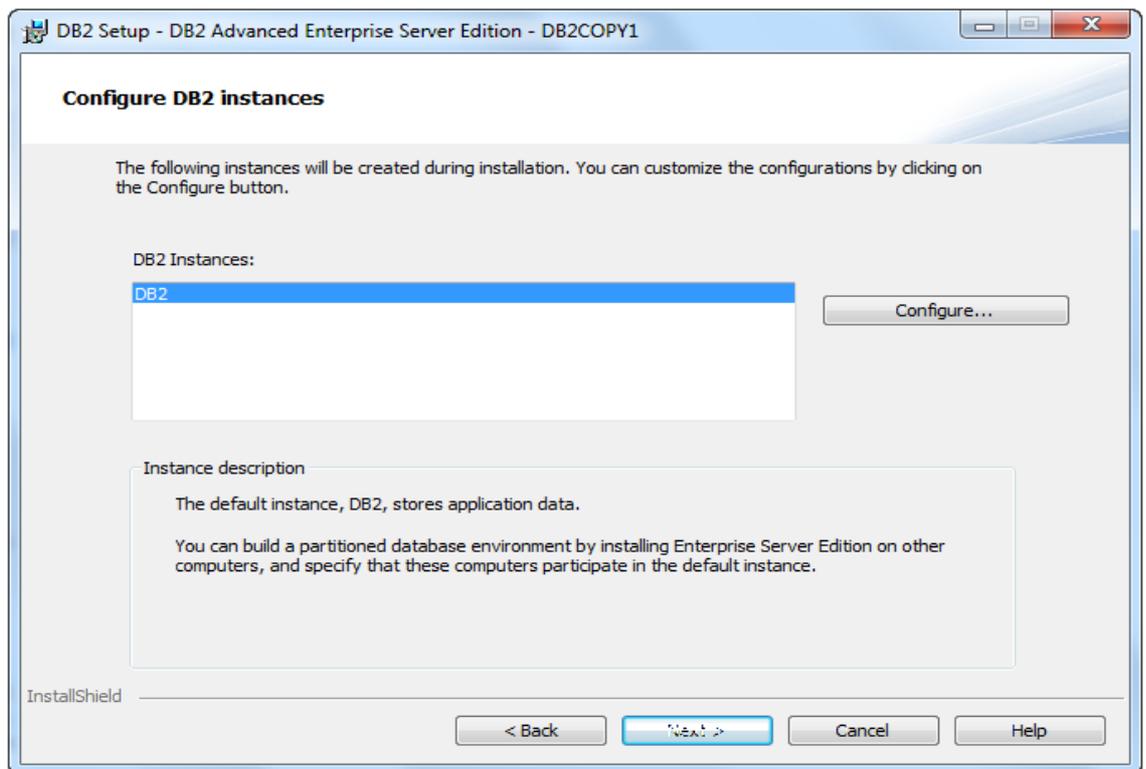


Figure: The Configure DB2 instances dialog box

In the **Configure DB2 instances** dialog box, you can configure the service name and port number of DB2 instance. You also can' configure it after finish installing, as shown below.

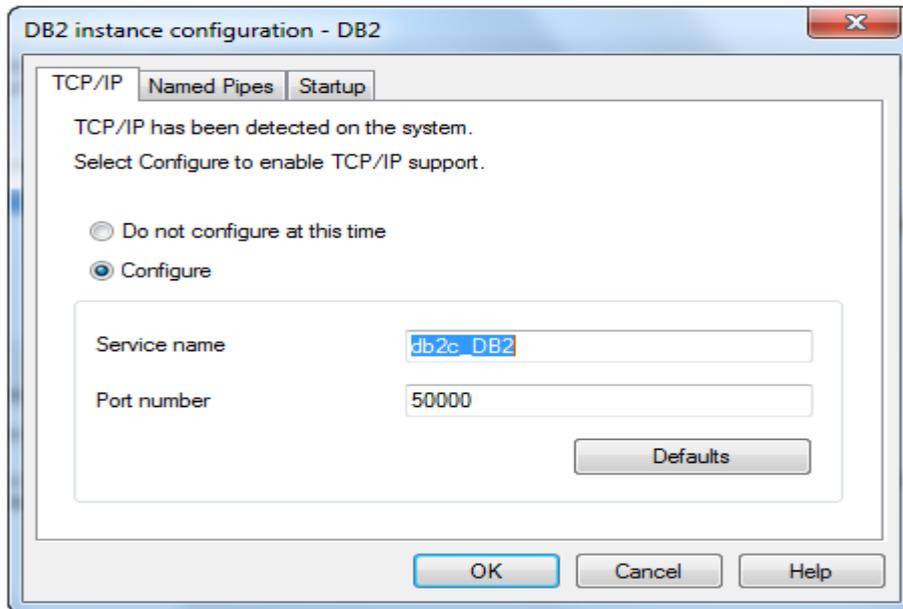


Figure: The "DB2 Instance Configuration" dialog box

- Continue installing, and pop up the **DB2 instance configuration** dialog box. Set the related user information of the default DB2 instances.

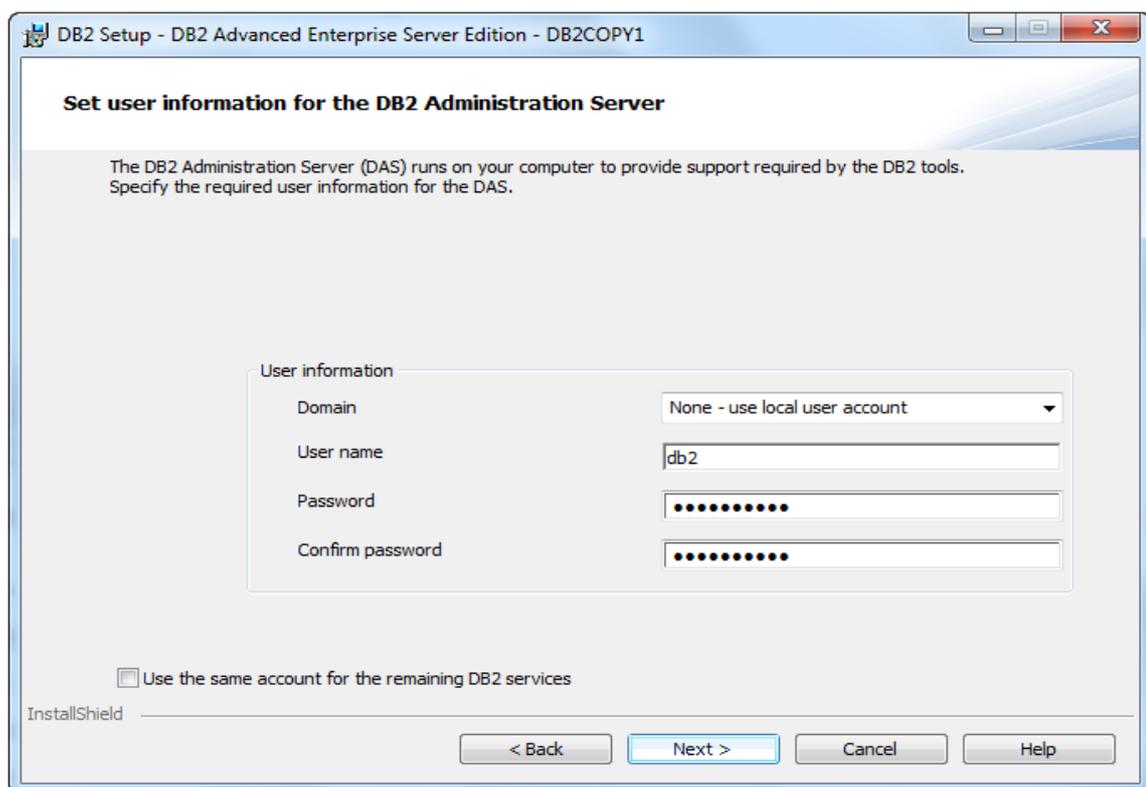


Figure: The DB2 instance configuration dialog box

11. Continue installing and pop up the **Prepare the DB2 tools catalog** dialog box. Click the **Next** button.

Only create the DB2 tools catalog, can you use the task center and dispatcher. The database created by DB2 tools catalog is stored in the DB2 database.

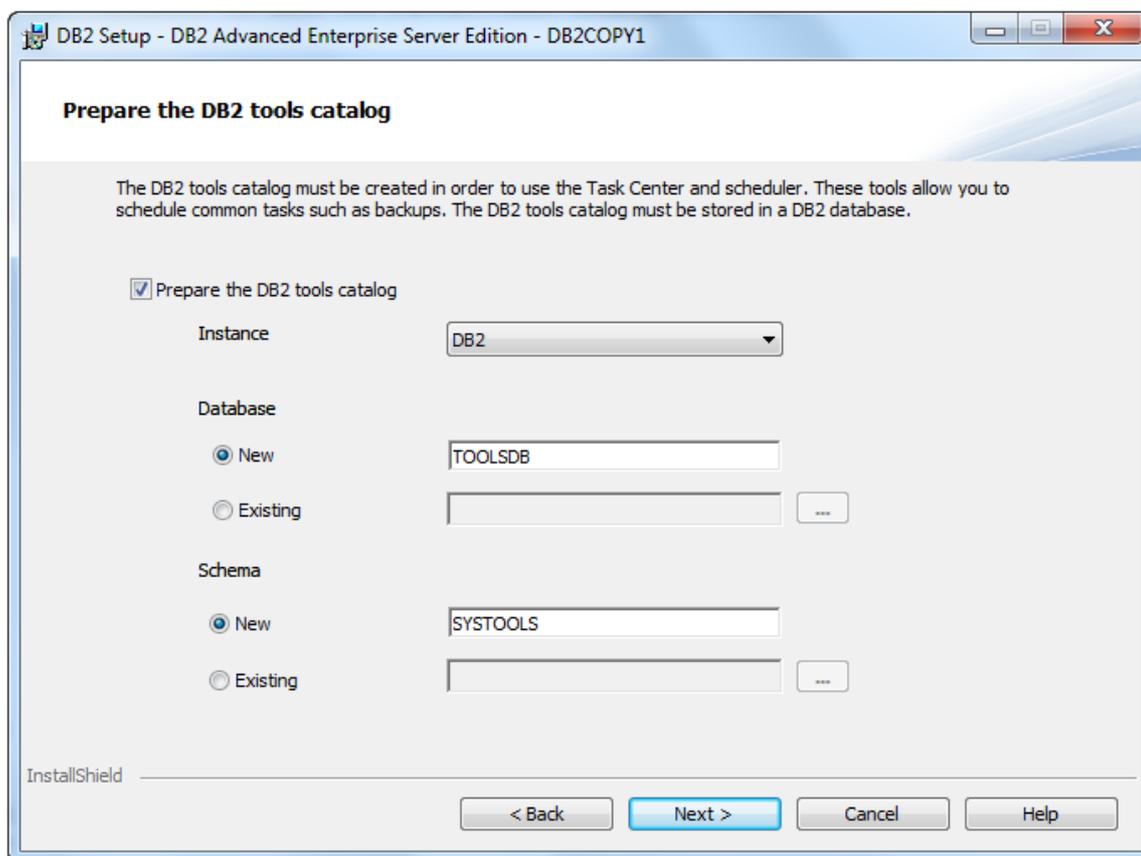


Figure: The Prepare the DB2 tools catalog dialog box

12. Continue installing, and pop up the **Set up notifications** dialog box, which is used to configure SMTP server for the DB2 server. You can send the running status alarm to the SMTP server. If you cancel the check box before **Set up your DB2 server to send notifications**, the running status of DB2 will be recored in the administration log, as shown below. Click the **Next** button.

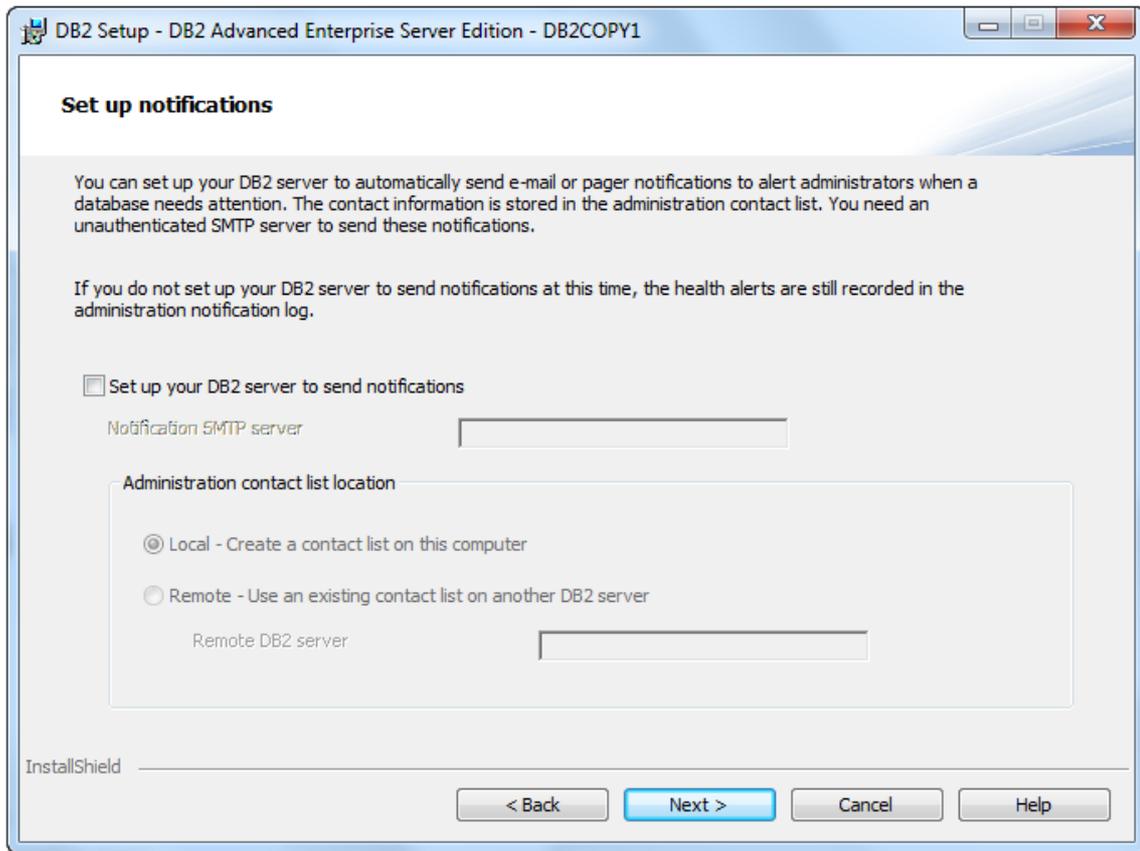


Figure: The Set up notifications dialog box

13. Continue installing and pop up the **Enable operating system security for DB2 objects** dialog box. Click the **Next** button.

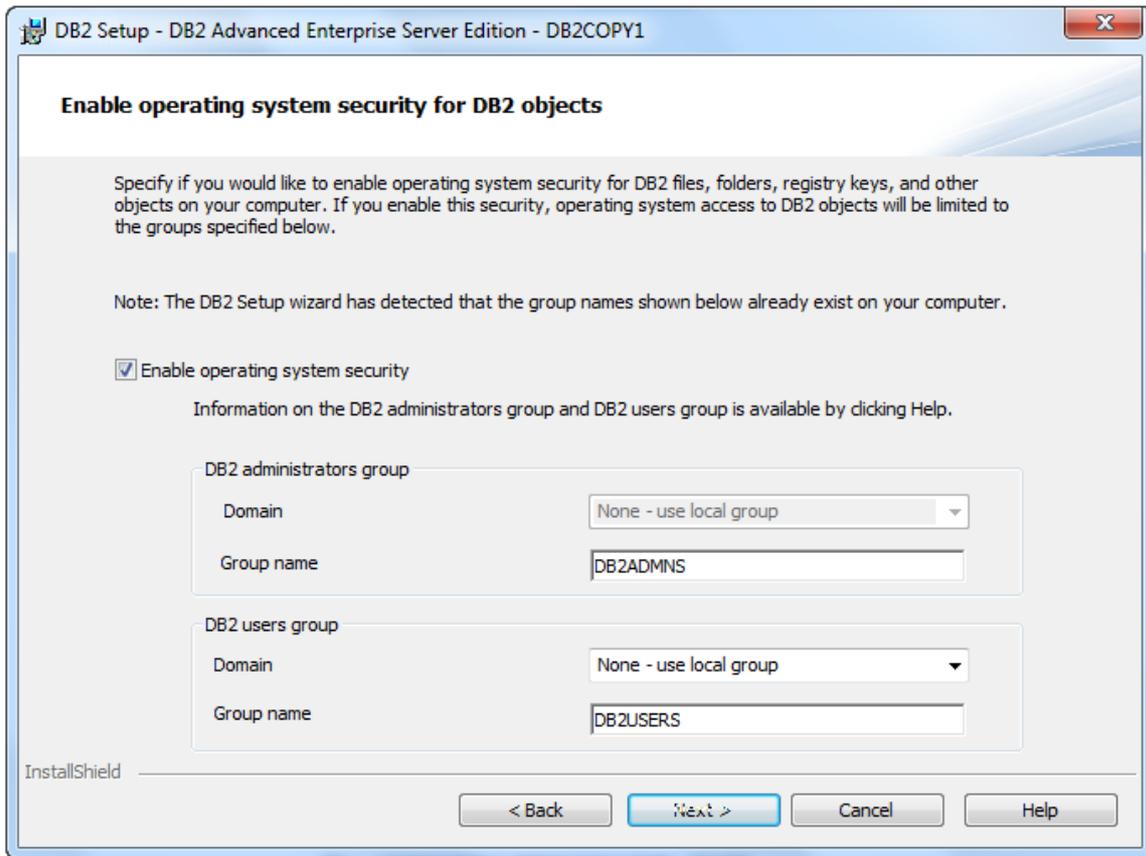


Figure: The Enable operating system security for DB2 objects dialog box

14. Continue installing and pop up the **Start copying files** dialog box. Click the **Finish** button.

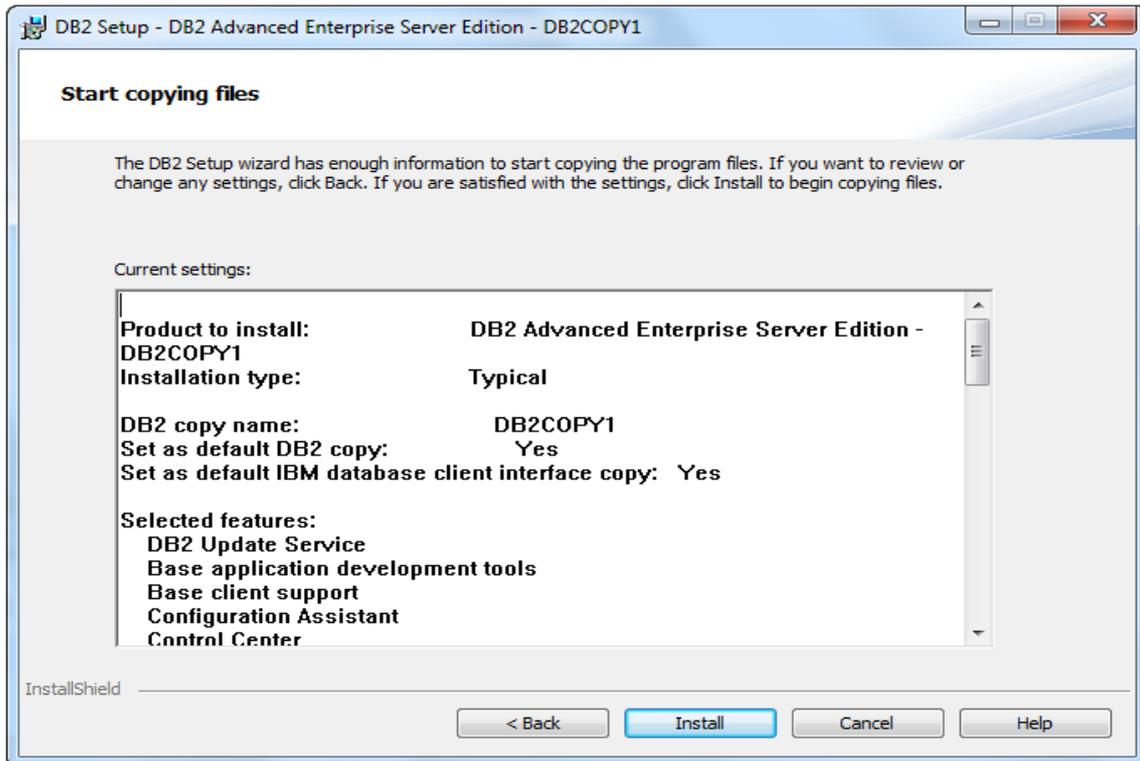


Figure: The Start copying files dialog box.

15. After finish installing, pop up the Setup is complete dialog box and click the Next button to install other products.

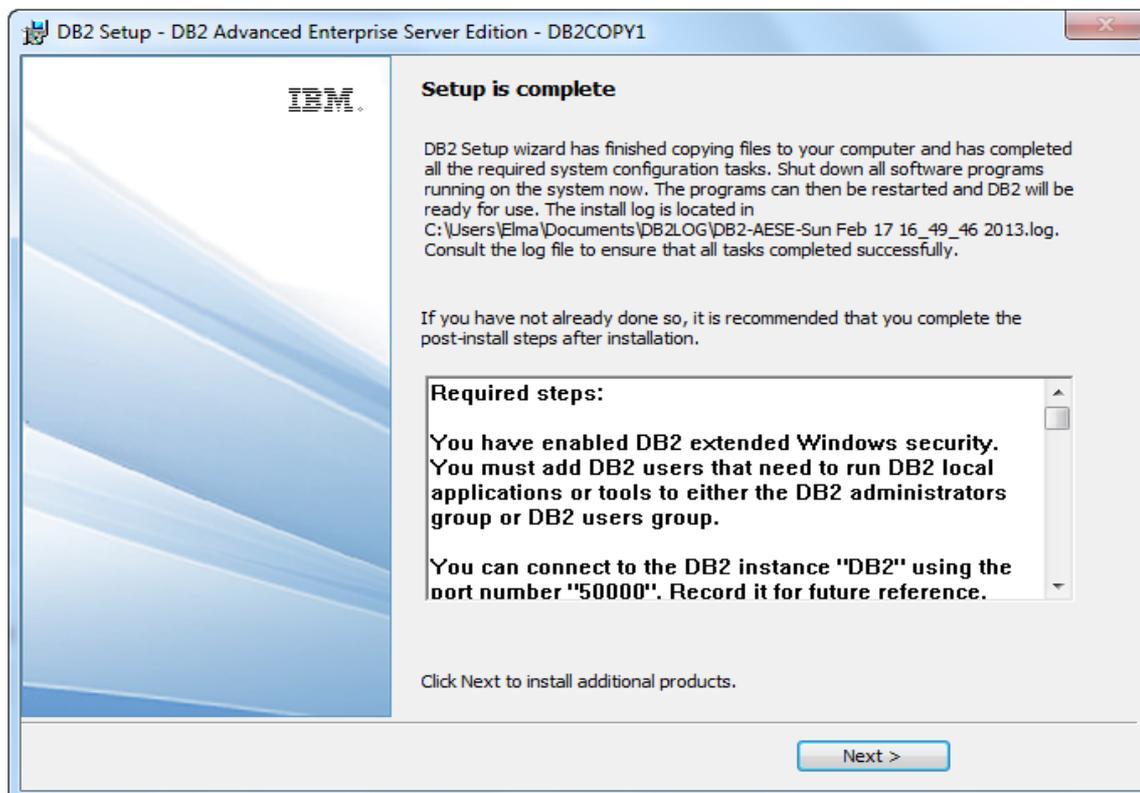


Figure: The Setup is complete dialog box

16. Pop up the **Install additional products** dialog box. If you don't want to install the additional products, click the **Finish** button. If you want to install the additional products, click the **Install** button to install the additional products.

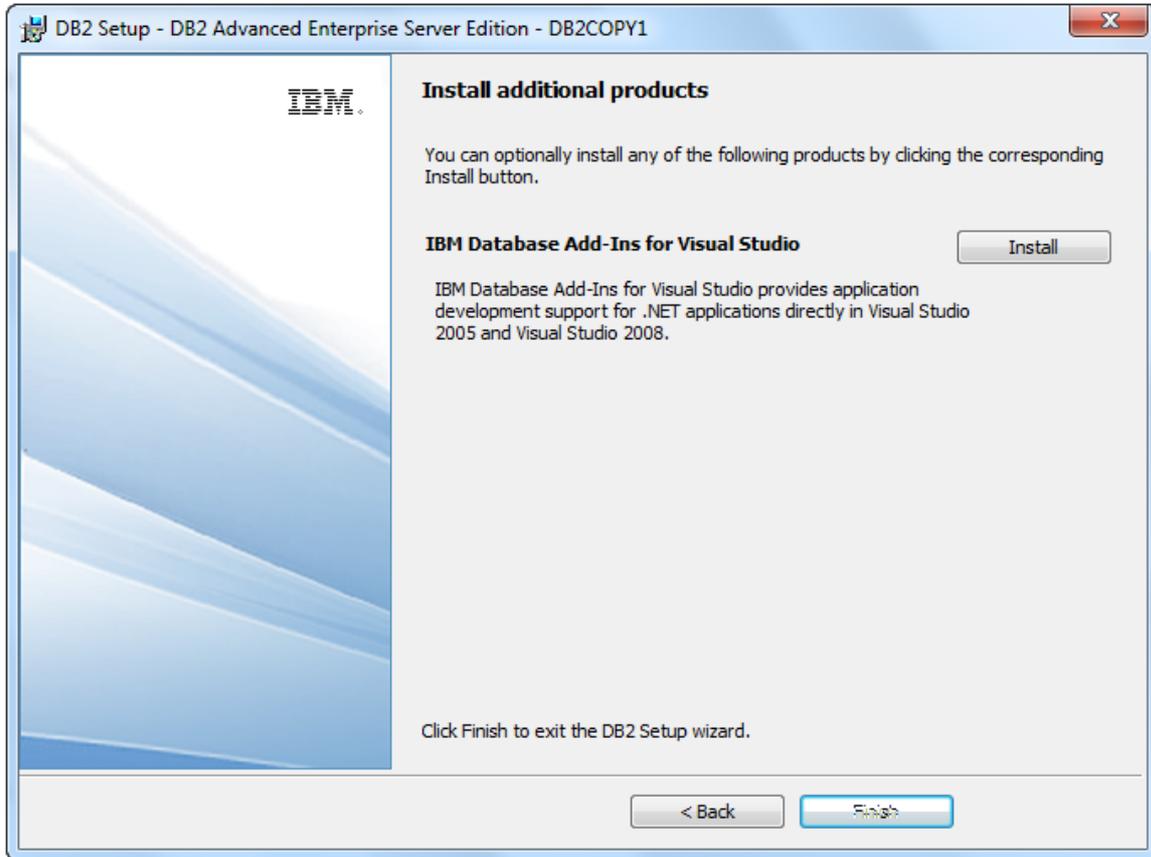


Figure: The Install additional products dialog box

The Catalog of DB2

Catalog is a database connecting process from the client to the server on local or remote. The purpose is to get the catalog information, namely generate the catalog used to assess the database. The system database catalog contains a list and a pointer. You can find the known database through the catalog no matter on local or remote. If there is no catalog info, the application can not connect to the database, so it should catalog before use the DB2.

Catalog includes the following two processes:

- Map the server to the client, namely the catalog node.
- Map the database under the server instances to the client, namely the catalog database.

You can execute the DB2 catalog operation through both the command method and the **Control Center** interface. There are three edit command modes:

- The **Command Window** with non-interactive mode.
- The **Command Line Processor** with interactive mode.
- The **Command Editor** with visualization and interactive mode.

The following introduces the detail operation for the two processes.

Node Cataloging

Through the catalog node, the client machine can recognize the server machine, building the mapping from server to the client, which includes how to catalog and anti-catalog the nodes.

In order to make the client distinguish the server, it needs to catalog the node. This will map the system on server and the instances in system to the client; If you want to cancel the mapping from server to client, it needs to anti-catalog node.

Node Cataloging

Node cataloging can map the server systems and instances on system to the client. You can catalog the node through command line or interface operation.

Basic Steps

Method One: Command Method

- Mode One: The **Command Window** with non-interactive mode

Input **db2cmd** on **Run** to enter the command window of DB2; You can also enter the command window through **Program** -> **IBM DB2** -> **DB2COPY1**-> **Command Line Tools**.

Input the node catalog command in the command window:

```
db2 catalog tcpip node node_name remote server_ip server server_port
```

- **node_name**: Input the node name to catalog, namely the instance name of server. The instance name must be unique in one machine. You can input the letter only or the combination of letters and figures. The letter is case insensitive. Note: The instance name can't be DB2 and it doesn't support the special character.
- **server_ip**: Input the IP address of server to catalog.
- **server_port**: Input the port number of server to catalog and the default is 50000.

If catalog the node successfully, the following contents are shown in command window.

```

Administrator: DB2 CLP - DB2COPY1
D:\Program Files\IBM\SQLLIB\BIN>db2 catalog tcpip node DBTest remote 172.16.119.
49 server 50000
DB20000I  The CATALOG TCP/IP NODE command completed successfully.
DB21056W  Directory changes may not be effective until the directory cache is
refreshed.
D:\Program Files\IBM\SQLLIB\BIN>
    
```

- Mode Two: The **Command Line Processor** with interactive mode

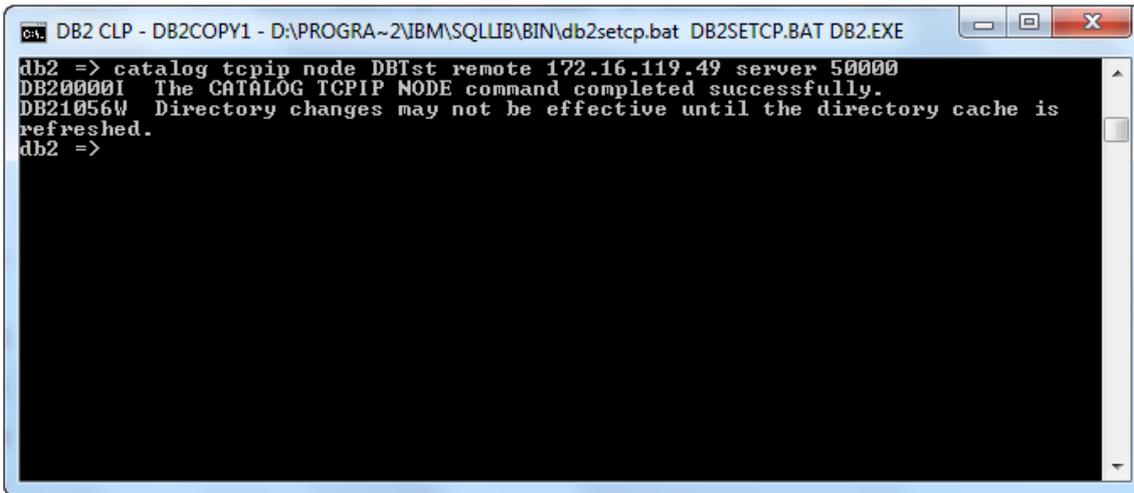
The same with mode one, enter the command line processor through **Program** → **IBM DB2** → **DB2COPY1** → **Command Line Tools**. Input the node catalog command in this processor:

```
catalog tcpip node node_name remote server_ip server server_port
```

- **node_name**: Input the node name to catalog, namely the instance name of server. The instance name must be unique in one machine. You can input the letter only or the combination of letters and figures. The letter is case insensitive. Note: The instance name can't be DB2 and it doesn't support the special character.
- **server_ip**: Input the IP address of server to catalog.
- **server_port**: Input the port number of server to catalog and the default is 50000.

Compared to the **Command Window**, the commands in "Command Line Processor" only lack db2 key word.

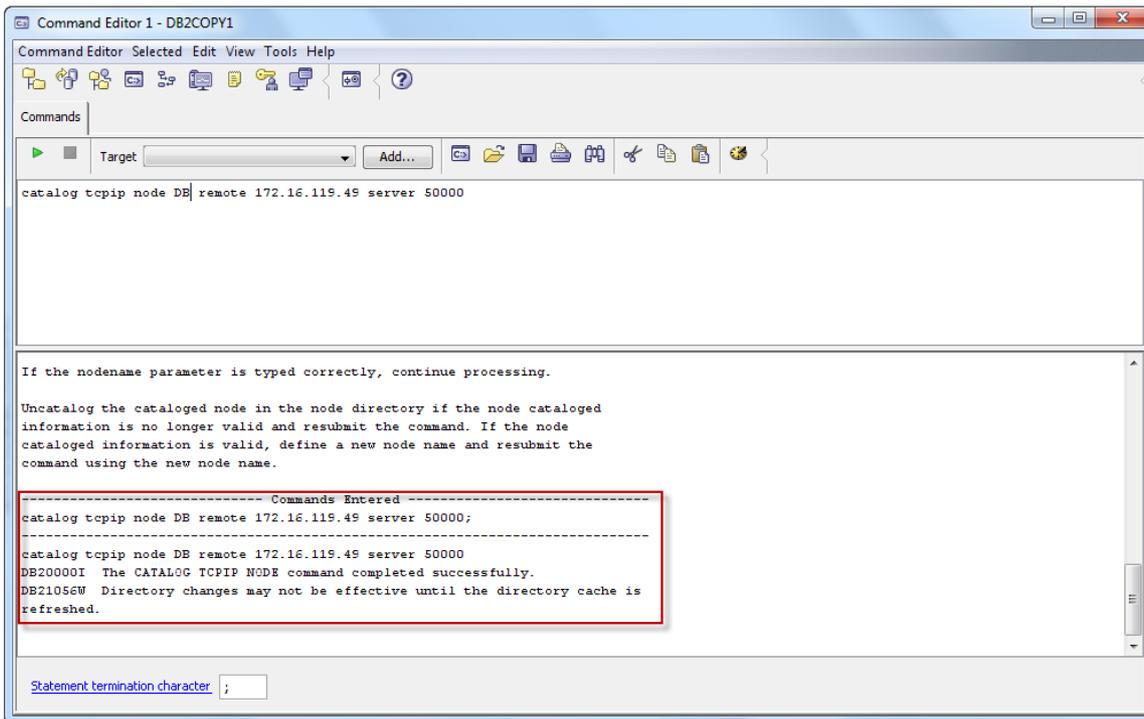
If catalog the node successfully, the following contents are shown in command line processor.



- Mode Three: The **Command Editor** with visualization and interactive mode

The same with mode one, enter the command line processor through **Program -> IBM DB2 -> DB2COPY1 -> Command Line Tools**. Input the database catalog command in this processor; You can also open this window through **Control Center** and Open with : **Program -> IBM DB2 -> DB2COPY1 -> General Administration Tools -> Control Center**.

Input the node catalog command in the command editor window and the command format is the same as mode two. Then click the  button to execute the command; Or you can select the **selected item -> execute**. The command result is shown in the window below. If something goes wrong, it will give the error info. If the result catalog successfully, the following contents are shown in the command editor.

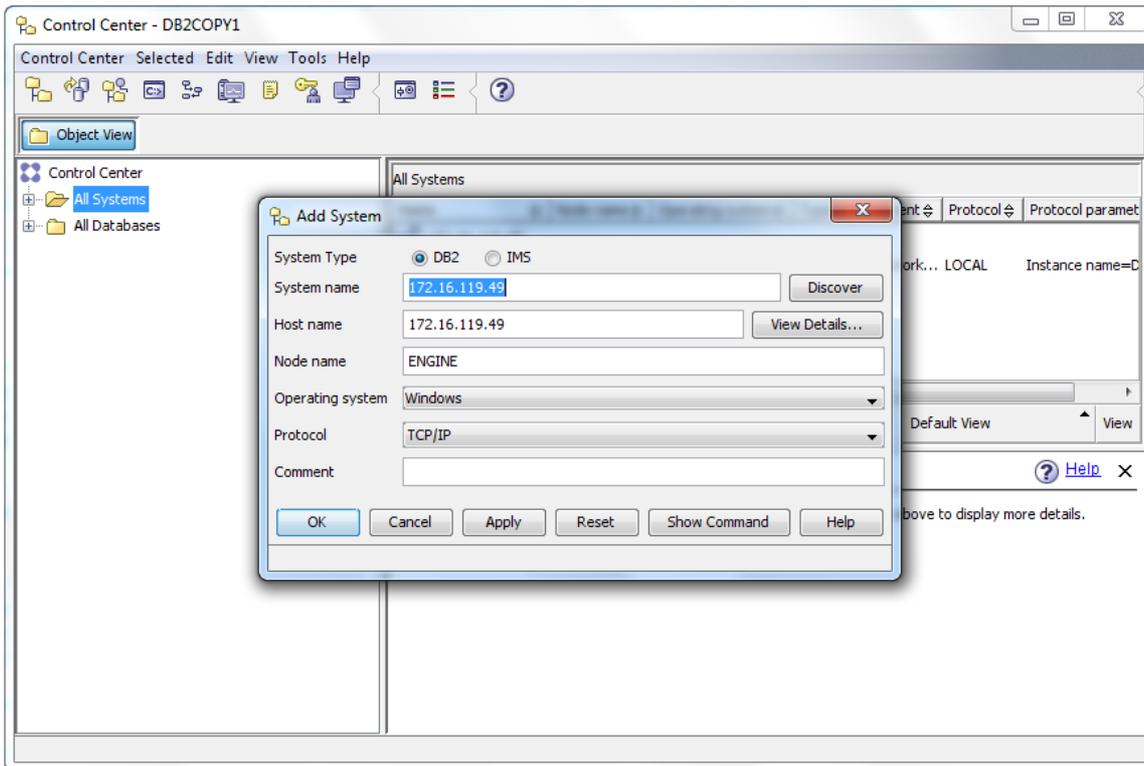


Method Two: Interface Execution Method

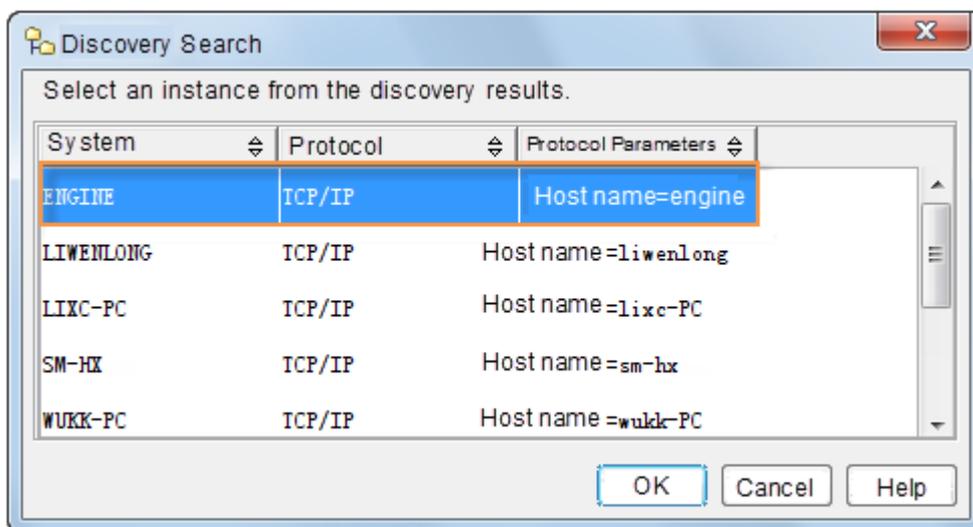
We can also catalog the DB2 node in **Control Center** through human computer interaction of interface method. It has two processes: the server node cataloging and the instances of server cataloging. The **Control Center** open with: **Program** -> **IBM DB2** -> **DB2COPY1** -> **General Administration Tools** -> **Control Center**.

1. Server node catalog.

Right click **All System** node in the left directory tree of the control center, and select **Add**. Pop up the **Add System** dialog box and set the system type, system name, host name, node name, operating system, connection protocol and notes of the server, as shown below. Click **OK** to finish.

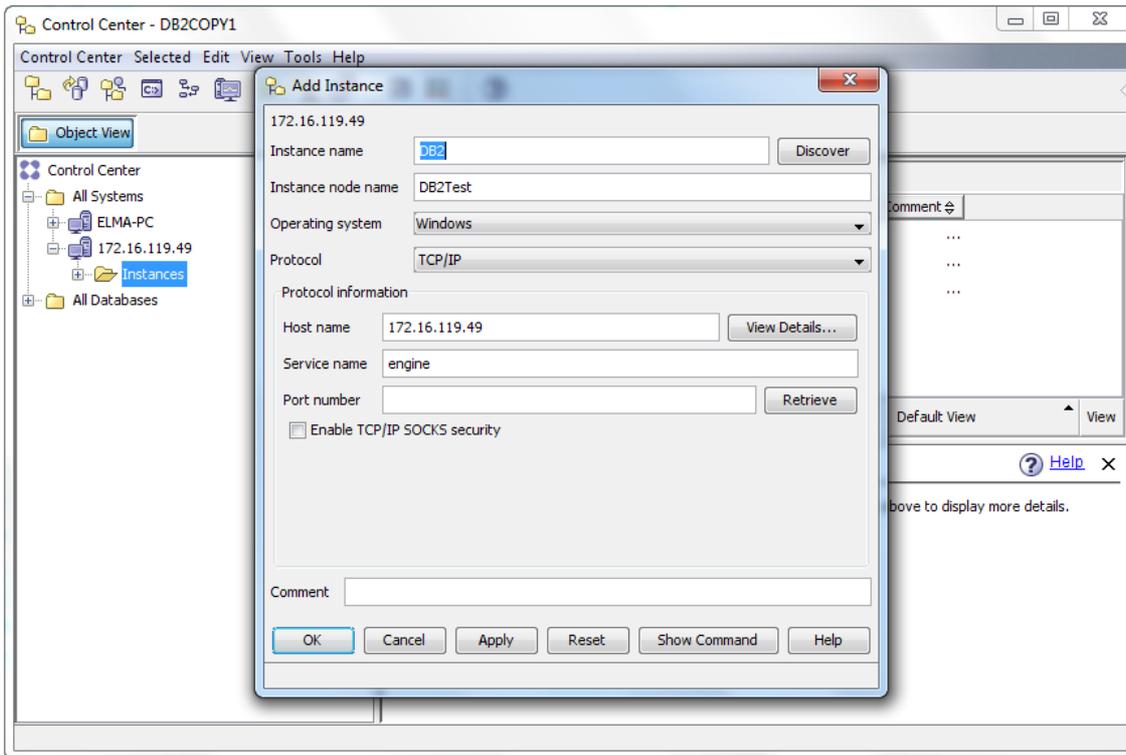


Besides, when set the system name and host name for the server, you can search the system by clicking the **Discover** button on the right of system name. Select the server system to connect, as shown below. At this time, other contents will be generated automatically.

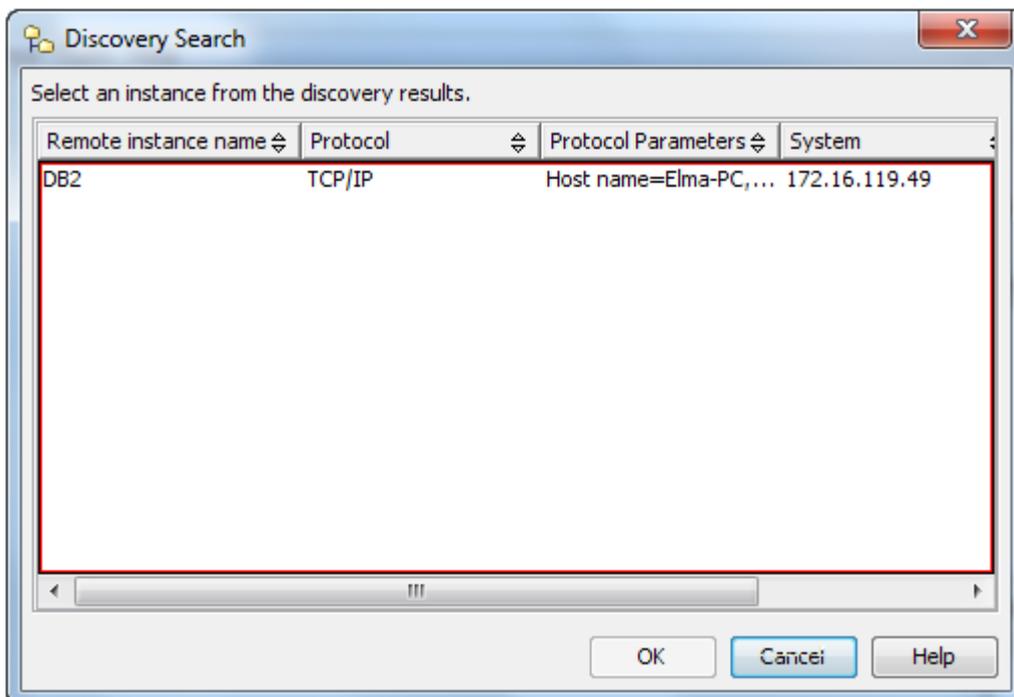


2. The catalog of instances in server.

Right click the **Instance** node under the server and select the **Add**. Pop up the **Add Instance** dialog box and set the instance name, instance node name, operating system, connection protocol, host name and port number that the target database belongs to, as shown below. Click "OK" to finish.

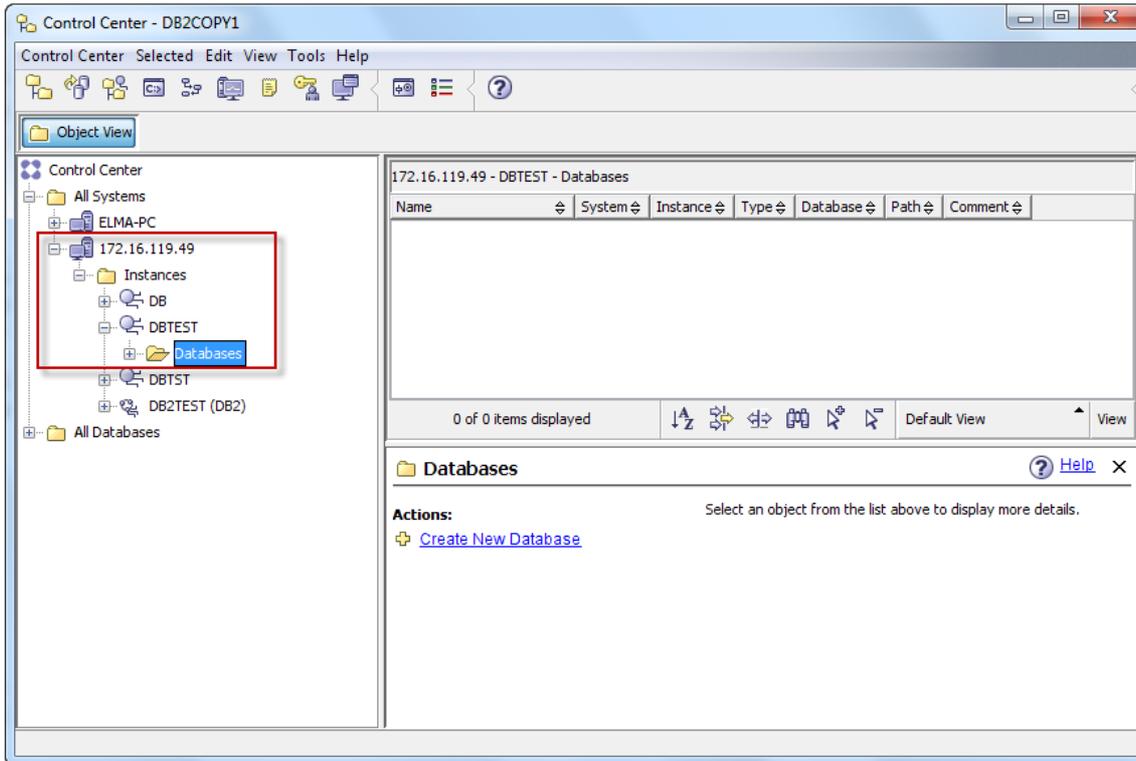


When set the instance, you can search the system by clicking the **Discover** button, and select the instance name to connect, as shown below.



After finish the node catalog between database and the client through the method above, you can view the catalog result in the **Control Center**. Right click the **Control Center** node of the directory tree, and select the **Refresh** item. The

result is shown as below. You can see that the server has already connected with the client.



Node Anti-cataloging

If cancel the mapping the server to the client, it needs to node anti-cataloging. You can finish the node anti-cataloging through the methods of command line or interface operation.

Basic Steps

Command Method

- Mode one: The **Command Window** of non-interactive mode

In the **Command Window**, the command of node anti-cataloging is as below:

```
db2 uncatolog node node_name
```

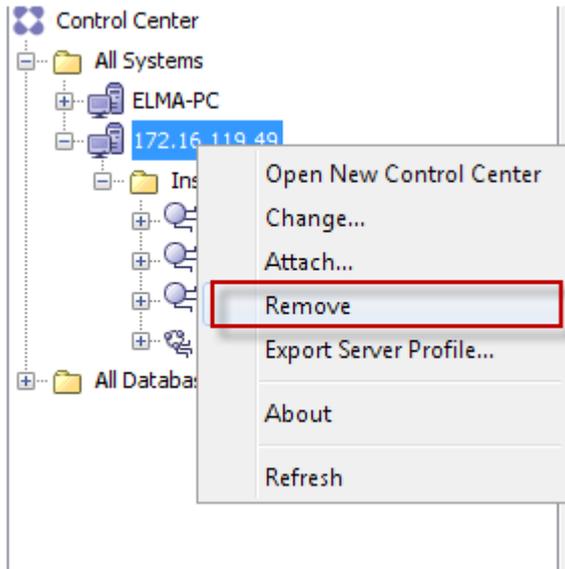
- **node_name**: The server name that needs to node anti-cataloging.
- Mode Two: The **Command Line Processor** with interactive mode

The commands in **Command Line Processor** and **Command Editor** are shown as below:

```
uncatalog node node_name
```

Interface Execution Method

In the directory tree of **Control Center**, right click the database that needs to database anti-cataloging and select the **Remove**.



Database Cataloging

After finish cataloging node, it needs to catalog the database, which is used to map the database under the server instance to the client in the form of alias. Include two parts: database cataloging and database anti-cataloging.

In order to access the database on server, after finish node cataloging, you should catalog the database. Cataloging database is to map the database under the server instance to the client in the form of alias; Canceling the mapping needs to anti-catalog the database.

Database Cataloging

After finish the node cataloging, you can catalog the database. Map the database underground the server instances to the client in the way of alias.

Basic Steps

Method One: Command Method

The same with the method of node catalog, you can catalog the database through following three command mode.

- Mode One: The **Command Window** with non-interactive mode

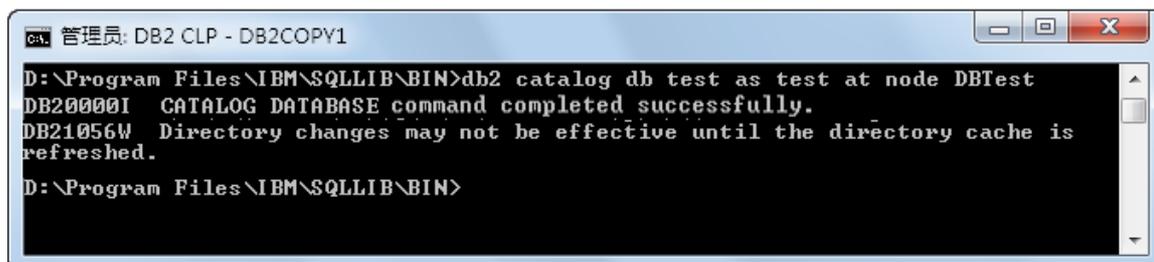
Input **db2cmd** on **Run** to enter the command window of DB2; You can also enter the command window through **Program** -> **IBM DB2** -> **DB2COPY1**-> **Command Line Tools**.

Input the database catalog command in the command window:

```
db2 catalog db db_name as db_alias at node node_name
```

- **db_name**: Input the database name to catalog. You can input the letters only or the combination of letters and figures. The letters are case-insensitive and doesn't support the special character.
- **db_alias**: Input the database catalog to the alias used by the client.
- **node_name**: **Input the node name that the sever to catalog belongs to.**

If catalog the node successfully, the following contents are shown in command window.



```
管理员: DB2 CLP - DB2COPY1
D:\Program Files\IBM\SQLLIB\BIN>db2 catalog db test as test at node DBTest
DB20000I  CATALOG DATABASE command completed successfully.
DB21056W  Directory changes may not be effective until the directory cache is
refreshed.
D:\Program Files\IBM\SQLLIB\BIN>
```

- Mode Two: The **Command Line Processor** with interactive mode

The same with mode one, enter the command line processor through **Program** -> **IBM DB2** -> **DB2COPY1** -> **Command Line Tools**. Input the database catalog command in this processor:

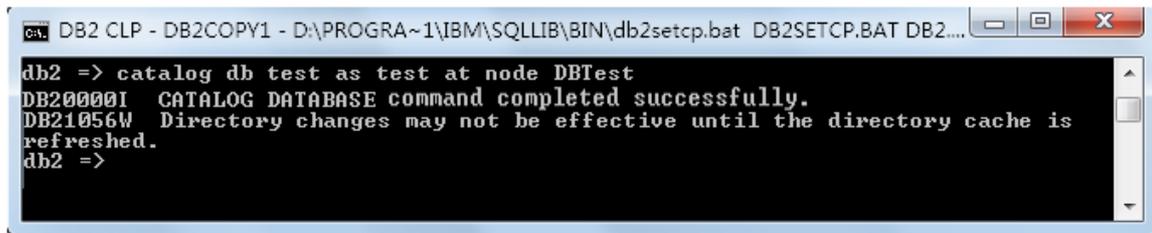
```
catalog db db_name as db_alias at node node_name
```

- **db_name**: Input the database name to catalog. You can input the letters only or the combination of letters and figures. The letters are case-insensitive and doesn't support the special character.

- **db_alias**: Input the database catalog to the alias used by the client.
- **node_name**: Input the node name that the sever to catalog belongs to.

Compared to the **Command Window**, the commands in "Command Line Processor" only lack db2 key word.

If catalog the database successfully, the following contents are shown in command line processor.



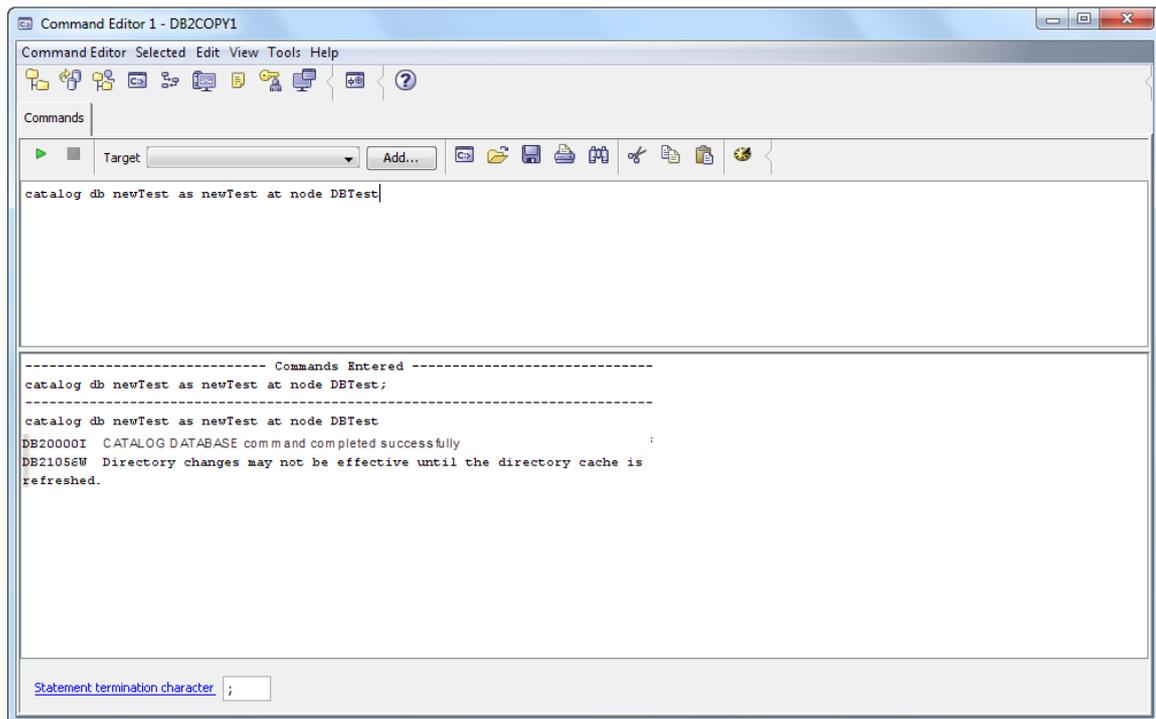
```

c:\. DB2 CLP - DB2COPY1 - D:\PROGRA~1\IBM\SQLLIB\BIN\db2setcp.bat DB2SETCP.BAT DB2...
db2 => catalog db test as test at node DBTest
DB20000I  CATALOG DATABASE command completed successfully.
DB21056W  Directory changes may not be effective until the directory cache is
refreshed.
db2 =>
    
```

- Mode Three: The **Command Editor** with visualization and interactive mode

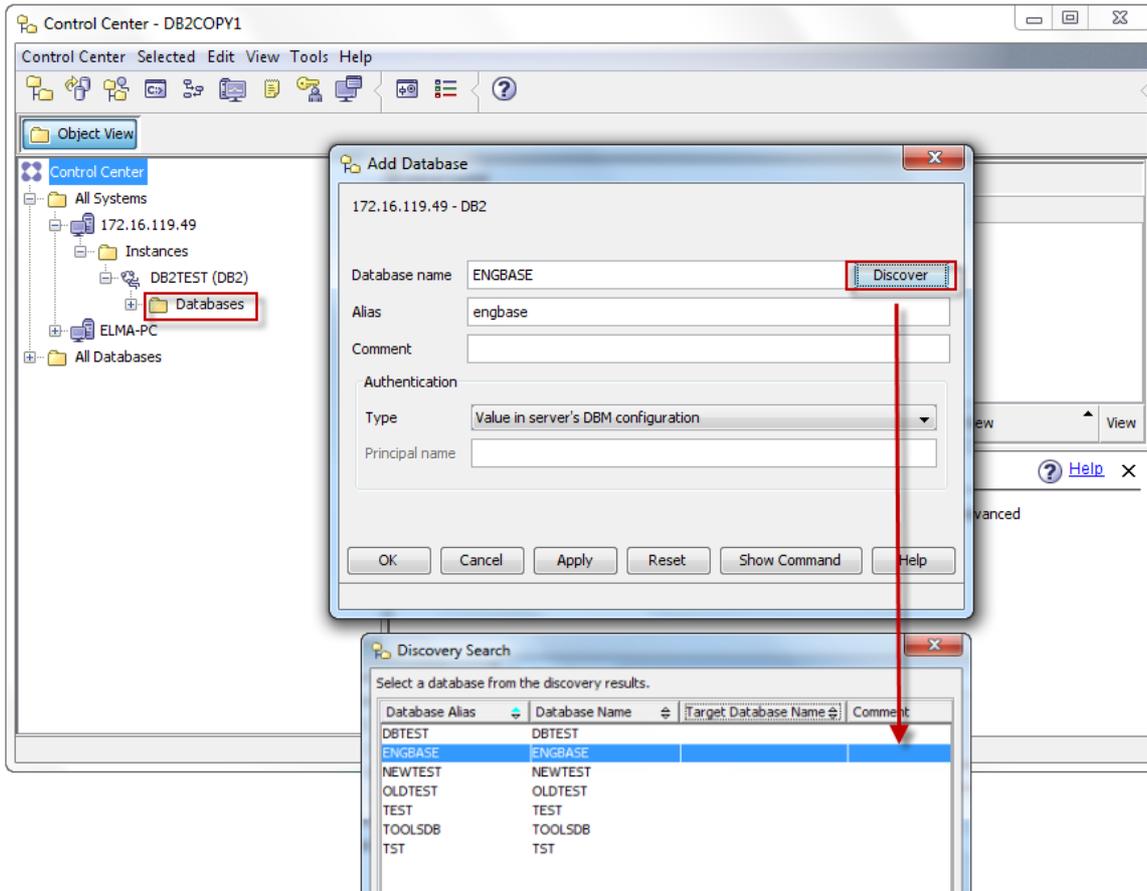
The same with mode one, enter the command line processor through **Program** -> **IBM DB2** -> **DB2COPY1** -> **Command Line Tools**. Input the database catalog command in this processor; You can also open this window through **Control Center** and Open with: **Program** -> **IBM DB2** -> **DB2COPY1** -> **General Administration Tools** -> **Control Center**.

Input the node catalog command in the command editor window and the command format is the same as mode two. Then click the  button to execute the command; Or you can select the **selected item** -> **execute**. The command result is shown in the window below. If something goes wrong, it will give the error info. If the result catalog successfully, the following contents are shown in the command editor.

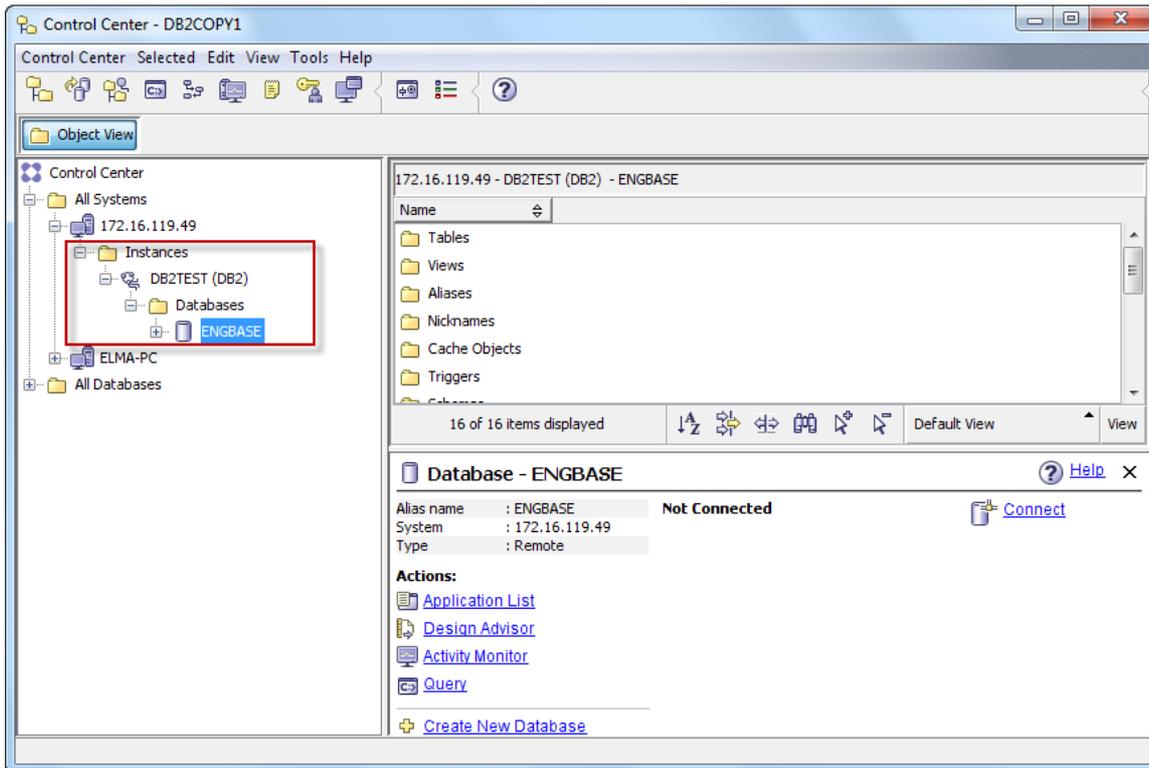


Interface Execution Method

Right click the database under the server instances, and select the **Add**. Set the database name, alias etc. in the pop-up **Add Database** dialog box. The database name can be searched through the **Discover** button, as shown below. Click **OK** to finish the mapping from database to the client.



After establish the database catalog between database under the server instances and the client through the method above, you can view the catalog result in the **Control Center**. Right click the **Control Center** node of the directory tree, and select the **Refresh** item. The result is shown as below. You can see that the server has already connected with the client.



Database Anti-cataloging

If cancel the mapping from database to the client, it needs to database anti-cataloging. You can execute the commands of database anti-cataloging through command line or interface operation to finish anti-cataloging the database.

Basic Steps

Command Method

- Mode One: The **Command Window** with non-interactive mode

In the "Command Window", the commands of database anti-cataloging are shown below:

```
db2 uncatalog db db_alias
```

- **db_alias: The database alias that needs to be node anti-cataloging.**
- Mode Two: The "Command Line Processor" with interactive mode

The commands in **Command Line Processor** and **Command Editor** are shown as below:

uncatalog db db_alias

Interface Execution Method

In the directory tree of **Control Center**, right click the database that needs to database anti-cataloging and select the **Remove**.

Connect Database

After finish the node cataloging and database cataloging, connect the databases on server and the client.

Command Method

- The commands in **command window** are shown as follows:

```
db2 connect to db_alias user user_name using user_password
```

- **db_alias**: Input the database catalog to the alias used by the client.
 - **user_name**: Input the user name of server to catalog.
 - **user_password**: Input the password of server to catalog.
- The commands in **Command Line Processor** and **Command Editor** are shown as below:

```
connect to db_alias user user_name using user_password
```

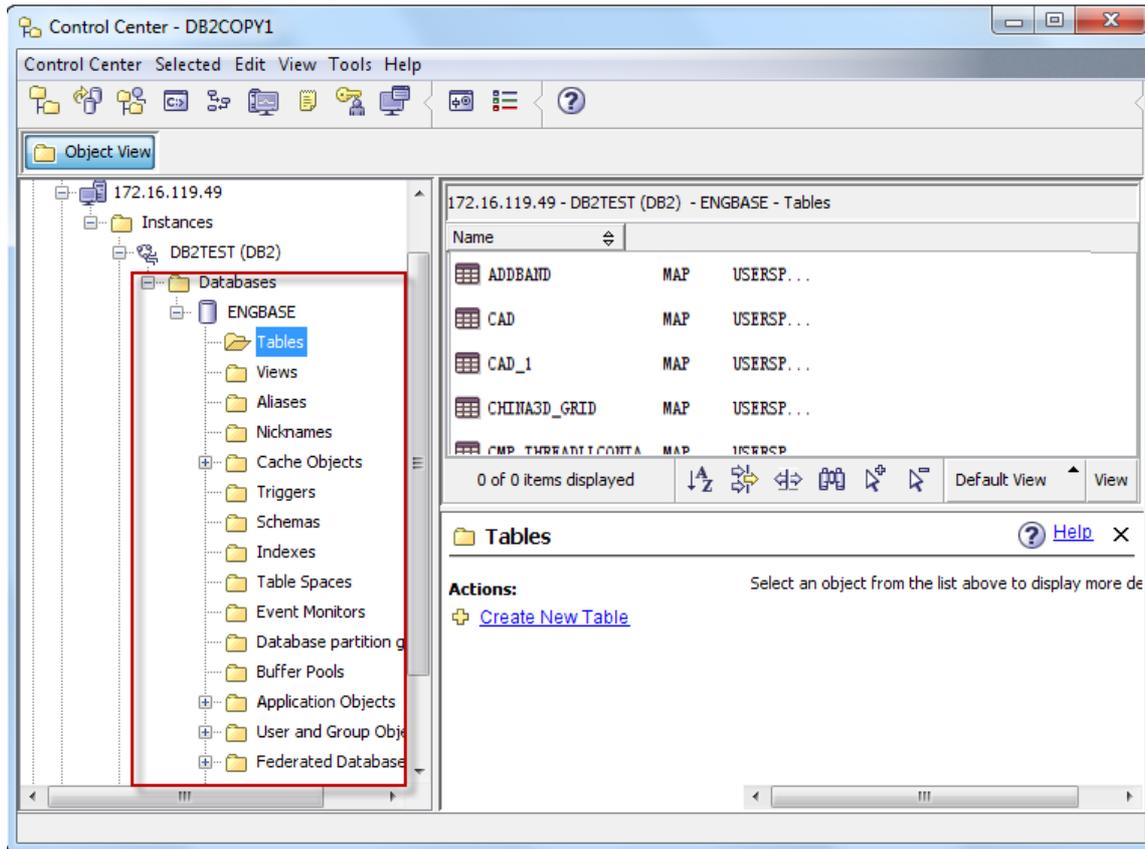
If connected the database successfully, the following contents are shown in command window.

```
C:\Program Files\IBM\SQLLIB\BIN>db2 connect to engbase user map using map
Database connection information
Database Server      =DB2/NT 9.7.4
SQL Identifier       =MAP
Local Database Alias =ENGBASE
```

Interface Execution Method

Right click the database to be connected in the directory tree in **Control Center**. Select **Connect** and pop up the **Connect** dialog box. Input the server name and password, and click **OK** to finish.

You can view the connecting status of mapping server in the Control Center, as shown below:



Import and Export DB2 Data

In the DB2 database, we can import and export the data through the commands. The following introduces the two process in detail.

Export data from the database

1. Sign in the operating system as the DB2 database user.
2. Create a new empty folder, which is used to store the data exported from the server database.
3. Execute the **db2cmd** command in the **Run** to enter the command window. And use the **cd** command to enter the folder which is stores the data (namely the new folder).
4. Execute the following command and export the statement:

```
db2look -d dbname -e -c -o *.sql -i username -w password
```

- **dbname**: The name of server database.
 - ***.wql**: The sql file of exported statements for building table.
 - **username**: The user name of server database.
 - **password**: The password of server database.
5. Execute the following command and export the data of data table:

```
db2move dbname export>*.log -u username -p password
```

6. After execute these commands, the data will be imported to the new folder.

Import the data into the database

1. Sign in the operating system as the DB2 database user.
2. Create a new empty folder, which is used to store the data imported to the server database.
3. Execute the **db2cmd** command in the **Run** to enter the command window. And use the **cd** command to enter the folder which is stores the data (namely the new folder).
4. Execute the following command and import to the datasheet:

```
db2 -tvf *.sql
```

5. Execute the following command and import to the data of data table:

```
db2move dbname import -u username -p password
```

6. After execute the command, the data will be imported into the database of server.

Note

About authorization. When export the DB2 database, it needs to give the corresponding permissions to the users. Here it gives the administrator permission of db2admin.