

**Actividad 5 - Conceptos y Comandos básicos del particionamiento en bases de
datos NoSQL**

**CORPORACIÓN UNIVERSITARIA IBEROAMERICANA
BASES DE DATOS AVANZADA**

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1. Requerimientos no funcionales

Para distribuir los documentos de cada una de las colecciones de la base de datos **torneoBasketball**, Mongo divide la cada colección según la clave de shard. La clave de shard consiste en un campo o campos inmutables que existen en cada documento en la colección de destino.

1. Para escoger una clave shard adecuada se debe tener en cuenta que:

- La clave shard debe ser inmutable
- La clave shard debe estar indexada
- La clave shard está limitada a 512 bytes de tamaño
- La clave shard se usará para enrutar las queries o consultas

2. Se debe elegir un campo comúnmente utilizado en queries

- Solo la clave shard puede ser única entre todos los shards.
- Por ejemplo el campo **_id** es único, pero sólo en un shard individual, es decir se puede repetir en diferentes shards.

3. Algas buenas prácticas para escoger la clave de shard incluyen:

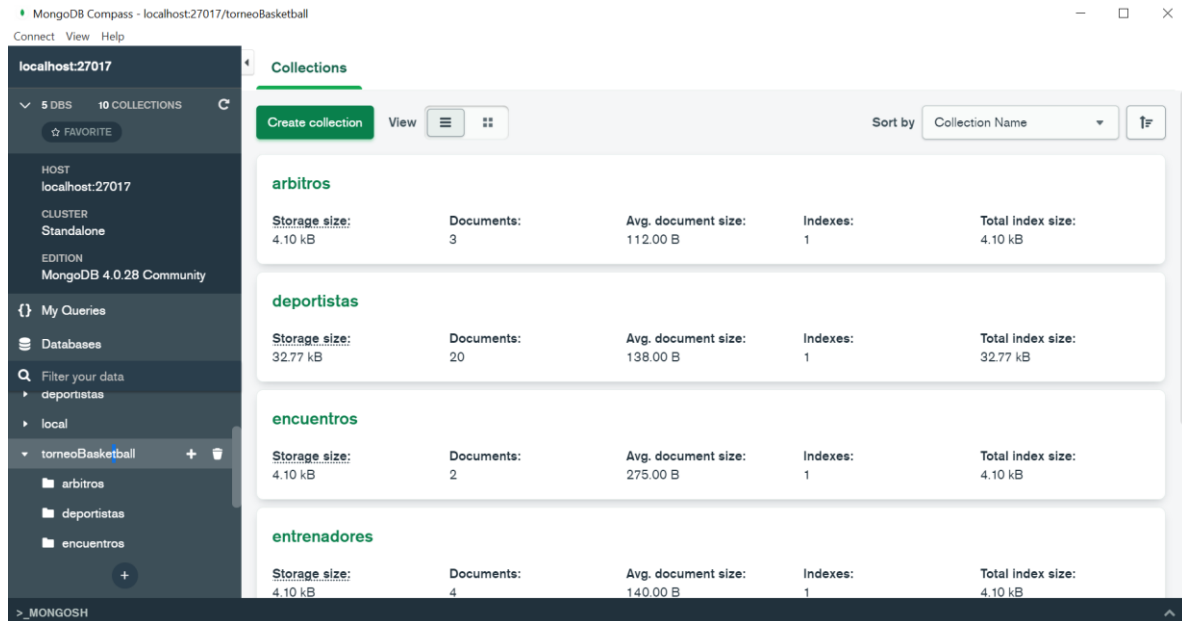
- Crear una clave de shard que sea fácilmente divisible
- Una clave de shard fácil de dividir hace que sea igualmente fácil para MongoDB distribuir contenido entre los shards.
- Las claves shard que tienen un número limitado de posibles valores pueden dar como resultado pedazos que son “no divisibles”.
- Por ejemplo, si un fragmento representa un único valor de clave de shard, entonces Mongo no puede dividir el fragmento incluso cuando el fragmento excede el tamaño en que se producen divisiones.

4. Crear una clave de shard que tenga un alto grado de aleatoriedad

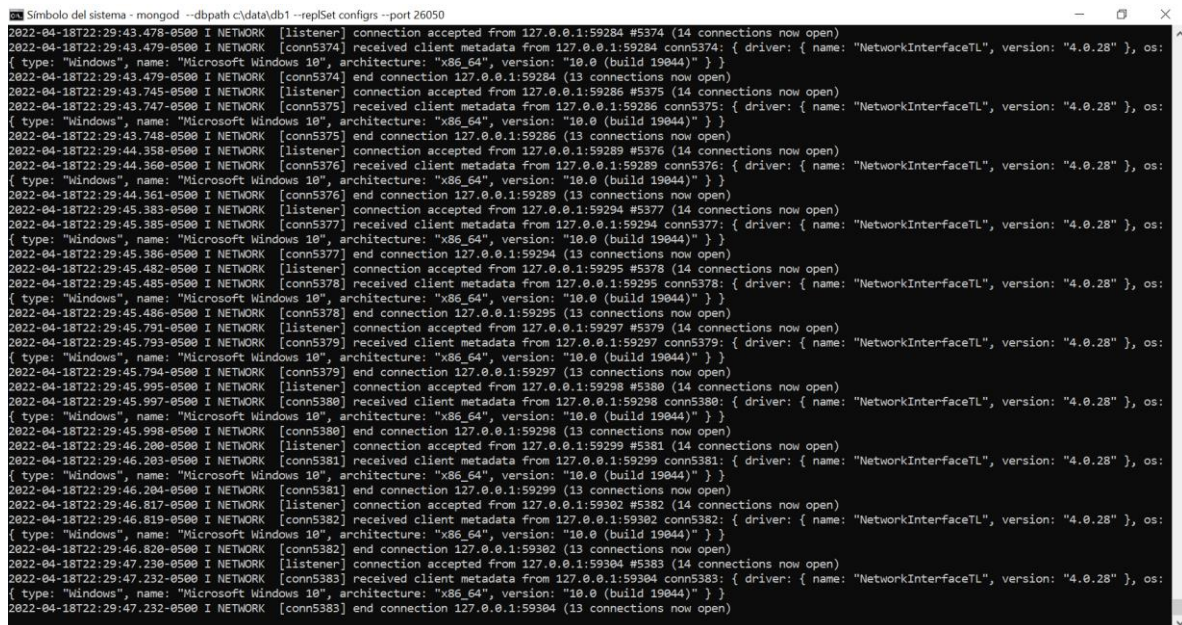
- Una clave de shard con alto grado de aleatoriedad impide que cualquier fragmento se convierta en un cuello de botella y distribuirá las operaciones de escritura entre el clúster.

2. Scripts:

Se tiene la base de datos con las colecciones y los documentos del taller inicial “torneoBasketball”



Creación de los servidores para la réplica “configs” puertos 26050,26051,26052



Simbolo del sistema - mongo --port 26050

```
{
  "lastCommittedOptimeAtElection" : {
    "ts" : Timestamp(0, 0),
    "t" : NumberLong(-1)
  },
  "lastSeenOptimeAtElection" : {
    "ts" : Timestamp(1650334959, 1),
    "t" : NumberLong(-1)
  },
  "numVotesNeeded" : 1,
  "priorityAtElection" : 1,
  "electionTimeoutMillis" : NumberLong(10000),
  "newTermStartDate" : ISODate("2022-04-19T02:22:39.832Z"),
  "wMajorityWriteAvailabilityDate" : ISODate("2022-04-19T02:22:39.862Z")
},
"members" : [
  {
    "_id" : 0,
    "name" : "localhost:26050",
    "health" : 1,
    "state" : 1,
    "stateStr" : "PRIMARY",
    "uptime" : 1209,
    "optime" : {
      "ts" : Timestamp(1650335719, 1),
      "t" : NumberLong(1)
    },
    "optimeDate" : ISODate("2022-04-19T02:35:19Z"),
    "syncingTo" : "",
    "syncSourceHost" : "",
    "syncSourceId" : -1,
    "infoMessage" : "",
    "electionTime" : Timestamp(1650334959, 2),
    "electionDate" : ISODate("2022-04-19T02:22:39Z"),
    "configVersion" : 3,
    "self" : true,
    "lastHeartbeatMessage" : ""
  },
  {
    "_id" : 1,
    "name" : "localhost:26051",
    "health" : 1,

```

Simbolo del sistema - mongo --port 26051

Microsoft Windows [Versión 10.0.19044.1645]

(c) Microsoft Corporation. Todos los derechos reservados.

C:\Users\Administrador>mongo --port 26051

MongoDB shell version v4.0.28

connecting to: mongodb://127.0.0.1:26051/?gssapiServiceName=mongodb

Implicit session: session { "id" : UUID("e38e3cb4-5f85-496d-b600-75d4bc79de36") }

MongoDB server version: 4.0.28

server has startup warnings:

```
2022-04-18T21:10:26.548-0500 I CONTROL [initandlisten]
2022-04-18T21:10:26.548-0500 I CONTROL [initandlisten] ** WARNING: Access control is not enabled for the database.
2022-04-18T21:10:26.549-0500 I CONTROL [initandlisten] **      Read and write access to data and configuration is unrestricted.
2022-04-18T21:10:26.549-0500 I CONTROL [initandlisten]
2022-04-18T21:10:26.549-0500 I CONTROL [initandlisten] ** WARNING: This server is bound to localhost.
2022-04-18T21:10:26.549-0500 I CONTROL [initandlisten] **      Remote systems will be unable to connect to this server.
2022-04-18T21:10:26.550-0500 I CONTROL [initandlisten] **      Start the server with --bind_ip <address> to specify which IP
2022-04-18T21:10:26.550-0500 I CONTROL [initandlisten] **      addresses it should serve responses from, or with --bind_ip_all to
2022-04-18T21:10:26.550-0500 I CONTROL [initandlisten] **      bind to all interfaces. If this behavior is desired, start the
2022-04-18T21:10:26.550-0500 I CONTROL [initandlisten] **      server with --bind_ip 127.0.0.1 to disable this warning.
2022-04-18T21:10:26.551-0500 I CONTROL [initandlisten]
---
```

Enable MongoDB's free cloud-based monitoring service, which will then receive and display metrics about your deployment (disk utilization, CPU, operation statistics, etc).

The monitoring data will be available on a MongoDB website with a unique URL accessible to you and anyone you share the URL with. MongoDB may use this information to make product improvements and to suggest MongoDB products and deployment options to you.

To enable free monitoring, run the following command: db.enableFreeMonitoring()

To permanently disable this reminder, run the following command: db.disableFreeMonitoring()

```

Simbolo del sistema - mongo --port 26052
2022-04-18T21:10:36.164-0500 I CONTROL [initandlisten]
2022-04-18T21:10:36.164-0500 I CONTROL [initandlisten] ** WARNING: Access control is not enabled for the database.
2022-04-18T21:10:36.164-0500 I CONTROL [initandlisten] **      Read and write access to data and configuration is unrestricted.
2022-04-18T21:10:36.164-0500 I CONTROL [initandlisten]
2022-04-18T21:10:36.165-0500 I CONTROL [initandlisten] ** WARNING: This server is bound to localhost.
2022-04-18T21:10:36.165-0500 I CONTROL [initandlisten] **      Remote systems will be unable to connect to this server.
2022-04-18T21:10:36.165-0500 I CONTROL [initandlisten] **      Start the server with --bind_ip <address> to specify which IP
2022-04-18T21:10:36.165-0500 I CONTROL [initandlisten] **      addresses it should serve responses from, or with --bind_ip_all to
2022-04-18T21:10:36.165-0500 I CONTROL [initandlisten] **      bind to all interfaces. If this behavior is desired, start the
2022-04-18T21:10:36.165-0500 I CONTROL [initandlisten] **      server with --bind_ip 127.0.0.1 to disable this warning.
2022-04-18T21:10:36.166-0500 I CONTROL [initandlisten]
---
Enable MongoDB's free cloud-based monitoring service, which will then receive and display
metrics about your deployment (disk utilization, CPU, operation statistics, etc).

The monitoring data will be available on a MongoDB website with a unique URL accessible to you
and anyone you share the URL with. MongoDB may use this information to make product
improvements and to suggest MongoDB products and deployment options to you.

To enable free monitoring, run the following command: db.enableFreeMonitoring()
To permanently disable this reminder, run the following command: db.disableFreeMonitoring()
---
>

```

Ahora se crean los servidores de sharding en este caso serán dos conjuntos de replicas con 3 miembros cada uno. Usando los puertos 27100,27101,27102,27200,272001,27202

```

Simbolo del sistema - mongod --shardsvr --port 27100 --repSet p1 --dbpath c:\datos\p1.1
2022-04-18T21:55:13.321-0500 I QUERY [clientcursormon] Cursor id 29762186014 timed out, idle since 2022-04-18T21:45:10.812-0500
2022-04-18T21:57:29.114-0500 I CONTROL [LogicalSessionCacheRefresh] Sessions collection is not set up; waiting until next sessions refresh interval: sharding state is not yet initialized
2022-04-18T21:57:29.114-0500 I CONTROL [LogicalSessionCacheReap] Sessions collection is not set up; waiting until next sessions reap interval: sharding state is not yet initialized
2022-04-18T22:00:48.521-0500 I NETWORK [listener] connection accepted from 127.0.0.1:49394 #17 (8 connections now open)
2022-04-18T22:00:48.525-0500 I NETWORK [conn17] received client metadata from 127.0.0.1:49394 conn17: { application: { name: "MongoDB Shell" }, driver: { name: "MongoDB Internal Client", version: "4.0.28" }, os: { type: "Windows", name: "Microsoft Windows 10", architecture: "x86_64", version: "10.0 (build 19044)" } }
2022-04-18T22:02:29.114-0500 I CONTROL [LogicalSessionCacheRefresh] Sessions collection is not set up; waiting until next sessions refresh interval: sharding state is not yet initialized
2022-04-18T22:02:29.115-0500 I CONTROL [LogicalSessionCacheReap] Sessions collection is not set up; waiting until next sessions reap interval: sharding state is not yet initialized
2022-04-18T22:07:29.115-0500 I CONTROL [LogicalSessionCacheRefresh] Sessions collection is not set up; waiting until next sessions refresh interval: sharding state is not yet initialized
2022-04-18T22:07:29.115-0500 I CONTROL [LogicalSessionCacheReap] Sessions collection is not set up; waiting until next sessions reap interval: sharding state is not yet initialized
2022-04-18T22:12:29.115-0500 I CONTROL [LogicalSessionCacheReap] Sessions collection is not set up; waiting until next sessions reap interval: sharding state is not yet initialized
2022-04-18T22:12:29.115-0500 I CONTROL [LogicalSessionCacheRefresh] Sessions collection is not set up; waiting until next sessions refresh interval: sharding state is not yet initialized
2022-04-18T22:17:29.115-0500 I CONTROL [LogicalSessionCacheReap] Sessions collection is not set up; waiting until next sessions reap interval: sharding state is not yet initialized
2022-04-18T22:17:29.115-0500 I CONTROL [LogicalSessionCacheRefresh] Sessions collection is not set up; waiting until next sessions refresh interval: sharding state is not yet initialized
2022-04-18T22:22:29.115-0500 I CONTROL [LogicalSessionCacheRefresh] Sessions collection is not set up; waiting until next sessions refresh interval: sharding state is not yet initialized
2022-04-18T22:22:29.115-0500 I CONTROL [LogicalSessionCacheReap] Sessions collection is not set up; waiting until next sessions reap interval: sharding state is not yet initialized
2022-04-18T22:27:29.115-0500 I CONTROL [LogicalSessionCacheRefresh] Sessions collection is not set up; waiting until next sessions refresh interval: sharding state is not yet initialized
2022-04-18T22:27:29.116-0500 I CONTROL [LogicalSessionCacheReap] Sessions collection is not set up; waiting until next sessions reap interval: sharding state is not yet initialized
2022-04-18T22:32:29.115-0500 I CONTROL [LogicalSessionCacheRefresh] Sessions collection is not set up; waiting until next sessions refresh interval: sharding state is not yet initialized
2022-04-18T22:32:29.116-0500 I CONTROL [LogicalSessionCacheReap] Sessions collection is not set up; waiting until next sessions reap interval: sharding state is not yet initialized
2022-04-18T22:37:29.116-0500 I CONTROL [LogicalSessionCacheRefresh] Sessions collection is not set up; waiting until next sessions refresh interval: sharding state is not yet initialized
2022-04-18T22:37:29.117-0500 I CONTROL [LogicalSessionCacheReap] Sessions collection is not set up; waiting until next sessions reap interval: sharding state is not yet initialized

```

```

[Symbol del sistema - mongod --shardsvr --port 27101 --replset p1 --dbpath c:/datos/p1.2
tting down. Last fetched optime and hash: { ts: Timestamp(0, 0), t: -1 }[0]
2022-04-18T21:45:07.031-0500 I REPL [replication-0] Initial sync attempt finishing up.
2022-04-18T21:45:07.033-0500 I REPL [replication-0] Initial Sync Attempt Statistics: { failedInitialSyncAttempts: 0, maxFailedInitialSyncAttempts: 10, initialSyncStart:
new Date(1658336306922), initialSyncAttempts: [], fetchedMissingDocs: 0, appliedOps: 0, initialSyncOplogStart: Timestamp(1658336306, 1), initialSyncOplogEnd: Timestamp(165
8336306, 1), databasesCloned: 2, admin: { collections: 1, clonedCollections: 1, start: new Date(1658336306969), end: new Date(1658336307004), elapsedMillis: 35
, admin.system.version: { documentsToCopy: 1, documentsCopied: 1, indexes: 1, fetchedBatches: 1, start: new Date(1658336306971), end: new Date(1658336307004), elapsedMillis
: 33 } }, config: { collections: 1, clonedCollections: 1, start: new Date(1658336307004), end: new Date(1658336307025), elapsedMillis: 21, config.transactions: { documentsT
oCopy: 0, documentsCopied: 0, indexes: 1, fetchedBatches: 0, start: new Date(1658336307005), end: new Date(1658336307025), elapsedMillis: 20 } } }
2022-04-18T21:45:07.037-0500 I STORAGE [replication-1] Finishing collection drop for local.temp_oplog_buffer (cf32405c-f0f0-4036-8874-6a9ea35d418).
2022-04-18T21:45:07.043-0500 I REPL [replication-1] Initial sync done; took 0s.
2022-04-18T21:45:07.047-0500 I REPL [replication-1] transition to RECOVERING from STARTUP2
2022-04-18T21:45:07.048-0500 I REPL [replication-1] Starting replication fetcher thread
2022-04-18T21:45:07.050-0500 I REPL [replication-1] Starting replication applier thread
2022-04-18T21:45:07.050-0500 I REPL [replication-1] Starting replication reporter thread
2022-04-18T21:45:07.050-0500 I REPL [rsSync-0] Starting oplog application
2022-04-18T21:45:07.051-0500 I REPL [rsBackgroundSync] could not find member to sync from
2022-04-18T21:45:07.054-0500 I REPL [rsSync-0] transition to SECONDARY from RECOVERING
2022-04-18T21:45:07.054-0500 I REPL [rsSync-0] Resetting sync source to empty, which was: 27817
2022-04-18T21:45:10.779-0500 I NETWORK [listener] connection accepted from 127.0.0.1:60576 #7 (2 connections now open)
2022-04-18T21:45:10.789-0500 I NETWORK [connv7] end connection 127.0.0.1:60576 (1 connection now open)
2022-04-18T21:45:10.829-0500 I NETWORK [listener] connection accepted from 127.0.0.1:60583 #9 (2 connections now open)
2022-04-18T21:45:10.837-0500 I REPL [replexec-0] New replica set config in use: { _id: "p1", version: 3, protocolVersion: 1, writeConcernMajorityJournalDefault: true, m
embers: [ { _id: 0, host: "localhost:27100", arbiterOnly: false, buildIndexes: true, hidden: false, priority: 1.0, tags: {}, slaveDelay: 0, votes: 1 }, { _id: 1, host: "loc
alhost:27101", arbiterOnly: false, buildIndexes: true, hidden: false, priority: 1.0, tags: {}, slaveDelay: 0, votes: 1 }, { _id: 2, host: "localhost:27102", arbiterOnly: fa
lse, buildIndexes: true, hidden: false, priority: 1.0, tags: {}, slaveDelay: 0, votes: 1 } ], settings: { chainingAllowed: true, heartbeatIntervalMillis: 2000, heartbeatTim
eoutSecs: 10, electionTimeoutMillis: 10000, catchUpTimeoutMillis: -1, catchUpTakeoverDelayMillis: 30000, getLastErrorModes: {}, getLastErrorDefaults: { w: 1, wtimeout: 0 } },
replicaSetId: ObjectId('625e2202ce3e1c97bcc00941') } }
2022-04-18T21:45:10.838-0500 I REPL [replexec-0] This node is localhost:27101 in the config
2022-04-18T21:45:10.840-0500 I ASIO [Replication] Connecting to localhost:27102
2022-04-18T21:45:10.841-0500 I NETWORK [conn9] end connection 127.0.0.1:60583 (1 connection now open)
2022-04-18T21:45:10.849-0500 I REPL [replexec-4] Member localhost:27102 is now in state STARTUP
2022-04-18T21:45:10.856-0500 I NETWORK [listener] connection accepted from 127.0.0.1:60585 #12 (2 connections now open)
2022-04-18T21:45:10.862-0500 I NETWORK [conn12] received client metadata from 127.0.0.1:60585 conn12: { driver: { name: "NetworkInterfaceTL", version: "4.0.28" }, os: { ty
pe: "Windows", name: "Microsoft Windows
pe: "Windows", name: "Microsoft Windows
2022-04-18T21:45:10.934-0500 I NETWORK [listener] connection accepted from 127.0.0.1:60587 #13 (3 connections now open)
2022-04-18T21:45:10.936-0500 I NETWORK [conn13] received client metadata from 127.0.0.1:60587 conn13: { driver: { name: "NetworkInterfaceTL", version: "4.0.28" }, os: { ty
pe: "Windows", name: "Microsoft Windows
2022-04-18T21:45:10.941-0500 I NETWORK [listener] connection accepted from 127.0.0.1:60588 #14 (4 connections now open)
2022-04-18T21:45:10.942-0500 I NETWORK [conn14] received client metadata from 127.0.0.1:60588 conn14: { driver: { name: "NetworkInterfaceTL", version: "4.0.28" }, os: { ty
pe: "Windows", name: "Microsoft Windows
2022-04-18T21:45:11.056-0500 I REPL [rsBackgroundSync] sync source candidate: localhost:27100
[Symbol del sistema - mongod --shardsvr --port 27102 --replset p1 --dbpath c:/datos/p1.3
alhost:27101", arbiterOnly: false, buildIndexes: true, hidden: false, priority: 1.0, tags: {}, slaveDelay: 0, votes: 1 }, { _id: 2, host: "localhost:27102", arbiterOnly: fa
lse, buildIndexes: true, hidden: false, priority: 1.0, tags: {}, slaveDelay: 0, votes: 1 } ], settings: { chainingAllowed: true, heartbeatIntervalMillis: 2000, heartbeatTim
eoutSecs: 10, electionTimeoutMillis: 10000, catchUpTimeoutMillis: -1, catchUpTakeoverDelayMillis: 30000, getLastErrorModes: {}, getLastErrorDefaults: { w: 1, wtimeout: 0 } },
replicaSetId: ObjectId('625e2202ce3e1c97bcc00941') } }
2022-04-18T21:45:10.864-0500 I REPL [replexec-0] This node is localhost:27102 in the config
2022-04-18T21:45:10.864-0500 I REPL [replexec-0] transition to STARTUP2 from STARTUP
2022-04-18T21:45:10.867-0500 I REPL [replexec-0] Starting replication storage threads
2022-04-18T21:45:10.867-0500 I REPL [replexec-2] Member localhost:27100 is now in state PRIMARY
2022-04-18T21:45:10.868-0500 I REPL [replexec-1] Member localhost:27101 is now in state SECONDARY
2022-04-18T21:45:10.870-0500 I STORAGE [replexec-0] createCollection: local.temp_oplog_buffer with generated UUID: e8da6519-db4b-4001-be44-059a12a970cb
2022-04-18T21:45:10.882-0500 I REPL [replication-0] Starting initial sync (attempt 1 of 10)
2022-04-18T21:45:10.883-0500 I STORAGE [replication-0] Finishing collection drop for local.temp_oplog_buffer (e8da6519-db4b-4001-be44-059a12a970cb).
2022-04-18T21:45:10.887-0500 I STORAGE [replication-0] createCollection: local.temp_oplog_buffer with generated UUID: 6104d3f6-76cb-411f-ad62-e139fa058af8
2022-04-18T21:45:10.901-0500 I REPL [replication-0] sync source candidate: localhost:27101
2022-04-18T21:45:10.902-0500 I REPL [replication-0] Initial syncer oplog truncation finished in: 0ms
2022-04-18T21:45:10.904-0500 I REPL [replication-0] *****
2022-04-18T21:45:10.904-0500 I REPL [replication-0] creating replication oplog of size: 11838MB...
2022-04-18T21:45:10.906-0500 I STORAGE [replication-0] createCollection: local.oplog.rs with generated UUID: 18dfd082-bb55-4fdb-8145-866222f19fca
2022-04-18T21:45:10.913-0500 I STORAGE [replication-0] Starting OplogTruncaterThread local.oplog.rs
2022-04-18T21:45:10.915-0500 I STORAGE [replication-0] The size storer reports that the oplog contains 0 records totaling to 0 bytes
2022-04-18T21:45:10.915-0500 I STORAGE [replication-0] Scanning the oplog to determine where to place markers for truncation
2022-04-18T21:45:10.916-0500 I STORAGE [replication-0] WiredTiger record store oplog processing took 1ms
2022-04-18T21:45:10.930-0500 I REPL [replication-0] *****
2022-04-18T21:45:10.930-0500 I STORAGE [replication-0] dropAllDatabasesExceptLocal 1
2022-04-18T21:45:10.932-0500 I ASIO [RS] Connecting to localhost:27101
2022-04-18T21:45:10.939-0500 I ASIO [RS] Connecting to localhost:27101
2022-04-18T21:45:10.941-0500 I REPL [replication-1] CollectionCloner: start called, on ns:admin.system.version
2022-04-18T21:45:10.944-0500 I STORAGE [repl writer worker 0] createCollection: admin.system.version with provided UUID: 29eea843-7742-43b0-963d-81fecec51afb
2022-04-18T21:45:10.955-0500 I INDEX [repl writer worker 0] build index on: admin.system.version properties: { v: 2, key: { _id: 1 }, name: "_id_", ns: "admin.system.ver
sion" }
2022-04-18T21:45:10.956-0500 I INDEX [repl writer worker 0] building index using bulk method; build may temporarily use up to 500 megabytes of RAM
2022-04-18T21:45:10.958-0500 I COMMAND [repl writer worker 0] setting featureCompatibilityVersion to 3.6
2022-04-18T21:45:10.959-0500 I REPL [repl writer worker 0] CollectionCloner ns:admin.system.version finished cloning with status: OK
2022-04-18T21:45:10.970-0500 I REPL [replication-0] CollectionCloner: start called, on ns:config.transactions
2022-04-18T21:45:10.971-0500 I STORAGE [repl writer worker 0] createCollection: config.transactions with provided UUID: a806da42-9b45-461d-963c-40fb0eb9868e
2022-04-18T21:45:10.982-0500 I INDEX [repl writer worker 0] build index on: config.transactions properties: { v: 2, key: { _id: 1 }, name: "_id_", ns: "config.transactio
ns" }
2022-04-18T21:45:10.982-0500 I INDEX [repl writer worker 0] building index using bulk method; build may temporarily use up to 500 megabytes of RAM
2022-04-18T21:45:10.984-0500 W REPL [repl writer worker 0] _insertDocumentsCallback, but no documents to insert for ns:config.transactions
2022-04-18T21:45:10.984-0500 I REPL [repl writer worker 0] CollectionCloner ns:config.transactions finished cloning with status: OK
2022-04-18T21:45:10.988-0500 I REPL [repl writer worker 0] Finished cloning data: OK. Beginning oplog replay.

```



```

Simbolo del sistema - mongod --shardsvr --port 27202 --repSet p1 --dbpath c:/datos/p2_3
2022-04-18T21:51:52.849-0500 I REPL [replication-0] *****
2022-04-18T21:51:52.849-0500 I STORAGE [replication-0] dropAllDatabasesExceptLocal 1
2022-04-18T21:51:52.851-0500 I ASIO [RS] Connecting to localhost:27200
2022-04-18T21:51:52.857-0500 I ASIO [RS] Connecting to localhost:27200
2022-04-18T21:51:52.859-0500 I REPL [replication-1] CollectionCloner::start called, on ns:admin.system.version
2022-04-18T21:51:52.862-0500 I STORAGE [repl writer worker 0] createCollection: admin.system.version with provided UUID: b768990f-804b-4ffc-9e57-081ea934f4db
2022-04-18T21:51:52.875-0500 I INDEX [repl writer worker 0] build index on: admin.system.version properties: { v: 2, key: { _id: 1 }, name: "_id_", ns: "admin.system.version" }
2022-04-18T21:51:52.875-0500 I INDEX [repl writer worker 0] building index using bulk method; build may temporarily use up to 500 megabytes of RAM
2022-04-18T21:51:52.877-0500 I COMMAND [repl writer worker 0] setting featureCompatibilityVersion to 3.6
2022-04-18T21:51:52.878-0500 I REPL [repl writer worker 0] CollectionCloner ns:admin.system.version finished cloning with status: OK
2022-04-18T21:51:52.889-0500 I REPL [replication-0] CollectionCloner::start called, on ns:config.transactions
2022-04-18T21:51:52.891-0500 I STORAGE [repl writer worker 0] createCollection: config.transactions with provided UUID: 14a4e833-58ae-452d-b5ad-34e3d425e845
2022-04-18T21:51:52.901-0500 I INDEX [repl writer worker 0] build index on: config.transactions properties: { v: 2, key: { _id: 1 }, name: "_id_", ns: "config.transactions" }
2022-04-18T21:51:52.902-0500 I INDEX [repl writer worker 0] building index using bulk method; build may temporarily use up to 500 megabytes of RAM
2022-04-18T21:51:52.903-0500 W REPL [repl writer worker 0] _insertDocumentsCallback, but no documents to insert for ns:config.transactions
2022-04-18T21:51:52.904-0500 I REPL [repl writer worker 0] CollectionCloner ns:config.transactions finished cloning with status: OK
2022-04-18T21:51:52.906-0500 I REPL [repl writer worker 0] Finished cloning data: OK. Beginning oplog replay.
2022-04-18T21:51:52.908-0500 I REPL [replication-1] No need to apply operations. (currently at { ts: Timestamp(1650336712, 1) })
2022-04-18T21:51:52.908-0500 I REPL [replication-1] Finished fetching oplog during initial sync: CallbackCanceled: error in fetcher batch callback: oplog fetcher is shutting down. Last fetched optime and hash: { ts: Timestamp(0, 0), h: -1 }[0]
2022-04-18T21:51:52.908-0500 I CONNPOOL [RS] Ending connection to host localhost:27200 due to bad connection status; 1 connections to that host remain open
2022-04-18T21:51:52.909-0500 I REPL [replication-1] Initial sync attempt finishing up.
2022-04-18T21:51:52.910-0500 I REPL [replication-1] Initial Sync Attempt Statistics: { failedInitialSyncAttempts: 0, maxFailedInitialSyncAttempts: 10, initialSyncStart: new Date(1650336712882), initialSyncAttempts: [], fetchedMissingDocs: 0, appliedOps: 0, initialSyncOplogStart: Timestamp(1650336712, 1), initialSyncOplogEnd: Timestamp(1650336712, 1), databases: { databasesCloned: 2, admin: { collections: 1, clonedCollections: 1, start: new Date(1650336712857), end: new Date(1650336712889), elapsedMillis: 32 }, admin.system.version: { documentsToCopy: 1, documentsCopied: 1, indexes: 1, fetchedBatches: 1, start: new Date(1650336712859), end: new Date(1650336712889), elapsedMillis: 30 } }, config: { collections: 1, clonedCollections: 1, start: new Date(1650336712897), end: new Date(1650336712907), elapsedMillis: 18, config.transactions: { documentsToCopy: 0, documentsCopied: 0, indexes: 1, fetchedBatches: 0, start: new Date(1650336712890), end: new Date(1650336712907), elapsedMillis: 17 } } }
2022-04-18T21:51:52.914-0500 I STORAGE [replication-0] Finishing collection drop for local.temp_oplog_buffer (9fa32982-ce3e-4e6c-8b6a-c86207379fbb).
2022-04-18T21:51:52.918-0500 I REPL [replication-0] Initial sync done; took 8s.
2022-04-18T21:51:52.918-0500 I REPL [replication-0] transition to RECOVERING from STARTUP2
2022-04-18T21:51:52.919-0500 I REPL [replication-0] Starting replication fetcher thread
2022-04-18T21:51:52.920-0500 I REPL [replication-0] Starting replication applier thread
2022-04-18T21:51:52.920-0500 I REPL [replication-0] Starting replication reporter thread
2022-04-18T21:51:52.920-0500 I REPL [rsSync-0] Starting oplog application
2022-04-18T21:51:52.920-0500 I REPL [rsBackgroundSync] could not find member to sync from
2022-04-18T21:51:52.923-0500 I REPL [rsSync-0] transition to SECONDARY from RECOVERING
2022-04-18T21:51:52.923-0500 I REPL [rsSync-0] Resetting sync source to empty, which was :27017
2022-04-18T21:51:53.474-0500 I NETWORK [listener] connection accepted from 127.0.0.1:62821 #11 (3 connections now open)

```

Luego se inicializan el nodo principal y se agregan los nodos para el primer conjunto “p1” en el puerto 27100

```

Simbolo del sistema - mongo --port 27100
{
  "majorityWriteAvailabilityDate" : ISODate("2022-04-19T02:44:18.793Z")
},
"members" : [
  {
    "_id" : 0,
    "name" : "localhost:27100",
    "health" : 1,
    "state" : 1,
    "stateStr" : "PRIMARY",
    "uptime" : 765,
    "optime" : {
      "ts" : Timestamp(1650336310, 1),
      "t" : NumberLong(1)
    },
    "optimeDate" : ISODate("2022-04-19T02:45:10Z"),
    "syncingTo" : "",
    "syncSourceHost" : "",
    "syncSourceId" : -1,
    "infoMessage" : "could not find member to sync from",
    "electionTime" : Timestamp(1650336258, 2),
    "electionDate" : ISODate("2022-04-19T02:44:18Z"),
    "configVersion" : 3,
    "self" : true,
    "lastHeartbeatMessage" : ""
  },
  {
    "_id" : 1,
    "name" : "localhost:27101",
    "health" : 1,
    "state" : 2,
    "stateStr" : "SECONDARY",
    "uptime" : 7,
    "optime" : {
      "ts" : Timestamp(1650336310, 1),
      "t" : NumberLong(1)
    },
    "optimeDurable" : {
      "ts" : Timestamp(1650336310, 1),
      "t" : NumberLong(1)
    },
    "optimeDate" : ISODate("2022-04-19T02:45:10Z"),
  }
]

```

Luego se inicializan el nodo principal y se agregan los nodos para el segundo conjunto “p2” en el puerto 27200

```
Símbolo del sistema - mongo --port 27200
{
  "name" : "localhost:27200",
  "health" : 1,
  "state" : 1,
  "stateStr" : "PRIMARY",
  "uptime" : 1068,
  "optime" : {
    "ts" : Timestamp(1650336712, 1),
    "t" : NumberLong(1)
  },
  "optimeDate" : ISODate("2022-04-19T02:51:52Z"),
  "syncingTo" : "",
  "syncSourceHost" : "",
  "syncSourceId" : -1,
  "infoMessage" : "",
  "electionTime" : Timestamp(1650336537, 2),
  "electionDate" : ISODate("2022-04-19T02:48:57Z"),
  "configVersion" : 3,
  "self" : true,
  "lastHeartbeatMessage" : ""
},
{
  "_id" : 1,
  "name" : "localhost:27201",
  "health" : 1,
  "state" : 2,
  "stateStr" : "SECONDARY",
  "uptime" : 5,
  "optime" : {
    "ts" : Timestamp(1650336712, 1),
    "t" : NumberLong(1)
  },
  "optimeDurable" : {
    "ts" : Timestamp(1650336712, 1),
    "t" : NumberLong(1)
  },
  "optimeDate" : ISODate("2022-04-19T02:51:52Z"),
  "optimeDurableDate" : ISODate("2022-04-19T02:51:52Z"),
  "lastHeartbeat" : ISODate("2022-04-19T02:51:54.734Z"),
  "lastHeartbeatRecv" : ISODate("2022-04-19T02:51:53.747Z"),
  "pingMs" : NumberLong(0),
  "lastHeartbeatMessage" : ""
}
```

Se proceden a crear los procesos en mongos

```
Símbolo del sistema - mongos --configdb configrs/127.0.0.1:26050,127.0.0.1:26051,127.0.0.1:26052 --logpath mongos1
Microsoft Windows [Versión 10.0.19044.1645]
(c) Microsoft Corporation. Todos los derechos reservados.

C:\Users\Administrador>mongos --configdb configrs/127.0.0.1:26050,127.0.0.1:26051,127.0.0.1:26052 mongos1
Error parsing command line: too many positional options have been specified on the command line
try 'mongos --help' for more information

C:\Users\Administrador>mongos --configdb configrs/127.0.0.1:26050,127.0.0.1:26051,127.0.0.1:26052 --logpath mongos1
```

Este proceso no se pudo correr desde mi maquina ni no pudimos avanzar llamando la variable de mongos para activar los conjuntos de réplicas que se agregaron anteriormente

En este paso se activaban los conjuntos de réplicas “p1”, “p2”

Después de este paso se ponían en marcha las particiones con el comando

```
Símbolo del sistema - mongo
Microsoft Windows [Versión 10.0.19044.1645]
(c) Microsoft Corporation. Todos los derechos reservados.

C:\Users\Administrador>mongo
MongoDB shell version v4.0.28
connecting to: mongodb://127.0.0.1:27017/?gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("b6c756b5-b17e-436c-bf61-82a33c398423") }
MongoDB server version: 4.0.28
Server has startup warnings:
2022-04-17T13:50:53.768-0500 I CONTROL [initandlisten]
2022-04-17T13:50:53.768-0500 I CONTROL [initandlisten] ** WARNING: Access control is not enabled for the database.
2022-04-17T13:50:53.768-0500 I CONTROL [initandlisten] **           Read and write access to data and configuration is unrestricted.
2022-04-17T13:50:53.768-0500 I CONTROL [initandlisten]
---
Enable MongoDB's free cloud-based monitoring service, which will then receive and display
metrics about your deployment (disk utilization, CPU, operation statistics, etc).

The monitoring data will be available on a MongoDB website with a unique URL accessible to you
and anyone you share the URL with. MongoDB may use this information to make product
improvements and to suggest MongoDB products and deployment options to you.

To enable free monitoring, run the following command: db.enableFreeMonitoring()
To permanently disable this reminder, run the following command: db.disableFreeMonitoring()
---
> sh.addShard("p1/127.0.0.1:27100")
{
  "ok" : 0,
  "errmsg" : "no such command: 'addShard'",
  "code" : 59,
  "codeName" : "CommandNotFound"
}
```

El proceso siguiente es habilitar la fragmentación en la base de datos “torneoBasketball”

```
Archivo Edición Formato Ver Ayuda
sh.enableShardin("torneoBasketball")
sh.status()
```

Luego de seleccionar la colección se le indica que puede partir los valores usando la clave `_id`

```
Archivo Edición Formato Ver Ayuda
sh.shardCollection("torneoBasketball.arbitros",{_id:1},true)
|
```

Al insertar datos a la colección se puede comprar el número de chunks en la colección con el comando

```
Archivo Edición Formato Ver Ayuda
db.arbitros.getShardDistribution()
|
```