

1. vagrant@vagrant-ubuntu-trusty-64:~\$ sudo mkdir -p /db/active1/data /db/active2/data /db/passive1/data
2. On three separate cmd windows:
  - (1) vagrant@vagrant-ubuntu-trusty-64:~\$ sudo mongod --port 27021 -dbpath /db/active1/data --replSet testset --smallfiles --oplogSize 128
  - (2) vagrant@vagrant-ubuntu-trusty-64:~\$ sudo mongod --port 27022 -dbpath /db/active2/data --replSet testset --smallfiles --oplogSize 128
  - (3) vagrant@vagrant-ubuntu-trusty-64:~\$ sudo mongod --port 27023 -dbpath /db/passive1/data --replSet testset --smallfiles --oplogSize 128
3. On the fourth cmd window:  
  
mongo 127.0.0.1:27021

```
> rs.initiate()
{
  "info2" : "no configuration specified. Using a default configuration for the set",
  "me" : "localhost:27021",
  "ok" : 1,
  "operationTime" : Timestamp(1552792370, 1),
  "$clusterTime" : {
    "clusterTime" : Timestamp(1552792370, 1),
    "signature" : {
      "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA"),
      "keyId" : NumberLong(0)
    }
  }
}
```

```

testset:OTHER> rs.status()
{
  "set" : "testset",
  "date" : ISODate("2019-03-17T03:14:25.017Z"),
  "myState" : 1,
  "term" : NumberLong(1),
  "syncingTo" : "",
  "syncSourceHost" : "",
  "syncSourceId" : -1,
  "heartbeatIntervalMillis" : NumberLong(2000),
  "optimes" : {
    "lastCommittedOpTime" : {
      "ts" : Timestamp(1552792463, 1),
      "t" : NumberLong(1)
    },
    "readConcernMajorityOpTime" : {
      "ts" : Timestamp(1552792463, 1),
      "t" : NumberLong(1)
    },
    "appliedOpTime" : {
      "ts" : Timestamp(1552792463, 1),
      "t" : NumberLong(1)
    },
    "durableOpTime" : {
      "ts" : Timestamp(1552792463, 1),
      "t" : NumberLong(1)
    }
  },
  "lastStableCheckpointTimestamp" : Timestamp(1552792433, 1),
  "members" : [
    {
      "_id" : 0,
      "name" : "localhost:27021",
      "health" : 1,
      "state" : 1,
      "stateStr" : "PRIMARY",
      "uptime" : 387,
      "optime" : {
        "ts" : Timestamp(1552792463, 1),
        "t" : NumberLong(1)
      },
      "optimeDate" : ISODate("2019-03-17T03:14:23Z"),
      "syncingTo" : "",
      "syncSourceHost" : "",
      "syncSourceId" : -1,
      "infoMessage" : "could not find member to sync from",
      "electionTime" : Timestamp(1552792372, 1),
      "electionDate" : ISODate("2019-03-17T03:12:52Z"),
      "configVersion" : 1,
      "self" : true,
      "lastHeartbeatMessage" : ""
    }
  ]
}

```

```

"ok" : 1,
"operationTime" : Timestamp(1552792463, 1),
"$clusterTime" : {
  "clusterTime" : Timestamp(1552792463, 1),
  "signature" : {
    "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA="),
    "keyId" : NumberLong(0)
  }
}
}

testset:PRIMARY> rs.add("127.0.0.1:27022")
{
  "ok" : 1,
  "operationTime" : Timestamp(1552792588, 1),
  "$clusterTime" : {
    "clusterTime" : Timestamp(1552792588, 1),
    "signature" : {
      "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA="),
      "keyId" : NumberLong(0)
    }
  }
}

testset:PRIMARY> rs.add("127.0.0.1:27023")
{
  "ok" : 1,
  "operationTime" : Timestamp(1552792808, 1),
  "$clusterTime" : {
    "clusterTime" : Timestamp(1552792808, 1),
    "signature" : {
      "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA="),
      "keyId" : NumberLong(0)
    }
  }
}

```

```

testset:PRIMARY> rs.status()
{
  "set" : "testset",
  "date" : ISODate("2019-03-17T03:20:51.827Z"),
  "myState" : 1,
  "term" : NumberLong(1),
  "syncingTo" : "",
  "syncSourceHost" : "",
  "syncSourceId" : -1,
  "heartbeatIntervalMillis" : NumberLong(2000),
  "optimes" : {
    "lastCommittedOpTime" : {
      "ts" : Timestamp(1552792843, 1),
      "t" : NumberLong(1)
    },
    "readConcernMajorityOpTime" : {
      "ts" : Timestamp(1552792843, 1),
      "t" : NumberLong(1)
    },
    "appliedOpTime" : {
      "ts" : Timestamp(1552792843, 1),
      "t" : NumberLong(1)
    },
    "durableOpTime" : {
      "ts" : Timestamp(1552792843, 1),
      "t" : NumberLong(1)
    }
  },
  "lastStableCheckpointTimestamp" : Timestamp(1552792793, 1),
  "members" : [
    {
      "_id" : 0,
      "name" : "localhost:27021",
      "health" : 1,
      "state" : 1,
      "stateStr" : "PRIMARY",
      "uptime" : 773,
      "optime" : {
        "ts" : Timestamp(1552792843, 1),
        "t" : NumberLong(1)
      },
      "optimeDate" : ISODate("2019-03-17T03:20:43Z"),
      "syncingTo" : "",
      "syncSourceHost" : "",
      "syncSourceId" : -1,
      "infoMessage" : "",
      "electionTime" : Timestamp(1552792372, 1),
      "electionDate" : ISODate("2019-03-17T03:12:52Z"),
      "configVersion" : 3,
      "self" : true,
      "lastHeartbeatMessage" : ""
    },
  ],

```

```

    "_id" : 1,
    "name" : "127.0.0.1:27022",
    "health" : 1,
    "state" : 2,
    "stateStr" : "SECONDARY",
    "uptime" : 263,
    "optime" : {
      "ts" : Timestamp(1552792843, 1),
      "t" : NumberLong(1)
    },
    "optimeDurable" : {
      "ts" : Timestamp(1552792843, 1),
      "t" : NumberLong(1)
    },
    "optimeDate" : ISODate("2019-03-17T03:20:43Z"),
    "optimeDurableDate" : ISODate("2019-03-17T03:20:43Z"),
    "lastHeartbeat" : ISODate("2019-03-17T03:20:50.851Z"),
    "lastHeartbeatRecv" : ISODate("2019-03-17T03:20:50.879Z"),
    "pingMs" : NumberLong(0),
    "lastHeartbeatMessage" : "",
    "syncingTo" : "localhost:27021",
    "syncSourceHost" : "localhost:27021",
    "syncSourceId" : 0,
    "infoMessage" : "",
    "configVersion" : 3
  },
  {
    "_id" : 2,
    "name" : "127.0.0.1:27023",
    "health" : 1,
    "state" : 2,
    "stateStr" : "SECONDARY",
    "uptime" : 42,
    "optime" : {
      "ts" : Timestamp(1552792843, 1),
      "t" : NumberLong(1)
    },
    "optimeDurable" : {
      "ts" : Timestamp(1552792843, 1),
      "t" : NumberLong(1)
    },
    "optimeDate" : ISODate("2019-03-17T03:20:43Z"),
    "optimeDurableDate" : ISODate("2019-03-17T03:20:43Z"),
    "lastHeartbeat" : ISODate("2019-03-17T03:20:50.858Z"),
    "lastHeartbeatRecv" : ISODate("2019-03-17T03:20:50.351Z"),
    "pingMs" : NumberLong(0),
    "lastHeartbeatMessage" : "",
    "syncingTo" : "127.0.0.1:27022",
    "syncSourceHost" : "127.0.0.1:27022",
    "syncSourceId" : 1,
    "infoMessage" : "",
    "configVersion" : 3
  }
}

```

```

testset:PRIMARY> conf = rs.conf()
{
  "id" : "testset",
  "version" : 3,
  "protocolVersion" : NumberLong(1),
  "writeConcernMajorityJournalDefault" : true,
  "members" : [
    {
      "id" : 0,
      "host" : "localhost:27021",
      "arbiterOnly" : false,
      "buildIndexes" : true,
      "hidden" : false,
      "priority" : 1,
      "tags" : {

      },
      "slaveDelay" : NumberLong(0),
      "votes" : 1
    },
    {
      "id" : 1,
      "host" : "127.0.0.1:27022",
      "arbiterOnly" : false,
      "buildIndexes" : true,
      "hidden" : false,
      "priority" : 1,
      "tags" : {

      },
      "slaveDelay" : NumberLong(0),
      "votes" : 1
    },
    {
      "id" : 2,
      "host" : "127.0.0.1:27023",
      "arbiterOnly" : false,
      "buildIndexes" : true,
      "hidden" : false,
      "priority" : 1,
      "tags" : {

      },
      "slaveDelay" : NumberLong(0),
      "votes" : 1
    }
  ],
  "settings" : {
    "chainingAllowed" : true,
    "heartbeatIntervalMillis" : 2000,

```

```

testset:PRIMARY> conf.members[2].hidden = true
true
testset:PRIMARY> conf.members[2].priority = 0
0
testset:PRIMARY> conf
{
  "_id" : "testset",
  "version" : 3,
  "protocolVersion" : NumberLong(1),
  "writeConcernMajorityJournalDefault" : true,
  "members" : [
    {
      "_id" : 0,
      "host" : "localhost:27021",
      "arbiterOnly" : false,
      "buildIndexes" : true,
      "hidden" : false,
      "priority" : 1,
      "tags" : {

      },
      "slaveDelay" : NumberLong(0),
      "votes" : 1
    },
    {
      "_id" : 1,
      "host" : "127.0.0.1:27022",
      "arbiterOnly" : false,
      "buildIndexes" : true,
      "hidden" : false,
      "priority" : 1,
      "tags" : {

      },
      "slaveDelay" : NumberLong(0),
      "votes" : 1
    },
    {
      "_id" : 2,
      "host" : "127.0.0.1:27023",
      "arbiterOnly" : false,
      "buildIndexes" : true,
      "hidden" : true,
      "priority" : 0,
      "tags" : {

      },
      "slaveDelay" : NumberLong(0),
      "votes" : 1
    }
  ],

```

```
testset:PRIMARY> rs.reconfig(conf)
{
  "ok" : 1,
  "operationTime" : Timestamp(1552793240, 1),
  "$clusterTime" : {
    "clusterTime" : Timestamp(1552793240, 1),
    "signature" : {
      "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA="),
      "keyId" : NumberLong(0)
    }
  }
}
```

#### 4. Add arbiter.

On the fifth cmd window:

- (1) vagrant@vagrant-ubuntu-trusty-64:~\$ sudo mkdir -p /db/arbiter1/data
- (2) vagrant@vagrant-ubuntu-trusty-64:~\$ sudo mongod --dbpath /db/arbiter1/data --port 27024 --replSet testset -rest

```
testset:PRIMARY> rs.addArb("127.0.0.1:27024")
{
  "ok" : 1,
  "operationTime" : Timestamp(1552793482, 1),
  "$clusterTime" : {
    "clusterTime" : Timestamp(1552793482, 1),
    "signature" : {
      "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA="),
      "keyId" : NumberLong(0)
    }
  }
}
```

rs.status()



```

    {
      "id" : 3,
      "name" : "127.0.0.1:27024",
      "health" : 1,
      "state" : 7,
      "stateStr" : "ARBITER",
      "uptime" : 30,
      "lastHeartbeat" : ISODate("2019-03-17T03:31:52.180Z"),
      "lastHeartbeatRecv" : ISODate("2019-03-17T03:31:50.876Z"),
      "pingMs" : NumberLong(0),
      "lastHeartbeatMessage" : "",
      "syncingTo" : "",
      "syncSourceHost" : "",
      "syncSourceId" : -1,
      "infoMessage" : "",
      "configVersion" : 5
    }
  ],
  "ok" : 1,
  "operationTime" : Timestamp(1552793503, 1),
  "$clusterTime" : {
    "clusterTime" : Timestamp(1552793503, 1),
    "signature" : {
      "hash" : BinData(0, "AAAAAAAAAAAAAAAAAAAAAAAAAAAA="),
      "keyId" : NumberLong(0)
    }
  }
}

```

rs.conf()

```

    {
      "_id" : 3,
      "host" : "127.0.0.1:27024",
      "arbiterOnly" : true,
      "buildIndexes" : true,
      "hidden" : false,
      "priority" : 0,
      "tags" : {

      },
      "slaveDelay" : NumberLong(0),
      "votes" : 1
    }
  ],
  "settings" : {
    "chainingAllowed" : true,
    "heartbeatIntervalMillis" : 2000,
    "heartbeatTimeoutSecs" : 10,
    "electionTimeoutMillis" : 10000,
    "catchUpTimeoutMillis" : -1,
    "catchUpTakeoverDelayMillis" : 30000,
    "getLastErrorModes" : {

    },
    "getLastErrorDefaults" : {
      "w" : 1,
      "wtimeout" : 0
    },
    "replicaSetId" : ObjectId("5c8dbb304c313a4e6c2938a4")
  }
}

```

```

testset:PRIMARY> conf.members[2].votes = 0
0
testset:PRIMARY> conf
{
  "_id" : "testset",
  "version" : 5,
  "protocolVersion" : NumberLong(1),
  "writeConcernMajorityJournalDefault" : true,
  "members" : [
    {
      "_id" : 0,
      "host" : "localhost:27021",
      "arbiterOnly" : false,
      "buildIndexes" : true,
      "hidden" : false,
      "priority" : 1,
      "tags" : {

      },
      "slaveDelay" : NumberLong(0),
      "votes" : 1
    },
    {
      "_id" : 1,
      "host" : "127.0.0.1:27022",
      "arbiterOnly" : false,
      "buildIndexes" : true,
      "hidden" : false,
      "priority" : 1,
      "tags" : {

      },
      "slaveDelay" : NumberLong(0),
      "votes" : 1
    },
    {
      "_id" : 2,
      "host" : "127.0.0.1:27023",
      "arbiterOnly" : false,
      "buildIndexes" : true,
      "hidden" : true,
      "priority" : 0,
      "tags" : {

      },
      "slaveDelay" : NumberLong(0),
      "votes" : 0
    },
    {
      "_id" : 3,
      "host" : "127.0.0.1:27024",

```

```

    },
    {
      "_id" : 3,
      "host" : "127.0.0.1:27024",
      "arbiterOnly" : true,
      "buildIndexes" : true,
      "hidden" : false,
      "priority" : 0,
      "tags" : {

      },
      "slaveDelay" : NumberLong(0),
      "votes" : 1
    }
  ],
  "settings" : {
    "chainingAllowed" : true,
    "heartbeatIntervalMillis" : 2000,
    "heartbeatTimeoutSecs" : 10,
    "electionTimeoutMillis" : 10000,
    "catchUpTimeoutMillis" : -1,
    "catchUpTakeoverDelayMillis" : 30000,
    "getLastErrorModes" : {

    },
    "getLastErrorDefaults" : {
      "w" : 1,
      "wtimeout" : 0
    },
    "replicaSetId" : ObjectId("5c8dbb304c313a4e6c2938a4")
  }
}

```

##### 5. Replication example and result:

```

testset:PRIMARY> use exampleDB
switched to db exampleDB
testset:PRIMARY> for(var i = 0; i < 1000; i++) db.exampleCollection.insert({x: i})
WriteResult({ "nInserted" : 1 })
testset:PRIMARY> db.exampleCollection.find()
{ "_id" : ObjectId("5c8dccf3fce7e0d930994dfd"), "x" : 0 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994dfe"), "x" : 1 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994dff"), "x" : 2 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e00"), "x" : 3 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e01"), "x" : 4 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e02"), "x" : 5 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e03"), "x" : 6 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e04"), "x" : 7 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e05"), "x" : 8 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e06"), "x" : 9 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e07"), "x" : 10 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e08"), "x" : 11 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e09"), "x" : 12 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e0a"), "x" : 13 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e0b"), "x" : 14 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e0c"), "x" : 15 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e0d"), "x" : 16 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e0e"), "x" : 17 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e0f"), "x" : 18 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e10"), "x" : 19 }
Type "it" for more
testset:PRIMARY> db.exampleCollection.count()
1000

```

```

testset:SECONDARY> db.getMongo().setSlaveOk()
testset:SECONDARY> use exampleDB
switched to db exampleDB
testset:SECONDARY> db.exampleCollection.count()
1000
testset:SECONDARY> db.exampleCollection.find()
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e07"), "x" : 10 }
{ "_id" : ObjectId("5c8dccf3fce7e0d930994dfd"), "x" : 0 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e06"), "x" : 9 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e0e"), "x" : 17 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994dff"), "x" : 2 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994dfe"), "x" : 1 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e01"), "x" : 4 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e05"), "x" : 8 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e04"), "x" : 7 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e03"), "x" : 6 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e0f"), "x" : 18 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e09"), "x" : 12 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e10"), "x" : 19 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e11"), "x" : 20 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e02"), "x" : 5 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e00"), "x" : 3 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e0c"), "x" : 15 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e0d"), "x" : 16 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e08"), "x" : 11 }
{ "_id" : ObjectId("5c8dccf4fce7e0d930994e0a"), "x" : 13 }
Type "it" for more
testset:SECONDARY>

```