#Abdirizak kulmiye

CNA350

**Real World Project: Database Shard GitHub**.

**This project is how to architecture backend servers and shard the Data with two servers using Maxscale server and show the client he is accessing one server but technically he is accessing two master MariaDB servers connecting with maxscale.**

**Pre-requisites.**

The prerequisites for this project is you need to have virtual machine running with OS ubuntu 20.04, and you need to install docker and docker-compose.

**this is how to install docker community edition**.

sudo apt update

sudo apt install apt-transport-https ca-certificates curl software-properties-common

curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo apt-key add -

sudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/ubuntu bionic stable"

sudo apt update

sudo apt install docker-ce

**Check the Docker status with command.**

sudo systemctl run docker

sudo systenctl enable docker

sudo systemctl status docker**.**

**Installation** **Docker Compose:**

**sudo apt install docker-compose.**

**install client access to MariaDB**

sudo apt install MariaDB-client.

**Set up and clone maxscale-docker repository from zohan GitHub**.

git clone https://github.com/Zohan/maxscale-docker.git

**to run the docker-compose up you must be in right directory "maxscale-docker/maxscale"**

**docker-compose up -d**

kumiye73@linux: ~/docker/maxscale-docker/maxscale$ docker-compose up -d

Starting maxscale\_master\_1 ... done

Starting maxscale\_master2\_1 ... done

Starting maxscale\_maxscale\_1 ... done

kumiye73@linux: ~/docker/maxscale-docker/maxscale$

**check all servers states and use this command.**

kumiye73@linux:~/docker/maxscale-docker/maxscale$ docker ps -a

CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES

950c32a177b6 MariaDB/maxscale: latest "/usr/bin/tini -- do…" 10 days ago Exited (0) About an hour ago maxscale\_maxscale\_1

6104009270cd MariaDB: latest "docker-entrypoint.s…" 10 days ago Up About an hour 0.0.0.0:4001->3306/tcp maxscale\_master\_1

401172fea7d8 MariaDB: latest "docker-entrypoint. s…" 10 days ago Up 52 seconds 0.0.0.0:4003->3306/tcp maxscale\_master2\_1

Check if the servers are running and connecting the ports, use this command.

docker-compose exec maxscale maxctrl list servers.

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│ Server │ Address │ Port │ Connections │ State │ GTID │

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│ zip\_master\_one │ master │ 3306 │ 0 │ Master, Running │ 0-3000-32 │

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│ zip\_master\_two │ master2 │ 3306 │ 0 │ Running │ 0-3000-31 │

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check if master down how to master2 become master1 and use this command.

docker-compose stop master.

docker-compose stop master.

Stopping maxscale\_master\_1 ... done

docker-compose exec maxscale maxctrl list servers.

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│ Server │ Address │ Port │ Connections │ State │ GTID │

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│ zip\_master\_one │ master │3306 │ 0 │ Down │ 0-3000-32 │

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│ zip\_master\_two │ master2 │ 3306 │ 0 │ Master, Running │ 0-3000-31 │

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**now create client to access the databases.using this commands**

**this is the way you can access your data from mysql console**.

mysql -umaxuser -pmaxpwd -h 127.0.0.1 -P 4000

Welcome to the MariaDB monitor. Commands end with; or \g.

Your MariaDB connection id is 4

Server version: 10.5.9-MariaDB-1:10.5.9+maria~focal-log mariadb.org binary distribution

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)]>

MariaDB [(none)]> show databases;

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| Database |

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| information\_schema |

| mysql |

| performance\_schema |

| zipcodes\_one |

| zipcodes\_two |

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5 rows in set (0.001 sec)

**Running python**

This is the output when I run python zipcodes.py

**The last 10 rows of zipcodes\_one are:**

(40843, 'STANDARD', 'HOLMES MILL', 'KY', 'PRIMARY', '36.86', '-83', 'NA-US-KY-HOLMES MILL', 'FALSE', '', '', '')

(41425, 'STANDARD', 'EZEL', 'KY', 'PRIMARY', '37.89', '-83.44', 'NA-US-KY-EZEL', 'FALSE', '390', '801', '10204009')

(40118, 'STANDARD', 'FAIRDALE', 'KY', 'PRIMARY', '38.11', '-85.75', 'NA-US-KY-FAIRDALE', 'FALSE', '4398', '7635', '122449930')

(40020, 'PO BOX', 'FAIRFIELD', 'KY', 'PRIMARY', '37.93', '-85.38', 'NA-US-KY-FAIRFIELD', 'FALSE', '', '', '')

(42221, 'PO BOX', 'FAIRVIEW', 'KY', 'PRIMARY', '36.84', '-87.31', 'NA-US-KY-FAIRVIEW', 'FALSE', '', '', '')

(41426, 'PO BOX', 'FALCON', 'KY', 'PRIMARY', '37.78', '-83', 'NA-US-KY-FALCON', 'FALSE', '', '', '')

(40932, 'PO BOX', 'FALL ROCK', 'KY', 'PRIMARY', '37.22', '-83.78', 'NA-US-KY-FALL ROCK', 'FALSE', '', '', '')

(40119, 'STANDARD', 'FALLS OF ROUGH', 'KY', 'PRIMARY', '37.6', '-86.55', 'NA-US-KY-FALLS OF ROUGH', 'FALSE', '760', '1468', '20771670')

(42039, 'STANDARD', 'FANCY FARM', 'KY', 'PRIMARY', '36.75', '-88.79', 'NA-US-KY-FANCY FARM', 'FALSE', '696', '1317', '20643485')

(40319, 'PO BOX', 'FARMERS', 'KY', 'PRIMARY', '38.14', '-83.54', 'NA-US-KY-FARMERS', 'FALSE', '', '', '')

**The first 10 rows of zipcodes\_two are:**

(42040, 'STANDARD', 'FARMINGTON', 'KY', 'PRIMARY', '36.67', '-88.53', 'NA-US-KY-FARMINGTON', 'FALSE', '465', '896', '11562973')

(41524, 'STANDARD', 'FEDSCREEK', 'KY', 'PRIMARY', '37.4', '-82.24', 'NA-US-KY-FEDSCREEK', 'FALSE', '', '', '')

(42533, 'STANDARD', 'FERGUSON', 'KY', 'PRIMARY', '37.06', '-84.59', 'NA-US-KY-FERGUSON', 'FALSE', '429', '761', '9555412')

(40022, 'STANDARD', 'FINCHVILLE', 'KY', 'PRIMARY', '38.15', '-85.31', 'NA-US-KY-FINCHVILLE', 'FALSE', '437', '839', '19909942')

(40023, 'STANDARD', 'FISHERVILLE', 'KY', 'PRIMARY', '38.16', '-85.42', 'NA-US-KY-FISHERVILLE', 'FALSE', '1884', '3733', '113020684')

(41743, 'PO BOX', 'FISTY', 'KY', 'PRIMARY', '37.33', '-83.1', 'NA-US-KY-FISTY', 'FALSE', '', '', '')

(41219, 'STANDARD', 'FLATGAP', 'KY', 'PRIMARY', '37.93', '-82.88', 'NA-US-KY-FLATGAP', 'FALSE', '708', '1397', '20395667')

(40935, 'STANDARD', 'FLAT LICK', 'KY', 'PRIMARY', '36.82', '-83.76', 'NA-US-KY-FLAT LICK', 'FALSE', '752', '1477', '14267237')

(40997, 'STANDARD', 'WALKER', 'KY', 'PRIMARY', '36.88', '-83.71', 'NA-US-KY-WALKER', 'FALSE', '', '', '')

(41139, 'STANDARD', 'FLATWOODS', 'KY', 'PRIMARY', '38.51', '-82.72', 'NA-US-KY-FLATWOODS', 'FALSE', '3692', '6748', '121902277')

The largest zip code number in zipcodes\_one is:

(47750,)

The smallest zip code number in zipcodes\_two is:

(38257,)

**## I worked this project with my class mate Vlado Luma Saied Mohamed and Igor.**

**Sources**

[**https://docs.docker.com/compose/install/**](https://docs.docker.com/compose/install/)

[**https://mariadb.com/kb/en/mariadb-maxscale-25-simple-sharding-with-two-servers/**](https://mariadb.com/kb/en/mariadb-maxscale-25-simple-sharding-with-two-servers/)

[**https://docs.docker.com/compose/compose-file/**](https://docs.docker.com/compose/compose-file/)

[**https://github.com/Zohan/maxscale-docker**](https://github.com/Zohan/maxscale-docker)

[**https://www.digitalocean.com/community/tutorials/how-to-install-and-use-docker-on-ubuntu-18-04**](https://www.digitalocean.com/community/tutorials/how-to-install-and-use-docker-on-ubuntu-18-04)

[**https://docker-curriculum.com/#what-are-containers-**](https://docker-curriculum.com/#what-are-containers-)