

# MariaDB/Mysql

Дано:

Две ВМ на yandex cloud с ОС Centos 7:

- mysql-master
- mysql-slave

Задание:

- Настроить кластер MariaDB режим Master — Slave
- Настроить кластер MariaDB режим Master — Master

# Две VM на yandex cloud с ОС Centos 7:

- mysql-master
- mysql-slave

The screenshot displays the Yandex Cloud console interface for managing virtual machines. The breadcrumb navigation shows the path: `console.cloud.yandex.ru/folders/b1gv4l14uqqeafgtpcpr/compute/instances`. The page title is "Виртуальные машины" (Virtual Machines). Below the title, there are filters for "Фильтр по имени" (Filter by name), "Все статусы" (All statuses), and "Все зоны доступности" (All availability zones). A table lists the virtual machines with the following columns: `Имя` (Name), `Статус` (Status), `ОС` (OS), `Платформа` (Platform), `vCPU`, `Доля vCPU` (vCPU share), `RAM`, `Прерываемая` (Interruptible), `Размер дисков` (Disk size), `Зона доступности` (Availability zone), `Внутренний IPv4` (Internal IPv4), `Публичный IPv4` (Public IPv4), `Дата создания` (Creation date), `Идентификатор` (Identifier), and a settings icon. Two VMs are listed: `mysql-master` and `mysql-slave`, both with a status of `Running`. Both VMs are based on the `Centos 7` OS and the `Intel Ice Lake` platform. They have 2 vCPU, 50% vCPU share, 2 GB RAM, and are not interruptible. The disk size is 20 GB. They are located in the `ru-central1-a` availability zone. The `mysql-master` VM has an internal IPv4 address of `10.128.0.31` and a public IPv4 address of `130.193.39.110`. The `mysql-slave` VM has an internal IPv4 address of `10.128.0.24` and a public IPv4 address of `51.250.87.254`. Both VMs were created on `2022-08-31`. The `mysql-master` VM was created at `16:34` and the `mysql-slave` VM was created at `16:40`. The identifiers are `fhn8d1ov7693ekg86589` for `mysql-master` and `fhn9f7ek9uubkc5pkqof` for `mysql-slave`. A "Создать VM" (Create VM) button is visible in the top right corner.

Имя	Статус	ОС	Платформа	vCPU	Доля vCPU	RAM	Прерываемая	Размер дисков	Зона доступности	Внутренний IPv4	Публичный IPv4	Дата создания	Идентификатор
mysql-master	Running	Centos 7	Intel Ice Lake	2	50 %	2 ГБ	нет	20 ГБ	ru-central1-a	10.128.0.31	130.193.39.110	2022-08-31, в 16:34	fhn8d1ov7693ekg86589
mysql-slave	Running	Centos 7	Intel Ice Lake	2	50 %	2 ГБ	нет	20 ГБ	ru-central1-a	10.128.0.24	51.250.87.254	2022-08-31, в 16:40	fhn9f7ek9uubkc5pkqof

# Задание 1. Настроить кластер MariaDB режим Master — Slave.

Редактируем конфиг файл MariaDB на сервере master.

```
root@mysql-master:~
GNU nano 2.3.1                               Файл: /etc/my.cnf

[mysqld]
server-id = 1
log_bin = mysql-bin
log_error = mysql-bin.err
binlog_ignore_db = information_schema,mysql,test
datadir=/var/lib/mysql
socket=/var/lib/mysql/mysql.sock
#replicate-do-db = base1
#replicate-do-db = base2
#replicate-do-table=base1.table1
#replicate-do-table=base1.table2
# Disabling symbolic-links is recommended to prevent assorted security risks
symbolic-links=0
# Settings user and group are ignored when systemd is used.
# If you need to run mysqld under a different user or group,
# customize your systemd unit file for mariadb according to the
# instructions in http://fedoraproject.org/wiki/Systemd

[mysqld_safe]
log-error=/var/log/mariadb/mariadb.log
pid-file=/var/run/mariadb/mariadb.pid

#
# include all files from the config directory
#
!includedir /etc/my.cnf.d

[ Прочитано 27 строк ]

^G Помощь      ^O Записать    ^R ЧитФайл    ^V ПредСтр    ^K Вырезать   ^C ТекПозиц
^X Выход      ^J Выворнять   ^W Поиск      ^V СледСтр    ^U ОтмВырезк   ^T Словарь

root@mysql-master:~
```

# Создаем служебную учетную запись на сервере master для репликации.

```
root@mysql-master:~  
[root@mysql-master ~]# mysql -uroot -p  
Enter password:  
Welcome to the MariaDB monitor.  Commands end with ; or \g.  
Your MariaDB connection id is 6  
Server version: 5.5.68-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)]> GRANT replication slave ON *.* TO "repl"@"51.250.87.254" IDENTIFIED BY "qweasdzxc";  
Query OK, 0 rows affected (0.00 sec)  
  
MariaDB [(none)]> show master status\G  
***** 1. row *****  
      File: mysql-bin.000001  
      Position: 561  
      Binlog_Do_DB:  
      Binlog_Ignore_DB: information_schema,mysql,test  
1 row in set (0.00 sec)  
  
MariaDB [(none)]> |
```

root@mysql-master:~

root@mysql-slave:~

# Редактируем конфиг файл MariaDB на сервере stage.

```
root@mysql-slave:~
GNU nano 2.3.1                               Файл: /etc/my.cnf

[mysqld]
server-id = 2
datadir=/var/lib/mysql
socket=/var/lib/mysql/mysql.sock
# Disabling symbolic-links is recommended to prevent assorted security risks
symbolic-links=0
# Settings user and group are ignored when systemd is used.
# If you need to run mysqld under a different user or group,
# customize your systemd unit file for mariadb according to the
# instructions in http://fedoraproject.org/wiki/Systemd

[mysqld_safe]
log-error=/var/log/mariadb/mariadb.log
pid-file=/var/run/mariadb/mariadb.pid

#
# include all files from the config directory
#
!includedir /etc/my.cnf.d

[ Прочитано 20 строк ]

^G Помощь      ^O Записать    ^R ЧитФайл    ^Y ПредСтр    ^K Вырезать    ^C ТекПозиц
^X Выход      ^J Выровнять  ^W Поиск      ^V СледСтр    ^U ОтмВырезк   ^T Словарь

root@mysql-master:~                                root@mysql-slave:~
```

Подключаем сервер slave к master по данным созданным на master.  
Запускаем сервер для репликации.  
Ниже видим что все успешно ошибок нет.

```
root@mysql-slave:~  
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)]> change master to master_host = "130.193.39.110", master_user = "repl", master_password = "qweasdzxc", master_log_file = "mysql-bin.000001", master_log_pos = 404;  
Query OK, 0 rows affected (0.03 sec)  
  
MariaDB [(none)]> start slave;  
Query OK, 0 rows affected (0.00 sec)  
  
MariaDB [(none)]> SHOW SLAVE STATUS\G  
***** 1. row *****  
Slave_IO_State: Waiting for master to send event  
Master_Host: 130.193.39.110  
Master_User: repl  
Master_Port: 3306  
Connect_Retry: 60  
Master_Log_File: mysql-bin.000001  
Read_Master_Log_Pos: 561  
Relay_Log_File: mariadb-relay-bin.000002  
Relay_Log_Pos: 686  
Relay_Master_Log_File: mysql-bin.000001  
Slave_IO_Running: Yes  
Slave_SQL_Running: Yes  
Replicate_Do_DB:  
Replicate_Ignore_DB:  
Replicate_Do_Table:  
Replicate_Ignore_Table:  
Replicate_Wild_Do_Table:  
Replicate_Wild_Ignore_Table:  
Last_Errno: 0  
Last_Error:  
Skip_Counter: 0  
Exec_Master_Log_Pos: 561  
Relay_Log_Space: 982  
Until_Condition: None  
Until_Log_File:  
Until_Log_Pos: 0  
Master_SSL_Allowed: No  
Master_SSL_CA_File:  
Master_SSL_CA_Path:  
Master_SSL_Cert:  
Master_SSL_Cipher:  
Master_SSL_Key:  
Seconds_Behind_Master: 0  
Master_SSL_Verify_Server_Cert: No  
Last_IO_Errno: 0  
Last_IO_Error:  
Last_SQL_Errno: 0  
Last_SQL_Error:  
  
root@mysql-master:~  
root@mysql-slave:~
```

# Для теста создаем БД project и таблицу clients на сервере master.

```
root@mysql-master:~  
[root@mysql-master ~]# mysql -uroot -p  
Enter password:  
Welcome to the MariaDB monitor.  Commands end with ; or \g.  
Your MariaDB connection id is 14  
Server version: 5.5.68-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 project;  
Query OK, 1 row affected (0.00 sec)  
  
MariaDB [(none)]> use project;  
Database changed  
MariaDB [project]> CREATE TABLE clients ( Id INT, Age INT, FirstName VARCHAR(20), LastName VARCHAR(20) );  
Query OK, 0 rows affected (0.00 sec)  
  
MariaDB [project]> SHOW TABLES;  
+-----+  
| Tables_in_project |  
+-----+  
| clients            |  
+-----+  
1 row in set (0.00 sec)  
  
MariaDB [project]> |
```

root@mysql-master:~

root@mysql-slave:~



Переходим на сервер slave и видим что там появилась БД project и таблица clients что означает что кластер master-slave работает.

```
root@mysql-slave:~  
Your MariaDB connection id is 6  
Server version: 5.5.68-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 |  
| project |  
| test |  
+-----+  
5 rows in set (0.00 sec)  
  
MariaDB [(none)]> use project;  
Reading table information for completion of table and column names  
You can turn off this feature to get a quicker startup with -A  
  
Database changed  
MariaDB [project]> SHOW TABLES;  
+-----+  
| Tables_in_project |  
+-----+  
| clients |  
+-----+  
1 row in set (0.00 sec)  
  
MariaDB [project]> |
```

root@mysql-master:~ x root@mysql-slave:~ x



## Задание 2. Настроить кластер MariaDB режим Master — Master.

На сервере slave дописываем строки в конфиг MariaDB.



```
root@mysql-slave:~  
GNU nano 2.3.1 Файл: /etc/my.cnf.d/server.cnf  
  
# This group is only read by MariaDB-5.5 servers.  
# If you use the same .cnf file for MariaDB of different versions,  
# use this group for options that older servers don't understand  
[mysqld-5.5]  
  
# These two groups are only read by MariaDB servers, not by MySQL.  
# If you use the same .cnf file for MySQL and MariaDB,  
# you can put MariaDB-only options here  
[mariadb]  
  
[mariadb-5.5]  
  
log_bin=mysql-bin  
log_error=mysql-bin.err  
binlog-ignore-db=information_schema,mysql,test  
  
^G Помощь      ^O Записать    ^R ЧитФайл    ^Y ПредСтр    ^K Вырезать   ^C ТекПозиц  
^X Выход      ^J Выворнять   ^W Поиск      ^V СледСтр    ^U ОтмВырезк  ^T Словарь  
  
root@mysql-master:~ root@mysql-slave:~
```

# Создадим учетную запись для репликации с сервера master.

```
root@mysql-slave:~  
[root@mysql-slave ~]# mysql -uroot -p  
Enter password:  
Welcome to the MariaDB monitor.  Commands end with ; or \g.  
Your MariaDB connection id is 19  
Server version: 5.5.68-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)]> GRANT replication slave ON *.* TO "repl"@"130.193.39.110" IDENTIFIED BY "qweasdzxc";  
Query OK, 0 rows affected (0.00 sec)  
  
MariaDB [(none)]> show master status\G  
***** 1. row *****  
      File: mysql-bin.000001  
      Position: 563  
      Binlog_Do_DB:  
      Binlog_Ignore_DB: information_schema,mysql,test  
1 row in set (0.00 sec)  
  
MariaDB [(none)]> |
```

root@mysql-master:~

root@mysql-slave:~

Подключаем сервер master к slave по данным созданным на slave.  
Запускаем сервер для репликации.  
Ниже видим что все успешно ошибок нет.

```
root@mysql-master:~  
Enter password:  
Welcome to the MariaDB monitor. Commands end with ; or \g.  
Your MariaDB connection id is 31  
Server version: 5.5.68-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)]> change master to master_host = "51.250.87.254", master_user = "reply", master_password = "qweasdzxc", master_log_file = "mysql-bin.000001", master_log_pos = 722;  
Query OK, 0 rows affected (0.03 sec)  
  
MariaDB [(none)]> start slave;  
Query OK, 0 rows affected (0.00 sec)  
  
MariaDB [(none)]> SHOW SLAVE STATUS\G  
***** 1. row *****  
Slave_IO_State: Waiting for master to send event  
Master_Host: 51.250.87.254  
Master_User: reply  
Master_Port: 3306  
Connect_Retry: 60  
Master_Log_File: mysql-bin.000001  
Read_Master_Log_Pos: 722  
Relay_Log_File: mariadb-relay-bin.000002  
Relay_Log_Pos: 529  
Relay_Master_Log_File: mysql-bin.000001  
Slave_IO_Running: Yes  
Slave_SQL_Running: Yes  
Replicate_Do_DB:  
Replicate_Ignore_DB:  
Replicate_Do_Table:
```

root@mysql-master:~

root@mysql-slave:~

# Для теста создаем БД server\_slave и таблицу users на сервере slave.

```
root@mysql-slave:~  
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 |  
| project |  
| test |  
+-----+  
5 rows in set (0.00 sec)  
  
MariaDB [(none)]> CREATE DATABASE server_slave;  
Query OK, 1 row affected (0.00 sec)  
  
MariaDB [(none)]> use server_slave;  
Database changed  
MariaDB [server_slave]> CREATE TABLE users ( id INT, Age INT, FirstName VARCHAR(20), LastName VARCHAR(20) );  
Query OK, 0 rows affected (0.02 sec)  
  
MariaDB [server_slave]> SHOW TABLES;  
+-----+  
| Tables_in_server_slave |  
+-----+  
| users |  
+-----+  
1 row in set (0.00 sec)  
  
MariaDB [server_slave]> |
```

root@mysql-master:~

root@mysql-slave:~



Переходим на сервер master и видим что там появилась БД server\_slave и таблица users что означает что кластер master-master работает.

```
root@mysql-master:~  
Last_SQL_Errno: 0  
Last_SQL_Error:  
Replicate_Ignore_Server_Ids:  
Master_Server_Id: 2  
1 row in set (0.00 sec)  
  
MariaDB [(none)]> SHOW DATABASES;  
+-----+  
| Database |  
+-----+  
| information_schema |  
| mysql |  
| performance_schema |  
| project |  
| server_slave |  
| test |  
+-----+  
6 rows in set (0.01 sec)  
  
MariaDB [(none)]> use server_slave;  
Reading table information for completion of table and column names  
You can turn off this feature to get a quicker startup with -A  
  
Database changed  
MariaDB [server_slave]> SHOW TABLES;  
+-----+  
| Tables_in_server_slave |  
+-----+  
| users |  
+-----+  
1 row in set (0.00 sec)  
  
MariaDB [server_slave]> |
```

root@mysql-master:~

×

root@mysql-slave:~

×

# Так же снова для теста можем создать БД и таблицу на сервере master.

```
root@mysql-master:~
+-----+
6 rows in set (0.01 sec)

MariaDB [(none)]> use server_slave;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
MariaDB [server_slave]> SHOW TABLES;
+-----+
| Tables_in_server_slave |
+-----+
| users                   |
+-----+
1 row in set (0.00 sec)

MariaDB [server_slave]> CREATE DATABASE server_master;
Query OK, 1 row affected (0.00 sec)

MariaDB [server_slave]> USE server_master;
Database changed
MariaDB [server_master]> CREATE TABLE test ( id INT, Age INT, FirstName VARCHAR(20), LastName VARCHAR(20) );
Query OK, 0 rows affected (0.00 sec)

MariaDB [server_master]> SHOW TABLES;
+-----+
| Tables_in_server_master |
+-----+
| test                     |
+-----+
1 row in set (0.00 sec)

MariaDB [server_master]> |
```

root@mysql-master:~

root@mysql-slave:~

Переходим на сервер slave и видим что БД и таблица появились.  
В итоге:  
Кластер master-master настроен.

```
root@mysql-slave:~  
+-----+  
| users |  
+-----+  
1 row in set (0.00 sec)  
  
MariaDB [server_slave]> SHOW DATABASES;  
+-----+  
| Database |  
+-----+  
| information_schema |  
| mysql |  
| performance_schema |  
| project |  
| server_master |  
| server_slave |  
| test |  
+-----+  
7 rows in set (0.00 sec)  
  
MariaDB [server_slave]> use server_master;  
Reading table information for completion of table and column names  
You can turn off this feature to get a quicker startup with -A  
  
Database changed  
MariaDB [server_master]> SHOW TABLES;  
+-----+  
| Tables_in_server_master |  
+-----+  
| test |  
+-----+  
1 row in set (0.00 sec)  
  
MariaDB [server_master]> |
```

root@mysql-master:~ x root@mysql-slave:~ x