



# 南昌大学实验报告

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实验类型: ☒ 验证 ☐ 综合 ☐ 设计 ☐ 创新 实验日期: 2021.12.22 实验成绩: \_\_\_\_\_

## 一、 实验项目名称

Linux 系统的数据库应用及编程开发

## 二、 实验目的

1. 了解 Linux 下常用数据库及编程环境。
2. 掌握 MySQL 数据库管理。
3. 掌握 Linux 下 C、C++、Java 语言编程。

## 三、 实验要求

要求使用 Xshell 进行登录，具体操作如下：

1. 安装并启动 Mariadb 服务。

记得还有一个 **mariadb-server**

```
[root@localhost ~]# rpm -qa | grep mariadb
mariadb-libs-5.5.65-1.el7.x86_64
[root@localhost ~]# yum -y install mariadb mariadb-server
已加载插件：fastestmirror
Determining fastest mirrors
dingjun | 3.6 kB 00:00
正在解决依赖关系
--> 正在检查事务
---> 软件包 mariadb.x86_64.1.5.5.65-1.el7 将被 安装
--> 正在处理依赖关系 perl(Sys::Hostname)，它被软件包 1:mariadb-5.5.65-1.el7.x86_64 需要
--> 正在处理依赖关系 perl(IPC::Open3)，它被软件包 1:mariadb-5.5.65-1.el7.x86_64 需要
--> 正在处理依赖关系 perl(Getopt::Long)，它被软件包 1:mariadb-5
```

```
[root@localhost ~]# systemctl start mariadb
[root@localhost ~]# systemctl status mariadb
● mariadb.service - MariaDB database server 8003119100 丁俊
   Loaded: loaded (/usr/lib/systemd/system/mariadb.service; disabled; vendor preset: disabled)
   Active: active (running) since 六 2021-12-25 13:00:04 CST; 6 s ago
           启动服务
   Process: 1692 ExecStartPost=/usr/libexec/mariadb-wait-ready $MAINPID (code=exited, status=0/SUCCESS)
   Process: 1608 ExecStartPre=/usr/libexec/mariadb-prepare-db-dir %n (code=exited, status=0/SUCCESS)
```

```
[root@localhost home]# mysql -V
mysql Ver 15.1 Distrib 5.5.65-MariaDB, for Linux (x86_64) using readline 5.1
```

2. 分别对数据库、表进行创建，并对数据记录进行 CRUD 操作。

进行数据库安全规则制定，设置 root 密码、移除匿名用户、取消远程访问权限、移除测试数据库、更新制定规则。

```
[root@localhost ~]# mysql_secure_installation
```

```
Reload privilege tables now? [Y/n] y
... Success!

Cleaning up... 8003119100 丁俊

All done! If you've completed all of the above
iaDB
installation should now be secure.

Thanks for using MariaDB!
```

登录 mariadb

```
[root@localhost ~]# mysql -u root -p 8003119100 丁俊
Enter password:
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 9
Server version: 5.5.65-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
```

创建 dingjun 数据库 database

```
Database changed
MariaDB [mysql]> create databases dingjun;
ERROR 1064 (42000): You have an error in your SQL sy
the manual that corresponds to your MariaDB server
the right syntax to use near 'databases dingjun' at
MariaDB [mysql]> create database dingjun;
Query OK, 1 row affected (0.00 sec)

MariaDB [mysql]> show databases;
+-----+
| Database |
+-----+
| information_schema |
| dingjun |
| mysql |
| performance_schema |
+-----+
4 rows in set (0.00 sec)
```

创建 star 表 table

```
MariaDB [(none)]> use dingjun;
Database changed
MariaDB [dingjun]> create table star(id int primary key,
-> name varchar(25) not null,
-> high varchar(15),
-> age int);
Query OK, 0 rows affected (0.01 sec)

MariaDB [dingjun]> describe star;
+-----+-----+-----+-----+-----+-----+
| Field | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| id    | int(11)       | NO   | PRI | NULL    |       |
| name  | varchar(25)   | NO   |     | NULL    |       |
| high  | varchar(15)   | YES  |     | NULL    |       |
| age   | int(11)       | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

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插入几条数据

```
MariaDB [dingjun]> insert into star values(1,'dingjun', 172, 20);
Query OK, 1 row affected (0.00 sec)

MariaDB [dingjun]> insert into star values(2,'zoukun', 170, 22);
Query OK, 1 row affected (0.00 sec)

MariaDB [dingjun]> insert into star values(3,'Haha', 165, 18);
Query OK, 1 row affected (0.00 sec)

MariaDB [dingjun]> insert into star values(4,'huier', 175, 24);
Query OK, 1 row affected (0.00 sec)
```

查询数据

```
MariaDB [dingjun]> select * from star;
+----+-----+-----+-----+
| id | name   | high | age |
+----+-----+-----+-----+
| 1  | dingjun | 172  | 20  |
| 2  | zoukun  | 170  | 22  |
| 3  | Haha    | 165  | 18  |
| 4  | huier   | 175  | 24  |
+----+-----+-----+-----+
4 rows in set (0.00 sec)
```

```
MariaDB [dingjun]> select * from star where age > 20;
+----+-----+-----+-----+
| id | name   | high | age |
+----+-----+-----+-----+
| 2  | zoukun  | 170  | 22  |
| 4  | huier   | 175  | 24  |
+----+-----+-----+-----+
2 rows in set (0.00 sec)
```

修改数据

```
MariaDB [dingjun]> update star set age = 15 where id = 1;
Query OK, 1 row affected (0.00 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [dingjun]> select * from star where id = 1;
+----+-----+-----+-----+
| id | name   | high | age |
+----+-----+-----+-----+
| 1  | dingjun | 172  | 15  |
+----+-----+-----+-----+
1 row in set (0.00 sec)
```



删除数据

```
MariaDB [dingjun]> delete from star where id = 3;
Query OK, 1 row affected (0.00 sec)
```

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```
MariaDB [dingjun]> select * from star;
+----+-----+-----+-----+
| id | name   | high | age |
+----+-----+-----+-----+
| 1  | dingjun | 172  | 15  |
| 2  | zoukun  | 170  | 22  |
| 4  | huier   | 175  | 24  |
+----+-----+-----+-----+
```

3. 创建一个以自己姓名全拼命名的账户，授予指定数据库查询、修改权限，需要验证。

新建一个数据库和表进行验证

```
MariaDB [mysql]> create database test;
Query OK, 1 row affected (0.00 sec)
```

```
MariaDB [mysql]> use test;
Database changed
MariaDB [test]> create table t1;
ERROR 1113 (42000): A table must have at least 1 column
MariaDB [test]> create table t1(id int,
-> name varchar(20),
-> high varchar(15),
-> age int);
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that
the right syntax to use near 'varchar(15),
age int)' at line 3
MariaDB [test]> create table t1(id int, name varchar(20), high varchar(15), age
Query OK, 0 rows affected (0.00 sec)

MariaDB [test]> insert into t1 values(1,'aaa',150,12);
Query OK, 1 row affected (0.01 sec)

MariaDB [test]> insert into t1 values(2,'bbb',160,15);
Query OK, 1 row affected (0.00 sec)

MariaDB [test]> insert into t1 values(3,'ccc',170,20);
Query OK, 1 row affected (0.00 sec)
```

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创建 dingjun 用户，授予查询和修改权限

```
Database changed
MariaDB [mysql]> create user 'dingjun'@'%' identified by '123456';
Query OK, 0 rows affected (0.00 sec)
```

```
MariaDB [mysql]> grant select,update on test.* to 'dingjun'@'%' ;
Query OK, 0 rows affected (0.00 sec)
```

刷新权限

```
MariaDB [(none)]> flush privileges;
Query OK, 0 rows affected (0.00 sec)
```

使用 dingjun 用户登录 mariadb，可以发现查询数据库只能看到 test 和自带的数据库

```
[root@localhost ~]# mysql -u dingjun -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 2
Server version: 5.5.65-MariaDB MariaDB Server

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)]> show databases;
+-----+
| Database |
+-----+
| information_schema |
| test |
+-----+
```

```
MariaDB [(none)]> use test;
Reading table information for completion
You can turn off this feature to get a quicker prompt

Database changed
MariaDB [test]> show tables;
+-----+
| Tables_in_test |
+-----+
| t1 |
+-----+
1 row in set (0.00 sec)
```

验证权限，dingjun 用户不能删除 test 数据库表中的数据

```
MariaDB [test]> insert into t1 values(5,'safw',190,12);
Query OK, 1 row affected (0.00 sec)

MariaDB [test]> delete from t1;
ERROR 1142 (42000): DELETE command denied to user 'dingjun'@'localhost' for table 't1'
MariaDB [test]> update t1 set name = 'fff' where name = 'aaa';
Query OK, 1 row affected (0.00 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [test]> select * from t1;
+-----+-----+-----+-----+
| id  | name | high | age |
+-----+-----+-----+-----+
| 1  | fff  | 150  | 12  |
| 2  | bbb  | 160  | 15  |
| 3  | ccc  | 170  | 20  |
| 4  | afs  | 123  | 12  |
| 5  | safw | 190  | 12  |
+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

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4. 允许 root 用户远程访问权限，需要验证。

赋予 root 用户远程访问的权限，%代表远程访问

```
MariaDB [mysql]> grant all on *.* to 'root'@'%' with grant option;
Query OK, 0 rows affected (0.00 sec)
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MariaDB [mysql]> update user set host='%' where user='root';
ERROR 1062 (23000): Duplicate entry '%-root' for key 'PRIMARY'
```

刷新权限

```
MariaDB [(none)]> grant all on *.* to 'root'@'%' identified by '123456' with grant option;
Query OK, 0 rows affected (0.00 sec)

MariaDB [(none)]> flush privileges;
Query OK, 0 rows affected (0.00 sec)
```

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```
MariaDB [mysql]> select user,host from user;
```

user	host
root	%
root	127.0.0.1
root	::1
root	localhost
root	localhost.localdomain

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开放权限端口

```
[root@localhost ~]# firewall-cmd --permanent --add-port=3306/tcp
success
[root@localhost ~]# firewall-cmd --reload
success
[root@localhost ~]# systemctl restart mariadb
```

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验证远程登录,登录成功

```
[root@localhost ~]# mysql -h 192.168.2.136 -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 8
Server version: 5.5.65-MariaDB MariaDB Server

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)]>
```

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5. 删除指定数据库，然后进行恢复，需要验证。

备份 test 数据库到/home/test/test.sql，登录 mariadb 并删除 test 数据库

```
connect
[root@localhost home]# mysqldump -h 192.168.2.136 -u root -p123456 test > /home/test/test.sql
[root@localhost home]# cd test
[root@localhost test]# ls
test.sql
[root@localhost test]# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 4
Server version: 5.5.65-MariaDB MariaDB Server

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)]> drop test;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right syntax to use near 'test' at line 1
MariaDB [(none)]> drop database test;
Query OK, 1 row affected (0.04 sec)
```

查看数据库已经删除 test，并创建新的数据库 test，这时候 test 数据库为空

```
MariaDB [(none)]> show databases;
+-----+
| Database |
+-----+
| information_schema |
| dingjun |
| mysql |
| performance_schema |
+-----+
4 rows in set (0.00 sec)

MariaDB [(none)]> create database test;
Query OK, 1 row affected (0.00 sec)

MariaDB [(none)]> use test;
Database changed
MariaDB [test]> show tables;
Empty set (0.00 sec)
```

恢复 test 数据库内容，查表成功

```
[root@localhost test]# mysql -u root -p6807234 test< /home/test/test.sql
[root@localhost test]# mysql -u root -p
Enter password: 8003119100丁俊
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 8
Server version: 5.5.65-MariaDB MariaDB Server

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 test;
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 [test]> show tables;
+-----+
| Tables_in_test |
+-----+
| t1              |
+-----+
1 row in set (0.00 sec)

MariaDB [test]>
```

6. 搭建 C、C++、Java 语言编程环境，并运行 C、C++、Java 语言编写的程序，需要验证。

搭建 c 语言环境

```
[root@localhost ~]# yum -y install gcc
已加载插件: fastestmirror
Loading mirror speeds from cached hostfile
正在解决依赖关系
--> 正在检查事务
---> 软件包 gcc.x86_64.0.4.8.5-39.el7 将被 安装
--> 正在处理依赖关系 cpp = 4.8.5-39.el7, 它被软件包 gcc-4.8.5-39.el7.x86_64 需要
--> 正在处理依赖关系 glibc-devel >= 2.2.90-12, 它被软件包 gcc-4.8.5-39.el7.x86_64 需要
--> 正在处理依赖关系 libmpfr.so.4()(64bit), 它被软件包 gcc-4.8.5-39.el7.x86_64 需要
--> 正在处理依赖关系 libmpc.so.3()(64bit), 它被软件包 gcc-4.8.5-39.el7.x86_64 需要
--> 正在检查事务
---> 软件包 cpp.x86_64.0.4.8.5-39.el7 将被 安装
---> 软件包 glibc-devel.x86_64.0.2.17-307.el7.1 将被 安装
--> 正在处理依赖关系 glibc-headers = 2.17-307.el7.1, 它被软件包 glibc-devel-2.17-307.el7.1.x86_64 需要
--> 正在处理依赖关系 glibc-headers, 它被软件包 glibc-devel-2.17-307.el7.1.x86_64 需要
--> 正在检查事务
---> 软件包 glibc-headers.x86_64.0.2.17-307.el7.1 将被 安装
```

```
已安装:
gcc.x86_64 0:4.8.5-39.el7

作为依赖被安装:
cpp.x86_64 0:4.8.5-39.el7          glibc-devel.x86_64 0:2.17-
kernel-headers.x86_64 0:3.10.0-1127.el7  libmpc.x86_64 0:1.0.1-3.el
完毕!
```

编写 C 程序

```
#include<stdio.h>
int main()
{
    printf("I am dingjun");
}
~
test.c
```

```
[root@localhost ~]# gcc -o test test.c
[root@localhost ~]# ls
anaconda-ks.cfg  a.out  a.txt  b  dingjun  lja.txt  test  test.c  yu
[root@localhost ~]# ./test
I am dingjun[root@localhost ~]#
```

搭建 C++环境

```
[root@localhost ~]# yum -y install gcc-c++
已加载插件: fastestmirror
Loading mirror speeds from cached hostfile
正在解决依赖关系
--> 正在检查事务
---> 软件包 gcc-c++.x86_64.0.4.8.5-39.el7 将被 安装
--> 正在处理依赖关系 libstdc++-devel = 4.8.5-39.el7, 它被软件包
--> 正在检查事务
---> 软件包 libstdc++-devel.x86_64.0.4.8.5-39.el7 将被 安装
--> 解决依赖关系完成
```

已安装:

gcc-c++.x86\_64 0:4.8.5-39.el7

作为依赖被安装:

libstdc++-devel.x86\_64 0:4.8.5-39.el7

完毕!

编写 C++ 程序

```
#include<iostream>
using namespace std;
int main() {
    int a = 1, b = 2;
    cout << "a+b=" << a + b << endl;
    return 0;
}
~
```

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```
[root@localhost ~]# vi test1.cpp
[root@localhost ~]# g++ -o test1 test1.cpp
[root@localhost ~]# ls
anaconda-ks.cfg a.out a.txt b dingjun lja.txt test test1 test1.cpp test.c yu
[root@localhost ~]# ./test1
a+b=3
```

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搭建 Java 环境

```
[root@localhost ~]# yum -y install java-1.8.0-openjdk.x86_64 java-1.8.0-openjdk-devel.x86_64
已加载插件: fastestmirror
Loading mirror speeds from cached hostfile
正在解决依赖关系
--> 正在检查事务
--> 软件包 java-1.8.0-openjdk.x86_64.1.1.8.0.242.b08-1.el7 将被 安装
--> 正在处理依赖关系 java-1.8.0-openjdk-headless(x86-64) = 1:1.8.0.242.b08-1.el7, 它被软件包 1:java-1.8.0.242.b08-1.el7.x86_64 需要
正在处理依赖关系
```

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```
libwayland-server.x86_64 0:1.15.0-1.el7
libxshmfence.x86_64 0:1.2-1.el7
mesa-libEGL.x86_64 0:18.3.4-7.el7
mesa-libgbm.x86_64 0:18.3.4-7.el7
pango.x86_64 0:1.42.4-4.el7_7
pixman.x86_64 0:0.34.0-1.el7
python-lxml.x86_64 0:3.2.1-4.el7
tzdata-java.noarch 0:2019c-1.el7
xorg-x11-fonts-Type1.noarch 0:7.5-9.el7

libxcb.x86_64 0:1.13-
lksctp-tools.x86_64 0:
mesa-libGL.x86_64 0:1
mesa-libglapi.x86_64
pcsc-lite-libs.x86_64
python-javapackages.n
ttmkfdir.x86_64 0:3.0
xorg-x11-font-utils.x
```

完毕!

```
[root@localhost ~]# rpm -qa | grep java
tzdata-java-2019c-1.el7.noarch
java-1.8.0-openjdk-1.8.0.242.b08-1.el7.x86_64
javapackages-tools-3.4.1-11.el7.noarch
java-1.8.0-openjdk-devel-1.8.0.242.b08-1.el7.x86_64
python-javapackages-3.4.1-11.el7.noarch
java-1.8.0-openjdk-headless-1.8.0.242.b08-1.el7.x86_64
```

```
[root@localhost jre-1.8.0-openjdk-1.8.0.242.b08-1.el7.x86_64]# cd bin
[root@localhost bin]# ls
java jjs keytool orbd pack200 policytool rmid rmiregistry servertool tnameserv unpack200
```

配置添加/etc/profile 文件中的全局环境变量 CLASSPATH 和 PATH 变量

```
if [ "${-#*i}" != "$-" ]; then
    . "$i"
else
    . "$i" >/dev/null
fi
done
export JAVA_HOME=/usr/lib/jvm
export CLASSPATH=.:$JAVA_HOME/jre/lib/rt.jar:$JAVA_HOME/lib/dt.jar:$JAVA_HOME/tools.jar
export PATH=$PATH:$JAVA_HOME/bin
```

重新加载配置文件

```
[root@localhost bin]# cd ../lib
[root@localhost lib]# ls
amd64 content-types.properties jce.jar management-agent.jar rt.jar
applet currency.data jexec meta-index security
calendars.properties ext jsse.jar net.properties sound.pr
charsets.jar flavormap.properties jvm.hprof.txt psfontj2d.properties tzdb.dat
classlist hijrah-config-umalqura.properties logging.properties psfont.properties.ja
cmm images management resources.jar
[root@localhost lib]# vi /etc/profile
[root@localhost lib]# source /etc/profile
```

编写 java 程序

```
public class javatest {
    public static void main(String[] args) {
        int monster = 20;
        int count = 0;
        int exp = 1200;
        for(int d = 2; d <= 20; d++) {
            int hero = 0;
            monster = (int)(monster * 1.05);
            exp = (int)(exp * 1.2);
            while(hero < exp) {
                hero += monster;
                count++;
            }
        }
        System.out.println(count + 1200 / 20);
    }
}
```

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```
[root@localhost ~]# vi javatest.java
[root@localhost ~]# vi javatest.java
[root@localhost ~]# javac javatest.java
[root@localhost ~]# ls
anaconda-ks.cfg  a.out  a.txt  b  dingjun  javatest.class  javatest.java  lja.txt  t
[root@localhost ~]# java javatest
6617
```

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7. 按照给定参考资料对数据库服务进行定制化处理及 Linux 下 C、C++、Java 语言进行编程。（选做）

1、利用 gcc 连接多个 c 文件编译程序

```
#include<stdio.h>
int factorial(int n)
{
    if (n <= 1)    return 1;
    else return factorial(n - 1) * n;
}
```

factorial.c 8003119100丁俊

```
#include<stdio.h>
int factorial(int n);
int main(int argc, char **argv)
{
    int n;
    n = atoi(argv[1]);
    printf("Factorial of %d is %d\n", n, factorial(n));
    return 0;
}
```

main.c 8003119100丁俊

```
[root@localhost ~]# vi factorial.c
[root@localhost ~]# vi main.c
[root@localhost ~]# gcc -o fact main.c factorial.c
[root@localhost ~]# ls
anaconda-ks.cfg  b      dingjun  factorial.c  javatest.java  main.c  test.c
a.txt            Ctest  fact     javatest.class  lja.txt       test1.cpp  yu
[root@localhost ~]# ./fact 6
Factorial of 6 is 720
```

## 2、mariadb 配置

datadir 指明数据目录的位置

```
[mysql]
datadir=/var/lib/mysql
socket=/var/lib/mysql/mysql.sock
# Disabling symbolic links is recommended
```

创建的数据库表结构默认都放在 datadir=/var/lib/mysql 目录下

```
[root@localhost etc]# cd /var/lib/mysql
[root@localhost mysql]# ls
aria_log.000000001  dingjun  ib_logfile0  mysql      performance_schema
aria_log_control    ibdata1  ib_logfile1  mysql.sock  test
[root@localhost mysql]# cd dingjun
[root@localhost dingjun]# ls
db.opt  star.frm
```

回收用户 dingjun 对 test 数据库的访问权限

```
[root@localhost ~]# mysql -u dingjun -p123456
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 4
Server version: 5.5.65-MariaDB MariaDB Server

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 test;
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 [test]> select * from t1;
```

id	name	high	age
1	fff	150	12
2	bbb	160	15
3	ccc	170	20
4	afs	123	12



使用 revoke 语句回收用户权限

```
[root@localhost ~]# mysql -u root -p6807234
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 5
Server version: 5.5.65-MariaDB MariaDB Server

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)]> revoke all on test.* from 'dingjun'@'%';
Query OK, 0 rows affected (0.00 sec)

MariaDB [(none)]> flush privileges;
Query OK, 0 rows affected (0.00 sec)
```

不显示 test 数据库，用户 dingjun 失去对 test 操作和查看的所有权限。

```
[root@localhost ~]# mysql -h 192.168.2.136 -u dingjun -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 2
Server version: 5.5.65-MariaDB MariaDB Server

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)]> show databases;
+-----+
| Database |
+-----+
| information_schema |
+-----+
1 row in set (0.00 sec)
```

### 3、C++工程创建

```
[root@localhost ~]# vi main.cpp
[root@localhost ~]# vi point.cpp
[root@localhost ~]# ls
anaconda-ks.cfg  b  dingjun  factorial.c  javatest.java  main.c  Point  point.h  test.c
a.txt           Ctest  fact     javatest.class  lja.txt       main.cpp  point.cpp  test1.cpp  yu
[root@localhost ~]# mv point.h point.cpp main.cpp Point
[root@localhost ~]# cd Point
[root@localhost Point]# ls
main.cpp  point.cpp  point.h
[root@localhost Point]# vi makefile
```

三个文件 point.h、point.cpp、main.cpp



```

#include<iostream>
#include "point.h"
void point::print(){
    std::cout << "x="<<this->x<<",y="<<this->y<<"\n";
}
~
~

```

Point.cpp 8003119100丁俊

```

class point{
private:
    int x;
    int y;
public:
    point(int a,int b):x(a), y(b){}
    void print();
    ~point(){}
};

```

Point.h 8003119100丁俊

```

#include<iostream>
#include<vector>
#include "point.h"
using namespace std;

int main(){
    point p0(3,4);
    point p1(1,2);
    point p2(5,8);
    vector<point> v;
    v.push_back(p0);
    v.push_back(p1);
    v.push_back(p2);
    for(int i = 0; i <v.size();i++) {
        v[i].print();
    }
    return 0;
}

```

main.cpp 8003119100丁俊

输入 make 命令构建 C++项目工程

```

[root@localhost Point]# make
g++ main.cpp point.cpp -o myapp -std=c++11
[root@localhost Point]# ./myapp
x=3,y=4
x=1,y=2
x=5,y=8

```

8003119100丁俊

```
[root@localhost Point]# ls
main.cpp  makefile  myapp  point.cpp  point.h
```

#### 四、主要仪器设备及耗材

计算机、VMware、CentOS 7、word

#### 五、实验步骤

#### 六、实验数据及处理结果

#### 七、思考讨论题或体会或对改进实验的建议

#### 八、参考资料

[1] 文东戈,赵艳芹.Linux 操作系统实用教程（第 2 版）[M].北京：清华大学出版社.2019,9.