

# Correction TP4

## ÉTAPE 1 : SHARD 1 (Port 27019) :

### 1.1 - Démarrage du serveur Shard 1 :

```
Invite de commandes - mong
Microsoft Windows [version 10.0.26100.7171]
(c) Microsoft Corporation. Tous droits réservés.

C:\Users\asus>mongod --port 27019 --dbpath C:/data/db/ns1 --shardsvr --replSet rs1
{"t":{"$date":"2025-12-02T09:55:24.091+01:00"},"s":"I", "c":"CONTROL", "id":23285, "ctx":"thread1","msg":"Automatica
lly disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"$date":"2025-12-02T09:55:24.224+01:00"},"s":"I", "c":"CONTROL", "id":5945603, "svc":"-", "ctx":"thread1","msg":
"Multi threading initialized"}
{"t":{"$date":"2025-12-02T09:55:24.225+01:00"},"s":"I", "c":"NETWORK", "id":4648601, "svc":"-", "ctx":"thread1","msg":
"Implicit TCP FastOpen unavailable. If TCP FastOpen is required, set at least one of the related parameters","attr":{"re
latedParameters":["tcpFastOpenServer","tcpFastOpenClient","tcpFastOpenQueueSize"]}}
{"t":{"$date":"2025-12-02T09:55:24.230+01:00"},"s":"I", "c":"NETWORK", "id":4915701, "svc":"-", "ctx":"thread1","msg":
"Initialized wire specification","attr":{"spec":{"incomingExternalClient":{"minWireVersion":0,"maxWireVersion":25},"inco
mingInternalClient":{"minWireVersion":0,"maxWireVersion":25},"outgoing":{"minWireVersion":6,"maxWireVersion":25},"isInte
rnalClient":true}}}
{"t":{"$date":"2025-12-02T09:55:24.232+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1","msg":
"Successfully registered PrimaryOnlyService","attr":{"service":"RenameCollectionParticipantService","namespace":"config.
localRenameParticipants"}}
{"t":{"$date":"2025-12-02T09:55:24.232+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1","msg":
"Successfully registered PrimaryOnlyService","attr":{"service":"ShardingDDLCoordinator","namespace":"config.system.shard
ing_ddl_coordinators"}}
{"t":{"$date":"2025-12-02T09:55:24.232+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1","msg":
"Successfully registered PrimaryOnlyService","attr":{"service":"ReshardingDonorService","namespace":"config.localReshard
ingOperations.donor"}}
{"t":{"$date":"2025-12-02T09:55:24.232+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1","msg":
"Successfully registered PrimaryOnlyService","attr":{"service":"ReshardingRecipientService","namespace":"config.localRes
hardingOperations.recipient"}}
{"t":{"$date":"2025-12-02T09:55:24.232+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1","msg":
"Successfully registered PrimaryOnlyService","attr":{"service":"MultiUpdateCoordinatorService","namespace":"config.local
MigrationBlockingOperations.multiUpdateCoordinators"}}
```

### 1.2 - Initialisation du Replica Set de Shard 1 :

```
C:\Users\asus>mongoimport --port 27019
Current Mongosh Log ID: 692ea9b5bdb9b6a1c1cebea3
Connecting to:      mongodb://127.0.0.1:27019/?directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+2
.5.8
Using MongoDB:      8.0.14
Using Mongosh:       2.5.8
mongosh 2.5.10 is available for download: https://www.mongodb.com/try/download/shell

For mongosh info see: https://www.mongodb.com/docs/mongosh-shell/

-----
The server generated these startup warnings when booting
2025-12-02T09:55:25.179+01:00: Access control is not enabled for the database. Read and write access to data and conf
iguration is unrestricted
2025-12-02T09:55:25.180+01:00: This server is bound to localhost. Remote systems will be unable to connect to this se
rver. Start the server with --bind_ip <address> to specify which IP addresses it should serve responses from, or with --
bind_ip_all to bind to all interfaces. If this behavior is desired, start the server with --bind_ip 127.0.0.1 to disable
this warning
-----
test>
```

## ÉTAPE 2 : IMPORTER LES DONNÉES :

**Remarque:** Télécharger <https://www.mongodb.com/try/download/database-tools>

Extraire le dossier le mettre dans c :programme entrer dans le dossier bin copier le path de mongoimport.exe entrer dans variable d'environnement dans path cliquer sur modifier ajouter le path et taper OK

```
C:\Users\asus>mongoimport -d dbtp -c restaurants --port 27019 --file C:/data/db/ns1/restaurants.json --jsonArray
2025-12-02T09:59:15.249+0100    connected to: mongodb://localhost:27019/
2025-12-02T09:59:18.172+0100    25357 document(s) imported successfully. 0 document(s) failed to import.

C:\Users\asus>
```

## ÉTAPE 3 : SHARD 2 (Port 27020) :

### 3.1 – Démarrage du serveur Shard 2 :

```
Invite de commandes - mong < + <
Microsoft Windows [version 10.0.26100.7171]
(c) Microsoft Corporation. Tous droits réservés.

C:\Users\asus>mongod --port 27020 --dbpath C:/data/db/ns2 --shardsvr --replSet rs2
{"t":{"$date":"2025-12-02T10:00:57.704+01:00"},"s":"I", "c":"CONTROL", "id":23285, "ctx":"thread1", "msg":"Automatica
lly disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"$date":"2025-12-02T10:00:57.879+01:00"},"s":"I", "c":"CONTROL", "id":5945603, "svc":"-", "ctx":"thread1", "msg":
"Multi threading initialized"}
{"t":{"$date":"2025-12-02T10:00:57.880+01:00"},"s":"I", "c":"NETWORK", "id":4648601, "svc":"-", "ctx":"thread1", "msg":
"Implicit TCP FastOpen unavailable. If TCP FastOpen is required, set at least one of the related parameters", "attr":{"re
latedParameters":["tcpFastOpenServer", "tcpFastOpenClient", "tcpFastOpenQueueSize"]}}
{"t":{"$date":"2025-12-02T10:00:57.884+01:00"},"s":"I", "c":"NETWORK", "id":4915701, "svc":"-", "ctx":"thread1", "msg":
"Initialized wire specification", "attr":{"spec":{"incomingExternalClient":{"minWireVersion":0, "maxWireVersion":25}, "inco
mingInternalClient":{"minWireVersion":0, "maxWireVersion":25}, "outgoing":{"minWireVersion":6, "maxWireVersion":25}, "isInte
rnalClient":true}}}}
{"t":{"$date":"2025-12-02T10:00:57.885+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1", "msg":
"Successfully registered PrimaryOnlyService", "attr":{"service":"RenameCollectionParticipantService", "namespace":"config.
localRenameParticipants"}}
{"t":{"$date":"2025-12-02T10:00:57.885+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1", "msg":
"Successfully registered PrimaryOnlyService", "attr":{"service":"ShardingDDLCoordinator", "namespace":"config.system.shard
ing_ddl_coordinators"}}
{"t":{"$date":"2025-12-02T10:00:57.886+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1", "msg":
"Successfully registered PrimaryOnlyService", "attr":{"service":"ReshardingDonorService", "namespace":"config.localReshard
ingOperations.donor"}}
{"t":{"$date":"2025-12-02T10:00:57.886+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1", "msg":
"Successfully registered PrimaryOnlyService", "attr":{"service":"ReshardingRecipientService", "namespace":"config.localRes
hardingOperations.recipient"}}
{"t":{"$date":"2025-12-02T10:00:57.886+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1", "msg":
"Successfully registered PrimaryOnlyService", "attr":{"service":"MultiUpdateCoordinatorService", "namespace":"config.local
MigrationBlockingOperations.multiUpdateCoordinators"}}
```

### 3.2 – Initialisation du Replica Set de Shard 2 :

```
C:\Users\asus>mongo --port 27020
Current MongoDB Log ID: 692eaa660811e97d8cebea3
Connecting to:      mongodb://127.0.0.1:27020/?directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+2
.5.8
Using MongoDB:      8.0.14
Using Mongosh:      2.5.8
mongosh 2.5.10 is available for download: https://www.mongodb.com/try/download/shell

For mongosh info see: https://www.mongodb.com/docs/mongosh-shell/

-----
The server generated these startup warnings when booting
2025-12-02T10:00:58.715+01:00: Access control is not enabled for the database. Read and write access to data and conf
iguration is unrestricted
2025-12-02T10:00:58.717+01:00: This server is bound to localhost. Remote systems will be unable to connect to this se
rver. Start the server with --bind_ip <address> to specify which IP addresses it should serve responses from, or with --
bind_ip_all to bind to all interfaces. If this behavior is desired, start the server with --bind_ip 127.0.0.1 to disable
this warning
-----

test>
```

## ÉTAPE 4 : SERVEUR DE CONFIGURATION (Port 27021) :

### 4.1 – Démarrage du serveur de configuration :

```

Microsoft Windows [version 10.0.26100.7171]
(c) Microsoft Corporation. Tous droits réservés.

C:\Users\asus>mongod --port 27021 --dbpath C:/data/db/confdb --configsvr --replSet configRS
{"t":{"date":"2025-12-02T10:02:49.508+01:00"},"s":"I", "c":"CONTROL", "id":23285, "svc":"-", "ctx":"thread1","msg":
"Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"date":"2025-12-02T10:02:49.612+01:00"},"s":"I", "c":"CONTROL", "id":5945603, "svc":"-", "ctx":"thread1","msg":
"Multi threading initialized"}
{"t":{"date":"2025-12-02T10:02:49.613+01:00"},"s":"I", "c":"NETWORK", "id":4648601, "svc":"-", "ctx":"thread1","msg":
"Implicit TCP FastOpen unavailable. If TCP FastOpen is required, set at least one of the related parameters","attr":{"re
latedParameters":{"tcpFastOpenServer","tcpFastOpenClient","tcpFastOpenQueueSize"}}}
{"t":{"date":"2025-12-02T10:02:49.616+01:00"},"s":"I", "c":"NETWORK", "id":4915701, "svc":"-", "ctx":"thread1","msg":
"Initialized wire specification","attr":{"spec":{"incomingExternalClient":{"minWireVersion":0,"maxWireVersion":25},"inco
mingInternalClient":{"minWireVersion":0,"maxWireVersion":25},"outgoing":{"minWireVersion":6,"maxWireVersion":25},"isInte
rnalClient":true}}}
{"t":{"date":"2025-12-02T10:02:49.617+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1","msg":
"Successfully registered PrimaryOnlyService","attr":{"service":"ReshardingCoordinatorService","namespace":"config.reshar
dingOperations"}}
{"t":{"date":"2025-12-02T10:02:49.618+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1","msg":
"Successfully registered PrimaryOnlyService","attr":{"service":"ConfigsvrCoordinatorService","namespace":"config.shardin
g_configsvr_coordinators"}}
{"t":{"date":"2025-12-02T10:02:49.618+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1","msg":
"Successfully registered PrimaryOnlyService","attr":{"service":"RenameCollectionParticipantService","namespace":"config.
localRenameParticipants"}}
{"t":{"date":"2025-12-02T10:02:49.618+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1","msg":
"Successfully registered PrimaryOnlyService","attr":{"service":"ShardingDDLCoordinator","namespace":"config.system.shard
ing_ddl_coordinators"}}
{"t":{"date":"2025-12-02T10:02:49.618+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1","msg":
"Successfully registered PrimaryOnlyService","attr":{"service":"ReshardingDonorService","namespace":"config.localReshar
dingOperations.donor"}}

```

## 4.2 – Initialisation du Replica Set de configuration :

```

C:\Users\asus>mongo --port 27021
Current Mongosh Log ID: 692eab5dd7a82d9591cebea3
Connecting to:      mongodb://127.0.0.1:27021/?directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+2
.5.8
Using MongoDB:      8.0.14
Using Mongosh:       2.5.8
mongosh 2.5.10 is available for download: https://www.mongodb.com/try/download/shell

For mongosh info see: https://www.mongodb.com/docs/mongosh-shell/

-----
The server generated these startup warnings when booting
  2025-12-02T10:02:50.476+01:00: Access control is not enabled for the database. Read and write access to data and conf
  igation is unrestricted
  2025-12-02T10:02:50.477+01:00: This server is bound to localhost. Remote systems will be unable to connect to this se
  rver. Start the server with --bind_ip <address> to specify which IP addresses it should serve responses from, or with --
  bind_ip_all to bind to all interfaces. If this behavior is desired, start the server with --bind_ip 127.0.0.1 to disable
  this warning
-----

```

## ÉTAPE 5 : ROUTEUR MONGOS (Port 27022) :

```

Microsoft Windows [version 10.0.26100.7171]
(c) Microsoft Corporation. Tous droits réservés.

C:\Users\asus>mongos --port 27022 --configdb configRS/localhost:27021 --bind_ip localhost
{"t":{"date":"2025-12-02T10:05:31.246Z"},"s":"W", "c":"SHARDING", "id":24132, "ctx":"thread1","msg":"Running a shard
ed cluster with fewer than 3 config servers should only be done for testing purposes and is not recommended for producti
on."}
{"t":{"date":"2025-12-02T10:05:31.260+01:00"},"s":"I", "c":"CONTROL", "id":23285, "ctx":"thread1","msg":"Automatica
lly disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"date":"2025-12-02T10:05:31.412+01:00"},"s":"I", "c":"NETWORK", "id":4648601, "svc":"-", "ctx":"thread1","msg":
"Implicit TCP FastOpen unavailable. If TCP FastOpen is required, set at least one of the related parameters","attr":{"re
latedParameters":{"tcpFastOpenServer","tcpFastOpenClient","tcpFastOpenQueueSize"}}}
{"t":{"date":"2025-12-02T10:05:31.413+01:00"},"s":"I", "c":"HEALTH", "id":5936503, "svc":"-", "ctx":"thread1","msg":
"Fault manager changed state ","attr":{"state":"StartupCheck"}}
{"t":{"date":"2025-12-02T10:05:31.413+01:00"},"s":"I", "c":"NETWORK", "id":4915701, "svc":"-", "ctx":"thread1","msg":
"Initialized wire specification","attr":{"spec":{"incomingExternalClient":{"minWireVersion":0,"maxWireVersion":25},"inco
mingInternalClient":{"minWireVersion":0,"maxWireVersion":25},"outgoing":{"minWireVersion":25,"maxWireVersion":25},"isInt
ernalClient":true}}}
{"t":{"date":"2025-12-02T10:05:31.417+01:00"},"s":"W", "c":"CONTROL", "id":22120, "svc":"-", "ctx":"thread1","msg":
"Access control is not enabled for the database. Read and write access to data and configuration is unrestricted","tags
":["startupWarnings"]}
{"t":{"date":"2025-12-02T10:05:31.417+01:00"},"s":"I", "c":"CONTROL", "id":23403, "svc":"R", "ctx":"mongosMain","ms
g":"Build Info","attr":{"buildInfo":{"version":"8.0.14","gitVersion":"bbdb887c2ac94424af0ee8fcaad39203bdf98671","modules
":["allocator","tcmalloc-gperf","environment":{"distmod":"windows"}}}}}
{"t":{"date":"2025-12-02T10:05:31.418+01:00"},"s":"I", "c":"CONTROL", "id":51765, "svc":"R", "ctx":"mongosMain","ms
g":"Operating System","attr":{"os":{"name":"Microsoft Windows 8","version":"6.2 (build 9200)}}}
{"t":{"date":"2025-12-02T10:05:31.418+01:00"},"s":"I", "c":"CONTROL", "id":21951, "svc":"R", "ctx":"mongosMain","ms
g":"Options set by command line","attr":{"options":{"net":{"bindIp":"localhost","port":27022},"sharding":{"configDB":"co
nfigRS/localhost:27021"}}}}}
{"t":{"date":"2025-12-02T10:05:31.424+01:00"},"s":"I", "c":"NETWORK", "id":4603701, "svc":"R", "ctx":"mongosMain","ms

```

## ÉTAPE 6 : CONFIGURATION DU SHARDING :

```
C:\Users\asus>mongosh --port 27022
Current Mongosh Log ID: 692eac1a5a42e570aecebea3
Connecting to:      mongodb://127.0.0.1:27022/?directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+2.5.8
Using MongoDB:      8.0.14
Using Mongosh:       2.5.8
mongosh 2.5.10 is available for download: https://www.mongodb.com/try/download/shell

For mongosh info see: https://www.mongodb.com/docs/mongodb-shell/

-----
The server generated these startup warnings when booting
  2025-12-02T10:05:31.417+01:00: Access control is not enabled for the database. Read and write access to data and configuration is unrestricted
-----
```

### L'ajout du Shard 1 :

```
-----
[direct: mongos] test> sh.addShard("rs1/localhost:27019")
{
  shardAdded: 'rs1',
  ok: 1,
  '$clusterTime': {
    clusterTime: Timestamp({ t: 1764666440, i: 21 }),
    signature: {
      hash: Binary.createFromBase64('AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA=', 0),
      keyId: Long('0')
    }
  },
  operationTime: Timestamp({ t: 1764666440, i: 21 })
}
[direct: mongos] test>
```

### L'ajout du Shard 2 :

```
[direct: mongos] test> sh.addShard("rs2/localhost:27020")
{
  shardAdded: 'rs2',
  ok: 1,
  '$clusterTime': {
    clusterTime: Timestamp({ t: 1764666522, i: 25 }),
    signature: {
      hash: Binary.createFromBase64('AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA=', 0),
      keyId: Long('0')
    }
  },
  operationTime: Timestamp({ t: 1764666522, i: 19 })
}
[direct: mongos] test>
```

### Activation du sharding sur la base dbtp :

```

[direct: mongos] test> sh.enableSharding("dbtp")
{
  ok: 1,
  '$clusterTime': {
    clusterTime: Timestamp({ t: 1764666560, i: 1 }),
    signature: {
      hash: Binary.createFromBase64('AAAAAAAAAAAAAAAAAAAAAAAAA=', 0),
      keyId: Long('0')
    }
  },
  operationTime: Timestamp({ t: 1764666560, i: 1 })
}
[direct: mongos] test>

```

Partitionner la collection restaurants avec \_id comme clé :

```

[direct: mongos] test> sh.shardCollection("dbtp.restaurants", {"_id": 1})
{
  collectionsSharded: 'dbtp.restaurants',
  ok: 1,
  '$clusterTime': {
    clusterTime: Timestamp({ t: 1764666627, i: 15 }),
    signature: {
      hash: Binary.createFromBase64('AAAAAAAAAAAAAAAAAAAAAAAAA=', 0),
      keyId: Long('0')
    }
  },
  operationTime: Timestamp({ t: 1764666627, i: 15 })
}
[direct: mongos] test>

```

## ÉTAPE 7 : AFFICHER LES INFORMATIONS DU SHARDING :

```

[direct: mongos] test> sh.status()
shardingVersion
{ _id: 1, clusterId: ObjectId('692ea7a60ec8245c305d5976') }
---
shards
[
  {
    _id: 'rs1',
    host: 'rs1/localhost:27019',
    state: 1,
    topologyTime: Timestamp({ t: 1764666440, i: 11 }),
    replSetConfigVersion: Long('-1')
  },
  {
    _id: 'rs2',
    host: 'rs2/localhost:27020',
    state: 1,
    topologyTime: Timestamp({ t: 1764666522, i: 10 }),
    replSetConfigVersion: Long('-1')
  }
]
---
active mongoses
[ { '8.0.14': 1 } ]
---
autosplit
{ 'Currently enabled': 'yes' }
---
balancer
{

```

```

---
balancer
{
  'Currently enabled': 'yes',
  'Failed balancer rounds in last 5 attempts': 0,
  'Currently running': 'no',
  'Migration Results for the last 24 hours': 'No recent migrations'
}
---
shardedDataDistribution
[
  {
    ns: 'dbtp.restaurants',
    shards: [
      {
        shardName: 'rs1',
        numOrphanedDocs: 0,
        numOwnedDocuments: 50714,
        ownedSizeBytes: 22973442,
        orphanedSizeBytes: 0
      }
    ]
  },
  {
    ns: 'config.system.sessions',
    shards: [
      {
        shardName: 'rs1',
        numOrphanedDocs: 0,
        numOwnedDocuments: 7,

```

```

        ns: 'config.system.sessions',
        shards: [
          {
            shardName: 'rs1',
            numOrphanedDocs: 0,
            numOwnedDocuments: 7,
            ownedSizeBytes: 693,
            orphanedSizeBytes: 0
          }
        ]
      }
    ]
  }
]
---
databases
[
  {
    database: { _id: 'config', primary: 'config', partitioned: true },
    collections: {
      'config.system.sessions': {
        shardKey: { _id: 1 },
        unique: false,
        balancing: true,
        chunkMetadata: [ { shard: 'rs1', nChunks: 1 } ],
        chunks: [
          { min: { _id: MinKey() }, max: { _id: MaxKey() }, 'on shard': 'rs1', 'last modified': Timestamp({ t: 1, i: 0 })
        ]
      }
    ],
    tags: []
  }
]

```

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Accédez aux paramètres pou

```

    tags: []
  }
}
},
{
  database: {
    _id: 'dbtp',
    primary: 'rs1',
    version: {
      uuid: UUID('1aa7b4ff-bd6f-4d83-af69-6caedaa5b08f'),
      timestamp: Timestamp({ t: 1764666440, i: 11 }),
      lastMod: 1
    }
  },
  collections: {
    'dbtp.restaurants': {
      shardKey: { _id: 1 },
      unique: false,
      balancing: true,
      chunkMetadata: [ { shard: 'rs1', nChunks: 1 } ],
      chunks: [
        { min: { _id: MinKey() }, max: { _id: MaxKey() }, 'on shard': 'rs1', 'last modified': Timestamp({ t: 1, i: 0 })
      ]
    },
    tags: []
  }
}
]
}
}
[direct: mongos] test>

```

Activer Windows  
Accédez aux paramètres pour

## ÉTAPE 8 : COMPTER LES RESTAURANTS :

Utilisation de la base dbtp :

```

]
[direct: mongos] test> use dbtp
switched to db dbtp
[direct: mongos] dbtp> |

```

Compter tous les restaurants :

```

[direct: mongos] dbtp> db.restaurants.count()
DeprecationWarning: Collection.count() is deprecated. Use countDocuments or estimatedDocumentCount.
50714
[direct: mongos] dbtp>

```

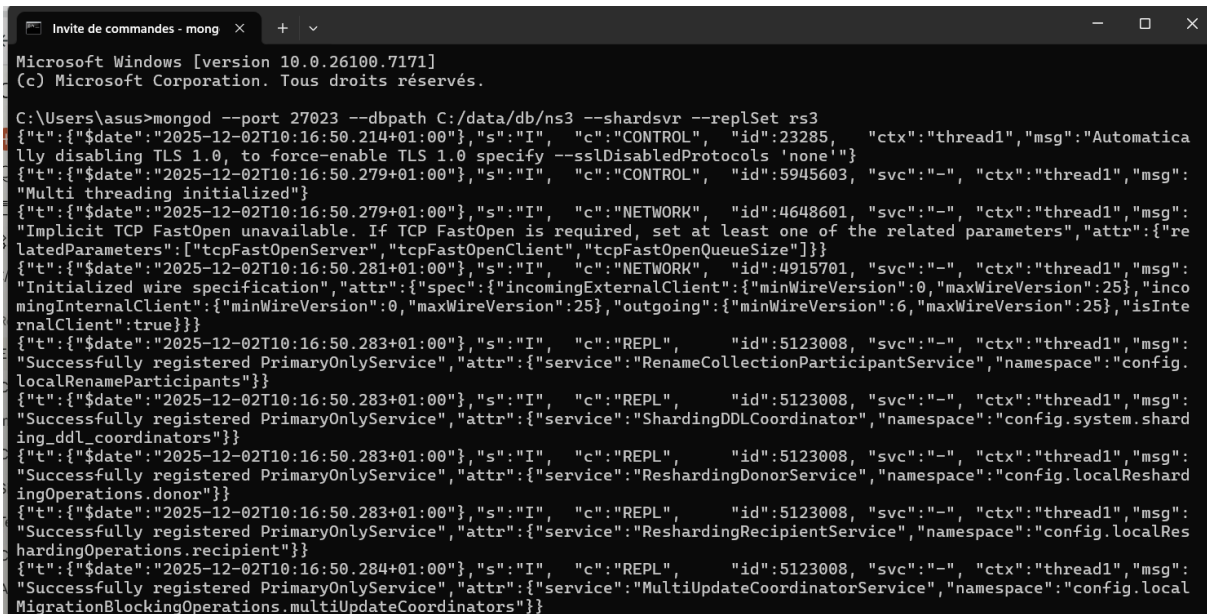
La distribution dans les shards :



```
[direct: mongos] dbtp> db.restaurants.getShardDistribution()
Shard rs1 at rs1/localhost:27019
{
  data: '21.91MiB',
  docs: 50714,
  chunks: 1,
  'estimated data per chunk': '21.91MiB',
  'estimated docs per chunk': 50714
}
---
Totals
{
  data: '21.91MiB',
  docs: 50714,
  chunks: 1,
  'Shard rs1': [
    '100 % data',
    '100 % docs in cluster',
    '453B avg obj size on shard'
  ]
}
[direct: mongos] dbtp> |
```

## ÉTAPE 9 : AJOUTER UN TROISIÈME SHARD (Port 27023) :

### 9.1 - Démarrage du serveur Shard 3 :



```
Microsoft Windows [version 10.0.26100.7171]
(c) Microsoft Corporation. Tous droits réservés.

C:\Users\asus>mongod --port 27023 --dbpath C:/data/db/ns3 --shardsvr --replSet rs3
{"t":{"$date":"2025-12-02T10:16:50.214+01:00"},"s":"I", "c":"CONTROL", "id":23285, "ctx":"thread1","msg":"Automatica
lly disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"$date":"2025-12-02T10:16:50.279+01:00"},"s":"I", "c":"CONTROL", "id":5945603, "svc":"-", "ctx":"thread1","msg":
"Multi threading initialized"}
{"t":{"$date":"2025-12-02T10:16:50.279+01:00"},"s":"I", "c":"NETWORK", "id":4648601, "svc":"-", "ctx":"thread1","msg":
"Implicit TCP FastOpen unavailable. If TCP FastOpen is required, set at least one of the related parameters","attr":{"re
latedParameters":{"tcpFastOpenServer","tcpFastOpenClient","tcpFastOpenQueueSize"}}}
{"t":{"$date":"2025-12-02T10:16:50.281+01:00"},"s":"I", "c":"NETWORK", "id":4915701, "svc":"-", "ctx":"thread1","msg":
"Initialized wire specification","attr":{"spec":{"incomingExternalClient":{"minWireVersion":0,"maxWireVersion":25},"inco
mingInternalClient":{"minWireVersion":0,"maxWireVersion":25},"outgoing":{"minWireVersion":6,"maxWireVersion":25},"isInte
rnalClient":true}}}
{"t":{"$date":"2025-12-02T10:16:50.283+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1","msg":
"Successfully registered PrimaryOnlyService","attr":{"service":"RenameCollectionParticipantService","namespace":"config.
localRenameParticipants"}}
{"t":{"$date":"2025-12-02T10:16:50.283+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1","msg":
"Successfully registered PrimaryOnlyService","attr":{"service":"ShardingDDLCoordinator","namespace":"config.system.shard
ing_ddl_coordinators"}}
{"t":{"$date":"2025-12-02T10:16:50.283+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1","msg":
"Successfully registered PrimaryOnlyService","attr":{"service":"ReshardingDonorService","namespace":"config.localReshard
ingOperations.donor"}}
{"t":{"$date":"2025-12-02T10:16:50.283+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1","msg":
"Successfully registered PrimaryOnlyService","attr":{"service":"ReshardingRecipientService","namespace":"config.localRes
hardingOperations.recipient"}}
{"t":{"$date":"2025-12-02T10:16:50.284+01:00"},"s":"I", "c":"REPL", "id":5123008, "svc":"-", "ctx":"thread1","msg":
"Successfully registered PrimaryOnlyService","attr":{"service":"MultiUpdateCoordinatorService","namespace":"config.local
MigrationBlockingOperations.multiUpdateCoordinators"}}

```

### 9.2 - Initialisation du Replica Set de Shard 3 :



```

C:\Users\asus>mongosh --port 27023
Current Mongosh Log ID: 692eae7c849d7ef7fcebea3
Connecting to:      mongodb://127.0.0.1:27023/?directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+2
.5.8
Using MongoDB:      8.0.14
Using Mongosh:      2.5.8
mongosh 2.5.10 is available for download: https://www.mongodb.com/try/download/shell

For mongosh info see: https://www.mongodb.com/docs/mongosh-shell/

-----
The server generated these startup warnings when booting
2025-12-02T10:16:50.348+01:00: Access control is not enabled for the database. Read and write access to data and conf
iguration is unrestricted
2025-12-02T10:16:50.349+01:00: This server is bound to localhost. Remote systems will be unable to connect to this se
rver. Start the server with --bind_ip <address> to specify which IP addresses it should serve responses from, or with --
bind_ip_all to bind to all interfaces. If this behavior is desired, start the server with --bind_ip 127.0.0.1 to disable
this warning
-----
test> |

```

```

test> rs.initiate({
...   _id: "rs3",
...   members: [{ _id: 0, host: "localhost:27023" }]
... })
{
  ok: 1,
  '$clusterTime': {
    clusterTime: Timestamp({ t: 1764667112, i: 1 }),
    signature: {
      hash: Binary.createFromBase64('AAAAAAAAAAAAAAAAAAAAAAAAAAAA=', 0),
      keyId: Long('0')
    }
  },
  operationTime: Timestamp({ t: 1764667112, i: 1 })
}
rs3 [direct: secondary] test> |

```

### 9.3 - Ajouter le Shard 3 au cluster :

- L'ajout du troisième shard :

```

[direct: mongos] dbtp> sh.addShard("rs3/localhost:27023")
{
  shardAdded: 'rs3',
  ok: 1,
  '$clusterTime': {
    clusterTime: Timestamp({ t: 1764667226, i: 18 }),
    signature: {
      hash: Binary.createFromBase64('AAAAAAAAAAAAAAAAAAAAAAAAAAAA=', 0),
      keyId: Long('0')
    }
  },
  operationTime: Timestamp({ t: 1764667226, i: 18 })
}
[direct: mongos] dbtp> |

```

- Vérification :

```
[direct: mongos] dbtp> sh.status()
shardingVersion
{ _id: 1, clusterId: ObjectId('692ea7a60ec8245c305d5976') }
---
shards
[
  {
    _id: 'rs1',
    host: 'rs1/localhost:27019',
    state: 1,
    topologyTime: Timestamp({ t: 1764666440, i: 11 }),
    replSetConfigVersion: Long('-1')
  },
  {
    _id: 'rs2',
    host: 'rs2/localhost:27020',
    state: 1,
    topologyTime: Timestamp({ t: 1764666522, i: 10 }),
    replSetConfigVersion: Long('-1')
  },
  {
    _id: 'rs3',
    host: 'rs3/localhost:27023',
    state: 1,
    topologyTime: Timestamp({ t: 1764667226, i: 9 }),
    replSetConfigVersion: Long('-1')
  }
]

```

Activer  
Accédez au

```
---
active mongoses
[ { '8.0.14': 1 } ]
---
autosplit
{ 'Currently enabled': 'yes' }
---
balancer
{
  'Currently enabled': 'yes',
  'Currently running': 'no',
  'Failed balancer rounds in last 5 attempts': 0,
  'Migration Results for the last 24 hours': 'No recent migrations'
}
---
shardedDataDistribution
[
  {
    ns: 'dbtp.restaurants',
    shards: [
      {
        shardName: 'rs1',
        numOrphanedDocs: 0,
        numOwnedDocuments: 50714,
        ownedSizeBytes: 22973442,
        orphanedSizeBytes: 0
      }
    ]
  }
]

```

```

    ]
  },
  {
    ns: 'config.system.sessions',
    shards: [
      {
        shardName: 'rs1',
        numOrphanedDocs: 0,
        numOwnedDocuments: 9,
        ownedSizeBytes: 891,
        orphanedSizeBytes: 0
      }
    ]
  }
]
]
---
databases
[
  {
    database: { _id: 'config', primary: 'config', partitioned: true },
    collections: {
      'config.system.sessions': {
        shardKey: { _id: 1 },
        unique: false,
        balancing: true,
        chunkMetadata: [ { shard: 'rs1', nChunks: 1 } ],
        chunks: [
          { min: { _id: MinKey() }, max: { _id: MaxKey() }, 'on shard': 'rs1', 'last modified': Timestamp({ t: 1, i: 0 })
        ]
      }
    }
  }
]

```

Activer Windows  
Accédez aux paramètres pour

```

    tags: []
  }
}
},
{
  database: {
    _id: 'dbtp',
    primary: 'rs1',
    version: {
      uuid: UUID('1aa7b4ff-bd6f-4d83-af69-6caedaa5b08f'),
      timestamp: Timestamp({ t: 1764666440, i: 11 }),
      lastMod: 1
    }
  },
  collections: {
    'dbtp.restaurants': {
      shardKey: { _id: 1 },
      unique: false,
      balancing: true,
      chunkMetadata: [ { shard: 'rs1', nChunks: 1 } ],
      chunks: [
        { min: { _id: MinKey() }, max: { _id: MaxKey() }, 'on shard': 'rs1', 'last modified': Timestamp({ t: 1, i: 0 })
      ]
    }
  },
  tags: []
}
]
}
}
[direct: mongos] dbtp>

```

Activer Windows  
Accédez aux paramètres pour

```
[direct: mongos] dbtp> db.restaurants.getShardDistribution()
Shard rs1 at rs1/localhost:27019
{
  data: '21.91MiB',
  docs: 50714,
  chunks: 1,
  'estimated data per chunk': '21.91MiB',
  'estimated docs per chunk': 50714
}
---
Totals
{
  data: '21.91MiB',
  docs: 50714,
  chunks: 1,
  'Shard rs1': [
    '100 % data',
    '100 % docs in cluster',
    '453B avg obj size on shard'
  ]
}
[direct: mongos] dbtp> |
```

**Bon travail !**