ITC 250/CPET 499 Web Systems
Nov. 13, 2018
Managing MySQL Database – Commands Line

MySQL Topics of Discussion

A) **SQL Statement Syntax**
B) **SQL Statement Examples**

MySQL Documentation, https://dev.mysql.com/doc/

- **MySQL 8.0 Reference Manual, 2018/11/13, https://dev.mysql.com/doc/refman/8.0/en/**
- **MySQL 8.0 Release Notes**

A) SQL Statement Syntax (Version 5.7, 10/25/2017)

1. **Data Definition Statements, https://dev.mysql.com/doc/refman/5.7/en/sql-syntax-data-definition.html**
    - ALTER: DATABASE, EVENT, FUNCTION, INSTANCE, LOGFILE GROUP, SERVER, TABLE, TABLE SPACE
    - CREATE: DATABASE, EVENT, FUNCTION, INDEX, LOGFILE GROUP, PROCEDURE, SERVER, TABLE, TABLE SPACE, VIEW
    - DROP: DATABASE, EVENT, FUNCTION, INSTANCE, LOGFILE GROUP, SERVER, TABLE, TABLE SPACE
    - RENAME TABLE
    - TRUNCATE TABLE
2. **Data Manipulation Statements, https://dev.mysql.com/doc/refman/5.7/en/sql-syntax-data-manipulation.html**
    - CALL, DELETE, DO HANDLER, INSERT, LOAD DATA INFILE, LOAD XML, REPLACE
    - SELECT, SUBQUERY, UPDATE
3. **Transactional and Locking Statements, https://dev.mysql.com/doc/refman/5.7/en/sql-syntax-transactions.html**
    - START TRANSACTION, COMMIT, ROLLBACK
    - SAVEPOINT, ROLLBACK TO SAVEPOINT, RELEASE SAVEPOINTS
    - LOCK TABLES, UNLOCK TABLES
    - SET TRANSACTION
4. **Replication Statements**
    - Controlling Masters
    - Controlling Slave Servers
    - Controlling Group Replication
5. **Prepared SQL Statements**
    - PREPARE, EXECUTE, DEALLOCATE PREPARE
6. **Compound Statement**
    - Begin … End
    - Statement Label
    - Declare
    - Variables in Stored Programs
    - Flow Control Statements
    - Cursors
    - Condition Handling

7. **Database Administration Statements**
    - Account Management:
        - ALTER USER
        - CREATE USER
        - DROP USER
        - GRANT
        - RENAME USER
        - REVOKE
        - SET PASSWORD
    - Table Maintenance:
    - Plugin and User-Defined Function
    - SET
    - SHOW
    - Other Administration Statements
        - FLUSH, RESET, SHUTDOWN
        - BINLOG, CACHE INDEX, KILL, LOAD INDEX INTO CACHE
8. **Utility Statements**
    - DESCRIBE
    - EXPLAIN
    - HELP
    - USE

B) Examples of MySQL Statements/Commands

Run the mysql Tool on XAMPP Server

- Start your XAMPP Console
- Click on Shell

```
Setting environment for using XAMPP for Windows.
Administrator@DESKTOP-H3PFGPI c:\xampp
# dir
 Volume in drive C is OS
 Volume Serial Number is 20AE-F744

 Directory of c:\xampp

09/25/2018  10:10 AM    <DIR>          .
09/25/2018  10:10 AM    <DIR>          ..
09/14/2018  07:07 PM    <DIR>          anonymous
09/14/2018  07:08 PM    <DIR>          apache
06/07/2013  06:15 AM               436 apache_start.bat
06/07/2013  06:15 AM               140 apache_stop.bat
…
09/14/2018  07:19 PM    <DIR>          cgi-bin
…
10/09/2018  09:22 AM    <DIR>          htdocs
09/14/2018  07:06 PM    <DIR>          img
```

```
…
09/14/2018  07:10 PM    <DIR>          mysql
06/07/2013  06:15 AM               481 mysql_start.bat
06/07/2013  06:15 AM               220 mysql_stop.bat
03/13/2017  06:04 AM               824 passwords.txt
09/14/2018  07:13 PM    <DIR>          perl
10/09/2018  08:50 AM    <DIR>          php
10/09/2018  08:33 AM    <DIR>          phpMyAdmin
Administrator@LIN-PC c:\xampp\mysql
#
```

Root Password is Not Configured

```
Administrator@LIN-PC c:\xampp\mysql
# mysql -u root
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 2
Server version: 10.1.35-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.
Type 'help;' or '\h' for help. Type '\c' to clear the current input
statement.
MariaDB [(none)]> exit
Bye

Administrator@DESKTOP-H3PFGPI c:\xampp
# cd mysql

Administrator@DESKTOP-H3PFGPI c:\xampp\mysql
# cd bin

Administrator@DESKTOP-H3PFGPI c:\xampp\mysql\bin
```

Set/Reset Root Password as 'secret'

```
Administrator@LIN-PC c:\xampp\mysql\bin
# mysqladmin -u root password secret
# cd ..
# mysql –u root –p
Enter Passwords: ******
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 4
Server version: 10.1.356-MariaDB mariadb.org binary distribution
Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.
Type 'help;' or '\h' for help. Type '\c' to clear the current input
statement.

MariaDB [(none)]>
```

SQL Query Statements

- **USE**
- **SHOW**
- **SELECT/FROM**
- **CREATE**
- **DESCRIBE**
- **DROP**
- **INSERT INTO**
- **databases, TABLE, VALUES**

```
MariaDB [(none)]> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| phpmyadmin         |
| test               |
+--------------------+
5 rows in set (0.05 sec)
MariaDB [(none)]>
```

SQL Query

- **use mysql;**
- **show tables;**

```
MariaDB [mysql]> use mysql;
Database changed
MariaDB [mysql]> show tables;
+---------------------------+
| Tables_in_mysql           |
+---------------------------+
| column_stats              |
| columns_priv              |
| db                        |
| event                     |
| func                      |
| general_log               |
| gtid_slave_pos            |
| help_category             |
| help_keyword              |
| help_relation             |
| help_topic                |
| host                      |
| index_stats               |
| innodb_index_stats        |
| innodb_table_stats        |
| ndb_binlog_index          |
| plugin                    |
| proc                      |
```

```
| procs_priv                |
| proxies_priv              |
| roles_mapping             |
| servers                   |
| slave_master_info         |
| slave_relay_log_info      |
| slave_worker_info         |
| slow_log                  |
| table_stats               |
| tables_priv               |
| time_zone                 |
| time_zone_leap_second     |
| time_zone_name            |
| time_zone_transition      |
| time_zone_transition_type |
| user                      |
+---------------------------+
34 rows in set (0.04 sec)
```

```
MariaDB [mysql]> select Host, User, Password from user;
+-----------+------+-------------------------------------------+
| Host      | User | Password                                  |
+-----------+------+-------------------------------------------+
| localhost | root | *14E65567ABDB5135D0CFD9A70B3032C179A49EE7 |
| 127.0.0.1 | root |                                           |
| ::1       | root |                                           |
| localhost |      |                                           |
| localhost | pma  |                                           |
+-----------+------+-------------------------------------------+
5 rows in set (0.00 sec)

MariaDB [mysql]>
```

Example: Use mysql database, create a userdb2 table

```
MariaDB [(none)]> use mysql;
Database changed
MariaDB [mysql]> CREATE TABLE userdb2(
    -> userID int,
    -> firstName varchar(20),
    -> lastName varchar(30),
    -> emailAddr varchar(50),
    -> facebookURL varchar(100),
    -> twitterHandle varchar(20)
    -> );
Query OK, 0 rows affected (0.33 sec)
```

SHOW all tables within the mysql database

```
MariaDB [mysql]> SHOW tables;
+---------------------------+
| Tables_in_mysql           |
+---------------------------+
| column_stats              |
| columns_priv              |
| db                        |
| event                     |
| func                      |
| general_log               |
| gtid_slave_pos            |
| help_category             |
| help_keyword              |
| help_relation             |
| help_topic                |
| host                      |
| index_stats               |
| innodb_index_stats        |
| innodb_table_stats        |
| ndb_binlog_index          |
| plugin                    |
| proc                      |
| procs_priv                |
| proxies_priv              |
| roles_mapping             |
| servers                   |
| slave_master_info         |
| slave_relay_log_info      |
| slave_worker_info         |
| slow_log                  |
| table_stats               |
| tables_priv               |
| time_zone                 |
| time_zone_leap_second     |
| time_zone_name            |
| time_zone_transition      |
| time_zone_transition_type |
| user                      |
| userdb                    |
| userdb2                   |
+---------------------------+
36 rows in set (0.01 sec)
```

```
MariaDB [mysql]> DESCRIBE userdb2;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| userID        | int(11)     | YES  |     | NULL    |       |
| firstName     | varchar(20) | YES  |     | NULL    |       |
| lastName      | varchar(30) | YES  |     | NULL    |       |
| emailAddr     | varchar(50) | YES  |     | NULL    |       |
| facebookURL   | varchar(100)| YES  |     | NULL    |       |
```

```
| twitterHandle | varchar(20)  | YES  |     | NULL    |       |
+---------------+--------------+------+-----+---------+-------+
6 rows in set (0.14 sec)
```

Insert one Row of Data Into "userdb2" database, then exit MySQL

```
MariaDB [mysql]> INSERT INTO userdb2
    -> VALUES (1, "Paul", "Lin", "pilin@purdue.edu",
    -> "https://www.facebook.com/paul.lin.3110567",
    -> "@pihailin631");
Query OK, 1 row affected (0.08 sec)

MariaDB [mysql]> SELECT * FROM userdb2;
+--------+-----------+----------+-----------------+-----------------------------------------+---------------+
| userID | firstName | lastName | emailAddr       | facebookURL                             | twitterHandle |
+--------+-----------+----------+-----------------+-----------------------------------------+---------------+
|      1 | Paul      | Lin      | pilin@purdue.edu | https://www.facebook.com/paul.lin.3110567 | @pihailin632  |
+--------+-----------+----------+-----------------+-----------------------------------------+---------------+
1 row in set (0.00 sec)


MariaDB [mysql]> SELECT firstName, lastName, twitterHandle FROM
userdb2;
+-----------+----------+---------------+
| firstName | lastName | twitterHandle |
+-----------+----------+---------------+
| Paul      | Lin      | @pihailin631  |
+-----------+----------+---------------+
1 row in set (0.00 sec)

MariaDB [mysql]> select facebookURL from userdb2 where firstName
='Paul';
+-----------------------------------------+
| facebookURL                             |
+-----------------------------------------+
| https://www.facebook.com/paul.lin.3110567 |
+-----------------------------------------+
1 row in set (0.00 sec)

MariaDB [mysql]>exit
Bye

Administrator@LIN-PC c:\xampp\mysql
```

The created "userdb2" table definition is saved with an .frm extension, which can be located in the following location :

```
Administrator@LIN-PC c:\xampp\mysql
# cd data
Administrator@LIN-PC c:\xampp\mysql\data
# cd mysql
Administrator@LIN-PC c:\xampp\mysql\data\mysql
Directory of c:\xampp\mysql\data\mysql
# dir
10/31/2016  03:03 PM    <DIR>          .
10/31/2016  03:03 PM    <DIR>          ..
```

```
…
10/26/2017  01:08 PM               802 userdb2.frm
10/26/2017  01:18 PM            98,304 userdb2.ibd
             100 File(s)      1,763,746 bytes
               2 Dir(s)  294,783,545,344 bytes free
```

Userdb2.ibd data file contains InnoDB table and its indexes.

References

- **11.1 MySQL .frm File Format, https://dev.mysql.com/doc/internals/en/frm-file-format.html**
- **15.1 Introduction to InnoDB (General Purpose Storage Engine), http://dev.mysql.com/doc/refman/5.7/en/innodb-introduction.html**
- **15.7.4 InnoDB File-Per-Table Tablespace, http://dev.mysql.com/doc/refman/5.7/en/innodb-multiple-tablespaces.html**