

Laboratory work 8

USER RIGHTS MANAGEMENT

Goal: learn basics of user accounts and privileges using the MySQL database.

Progress

1. Create new user accounts

The MySQL database management system is a multi-user environment, so different accounts with different privileges can be created to access the supply database tables.

The supply manager's account can be provided with privileges to view the supplier, supplier_org, supplier_person and contract tables, add new records, delete and update existing records in the data tables.

Database administrator can be given wider rights (privileges to create tables, editing and deleting existing tables, creating and editing user accounts, etc.).

For a warehouse employee it is enough just to view the contract and supplied tables, as well as add new records, delete and update already existing records in the supplied table.

Consider creating accounts for different database users.

```
CREATE USER 'admin'@'localhost' IDENTIFIED BY 'admin123';  
CREATE USER 'manager'@'localhost' IDENTIFIED BY 'manager123';  
CREATE USER 'storekeeper'@'localhost' IDENTIFIED BY 'storekeeper123';
```

These statements allow to create accounts for the following users:

- 1) administrator with the password «admin123»;
- 2) supply manager with the password «manager123»;
- 3) warehouse employee with the password «storekeeper123».

The DROP USER statement is used to delete an account. The change of user name in the account is performed with the operator RENAME USER %old_name% TO %new_name%.

Since all user accounts are stored in the mysql system user's table, you can check the creation of the accounts by using the following query (figure 8.1):

```
SELECT Host, User, Password FROM mysql.user;
```

Figure 8.1 shows a screenshot of a MySQL command-line interface (CLI) window titled "XAMPP for Windows". The window displays the output of the query `SELECT Host, User, Password FROM mysql.user;` executed in the MariaDB shell. The output is a table with 10 rows and 3 columns: Host, User, and Password. The first three rows show the root user for localhost, 127.0.0.1, and ::1. The remaining seven rows show other users: pma, supply_manager, manager, admin, and storekeeper, all for localhost. The passwords are displayed as hexadecimal strings.

Host	User	Password
localhost	root	
127.0.0.1	root	
::1	root	
localhost	pma	
localhost	supply_manager	*D3EA2B50EA2CDB63852452342425A884B6C6A8DC
localhost	supply_manager	*D3EA2B50EA2CDB63852452342425A884B6C6A8DC
localhost	manager	*1B2333B70420F3DB5F4F164A9B89E21810F06840
localhost	admin	*01A6717B58FF5C7EAF6CB7C96F7428EA65FE4C
localhost	storekeeper	*6A8DA8D9B9189005A0B1791874632DFD2DDD7DFA

10 rows in set (0.00 sec)

Figure 8.1

2. Assign privileges for created accounts

The above operators allow you to create, delete, and edit accounts, but they do not allow you to change user privileges – to tell the MySQL DBMS, which user is only allowed to read information or to read and edit, and who are given the rights to change the structure of the database and create accounts.

It is required to assign privileges for the created accounts.

```
GRANT ALL ON supply.* TO 'admin'@'localhost';

GRANT SELECT, INSERT, UPDATE, DELETE ON supply.supplier TO 'manager'@'localhost';
GRANT SELECT, INSERT, UPDATE, DELETE ON supply.supplier_org TO 'manager'@'localhost';
GRANT SELECT, INSERT, UPDATE, DELETE ON supply.supplier_person TO 'manager'@'localhost';
GRANT SELECT, INSERT, UPDATE, DELETE ON supply.contract TO 'manager'@'localhost';
GRANT SELECT ON supply.supplied TO 'manager'@'localhost';
GRANT EXECUTE ON supply.* TO 'manager'@'localhost';

GRANT SELECT, INSERT, UPDATE, DELETE ON supply.supplied TO 'storekeeper'@'localhost';
GRANT SELECT ON supply.contract TO 'storekeeper'@'localhost';
GRANT EXECUTE ON supply.* TO 'storekeeper'@'localhost';
```

The REVOKE operator is used to deprive the user of certain privileges. This operator does not delete accounts, but only cancels the previously granted privileges. Therefore, for the final removal of the account, you must use the operator DROP USER.

Check the privileges of the admin account granted with all rights at the supply database level using the following query (figure 8.2).

```
SELECT * FROM mysql.db
WHERE Db = 'supply';
```

XAMPP for Windows - mysql -u root -p

```
MariaDB [(none)]> SELECT * FROM mysql.db
-> WHERE Db = 'supply';
```

Host	Db	User	Select_priv	Insert_priv	Update_priv	Delete_priv	Create_priv	Drop_priv	Grant_priv	References_priv	Index_priv	Alter_priv	Create_tmp_table_priv	Lock_tables_priv	Create_view_priv	Show_view_priv	Create_routine_priv	Alter_routine_priv	Execute_priv	Event_priv	Trigger_priv
localhost	supply	admin	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
localhost	supply	manager	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
localhost	supply	storekeeper	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

3 rows in set (0.00 sec)

Figure 8.2

Similarly, you can check the privileges of the manager and storekeeper accounts, for which certain restrictions were encountered with the supply database tables (figure 8.3).

```
SELECT Db, User, Table_name, Table_priv FROM mysql.tables_priv
WHERE Db = 'supply';
```

XAMPP for Windows - mysql -u root -p

```
MariaDB [(none)]> SELECT Db, User, Table_name, Table_priv FROM mysql.tables_priv
-> WHERE Db = 'supply';
```

Db	User	Table_name	Table_priv
supply	manager	supplier	Select,Insert,Update,Delete
supply	manager	supplier_org	Select,Insert,Update,Delete
supply	manager	supplier_person	Select,Insert,Update,Delete
supply	manager	contract	Select,Insert,Update,Delete
supply	manager	supplied	Select
supply	storekeeper	supplied	Select,Insert,Update,Delete
supply	storekeeper	contract	Select

7 rows in set (0.00 sec)

Figure 8.3

In addition, certain users must also have privileges that allow them to use the views contained in the supply database. For example, the manager user should be given permissions to view the contract_supplier and supplier_info views, whereas only the contract_supplier view for the user storekeeper should be available.

3. Make a report for the laboratory work

The report should include the main stages of laboratory work and screenshots that demonstrate them.

4. Questions

1. What is the structure of a user account in the MySQL DBMS?
2. Which components a user account is contains of?
3. What is the purpose of each component of a user account?
4. How to view all user accounts?
5. What command is used to create a user account?
6. What command is used to delete a user account?
7. How to change a name of a user?
8. What statement is used to define certain privileges for a certain user account?
9. What operator is used to cancel given privileges?
10. Which privileges might be defined for a user account?
11. What levels of privileges do you know?
12. How to check the global privileges, database privileges, and table privileges?