Администрирование MariaDB

Установка, настройка и резервное копирование

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Цель работы

Основная цель

Освоить установку, настройку и эксплуатацию системы управления базами данных MariaDB, включая создание БД, таблиц, пользователей и выполнение резервного копирования.

Установка MariaDB

Просмотрены файлы `/etc/my.cnf` и содержимое каталога `/etc/my.cnf.d`.

```
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.trseidaliev.net ~]# ls /etc/my.cnf.d/
auth_gssapi.cnf  enable_encryption.preset  mysql-clients.cnf   provider_lz4.cnf  provider_snappy.cnf
client.cnf       mariadb-server.cnf        provider_bzip2.cnf  provider_lzo.cnf  spider.cnf
[root@server.trseidaliev.net ~]# 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.trseidaliev.net ~]#
```

Рис. 1: Конфигурация MariaDB

Запуск и проверка работы

Служба MariaDB запущена, добавлена в автозагрузку.

Порт 3306 слушается процессом `mariadbd`.

```
[root@server.trseidaliev.net ~]#
[root@server.trseidaliev.net ~]# systemctl start mariadb
[root@server.trseidaliev.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.servi
ce'.
[root@server.trseidaliev.net ~]# ss -tulpen | grep mysql
[root@server.trseidaliev.net ~]# ss -tulpen | grep maria
tcp   LISTEN 0      80           0.0.0.0:3306       0.0.0.0:*    users:(("mariadbd",pid=16621,fd=18))
                                                                      uid:27 ino:92920 sk:18 cgroup:/system.slice

/mariadb.service <->
tcp   LISTEN 0      80              [::]:3306          [::]:*    users:(("mariadbd",pid=16621,fd=19))
                                                                      uid:27 ino:92921 sk:24 cgroup:/system.slice

/mariadb.service v6only:1 <->
[root@server.trseidaliev.net ~]#
```

Рис. 2: Проверка порта

mysql_secure_installation

Выполнены основные шаги защиты MariaDB:

- установка пароля root
- удаление тестовой базы
- отключение анонимных пользователей
- запрет удалённого входа root

```
production environment.

Remove anonymous users? [Y/n]
 ... 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]
 ... 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...
```

Работа с базами данных

Просмотр команд и системных БД

Проверены команды MariaDB и список системных баз данных.

```
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'.
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.
```

Просмотр команд и системных БД

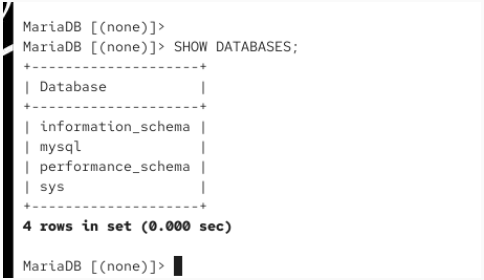

Рис. 5: Список БД

Настройка кодировки UTF-8

Создан файл `utf8.cnf`, задана кодировка UTF-8 для сервера и клиента.

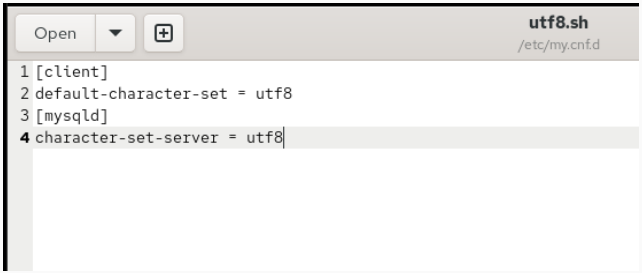

Рис. 6: Файл utf8.cnf

Результат

Кодировка успешно изменилась на `utf8mb3`.

```
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:                 6 sec

Threads: 1  Questions: 4  Slow queries: 0  Opens: 17  Open tables: 10  Queries per second avg: 0.666
```

Создание базы addressbook

Таблица city

Создана БД `addressbook` и таблица `city`.

Добавлены три записи: Иванов, Петров, Сидоров.

```
MariaDB [(none)]> CREATE DATABASE addressbook CHARACTER SET utf8 COLLATE utf8_general_ci;
Query OK, 1 row affected (0.000 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 (0.004 sec)

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

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

MariaDB [addressbook]> INSERT INTO city(name,city) VALUES ('Сидоров','Дубна');
Query OK, 1 row affected (0.003 sec)

MariaDB [addressbook]> SELECT * FROM city
    -> ;
+----------------+--------------+
| name           | city         |
+----------------+--------------+
| Иванов         | Мюсква       |
```

Создание пользователя

Создан пользователь и выданы права `SELECT, INSERT, UPDATE, DELETE`.

```
MariaDB [addressbook]>
MariaDB [addressbook]> CREATE USER trseidaliev@'%' IDENTIFIED BY '123456';
Query OK, 0 rows affected (0.004 sec)

MariaDB [addressbook]> GRANT SELECT,INSERT,UPDATE,DELETE ON addressbook.* TO trseidaliev@'%';
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: Права пользователя

Резервное копирование

Создание копий

Выполнено:

- обычное резервное копирование
- сжатое gzip
- копия с отметкой времени

```
[root@server.trseidaliev.net my.cnf.d]#
[root@server.trseidaliev.net my.cnf.d]# mkdir -p /var/backup
[root@server.trseidaliev.net my.cnf.d]# cd /var/backup/
[root@server.trseidaliev.net backup]# mysqldump -u root -p addressbook > addressbook.sql
Enter password:
[root@server.trseidaliev.net backup]# mysqldump -u root -p addressbook | gzip > addressbook.sql.gz
Enter password:
[root@server.trseidaliev.net backup]# mysqldump -u root -p addressbook | gzip > $(date +addressbook.%Y%m$d.%H$M%S.sql.
gz)
Enter password:
[root@server.trseidaliev.net backup]# ls
addressbook.202511.1750.sql.gz  addressbook.sql  addressbook.sql.gz
[root@server.trseidaliev.net backup]#
[root@server.trseidaliev.net backup]# mysql -u root -p addressbook < addressbook.sql
Enter password:
[root@server.trseidaliev.net backup]# zcat addressbook.sql.gz | mysql -u root -p addressbook
Enter password:
[root@server.trseidaliev.net backup]#
```

Итоги работы

Основные результаты

- MariaDB установлена и настроена
- выполнена настройка безопасности
- создана база `addressbook` и таблица `city`
- добавлены данные и выданы права пользователю
- выполнено резервное копирование и восстановление
- подготовлена автоматизация через скрипт `mysql.sh`