

Sharding in MongoDB

Configuration

We create 4 config servers, one for each shard and place them each in separate folders

```
$ mongod --configsvr --replSet configRS --bind_ip localhost --port 31001 --dbpath /data/rsconfigdb/c1
$ mongod --configsvr --replSet configRS --bind_ip localhost --port 31002 --dbpath /data/rsconfigdb/c2
$ mongod --configsvr --replSet configRS --bind_ip localhost --port 31003 --dbpath /data/rsconfigdb/c3
```

We go in the mongo shell of one of them and initiate them all at once. Then we exit the shell

```
$ mongosh --host localhost --port 31001

$ rsConf = { _id: "configRS", configsvr: true, members: [ { _id: 0, host: "localhost:31001" }, { _id: 1, host: "localhost:31002" }, { _id: 2, host: "localhost:31003" } ] }

$ rs.initiate(rsConf)

exit
```

Shards

We create all the shards

```
$ mongod --shardsvr --replSet "rsShard_repl0" --dbpath c:/data/shard0 --bind_ip localhost --port 30000
$ mongod --shardsvr --replSet "rsShard_repl1" --dbpath c:/data/shard1 --bind_ip localhost --port 30001
$ mongod --shardsvr --replSet "rsShard_repl2" --dbpath c:/data/shard2 --bind_ip localhost --port 30002
$ mongod --shardsvr --replSet "rsShard_repl3" --dbpath c:/data/shard3 --bind_ip localhost --port 30003
```

We initiate each shard in it's own shell

```
$ mongosh --host localhost --port 30000
$ rs.initiate({_id: "rsShard_repl0", members: [{_id: 0, host: "localhost:30000"}]})
$ rs.status()
$ exit
```

```

$ mongosh --host localhost --port 30001
$ rs.initiate({_id: "rsShard_repl1", members: [{_id: 0, host:
"localhost:30001"}]})
$ rs.status()
$ exit

$ mongosh --host localhost --port 30002
$ rs.initiate({_id: "rsShard_repl2", members: [{_id: 0, host:
"localhost:30002"}]})
$ rs.status()
$ exit

$ mongosh --host localhost --port 30003
$ rs.initiate({_id: "rsShard_repl3", members: [{_id: 0, host:
"localhost:30003"}]})
$ rs.status()
$ exit

```

Mongos and database configuration

We create the mongos and go into the mongos shell

```

$ mongos -configdb
configRS/localhost:31001,localhost:31002,localhost:31003 --port
27020

$ mongosh --host localhost --port 27020

```

We add the shards

```

$ sh.addShard("rsShard_repl0/localhost:30000")
$ sh.addShard("rsShard_repl1/localhost:30001")
$ sh.addShard("rsShard_repl2/localhost:30002")
$ sh.addShard("rsShard_repl3/localhost:30003")

```

We configure the velo db

```

$ sh.enableSharding("velo")
$ use config

$ db.settings.insertOne( { _id:"chunksize", value: 1 } )

$ use velo

$ db.rides.ensureIndex({StartStationId:1})

$ sh.shardCollection("velo.rides",{ "StartStationId":"hashed"})
$ sh.status()

```

We then import the data to the mongoDB Compass, we first connect to port 27020 and we import the data from the json.

It should be working now and we can test this with the following commands

Testing

```
[direct: mongos] velo> db.rides.find({ "StartStationId": 1 }).explain()
{
  queryPlanner: {
    mongosPlannerVersion: 1,
    winningPlan: {
      stage: 'SINGLE_SHARD',
      shards: [
        {
          shardName: 'rsShard_repl3',
          connectionString: 'rsShard_repl3/localhost:30003',
          serverInfo: {
            host: 'LAPTOP-04PB15VJ',
            port: 30003,
            version: '6.0.5',
            gitVersion: 'c9a99c120371d4d4c52cbb15dac34a36ce8d3b1d'
          }
        }
      ]
    }
  },
```

The rides that start at the Station with ID 1 are stored in the shard 3

```
[direct: mongos] velo> db.rides.find({ "StartStationId": 50 }).explain()
{
  queryPlanner: {
    mongosPlannerVersion: 1,
    winningPlan: {
      stage: 'SINGLE_SHARD',
      shards: [
        {
          shardName: 'rsShard_repl1',
          connectionString: 'rsShard_repl1/localhost:30001',
          serverInfo: {
            host: 'LAPTOP-04PB15VJ',
            port: 30001,
            version: '6.0.5',
            gitVersion: 'c9a99c120371d4d4c52cbb15dac34a36ce8d3b1d'
          }
        }
      ]
    }
  },
```

The rides that start at the Station with ID 50 are stored in the shard 1

```
[direct: mongos] velo> db.rides.find({ "StartStationId": 100 }).explain()
{
  queryPlanner: {
    mongosPlannerVersion: 1,
    winningPlan: {
      stage: 'SINGLE_SHARD',
      shards: [
        {
          shardName: 'rsShard_repl0',
          connectionString: 'rsShard_repl0/localhost:30000',
          serverInfo: {
            host: 'LAPTOP-04PB15VJ',
            port: 30000,
            version: '6.0.5',
            gitVersion: 'c9a99c120371d4d4c52cbb15dac34a36ce8d3b1d'
          }
        }
      ]
    }
  },
```

The rides that start at the Station with ID 100 are stored in the shard 0