Installing and Configuring MySQL

Session 2

Objectives

- *Explain the various distribution options of MySQL*
- *Explain the installation process of MySQL on Microsoft Windows*
- *Explain the installation process of MySQL on Red Hat Enterprise Linux*
- *Explain the configuration process of MySQL using Scripts*
- *Explain initialization of MySQL at startup*

Evaluating the Various Distribution Options of MySQL

- You can install MySQL using either the binary distribution or the source distribution
- The binary distribution contains a setup program that performs the installation
- If you use the source distribution that contains the source code of MySQL, you will have to compile the code before installation
- The binary distribution is normally used for installation as the binary distribution is a pre-compiled, ready-to-install distribution

- Binary distribution is available in different formats that are compatible with a specific operating system
- RPM files or compressed ZIP or tar files are available for installing MySQL on Linux
- Binary installations are fast and easy to install

- The installation, using the binary distribution under Linux or UNIX, creates the following directories:

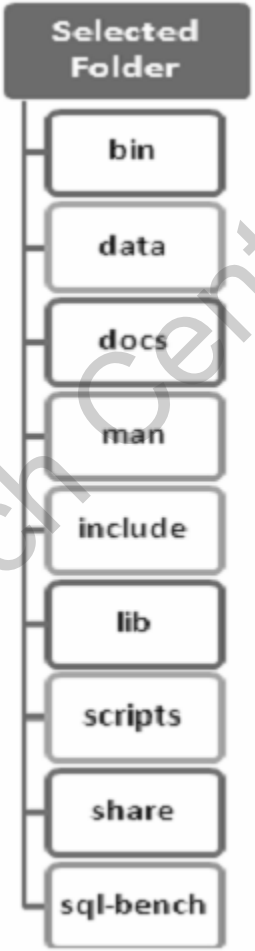


Table lists the default folders under source directory and its contents

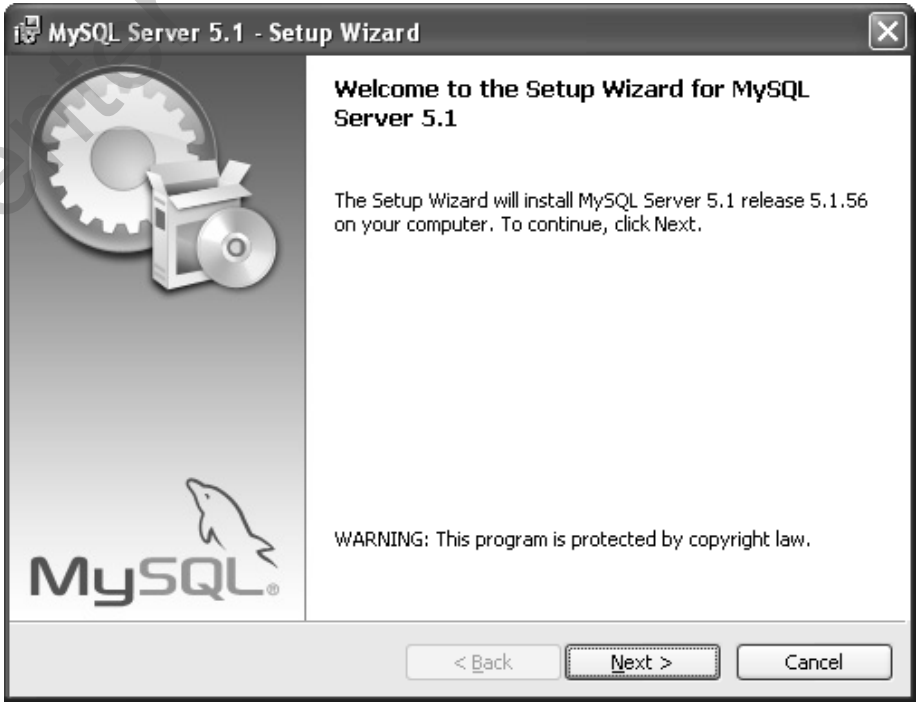
Directory	Content
bin	Contains Client utilities and mysqld daemon
data	Contains database and log files
docs	Contains documentation in the Info format
man	Contains UNIX manual pages
include	Contains header files
lib	Contains library files
scripts	Contains mysql_install_db file
share	Contains support files such as error messages
sql-bench	Contains benchmarks of MySQL database

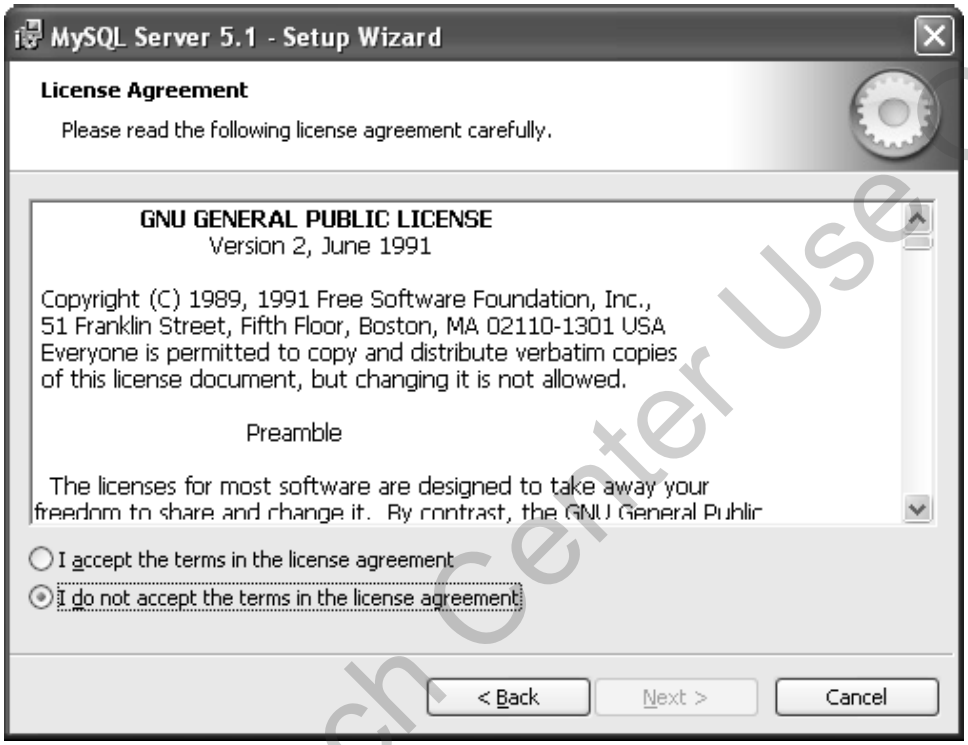
- The only disadvantage of a binary distribution is that customization in terms of directory locations, and so forth is not possible
- You can use source distribution to create a distribution:
  - Having customized directory structure
  - Having a custom set of features by enabling or disabling features
  - From the latest development source (binaries are available only for release candidates)
- If you do not customize the installation folder structure, the distribution generated by compiling the source uses the same folder structure as the binary distribution

Installing and Configuring MySQL on Different Platforms

- The OS or platforms that support MySQL are as follows:
  - Solaris
  - Linux
  - Microsoft Windows XP/Vista/7
  - Microsoft Windows Server 2003/2008
  - Mac OS X
  - FreeBSD
  - AIX

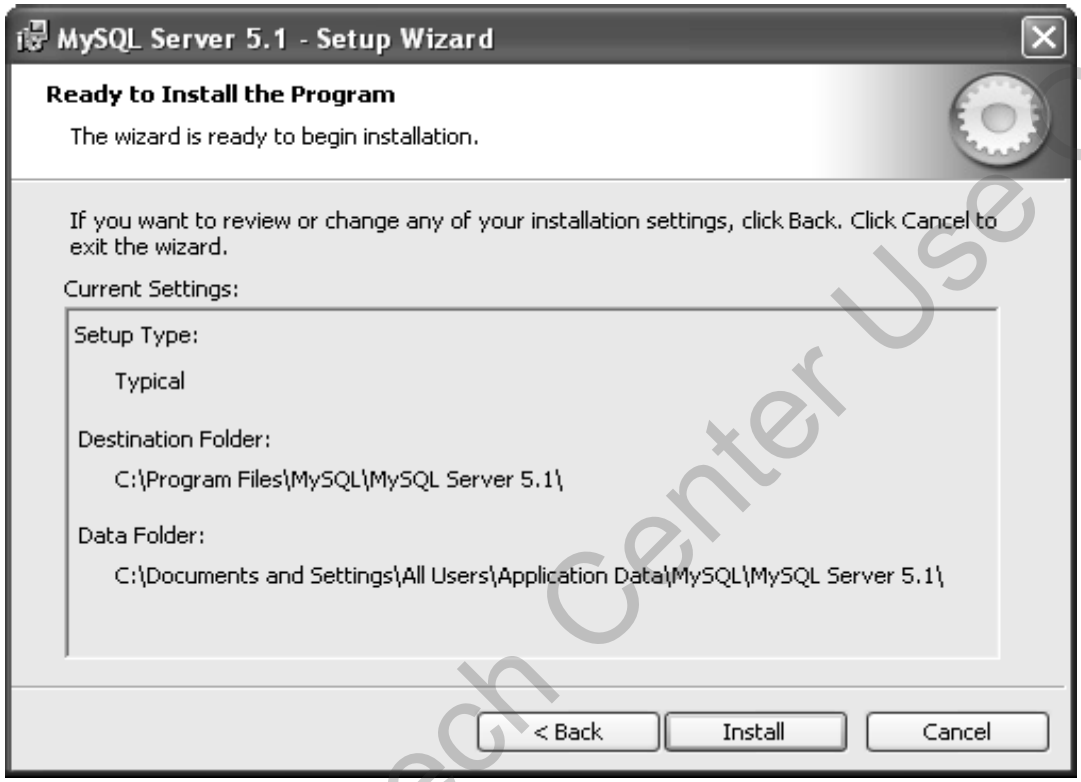
- The steps followed for installing MySQL on Microsoft Windows XP are as follows:
  - Browse and locate the downloaded installation package, and double click the file
  - The **Open File Security Warning** dialog box is displayed
  - Click **Run**
  - The Windows Installer prepares the installation process and **MySQL Server 5.1- Setup Wizard** dialog box is displayed
  - Click **Next** to display the **License Agreement** pane in the **MySQL Server 5.1 – Setup Wizard** dialog box





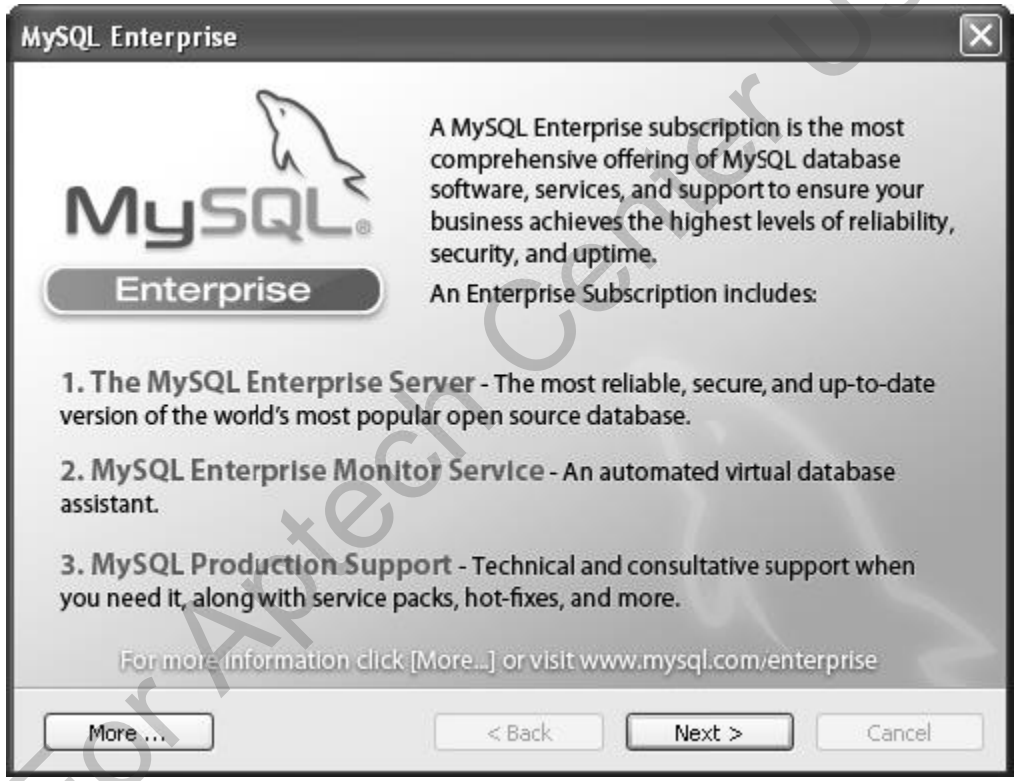
- Select **'I accept the terms in the license agreement'**
- Click **Next** to display the **Setup Type** pane in the **MySQL Server 5.1 – Setup Wizard** dialog box

- Click **Typical**
- Click **Next** to display the **Ready to Install the Program** pane in the **MySQL Server 5.1 – Setup Wizard** dialog box

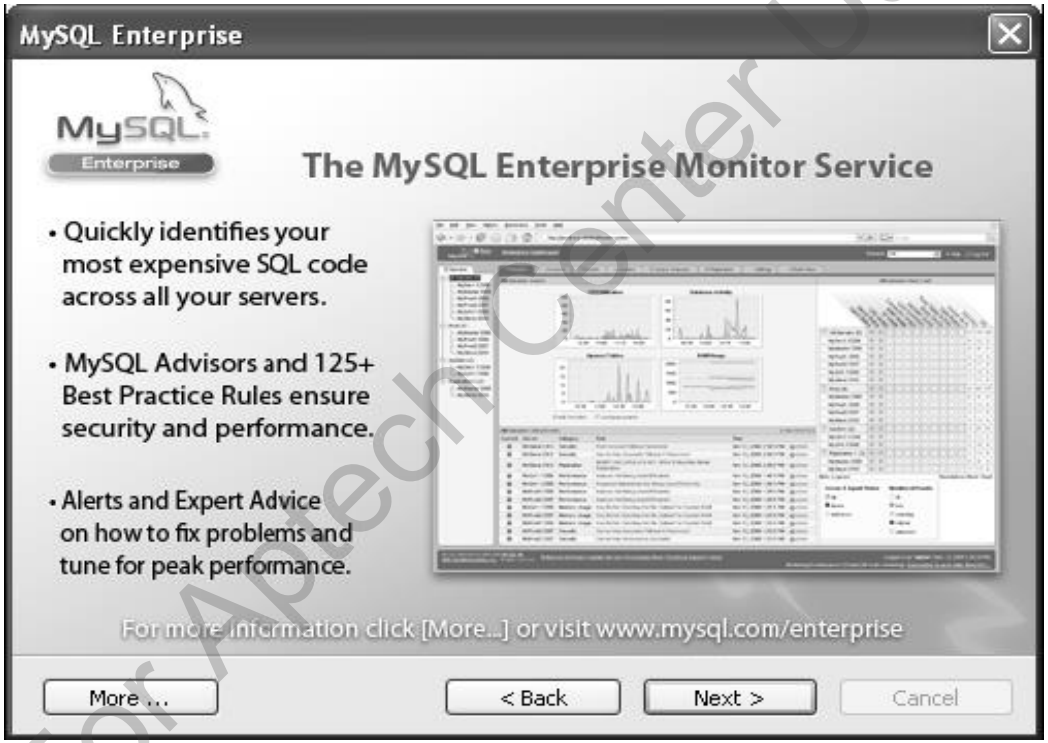


- Click **Install**

- The Setup Wizard completes the installation process and the **MySQL Enterprise** dialog box is displayed
- Click **Next**



- The **MySQL Enterprise Monitor Service** pane of the **MySQL Enterprise** dialog box is displayed
- Click **Next**



- **The MySQL Server 5.1 - Setup Wizard** dialog box displays the completion of the installation process by displaying the **Wizard Completed** pane

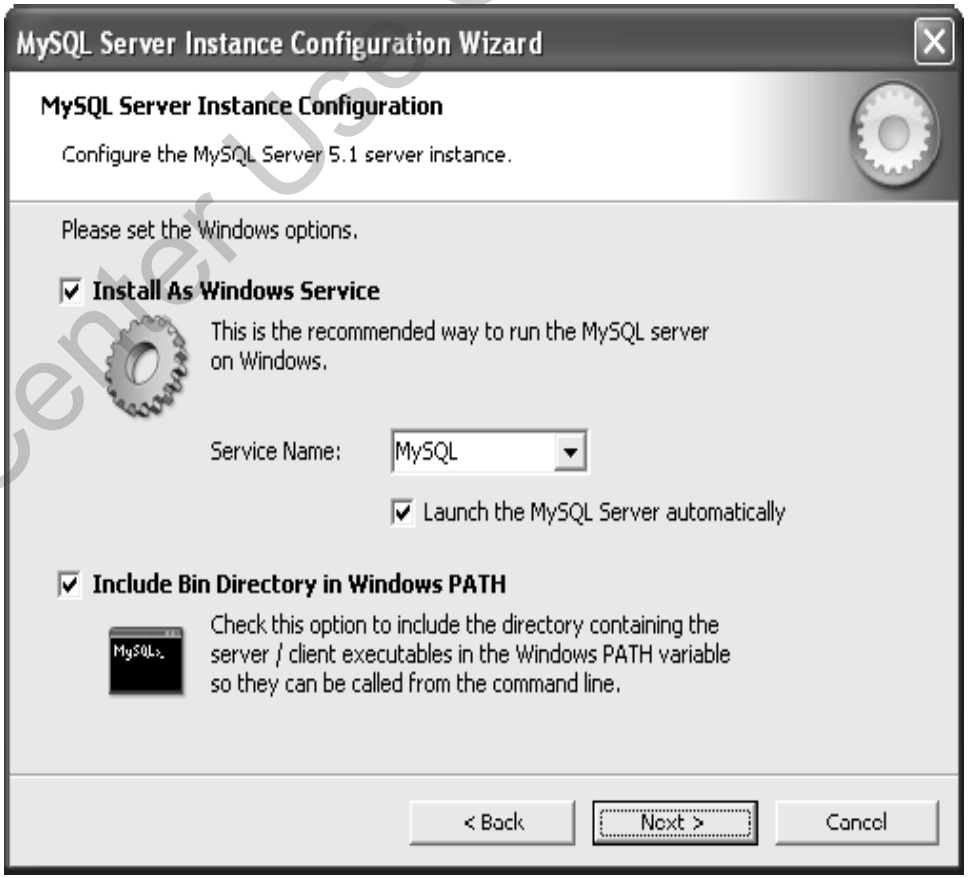
- Click **Finish**

- **The MySQL Server Instance Configuration Wizard** pane is displayed

- Click **Next** to display the **MySQL Server Instance Configuration** pane of the **MySQL Server Instance Configuration Wizard** dialog box is displayed

- Click **Standard Configuration**
- Click **Next** to display the **Windows Options** pane of the **MySQL Server Instance Configuration Wizard**

- Options available include:
  - **Install as Windows Service** – starts MySQL server at system startup
  - **Launch the MySQL Server automatically** – starts MySQL with Windows
  - **Include Bin Directory in Windows PATH** – copies the server and client executables in the Windows PATH variable. These variables can be invoked from the command line



- Select the **Install As Windows Service** check box
- Select the **Include Bin Directory in Windows PATH** check box
- Click **Next**

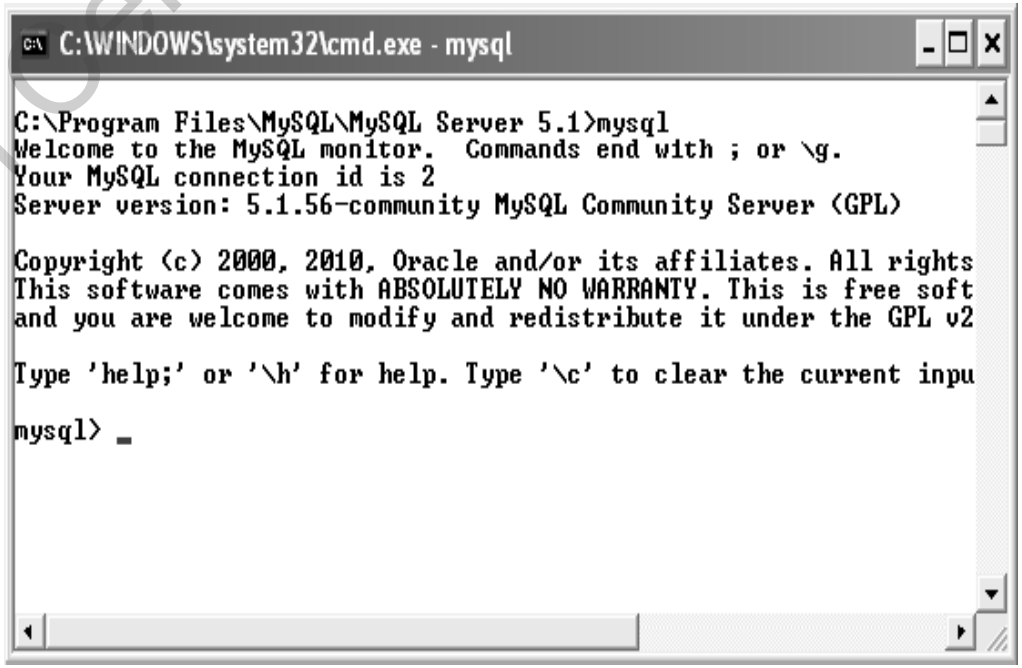
- The different options available include:
  - **Modify Security Settings** – changes the default security settings
  - **New root password** – accepts password for the root user
  - **Confirm –** accepts the password for the root user
  - **Enable root access from remote machines** – allows root users to connect to MySQL from other computers
  - **Create An Anonymous Account** – specifies to generate a hidden login account
- Clear the **Modify Security Settings** check box

- Click **Next** to display **configuration** tasks in the **MySQL Server Instance Configuration Wizard**

- Click **Execute**
- The wizard configures the settings and a confirmation message box is displayed

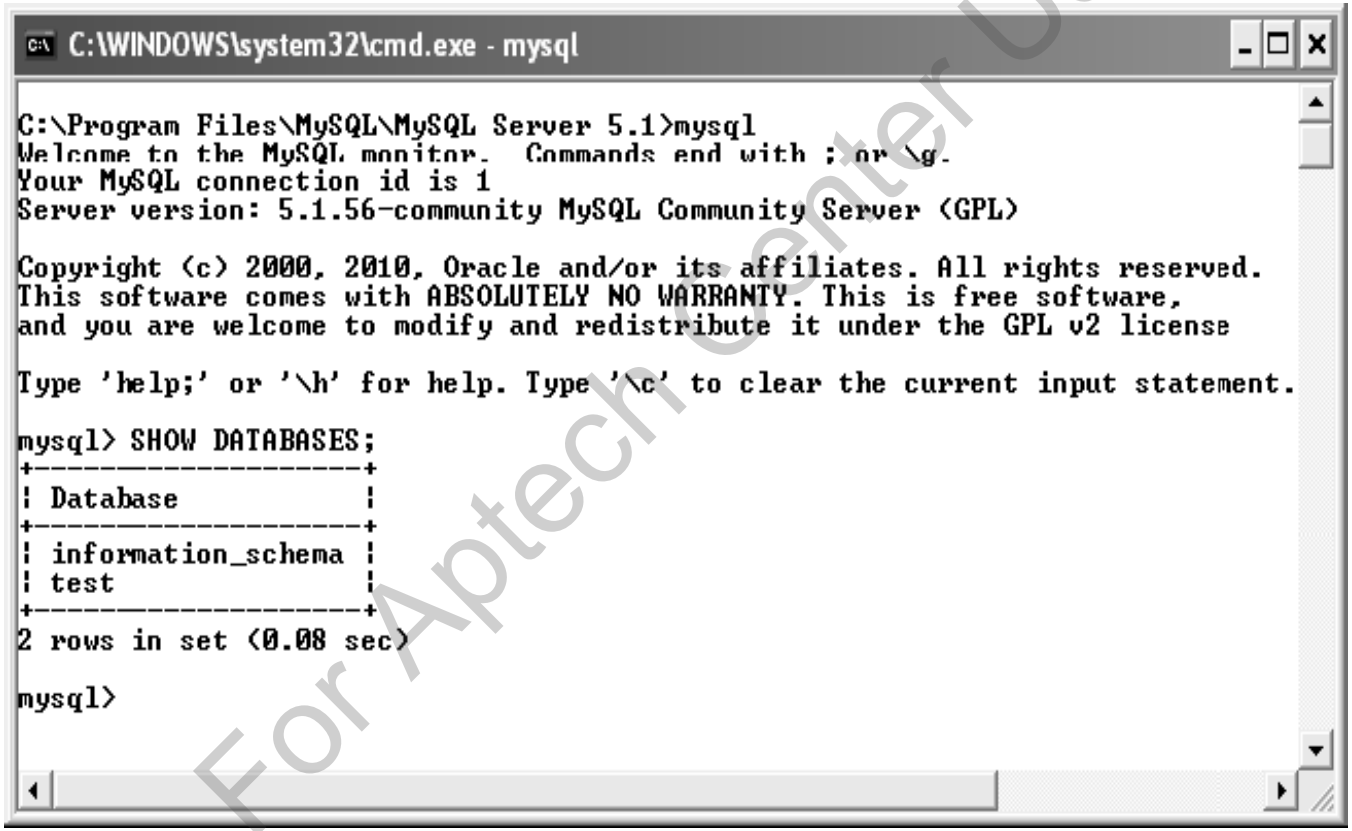
- Click **Finish**

- The following steps helps to start MySQL
  - Start the `MS-DOS` command prompt
  - Change the directory to `C:\Program Files\MySQL\MySQL Server5.1` folder
  - Enter the following command at the command prompt: `mysql`
- MySQL starts and displays the '`mysql`' prompt



- To view the default databases after installation, enter the following command at the prompt: `SHOW DATABASES`

  The figure shows all the databases available



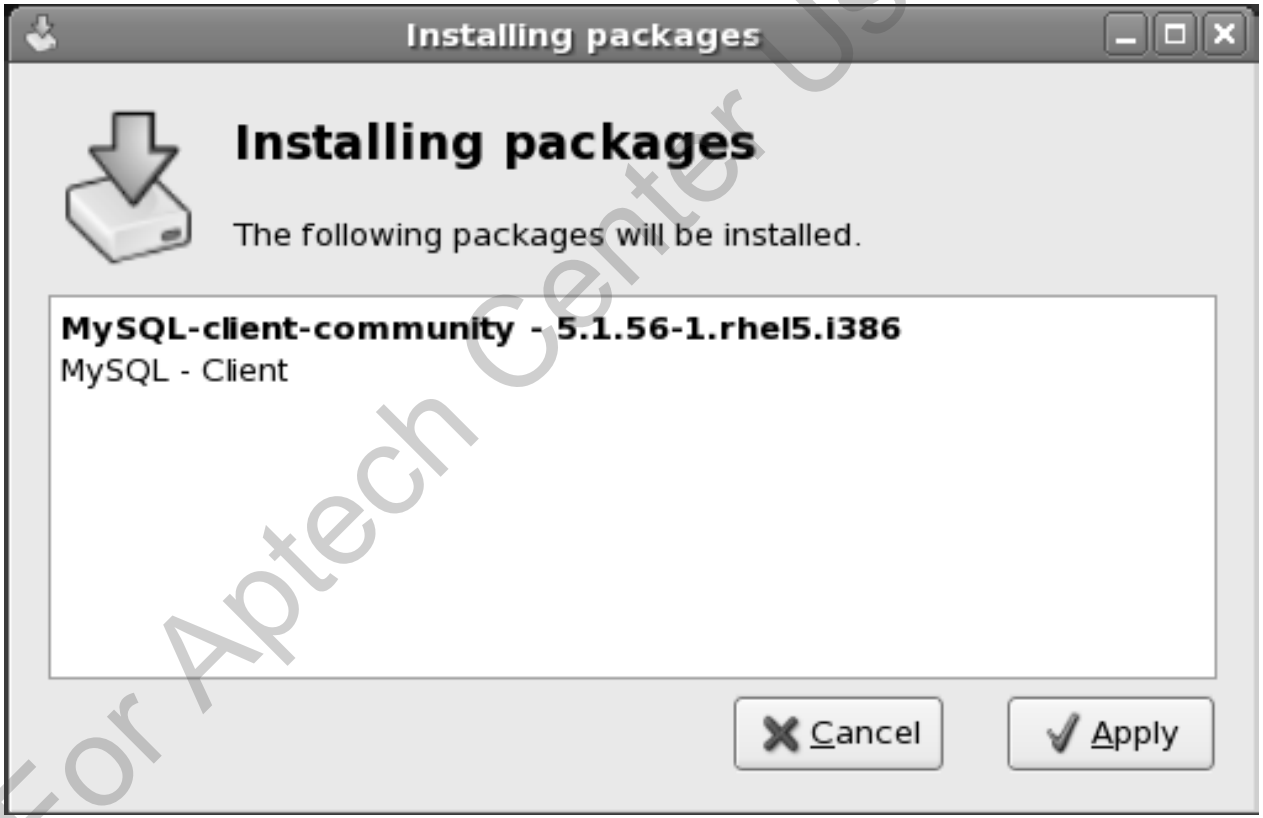
Installing MySQL on Red Hat Enterprise Linux

- Use the RPM packages to install MySQL on Red Hat Enterprise Linux
- The different RPM packages required are as follows:
  - MySQL-client-community-5.1.56-1.rhel5.i386.rpm
  - MySQL-server-community-5.1.56-1.rhel5.i386.rpm
- These packages can be downloaded from the Downloads section of the MySQL Website by selecting **Red Hat and Oracle Enterprise Linux** to view the list of packages that can be used to install MySQL
- If a previous version of MySQL is already present in the system, you will need to first uninstall the previous version and then install the new version

- To execute the server RPMs, double-click the **MySQL-server-community-5.1.56-1.rhel5.i386.rpm** package
- The installation prompts for confirmation

- Click **Apply**
- The installation process completes and a confirmation message is displayed

- To execute the client RPMs, double-click the **MySQL-client-community - 5.1.56-1.rhel5.i386.rpm** package
- The installation prompts for confirmation

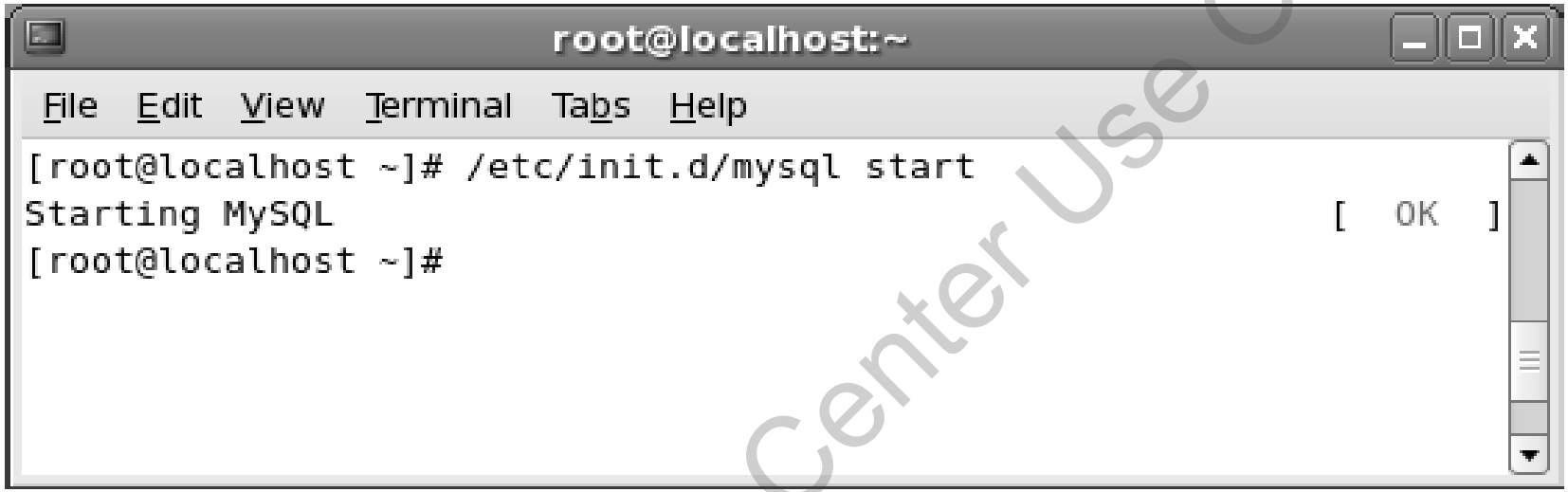


- Click **Apply**

- The installation process completes and a confirmation message is displayed
- Start the terminal in Linux
- To start the MySQL service, enter the following command at the command prompt:

```
/etc/init.d/mysql start
```

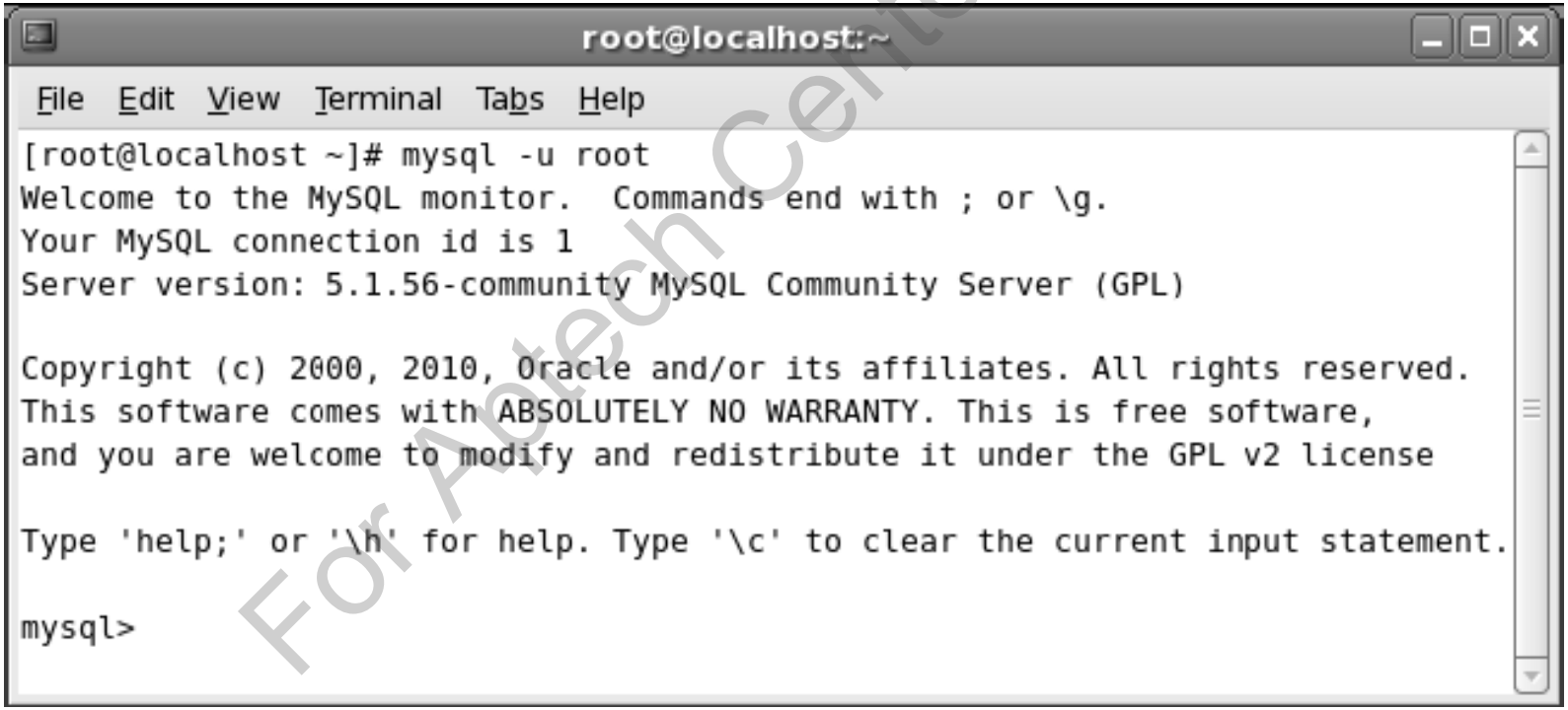
Figure displays the output of the command



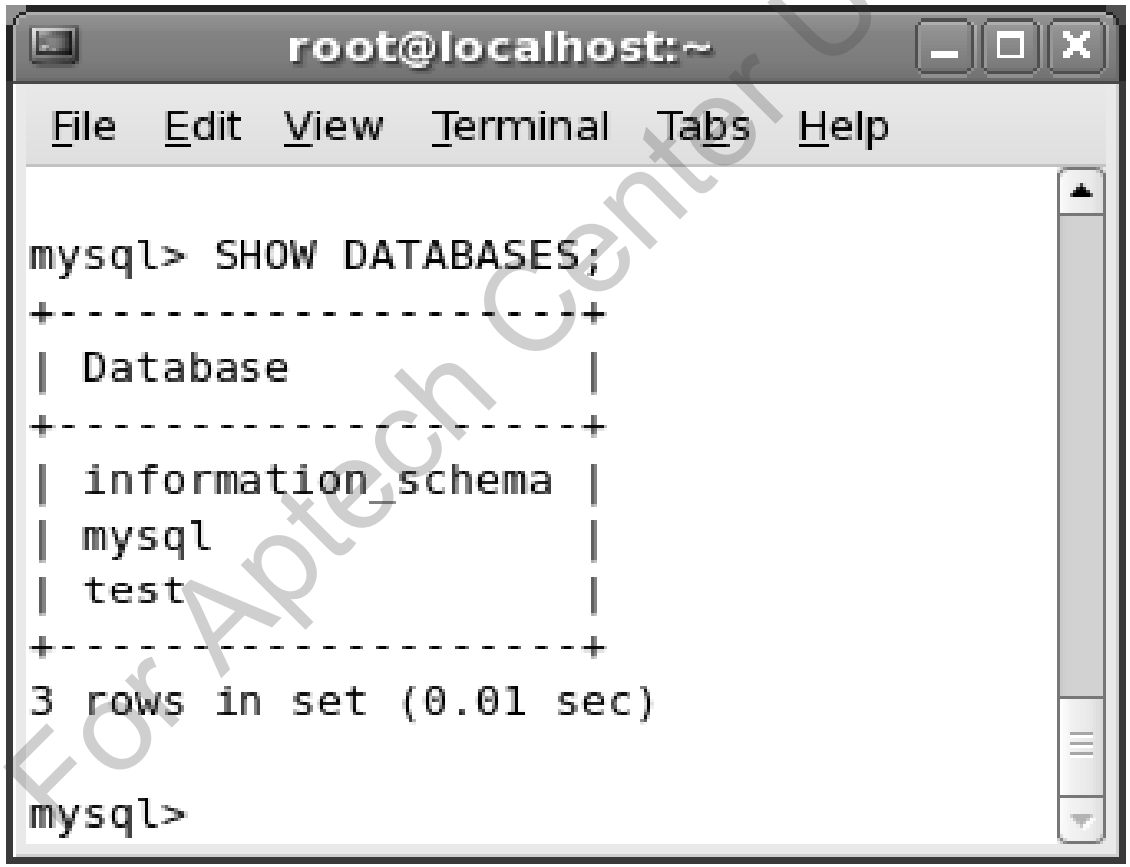
- To start MySQL, enter the following command at the command prompt:

```
mysql –u root
```

Figure displays the output of the command



- To view the list of default databases present on the server after installation, enter the following command at the command prompt: `SHOW DATABASES;`



Using Scripts to Customize the Configuration of MySQL

- The configure script enables you to control the MySQL distribution
- You can configure MySQL using the combination of command-line options, configuration files, and environment variables

The environment variables used by MySQL are listed in table

Variable	Description
CXX	Specifies the name of C++ compiler
CC	Specifies the name of C compiler
CFLAGS	Specifies instructions for the C compiler
CXXFLAGS	Specifies instructions for the C++ compiler
DBI_USER	Specifies the default user name for Perl DBI
DBI_TRACE	Specifies trace options for Perl DBI
HOME	Specifies the default path for the MySQL history file. The default path is $HOME/.mysql_history
LD_RUN_PATH	Specifies the directories to be searched by the dynamic linker

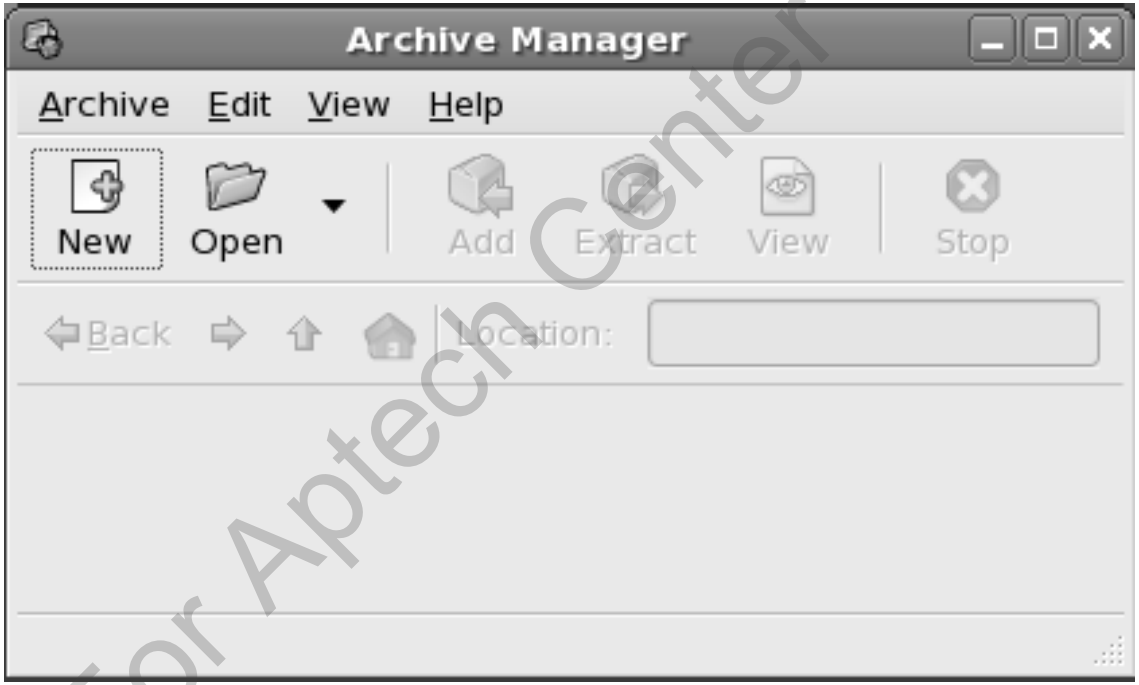
Variable	Description
MYSQL_DEBUG	Enables debugging options
MYSQL_GROUP_SUFFIX	Specifies to read groups with a suffix
MYSQL_HISTFIL	Specifies the default path for the MySQL history file. The default path is $HOME/.mysql_history
MYSQL_HOME	Specifies the path of the directory where my.cnf file is located
MYSQL_HOST	Specifies the default host name for the command line client
MYSQL_PS1	Specifies the command prompt for the command line client
MYSQL_PWD	Specifies the default password while connecting to MySQL

Variable	Description
MYSQL_TCP_PORT	Specifies the default TCP/IP port number
MYSQL_UNIX_PORT	Specifies the default UNIX socket file name
PATH	Enables the shell to search for MySQL programs
TMPDIR	Specifies the directory to create temporary files
TZ	Specifies the local time zone
UMASK	Specifies the mode to create files
UMASK_DIR	Specifies the mode to create directories
USER	Specifies the user name on Windows when connecting to MySQL

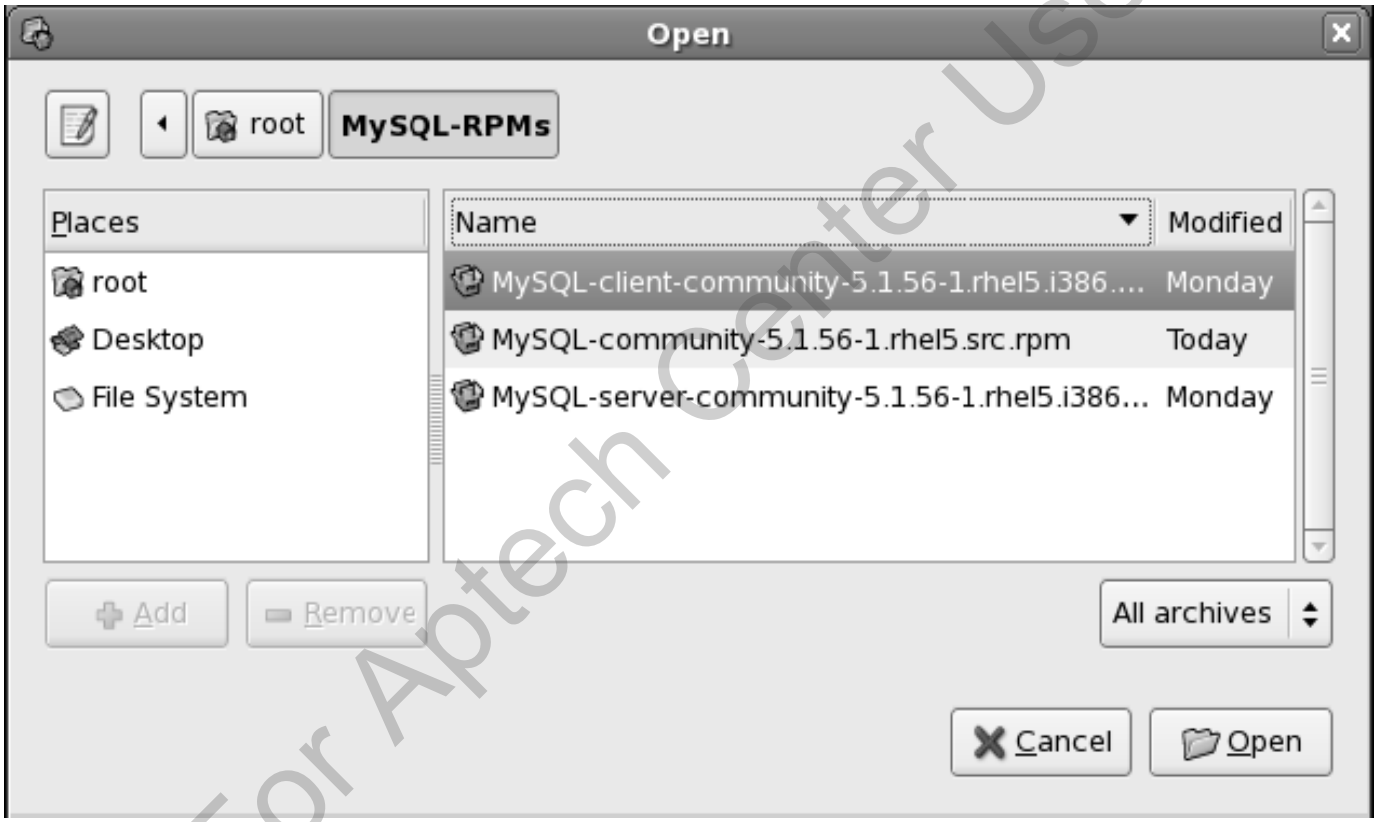
- The configuration options are stored in configuration files
- You will be required to download the source code and extract the files to a folder before making changes to the configuration files
- You must download the **MySQL-community-5.1.56-1.rhel5.src.rpm** package to extract the source code

- To extract the RPM package containing the source code:
  - Create a folder named **mysql under the root directory**
  - Select **Applications -> Accessories -> Archive Manager**

    The **Archive Manager** screen is displayed as shown

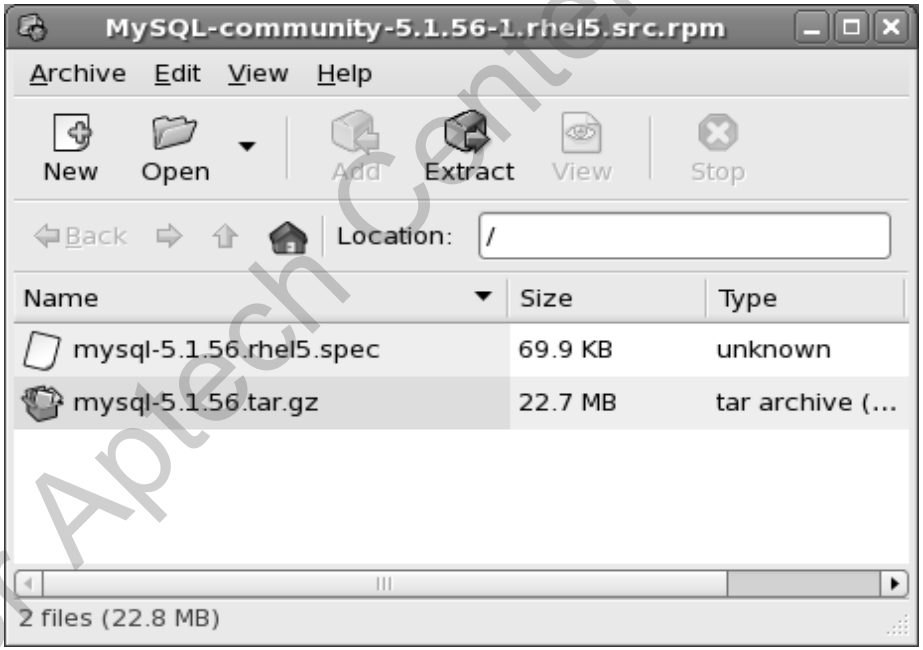


- Select **Archive -> Open**
- **The Open dialog** box is displayed as shown



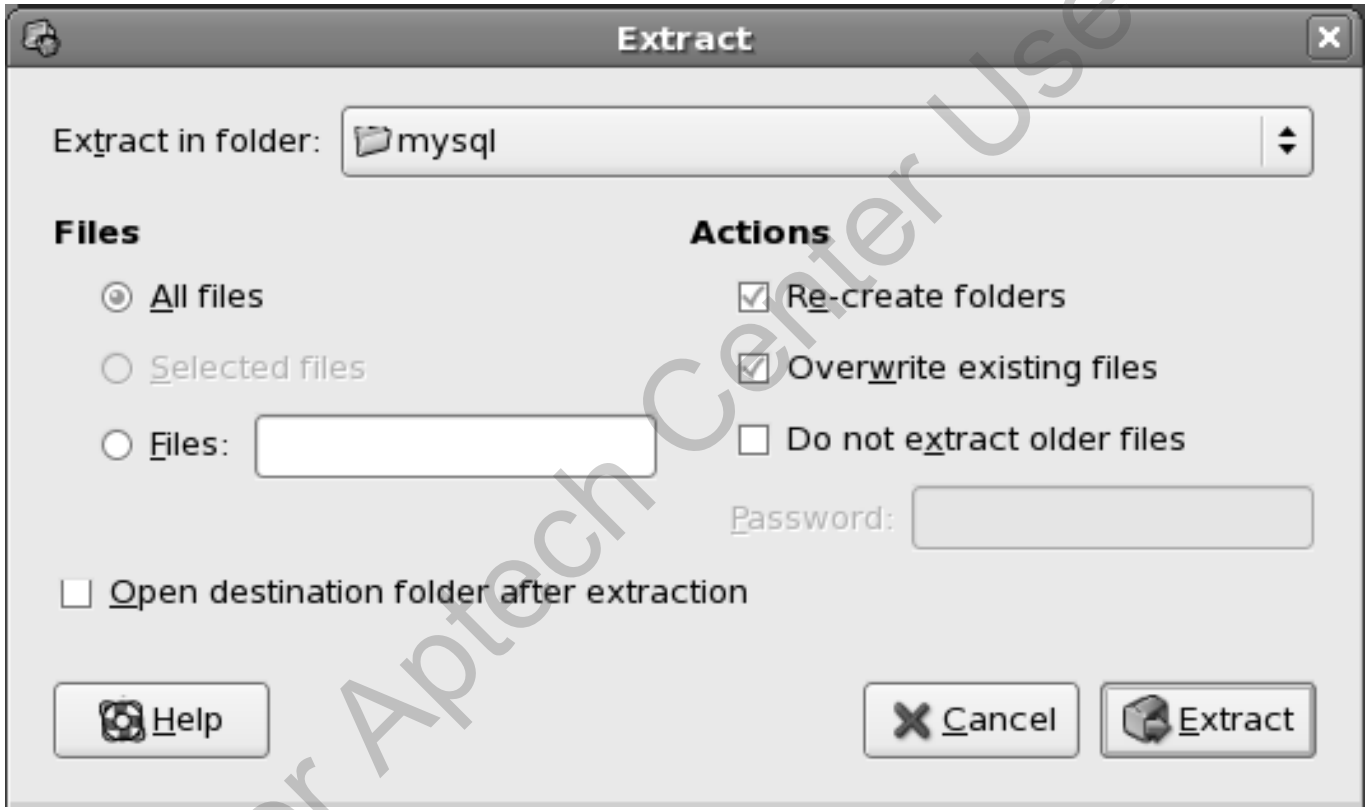
- Browse to the folder containing the **MySQL-community-5.1.56-1.rhel5.src.rpm** file
- Click **Open**

The contents of the RPM package are displayed

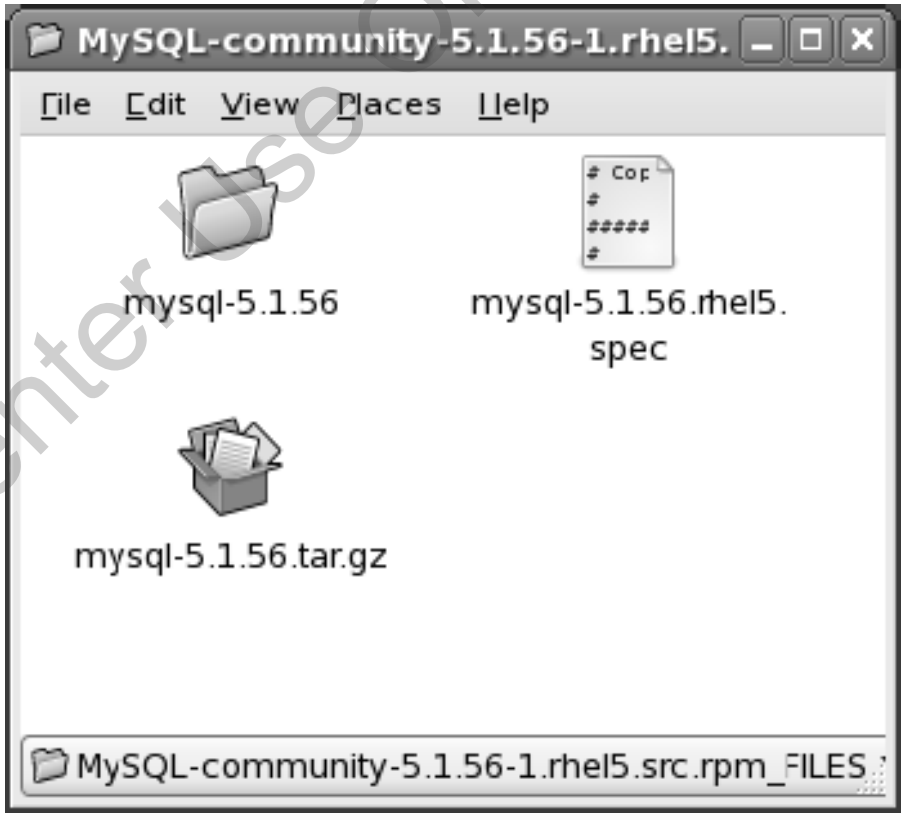


- Select **Archive -> Extract**

  The Extract dialog box is displayed



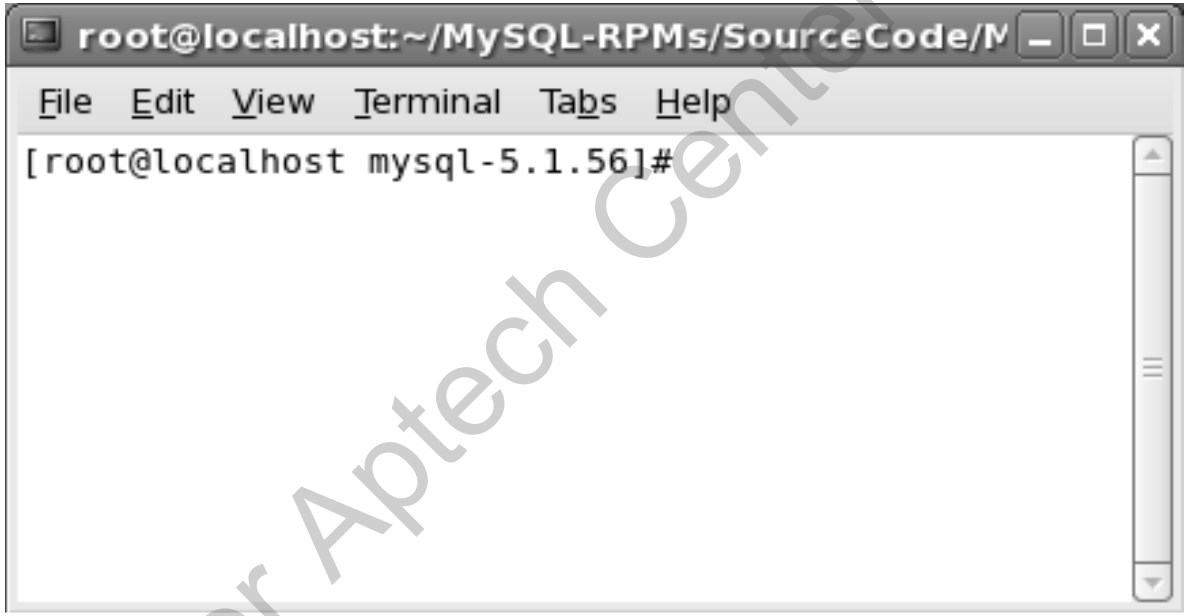
- Browse to the **mysql** folder in the Extract in folder drop-down box
- Click **Extract**
- The application extracts the package contents
- Right-click the **mysql-5.1.56.tar.gz** file
- Select **Extract Here** from the popup menu



- After extracting the package contents, a symbolic link will be created
- A symbolic link enables to move a database directory on a specific disk
- The link will be named as root and will be use to start the MySQL client

- Right-click the **mysql-5.1.56** folder and select **Open In Terminal**

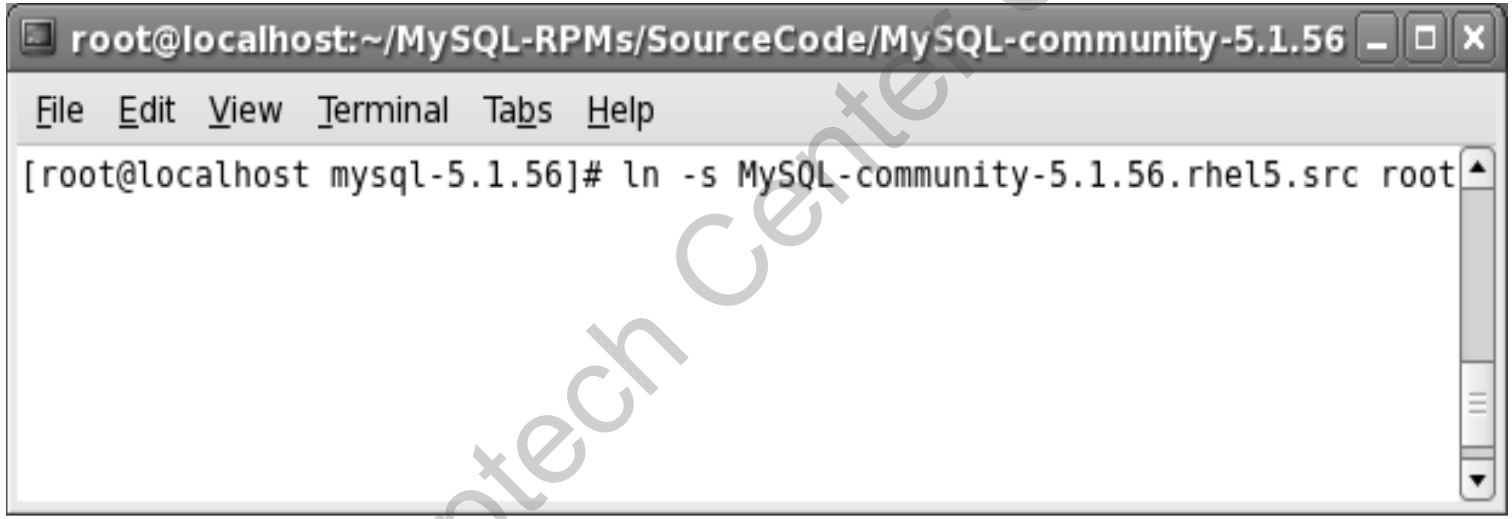
The Terminal window is displayed



- Enter the following command at the command prompt:

```
ln –s MySQL-community-5.1.56.rhel5.src root
```

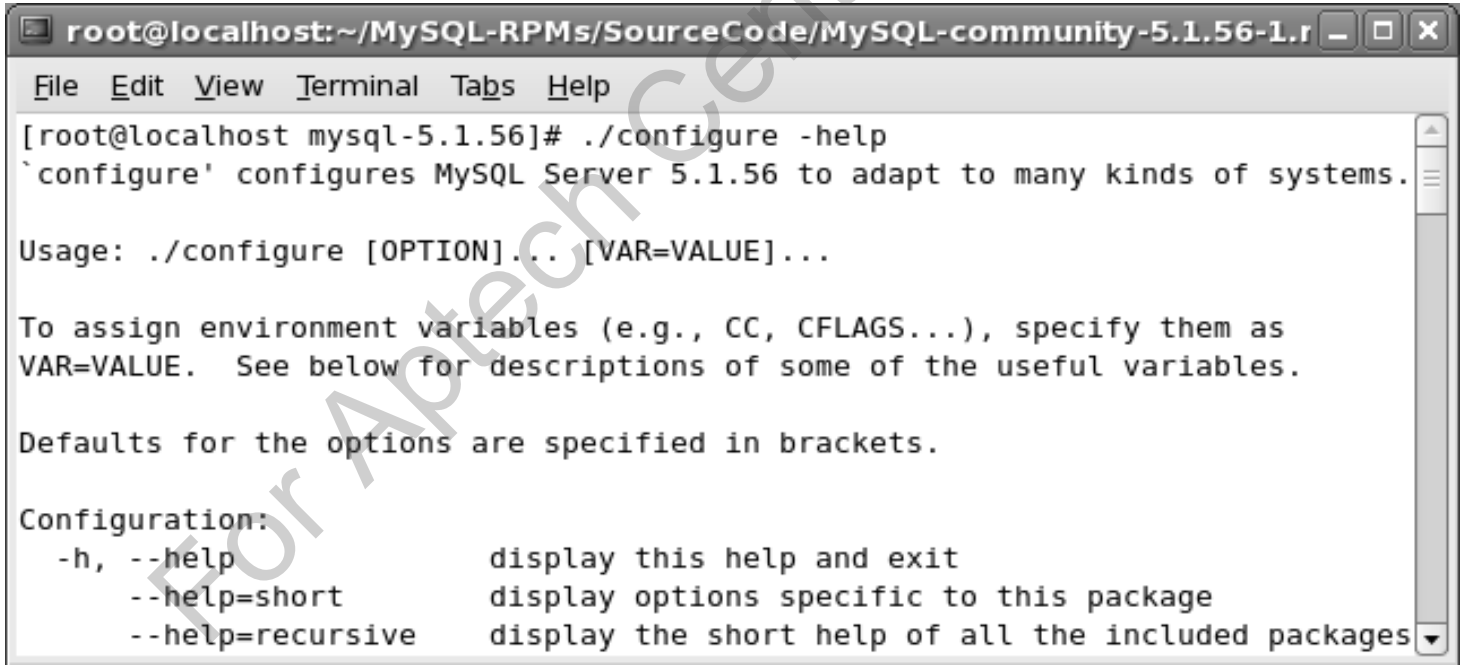
Figure displays the output of the command



- To view the options for configuration, enter the following command at the command prompt:

```
./configure –help
```

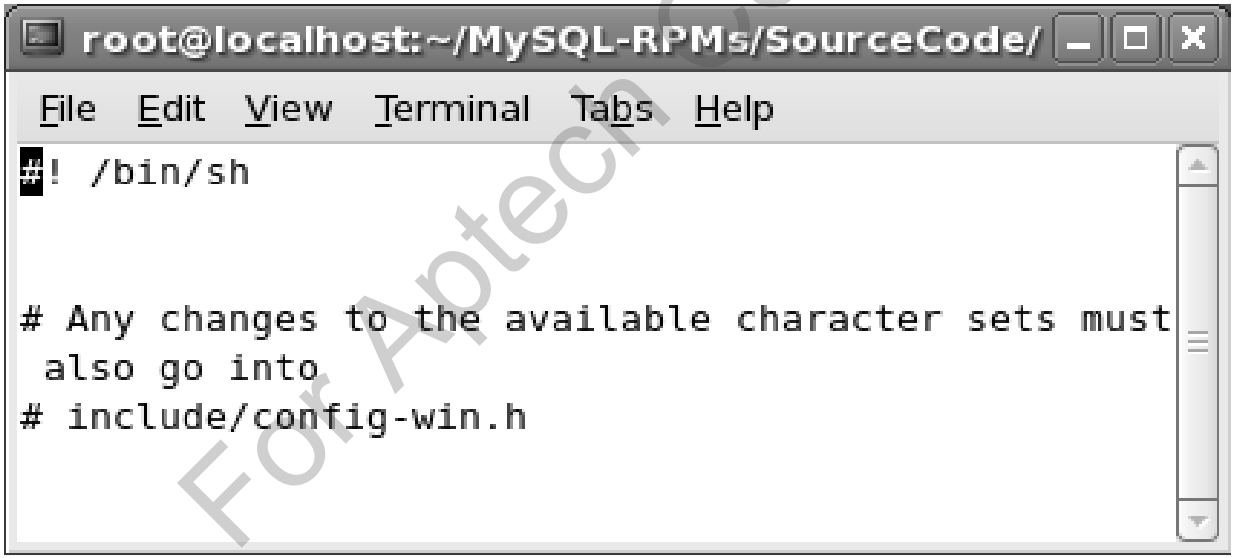
Figure displays the output of the command



- To open the configuration file, enter the following command at the command prompt:

```
vi configure
```

Figure displays the configuration file in vi editor



- To compile only MySQL client and library programs without the server, use configure with the --without-server option as shown :

```
./configure --without-server
```

- To relocate log files and database directories from `/usr/local/var` location, use configure with the --prefix option

```
./configure --prefix=/usr/local/mysql
./configure --prefix=/usr/local\--
localstatedir=/usr/local/mysql/data
```

- The first command changes the installation default location from `/usr/local to /usr/local/mysql`
- The second command maintains the chosen default installation location, and places the database directories from `/usr/local/var to /usr/local /mysql/ data`

- To build binary distributions, to increase the speed, or to work with the bugs, use configure with the `–with-client-Idflags` option

```
./configure –with-client-Idflags=-all-static\--with-mysqld-Idflags=-all-static
```

- To configure MySQL for not using `DEFAULT` value in the columns that cannot contain `NULL` values. Use configure with the option `DDONT_USE_DEFAULT_FIELDS` as shown:

```
CXXFLAGS=-DDONT_USE_DEFAULT_FIELDS./configure
```

- `CXXFLAGS` is a flag used for C++ compiler this is one of the environment variables. With the help of this command, it is specified that no columns will be accepting `NULL` value. This will help the `INSERT` command to avoid errors while inserting values in the tables

- To change the default character set, use configure with the `--with-charset` option as shown:

```
./configure --with-charset=CHARSET
```

- You can use the character sets, such as `big5`, `dec8`, `cp850`, `hp8`, `koi8r`, `latin1`, `latin2`, `swe7`, `ascii`, `ujis`, `sjis`, `hebrew`, `tis620`, `euckr`, `koi8u`, `gb2312`, `greek`, `cp1250`, `gbk`, `latin5`, `armscii8`, `utf8`, `ucs2`, `cp866`, `keybcs2`, `macce`, `macroman`, `cp852`, `latin7`, `utf8mb4`, `cp1251`, `utf16`, `cp1256`, `cp1257`, `utf32`, `binary`, `geostd8`, `cp932`, and `eucjpms` as the default character set in MySQL

- To configure MySQL with codes for debugging, use configure with the --with-debug option as shown:

```
./configure --with-debug
```

- You can debug errors and get the output with the help of this command

Controlling MySQL Options Using my.cnf file

- MySQL reads the default startup options for the server and the client and are stored in the `my.cnf` file
- On Microsoft Windows OS , MySQL reads the default options from `my.ini` file and MySQL Server Instance Configuration wizard generates this file and stores it in the MySQL Server 5.1 folder under the **C:\Program Files** folder

On the Red Hat Enterprise Linux platform, the files from which MySQL reads default options are listed in table

File	Purpose
/etc/my.cnf	Defines global options
/etc/mysql/my.cnf	Defines global options
$MYSQL_HOME/my.cnf	Defines server specific options
~/.my.cnf	Defines user specific options

- The programs that support option files are as follows:

```
mysql, mysqladmin, mysqld, mysqld_safe,
mysql.server, mysqldump, mysqlimport,
mysqlshow, mysqlcheck, myisamchk, and
myisampack
```

- An option file consists of the following details:
  - **Comments** - starts lines with symbols, such as '#' or ';'. A comment is non-executable statement in a file that is added to provide extra information to the user
  - **Group** - specifies the name for which the user wants to set the options
  - **Option** - specifies the --option on the command line
  - **option=value** - specifies the value for the option. It is the same as specifying --option=value on the command line
  - **set-variable=variable value** - assigns a variable. It is the same as --set-variable variable=value on the command line

- To open the **my.cnf** file:
  - Browse to the **mysql-test** folder under the mysql source code folder
  - Right-click the include folder and select **Open In Terminal**
  - The Terminal window appears
  - Enter the following command at the command prompt:

```
vi default_my.cnf
```

Figure displays the output of the command

root@localhost:~/MySQL-RPMs/SourceCode/MySQL-community-5.1.56-1.rhel

File Edit View Terminal Tabs Help

```
# Use default setting for mysqld processes
!include default_mysqld.cnf

[mysqld.1]

# Run the master.sh script before starting this process
#!run-master-sh

log-bin=                master-bin


[mysqlbinlog]
disable-force-if-open

# mysql_fix_privilege_tables.sh does not read from [client] so it
# need its own section
[mysql_fix_privilege_tables]
socket=                 @client.socket
port=                   @client.port
user=                   @client.user
password=               @client.password

[ENV]
"default_my.cnf" 25L, 597C
```

- In figure, the lines beginning with the # symbol are comments
- These lines are not executable and provide information about this file
- The file contains:
  - Socket
  - Port Number
  - User Name
  - Password

Summary

- You can use binary distribution format instead of source distribution format while installing MySQL. After the installation of binary distribution, default directories are created in the source directory
- Binary distribution format contains setup program that installs every component for the server from the start. Source distribution format contains all the codes and support files for making the files executable
- Solaris, Linux, Windows XP/2003/Vista/2007, Mac OS X, FreeBSD, and AIX are the different operating systems that support MySQL
- You can customize the configuration of MySQL using `./configure` command. You can also use various options of the configure command to configure MySQL on the command line

Summary

- The environment variables enable to edit or alter the configure file
- MySQL can be configured using the combination of command-line options, configuration files, and environment variables
- The programs like `mysql`, `mysqladmin`, `mysqld`, `mysqld_safe`, `mysql.server`, `mysqldump`, `mysqlimport`, `mysqlshow`, `mysqlcheck`, `myisamchk`, and `myisampack` supports option files of my.cnf file
- The OS can be configured to start MySQL at startup