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MySQL Database		Only for Recipients' Reference
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# MySQL Database

## Installation & application

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## 1 MySQL Download

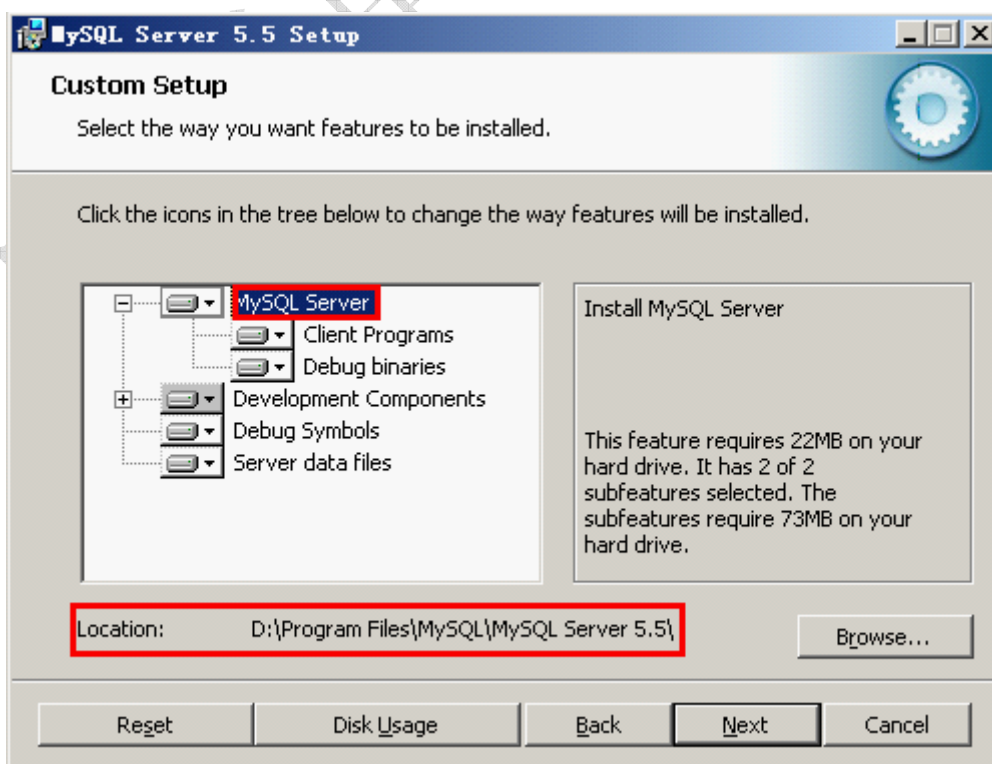
You can download from MySQL's official website. In enterprise development, generally choose a more stable version, presently MySQL5.X is more stable, and it can be downloaded according to your own computer operating system, the download address is: <http://www.mysql.com/downloads/mysql/>.



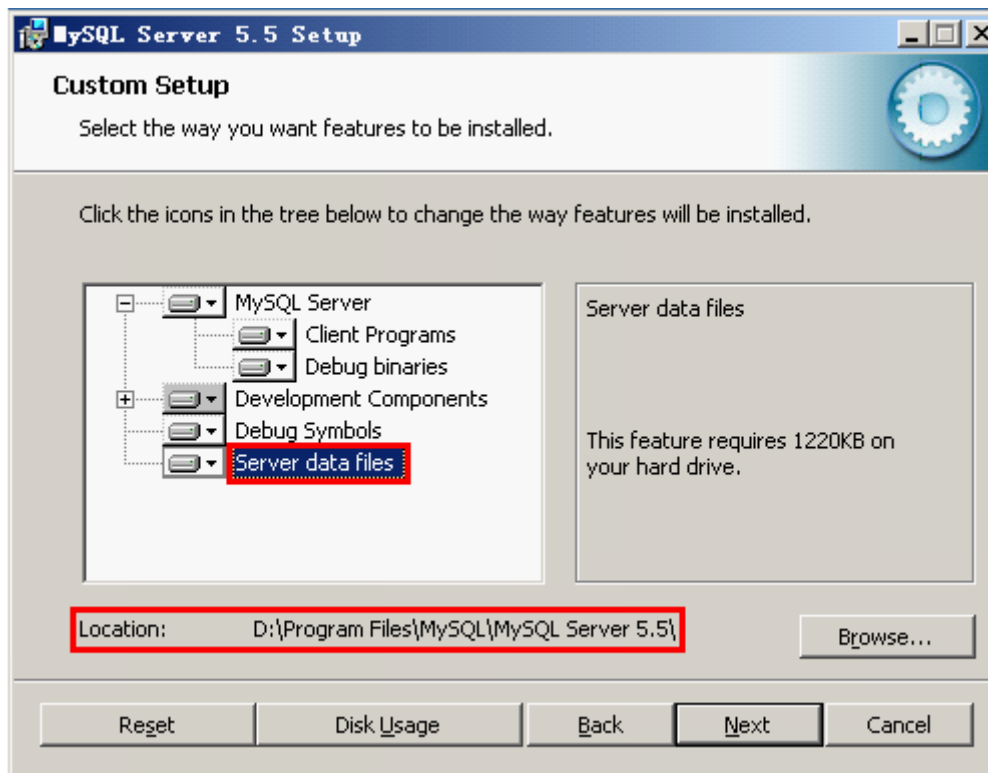
## 2 MySQL Installation

Step 1: double left click the downloaded installation package, then appears Setup Wizard interface; click on "Next" to continue, and in the following screen, select "Custom" option, and to familiar with the installation process.

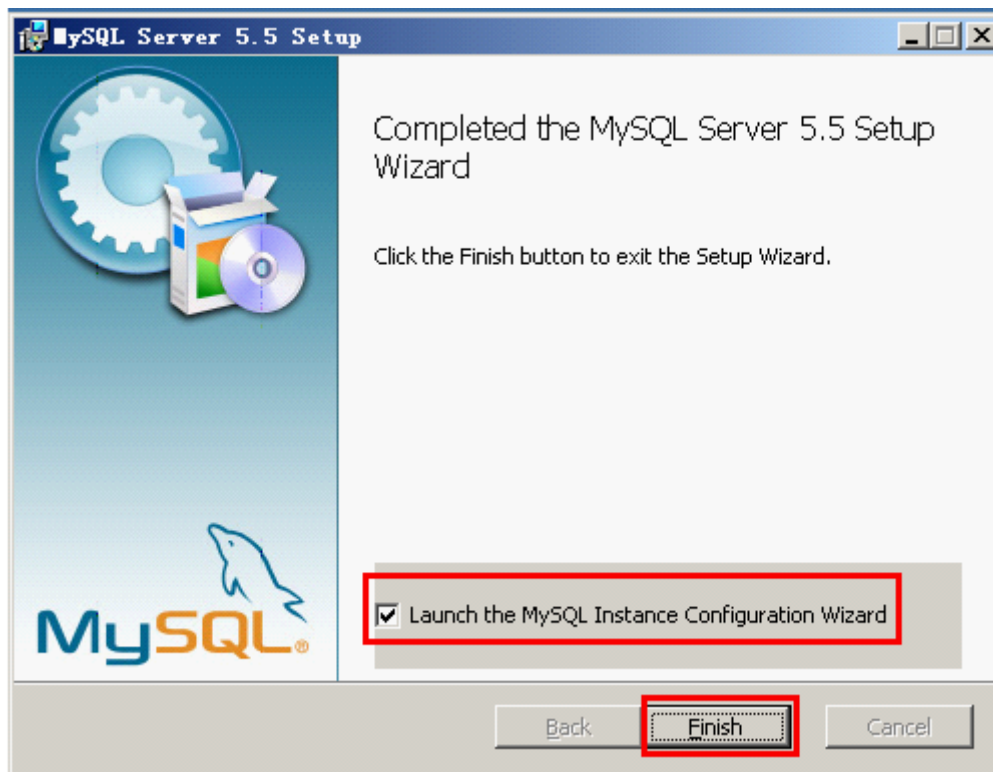
Step 2: select the Mysql installation directory and Data directory, select the MySQL Server, select location as a non-system disk, and then copy the installation directory (for example, D:\Program Files\MySQL\MySQL Server 5.5\).



Then select the Server data files, and select the location as non-system disk as well, directly paste the installation directory that just copied.



Step 3: confirm the previous settings, click "Install" to start the installation. After the software installation is complete, the following screen appears, check the configure MySQL directly, click Finish to complete.

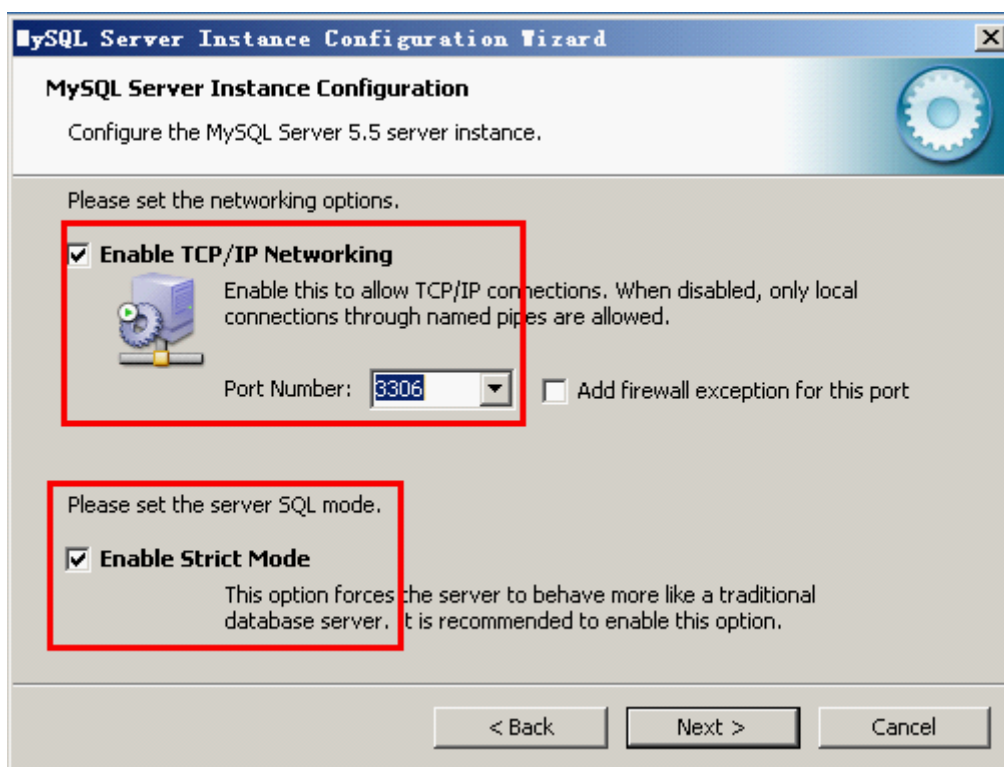


Step 4: select the configuration of "Detailed Configuration" and to familiar with the configuration process.

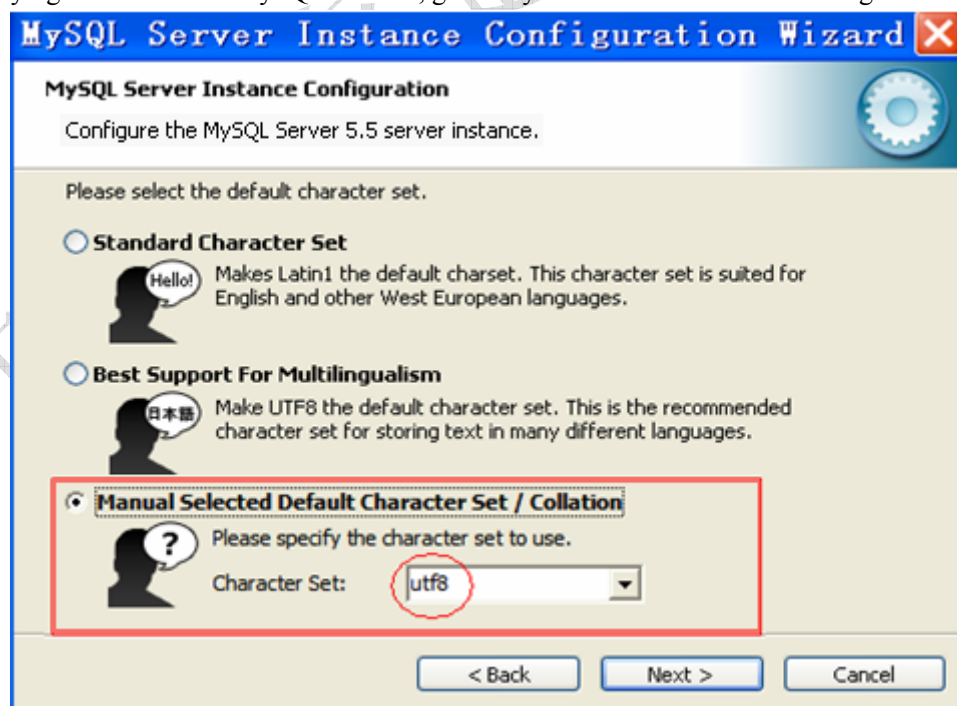
Step 5: select the server type as "Server Machine", MySQL occupies more resources.

Step 6: choose usage of MySQL database, here select "Transactional Database Only".

Step 7: Use the default location to configure the InnoDB Tablespace, and can manual set the number of concurrent connections, click "Next" to continue. Enable TCP/IP Networking, set the Port Number as 3306 (MySQL default port).

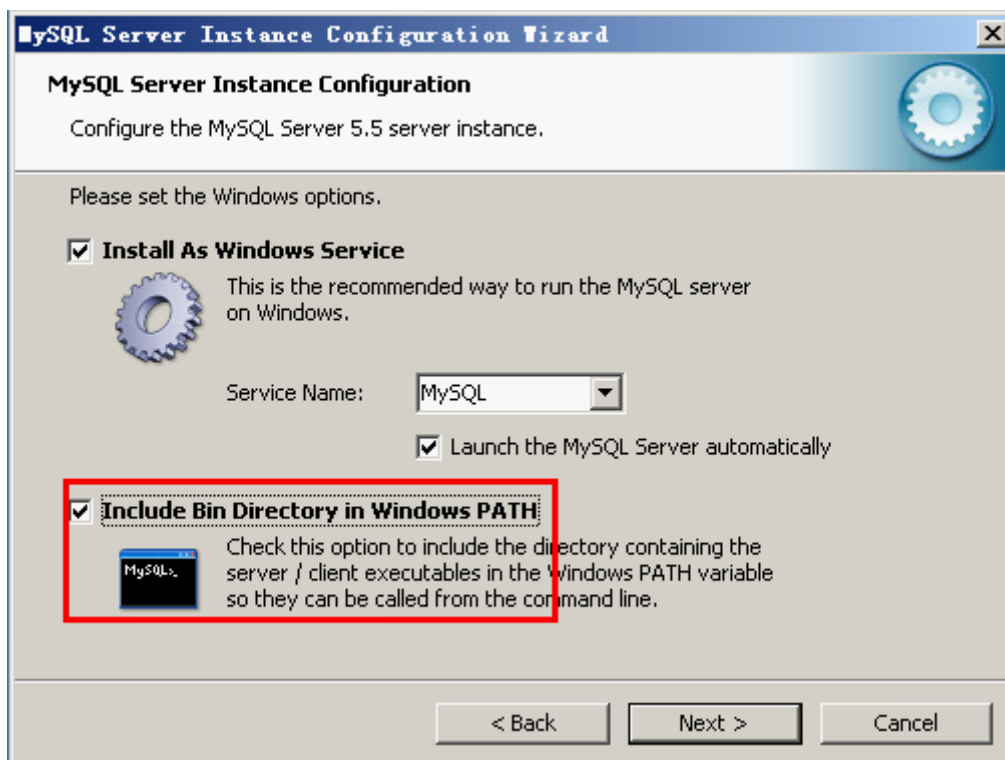


Step 8: Character Set selection or fill in the "utf8" with normal characters (or other text). MySQL's default encoding is Latin1 which does not support Chinese, need to modify the database default encoding to gbk, gb2312 or utf8 if want to support Chinese. For normal displaying Chinese in the MySQL console, generally set the character set encoding as utf8.



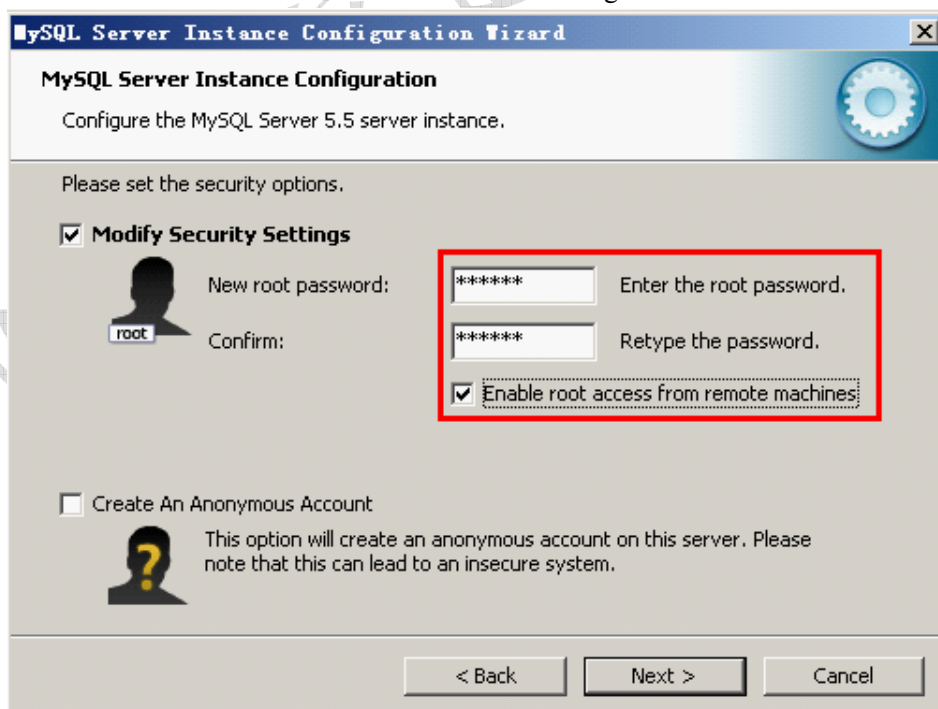
Step 9: tick the following “Include Bin Directory in Windows PATH”, and then the next step.





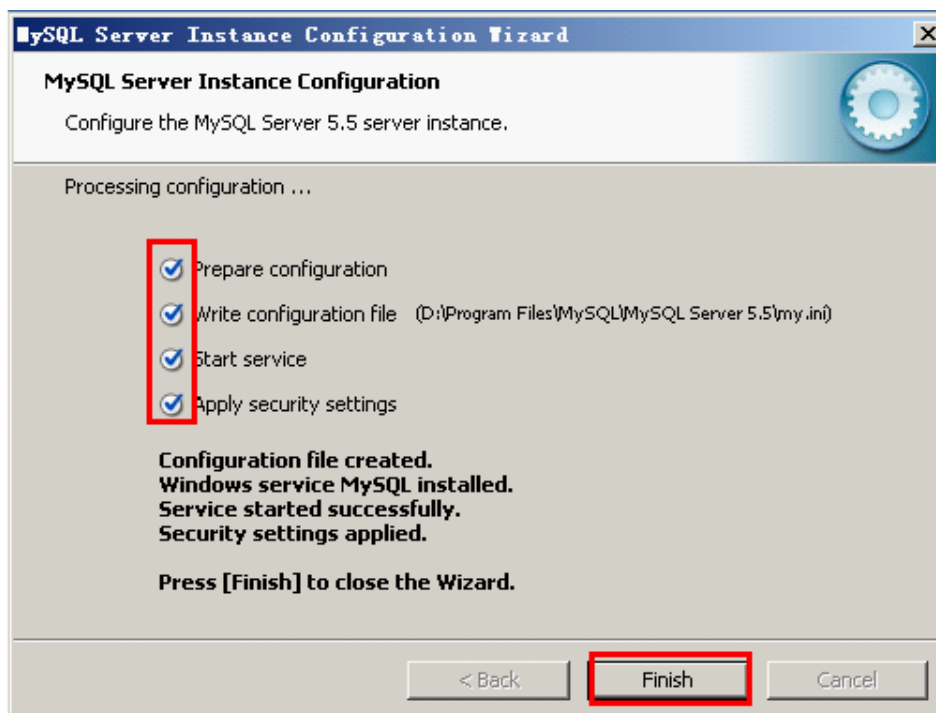
Step 10: modify the default root user (admin) password is "root" (default is blank), tick the "Enable root access from remote machines", then the next step.

MySQL database default user name is root and the default password is blank. When configure it, set a password for the database connection and access management.



Step 11: confirm the setting is correct, press the "Execute" to validate the setting. After the following 4 items have been ticked, and then click Finish to complete the installation.



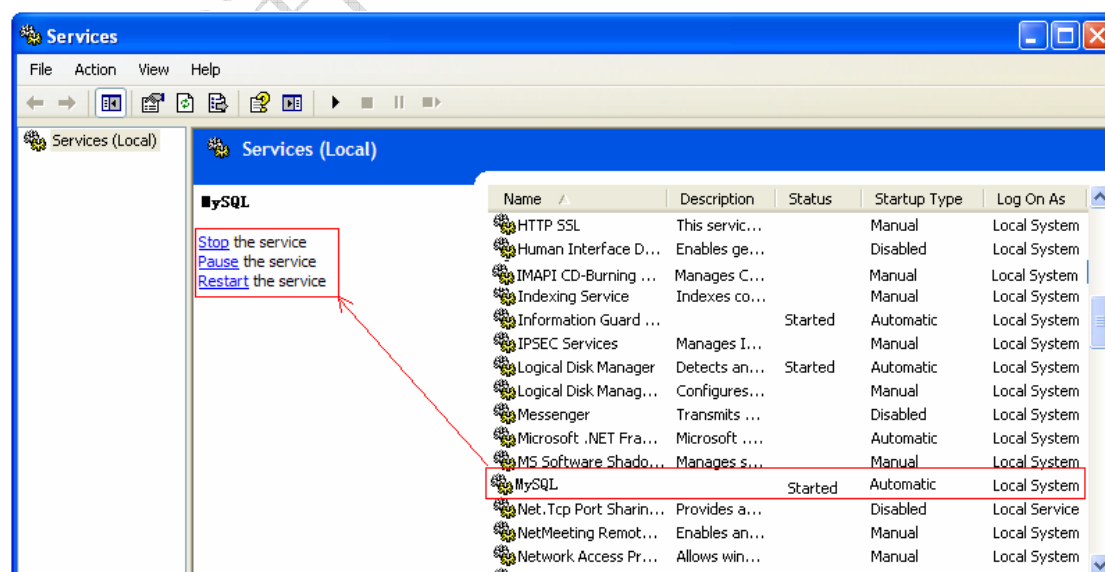


### 3 MySQL Server

MySQL is a database server. After the installation is finished, you need to start the server first, and then you can use the client successfully connected and operating.

After MySQL is installed, the server is started automatically by default (start with the Windows operating system), therefore, do not be started again. Of course you can set startup type (automatic start, manual start, and etc).

Open the control panel-> management tool-> service as shown in the following figure:



By default, it is the start state. You can click on the "stop" links to shut down the service.

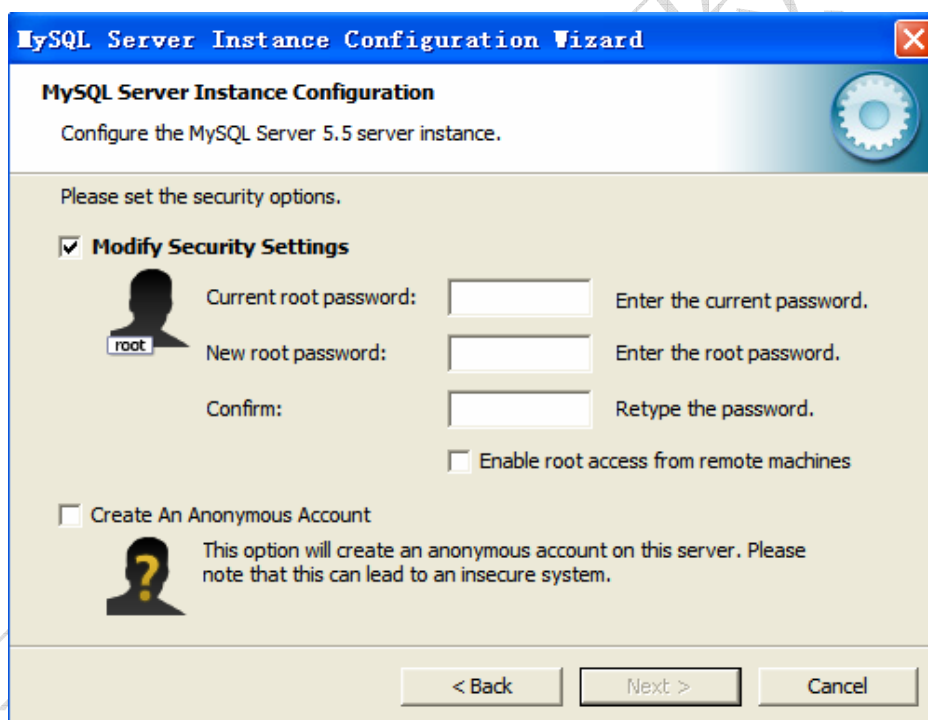
## 4 MySQL Server Configuration

When install MySQL, we made the following configuration: set up MySQL port (Port Number) to 3306; set the character set (for example, UTF8) with the characters in the normal display; set access database user name to root, password to root.

Modify the configuration information in the following.

### 4.1 Set Account

Click on the start menu, select "MySQL" -> "MySQL Server 5.X" -> "MySQL InstanceConfig". In the pop-up box, using the previous configuration, click "Next" until the password configuration interface:



From top to bottom and then fill in: current password, new password and confirm the password. Click the "Next", and set the following by the default configuration.

### 4.2 Set Character Set

MySQL character set and collation. Support four levels to character set: server, database, table and connection.

#### 1. Database coding method

After logging in as a root user, use the command view encoding: `>show variables`

like'character%';

```
mysql> show variables like 'character%';
+-----+
| Variable_name | Value |
+-----+
| character_set_client | utf8 |
| character_set_connection | utf8 |
| character_set_database | utf8 |
| character_set_filesystem | binary |
| character_set_results | utf8 |
| character_set_server | utf8 |
| character_set_system | utf8 |
| character_sets_dir | C:\Program Files |
+-----+
```

The coding method of each variable is described below.

Variable	Description
character_set_client	client coding method
character_set_connection	coding used to establish a connection
character_set_database	database coding
character_set_results	results coding
character_set_server	database server coding

## 2. Set character set coding

Usually set MySQL default character set key values in the my.ini file in the MySQL.

```
default-character-set = utf8
```

There are 2 methods of setting other character set coding of MySQL:

### (1) Configure in the graphics window (already configured during installation)

MySQL character set encoding can be configured via graphical window; set the character set coding as UTF8.

As configured on the bottom, the following code values of variables are set as utf8.

```
character_set_client
character_set_connection
character_set_database
character_set_results
character_set_server
```

### (2) Using the command in the console

The coding can be modified in MySQL console.

Such as: mysql> SET character\_set\_client = utf8; or

mysql> SET NAMES utf8; this directive is equivalent to the following:

```
set character_set_client = utf8;  
set character_set_connection = utf8;  
set character_set_results = utf8;
```

The function of SET NAMES statement is just temporary; it only works for the current console settings; if use this statement to set the character coding in the program, it will return to the default values when MySQL restarts.

## 5 MySQL Database Application

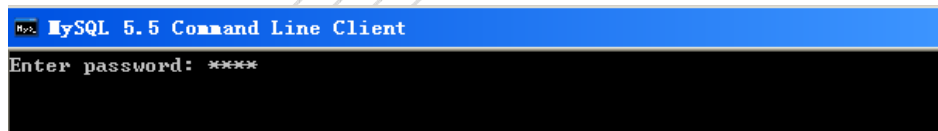
MySQL comes with a Command Line Client, we can log in MySQL server, and make database operations; database operations can also be connected through other means, such as using the graphical user interface, like SQLyog, MySQL-Front, Navicat and etc to enhance operation efficiency. In addition, it can also be accessed by programming, such as JDBC (Java Data Base Connectivity).

The following describes the three ways.

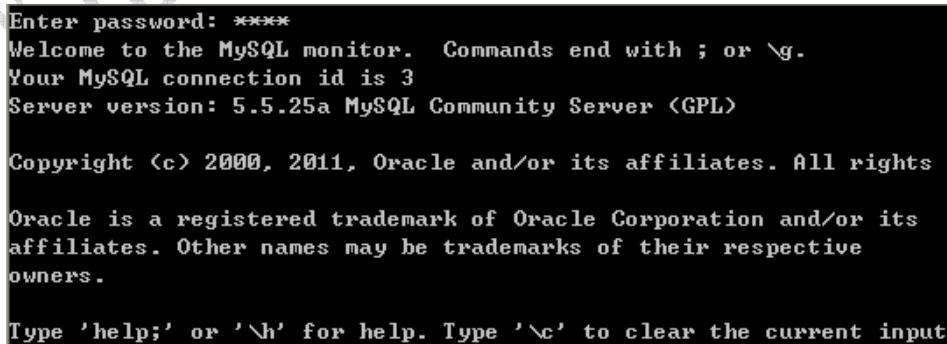
### 5.1 Usage of MySQL Command Line Client

#### 1. Login MySQL

Click on the start menu, select "MySQL" → "MySQL Server 5.X" → "MySQL Command Line Client". In the DOS window that pops up, enter the database login password (password is configured when install MySQL), and carriage return.



If the Window is exited, which means the password is incorrect, if shown as in the figure below, which indicates login success.



#### 2. MySQL basic command

Give examples to make these basic command operations.

### Show database

Use the SHOW statement to identifying what database currently exists in the MySQL Server.

Command: `mysql> show database;`

### Create database

Create a database userdb.

Command: `mysql> create database userdb;`

### Enter database

Select the database that created.

Command: `mysql> use userdb;`

### Create table in database

To create a database table, firstly need to check what table exists in the current database:

Comman: `mysql> show tables;`

If appears the "Empty set (0.00 sec)", which means the database table does not exist in the just created database.

Then create a database table `t_user`:

Command: `mysql> create table t_user(name varchar(50),password varchar(50));`

After created a table, we can view structure of this table:

Command: `mysql> desc t_user;`

```
mysql> desc t_user;
```

Field	Type	Null	Key	Default	Extra
name	varchar(50)	YES		NULL	
password	varchar(50)	YES		NULL	

### Operation to database table

(1) View all data in the table by SELECT command:

Command: `mysql> select * from t_user;`

If appears "Empty set (0.00 sec)" it means there are no data in the just created table.

(2) Then insert a data in the table:

Command: `mysql> insert into t_user values ('admin','123456');`

And to see the changes by SELECT command.

```
mysql> select * from t_user;
```

name	password
admin	123456

1 row in set (0.00 sec)

(3) Update data in the table:

Command: `mysql> update t_user set password = '654321' where name = 'admin';`

See the changes by above SELECT command.

(4) Delete data in the table

Command: mysql> delete from t\_user;

See the changes by above SELECT command.

(5) Delete table

Command: mysql> drop table t\_user;

(6) Delete database

Command: mysql> drop database userdb;

#### Note:

(1) These databases and tables as well as the data in the table all are created by commands. When there are many tables and data information, it is easy to make error as its hard and heavy workload. We can import existing SQL script files to create them.

(2) When we want to store data in a table to a different location, or store in other formats (such as text, tables, etc), we can export the database table information.

### 3. Import/export database script

#### Import command

Syntax: source [filepath];

Example: if the script location is d:\mysql\_script\userdb.SQL, enter the command in the console: source d:/mysql\_script/UserDB.SQL; click on Enter to perform the script import.

```
mysql> source D:/mysql_script/userdb.sql;
```

#### Export command

(1) Export the whole database

mysqldump.exe is an export tool by Mysql command line, which is default stored in the bin under the Mysql installation directory. Need to enter into bin directory in the console when use it, and then use the mysqldump command (does not use a semi-colon at the end).

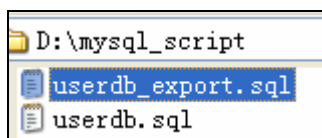
Syntax: mysqldump -u [username] -p [-opt] [databasename] > [filepath]

Description: [-opt] is parameter setting, optional.

Example: mysqldump -u root -p userdb > d:/mysql\_script/userdb\_export.sql

```
D:\Program Files\MySQL\MySQL Server 5.0\bin>mysqldump -u root -p userdb >
d:/mysql_script/userdb_export.sql
Enter password: ****
```

The effect is as follows:



(2) Export a database structure

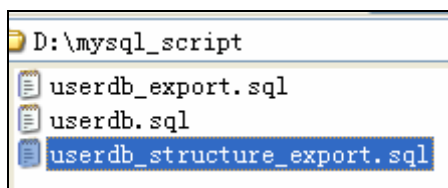
Syntax: mysqldump -u [username] -p -d --add-drop-table [databasename] >[filepath]

Description: -d: has no data; --add-drop-table: add a “drop table” statement before each “create” statement.

Example: mysqldump -u root -p -d --add-drop-table userdb >  
d:/mysql\_script/userdb\_structure\_export.sql

```
D:\Program Files\MySQL\MySQL Server 5.0\bin>mysqldump -u root -p -d --add-drop-table userdb  
> d:/mysql_script/userdb_structure_export.sql  
Enter password: ****
```

The effect is as follows:



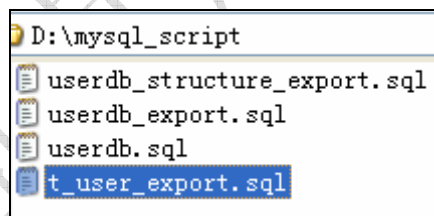
### (3) Export a table

Syntax: mysqldump -u [username] -p [databasename] [tablename]> [filepath]

Example: mysqldump -u root -p userdb t\_user > d:/mysql\_script/t\_user\_export.sql

```
D:\Program Files\MySQL\MySQL Server 5.0\bin>mysqldump -u root -p userdb t_user >  
d:/mysql_script/t_user_export.sql  
Enter password: ****
```

The effect is as follows:



## 5.2 Access MySQL by Visual Tool

To operate to the data in MySQL database server (stored data), we can achieve not only by command line, but also through the client graphical user interface. By this way we can easily perform database operations.

Most commonly used MySQL GUI tools are **SQLyog**、**MySQL-Front**、**Navica** and etc. This article will be focus on introducing the Navicat tool.

### 1. Software downloading and installation

Downloading link: <http://www.Navicat.com.CN/download>, official website offers Chinese Simplified version for trial (for 30days).

Installation: install steps omitted here.



## 2. The usage of software

### Start software

After the installation is complete, if you select to install shortcuts on the desktop, you can start the software by double-clicking it.

### Create database connection

In the left corner of the main window has a "connect" button, a connection properties prompt box will be popped up after clicking on it. Give the "connection" a proper name and then enter the correct connection information; if you want to manage remote database, just enter the correct IP address in the IP address field.

In this example, we will set the easiest general connection which is to manage the local database as demonstration.

### View database

When the connection is successful, in the left-hand navigation window will see all native MySQL database, which gray means the database is not opened, green means database has been opened. For a database that is already open, we can manipulate it by writing the basic instructions.

## 5.3 Access MySQL by Programming

Earlier introduced accessing and manipulating databases by MySQL Command Line Client and visualization tools, then how should it be programmatically accessed? In the software development process, we can use the JDBC, ADO for database access and manipulation.

The requirements is as follows:

Access the Mysql server run on 192.168.0.1, the name of database is userdb, and database access account is root, password is 123456.

### 1. Example: using JDBC to access MySQL

The link is written as:

```
url="jdbc:mysql://192.168.0.1:3306/userdb? user=root& password=123456& useUnicode=true& characterEncoding=utf8";
```

### 2. Example: using ADO to access MySQL

The link is written as:

```
url="Provider=MSDASQL.1;Driver={MySQL ODBC 3.51 Driver};  
Server=192.168.0.1;DataBase=userdb;UID=root;PWD=123456";
```