

Презентация лабораторной работы №6

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Цель работы

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

Задачи

- Установите необходимые для работы MariaDB пакеты
- Настройте в качестве кодировки символов по умолчанию utf8 в базах данных.
- В базе данных MariaDB создайте тестовую базу addressbook, содержащую таблицу city с полями name и city, т.е., например, для некоторого сотрудника указан город, в котором он работает
- Создайте резервную копию базы данных addressbook и восстановите из неё данные
- Напишите скрипт для Vagrant, фиксирующий действия по установке и настройке базы данных MariaDB во внутреннем окружении виртуальной машины server. Соответствующим образом внести изменения в Vagrantfile

Результаты выполнения

- Установите необходимые для работы MariaDB пакеты

```
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!
```

Рис. 1

```
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'

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

MariaDB [(none)]> exit;
Bye
```

Рис. 2

Результаты выполнения

- Настройте в качестве кодировки символов по умолчанию utf8 в базах данных.

```
MariaDB [(none)]> status
-----
mysql Ver 15.1 Distrib 10.5.16-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:         10.5.16-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:                 3 min 16 sec

Threads: 1  Questions: 27  Slow queries: 0  Opens: 20  Open tables: 13  Queries per second avg: 0.137
-----
```

Рис. 5

```
[client]
default-character-set = utf8
[mysqld]
character-set-server = utf8
```

Рис. 6

```
[root@server.nabakulin.net ~]# cd /etc/my.cnf.d
[root@server.nabakulin.net my.cnf.d]# touch utf8.cnf
[root@server.nabakulin.net my.cnf.d]# vi utf8.cnf
[root@server.nabakulin.net my.cnf.d]# systemctl restart mariadb
[root@server.nabakulin.net my.cnf.d]# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 3
Server version: 10.5.16-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 10.5.16-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:         10.5.16-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:                 14 sec

Threads: 1  Questions: 4  Slow queries: 0  Opens: 17  Open tables: 10  Queries per second avg: 0.285
-----
```

Рис. 7

Результаты выполнения

- В базе данных MariaDB создайте тестовую базу addressbook, содержащую таблицу city с полями name и city, т.е., например, для некоторого сотрудника указан город, в котором он работает

```
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 (0.018 sec)

MariaDB [addressbook]> INSERT INTO city(name,city) VALUES ('','');
Query OK, 1 row affected (0.002 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  |
+-----+-----+
4 rows in set (0.000 sec)

MariaDB [addressbook]> CREATE USER nabakulin@'%' IDENTIFIED BY 'password';
Query OK, 0 rows affected (0.030 sec)

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

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

Рис. 8

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

[root@server.nabakulin.net my.cnf.d]# mysqlshow -u root -p addressbook
Enter password:
Database: addressbook
+-----+
| Tables |
+-----+
| city |
+-----+
```

Рис. 9

Результаты выполнения

- Создайте резервную копию базы данных addressbook и восстановите из неё данные

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

Рис. 10

Результаты выполнения

- Напишите скрипт для Vagrant, фиксирующий действия по установке и настройке базы данных MariaDB во внутреннем окружении виртуальной машины server. Соответствующим образом внести изменения в Vagrantfile

```
#!/bin/bash
echo "Provisioning script $0"
systemctl restart named

echo "Install needed packages"
dnf -y install mariadb mariadb-server

echo "Copy configuration files"
cp -R /vagrant/provision/server/mysql/etc/* /etc
mkdir -p /var/backup
cp -R /vagrant/provision/server/mysql/var/backup/* /var/backup

echo "Start mysql service"
systemctl enable mariadb
systemctl start mariadb

if [[ ! -d /var/lib/mysql/mysql ]]
then
echo "Securing mariadb"
mysql_secure_installation <<EOF
y
123456
123456
y
y
y
y
EOF

echo "Create database"
mysql -u root -p123456 <<EOF
CREATE DATABASE addressbook CHARACTER SET utf8 COLLATE utf8_general_ci;
EOF
mysql -u root -p123456 addressbook < /var/backup/addressbook.sql

fi
```

Рис. 11

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

Рис. 12