Лабораторная работа №6

Тема «Установка и настройка системы управления базами данных MariaDB»

по дисциплине «Администрирование сетевых подсистем»

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«20» ноября 2023г.

Цель работы:

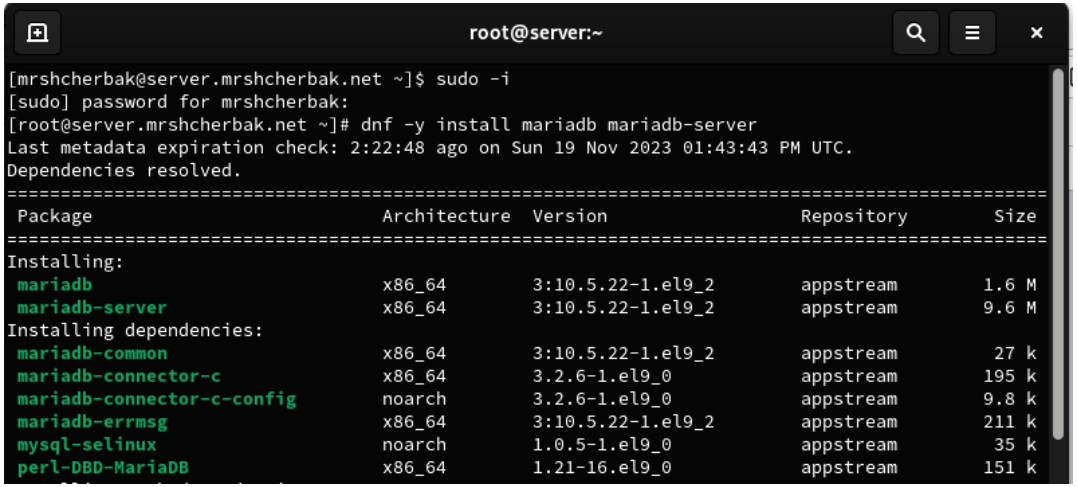
Приобретение практических навыков по установке и конфигурированию системы управления базами данных на примере программного обеспечения MariaDB.

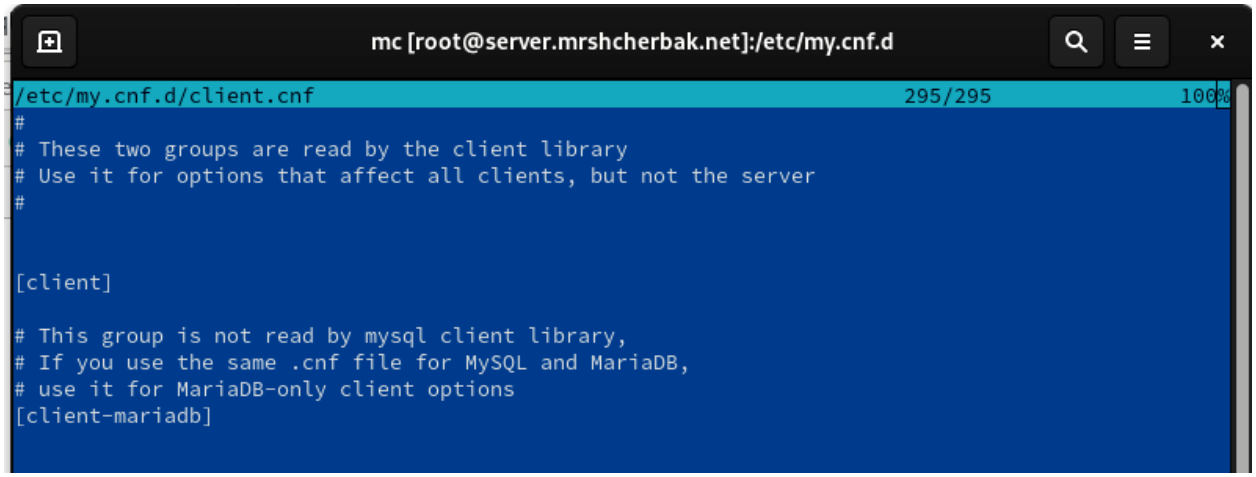
Задание

1. Установить необходимые для работы MariaDB пакеты.
2. Настроить в качестве кодировки символов по умолчанию utf8 в базах данных.
3. В базе данных MariaDB создать тестовую базу addressbook, содержащую таблицу city с полями name и city, т.е., например, для некоторого сотрудника указан город, в котором он работает.
4. Создать резервную копию базы данных addressbook и восстановить из неё данные.
5. Написать скрипт для Vagrant, фиксирующий действия по установке и настройке базы данных MariaDB во внутреннем окружении виртуальной машины server. Соответствующим образом внести изменения в Vagrantfile.

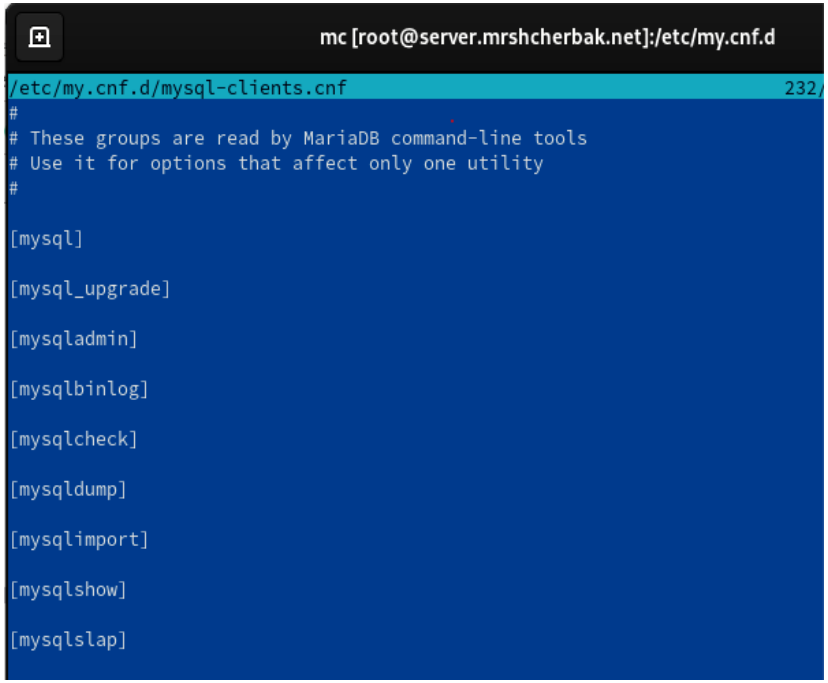
Выполнение работы

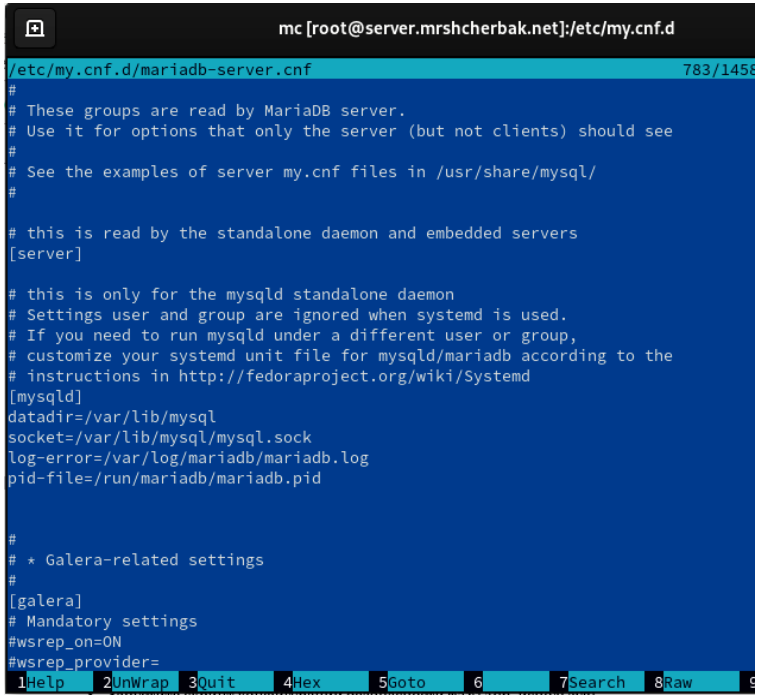
Установка MariaDB

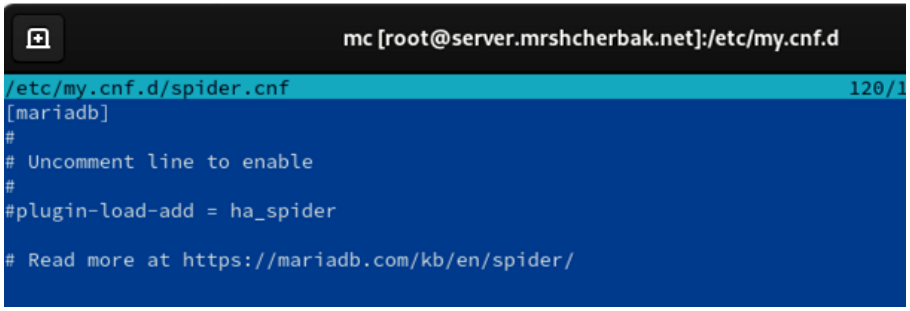


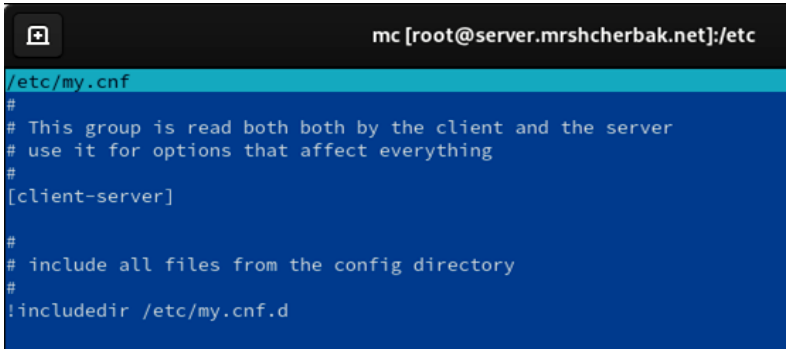


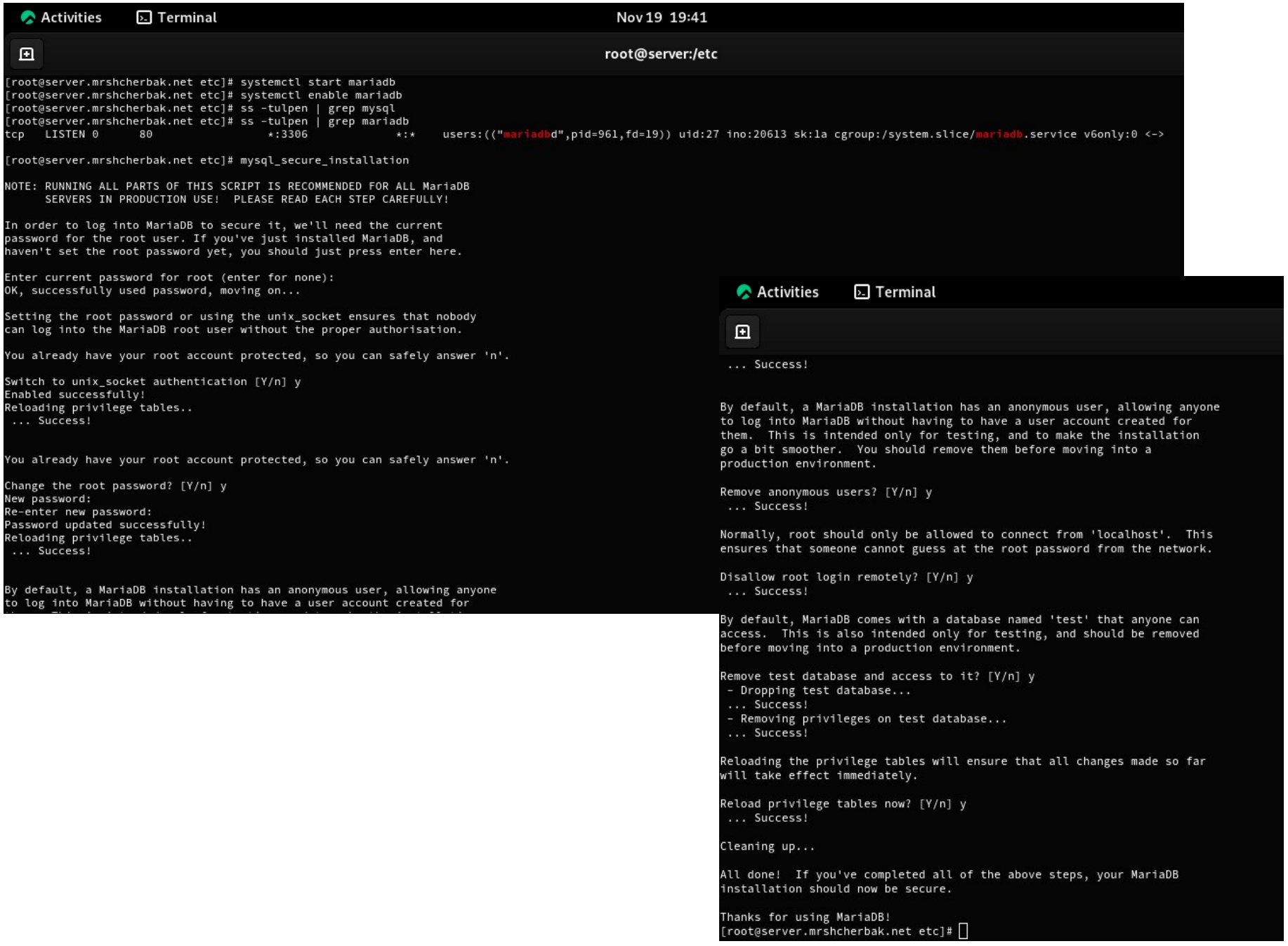
Просмотр конфигурационных файлов mariadb в каталоге /etc/my.cnf.d и в файле /etc/my.cnf










Activities
Terminal
Nov 19 19:41
root@server:/etc
[root@server.mrshcherbak.net etc]# systemctl start mariadb
[root@server.mrshcherbak.net etc]# systemctl enable mariadb
[root@server.mrshcherbak.net etc]# ss -tulpen | grep mysql
[root@server.mrshcherbak.net etc]# ss -tulpen | grep mariadb
tcp LISTEN 0 80 *:3306 *:* users:(("mariadbd",pid=961,fd=19)) uid:27 ino:20613 sk:1a cgroup:/system.slice/mariadb.service v6only:0 <->
[root@server.mrshcherbak.net etc]# mysql_secure_installation
NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MariaDB
SERVERS IN PRODUCTION USE! PLEASE READ EACH STEP CAREFULLY!
In order to log into MariaDB to secure it, we'll need the current
password for the root user. If you've just installed MariaDB, and
haven't set the root password yet, you should just press enter here.
Enter current password for root (enter for none):
OK, successfully used password, moving on...
Setting the root password or using the unix_socket ensures that nobody
can log into the MariaDB root user without the proper authorisation.
You already have your root account protected, so you can safely answer 'n'.
Switch to unix_socket authentication [Y/n] y
Enabled successfully!
Reloading privilege tables..
... Success!
You already have your root account protected, so you can safely answer 'n'.
Change the root password? [Y/n] y
New password:
Re-enter new password:
Password updated successfully!
Reloading privilege tables..
... Success!
By default, a MariaDB installation has an anonymous user, allowing anyone
to log into MariaDB without having to have a user account created for
Activities
Terminal
... Success!
By default, a MariaDB installation has an anonymous user, allowing anyone
to log into MariaDB without having to have a user account created for
them. This is intended only for testing, and to make the installation
go a bit smoother. You should remove them before moving into a
production environment.
Remove anonymous users? [Y/n] y
... Success!
Normally, root should only be allowed to connect from 'localhost'. This
ensures that someone cannot guess at the root password from the network.
Disallow root login remotely? [Y/n] y
... Success!
By default, MariaDB comes with a database named 'test' that anyone can
access. This is also intended only for testing, and should be removed
before moving into a production environment.
Remove test database and access to it? [Y/n] y
- Dropping test database...
... Success!
- Removing privileges on test database...
... Success!
Reloading the privilege tables will ensure that all changes made so far
will take effect immediately.
Reload privilege tables now? [Y/n] y
... Success!
Cleaning up...
All done! If you've completed all of the above steps, your MariaDB
installation should now be secure.
Thanks for using MariaDB!
[root@server.mrshcherbak.net etc]#

```
[root@server.mrshcherbak.net etc]# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 13
Server version: 10.5.22-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)]> \h

General information about MariaDB can be found at
http://mariadb.org

List of all client commands:
Note that all text commands must be first on line and end with ';'
?         (\?) Synonym for `help'.
clear     (\c) Clear the current input statement.
connect   (\r) Reconnect to the server. Optional arguments are db and host.
delimiter (\d) Set statement delimiter.
edit      (\e) Edit command with $EDITOR.
ego       (\G) Send command to MariaDB server, display result vertically.
exit      (\q) Exit mysql. Same as quit.
go        (\g) Send command to MariaDB server.
help      (\h) Display this help.
nopager   (\n) Disable pager, print to stdout.
notee     (\t) Don't write into outfile.
pager     (\P) Set PAGER [to_pager]. Print the query results via PAGER.
print     (\p) Print current command.
prompt    (\R) Change your mysql prompt.
quit      (\q) Quit mysql.
rehash    (\#) Rebuild completion hash.
source    (\.) Execute an SQL script file. Takes a file name as an argument.
status    (\s) Get status information from the server.
system    (\!) Execute a system shell command.
tee       (\T) Set outfile [to_outfile]. Append everything into given outfile.
use       (\u) Use another database. Takes database name as argument.
charset   (\C) Switch to another charset. Might be needed for processing binlog with multi-byte charsets.
warnings  (\W) Show warnings after every statement.
nowarning (\w) Don't show warnings after every statement.

For server side help, type 'help contents'
```

Просмотр команд

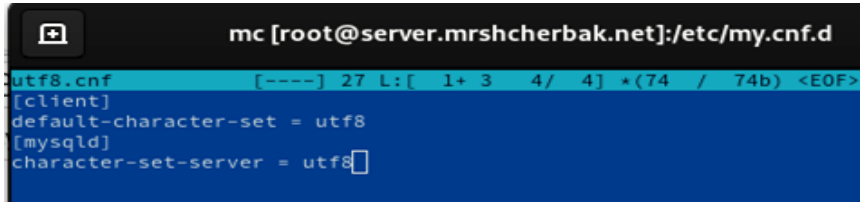
Вывод о базах данных

```
MariaDB [(none)]> SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
+--------------------+
3 rows in set (0.022 sec)

MariaDB [(none)]> exit;
Bye
[root@server.mrshcherbak.net etc]#
```

Конфигурация кодировки символов

```
[root@server.mrshcherbak.net etc]# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 14
Server version: 10.5.22-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)]> status
--------------
mysql  Ver 15.1 Distrib 10.5.22-MariaDB, for Linux (x86_64) using  EditLine wrapper

Connection id:          14
Current database:
Current user:           root@localhost
SSL:                    Not in use
Current pager:          stdout
Using outfile:          ''
Using delimiter:        ;
Server:                 MariaDB
Server version:         10.5.22-MariaDB MariaDB Server
Protocol version:       10
Connection:             Localhost via UNIX socket
Server characterset:    latin1
Db     characterset:    latin1
Client characterset:    utf8
Conn.  characterset:    utf8
UNIX socket:            /var/lib/mysql/mysql.sock
Uptime:                 11 min 5 sec

Threads: 2  Questions: 27  Slow queries: 0  Opens: 20  Open tables: 13  Queries per second avg: 0.040
--------------

MariaDB [(none)]>
```

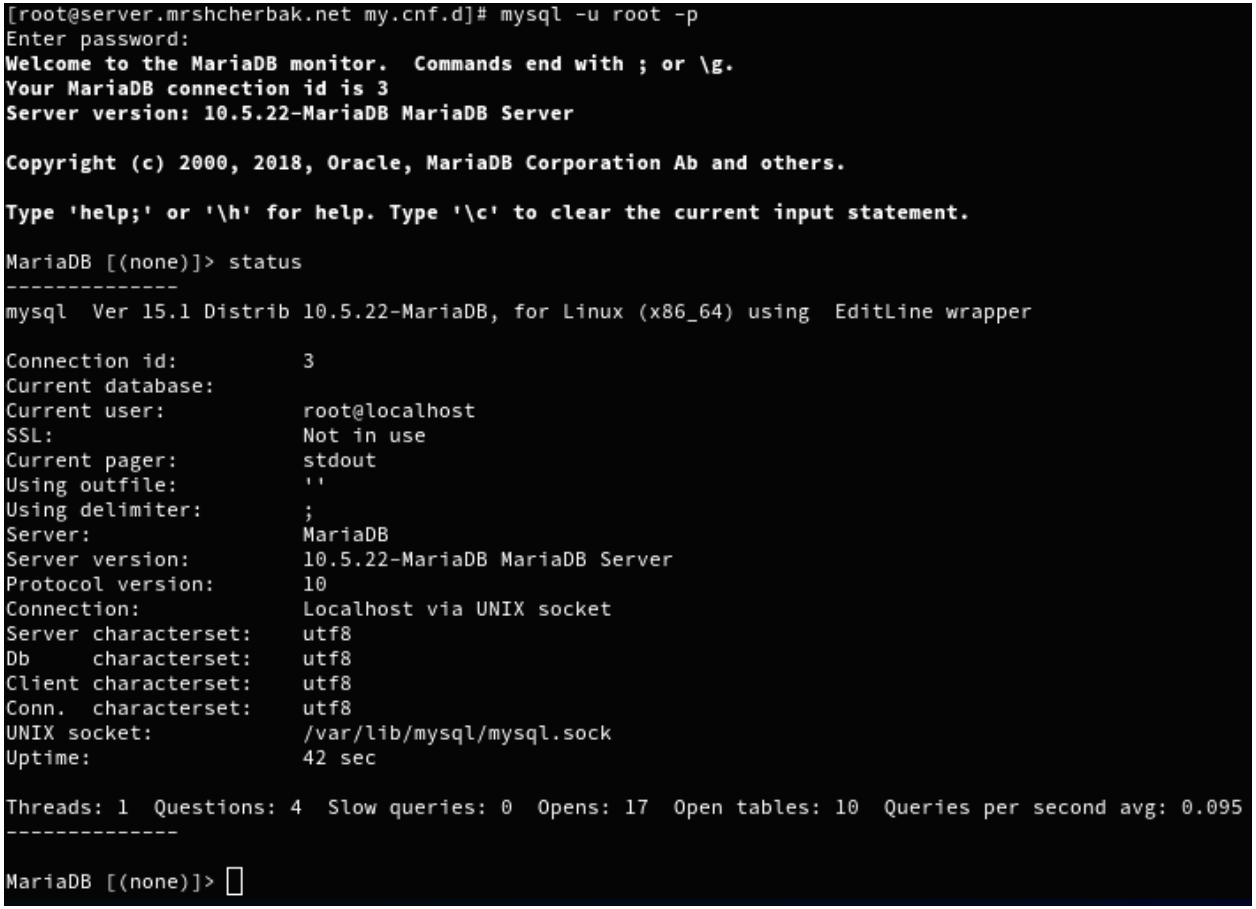
Редактирование файла utf8.cnf



Создание файла и перезапуск MariaDB

```
[root@server.mrshcherbak.net etc]# cd /etc/my.cnf.d
[root@server.mrshcherbak.net my.cnf.d]# touch utf8.cnf
[root@server.mrshcherbak.net my.cnf.d]# mc

[root@server.mrshcherbak.net my.cnf.d]# systemctl restart mariadb
[root@server.mrshcherbak.net my.cnf.d]#
```

Вход в базу данных с правами администратора и просмотр статуса MariaDB



Создание базы данных

```
[root@server.mrshcherbak.net ~]# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 4
Server version: 10.5.22-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)]> CREATE DATABASE addressbook CHARACTER SET utf8 COLLATE utf8_general_ci;
Query OK, 1 row affected (0.015 sec)

MariaDB [(none)]> USE addressbook;
Database changed
MariaDB [addressbook]> SHOW TABLES;
Empty set (0.000 sec)

MariaDB [addressbook]> CREATE TABLE city(name VARCHAR(40), city VARCHAR(40));
Query OK, 0 rows affected (0.037 sec)

MariaDB [addressbook]> INSERT INTO city(name,city) VALUES ('Иванов','Москва');
Query OK, 1 row affected (0.026 sec)

MariaDB [addressbook]> INSERT INTO city(name,city) VALUES ('Петров','Сочи');
Query OK, 1 row affected (0.011 sec)

MariaDB [addressbook]> INSERT INTO city(name,city) VALUES ('Сидоров','Дубна');
Query OK, 1 row affected (0.008 sec)

MariaDB [addressbook]> SELECT * FROM city;
+----------------+--------------+
| name           | city         |
+----------------+--------------+
| Иванов         | Москва       |
| Петров         | Сочи         |
| Сидоров        | Дубна        |
+----------------+--------------+
3 rows in set (0.000 sec)
```

```
MariaDB [addressbook]> CREATE USER mrshcherbak@'%' IDENTIFIED BY 'Rastamana035';
Query OK, 0 rows affected (0.019 sec)

MariaDB [addressbook]> GRANT SELECT,INSERT,UPDATE,DELETE ON addressbook.* TO mrshcherbak@'%';
Query OK, 0 rows affected (0.013 sec)

MariaDB [addressbook]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.008 sec)

MariaDB [addressbook]> DESCRIBE city;
+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| name  | varchar(40) | YES  |     | NULL    |       |
| city  | varchar(40) | YES  |     | NULL    |       |
+-------+-------------+------+-----+---------+-------+
2 rows in set (0.014 sec)

MariaDB [addressbook]> quit
Bye
```

```
[root@server.mrshcherbak.net ~]# mysqlshow -u root -p
Enter password:
+--------------------+
|     Databases      |
+--------------------+
| addressbook        |
| information_schema |
| mysql              |
| performance_schema |
+--------------------+
[root@server.mrshcherbak.net ~]# mysqlshow -u root -p addressbook
Enter password:
Database: addressbook
+--------+
| Tables |
+--------+
| city   |
+--------+
[root@server.mrshcherbak.net ~]# mysqlshow -u mrshcherbak -p addressbook
Enter password:
Database: addressbook
+--------+
| Tables |
+--------+
| city   |
+--------+
[root@server.mrshcherbak.net ~]#
```

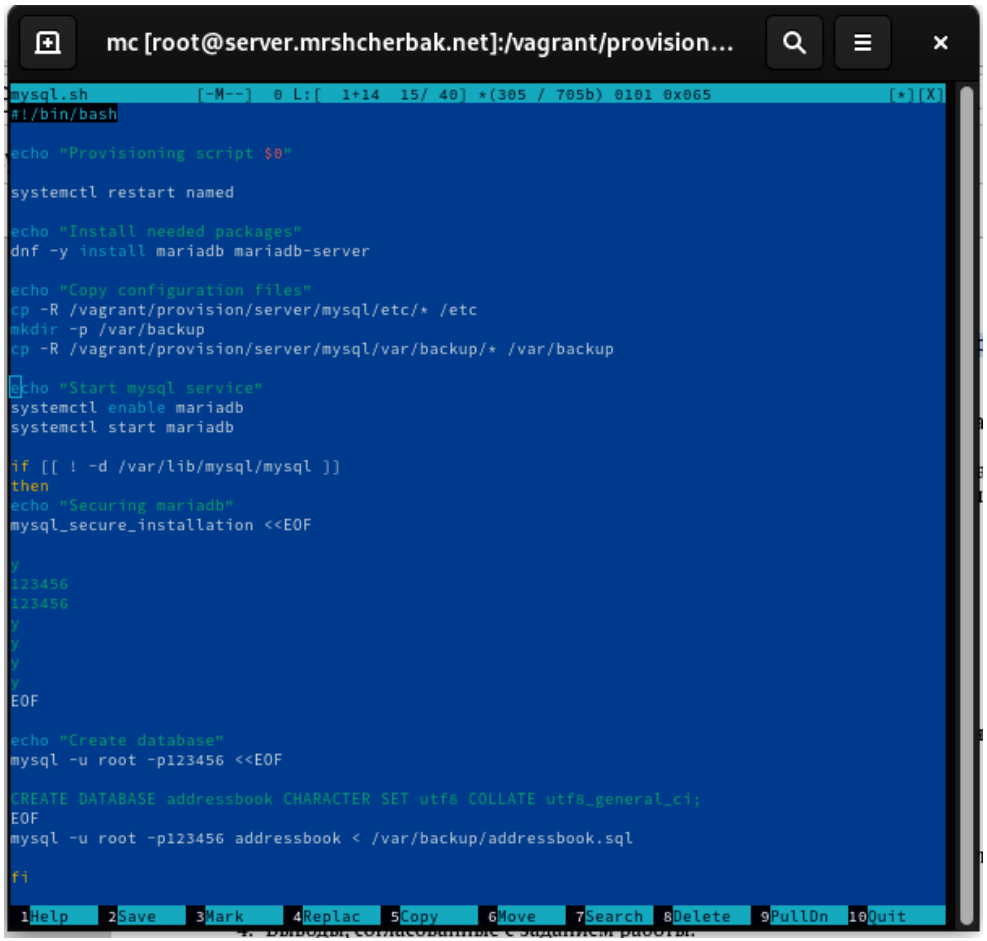
Просмотр списка баз данных и списка таблиц базы данных addressbook

Резервные копии

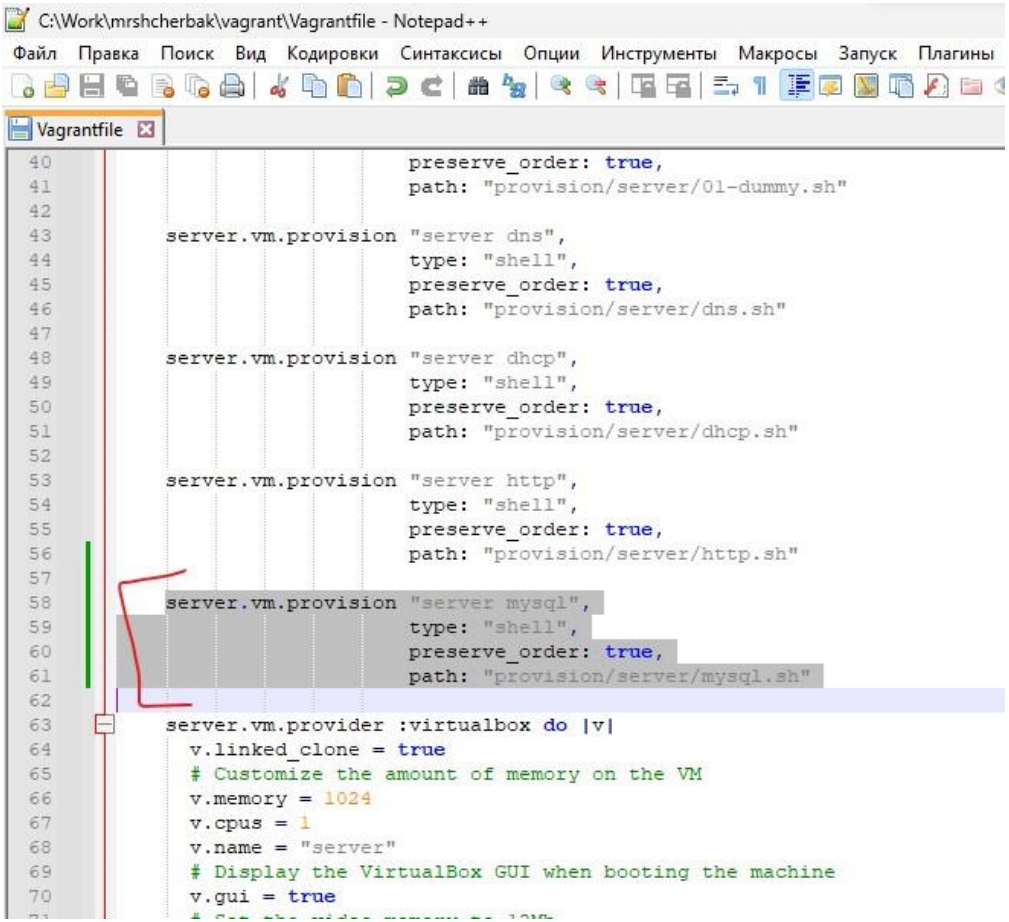
```
[root@server.mrshcherbak.net ~]# mkdir -p /var/backup
[root@server.mrshcherbak.net ~]# mysqldump -u root -p addressbook > /var/backup/addressbook.sql
Enter password:
[root@server.mrshcherbak.net ~]# mysqldump -u root -p addressbook | gzip > /var/backup/addressbook.sql.gz
Enter password:
[root@server.mrshcherbak.net ~]# mysqldump -u root -p addressbook | gzip > $(date +/var/backup/addressbook.%Y%m%d.%H%M%S.sql.gz)
Enter password:
[root@server.mrshcherbak.net ~]# mysql -u root -p addressbook < /var/backup/addressbook.sql
Enter password:
[root@server.mrshcherbak.net ~]# zcat /var/backup/addressbook.sql.gz | mysql -u root -p addressbook
Enter password:
[root@server.mrshcherbak.net ~]#
```

Внесение изменений в настройки внутреннего окружения виртуальной машины

```
[root@server.mrshcherbak.net ~]# cd /vagrant/provision/server
[root@server.mrshcherbak.net server]# mkdir -p /vagrant/provision/server/mysql/etc/my.cnf.d
[root@server.mrshcherbak.net server]# mkdir -p /vagrant/provision/server/mysql/var/backup
[root@server.mrshcherbak.net server]# cp -R /etc/my.cnf.d/utf8.cnf /vagrant/provision/server/mysql/etc/my.cnf.d/
[root@server.mrshcherbak.net server]# cp -R /var/backup/* /vagrant/provision/server/mysql/var/backup/
[root@server.mrshcherbak.net server]# cd /vagrant/provision/server
[root@server.mrshcherbak.net server]# touch mysql.sh
[root@server.mrshcherbak.net server]# chmod +x mysql.sh
[root@server.mrshcherbak.net server]#
```



Редактирование файла mysql.sh



Вывод: таким образом, в ходе выполнения л/р №6, я приобрела практические навыки по установке и конфигурированию системы управления базами данных на примере программного обеспечения MariaDB.