

# 《数据库原理(2)》实验报告

## 实验一

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### 实验过程 1:

1. 更新软件，确保所有存储库和 PPA 中的软件包列表都是最新的  
`sudo apt-get update`
2. 安装 VIM——Linux 系统上一款文本编辑器  
`sudo apt-get install vim`
3. 安装 ssh  
`sudo apt-get install openssh-server`
4. 在 master 端创建私钥(id\_rsa)与公钥(id\_rsa.pub)  
`ssh-keygen -t rsa -C "yanxinyu@shu.edu.cn"`
5. 将公钥(id\_rsa.pub)中的内容追加到 authorized\_keys 中  
`cd ~/.ssh`  
`cat id_rsa.pub >> authorized_keys`
6. 尝试无密码访问自身  
`ssh localhost`
7. 在 master 端使用 scp 命令，传送私钥 (id\_rsa)与公钥 (id\_rsa.pub)至 slave 端，以保证两个服务器使用同一对公钥和私钥  
`scp id_rsa.pub ubuntu@1.13.196.168:~/.ssh`  
`scp id_rsa ubuntu@1.13.196.168:~/.ssh`
8. 在 slave 端，同理将公钥(id\_rsa.pub)中的内容追加到 authorized\_keys 中
9. 在 master 端 ssh 登录 slave 端  
`ssh ubuntu@ 1.13.196.168`
10. 修改系统主机名 hostname  
`sudo vim /etc/hostname`  
配置 hosts 文件，增加目标的名称  
`sudo vim /etc/hosts`
11. 配置完成后，在两机分别再次使用 ssh 登录对方主机，实验结果如下所示

### 实验结果 1:

```
ubuntu@master:~$ ssh slave
Welcome to Ubuntu 22.04 LTS (GNU/Linux 5.15.0-56-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Thu Mar 30 08:22:24 PM CST 2023

System load: 0.31396484375   Processes:            119
Usage of /:   8.7% of 49.10GB Users logged in:             0
Memory usage: 16%          IPv4 address for eth0: 10.206.0.17
Swap usage:   0%

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
just raised the bar for easy, resilient and secure K8s cluster deployment.

https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Last login: Thu Mar 30 20:22:29 2023 from 129.211.212.87
ubuntu@slave:~$
```

图 1 master ssh slave

```
ubuntu@slave:~$ ssh master
Welcome to Ubuntu 22.04 LTS (GNU/Linux 5.15.0-56-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Thu Mar 30 08:25:03 PM CST 2023

System load: 0.03369140625   Processes:            116
Usage of /:   8.7% of 49.10GB Users logged in:             0
Memory usage: 18%          IPv4 address for eth0: 10.206.0.14
Swap usage:   0%

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https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Last login: Thu Mar 30 20:25:19 2023 from 1.13.196.168
ubuntu@master:~$
```

图 2 slave ssh master

## 实验过程 2:

1. 在 master 与 slave 端安装 MySQL -Server

```
sudo apt-get install mysql-server
```

2. 打开 MySQL

```
sudo mysql -u root -p
```

3. 创建数据库 EXP1

```
create database EXP1;
```

4. 查看/显示数据库

```
show databases;
```

5. 修改 MySQL 配置文件，允许外网访问

```
#修改 mysqld.cnf 中 bind-address = 0.0.0.0  
sudo vim /etc/mysql/mysql.conf.d/mysqld.cnf
```

6. 重启数据库

```
sudo service mysql restart
```

7. 创建一个用户 slave

```
#在操作过程中发现此处的 IP 只能为内网 IP，否则无法远程访问  
create user 'slave'@'10.206.0.17' identified by 'yan';
```

8. 赋给用户 slave 远程权限

```
grant all on *.* to 'slave'@'10.206.0.17';
```

9. 刷新 MySQL 的系统权限相关表

```
flush privileges;
```

10. 在 slave 端访问 master 端数据库

```
mysql -h 10.206.0.14 -u slave -p
```

11. 在 slave 端对数据库进行操纵，实验结果如下所示

## 实验结果 2:

```
ubuntu@slave:~$ mysql -h 10.206.0.14 -u slave -p  
Enter password:  
Welcome to the MySQL monitor.  Commands end with ; or \g.  
Your MySQL connection id is 14  
Server version: 8.0.32-0ubuntu0.22.04.2 (Ubuntu)  
  
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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> show databases;  
+-----+  
| Database |  
+-----+  
| EXP1 |  
| information_schema |  
| mysql |  
| performance_schema |  
| sys |  
+-----+  
5 rows in set (0.00 sec)
```

图 3 在 slave 端对数据库进行操纵