Practical-6

1. **Create three Config Server. Then Set one Config Server as Primary and remaining two as secondary.**

   mongod --configsvr --dbpath "C:\config\c1" --port 27018 --replSet=c0

```
C:\Program Files\MongoDB\Server\4.4\bin>mongod --configsvr --dbpath "C:\config\c1" --port 27018 --repl
Set=c0
{"t":{"$date":"2023-05-02T12:11:27.872+05:30"},"s":"I",  "c":"CONTROL",  "id":23285,   "ctx":"main","m
sg":"Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"$date":"2023-05-02T12:11:27.877+05:30"},"s":"W",  "c":"ASIO",     "id":22601,   "ctx":"main","m
sg":"No TransportLayer configured during NetworkInterface startup"}
{"t":{"$date":"2023-05-02T12:11:27.877+05:30"},"s":"I",  "c":"NETWORK",  "id":4648602, "ctx":"main","m
sg":"Implicit TCP FastOpen in use."}
```

   mongod --configsvr --dbpath "C:\config\c2" --port 27019 --replSet=c0

```
C:\Program Files\MongoDB\Server\4.4\bin>mongod --configsvr --dbpath "C:\config\c2" --port 27019 --repl
Set=c0
{"t":{"$date":"2023-05-02T12:12:39.615+05:30"},"s":"I",  "c":"CONTROL",  "id":23285,   "ctx":"main","m
sg":"Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"$date":"2023-05-02T12:12:39.616+05:30"},"s":"W",  "c":"ASIO",     "id":22601,   "ctx":"main","m
sg":"No TransportLayer configured during NetworkInterface startup"}
{"t":{"$date":"2023-05-02T12:12:39.616+05:30"},"s":"I",  "c":"NETWORK",  "id":4648602, "ctx":"main","m
sg":"Implicit TCP FastOpen in use."}
```

   mongod --configsvr --dbpath "C:\config\c3" --port 27020 --replSet=c0

```
C:\Program Files\MongoDB\Server\4.4\bin>mongod --configsvr --dbpath "C:\config\c3" --port 27020 --repl
Set=c0
{"t":{"$date":"2023-05-02T12:13:24.568+05:30"},"s":"I",  "c":"CONTROL",  "id":23285,   "ctx":"main","m
sg":"Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"$date":"2023-05-02T12:13:24.823+05:30"},"s":"W",  "c":"ASIO",     "id":22601,   "ctx":"main","m
sg":"No TransportLayer configured during NetworkInterface startup"}
{"t":{"$date":"2023-05-02T12:13:24.823+05:30"},"s":"I",  "c":"NETWORK",  "id":4648602, "ctx":"main","m
sg":"Implicit TCP FastOpen in use."}
```

2. **Now open any mongo client among all and connect with server using below command.**

   mongo --port 27019

```
c:\>mongo --port 27019
MongoDB shell version v4.4.2
connecting to: mongodb://127.0.0.1:27019/?compressors=disabled&gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("26041c3a-9a12-4f11-bc5d-08f36b170dd7") }
MongoDB server version: 4.4.2
```

3. **Create a group ,assign ids and replica using below command.**

   config = { _id: "c0", members:[
   { _id : 0, host : "localhost:27018" },
   { _id : 1, host : "localhost:27019" },
   { _id : 2, host : "localhost:27020" }]};

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```
> config = { _id: "c0", members:[
... { _id : 0, host : "localhost:27018" },
... { _id : 1, host : "localhost:27019" },
... { _id : 2, host : "localhost:27020" }]};
{
        "_id" : "c0",
        "members" : [
                {
                        "_id" : 0,
                        "host" : "localhost:27018"
                },
                {
                        "_id" : 1,
                        "host" : "localhost:27019"
                },
                {
                        "_id" : 2,
                        "host" : "localhost:27020"
                }
        ]
}
```

4. **Set any node as primary node using below given command.**
   rs.initiate(config)

```
> rs.initiate(config)
{
        "ok" : 1,
        "$gleStats" : {
                "lastOpTime" : Timestamp(1683010085, 1),
                "electionId" : ObjectId("000000000000000000000000")
        },
        "lastCommittedOpTime" : Timestamp(0, 0),
        "$clusterTime" : {
                "clusterTime" : Timestamp(1683010085, 1),
                "signature" : {
                        "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAA="),
                        "keyId" : NumberLong(0)
                }
        },
        "operationTime" : Timestamp(1683010085, 1)
}
```

5. **(SHARD 1)**
   OPEN command Prompt.
   Create three Shard Server. Then Set one shard Server as Primary and remaining two as secondary.
   mongod --replSet s1 --dbpath "C:\shard2\s1" --port 37019 –shardsvr

```
C:\Program Files\MongoDB\Server\4.4\bin>mongod --replSet s1 --dbpath "C:\shard2\s1" --port 37019 --shardsvr
{"t":{"$date":"2023-05-02T12:20:19.535+05:30"},"s":"I",  "c":"CONTROL",  "id":23285,   "ctx":"main","msg":"Au
tomatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"$date":"2023-05-02T12:20:19.798+05:30"},"s":"W",  "c":"ASIO",     "id":22601,   "ctx":"main","msg":"No
 TransportLayer configured during NetworkInterface startup"}
{"t":{"$date":"2023-05-02T12:20:19.798+05:30"},"s":"I",  "c":"NETWORK",  "id":4648602, "ctx":"main","msg":"Im
plicit TCP FastOpen in use."}
```

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mongod --replSet s1 --dbpath "C:\shard2\s2" --port 37020 --shardsvr

```
C:\Program Files\MongoDB\Server\4.4\bin>mongod --replSet s1 --dbpath "C:\shard2\s2" --port 37020 --sha
rdsvr
{"t":{"$date":"2023-05-02T12:21:06.379+05:30"},"s":"I",  "c":"CONTROL",  "id":23285,   "ctx":"main","m
sg":"Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"$date":"2023-05-02T12:21:06.382+05:30"},"s":"W",  "c":"ASIO",     "id":22601,   "ctx":"main","m
sg":"No TransportLayer configured during NetworkInterface startup"}
{"t":{"$date":"2023-05-02T12:21:06.383+05:30"},"s":"I",  "c":"NETWORK",  "id":4648602, "ctx":"main","m
sg":"Implicit TCP FastOpen in use."}
```

mongod --replSet s1 --dbpath "C:\shard2\s3" --port 37021 --shardsvr

```
C:\Program Files\MongoDB\Server\4.4\bin>mongod --replSet s1 --dbpath "C:\shard2\s3" --port 37021 --sha
rdsvr
{"t":{"$date":"2023-05-02T12:21:38.467+05:30"},"s":"I",  "c":"CONTROL",  "id":23285,   "ctx":"main","m
sg":"Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"$date":"2023-05-02T12:21:38.720+05:30"},"s":"W",  "c":"ASIO",     "id":22601,   "ctx":"main","m
sg":"No TransportLayer configured during NetworkInterface startup"}
{"t":{"$date":"2023-05-02T12:21:38.720+05:30"},"s":"I",  "c":"NETWORK",  "id":4648602, "ctx":"main","m
sg":"Implicit TCP FastOpen in use."}
```

6. **Now open any mongo client among all and connect with server using below command.**

   mongo --port 37019

```
C:\Users\HP>mongo --port 37019
MongoDB shell version v4.4.2
connecting to: mongodb://127.0.0.1:37019/?compressors=disabled&gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("00a7343d-0762-4fe1-a97d-4c6481cdb88e") }
MongoDB server version: 4.4.2
```

7. **Create a group ,assign ids and replica using below command.**

   config = { _id: "s1", members:[
   { _id : 0, host : "localhost:37019" },
   { _id : 1, host : "localhost:37020" },
   { _id : 2, host : "localhost:37021" }]};

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```
> config = { _id: "s1", members:[
... { _id : 0, host : "localhost:37019" },
... { _id : 1, host : "localhost:37020" },
... { _id : 2, host : "localhost:37021" }]};
{
        "_id" : "s1",
        "members" : [
                {
                        "_id" : 0,
                        "host" : "localhost:37019"
                },
                {
                        "_id" : 1,
                        "host" : "localhost:37020"
                },
                {
                        "_id" : 2,
                        "host" : "localhost:37021"
                }
        ]
}
```

8. Set any node as primary node using below given command.

rs.initiate(config)

```
> rs.initiate(config)
{
        "ok" : 1,
        "$clusterTime" : {
                "clusterTime" : Timestamp(1683010432, 1),
                "signature" : {
                        "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAA="),
                        "keyId" : NumberLong(0)
                }
        },
        "operationTime" : Timestamp(1683010432, 1)
}
```

9. (SHARD 2)

OPEN command Prompt.

Create three Shard Server. Then Set one shard Server as Primary and remaining two as secondary.

mongod --replSet s0 --dbpath "C:\shard1\s1" --port 50001 –shardsvr

```
C:\Program Files\MongoDB\Server\4.4\bin>mongod --replSet s0 --dbpath "C:\shard1\s1" --port 50001 --sha
rdsvr
{"t":{"$date":"2023-05-02T12:25:56.671+05:30"},"s":"I",  "c":"CONTROL",  "id":23285,   "ctx":"main","m
sg":"Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"$date":"2023-05-02T12:25:56.931+05:30"},"s":"W",  "c":"ASIO",     "id":22601,   "ctx":"main","m
sg":"No TransportLayer configured during NetworkInterface startup"}
{"t":{"$date":"2023-05-02T12:25:56.932+05:30"},"s":"I",  "c":"NETWORK",  "id":4648602, "ctx":"main","m
sg":"Implicit TCP FastOpen in use."}
```

mongod --replSet s0 --dbpath "C:\shard1\s2" --port 50002 --shardsvr

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```
C:\Program Files\MongoDB\Server\4.4\bin>mongod --replSet s0 --dbpath "C:\shard1\s2" --port 50002 --sha
rdsvr
{"t":{"$date":"2023-05-02T12:26:18.245+05:30"},"s":"I",  "c":"CONTROL",  "id":23285,   "ctx":"main","m
sg":"Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"$date":"2023-05-02T12:26:18.508+05:30"},"s":"W",  "c":"ASIO",     "id":22601,   "ctx":"main","m
sg":"No TransportLayer configured during NetworkInterface startup"}
{"t":{"$date":"2023-05-02T12:26:18.508+05:30"},"s":"I",  "c":"NETWORK",  "id":4648602, "ctx":"main","m
sg":"Implicit TCP FastOpen in use."}
```

mongod --replSet s0 --dbpath "C:\shard1\s3" --port 50003 --shardsvr

```
C:\Program Files\MongoDB\Server\4.4\bin>mongod --replSet s0 --dbpath "C:\shard1\s3" --port 50003 --sha
rdsvr
{"t":{"$date":"2023-05-02T12:26:33.798+05:30"},"s":"I",  "c":"CONTROL",  "id":23285,   "ctx":"main","m
sg":"Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"$date":"2023-05-02T12:26:33.799+05:30"},"s":"W",  "c":"ASIO",     "id":22601,   "ctx":"main","m
sg":"No TransportLayer configured during NetworkInterface startup"}
{"t":{"$date":"2023-05-02T12:26:33.800+05:30"},"s":"I",  "c":"NETWORK",  "id":4648602, "ctx":"main","m
sg":"Implicit TCP FastOpen in use."}
```

10.Now open any mongo client among all and connect with server using below command.

mongo --port 50001

```
C:\Users\HP>mongo --port 50001
MongoDB shell version v4.4.2
connecting to: mongodb://127.0.0.1:50001/?compressors=disabled&gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("bb745901-301d-40ac-bd09-1a7d246fe3d3") }
MongoDB server version: 4.4.2
```

11.Create a group ,assign ids and replica using below command

config = { _id: "s0", members:[
{ _id : 0, host : "localhost:50001" },
{ _id : 1, host : "localhost:50002" },
{ _id : 2, host : "localhost:50003" }]};

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```
> config = { _id: "s0", members:[
... { _id : 0, host : "localhost:50001" },
... { _id : 1, host : "localhost:50002" },
... { _id : 2, host : "localhost:50003" }]};
{
        "_id" : "s0",
        "members" : [
                {
                        "_id" : 0,
                        "host" : "localhost:50001"
                },
                {
                        "_id" : 1,
                        "host" : "localhost:50002"
                },
                {
                        "_id" : 2,
                        "host" : "localhost:50003"
                }
        ]
}
```

12.Set any node as primary node using below given command.

rs.initiate(config)

```
> rs.initiate(config)
{
        "ok" : 1,
        "$clusterTime" : {
                "clusterTime" : Timestamp(1683010733, 1),
                "signature" : {
                        "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAA="),
                        "keyId" : NumberLong(0)
                }
        },
        "operationTime" : Timestamp(1683010733, 1)
}
```

13.Communication with both shards is possible using config servers.

So open cmd and write command.This creates mongos config server.

mongos.exe --configdb c0/localhost:27018,localhost:27019,localhost:27020 --port 1000

```
c:\>mongos.exe --configdb c0/localhost:27018,localhost:27019,localhost:27020 --port 1000
{"t":{"$date":"2023-05-02T12:30:38.006+05:30"},"s":"I",  "c":"CONTROL",  "id":23285,   "ctx":"main","m
sg":"Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"$date":"2023-05-02T12:30:38.021+05:30"},"s":"W",  "c":"CONTROL",  "id":22120,   "ctx":"main","m
sg":"Access control is not enabled for the database. Read and write access to data and configuration i
s unrestricted","tags":["startupWarnings"]}
```

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14. Open a client mongos command window to communicate with server.

mongo.exe --host localhost --port 1000

15. And then both the shards which we are created add that shards into shard cluster using given below commands.

```
sh.addShard("s0/localhost:50001");
sh.addShard("s1/localhost:37019");
```

16. To see the shards which are in shard cluster run the command in the same

command prompt(1000)

```
db.runCommand({listShards:1});
```

17. Now create database.

```
mongos> use projectionDB
```

18. Move to admin mode.

```
mongos> use admin
```

19. Enable Database Sharding property.So that table data can be distributed on multiple shards using given command.

```
mongos> db.runCommand({enableSharding:"projectionDB"});
```

20. Create collection and set hash key.

```
mongos> sh.shardCollection("projectionDB.bios", {"name":"hashed"})
```

21. Now insert data into bios table.

```
mongos> db.bios.insert({
name:"Prachi",
lname:"Shah",
city:"Mehsana",
state:"Gujarat"
});
mongos> db.bios.insert({
name:"sunita",
lname:"chauhan",
city:"Ahmedabad",
state:"Gujarat" })
```

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```
mongos> db.bios.insert({
... name:"agam",
... lname:"shah",
... city:"Mehsana",
... state:"Gujarat"
... })
mongos> db.bios.insert({
... name:"Shraddha",
... lname:"Mehta",
... city:"Baroda",
... state:"Gujarat"
... })
mongos> db.bios.insert({
... name:"Shurya",
... lname:"Pandya",
... city:"Mehsana",
... state:"Gujarat"
... })
mongos> db.bios.insert({
... name:"Khushi",
... lname:"Patel",
... city:"Mehsana",
... state:"Gujarat"
... })
mongos> db.bios.insert({
... name:"Pooja",
... lname:"Mevada",
... city:"Ahmedabad",
... state:"Gujarat"
... })
mongos> db.bios.insert({
... name:"Meeta",
... lname:"Shah",
... city:"Ahmedabad",
... state:"Gujarat"
... })
mongos> db.bios.insert({
... name:"Avinash",
... lname:"Mehta",
```

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```
... city:"Ahmedabad",
... state:"Gujarat"
... })
mongos> db.bios.insert({
... name:"Vency",
... lname:"Parekh",
... city:"Ahmedabad",
... state:"Gujarat"
... })
mongos> db.bios.insert({
... name:"Dhruv",
... lname:"Shah",
... city:"Ahmedabad",
... state:"Gujarat"
... })
```

22. Run the command to see the total number of documents in bios table.

```
db.gnu.count();
```

23. To see how data is distributed on shard 1.

Open the mongo client of shard 1 which is on port 50001.

Run the commands like.

```
Show dbs
Show collection
use projectionDB;
db.bios.count();
```

24. To see how data is distributed on shard 2.

Open the mongo client of shard 2 which is on port 37019.

Run the commands like.

```
Show dbs
Show collection
use projectionDB;
db.bios.count();
```

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