

Презентация по лабораторной работе №6

Установка и настройка системы управления базами данных MariaDB

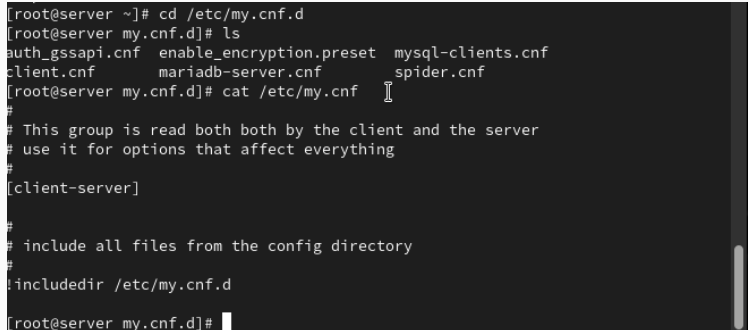
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Приобретение практических навыков по установке и конфигурированию системы управления базами данных на примере программного обеспечения MariaDB.

Установка MariaDB

A terminal window with a dark background and light gray text. The user is root on a server. They navigate to /etc/my.cnf.d and list files. Then they cat /etc/my.cnf, which shows a group configuration for client-server.

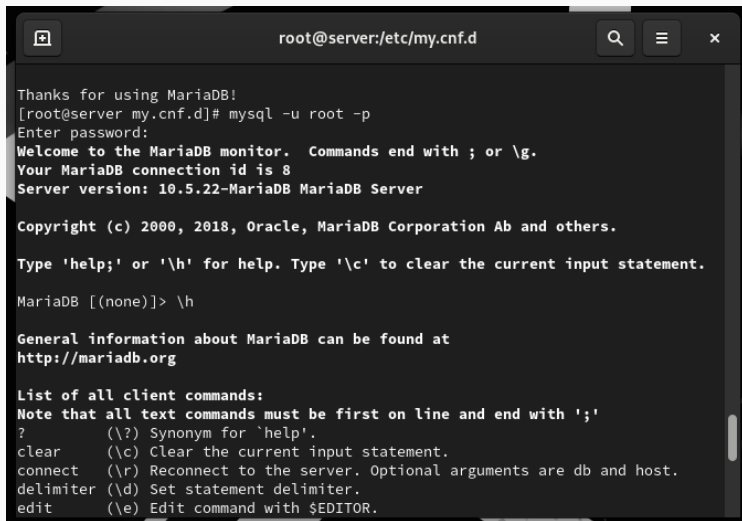
```
[root@server ~]# cd /etc/my.cnf.d
[root@server my.cnf.d]# ls
auth_gssapi.cnf  enable_encryption.preset  mysql-clients.cnf
client.cnf      mariadb-server.cnf       spider.cnf
[root@server my.cnf.d]# cat /etc/my.cnf
#
# This group is read both both by the client and the server
# use it for options that affect everything
#
[client-server]
#
# include all files from the config directory
#
!includedir /etc/my.cnf.d
[root@server my.cnf.d]#
```

Рис. 1: Просмотр конфигурационных файлов

```
[root@server my.cnf.d]# ss -tulpen | grep 3306
tcp    LISTEN 0      80          *:3306      *:*        users:((("mariadb",pid=9966,fd=19)) uid:27 ino:44553 sk:14 cgroup:/system.slice/mariadb.service
v6only:0 <->
```

```
[root@server my.cnf.d]#
```

Рис. 2: Прослушивание порта 3306



```
root@server:/etc/my.cnf.d

Thanks for using MariaDB!
[root@server my.cnf.d]# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 8
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.
```

Рис. 3: Вход в БД и просмотр списка команд

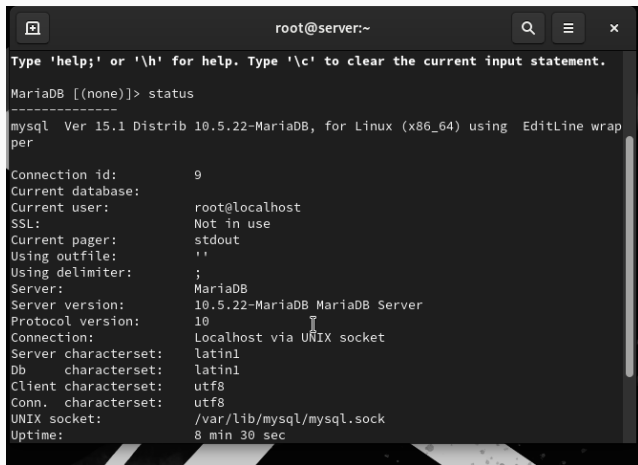
```
MariaDB [(none)]> SHOW DATABASES;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
+-----+
3 rows in set (0.001 sec)

MariaDB [(none)]> exit;
Bye
[root@server my.cnf.d]#
```

Рис. 4: Имеющиеся в системе БД

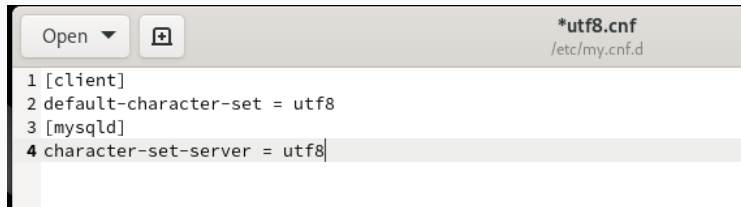
Конфигурация кодировки символов

Выполнение лабораторной работы



```
root@server:~  
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:          9  
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:                 8 min 30 sec
```

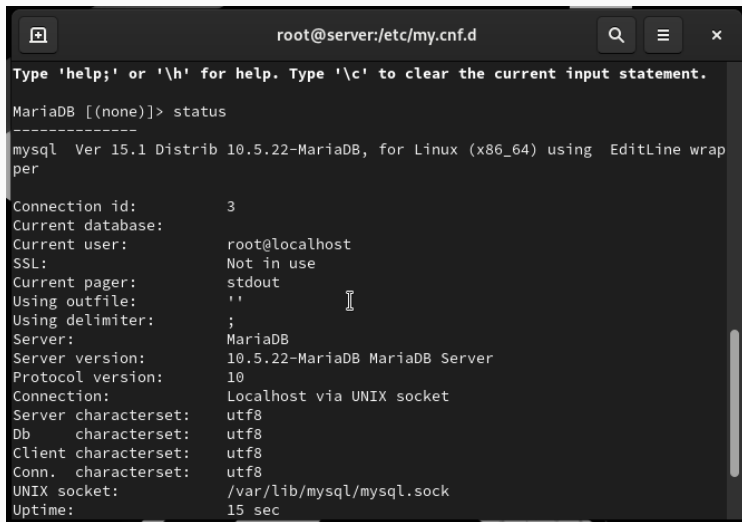
Рис. 5: Статус MariaDB



The image shows a text editor window with a title bar that includes an 'Open' button with a dropdown arrow, a '+' icon, and the filename '*utf8.cnf' with the path '/etc/my.cnf.d' below it. The editor contains four lines of text: line 1 is '[client]', line 2 is 'default-character-set = utf8', line 3 is '[mysqld]', and line 4 is 'character-set-server = utf8'. The line number '4' is highlighted in the left margin.

```
1 [client]
2 default-character-set = utf8
3 [mysqld]
4 character-set-server = utf8
```

Рис. 6: Редактирование файла `/etc/my.cnf.d/utf8.cnf`



The screenshot shows a terminal window with a dark background. The title bar at the top reads 'root@server:/etc/my.cnf.d'. Below the title bar, there is a prompt 'Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.' followed by the MariaDB prompt 'MariaDB [(none)]>'. The user has entered the command 'status'. The output of the command is displayed below, showing various connection and server details. The text is as follows:

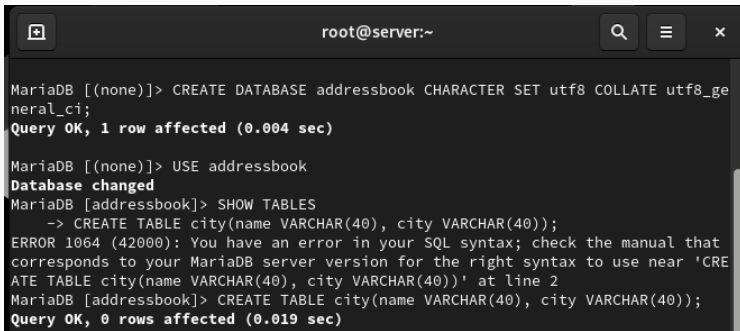
```
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> status
-----
mysql Ver 15.1 Distrib 10.5.22-MariaDB, for Linux (x86_64) using EditLine wrap
per

Connection id:          3
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:    utf8
Db      characterset:    utf8
Client characterset:    utf8
Conn.  characterset:    utf8
UNIX socket:            /var/lib/mysql/mysql.sock
Uptime:                 15 sec
```

Рис. 7: Статус MariaDB после конфигурации кодировки символов

Создание базы данных

A screenshot of a terminal window with a dark background. The window title bar shows 'root@server:~' and standard window controls (search, menu, close). The terminal content shows a sequence of MariaDB commands and their outputs. The first command creates a database named 'addressbook' with utf8 encoding and utf8_general_ci collation, which succeeds. The second command switches to the 'addressbook' database. The third command shows the tables, indicating that a table 'city' was not created due to a syntax error. The fourth command attempts to create the 'city' table again, but it fails with the same error message.

```
root@server:~  
MariaDB [(none)]> CREATE DATABASE addressbook CHARACTER SET utf8 COLLATE utf8_general_ci;  
Query OK, 1 row affected (0.004 sec)  
  
MariaDB [(none)]> USE addressbook  
Database changed  
MariaDB [addressbook]> SHOW TABLES  
-> CREATE TABLE city(name VARCHAR(40), city VARCHAR(40));  
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 'CREATE TABLE city(name VARCHAR(40), city VARCHAR(40))' at line 2  
MariaDB [addressbook]> CREATE TABLE city(name VARCHAR(40), city VARCHAR(40));  
Query OK, 0 rows affected (0.019 sec)
```

Рис. 8: Создание БД addressbook и таблицы city

```

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

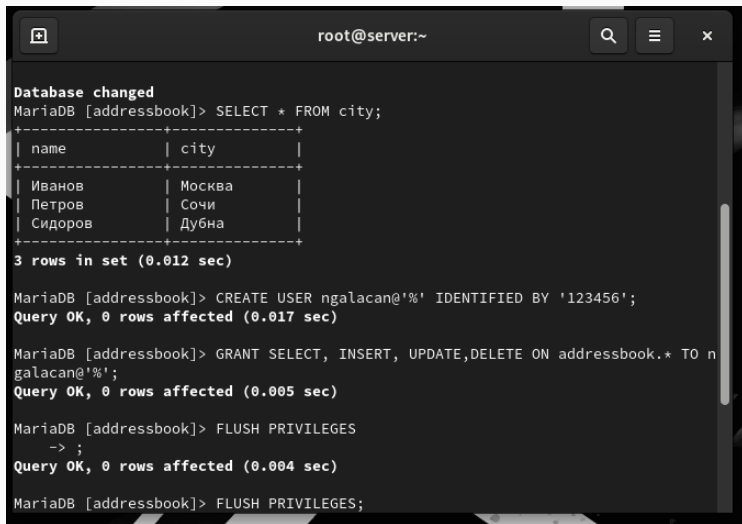
MariaDB [addressbook]> INSERT INTO city(name,city) VALUES ('Петров', 'Сочи');
Query OK, 1 row affected (0.005 sec)

MariaDB [addressbook]> INSERT INTO city(name,city) VALUES ('Сидоров', 'Дубна');
Query OK, 1 row affected (0.004 sec)

MariaDB [addressbook]>

```

Рис. 9: Вставка данных в таблицу



```
root@server:~  
  
Database changed  
MariaDB [addressbook]> SELECT * FROM city;  
+-----+-----+  
| name      | city    |  
+-----+-----+  
| Иванов    | Москва  |  
| Петров    | Сочи    |  
| Сидоров   | Дубна   |  
+-----+-----+  
3 rows in set (0.012 sec)  
  
MariaDB [addressbook]> CREATE USER ngalacan@%' IDENTIFIED BY '123456';  
Query OK, 0 rows affected (0.017 sec)  
  
MariaDB [addressbook]> GRANT SELECT, INSERT, UPDATE,DELETE ON addressbook.* TO n  
galacan@'%';  
Query OK, 0 rows affected (0.005 sec)  
  
MariaDB [addressbook]> FLUSH PRIVILEGES  
-> ;  
Query OK, 0 rows affected (0.004 sec)  
  
MariaDB [addressbook]> FLUSH PRIVILEGES;
```



```
MariaDB [addressbook]> DESCRIBE city;
```

Field	Type	Null	Key	Default	Extra
name	varchar(40)	YES		NULL	
city	varchar(40)	YES		NULL	

```
2 rows in set (0.005 sec)
```

```
MariaDB [addressbook]> quit
```

```
Bye
```

```
[root@server ~]#
```

Рис. 11: Общая информация о таблице

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

Рис. 12: Список БД, список таблиц БД addressbook

Резервные копии

```
[root@server backup]# ls  
addressbook.20240929.204328.sql.gz  addressbook.sql  addressbook.sql.gz  
[root@server backup]# mysql -u root -p addressbook < /var/backup/addressbook.sql  
Enter password:  
[root@server backup]# zcat /var/backup/addressbook.sql.gz | mysql -u root -p addressbook  
Enter password:  
[root@server backup]#
```

Рис. 13: Созданные резервные копии, восстановление резервных копий

Внесение изменений в настройки
внутреннего окружения
виртуальной машины

Выполнение лабораторной работы



```
*mysql.sh
/vagrant/provision/server

1 #!/bin/bash
2 echo "Provisioning script $0"
3 systemctl restart named
4 echo "Install needed packages"
5 dnf -y install mariadb mariadb-server
6 echo "Copy configuration files"
7 cp -R /vagrant/provision/server/mysql/etc/* /etc
8 mkdir -p /var/backup
9 cp -R /vagrant/provision/server/mysql/var/backup/* /var/backup
10 echo "Start mysql service"
11 systemctl enable mariadb
12 systemctl start mariadb
13 if [[ ! -d /var/lib/mysql/mysql ]]
14 then
15 echo "Securing mariadb"
16 mysql_secure_installation <<EOF
17 y
18 123456
19 123456
20 y
21 y
22 y
23 y
24 EOF
25 echo "Create database"
26 mysql -u root -p123456 <<EOF
27 CREATE DATABASE addressbook CHARACTER SET utf8 COLLATE utf8_general_ci;
28 EOF
29 mysql -u root -p123456 addressbook < /var/backup/addressbook.sql
30 fi
```

Рис. 14: Создание скрипта `mysql.sh`

```
server.vm.provision "server mysql",  
  type: "shell",  
  preserve_order: true,  
  path: "provision/server/mysql.sh"
```

В результате выполнения работы были приобретены практические навыки по установке и конфигурированию системы управления базами данных на примере программного обеспечения MariaDB.