Администрирование сетевых подсистем

Установка и настройка MariaDB

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30 сентября 2025

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Цели и задачи работы

Цель лабораторной работы

Приобрести практические навыки по установке и конфигурации системы управления базами данных MariaDB.

Выполнение лабораторной работы

Установка и базовая настройка

```
Installed:
  mariadb-3:10.11.11-1.el10.x86_64                    mariadb-backup-3:10.11.11-1.el10.x86_64
  mariadb-client-utils-3:10.11.11-1.el10.x86_64       mariadb-common-3:10.11.11-1.el10.noarch
  mariadb-errmsg-3:10.11.11-1.el10.noarch             mariadb-gssapi-server-3:10.11.11-1.el10.x86_64
  mariadb-server-3:10.11.11-1.el10.x86_64             mariadb-server-utils-3:10.11.11-1.el10.x86_64
  mysql-selinux-1.0.14-1.el10_0.noarch                perl-DBD-MariaDB-1.23-10.el10.x86_64
  perl-Sys-Hostname-1.25-512.2.el10_0.x86_64

Complete!
[root@server.ahmedfarg.net ~]#
[root@server.ahmedfarg.net ~]# systemctl start mariadb
[root@server.ahmedfarg.net ~]# systemctl enable mariadb
Created symlink '/etc/systemd/system/mysql.service' → '/usr/lib/systemd/system/mariadb.service'.
Created symlink '/etc/systemd/system/mysqld.service' → '/usr/lib/systemd/system/mariadb.service'.
Created symlink '/etc/systemd/system/multi-user.target.wants/mariadb.service' → '/usr/lib/systemd/system/mariadb.s
ervice'.
[root@server.ahmedfarg.net ~]#
```

Рис. 1: Установка и запуск службы mariadb

Конфигурация безопасности

```
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]
 ... 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]
 - 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]
 ... 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.ahmedfarg.net ~]#
```

Просмотр баз данных

```
[root@server.ahmedfarg.net ~]#
[root@server.ahmedfarg.net ~]# mysql -y root -p
mysql: unknown option '-y'
[root@server.ahmedfarg.net ~]# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 13
Server version: 10.11.11-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 |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
4 rows in set (0.000 sec)

MariaDB [(none)]>
```

Список доступных команд

```
Note that all text commands must be first on line and end with ';'
?         (\?) Synonym for `help'.
charset   (\C) Switch to another charset. Might be needed for processing binlog with multi-byte charsets
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.
nowarning (\w) Don't show warnings after every statement.
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.
sandbox   (\-) Disallow commands that access the file system (except \P without an argument and \e).
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.
warnings  (\W) Show warnings after every statement.

For server side help, type 'help contents'

MariaDB [(none)]>
```

Статус MariaDB до изменения кодировки

```
MariaDB [(none)]>
MariaDB [(none)]> status
--------------
mysql  Ver 15.1 Distrib 10.11.11-MariaDB, for Linux (x86_64) using  EditLine wrapper

Connection id:          13
Current database:
Current user:           root@localhost
SSL:                    Not in use
Current pager:          stdout
Using outfile:          ''
Using delimiter:        ;
Server:                 MariaDB
Server version:         10.11.11-MariaDB MariaDB Server
Protocol version:       10
Connection:             Localhost via UNIX socket
Server characterset:    latin1
Db     characterset:    latin1
Client characterset:    utf8mb3
Conn.  characterset:    utf8mb3
UNIX socket:            /var/lib/mysql/mysql.sock
Uptime:                 5 min 32 sec

Threads: 1  Questions: 25  Slow queries: 0  Opens: 20  Open tables: 13  Queries per second avg: 0.075
--------------

MariaDB [(none)]>
```

Рис. 5: Статус MariaDB до изменения конфигурации

Конфигурация utf8.cnf

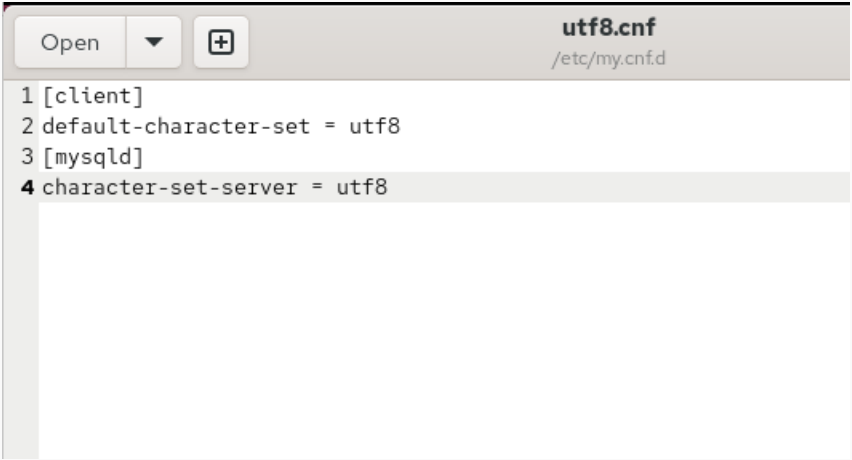

Рис. 6: Файл utf8.cnf

Статус MariaDB после изменения кодировки

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

MariaDB [(none)]> status
--------------
mysql  Ver 15.1 Distrib 10.11.11-MariaDB, for Linux (x86_64) using  EditLine wrapper

Connection id:          3
Current database:
Current user:           root@localhost
SSL:                    Not in use
Current pager:          stdout
Using outfile:          ''
Using delimiter:        ;
Server:                 MariaDB
Server version:         10.11.11-MariaDB MariaDB Server
Protocol version:       10
Connection:             Localhost via UNIX socket
Server characterset:    utf8mb3
Db     characterset:    utf8mb3
Client characterset:    utf8mb3
Conn.  characterset:    utf8mb3
UNIX socket:            /var/lib/mysql/mysql.sock
Uptime:                 17 sec

Threads: 1  Questions: 4  Slow queries: 0  Opens: 17  Open tables: 10  Queries per second avg: 0.235
--------------

MariaDB [(none)]>
```

Рис. 7: Статус MariaDB после изменения конфигурации

Создание базы и проверка таблиц

```
MariaDB [(none)]> USE addressbook;
Database changed
MariaDB [addressbook]> SHOW TABLES;
Empty set (0.001 sec)

MariaDB [addressbook]> CREATE TABLE city(name VARCHAR(40), city VARCHAR(40));
Query OK, 0 rows affected (0.005 sec)

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

MariaDB [addressbook]> INSERT INTO city(name,city) VALUES ('Petrov','Sochi');
Query OK, 1 row affected (0.001 sec)

MariaDB [addressbook]> INSERT INTO city(name,city) VALUES ('Sidorov','Dubna');
Query OK, 1 row affected (0.001 sec)

MariaDB [addressbook]> SELECT * FROM city;
+---------+--------+
| name    | city   |
+---------+--------+
| Ivanov  | Moscow |
| Petrov  | Sochi  |
| Sidorov | Dubna  |
+---------+--------+
3 rows in set (0.000 sec)

MariaDB [addressbook]>
```

Создание таблицы и добавление данных

```
MariaDB [addressbook]>
MariaDB [addressbook]> CREATE USER faisalahmad@'%' IDENTIFIED BY '123456';
Query OK, 0 rows affected (0.001 sec)

MariaDB [addressbook]> GRANT SELECT,INSERT,UPDATE,DELETE ON addressbook.* TO faisalahmad@'%';
Query OK, 0 rows affected (0.001 sec)

MariaDB [addressbook]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.000 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 (0.001 sec)

MariaDB [addressbook]>
```

Рис. 9: Создание таблицы и добавление данных

Создание пользователя и проверка структуры

```
Bye
[root@server.ahmedfarg.net my.cnf.d]#
[root@server.ahmedfarg.net my.cnf.d]# mysqlshow -u root -p
Enter password:
+--------------------+
|     Databases      |
+--------------------+
| addressbok         |
| addressbook        |
| information_schema |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
[root@server.ahmedfarg.net my.cnf.d]# mysqlshow -u root -p addressbook
Enter password:
Database: addressbook
+--------+
| Tables |
+--------+
| city   |
+--------+
[root@server.ahmedfarg.net my.cnf.d]#
```

Просмотр списка баз и таблиц

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

Рис. 11: Просмотр списка баз данных и таблиц

Резервное копирование базы

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

Рис. 12: Создание резервных копий базы addressbook

Восстановление базы из резервной копии

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

Рис. 13: Подготовка окружения и копирование файлов

Выводы по проделанной работе

Вывод

В ходе работы была установлена и сконфигурирована СУБД MariaDB.

Выполнена настройка безопасности и кодировок, создана база данных `addressbook` с таблицей `city`.

Реализовано резервное копирование и восстановление, а также подготовлено окружение для автоматизации.