How to setup MongoDB - Four sharded replicas in Windows 10 on Single machine/Laptop

------------ USE Following steps sequentially in windows cmd prompt.

1) setup config servers
Open windows cmd prompt
cd \
mkdir data\config1
mkdir data\config2
mkdir data\config3
mkdir data\logs

Open multiple windows cmd prompt's as needed to run each of these individually

mongod --configsvr --dbpath data/config1 --port 2011 --replSet rs0 --bind_ip localhost
mongod --configsvr --dbpath data/config2 --port 2012 --replSet rs0 --bind_ip localhost
mongod --configsvr --dbpath data/config3 --port 2013 --replSet rs0 --bind_ip localhost

---connect to config1 server
Open windows cmd prompt
mongo --port 2011

```
rs.initiate(
 {
   _id: "rs0",
   configsvr: true,
   members: [
     { _id : 0, host : "localhost:2011" },
     { _id : 1, host : "localhost:2012" },
     { _id : 2, host : "localhost:2013" }
   ]
 }
)
```


2) setup shard1
Open windows cmd prompt
cd \
mkdir data\shard1\rs2

mkdir data\shard1\rs2
mkdir data\shard1\rs3

Open multiple windows cmd prompt's as needed to run each of these individually cmd prompt

mongod --shardsvr --replSet shard1rs --port 20010 --dbpath data/shard1/rs1 --bind_ip
localhost
mongod --shardsvr --replSet shard1rs --port 20011 --dbpath data/shard1/rs2   --bind_ip
localhost
mongod --shardsvr --replSet shard1rs --port 20012 --dbpath data/shard1/rs3 --bind_ip
localhost

---connect to shard1 host
Open windows cmd prompt

mongo --port 20010

rs.initiate(
 {
   _id: "shard1rs",
   members: [
     { _id : 0, host : "localhost:20010" },
     { _id : 1, host : "localhost:20011" },
     { _id : 2, host : "localhost:20012" }
   ]
 }
)

3) setup shard2
Open windows cmd prompt
cd \
mkdir data\shard2\rs2
mkdir data\shard2\rs2
mkdir data\shard2\rs3

Open multiple windows cmd prompt's as needed to run each of these individually cmd prompt

mongod --shardsvr --replSet shard2rs --port 20013 --dbpath data/shard2/rs1
mongod --shardsvr --replSet shard2rs --port 20014 --dbpath data/shard2/rs2
mongod --shardsvr --replSet shard2rs --port 20015 --dbpath data/shard2/rs3

Open windows cmd prompt

```
mongo --port 20013
rs.initiate(
 {
   _id: "shard2rs",
   members: [
     { _id : 0, host : "localhost:20013" },
     { _id : 1, host : "localhost:20014" },
     { _id : 2, host : "localhost:20015" }
   ]
 }
)
```

4) setup shard3

Open windows cmd prompt
cd \
mkdir data\shard3\rs2
mkdir data\shard3\rs2
mkdir data\shard3\rs3

Open multiple windows cmd prompt's as needed to run each of these individually cmd prompt

mongod --shardsvr --replSet shard3rs --port 20016--dbpath data/shard3/rs1   --bind_ip
localhost
mongod --shardsvr --replSet shard3rs --port 20017 --dbpath data/shard3/rs2   --bind_ip
localhost
mongod --shardsvr --replSet shard3rs --port 20018 --dbpath data/shard3/rs3 --bind_ip
localhost

Open windows cmd prompt

```
mongo --port 20016
rs.initiate(
 {
   _id: "shard3rs",
   members: [
     { _id : 0, host : "localhost:20016" },
     { _id : 1, host : "localhost:20017" },
     { _id : 2, host : "localhost:20018" }
   ]
 }
)
```

5) setup shard4
Open windows cmd prompt
cd \
mkdir data\shard4\rs2
mkdir data\shard4\rs2
mkdir data\shard4\rs3

Open multiple windows cmd prompt's as needed to run each of these individually cmd prompt

mongod --shardsvr --replSet shard4rs --port 20019 --dbpath data/shard4/rs1   --bind_ip
localhost
mongod --shardsvr --replSet shard4rs --port 20020 --dbpath data/shard4/rs2   --bind_ip
localhost
mongod --shardsvr --replSet shard4rs --port 20021 --dbpath data/shard4/rs3 --bind_ip
localhost

Open windows cmd prompt

mongo --port 20019
rs.initiate(
 {
  _id: "shard4rs",
  members: [
   { _id : 0, host : "localhost:20019" },
   { _id : 1, host : "localhost:20020" },
   { _id : 2, host : "localhost:20021" }
  ]
 }
)

6) setup mongos and add shards
Open windows cmd prompt
cd \
mongos --configdb "rs0/localhost:2011,localhost:2012,localhost:2013" --logpath
data/logs/log.mongos0 --port 27200

--connect to mongos and add shards:
Open windows cmd prompt

mongo --port 27200

```
mongos>  use config
mongos> sh.addShard("shard1rs/localhost:20010")
mongos> sh.addShard("shard2rs/localhost:20013")
mongos> sh.addShard("shard3rs/localhost:20016")
mongos> sh.addShard("shard4rs/localhost:20019")
```

mongos> sh.status()

db.shards.find()

7)enable sharding on mongoMart and at collection level

use mongoMart
sh.enableSharding("mongoMart")

---enable sharding on collection level

sh.shardCollection("mongoMart.shop",{"_id":"hashed"})

for (var i =1;i<=100;i++) db.shop.insert({x:i})

```
mongos> db.shop.find().count()
100
```

verfiy distribution and enjoy:
mongos> db.shop.getShardDistribution()

connect to each shards primary and verify counts

Create additional collections:

sh.shardCollection("mongoMart.restaurants",{"_id":"hashed"})

mongoimport --port 27200   --db mongoMart --collection restaurants --file restaurants.json

```
2021-05-24T11:32:59.200-0400    connected to: mongodb://localhost:27200/
2021-05-24T11:33:02.200-0400    [#.....................] mongoMart.restaurants      7.56MB/144MB
(5.3%)
2021-05-24T11:33:05.200-0400    [##....................] mongoMart.restaurants
13.8MB/144MB (9.6%)
2021-05-24T11:33:08.200-0400    [##....................] mongoMart.restaurants
16.1MB/144MB (11.2%)
```

2021-05-24T11:33:11.200-0400   [###...................] mongoMart.restaurants
21.9MB/144MB (15.2%)
2021-05-24T11:33:14.201-0400   [####..................] mongoMart.restaurants
26.9MB/144MB (18.7%)
2021-05-24T11:33:17.200-0400   [#####.................] mongoMart.restaurants
34.7MB/144MB (24.1%)
2021-05-24T11:33:20.201-0400   [#######...............] mongoMart.restaurants
42.6MB/144MB (29.7%)
2021-05-24T11:33:23.201-0400   [########..............] mongoMart.restaurants
50.0MB/144MB (34.8%)
2021-05-24T11:33:26.200-0400   [#########.............] mongoMart.restaurants
55.0MB/144MB (38.3%)
2021-05-24T11:33:29.200-0400   [##########............] mongoMart.restaurants
61.5MB/144MB (42.8%)
2021-05-24T11:33:32.201-0400   [###########...........] mongoMart.restaurants
67.0MB/144MB (46.6%)
2021-05-24T11:33:35.200-0400   [############..........] mongoMart.restaurants
74.4MB/144MB (51.8%)
2021-05-24T11:33:38.201-0400   [#############.........] mongoMart.restaurants
82.3MB/144MB (57.3%)
2021-05-24T11:33:41.202-0400   [###############.......] mongoMart.restaurants
90.3MB/144MB (62.8%)
2021-05-24T11:33:44.201-0400   [################......] mongoMart.restaurants
98.2MB/144MB (68.3%)
2021-05-24T11:33:47.200-0400   [#################.....] mongoMart.restaurants
104MB/144MB (72.6%)
2021-05-24T11:33:50.201-0400   [##################....] mongoMart.restaurants
110MB/144MB (76.4%)
2021-05-24T11:33:53.200-0400   [###################...] mongoMart.restaurants
115MB/144MB (79.8%)
2021-05-24T11:33:56.200-0400   [###################...] mongoMart.restaurants
120MB/144MB (83.4%)
2021-05-24T11:33:59.201-0400   [####################..] mongoMart.restaurants
126MB/144MB (87.8%)
2021-05-24T11:34:02.200-0400   [#####################.] mongoMart.restaurants
134MB/144MB (93.3%)
2021-05-24T11:34:05.200-0400   [######################] mongoMart.restaurants
140MB/144MB (97.7%)
2021-05-24T11:34:07.325-0400   [######################] mongoMart.restaurants
144MB/144MB (100.0%)
2021-05-24T11:34:07.325-0400   1000000 document(s) imported successfully. 0 document(s)
failed to import

mongos> **db.restaurants.getShardDistribution()**

mongoimport --port 27200   --db mongoMart --collection restaurants2 --file restaurants2.json

mongos> db.restaurants2.find({cuisine: "Bakery", name: /^Morris/})
{ "_id" : ObjectId("60ac5dd87f9558d81958acb7"), "address" : { "building" : "1007", "coord" : [-73.856077, 40.848447], "street" : "Morris Park Ave", "zipcode" : "10462" }, "borough" : "Bronx", "cuisine" : "Bakery", "grades" : [{ "date" : ISODate("2014-03-03T00:00:00Z"), "grade" : "A", "score" : 2 }, { "date" : ISODate("2013-09-11T00:00:00Z"), "grade" : "A", "score" : 6 }, { "date" : ISODate("2013-01-24T00:00:00Z"), "grade" : "A", "score" : 10 }, { "date" : ISODate("2011-11-23T00:00:00Z"), "grade" : "A", "score" : 9 }, { "date" : ISODate("2011-03-10T00:00:00Z"), "grade" : "B", "score" : 14 }], "name" : "Morris Park Bake Shop", "restaurant_id" : "30075445" }

Enabling Authentication of whole cluster
   1) Create keyfile :
        openssl rand -base64 768 > data/keys/shard_cluster_keyfile

start_mongo_2
Auth.bat
   2) Use   file to start shard cluster