Getting Started with MySQL

Abstract

MySQL is the world's most popular open-source database. Despite its powerful features, MySQL is simple to set up and easy to use. Below are some instructions to help you get MySQL up and running in a few easy steps. We also explain how to perform some basic operations with MySQL using the mysql client.

Notes

- The following instructions do not necessarily apply to versions of MySQL older than MySQL 5.7.
- These are instructions for a fresh installation only. If you are already using MySQL and want to upgrade to a newer version, see Upgrading MySQL.

For legal information, see the Legal Notices.

For help with using MySQL, please visit the MySQL Forums, where you can discuss your issues with other MySQL users.

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Installing and Starting MySQL

There are different ways to install MySQL. The following covers the easiest methods for installing and starting MySQL on different platforms.

- Linux. The easiest way to install MySQL is to use the MySQL repositories:
 - For Yum-based Linux distributions like Oracle Linux, Red Hat Enterprise Linux, and Fedora, follow the instructions in A Quick Guide to Using the MySQL Yum Repository. If your system cannot use the MySQL Yum repository for some reason, follow the instructions in Installing MySQL on Linux Using RPM Packages from Oracle.
 - For APT-based distributions like Debian and Ubuntu, follow the instructions in A Quick Guide to Using the MySQL APT Repository. If your system cannot use the MySQL APT repository for some reason, follow the instructions in Installing MySQL on Linux Using Debian Packages from Oracle.
 - For SUSE Linux Enterprise, follow the instructions in A Quick Guide to Using the MySQL SLES Repository. If your system cannot use the MySQL SUSE repository for some reason, follow the instructions in Installing MySQL on Linux Using RPM Packages from Oracle.

For Linux distributions that do not support the MySQL repositories or the installation packages mentioned above, you can install MySQL using generic binaries:

- Download the .tar or .tar.gz archive for the generic binaries for Linux from the Download MySQL Community Server page.
- See Installing MySQL on Unix/Linux Using Generic Binaries for instructions on installing the binaries.
- After installing the binaries, following the instructions given in Initializing the Data Directory. It is especially important to note the random root password generated for you during the initialization process; see Initializing the Data Directory for more detail.
- Next, follow the instructions given in Starting the Server.

Detailed instructions, as well as other methods for installation, can be found in Installing MySQL on Linux.

• **Microsoft Windows.** The recommended way to install MySQL on Microsoft Windows is to use the MySQL Installer; see MySQL Installer Method on how to download and run the MySQL Installer. For a detailed explanation for each step of the installation wizard, see MySQL Installer for Windows.

If you have chosen to configure MySQL as a Windows service during the installation process, which is the default option (see Windows Service for details), the MySQL server will start automatically after the installation process is completed.

Detailed information regarding Windows installation, including alternative installation methods and instructions for troubleshooting, can be found in Installing MySQL on Microsoft Windows.

• macOS. The recommended way for installing MySQL on macOS is to use the macOS installer package. See Installing MySQL on macOS Using Native Packages on how to download and run the installer package, and how to start the MySQL server afterward.

Detailed information regarding installation on macOS can be found in Installing MySQL on macOS.

• Other platforms. For installations on other platforms (for example, FreeBSD and Solaris), as well as installation methods not covered above, see Installing MySQL.

Connecting to the MySQL Server with the mysql Client

Once your MySQL server is up and running, you can connect to it as the superuser root with the mysql client.

• On Linux, enter the following command at the command line terminal (for installation using generic binaries, you might need to go first to the bin folder under the base directory of your MySQL installation):

\$> mysql -u root -p

• On Windows, click Start, All Programs, MySQL, MySQL 5.7 Command Line Client (or MySQL 8.0 Command Line Client, respectively). If you did not install MySQL with the MySQL Installer, open a command prompt, go to the bin folder under the base directory of your MySQL installation, and issue the following command:

C:\> mysql -u root -p

You are then asked for the root password, which was assigned in different manners according to the way you installed MySQL. The installation and initialization instructions given above already explain the root password, but here is a quick summary:

• For installations using the MySQL Yum repository, MySQL SUSE repository, or RPM packages directly downloaded from Oracle, the generated root password is in the error log. View it with, for example, the following command:

\$> sudo grep 'temporary password' /var/log/mysqld.log

- For installations using the MySQL APT repository or Debian packages directly downloaded from Oracle, you should have already assigned the root password yourself; if you have not done that for some reason, see the "Important" note here or How to Reset the Root Password.
- For installations on Linux using the generic binaries followed by a data directory initialization using mysqld --initialize as discussed in Initializing the Data Directory, the generated root password is displayed in the standard error stream during the data directory's initialization:

```
[Warning] A temporary password is generated for root@localhost:
iTag*AfrH5ej
```

Note

Depending on the configuration you used to initialize the MySQL server, the error output might have been directed to the MySQL error log; go there and check for the password if you do not see the above message on your screen. The error log is a file with a .err extension, usually found under the server's data directory

(the location of which depends on the server's configuration, but is likely to be the data folder under the base directory of your MySQL installation, or the /var/lib/mysql folder).

If you have initialized the data directory with mysqld --initialize-insecure instead, the root password is empty.

• For installations on Windows using the MySQL Installer and OS X using the installer package, you should have assigned a root password yourself.

If you have forgotten the root password you have chosen or have problems finding the temporary root password generated for you, see How to Reset the Root Password.

Once you are connected to the MySQL server, a welcome message is displayed and the mysql> prompt appears, which looks like this:

Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 4 Server version: 5.7.32 MySQL Community Server (GPL) Copyright (c) 2000, 2020, Oracle and/or its affiliates. Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners. Type 'help;' or '\h' for help. Type '\c' to clear the current input statement. mysql>

At this point, if you have logged in using a temporary **root** password that was generated during the installation or initialization process (which will be the case if you installed MySQL using the MySQL Yum repository, or using RPM packages or generic binaries from Oracle), change your **root** password by typing the following statement at the prompt:

mysql> ALTER USER 'root'@'localhost' IDENTIFIED BY 'new_password';

Until you change your root password, you will not be able to exercise any of the superuser privileges, even if you are logged in as root.

Here are a few useful things to remember when using the mysql client:

- Client commands (for example, help, quit, and clear) and keywords in SQL statements (for example, SELECT, CREATE TABLE, and INSERT) are not case-sensitive.
- Column names are case-sensitive. Table names are case-sensitive on most Unix-like platforms, but
 not case-sensitive on Windows platforms. Case-sensitivity during string comparison depends on the
 character collation you use. In general, it is a good idea to treat all identifiers (database names, table
 names, column names, etc.) and strings as case-sensitive. See Identifier Case Sensitivity and Case
 Sensitivity in String Searches for details.
- You can type your SQL statements on multiple lines by pressing Enter in the middle of it. Typing a semicolon (;) followed by an Enter ends an SQL statement and sends it to the server for execution; the same happens when a statement is ended with \g or \G (with the latter, returned results are displayed vertically). However, client commands (for example, help, quit, and clear) do not require a terminator.

To disconnect from the MySQL server, type QUIT or q at the client:

mysql> QUIT

Some Basic Operations with MySQL

Here are some basic operations with the MySQL server. SQL Statements explains in detail the rich syntax and functionality of the SQL statements that are illustrated below.

Showing existing databases. Use a SHOW DATABASES statement:

my	/sql>	SHC	DW DI	ATABAS	ES;
+-					+
	Datab	base	5		
+-					+
	info	cmat	ion_	_schem	a
	mysql	L			
	perfo	orma	ance_	_schem	a
	sys				
+-					+
4	rows	in	set	(0.00	sec

Creating a new database. Use a CREATE DATABASE statement:

```
mysql> CREATE DATABASE pets;
Query OK, 1 row affected (0.01 sec)
```

Check if the database has been created:

```
mysql> SHOW DATABASES;
+-----+
| Database |
+----+
| information_schema |
| mysql |
| performance_schema |
| pets |
| sys |
+----+
5 rows in set (0.00 sec)
```

Creating a table inside a database. First, pick the database in which you want to create the table with a USE statement:

mysql> USE pets Database changed

The USE statement tells MySQL to use pets as the default database for subsequent statements. Next, create a table with a CREATE TABLE statement:

CREA	LE IABLE	Cals											
(
id			INT unsigned	NOT	NULL	AUTO_INC	REMENT,	#	Unique I	D fo	or th	ne record	d
nai	ne		VARCHAR(150)	NOT	NULL,	,		#	Name of	the	cat		
OW	ner		VARCHAR(150)	NOT	NULL,	,		#	Owner of	the	e cat	ī.	
bi	th		DATE NOT NULI	_,				#	Birthday	of	the	cat	
PR	MARY KE	Y	(id)					#	Make the	id	the	primary	key
);													

Data types you can use in each column are explained in Data Types. Primary Key Optimization explains the concept of a primary key. What follows a # on each line is a comment, which is ignored by the mysql client; see Comments for other comment styles.

Check if the table has been created with a SHOW TABLES statement:

mysql> SHOW TABLES;

```
+----+
| Tables_in_pets |
+----+
| cats |
+----+
1 row in set (0.00 sec)
```

DESCRIBE shows information on all columns of a table:

mysql> DESCRIBE cats;

+		+ Null		Default	Extra			
id name owner birth	<pre>int(10) unsigned varchar(150) varchar(150) date</pre>	NO NO NO NO	PRI	NULL NULL NULL NULL	auto_increment			
4 rows in set (0.00 sec)								

Adding records into a table. Use, for example, an INSERT...VALUES statement:

```
INSERT INTO cats ( name, owner, birth) VALUES
( 'Sandy', 'Lennon', '2015-01-03' ),
( 'Cookie', 'Casey', '2013-11-13' ),
( 'Charlie', 'River', '2016-05-21' );
```

See Literal Values for how to write string, date, and other kinds of literals in MySQL.

Retrieving records from a table. Use a **SELECT** statement, and "*" to match all columns:

mysql>	SELECT * FROM cats;						
id	name	owner	birth				
1 2 3	Sandy Cookie Charlie	Lennon Casey River	2015-01-03 2013-11-13 2016-05-21				
++	in set (0		+				

3 rows in set (0.00 sec)

To select specific columns and rows by a certain condition using the WHERE clause:

```
mysql> SELECT name FROM cats WHERE owner = 'Casey';
+-----+
| name |
+-----+
| Cookie |
+-----+
1 row in set (0.00 sec)
```

Deleting a record from a table. Use a DELETE statement to delete a record from a table, specifying the criterion for deletion with the WHERE clause:

```
mysql> DELETE FROM cats WHERE name='Cookie';
Query OK, 1 row affected (0.05 sec)
mysql> SELECT * FROM cats;
+----+
| id | name | owner | birth |
+----+
| 1 | Sandy | Lennon | 2015-01-03 |
| 3 | Charlie | River | 2016-05-21 |
+----+
2 rows in set (0.00 sec)
```

Adding or deleting a column from a table. Use an ALTER TABLE...ADD statement to add a column. You can use, for example, an AFTER clause to specify the location of the new column:

mysql> ALTER TABLE cats ADD gender CHAR(1) AFTER name; Query OK, 0 rows affected (0.24 sec) Records: 0 Duplicates: 0 Warnings: 0

Use **DESCRIBE** to check the result:

				L	
Field	Туре	Null	Кеу	Default	Extra
id name gender owner birth	<pre>int(10) unsigned varchar(150) char(1) varchar(150) date</pre>	NO NO YES NO NO	PRI	NULL NULL NULL NULL NULL	auto_increment

5 rows in set (0.00 sec)

mycal > DESCRIBE cate:

SHOW CREATE TABLE shows a CREATE TABLE statement, which provides even more details on the table:

Use ALTER TABLE...DROP to delete a column:

```
mysql> ALTER TABLE cats DROP gender;
Query OK, 0 rows affected (0.19 sec)
Records: 0 Duplicates: 0 Warnings: 0
mysql> DESCRIBE cats;
+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+
| id | int(10) unsigned | NO | PRI | NULL | auto_increment |
| name | varchar(150) | NO | NULL | uto_increment |
| owner | varchar(150) | NO | NULL | uto_increment |
| birth | date | NO | NULL | uto_increment |
| birth | date | NO | NULL | uto_increment | uto_increment | uto_increment | uto_increment | utoo_increment | utoo_incr
```

4 rows in set (0.00 sec)

See the Tutorial for more instructions on how to work with the MySQL server.

Other Important Tasks to Perform

Create more user accounts. root is a superuser account for administration of the MySQL server which should not be used for general operations. On how to create user accounts of various kinds, see Adding Accounts, Assigning Privileges, and Dropping Accounts.

Configure MySQL to be managed with systemd. If you have installed MySQL on a systemd platform using generic binaries and want it to be managed with systemd, see Managing MySQL Server with systemd.

Troubleshooting

The following are resources for troubleshooting some problems you might run into:

- Troubleshooting Problems Starting the MySQL Server
- Troubleshooting Problems Connecting to MySQL
- · How to Reset the Root Password
- Common Errors When Using MySQL Programs

Other Helpful Resources

- MySQL Reference Manual (select the version with the version switch)
- Download MySQL Community Server
- Installing MySQL
- Using Option Files
- Tutorial on using the mysql client program to work with MySQL
- What Is New in MySQL 8.0
- Using MySQL as a Document Store

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