RESHMA KEESARI
L036

PRACTICAL NO. : 05

AIM: Sharding using MongoDB

STEPS:

Step1: create a folder and in that folder make 9 files/folders with name(primary, secondry1, secondry2, server1, server2, server3, shard1, shard2, shard3) and run the commands mentioned below

Step2:

replication
open cmd and run commands
cd (path in which you created your folder)
e.g(cd C:\Users\RESHMA KEESARI\OneDrive\Desktop\Pract5)

start mongod --port=50000 --replSet="Server1" --dbpath="(folder path)/primary"
e.g(start mongod --port=50000 --replSet="Server1" --dbpath="C:/Users/RESHMA KEESARI/OneDrive/Desktop/Pract5/primary"
)
"MAKE SURE TO CHANGE PATH"

start mongod --port=50001 --replSet="Server1" --dbpath="(folder path)/secondry1"

start mongod --port=50002 --replSet="Server1" --dbpath="(folder path)/secondry2"

open cmd and run
mongosh --port=50000

```
rs.initiate({
   _id:"Server1",
   members:[
      {_id:0, host:"localhost:50000"},
      {_id:1, host:"localhost:50001"},
      {_id:2, host:"localhost:50002"}
   ]
});
```

Step3:

config server
open cmd and run commands
cd (path in which you created your folder)

mongod --configsvr --port=1030 --replSet="Server1" --dbpath="(folder path)/server1"

mongod --configsvr --port=1040 --replSet="Server1" --dbpath="(folder path)/server2"

mongod --configsvr --port=1050 --replSet="Server1" --dbpath="(folder path)/server3"

open cmd and run
mongosh --host="localhost:1030"

```
rs.initiate({
   _id:"Server1",
   configsvr:true,
   members:[
      {_id:0, host:"localhost:1030"},
```

```
      {_id:1, host:"localhost:1040"},
      {_id:2, host:"localhost:1050"}
   ]
})
```

Step4:
shards
open cmd and run commands
cd (path in which you created your folder)

mongod --shardsvr --port=1130 --dbpath="(folder path)/shard1" --replSet="Server1"

mongod --shardsvr --port=1140 --dbpath="(folder path)/shard2" --replSet="Server1"

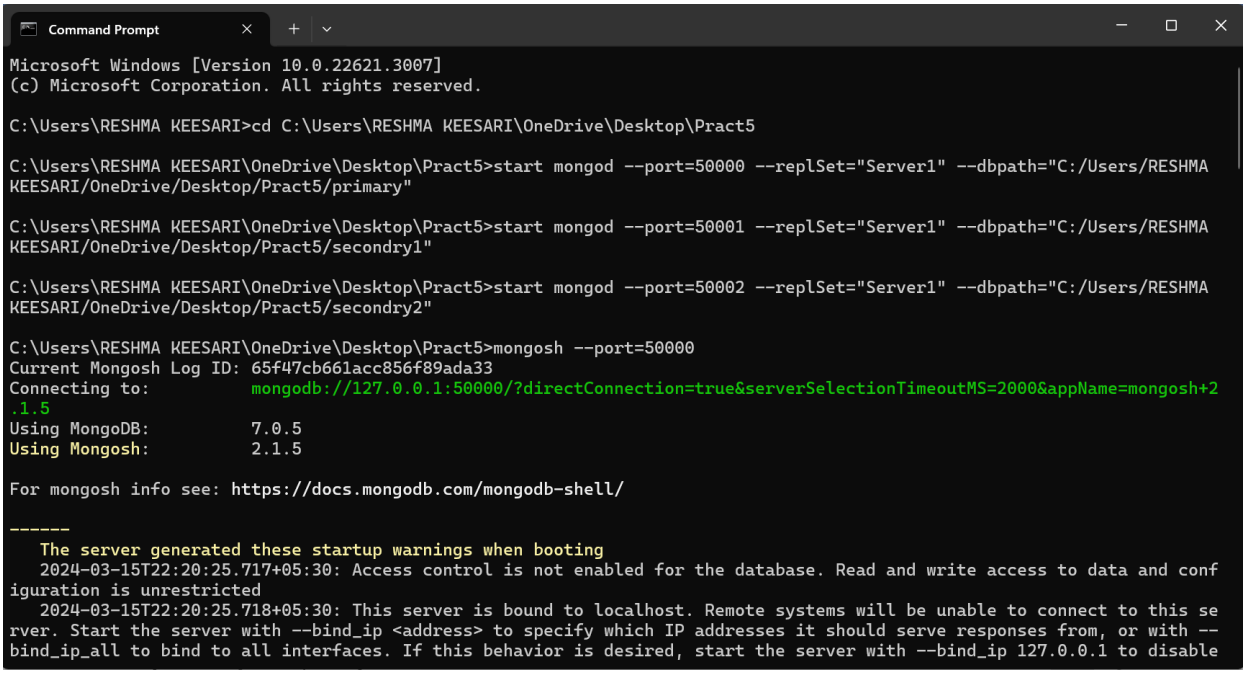
mongod --shardsvr --port=1150 --dbpath="(folder path)/shard3" --replSet="Server1"

open cmd and run
mongosh --host="localhost:1130"

```
rs.initiate({
   _id:"Server1",
   members: [
      {_id: 0, host: "localhost:1130"},
      {_id: 1, host: "localhost:1140"},
      {_id: 2, host: "localhost:1150"}
   ]
})
```

OUTPUT :

REPLICATION:



RESHMA KEESARI
L036

```
Server1 [direct: primary] test> rs.initiate({
...     _id:"Server1",
...     members:[
...         {_id:0, host:"localhost:50000"},
...         {_id:1, host:"localhost:50001"},
...         {_id:2, host:"localhost:50002"}
...     ]
... });
MongoServerError[AlreadyInitialized]: already initialized
Server1 [direct: primary] test> rs.status()
{
  set: 'Server1',
  date: ISODate('2024-03-15T16:52:52.124Z'),
  myState: 1,
  term: Long('2'),
  syncSourceHost: '',
  syncSourceId: -1,
  heartbeatIntervalMillis: Long('2000'),
  majorityVoteCount: 2,
  writeMajorityCount: 2,
  votingMembersCount: 3,
  writableVotingMembersCount: 3,
  optimes: {
    lastCommittedOpTime: { ts: Timestamp({ t: 1710521572, i: 1 }), t: Long('2') },
    lastCommittedWallTime: ISODate('2024-03-15T16:52:52.063Z'),
    readConcernMajorityOpTime: { ts: Timestamp({ t: 1710521572, i: 1 }), t: Long('2') },
    appliedOpTime: { ts: Timestamp({ t: 1710521572, i: 1 }), t: Long('2') },
    durableOpTime: { ts: Timestamp({ t: 1710521572, i: 1 }), t: Long('2') },
    lastAppliedWallTime: ISODate('2024-03-15T16:52:52.063Z'),
    lastDurableWallTime: ISODate('2024-03-15T16:52:52.063Z')
  },
  lastStableRecoveryTimestamp: Timestamp({ t: 1710521542, i: 1 }),
```

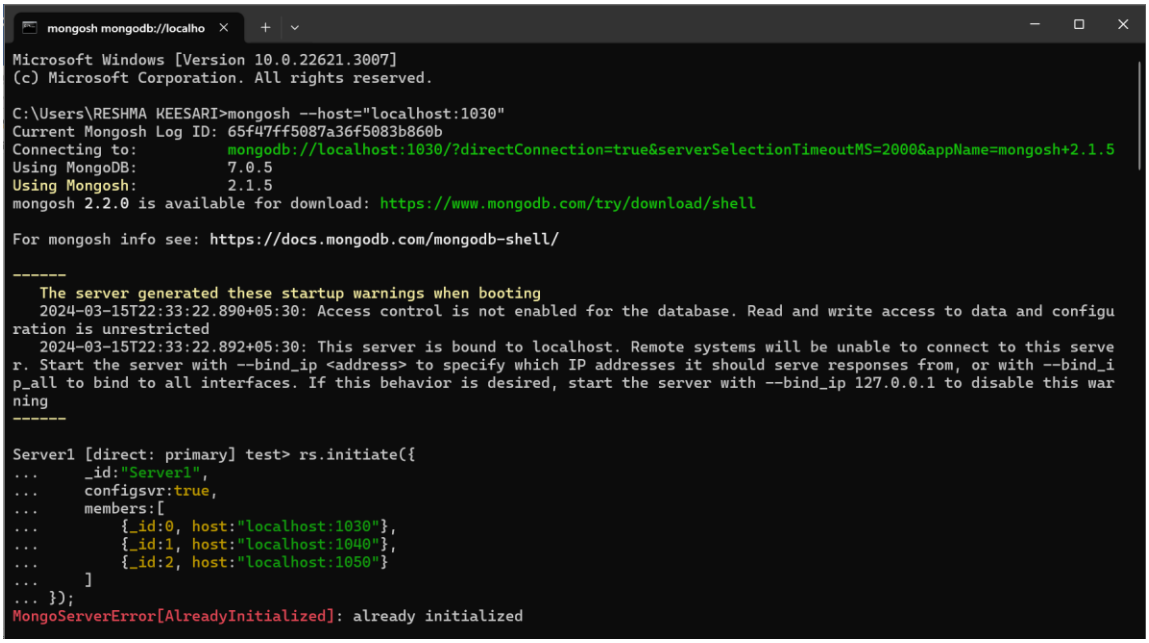
```
 members: [
   {
     _id: 0,
     name: 'localhost:50000',
     health: 1,
     state: 1,
     stateStr: 'PRIMARY',
     uptime: 150,
     optime: { ts: Timestamp({ t: 1710521572, i: 1 }), t: Long('2') },
     optimeDate: ISODate('2024-03-15T16:52:52.000Z'),
     lastAppliedWallTime: ISODate('2024-03-15T16:52:52.063Z'),
     lastDurableWallTime: ISODate('2024-03-15T16:52:52.063Z'),
     syncSourceHost: '',
     syncSourceId: -1,
     infoMessage: 'Could not find member to sync from',
     electionTime: Timestamp({ t: 1710521489, i: 1 }),
     electionDate: ISODate('2024-03-15T16:51:29.000Z'),
     configVersion: 1,
     configTerm: 2,
     self: true,
     lastHeartbeatMessage: ''
   },
```

RESHMA KEESARI
L036

```
    },
    {
      _id: 1,
      name: 'localhost:50001',
      health: 1,
      state: 2,
      stateStr: 'SECONDARY',
      uptime: 86,
      optime: { ts: Timestamp({ t: 1710521562, i: 1 }), t: Long('2') },
      optimeDurable: { ts: Timestamp({ t: 1710521562, i: 1 }), t: Long('2') },
      optimeDate: ISODate('2024-03-15T16:52:42.000Z'),
      optimeDurableDate: ISODate('2024-03-15T16:52:42.000Z'),
      lastAppliedWallTime: ISODate('2024-03-15T16:52:52.063Z'),
      lastDurableWallTime: ISODate('2024-03-15T16:52:52.063Z'),
      lastHeartbeat: ISODate('2024-03-15T16:52:50.790Z'),
      lastHeartbeatRecv: ISODate('2024-03-15T16:52:51.064Z'),
      pingMs: Long('0'),
      lastHeartbeatMessage: '',
      syncSourceHost: 'localhost:50000',
      syncSourceId: 0,
      infoMessage: '',
      configVersion: 1,
      configTerm: 2
    },
    {
      name: 'localhost:50002',
      health: 1,
      state: 2,
      stateStr: 'SECONDARY',
      uptime: 64,
      optime: { ts: Timestamp({ t: 1710521562, i: 1 }), t: Long('2') },
      optimeDurable: { ts: Timestamp({ t: 1710521562, i: 1 }), t: Long('2') },
      optimeDate: ISODate('2024-03-15T16:52:42.000Z'),
      optimeDurableDate: ISODate('2024-03-15T16:52:42.000Z'),
      lastAppliedWallTime: ISODate('2024-03-15T16:52:52.063Z'),
      lastDurableWallTime: ISODate('2024-03-15T16:52:52.063Z'),
      lastHeartbeat: ISODate('2024-03-15T16:52:50.337Z'),
      lastHeartbeatRecv: ISODate('2024-03-15T16:52:51.675Z'),
      pingMs: Long('0'),
      lastHeartbeatMessage: '',
      syncSourceHost: 'localhost:50001',
      syncSourceId: 1,
      infoMessage: '',
      configVersion: 1,
      configTerm: 2
    }
  ],
  ok: 1,
  '$clusterTime': {
    clusterTime: Timestamp({ t: 1710521572, i: 1 }),
    signature: {
      hash: Binary.createFromBase64('AAAAAAAAAAAAAAAAAAAAAAAAAAA=', 0),
      keyId: Long('0')
    }
  },
  operationTime: Timestamp({ t: 1710521572, i: 1 })
}
```

RESHMA KEESARI
L036

CONFIG SERVER:



RESHMA KEESARI
L036

mongosh mongodb://localho

```
Server1 [direct: primary] test> rs.status()
{
  set: 'Server1',
  date: ISODate('2024-03-15T17:06:58.419Z'),
  myState: 1,
  term: Long('2'),
  syncSourceHost: '',
  syncSourceId: -1,
  configsvr: true,
  heartbeatIntervalMillis: Long('2000'),
  majorityVoteCount: 2,
  writeMajorityCount: 2,
  votingMembersCount: 3,
  writableVotingMembersCount: 3,
  optimes: {
    lastCommittedOpTime: { ts: Timestamp({ t: 1710522418, i: 1 }), t: Long('2') },
    lastCommittedWallTime: ISODate('2024-03-15T17:06:58.265Z'),
    readConcernMajorityOpTime: { ts: Timestamp({ t: 1710522418, i: 1 }), t: Long('2') },
    appliedOpTime: { ts: Timestamp({ t: 1710522418, i: 1 }), t: Long('2') },
    durableOpTime: { ts: Timestamp({ t: 1710522418, i: 1 }), t: Long('2') },
    lastAppliedWallTime: ISODate('2024-03-15T17:06:58.265Z'),
    lastDurableWallTime: ISODate('2024-03-15T17:06:58.265Z')
  },
  lastStableRecoveryTimestamp: Timestamp({ t: 1710522382, i: 1 }),
  electionCandidateMetrics: {
    lastElectionReason: 'electionTimeout',
    lastElectionDate: ISODate('2024-03-15T17:05:00.442Z'),
    electionTerm: Long('2'),
    lastCommittedOpTimeAtElection: { ts: Timestamp({ t: 0, i: 0 }), t: Long('-1') },
    lastSeenOpTimeAtElection: { ts: Timestamp({ t: 1709983155, i: 1 }), t: Long('1') },
    numVotesNeeded: 2,
    priorityAtElection: 1,
```

```
  members: [
    {
      _id: 0,
      name: 'localhost:1030',
      health: 1,
      state: 1,
      stateStr: 'PRIMARY',
      uptime: 219,
      optime: { ts: Timestamp({ t: 1710522418, i: 1 }), t: Long('2') },
      optimeDate: ISODate('2024-03-15T17:06:58.000Z'),
      lastAppliedWallTime: ISODate('2024-03-15T17:06:58.265Z'),
      lastDurableWallTime: ISODate('2024-03-15T17:06:58.265Z'),
      syncSourceHost: '',
      syncSourceId: -1,
      infoMessage: 'Could not find member to sync from',
      electionTime: Timestamp({ t: 1710522300, i: 1 }),
      electionDate: ISODate('2024-03-15T17:05:00.000Z'),
      configVersion: 1,
      configTerm: 2,
      self: true,
      lastHeartbeatMessage: ''
    },
```

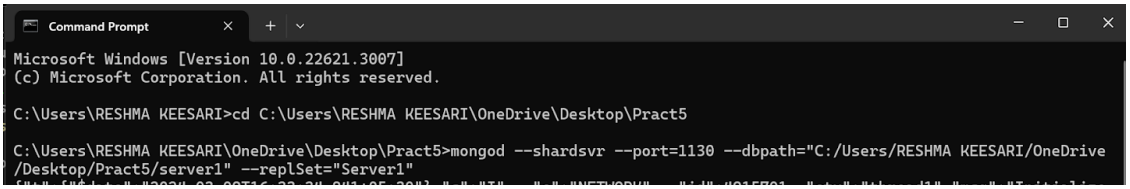
RESHMA KEESARI
L036

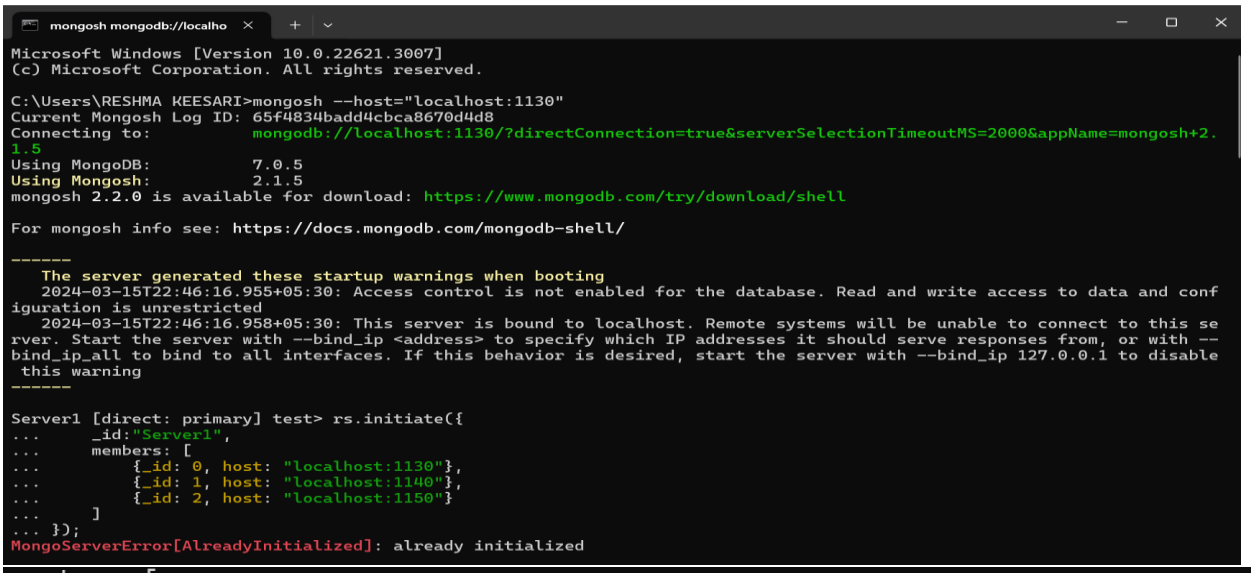
```
  },
  {
    _id: 1,
    name: 'localhost:1040',
    health: 1,
    state: 2,
    stateStr: 'SECONDARY',
    uptime: 126,
    optime: { ts: Timestamp({ t: 1710522417, i: 1 }), t: Long('2') },
    optimeDurable: { ts: Timestamp({ t: 1710522417, i: 1 }), t: Long('2') },
    optimeDate: ISODate('2024-03-15T17:06:57.000Z'),
    optimeDurableDate: ISODate('2024-03-15T17:06:57.000Z'),
    lastAppliedWallTime: ISODate('2024-03-15T17:06:58.265Z'),
    lastDurableWallTime: ISODate('2024-03-15T17:06:58.265Z'),
    lastHeartbeat: ISODate('2024-03-15T17:06:57.300Z'),
    lastHeartbeatRecv: ISODate('2024-03-15T17:06:58.327Z'),
    pingMs: Long('1'),
    lastHeartbeatMessage: '',
    syncSourceHost: 'localhost:1030',
    syncSourceId: 0,
    infoMessage: '',
    configVersion: 1,
    configTerm: 2
  },
  {
```

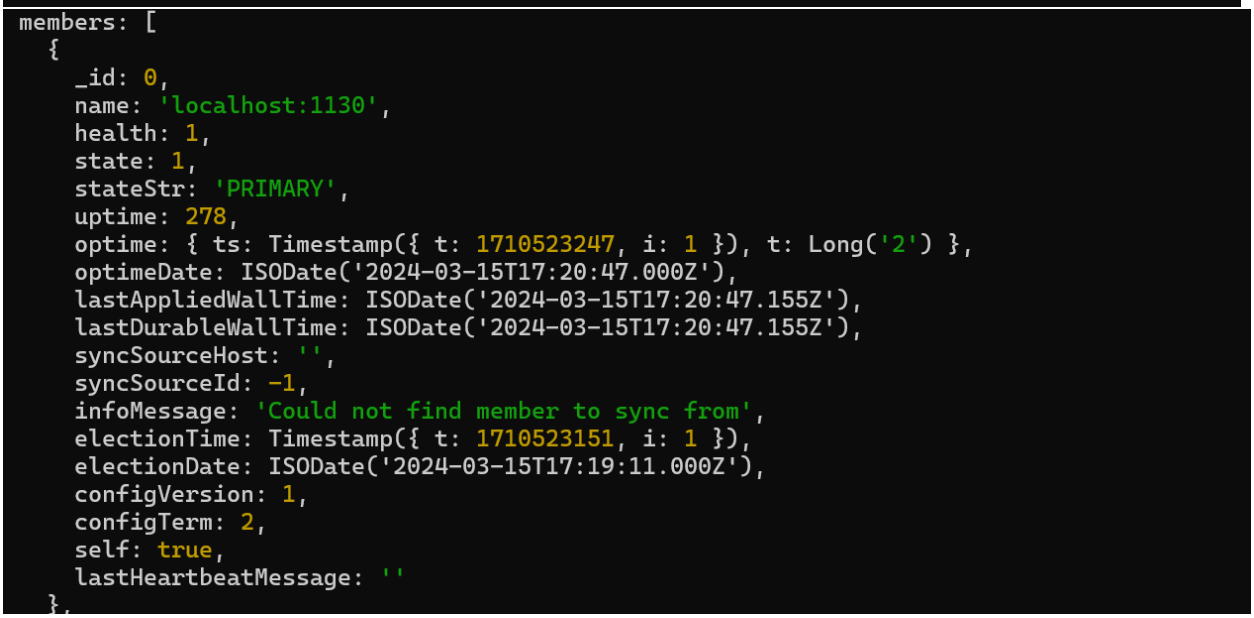
```
  {
    _id: 2,
    name: 'localhost:1050',
    health: 1,
    state: 2,
    stateStr: 'SECONDARY',
    uptime: 83,
    optime: { ts: Timestamp({ t: 1710522417, i: 1 }), t: Long('2') },
    optimeDurable: { ts: Timestamp({ t: 1710522417, i: 1 }), t: Long('2') },
    optimeDate: ISODate('2024-03-15T17:06:57.000Z'),
    optimeDurableDate: ISODate('2024-03-15T17:06:57.000Z'),
    lastAppliedWallTime: ISODate('2024-03-15T17:06:58.265Z'),
    lastDurableWallTime: ISODate('2024-03-15T17:06:58.265Z'),
    lastHeartbeat: ISODate('2024-03-15T17:06:57.922Z'),
    lastHeartbeatRecv: ISODate('2024-03-15T17:06:58.340Z'),
    pingMs: Long('0'),
    lastHeartbeatMessage: '',
    syncSourceHost: 'localhost:1030',
    syncSourceId: 0,
    infoMessage: '',
    configVersion: 1,
    configTerm: 2
  }
],
ok: 1,
'$clusterTime': {
  clusterTime: Timestamp({ t: 1710522418, i: 1 }),
  signature: {
    hash: Binary.createFromBase64('AAAAAAAAAAAAAAAAAAAAAAAAAAA=', 0),
    keyId: Long('0')
  }
},
```

RESHMA KEESARI
L036

SHARDS:







RESHMA KEESARI
L036

```
    {
      _id: 1,
      name: 'localhost:1140',
      health: 1,
      state: 2,
      stateStr: 'SECONDARY',
      uptime: 102,
      optime: { ts: Timestamp({ t: 1710523247, i: 1 }), t: Long('2') },
      optimeDurable: { ts: Timestamp({ t: 1710523247, i: 1 }), t: Long('2') },
      optimeDate: ISODate('2024-03-15T17:20:47.000Z'),
      optimeDurableDate: ISODate('2024-03-15T17:20:47.000Z'),
      lastAppliedWallTime: ISODate('2024-03-15T17:20:47.155Z'),
      lastDurableWallTime: ISODate('2024-03-15T17:20:47.155Z'),
      lastHeartbeat: ISODate('2024-03-15T17:20:49.978Z'),
      lastHeartbeatRecv: ISODate('2024-03-15T17:20:49.920Z'),
      pingMs: Long('0'),
      lastHeartbeatMessage: '',
      syncSourceHost: 'localhost:1130',
      syncSourceId: 0,
      infoMessage: '',
      configVersion: 1,
      configTerm: 2
    },
    {
      _id: 2,
      name: 'localhost:1150',
      health: 1,
      state: 2,
      stateStr: 'SECONDARY',
      uptime: 55,
      optime: { ts: Timestamp({ t: 1710523247, i: 1 }), t: Long('2') },
      optimeDurable: { ts: Timestamp({ t: 1710523247, i: 1 }), t: Long('2') },
      optimeDate: ISODate('2024-03-15T17:20:47.000Z'),
      optimeDurableDate: ISODate('2024-03-15T17:20:47.000Z'),
      lastAppliedWallTime: ISODate('2024-03-15T17:20:47.155Z'),
      lastDurableWallTime: ISODate('2024-03-15T17:20:47.155Z'),
      lastHeartbeat: ISODate('2024-03-15T17:20:49.787Z'),
      lastHeartbeatRecv: ISODate('2024-03-15T17:20:50.368Z'),
      pingMs: Long('0'),
      lastHeartbeatMessage: '',
      syncSourceHost: 'localhost:1140',
      syncSourceId: 1,
      infoMessage: '',
      configVersion: 1,
      configTerm: 2
    }
  ],
  ok: 1,
  '$clusterTime': {
    clusterTime: Timestamp({ t: 1710523247, i: 1 }),
    signature: {
      hash: Binary.createFromBase64('AAAAAAAAAAAAAAAAAAAAAAAAAAA=', 0),
      keyId: Long('0')
    }
  },
  operationTime: Timestamp({ t: 1710523247, i: 1 })
```