

Лабораторная работа №6

Администрирование сетевых подсистем

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

Выполнение лабораторной работы

Установка MariaDB

```
[aamishina@server aamishina.net ~]$ sudo -i
[sudo] password for aamishina:
[root@server aamishina.net ~]# df -y install mariadb mariadb-server
Extra Packages for Enterprise Linux 9 - x86_64                12 kB/s | 24 kB  00:02
Extra Packages for Enterprise Linux 9 - x86_64              754 kB/s | 23 MB  00:30
Extra Packages for Enterprise Linux 9 openh264 (From Cisco) - x86_64 1.2 kB/s | 993 B  00:00
Rocky Linux 9 - BaseOS                                       2.0 kB/s | 4.1 kB  00:02
Rocky Linux 9 - BaseOS                                       1.3 MB/s | 2.3 MB  00:01
Rocky Linux 9 - AppStream                                    12 kB/s | 4.5 kB  00:00
Rocky Linux 9 - AppStream                                    3.3 MB/s | 8.0 MB  00:02
Rocky Linux 9 - Extras                                       6.0 kB/s | 2.9 kB  00:00
Rocky Linux 9 - Extras                                       21 kB/s | 15 kB  00:00
Dependencies resolved.

=====
Package                                Architecture      Version           Repository        Size
=====
Installing:
mariadb                                x86_64            3:10.5.22-1.el9_2 appstream         1.6 M
mariadb-server                         x86_64            3:10.5.22-1.el9_2 appstream         9.6 M
Installing dependencies:
mariadb-common                        x86_64            3:10.5.22-1.el9_2 appstream         27 k
mariadb-connector-c                   x86_64            3.2.4-1.el9_0     appstream        195 k
mariadb-connector-c-config            march             3.2.4-1.el9_0     appstream         9.8 k
mariadb-errmsg                        x86_64            3:10.5.22-1.el9_2 appstream         211 k
mysql-libs                             march             1.0.10-1.el9      appstream         36 k
perl-BDB-MariaDB                     x86_64            1.21-16.el9_0     appstream        151 k
perl-Sys-Hostname                     x86_64            1.23-481.el9      appstream         16 k
Installing weak dependencies:
mariadb-backup                        x86_64            3:10.5.22-1.el9_2 appstream         6.4 M
mariadb-gssapi-server                 x86_64            3:10.5.22-1.el9_2 appstream         15 k
mariadb-server-utils                  x86_64            3:10.5.22-1.el9_2 appstream        210 k

Transaction Summary
=====
Install 12 Packages
```

Рис. 1: Установка пакетов

```
[root@server.aamishina.net ~]# cd /etc/my.cnf.d
[root@server.aamishina.net my.cnf.d]# ls
auth_gssapi.cnf client.cnf enable_encryption.preset mariadb-server.cnf mysql-clients.cnf spider.cnf
[root@server.aamishina.net my.cnf.d]# vim auth_gssapi.cnf
[root@server.aamishina.net my.cnf.d]# vim client.cnf
[root@server.aamishina.net my.cnf.d]# vim enable_encryption.preset
[root@server.aamishina.net my.cnf.d]# vim mariadb-server.cnf
[root@server.aamishina.net my.cnf.d]# vim mysql-clients.cnf
[root@server.aamishina.net my.cnf.d]# vim spider.cnf
[root@server.aamishina.net my.cnf.d]# vim /etc/my.cnf
[root@server.aamishina.net my.cnf.d]# cd
[root@server.aamishina.net ~]# systemctl start mariadb
[root@server.aamishina.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.service.
[root@server.aamishina.net ~]# ss -tulpen | grep mysql
[root@server.aamishina.net ~]# ss -tulpen | grep 3306
tcp LISTEN 0      80          *:*        users:((("mariabdb",pid=13313,fd=16)) uid:27 ino:48690 sk:14 cgroup:/system.slice/mariadb.serv
ice v6only:0 <->)
[root@server.aamishina.net ~]#
```

Рис. 2: Просмотр конфигурационных файлов. Прослушивание порта 3306

- mysql_secure_installation

```
All done! If you've completed all of the above steps, your MariaDB
installation should now be secure.

Thanks for using MariaDB!
[root@server.samshina.net ~]# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 9
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 '\n'
?          (?) Synonym for 'help'.
clear      (C) Clear the current input statement.
connect    (v) Reconnect to the server. Optional arguments are db and host.
delimiter (d) Set statement delimiter.
edit       (e) Edit command with $EDITOR.
ego        (S) 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.
notes      (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     (R) 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
```

Рис. 3: Вход в БД и просмотр списка команд

```
MariaDB [(none)]> SHOW DATABASES;  
+-----+  
| Database |  
+-----+  
| information_schema |  
| mysql |  
| performance_schema |  
+-----+  
3 rows in set (0.003 sec)  
  
MariaDB [(none)]> exit  
Bye  
[root@server.aamishina.net ~]#
```

Рис. 4: Имеющиеся в системе БД

Конфигурация кодировки символов

```
[root@server.aantishia.net ~]# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 18
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)]> status
-----
mysql Ver 15.1 Distrib 10.5.22-MariaDB, for Linux (x86_64) using Editline wrapper

Connection id:          28
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 character set:    latin1
DB character set:        latin1
Client character set:    utf8
Conn. character set:     utf8
UNIX socket:             /var/lib/mysql/mysql.sock
Uptime:                  28 min 43 sec

Threads: 1  Questions: 19  Slow queries: 0  Opens: 28  Open tables: 13  Queries per second avg: 6.829
-----
MariaDB [(none)]> |
```

Рис. 5: Статус MariaDB

```
root@server:~  
[client]  
default-character-set = utf8  
[mysqld]  
character-set-server = utf8  
~  
~
```

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

```

kya
[root@server.xamishina.net ~]# systemctl restart mariadb
[root@server.xamishina.net ~]# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 3
Server version: 10.5.22-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)]> status
-----
mysql Ver 15.1 Distrib 10.5.22-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:          10.5.22-MariaDB MariaDB Server
Protocol version:        10
Connection:              Localhost via UNIX socket
Server character set:    utf8
Db      character set:   utf8
Client character set:    utf8
Conn.  character set:    utf8
UNIX socket:             /var/lib/mysql/mysql.sock
Uptime:                  12 sec

Threads: 1  Questions: 4  Slow queries: 0  Opens: 17  Open tables: 16  Queries per second avg: 0.333
-----
MariaDB [(none)]> |
```

Рис. 7: Статус MariaDB после конфигурации кодировки символов

Создание базы данных

```
[root@server.aamishina.net ~]# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 4
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)]> CREATE DATABASE addressbook CHARACTER SET utf8 COLLATE utf8_general_ci;
Query OK, 1 row affected (0.001 sec)

MariaDB [(none)]> USE addressbook;
ERROR 1049 (42000): Unknown database 'addressbook'
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 (0.021 sec)

MariaDB [addressbook]>
```

Рис. 8: Создание БД addressbook и таблицы city

```
MariaDB [addressbook]> INSERT INTO city(name,city) VALUES ('Иванов','Москва');  
Query OK, 1 row affected (0.006 sec)  
  
MariaDB [addressbook]> INSERT INTO city(name,city) VALUES ('Петров','Сочи');  
Query OK, 1 row affected (0.008 sec)  
  
MariaDB [addressbook]> INSERT INTO city(name,city) VALUES ('Сидоров','Дубна');  
Query OK, 1 row affected (0.005 sec)  
  
MariaDB [addressbook]> █
```

Рис. 9: Вставка данных в таблицу

```
MariaDB [addressbook]> SELECT * FROM city;
+-----+-----+
| name   | city   |
+-----+-----+
| Иванов | Москва |
| Петров | Сочи   |
| Сидоров| Дубна  |
+-----+-----+
3 rows in set (0.001 sec)

MariaDB [addressbook]> CREATE USER aamishina@'%' IDENTIFIED BY '123456'
->
-> q
-> ;
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 '
' at line 3
MariaDB [addressbook]> CREATE USER aamishina@'%' IDENTIFIED BY '123456';
Query OK, 0 rows affected (0.006 sec)

MariaDB [addressbook]> GRANT SELECT,INSERT,UPDATE,DELETE ON addressbook.* TO aamishina@'%';
Query OK, 0 rows affected (0.005 sec)

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

Рис. 10: Просмотр таблицы, создание пользователя, предоставление прав, обновление привилегий


```
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]> quit
```

Рис. 11: Общая информация о таблице

```
MariaDB [addressbook]> quit
Bye
[root@server.aamishina.net ~]# mysqlshow -u root -p
Enter password:
+-----+
| Databases |
+-----+
| addressbook |
| information_schema |
| mysql |
| performance_schema |
+-----+

[root@server.aamishina.net ~]# mysqlshow -u root -p addressbook
Enter password:
Database: addressbook
+-----+
| Tables |
+-----+
| city |
+-----+
[root@server.aamishina.net ~]#
```

Рис. 12: Список БД, список таблиц БД addressbook

Резервные копии

```
[root@server.aamishina.net ~]# mkdir -p /var/backup
[root@server.aamishina.net ~]# mysqldump -u root -p addressbook > /var/backup/addressbook.sql
Enter password:
[root@server.aamishina.net ~]# mysqldump -u root -p addressbook | gzip > /var/backup/addressbook.sql.gz
Enter password:
[root@server.aamishina.net ~]# 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.aamishina.net ~]# mysqldump -u root -p addressbook | gzip > $(date +var/backup/addressbook.%Y%m%d.%H%M%S.sql.gz)
Enter password:
[root@server.aamishina.net ~]# mysql -u root -p addressbook < /var/backup/addressbook.sql
Enter password:
[root@server.aamishina.net ~]# zcat /var/backup/addressbook.sql.gz | mysql -u root -p addressbook
Enter password:
[root@server.aamishina.net ~]# ls /var/backup/
addressbook.20241009.143243.sql.gz  addressbook.sql  addressbook.sql.gz
[root@server.aamishina.net ~]#
```

Рис. 13: Созданные резервные копии, восстановление резервных копий

Внесение изменений в настройки
внутреннего окружения
виртуальной машины

Внесение изменений в настройки внутреннего окружения

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

Рис. 14: Копирование каталогов, создание скрипта

[illegible]

Рис. 15: Создание скрипта `mysql.sh`

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