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Running the kubectl apply -f on config, deployment, secret files to setup the mongo express and mongo db.

```
muhammadsafi@all-MS-7035:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl apply -f mongo-secret.yaml
secret/mongodb-secret created
muhammadsafi@all-MS-7035:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl apply -f mongodb-deployment.yaml
deployment.apps/mongo-deployment created
muhammadsafi@all-MS-7035:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl apply -f mongodb-service.yaml
service/mongo-service unchanged
muhammadsafi@all-MS-7035:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl apply -f mongodb-service.yaml
service/mongo-service unchanged
muhammadsafi@all-MS-7035:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl apply -f mongo-configmap.yaml
configmap/mongodb-configmap created
muhammadsafi@all-MS-7035:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl apply -f mongo-express-deployment.yaml
deployment.apps/mongo-express created
muhammadsafi@all-MS-7035:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl apply -f mongo-express-service.yaml
service/mongo-express-service unchanged
muhammadsafi@all-MS-7035:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl get deployments
NAME READY UP-TO-DATE AVAILABLE AGE
mongo-deployment 1/1 1 1 26s2s
mongo-express 1/1 1 1 32s
nginx 1/1 1 1 2d20h
```

Checking the deployments.

```
muhammadsafi@all-MS-7035:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl get deployments
NAME READY UP-TO-DATE AVAILABLE AGE
mongo-deployment 1/1 1 1 66m
mongo-express 1/1 1 1 64s
nginx 1/1 1 1 2d21h
muhammadsafi@all-MS-7035:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$
```

Checking the specifications of the deployment mongo-deployment.

```
muhammadsafi@all-MS-7035:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl describe deployment mongo-deployment
Name: mongo-deployment
Namespace: default
CreationTimestamp: Fri, 12 May 2023 09:52:40 +0500
Labels: app=mongodb
Annotations: deployment.kubernetes.io/revision: 1
Selector: app=mongodb
Replicas: 1 desired | 1 updated | 1 total | 1 available | 0 unavailable
StrategyType: RollingUpdate
RollingUpdateStrategy: 25% max unavailable, 25% max surge
MinReadySeconds: 0
Pod Template:
  Labels: app=mongodb
  Containers:
    mongodb:
      Image: mongo
      Port: 27017/TCP
      Host Port: 0/TCP
      Environment:
        MONGO_INITDB_DATABASE: admin
        MONGO_INITDB_ROOT_USERNAME: <set to the key 'mongo-root-username' in secret 'mongodb-secret'> Optional: false
        MONGO_INITDB_ROOT_PASSWORD: <set to the key 'mongo-root-password' in secret 'mongodb-secret'> Optional: false
        Mounts:
          <none>
  Volumes:
    <none>
Conditions:
  Type Status Reason
  ----
  Available True MinimumReplicasAvailable
  Progressing True NewReplicaSetAvailable
  OldReplicaSets: <none>
  NewReplicaSet: mongo-deployment-85bbdc6549 (1/1 replicas created)
  Events:
    <none>
```

Checking the specifications of the deployed pod.

```
➤ muhammadsafi@all-MS-7035:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl describe pod mongo-deployment-85bdc6549-rnddf
Name:         mongo-deployment-85bdc6549-rnddf
Namespace:    default
Priority:      0
Service Account: default
Node:         minikube/192.168.49.2
Start Time:   Fri, 12 May 2023 09:52:40 +0500
Labels:       app=mongodb
              pod-template-hash=85bdc6549
Annotations:  <none>
Status:       Running
IP:           10.244.0.23
IPs:          10.244.0.23
Controlled By: ReplicaSet/mongo-deployment-85bdc6549
Containers:
  mongodb:
    Container ID:  docker://8329b3db9e5e1afe532ba318dd2efcaa973c47c674fd4cd32d5cd1f44f81d9b7
    Image:          mongo
    Image ID:       docker-pullable://mongo@sha256:928347070dc883a596f869a22a4204c0feacc3eb03478a6a2de681411fb7399
    Port:           27017/TCP
    Host Port:      0/TCP
    State:          Running
      Started:      Fri, 12 May 2023 09:52:43 +0500
    Ready:          True
    Restart Count:  0
    Environment:
      MONGO_INITDB_DATABASE:      admin
      MONGO_INITDB_ROOT_USERNAME: <set to the key 'mongo-root-username' in secret 'mongodb-secret'> Optional: false
      MONGO_INITDB_ROOT_PASSWORD: <set to the key 'mongo-root-password' in secret 'mongodb-secret'> Optional: false
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-9chs8 (ro)
Conditions:
  Type              Status
  Initialized        True
  Ready              True
  ContainersReady    True
  PodScheduled       True
Volumes:
  kube-api-access-9chs8:
    Type:              Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds: 3607
    ConfigMapName:       kube-root-ca.crt
    ConfigMapOptional:    <nil>
    DownwardAPI:         true
  QoS Class:           BestEffort
  Node-Selectors:      <none>
  Tolerations:         node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
```

Checking all the services.

```
➤ muhammadsafi@all-MS-7035:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl get services
NAME                TYPE        CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
database            ClusterIP    10.96.0.1        <none>            <none>            2d10h
kubernetes           ClusterIP    10.96.0.1        <none>            443/TCP           2d21h
mongo-express-service LoadBalancer 10.107.140.194   192.168.0.10     8080:30801/TCP    189m
mongo-service        ClusterIP    10.109.94.225    <none>            27017/TCP         189m
nginx                NodePort     10.102.192.254   <none>            8080:32654/TCP    2d21h
```

Checking the specifications of the service mongo-service.

```
➤ muhammadsafi@all-MS-7035:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl describe service mongo-service
Name:         mongo-service
Namespace:    default
Labels:       <none>
Annotations:  <none>
Selector:     app=mongodb
Type:         ClusterIP
IP Family Policy: SingleStack
IP Families:  IPv4
IP:           10.109.94.225
IPs:          10.109.94.225
Port:         <unset> 27017/TCP
TargetPort:   27017/TCP
Endpoints:    10.244.0.23:27017
Session Affinity: None
Events:       <none>
```

Running the deployment and checking the logs.

```
➤ muhammadsafi@all-MS-7035:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl exec -it mongo-deployment-85bdc6549-rnddf -- /bin/bash
root@mongo-deployment-85bdc6549-rnddf:/# mongosh -u $MONGO_INITDB_ROOT_USERNAME -p $MONGO_INITDB_ROOT_PASSWORD
Current Mongosh Log ID: 645dd7e8182caa504dc58d5
Connecting to:          mongodb://<credentials>@127.0.0.1:27017/?directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+1.8.2
Using Mongosh:          0.9.5
Using Mongosh:          1.8.2

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

-----
  The server generated these startup warnings when booting
  2023-05-12T04:52:40.203+00:00: Using the XFS filesystem is strongly recommended with the WiredTiger storage engine. See http://dochub.mongodb.org/core/prodnotes-filesystem
  2023-05-12T04:52:47.222+00:00: vm.max_map_count is too low
  -----

  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()
  -----

root@mongo-deployment-85bdc6549-rnddf:/#
```

Accessing the mongo-express frontend.

```
muhammadasif@195-7933:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ minikube service mongo-express-service
0012 00:53:26.186447 187466 main.go:291] unable to resolve the current Docker CLI context "default": context "default" does not exist
NAMESPACE      NAME          TARGET PORT  URL
-----
default        mongo-express-service  8080        http://192.168.49.2:30001
Opening service default/mongo-express-service in default browser...
/snap/core28/current/lib/x86_64-linux-gnu/libstdc++.so.6: version 'GLIBCXX_3.4.29' not found (required by ./lib/x86_64-linux-gnu/libproxy.so.1)
failed to load module: /home/muhammadasif/snap/core/common/.cache/gio/modules/libgiolibrary.so
```

Adding a JSON document to collection_test.

Viewing Collection: collection_test

Document added!

New Document New Index

Simple Advanced

Key Value String Find

Delete all 7 documents retrieved

_id	color	value
645dc713bb1ae1000712f79b	red	#f00
645dc713bb1ae1000712f79c	green	#0f0
645dc713bb1ae1000712f79d	blue	#00f
645dc713bb1ae1000712f79e	cyan	#0ff
645dc713bb1ae1000712f79f	magenta	#cf0
645dc713bb1ae1000712f7a0	yellow	#f0
645dc713bb1ae1000712f7a1	black	#000

Accessing the mongo shell via mongosh.

```
muhammadasif@195-7933:~/data-engineering/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl exec --stdin --tty mongo-deployment-85bdc6549-n
root@mongo-deployment-85bdc6549-nmddf:/# mongosh -u $MONGO_INITDB_ROOT_USERNAME -p $MONGO_INITDB_PASSWORD
Current Mongosh Log ID: 645dd1f9e45feca3eae26a7
Connecting to:
  Using MongoDB:
    6.0.5
  Using Mongosh:
    1.8.2
For mongosh info see: https://docs.mongodb.com/mongosh-shell/
*****
The server generated these startup warnings when booting
2023-05-12T04:52:46.723+00:00: Using the XFS filesystem is strongly recommended with the WiredTiger storage engine. See http://dochub.mongodb.org/core/prodnotes-filesystem
2023-05-12T04:52:47.222+00:00: vm.max_map_count is too low
*****
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()
*****
```

Checking the collections.

```
test> show collections
collection_test
delete_me
test> db.collection_test
test.collection_test
```

Accessing the added files from the front end.

```
test> db.collection.test.find({})
[
  {
    _id: ObjectId("645dc713bblae1000712f79b"),
    color: 'red',
    value: '#f00'
  },
  {
    _id: ObjectId("645dc713bblae1000712f79c"),
    color: 'green',
    value: '#0f0'
  },
  {
    _id: ObjectId("645dc713bblae1000712f79d"),
    color: 'blue',
    value: '#0ff'
  },
  {
    _id: ObjectId("645dc713bblae1000712f79e"),
    color: 'cyan',
    value: '#0ff'
  },
  {
    _id: ObjectId("645dc713bblae1000712f79f"),
    color: 'magenta',
    value: '#ff0'
  },
  {
    _id: ObjectId("645dc713bblae1000712f7a0"),
    color: 'yellow',
    value: '#ff0'
  },
  {
    _id: ObjectId("645dc713bblae1000712f7a1"),
    color: 'black',
    value: '#000'
  }
]
test>
[To exit, press Ctrl+C again or Ctrl+D or type .exit]
test>
```