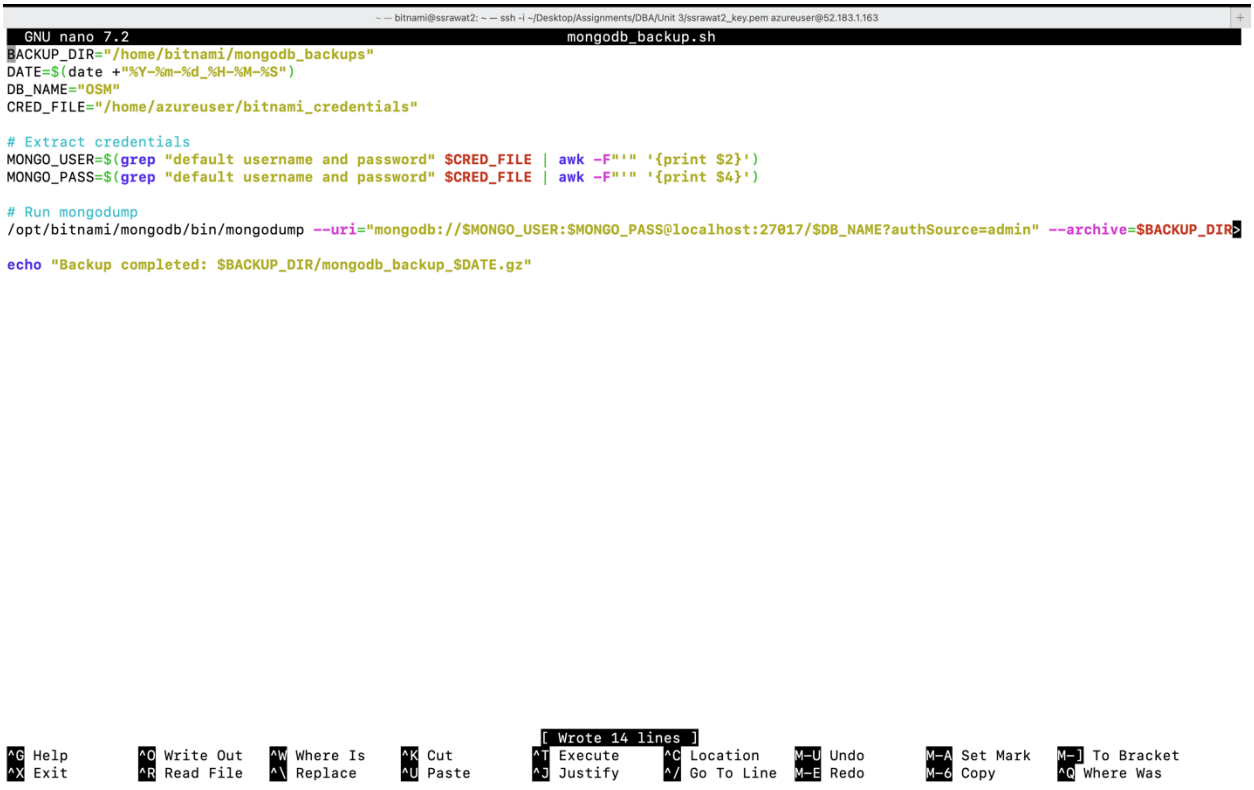
MongoDB Report

Step 1: Extract data from OSM

a. We tried pushing the pbf files directly to the VM and then use that file to be uploaded to MongoDB, but we found that the JSON retrieved had to be formatted in order

Backup

a. Shell Script for automated backup



b. Scheduling backup script using crontab

c. Backup log as output file of backups

```
2024-11-30T20:10:01.943+0000    writing OSM.Kansas to archive '/home/bitnami/mongodb_backups/mongodb_backup_2024-11-30_20-10-01.gz'
2024-11-30T20:10:01.946+0000    writing OSM.Maine to archive '/home/bitnami/mongodb_backups/mongodb_backup_2024-11-30_20-10-01.gz'
2024-11-30T20:10:01.951+0000    writing OSM.kentucky to archive '/home/bitnami/mongodb_backups/mongodb_backup_2024-11-30_20-10-01.gz'
2024-11-30T20:10:01.953+0000    writing OSM.Texas to archive '/home/bitnami/mongodb_backups/mongodb_backup_2024-11-30_20-10-01.gz'
2024-11-30T20:10:04.922+0000    [##......................]    OSM.Kansas  295169/2366351  (12.5%)
2024-11-30T20:10:04.922+0000    [##################......]     OSM.Texas   322278/418701  (77.0%)
2024-11-30T20:10:04.922+0000    [.......................]  OSM.kentucky   80288/3112803   (2.6%)
2024-11-30T20:10:04.922+0000    [##......................]     OSM.Maine  144197/1631849   (8.8%)
2024-11-30T20:10:04.922+0000
2024-11-30T20:10:07.921+0000    [####....................]    OSM.Kansas  419239/2366351  (17.7%)
2024-11-30T20:10:07.921+0000    [######################..]     OSM.Texas   397566/418701  (95.0%)
2024-11-30T20:10:07.921+0000    [##......................]  OSM.kentucky  303545/3112803   (9.8%)
2024-11-30T20:10:07.921+0000    [####....................]     OSM.Maine  274903/1631849  (16.8%)
2024-11-30T20:10:07.921+0000
2024-11-30T20:10:08.093+0000    [########################]  OSM.Texas  418701/418701  (100.0%)
2024-11-30T20:10:10.724+0000    done dumping OSM.Texas (418701 documents)
2024-11-30T20:10:10.921+0000    [####....................]    OSM.Kansas  468421/2366351  (19.8%)
2024-11-30T20:10:10.921+0000    [###.....................]  OSM.kentucky  492139/3112803  (15.8%)
2024-11-30T20:10:10.921+0000    [####....................]     OSM.Maine  274903/1631849  (16.8%)
2024-11-30T20:10:10.921+0000
2024-11-30T20:10:13.922+0000    [#####...................]    OSM.Kansas  493432/2366351  (20.9%)
2024-11-30T20:10:13.922+0000    [###.....................]  OSM.kentucky  508181/3112803  (16.3%)
2024-11-30T20:10:13.922+0000    [####....................]     OSM.Maine  339620/1631849  (20.8%)
2024-11-30T20:10:13.922+0000
2024-11-30T20:10:16.922+0000    [#####...................]    OSM.Kansas  518266/2366351  (21.9%)
2024-11-30T20:10:16.922+0000    [####....................]  OSM.kentucky  538447/3112803  (17.3%)
2024-11-30T20:10:16.922+0000    [#####...................]     OSM.Maine  405311/1631849  (24.8%)
2024-11-30T20:10:16.922+0000
2024-11-30T20:10:19.921+0000    [#####...................]    OSM.Kansas  568541/2366351  (24.0%)
2024-11-30T20:10:19.921+0000    [####....................]  OSM.kentucky  554343/3112803  (17.8%)
2024-11-30T20:10:19.921+0000    [#####...................]     OSM.Maine  405311/1631849  (24.8%)
2024-11-30T20:10:19.921+0000

^G Help        ^O Write Out   ^W Where Is    ^K Cut         ^T Execute     ^C Location    M-U Undo       M-A Set Mark   M-] To Bracket
^X Exit        ^R Read File   ^\ Replace     ^U Paste       ^J Justify     ^/ Go To Line  M-E Redo       M-6 Copy       ^Q Where Was
```

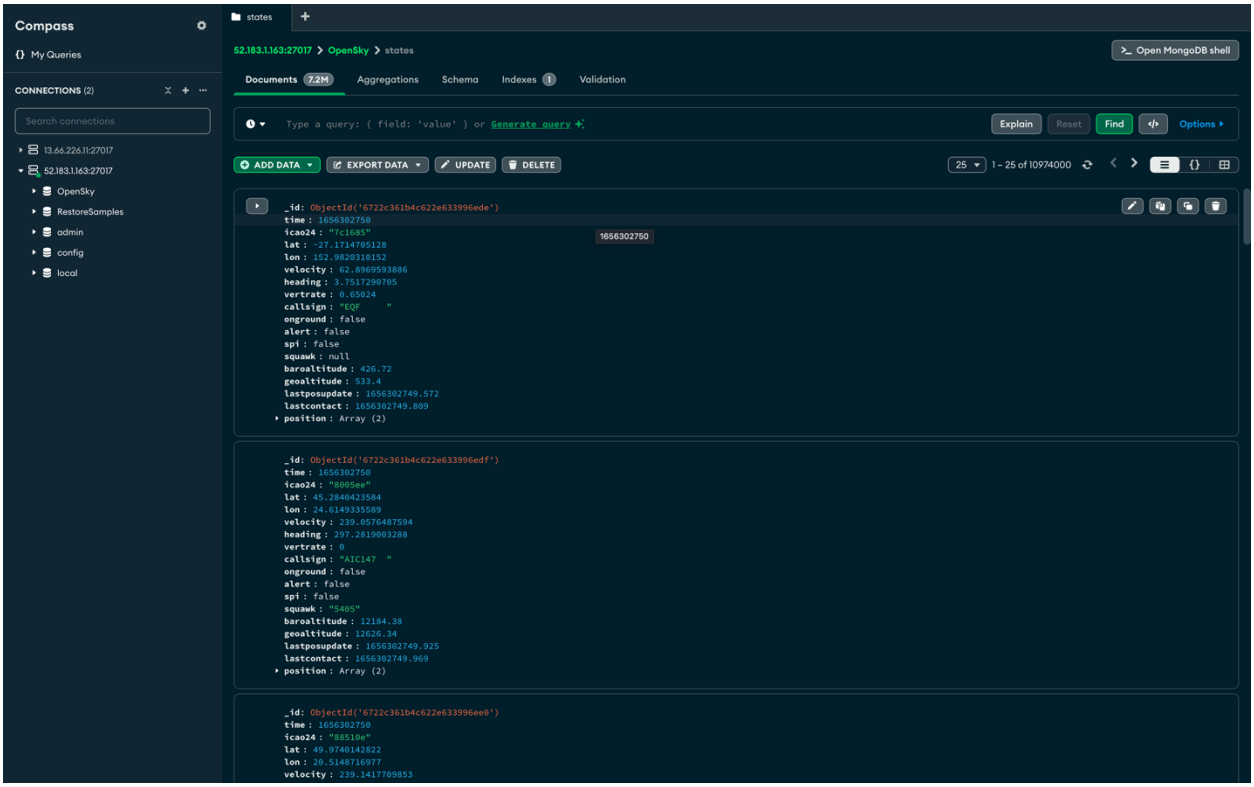
```
~ — bitnami@ssrawat2: ~ — ssh -i ~/Desktop/Assignments/DBA/Unit 3/ssrawat2_key.pem azureuser@52.183.1.163

  GNU nano 7.2                                                backup.log
2024-11-30T20:12:49.922+0000    [########################.]     OSM.Maine  1597167/1631849  (97.9%)
2024-11-30T20:12:49.922+0000
2024-11-30T20:12:52.922+0000    [####################...]    OSM.Kansas  2169046/2366351  (91.7%)
2024-11-30T20:12:52.922+0000    [###############.........]  OSM.kentucky  1993308/3112803  (64.0%)
2024-11-30T20:12:52.922+0000    [########################.]     OSM.Maine  1620255/1631849  (99.3%)
2024-11-30T20:12:52.922+0000
2024-11-30T20:12:53.848+0000    [########################]  OSM.Maine  1631849/1631849  (100.0%)
2024-11-30T20:12:55.921+0000    [######################..]    OSM.Kansas  2203099/2366351  (93.1%)
2024-11-30T20:12:55.921+0000    [###############.........]  OSM.kentucky  1993308/3112803  (64.0%)
2024-11-30T20:12:55.921+0000
2024-11-30T20:12:57.082+0000    done dumping OSM.Maine (1631849 documents)
2024-11-30T20:12:58.921+0000    [######################..]    OSM.Kansas  2258839/2366351  (95.5%)
2024-11-30T20:12:58.921+0000    [###############.........]  OSM.kentucky  2061565/3112803  (66.2%)
2024-11-30T20:12:58.921+0000
2024-11-30T20:13:01.922+0000    [########################.]    OSM.Kansas  2283208/2366351  (96.5%)
2024-11-30T20:13:01.922+0000    [################........]  OSM.kentucky  2123224/3112803  (68.2%)
2024-11-30T20:13:01.922+0000
2024-11-30T20:13:04.922+0000    [########################.]    OSM.Kansas  2354817/2366351  (99.5%)
2024-11-30T20:13:04.922+0000    [################........]  OSM.kentucky  2154696/3112803  (69.2%)
2024-11-30T20:13:04.922+0000
2024-11-30T20:13:06.417+0000    [########################]  OSM.Kansas  2366351/2366351  (100.0%)
2024-11-30T20:13:07.922+0000    [################.......]  OSM.kentucky  2222498/3112803  (71.4%)
2024-11-30T20:13:08.455+0000    done dumping OSM.Kansas (2366351 documents)
2024-11-30T20:13:10.921+0000    [################.......]  OSM.kentucky  2288517/3112803  (73.5%)
2024-11-30T20:13:13.922+0000    [#################......]  OSM.kentucky  2389588/3112803  (76.8%)
2024-11-30T20:13:16.921+0000    [#################......]  OSM.kentucky  2439220/3112803  (78.4%)
2024-11-30T20:13:19.921+0000    [##################.....]  OSM.kentucky  2499639/3112803  (80.3%)
2024-11-30T20:13:22.921+0000    [##################.....]  OSM.kentucky  2553793/3112803  (82.0%)
2024-11-30T20:13:25.921+0000    [###################....]  OSM.kentucky  2637097/3112803  (84.7%)
2024-11-30T20:13:28.921+0000    [###################....]  OSM.kentucky  2706018/3112803  (86.9%)
2024-11-30T20:13:31.922+0000    [####################...]  OSM.kentucky  2799091/3112803  (89.9%)
2024-11-30T20:13:34.922+0000    [####################..]  OSM.kentucky  2891897/3112803  (92.9%)
2024-11-30T20:13:37.921+0000    [####################..]  OSM.kentucky  2955825/3112803  (95.0%)
2024-11-30T20:13:40.921+0000    [#####################.]  OSM.kentucky  3045494/3112803  (97.8%)
2024-11-30T20:13:43.922+0000    [#####################.]  OSM.kentucky  3097766/3112803  (99.5%)
2024-11-30T20:13:44.138+0000    [########################]  OSM.kentucky  3112803/3112803  (100.0%)
2024-11-30T20:13:44.514+0000    done dumping OSM.kentucky (3112803 documents)
Backup completed: /home/bitnami/mongodb_backups/mongodb_backup_2024-11-30_20-10-01.gz

^G Help        ^O Write Out   ^W Where Is    ^K Cut         ^T Execute     ^C Location    M-U Undo       M-A Set Mark   M-] To Bracket
^X Exit        ^R Read File   ^\ Replace     ^U Paste       ^J Justify     ^/ Go To Line  M-E Redo       M-6 Copy       ^Q Where Was
```

Restore

a. Restore shell script

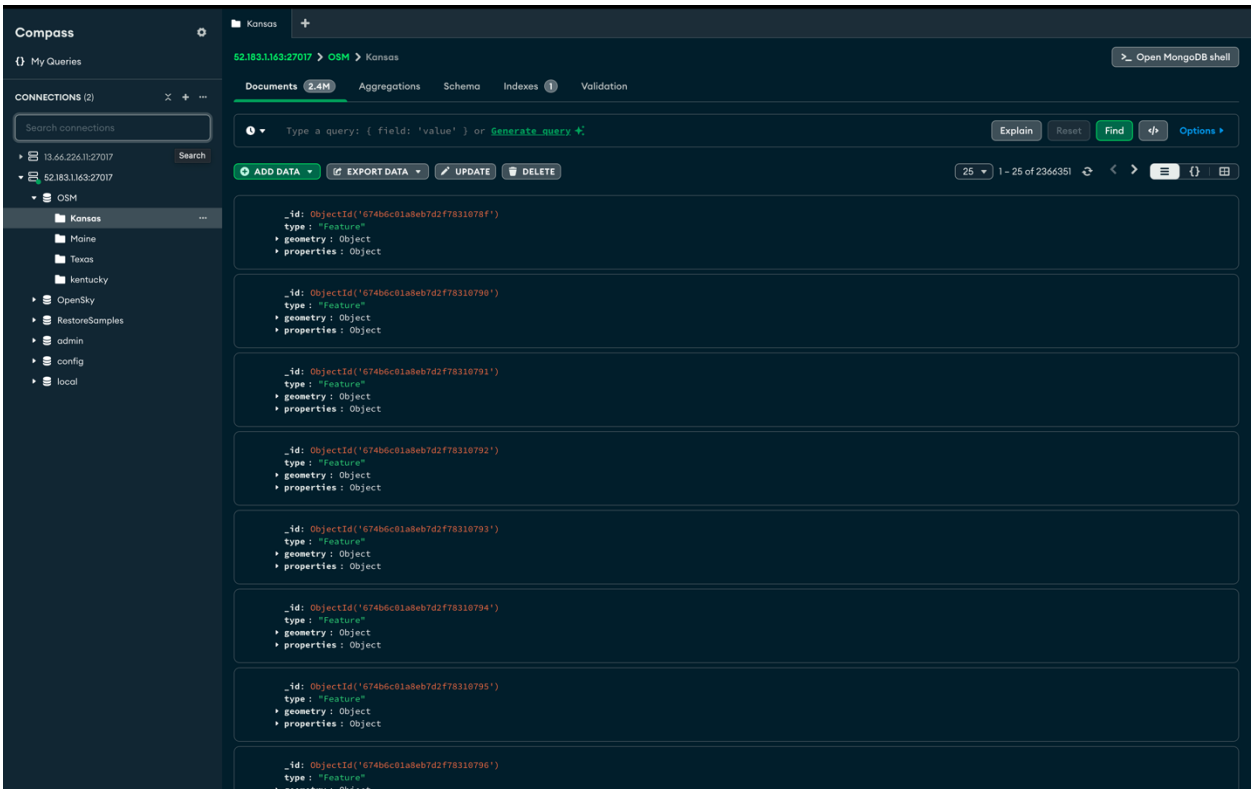
```
~ — bitnami@ssrawat2: ~ — ssh -i ~/Desktop/Assignments/DBA/Unit 3/ssrawat2_key.pem azureuser@52.183.1.163
 GNU nano 7.2                                  mongo_restore.sh
#!/bin/bash
# Variables (embedded in the script)
BACKUP_DIR="/home/bitnami/mongodb_backups"
DB_NAME="OSM"
CRED_FILE="/home/azureuser/bitnami_credentials"

# Extract credentials
MONGO_USER=$(grep "default username and password" $CRED_FILE | awk -F"'" '{print $2}')
MONGO_PASS=$(grep "default username and password" $CRED_FILE | awk -F"'" '{print $4}')

# Identify the latest backup file
LATEST_BACKUP=$(ls -t $BACKUP_DIR/mongodb_backup_*.gz | head -n 1)

# Run mongorestore
/opt/bitnami/mongodb/bin/mongorestore \
    --uri="mongodb://$MONGO_USER:$MONGO_PASS@localhost:27017/$DB_NAME?authSource=admin" \
    --archive=$LATEST_BACKUP \
    --gzip

echo "Restore completed from: $LATEST_BACKUP"

                              [ Read 20 lines ]
^G Help      ^O Write Out   ^W Where Is    ^K Cut         ^T Execute     ^C Location   M-U Undo      M-A Set Mark    M-] To Bracket
^X Exit      ^R Read File   ^\ Replace     ^U Paste       ^J Justify     ^/ Go To Line M-E Redo      M-6 Copy        ^Q Where Was
```

b. Deleted OSM Database from compass (Replicating any data loss)



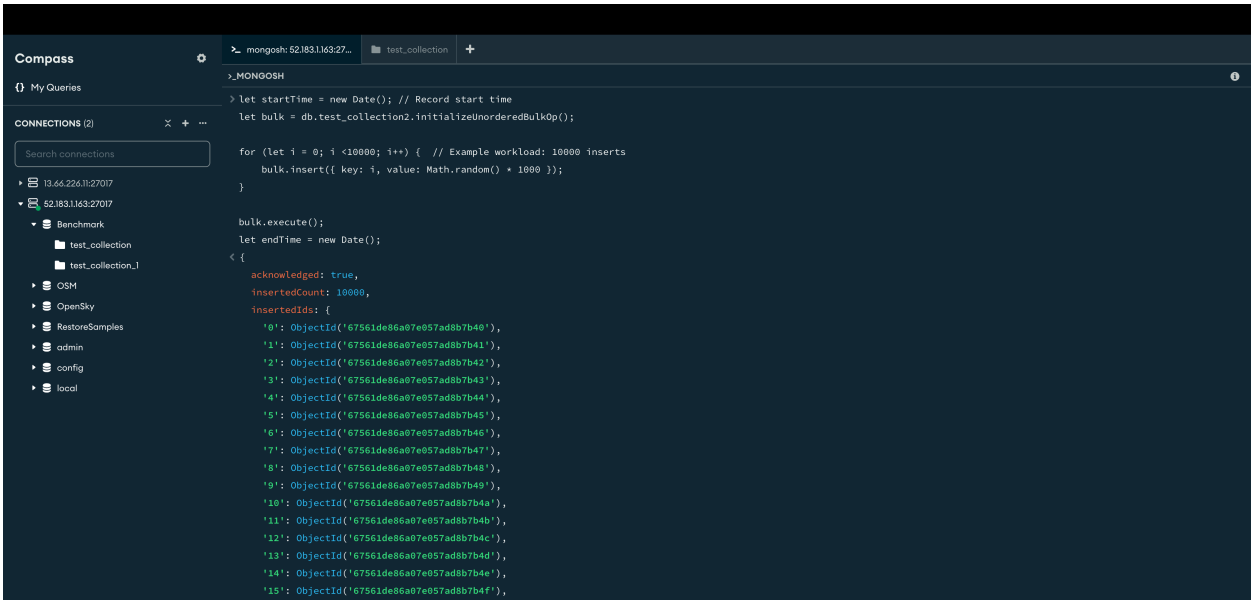
c. Restore script execution and output

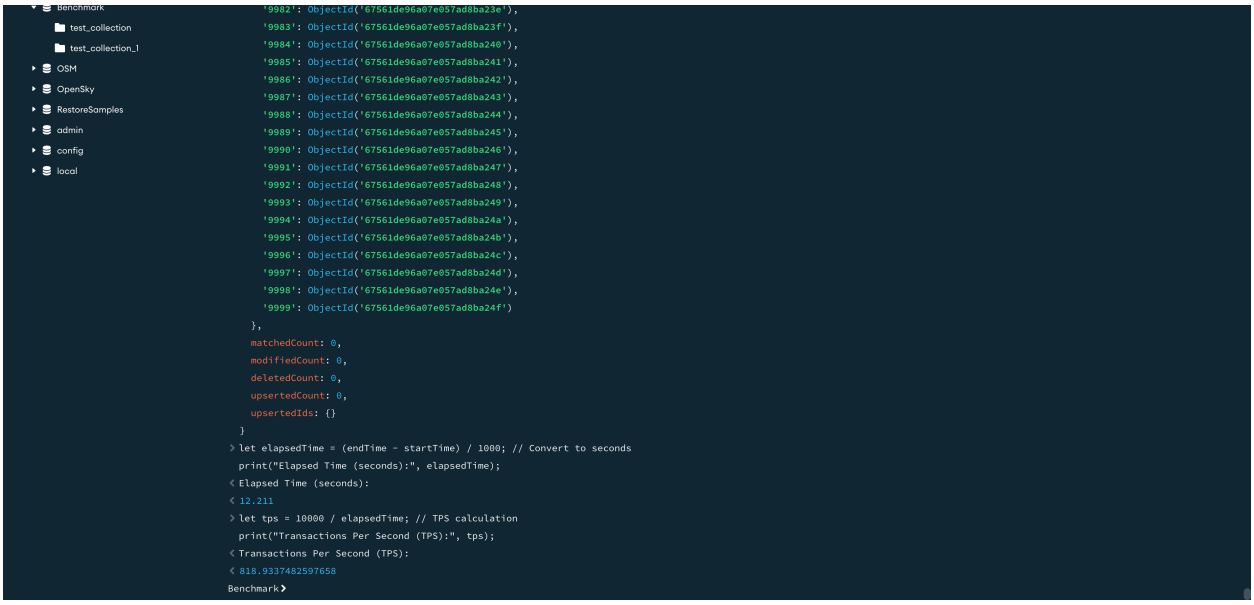
```
bitnami@ssrawat2:~$ ./mongo_restore.sh
2024-11-30T20:54:06.423+0000    The --db and --collection flags are deprecated for this use-case; please use --nsInclude instead, i.e. with --nsInclude=${DATABASE}.${COLLECTION}
2024-11-30T20:54:06.455+0000    preparing collections to restore from
2024-11-30T20:54:06.473+0000    reading metadata for OSM.Texas from archive '/home/bitnami/mongodb_backups/mongodb_backup_2024-11-30_20-10-01.gz'
2024-11-30T20:54:06.473+0000    reading metadata for OSM.kentucky from archive '/home/bitnami/mongodb_backups/mongodb_backup_2024-11-30_20-10-01.gz'
2024-11-30T20:54:06.473+0000    reading metadata for OSM.Maine from archive '/home/bitnami/mongodb_backups/mongodb_backup_2024-11-30_20-10-01.gz'
2024-11-30T20:54:06.473+0000    reading metadata for OSM.Kansas from archive '/home/bitnami/mongodb_backups/mongodb_backup_2024-11-30_20-10-01.gz'
2024-11-30T20:54:06.518+0000    restoring OSM.Kansas from archive '/home/bitnami/mongodb_backups/mongodb_backup_2024-11-30_20-10-01.gz'
2024-11-30T20:54:07.587+0000    restoring OSM.Texas from archive '/home/bitnami/mongodb_backups/mongodb_backup_2024-11-30_20-10-01.gz'
2024-11-30T20:54:09.423+0000    OSM.Kansas  30.2MB
2024-11-30T20:54:09.423+0000     OSM.Texas  16.0MB
2024-11-30T20:54:09.423+0000
2024-11-30T20:54:10.523+0000    restoring OSM.Maine from archive '/home/bitnami/mongodb_backups/mongodb_backup_2024-11-30_20-10-01.gz'
2024-11-30T20:54:12.321+0000    restoring OSM.kentucky from archive '/home/bitnami/mongodb_backups/mongodb_backup_2024-11-30_20-10-01.gz'
2024-11-30T20:54:12.423+0000      OSM.Kansas  32.0MB
2024-11-30T20:54:12.423+0000       OSM.Texas  48.0MB
2024-11-30T20:54:12.423+0000       OSM.Maine  16.0MB
2024-11-30T20:54:12.423+0000    OSM.kentucky  1.97MB
2024-11-30T20:54:12.423+0000
2024-11-30T20:54:15.423+0000      OSM.Kansas  43.2MB
2024-11-30T20:54:15.423+0000       OSM.Texas  48.0MB
2024-11-30T20:54:15.424+0000       OSM.Maine  32.0MB
2024-11-30T20:54:15.424+0000    OSM.kentucky  32.0MB
2024-11-30T20:54:15.424+0000
2024-11-30T20:54:18.423+0000      OSM.Kansas  64.0MB
2024-11-30T20:54:18.423+0000       OSM.Texas  60.6MB
2024-11-30T20:54:18.423+0000       OSM.Maine  48.0MB
2024-11-30T20:54:18.423+0000    OSM.kentucky  48.0MB
2024-11-30T20:54:18.423+0000
2024-11-30T20:54:21.425+0000      OSM.Kansas  70.6MB
2024-11-30T20:54:21.425+0000       OSM.Texas  80.0MB
2024-11-30T20:54:21.425+0000       OSM.Maine  48.0MB
2024-11-30T20:54:21.425+0000    OSM.kentucky  80.0MB
2024-11-30T20:54:21.426+0000
2024-11-30T20:54:24.423+0000      OSM.Kansas  96.0MB

2024-11-30T20:56:39.211+0000    OSM.kentucky  1.57GB
2024-11-30T20:56:39.211+0000    finished restoring OSM.kentucky (3112803 documents, 0 failures)
2024-11-30T20:56:39.212+0000    no indexes to restore for collection OSM.Maine
2024-11-30T20:56:39.212+0000    no indexes to restore for collection OSM.Kansas
2024-11-30T20:56:39.212+0000    restoring indexes for collection OSM.Texas from metadata
2024-11-30T20:56:39.222+0000    index: &idx.IndexDocument{Options:primitive.M{"2dsphereIndexVersion":3, "name":"position_2dsphere", "v":2}, Key:primitive.D{primitive.E{Key:"position", Value:"2dsphere"}}, PartialFilterExpression:primitive.D(nil)}
2024-11-30T20:56:39.222+0000    no indexes to restore for collection OSM.kentucky
2024-11-30T20:56:41.474+0000    7529704 document(s) restored successfully. 0 document(s) failed to restore.
Restore completed from: /home/bitnami/mongodb_backups/mongodb_backup_2024-11-30_20-10-01.gz
```



Benchmarking

For Scaling Factor -10000





TPS came out to be **818.93**

Monitoring Screenshots