

《数据库系统原理》实验报告（三）

题目：数据库安全性（实验三）

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实验环境：Docker + mariadb

实验步骤及结果截图：

(1) 在 sys 数据库中，创建表 studentA

```
关键字 字符类型 约束
*****
Sno      varchar2(9)  primary key
Sname    varchar2(20) unique
Ssex     varchar2(2)
Sage     smallint
Sdept    varchar2(20)
*****
```

```
MariaDB [(none)]> CREATE DATABASE IF NOT EXISTS sys;
Query OK, 0 rows affected, 1 warning (0.000 sec)

MariaDB [(none)]> use sys
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
```

```
MariaDB [sys]> create table studentA (
-> Sno varchar(9) primary key,
-> Sname varchar(20) unique,
-> Ssex varchar(2),
-> Sage smallint,
-> Sdept varchar(20)
-> );
Query OK, 0 rows affected (0.011 sec)

MariaDB [sys]> desc studentA
-> ;
+-----+-----+-----+-----+-----+
| Field | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| Sno   | varchar(9)    | NO   | PRI | NULL    |      |
| Sname | varchar(20)   | YES  | UNI | NULL    |      |
| Ssex  | varchar(2)    | YES  |     | NULL    |      |
| Sage  | smallint(6)   | YES  |     | NULL    |      |
| Sdept | varchar(20)   | YES  |     | NULL    |      |
+-----+-----+-----+-----+-----+
5 rows in set (0.001 sec)
```

(2) 向 table studentA 插入两个元组('200215121','Tom','m',20,'CS')、('200215122','Lily','f',19,'CS')

```
MariaDB [sys]> insert into studentA (Sno, Sname, Ssex, Sage, Sdept) values('200215121', 'Tom', 'm', 20, 'CS');
Query OK, 1 row affected (0.003 sec)

MariaDB [sys]> insert into studentA (Sno, Sname, Ssex, Sage, Sdept) values('200215122', 'Lily', 'f', 19, 'CS');
Query OK, 1 row affected (0.001 sec)

MariaDB [sys]> select* from studentA;
+-----+-----+-----+-----+-----+
| Sno      | Sname | Ssex | Sage | Sdept |
+-----+-----+-----+-----+-----+
| 200215121 | Tom   | m    | 20   | CS    |
| 200215122 | Lily  | f    | 19   | CS    |
+-----+-----+-----+-----+-----+
2 rows in set (0.000 sec)
```

- (3) 建立用户 masterA, 授予用户 masterA 以系统特权, 包括 create session、create table、create user、alter user 和 drop user 等, 并赋予其再授权的能力

```
MariaDB [mysql]> select Host,User,Password from user;
+-----+-----+-----+
| Host      | User      | Password |
+-----+-----+-----+
| localhost | mariadb.sys |          |
| localhost | root      | *B1F236299125243B3686EDBD2CACE9EF32A56D6D |
| %         | root      | *B1F236299125243B3686EDBD2CACE9EF32A56D6D |
| 127.0.0.1 | healthcheck | *B33693FBE57179A3DF91C2B3C9866D0E609BFF2C |
| ::1       | healthcheck | *B33693FBE57179A3DF91C2B3C9866D0E609BFF2C |
| localhost | healthcheck | *B33693FBE57179A3DF91C2B3C9866D0E609BFF2C |
| %         | liechain   | *FEB897008EB3E2A3665265D8A2EA01830B08A532 |
+-----+-----+-----+
```

```
MariaDB [mysql]> grant create, alter, drop on *.* to masterA identified by 'a' with grant option;
Query OK, 0 rows affected (0.001 sec)

MariaDB [mysql]> select Host,User,Password from user;
+-----+-----+-----+
| Host      | User      | Password |
+-----+-----+-----+
| localhost | mariadb.sys |          |
| localhost | root      | *B1F236299125243B3686EDBD2CACE9EF32A56D6D |
| %         | root      | *B1F236299125243B3686EDBD2CACE9EF32A56D6D |
| 127.0.0.1 | healthcheck | *B33693FBE57179A3DF91C2B3C9866D0E609BFF2C |
| ::1       | healthcheck | *B33693FBE57179A3DF91C2B3C9866D0E609BFF2C |
| localhost | healthcheck | *B33693FBE57179A3DF91C2B3C9866D0E609BFF2C |
| %         | liechain   | *FEB897008EB3E2A3665265D8A2EA01830B08A532 |
| %         | masterA    | *667F407DE7C6AD07358FA38DAED7828A72014B4E |
+-----+-----+-----+
8 rows in set (0.001 sec)
```

- (4) (PPT 似乎跳过这里)
- (5) 删除 masterA 的 create user、alter user 和 drop user 的系统特权

```
MariaDB [mysql]> revoke create, alter, drop on *.* from masterA;
Query OK, 0 rows affected (0.001 sec)

MariaDB [mysql]> flush privileges;
Query OK, 0 rows affected (0.000 sec)
```

- (6) 在 masterA 用户下尝试查询 table studentA(注意使用 sys.studentA)

```
# mariadb -u masterA -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 5
Server version: 11.1.2-MariaDB-1:11.1.2+maria~ubu2204 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)]> use sys
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
MariaDB [sys]> 
```

```
MariaDB [sys]> select * from studentA;
ERROR 1142 (42000): SELECT command denied to user 'masterA'@'localhost' for table 'sys`.`studentA`
```

- (7) 授予用户 **masterA** 对表 **studentA** 的查询、插入、修改等对象特权，并赋予其再授权的能力

```
MariaDB [mysql]> grant select, insert, update on sys.studentA to masterA;
Query OK, 0 rows affected (0.003 sec)

MariaDB [mysql]> grant grant option on sys.studentA to masterA;
Query OK, 0 rows affected (0.001 sec)
```

- (8) 在 **masterA** 用户下查询 **sys.studentA**(注意使用 **sys.studentA**)

```
# mariadb -u masterA -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 7
Server version: 11.1.2-MariaDB-1:11.1.2+maria~ubu2204 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)]> use sys
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
MariaDB [sys]> select * from studentA;
+-----+-----+-----+-----+
| Sno      | Sname | Ssex | Sage | Sdept |
+-----+-----+-----+-----+
| 200215121 | Tom   | m    | 20   | CS     |
| 200215122 | Lily  | f    | 19   | CS     |
+-----+-----+-----+-----+
2 rows in set (0.001 sec)
```

- (9) 在 **masterA** 用户下再插入一个元组的数据('200215123','Bob','m',21,'IS')，并在 **masterA** 用户下查询(注意使用 **sys.studentA**)

```
MariaDB [sys]> insert into studentA (Sno, Sname, Ssex, Sage, Sdept) values('200215123', 'Bob', 'm', 21, 'IS');
Query OK, 1 row affected (0.003 sec)

MariaDB [sys]> select * from studentA;
+-----+-----+-----+-----+-----+
| Sno      | Sname | Ssex | Sage | Sdept |
+-----+-----+-----+-----+-----+
| 200215121 | Tom   | m    | 20   | CS     |
| 200215122 | Lily  | f    | 19   | CS     |
| 200215123 | Bob   | m    | 21   | IS     |
+-----+-----+-----+-----+-----+
3 rows in set (0.000 sec)
```

(10) 删除今天创建的 masterA 用户

```
# mariadb -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 8
Server version: 11.1.2-MariaDB-1:11.1.2+maria~ubu2204 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)]> use my sql
ERROR 1049 (42000): Unknown database 'my'
MariaDB [(none)]> use mysql
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
MariaDB [mysql]> drop user masterA;
Query OK, 0 rows affected (0.001 sec)

MariaDB [mysql]> select Host,User,Password from user;
+-----+-----+-----+
| Host      | User      | Password |
+-----+-----+-----+
| localhost | mariadb.sys |          |
| localhost | root       | *B1F236299125243B3686EDBD2CACE9EF32A56D6D |
| %         | root       | *B1F236299125243B3686EDBD2CACE9EF32A56D6D |
| 127.0.0.1 | healthcheck | *B33693FBE57179A3DF91C2B3C9866D0E609BFF2C |
| :::1      | healthcheck | *B33693FBE57179A3DF91C2B3C9866D0E609BFF2C |
| localhost | healthcheck | *B33693FBE57179A3DF91C2B3C9866D0E609BFF2C |
| %         | liechain   | *FEB897008EB3E2A3665265D8A2EA01830B08A532 |
+-----+-----+-----+
7 rows in set (0.001 sec)
```

出现的问题:

- (1) 把 revoke 错误打成了 revork, 连续尝试了好几次都报错。
- (2) 对不同工具不同版本的授给权限的区别有一些疑惑, 对权限的精细化管理认识不全面

解决方案：

- (1) 拼写错误进行改正。
- (2) 对不会的内容查阅+询问。