Администрирование СУБД

Установка и настройка MariaDB (Лабораторная работа №6)

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Цели и задачи работы

Цель лабораторной работы

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

Задачи лабораторной работы

1. Установить и запустить службу MariaDB.
2. Настроить параметры безопасности.
3. Создать базу данных и таблицы.
4. Создать пользователей и выдать им права.
5. Настроить кодировку символов.
6. Выполнить резервное копирование и восстановление базы.
7. Сохранить конфигурацию и автоматизировать развертывание.

Теоретическая часть

Основы MariaDB

- СУБД с открытым исходным кодом, форк MySQL.
- Основные компоненты: сервер, клиентские утилиты, хранилища данных.
- Возможности: SQL, многопользовательский доступ, репликация, совместимость с MySQL.

Процесс выполнения лабораторной работы

Установка и первичная настройка

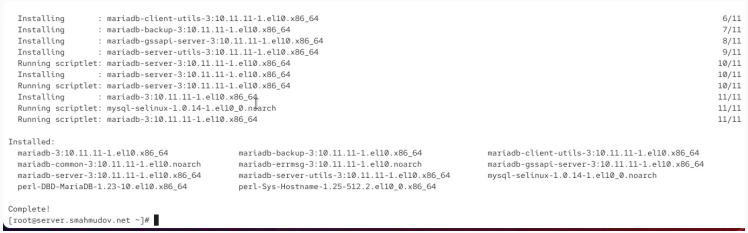

Рис. 1: Установка и запуск MariaDB

Настройка 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.smahmudov.net ~]# mysql -u root -p
Enter password:
```

Проверка системных баз данных

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

MariaDB [(none)]> SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
4 rows in set (0.000 sec)

MariaDB [(none)]>
```

Рис. 3: Проверка системных БД

Конфигурация кодировки символов

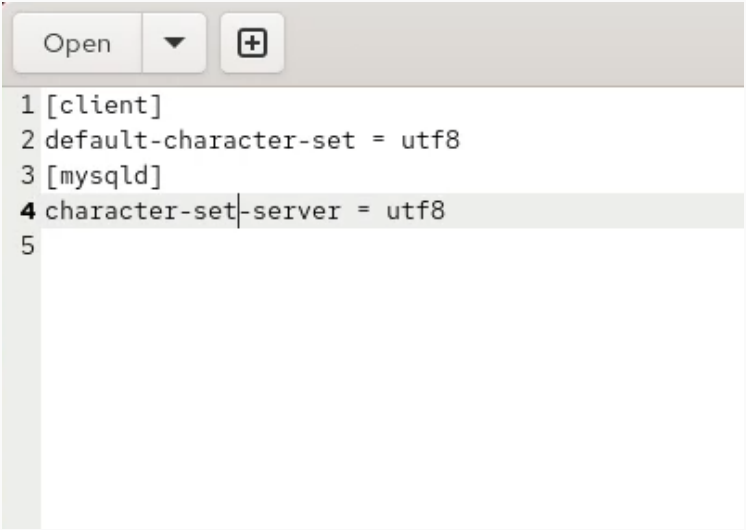

Рис. 4: Создание utf8.cnf

Проверка кодировки

```
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:                 11 sec

Threads: 1  Questions: 4  Slow queries: 0  Opens: 17  Open tables: 10  Queries per second avg: 0.363
--------------

MariaDB [(none)]>
```

Рис. 5: Статус MariaDB после изменения

Создание базы данных и таблицы

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

MariaDB [addressbook]> CREATE TABLE city(name VARCHAR(40)m city VARCHAR(40));
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to
city VARCHAR(40))' at line 1
MariaDB [addressbook]> CREATE TABLE city(name VARCHAR(40), city VARCHAR(40));
Query OK, 0 rows affected (0.004 sec)

MariaDB [addressbook]> INSERT INTO city(name,city) VALUES ('Ivanov', 'Moscow');
Query OK, 1 row affected (0.001 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]>
```

Добавление данных и просмотр

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

MariaDB [addressbook]> CREATE TABLE city(name VARCHAR(40)m city VARCHAR(40));
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to
city VARCHAR(40))' at line 1
MariaDB [addressbook]> CREATE TABLE city(name VARCHAR(40), city VARCHAR(40));
Query OK, 0 rows affected (0.004 sec)

MariaDB [addressbook]> INSERT INTO city(name,city) VALUES ('Ivanov', 'Moscow');
Query OK, 1 row affected (0.001 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]>
```

Управление пользователями и правами

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

MariaDB [addressbook]> GRANT SELECT,INSERT,UPDATE,DELETE ON addressbook.* TO smahmudov@'%';
Query OK, 0 rows affected (0.002 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. 8: Создание пользователя и выдача прав

Проверка доступа к базе данных

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

Резервное копирование базы данных

```
[root@server.smahmudov.net my.cnf.d]#
[root@server.smahmudov.net my.cnf.d]# mkdir -p /var/backup
[root@server.smahmudov.net my.cnf.d]# mysqldump -u root -p addressbook > /var/backup/addressbook.sql
Enter password:
[root@server.smahmudov.net my.cnf.d]# mysqldump -u root -p addressbook | gzip > /var/backup/addressbook.sql.gz
Enter password:
[root@server.smahmudov.net my.cnf.d]# mysqldump -u root -p addressbook | gzip > $(/var/backup/addressbook.%Y%m%d.%H%M%S.sql.gz)
-bash: /var/backup/addressbook.%Y%m%d.%H%M%S.sql.gz: No such file or directory
-bash: $(/var/backup/addressbook.%Y%m%d.%H%M%S.sql.gz): ambiguous redirect
Enter password:
mysqldump: Got errno 32 on write
[root@server.smahmudov.net my.cnf.d]#
[root@server.smahmudov.net my.cnf.d]# mysqldump -u root -p addressbook | gzip > $(date+/var/backup/addressbook.%Y%m%d.%H%M%S.sql.gz)
-bash: date+/var/backup/addressbook.%Y%m%d.%H%M%S.sql.gz: No such file or directory
-bash: $(date+/var/backup/addressbook.%Y%m%d.%H%M%S.sql.gz): ambiguous redirect
Enter password:
mysqldump: Got errno 32 on write
[root@server.smahmudov.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.smahmudov.net my.cnf.d]# ls /var/backup/
addressbook.20250926.123550.sql.gz  addressbook.sql  addressbook.sql.gz
[root@server.smahmudov.net my.cnf.d]# mysql -u root -p addressbook < /var/backup/addressbook.sql
Enter password:
[root@server.smahmudov.net my.cnf.d]#
[root@server.smahmudov.net my.cnf.d]# zcat /var/backup/addressbook.sql.gz | mysql -u root -p addressbook
Enter password:
[root@server.smahmudov.net my.cnf.d]#
[root@server.smahmudov.net my.cnf.d]#
```

Рис. 10: Создание резервных копий

Сохранение конфигурации и резервных копий

```
[root@server.smahmudov.net my.cnf.d]#
[root@server.smahmudov.net my.cnf.d]# cd /vagrant/provision/server/
[root@server.smahmudov.net server]# mkdir -p /vagrant/provision/server/mysql/etc/my.cnf.d
[root@server.smahmudov.net server]# mkdir -p /vagrant/provision/server/mysql/var/backup
[root@server.smahmudov.net server]# cp -R /etc/my.cnf.d/utf8.cnf > /vagrant/provision/server/mysql/etc/my.cnf.d/
-bash: /vagrant/provision/server/mysql/etc/my.cnf.d/: Is a directory
[root@server.smahmudov.net server]# cp -R /etc/my.cnf.d/utf8.cnf /vagrant/provision/server/mysql/etc/my.cnf.d/
[root@server.smahmudov.net server]# cp -R /var/backup/* /vagrant/provision/server/mysql/var/backup/
[root@server.smahmudov.net server]# touch mysql.sh
[root@server.smahmudov.net server]#
```

Рис. 11: Сохранение конфигурации и бэкапов

Вывод

Вывод

В ходе лабораторной работы была установлена и настроена СУБД MariaDB. Реализованы: настройка безопасности, создание базы данных и таблиц, управление пользователями, конфигурация кодировки. Выполнено резервное копирование и восстановление, а также сохранение конфигурации для автоматизированного развертывания.