Talha Khan (2303.009.KHI.DEG)

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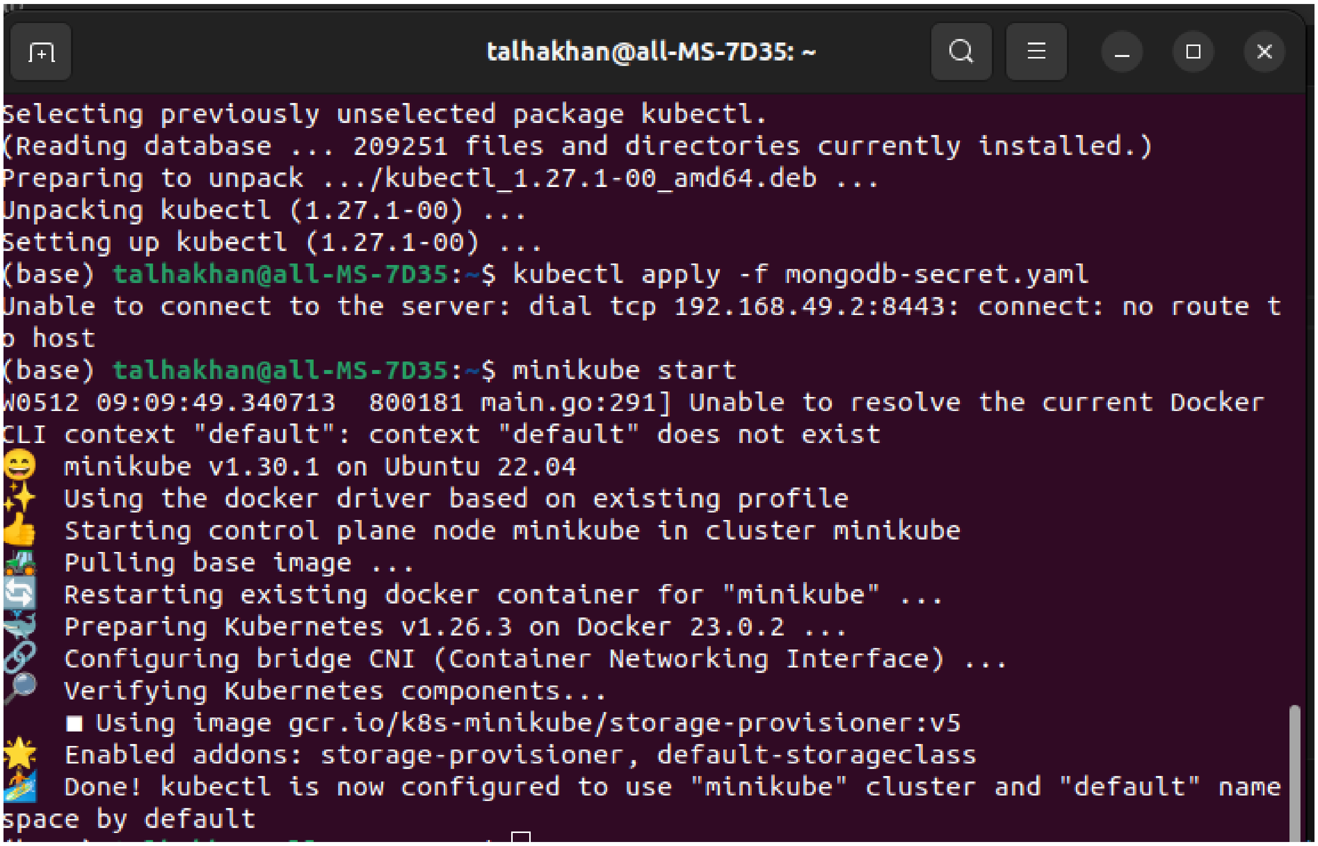
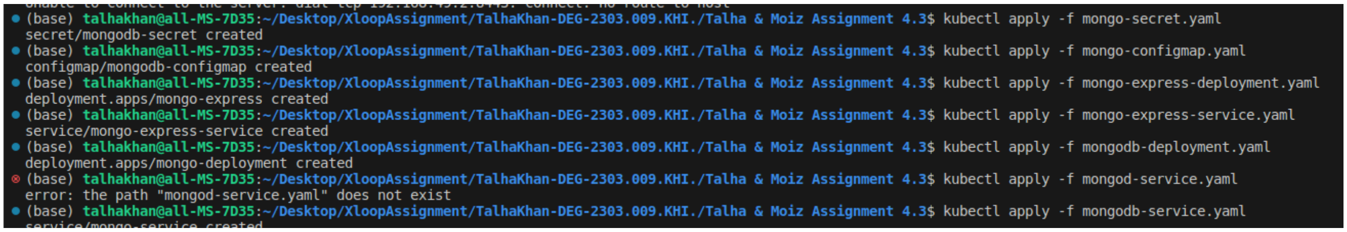
ASSIGNMNET 4.3



```
Selecting previously unselected package kubectl.
(Reading database ... 209251 files and directories currently installed.)
Preparing to unpack .../kubectl_1.27.1-00_amd64.deb ...
Unpacking kubectl (1.27.1-00) ...
Setting up kubectl (1.27.1-00) ...
(base) talhakhan@all-MS-7D35:~$ kubectl apply -f mongodb-secret.yaml
Unable to connect to the server: dial tcp 192.168.49.2:8443: connect: no route t
o host
(base) talhakhan@all-MS-7D35:~$ minikube start
W0512 09:09:49.340713  800181 main.go:291] Unable to resolve the current Docker
CLI context "default": context "default" does not exist
😄  minikube v1.30.1 on Ubuntu 22.04
✨  Using the docker driver based on existing profile
👍  Starting control plane node minikube in cluster minikube
🚜  Pulling base image ...
🔄  Restarting existing docker container for "minikube" ...
🐳  Preparing Kubernetes v1.26.3 on Docker 23.0.2 ...
🔗  Configuring bridge CNI (Container Networking Interface) ...
🔎  Verifying Kubernetes components...
    ▪ Using image gcr.io/k8s-minikube/storage-provisioner:v5
🌟  Enabled addons: storage-provisioner, default-storageclass
🏄  Done! kubectl is now configured to use "minikube" cluster and "default" name
space by default
```

- "kubectl" Commands applies the configuration defined in the ".yaml" file to the Kubernetes cluster using the Kubernetes command-line tool.

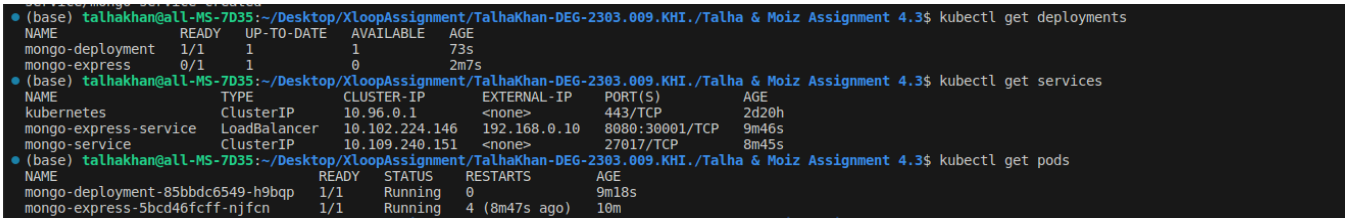


```
Unable to connect to the server: dial tcp 192.168.49.2:8443: connect: no route to host
● (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl apply -f mongo-secret.yaml
  secret/mongodb-secret created
● (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl apply -f mongo-configmap.yaml
  configmap/mongodb-configmap created
● (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl apply -f mongo-express-deployment.yaml
  deployment.apps/mongo-express created
● (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl apply -f mongo-express-service.yaml
  service/mongo-express-service created
● (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl apply -f mongodb-deployment.yaml
  deployment.apps/mongo-deployment created
⊗ (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl apply -f mongod-service.yaml
  error: the path "mongod-service.yaml" does not exist
● (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl apply -f mongodb-service.yaml
  service/mongo-service created
```

- The command "kubectl get deployments" is used to retrieve information about the Deployments running on a Kubernetes cluster using the "kubectl" command-line tool.
- When you run the "kubectl get deployments" command, Kubernetes will retrieve and display a list of all the Deployments currently running on the cluster, including their names, number of replicas, status, and other information such as the desired and current image versions.

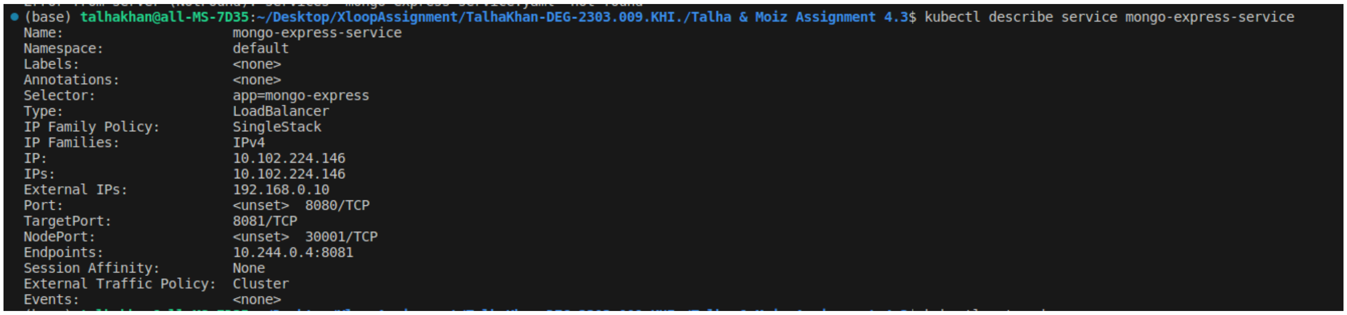
- The command "kubectl get services" is used to retrieve information about the Services running on a Kubernetes cluster using the "kubectl" command-line tool.
- When you run the "kubectl get services" command, Kubernetes will retrieve and display a list of all the Services currently running on the cluster, including their names, IP addresses, ports, and other information.

- The command "kubectl get pods" is used to retrieve information about the Pods running on a Kubernetes cluster using the "kubectl" command-line tool.
- When you run the "kubectl get pods" command, Kubernetes will retrieve and display a list of all the Pods currently running on the cluster, including their names, statuses, and other information such as the node they are running on and the version of the container image they are using.



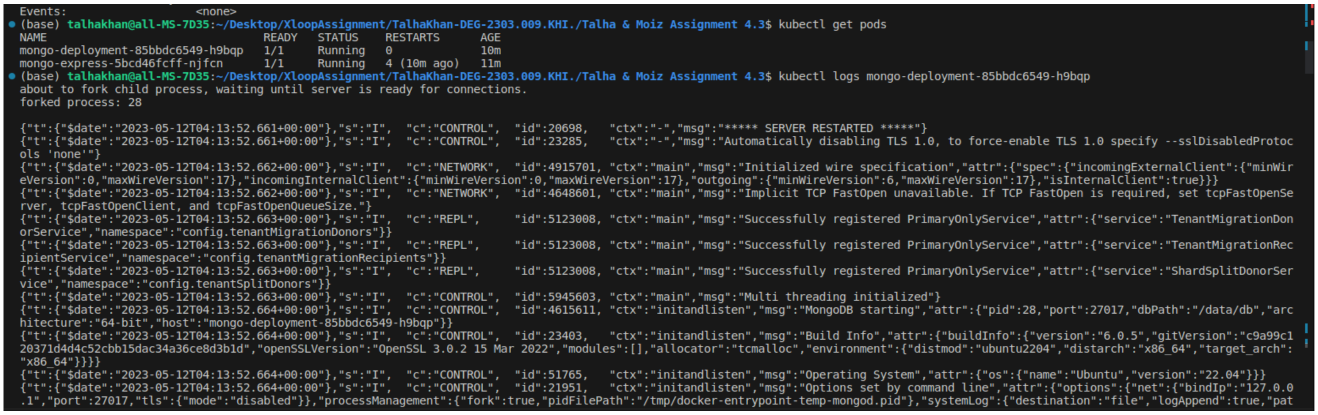
```
  service/mongo-service created
● (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl get deployments
  NAME               READY   UP-TO-DATE   AVAILABLE   AGE
  mongo-deployment   1/1     1            1           73s
  mongo-express      0/1     1            0           2m7s
● (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl get services
  NAME                    TYPE           CLUSTER-IP       EXTERNAL-IP    PORT(S)          AGE
  kubernetes              ClusterIP      10.96.0.1        <none>         443/TCP          2d20h
  mongo-express-service   LoadBalancer   10.102.224.146   192.168.0.10   8080:30001/TCP   9m46s
  mongo-service           ClusterIP      10.109.240.151   <none>         27017/TCP        8m45s
● (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl get pods
  NAME                                READY   STATUS    RESTARTS        AGE
  mongo-deployment-85bbdc6549-h9bqp   1/1     Running   0               9m18s
  mongo-express-5bcd46fcff-njfcn      1/1     Running   4 (8m47s ago)   10m
```

- The command "kubectl describe service mongo-express-service" is used to display detailed information about the Kubernetes Service object named "mongo-express-service" using the "kubectl" command-line tool.
- When you run the command, Kubernetes will retrieve and display information such as the Service's name, type, cluster IP address, port information, and any annotations or labels that are associated with it. It will also display information about the Endpoints associated with the Service, which are the network endpoints that the Service routes traffic to.



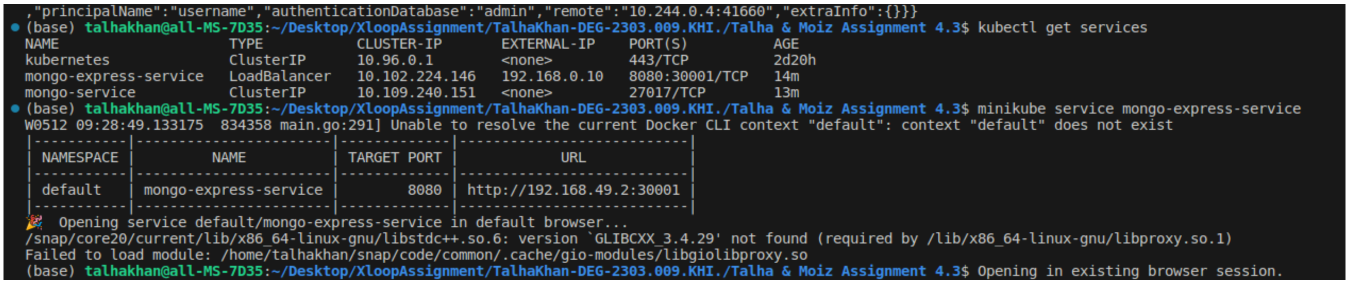
```
● (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl describe service mongo-express-service
  Name:                     mongo-express-service
  Namespace:                default
  Labels:                   <none>
  Annotations:              <none>
  Selector:                 app=mongo-express
  Type:                     LoadBalancer
  IP Family Policy:         SingleStack
  IP Families:              IPv4
  IP:                       10.102.224.146
  IPs:                      10.102.224.146
  External IPs:             192.168.0.10
  Port:                     <unset>  8080/TCP
  TargetPort:               8081/TCP
  NodePort:                 <unset>  30001/TCP
  Endpoints:                10.244.0.4:8081
  Session Affinity:         None
  External Traffic Policy:  Cluster
  Events:                   <none>
```

- The command "kubectl logs mongo-deployment-85bbdc6549-h9bqp" is used to display the logs of the container running inside the Kubernetes Pod named "mongo-deployment-85bbdc6549-h9bqp", using the "kubectl" command-line tool.
- When you run the command, Kubernetes will retrieve the logs generated by the container and display them on the console.



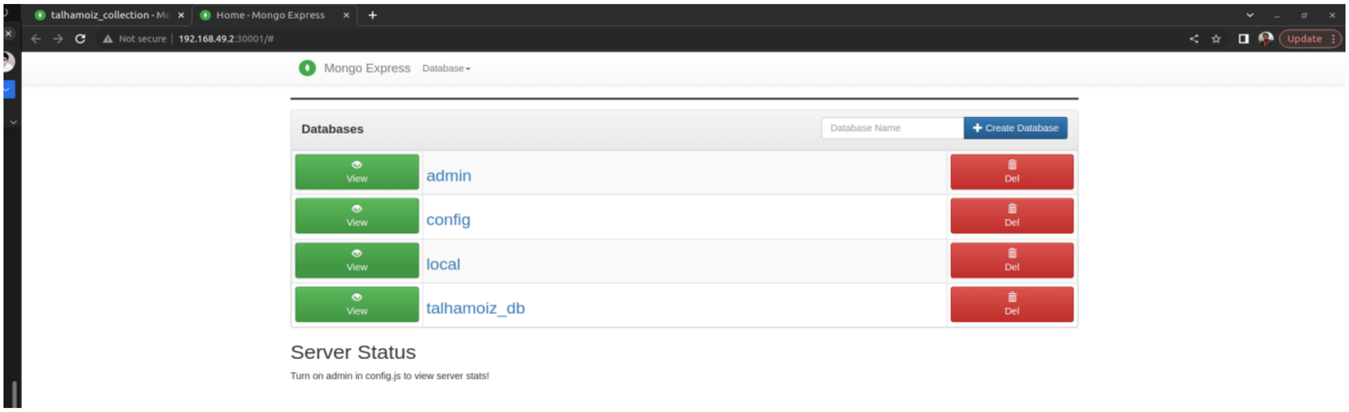
```
  Events:                   <none>
● (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl get pods
  NAME                                READY   STATUS    RESTARTS      AGE
  mongo-deployment-85bbdc6549-h9bqp   1/1     Running   0             10m
  mongo-express-5bcd46fcff-njfcn      1/1     Running   4 (10m ago)   11m
● (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl logs mongo-deployment-85bbdc6549-h9bqp
  about to fork child process, waiting until server is ready for connections.
  forked process: 28

  {"t":{"$date":"2023-05-12T04:13:52.661+00:00"},"s":"I",  "c":"CONTROL",  "id":20698,   "ctx":"-","msg":"***** SERVER RESTARTED *****"}
  {"t":{"$date":"2023-05-12T04:13:52.661+00:00"},"s":"I",  "c":"CONTROL",  "id":23285,   "ctx":"-","msg":"Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtoc
  ols 'none'"}
  {"t":{"$date":"2023-05-12T04:13:52.662+00:00"},"s":"I",  "c":"NETWORK",  "id":4915701, "ctx":"main","msg":"Initialized wire specification","attr":{"spec":{"incomingExternalClient":{"minWir
  eVersion":0,"maxWireVersion":17},"incomingInternalClient":{"minWireVersion":0,"maxWireVersion":17},"outgoing":{"minWireVersion":6,"maxWireVersion":17},"isInternalClient":true}}}
  {"t":{"$date":"2023-05-12T04:13:52.662+00:00"},"s":"I",  "c":"NETWORK",  "id":4648601, "ctx":"main","msg":"Implicit TCP FastOpen unavailable. If TCP FastOpen is required, set tcpFastOpenSe
  rver, tcpFastOpenClient, and tcpFastOpenQueueSize."}
  {"t":{"$date":"2023-05-12T04:13:52.663+00:00"},"s":"I",  "c":"REPL",     "id":5123008, "ctx":"main","msg":"Successfully registered PrimaryOnlyService","attr":{"service":"TenantMigrationDon
  orService","namespace":"config.tenantMigrationDonors"}}
  {"t":{"$date":"2023-05-12T04:13:52.663+00:00"},"s":"I",  "c":"REPL",     "id":5123008, "ctx":"main","msg":"Successfully registered PrimaryOnlyService","attr":{"service":"TenantMigrationRec
  ipientService","namespace":"config.tenantMigrationRecipients"}}
  {"t":{"$date":"2023-05-12T04:13:52.663+00:00"},"s":"I",  "c":"REPL",     "id":5123008, "ctx":"main","msg":"Successfully registered PrimaryOnlyService","attr":{"service":"ShardSplitDonorSer
  vice","namespace":"config.tenantSplitDonors"}}
  {"t":{"$date":"2023-05-12T04:13:52.663+00:00"},"s":"I",  "c":"CONTROL",  "id":5945603, "ctx":"main","msg":"Multi threading initialized"}
  {"t":{"$date":"2023-05-12T04:13:52.664+00:00"},"s":"I",  "c":"CONTROL",  "id":4615611, "ctx":"initandlisten","msg":"MongoDB starting","attr":{"pid":28,"port":27017,"dbPath":"/data/db","arc
  hitecture":"64-bit","host":"mongo-deployment-85bbdc6549-h9bqp"}}
  {"t":{"$date":"2023-05-12T04:13:52.664+00:00"},"s":"I",  "c":"CONTROL",  "id":23403,   "ctx":"initandlisten","msg":"Build Info","attr":{"buildInfo":{"version":"6.0.5","gitVersion":"c9a99c1
  20371d4d4c52cbb15dac34a36ce8d3b1d","openSSLVersion":"OpenSSL 3.0.2 15 Mar 2022","modules":[],"allocator":"tcmalloc","environment":{"distmod":"ubuntu2204","distarch":"x86_64","target_arch":
  "x86_64"}}}}
  {"t":{"$date":"2023-05-12T04:13:52.664+00:00"},"s":"I",  "c":"CONTROL",  "id":51765,   "ctx":"initandlisten","msg":"Operating System","attr":{"os":{"name":"Ubuntu","version":"22.04"}}}
  {"t":{"$date":"2023-05-12T04:13:52.664+00:00"},"s":"I",  "c":"CONTROL",  "id":21951,   "ctx":"initandlisten","msg":"Options set by command line","attr":{"options":{"net":{"bindIp":"127.0.0
  .1","port":27017,"tls":{"mode":"disabled"}},"processManagement":{"fork":true,"pidFilePath":"/tmp/docker-entrypoint-temp-mongod.pid"},"systemLog":{"destination":"file","logAppend":true,"pat
```

- The command "minikube service mongo-express-service" is used to open a web browser with the URL of the service named "mongo-express-service" in a local Kubernetes cluster created with Minikube.
- When you run the command, Minikube will open the default web browser with the URL of the service, which will allow you to access the MongoDB database using the web-based MongoDB client, Mongo Express.



```
 ,"principalName":"username","authenticationDatabase":"admin","remote":"10.244.0.4:41660","extraInfo":{}}}
● (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl get services
 NAME                    TYPE           CLUSTER-IP       EXTERNAL-IP    PORT(S)          AGE
 kubernetes              ClusterIP      10.96.0.1        <none>         443/TCP          2d20h
 mongo-express-service   LoadBalancer   10.102.224.146   192.168.0.10   8080:30001/TCP   14m
 mongo-service           ClusterIP      10.109.240.151   <none>         27017/TCP        13m
● (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ minikube service mongo-express-service
 W0512 09:28:49.133175  834358 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/core20/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/talhakhan/snap/code/common/.cache/gio-modules/libgiolibproxy.so
 (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ Opening in existing browser session.
```

- launched mongo-express web client / GUI



Databases

admin

config

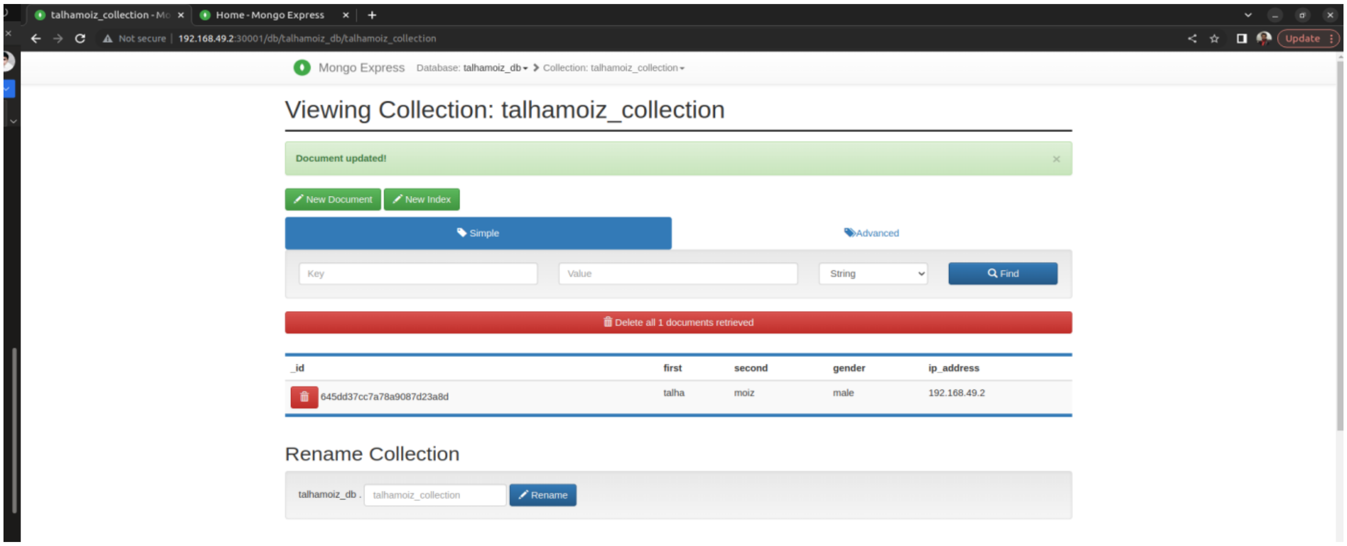
local

talhamoiz_db

Server Status

Turn on admin in config.js to view server stats!

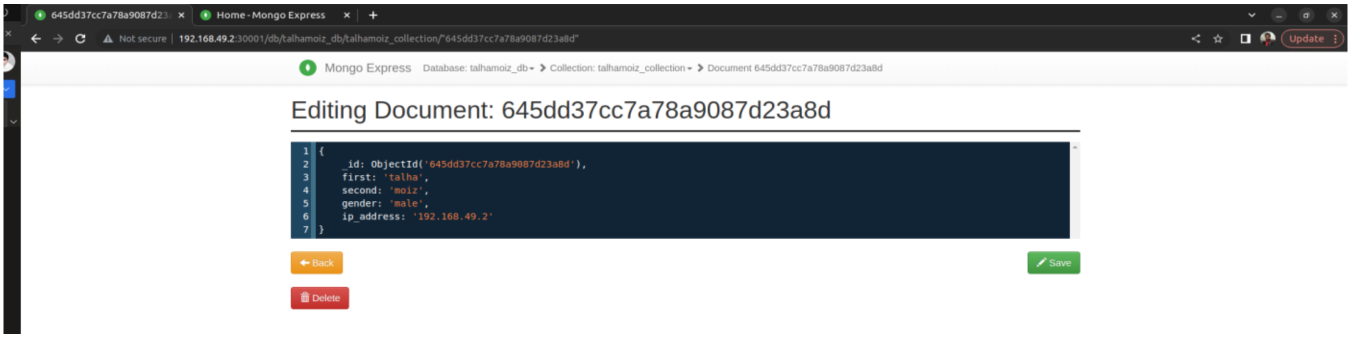
- Created db, collection and inserted a document using mongo-express web client / GUI



Viewing Collection: talhamoiz_collection

Document updated!

_id	first	second	gender	ip_address
645dd37cc7a78a9087d23a8d	talha	moiz	male	192.168.49.2

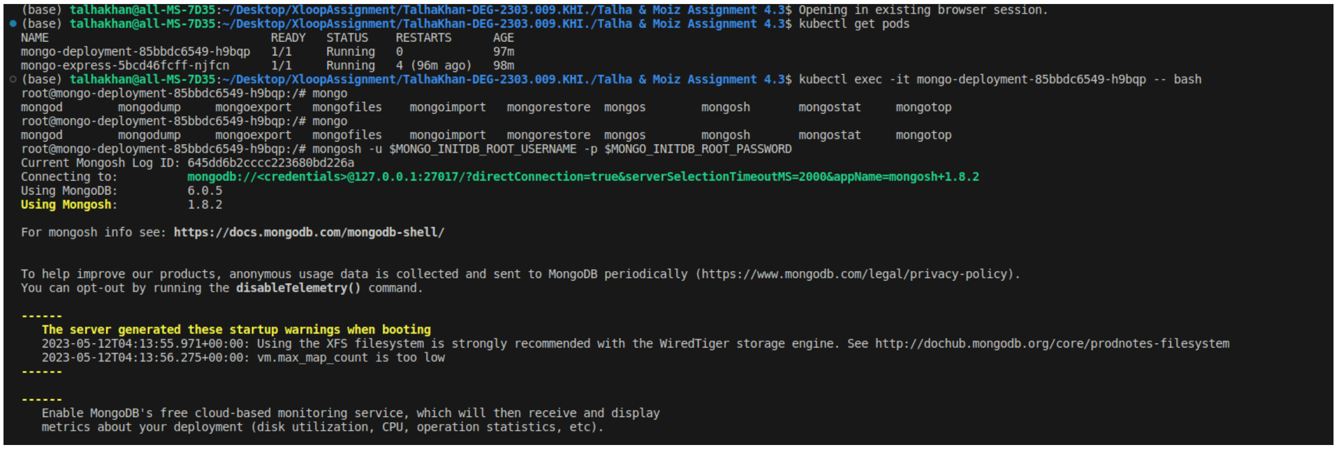

645dd37cc7a78a9087d23a
Home - Mongo Express
Not secure | 192.168.49.2:30001/db/talhamoiz_db/talhamoiz_collection/"645dd37cc7a78a9087d23a8d"
Update
Mongo Express
Database: talhamoiz_db
Collection: talhamoiz_collection
Document 645dd37cc7a78a9087d23a8d
Back
Save
Delete

Editing Document: 645dd37cc7a78a9087d23a8d

```
{
    _id: ObjectId('645dd37cc7a78a9087d23a8d'),
    first: 'talha',
    second: 'moiz',
    gender: 'male',
    ip_address: '192.168.49.2'
}
```

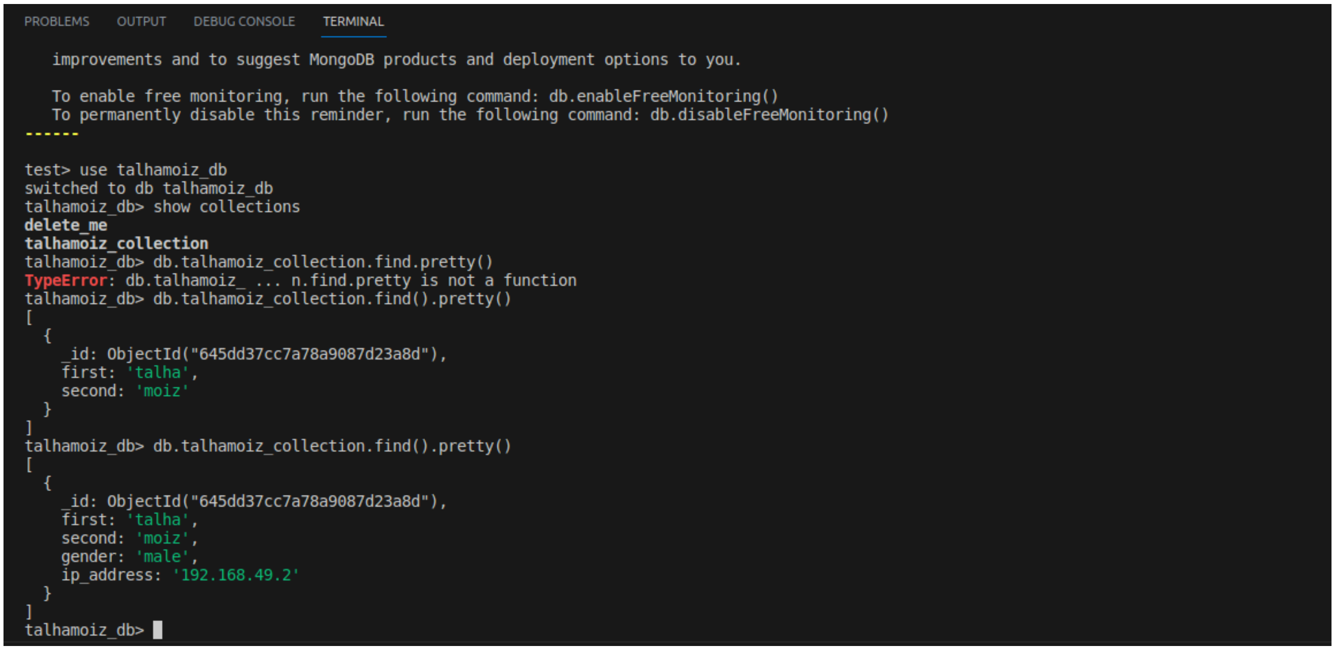
- The command "kubectl exec -it mongo-deployment-85bbdc6549-h9bqp -- bash" is used to start an interactive shell session within the container running inside the Kubernetes Pod named "mongo-deployment-85bbdc6549-h9bqp", using the "kubectl" command-line tool.
- When you run the command, Kubernetes will execute the "bash" command inside the container, giving you access to a shell session where you can run commands and interact with the container's file system.
- The command "mongosh -u $MONGO_INITDB_ROOT_USERNAME -p $MONGO_INITDB_ROOT_PASSWORD" is used to start the MongoDB shell and connect to a MongoDB database running in a Kubernetes cluster.

- When you run the command, the MongoDB shell starts up and prompts you for a connection string. You will need to provide the connection details, including the hostname or IP address of the MongoDB database, the port number, and the name of the database. The username and password are passed as environment variables $MONGO_INITDB_ROOT_USERNAME and $MONGO_INITDB_ROOT_PASSWORD respectively, and will be used to authenticate your connection to the database.



```
 (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ Opening in existing browser session.
● (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl get pods
 NAME                              READY   STATUS    RESTARTS      AGE
 mongo-deployment-85bbdc6549-h9bqp   1/1     Running   0             97m
 mongo-express-5bcd46fcff-njfcn      1/1     Running   4 (96m ago)   98m
○ (base) talhakhan@all-MS-7D35:~/Desktop/XloopAssignment/TalhaKhan-DEG-2303.009.KHI./Talha & Moiz Assignment 4.3$ kubectl exec -it mongo-deployment-85bbdc6549-h9bqp -- bash
 root@mongo-deployment-85bbdc6549-h9bqp:/# mongo
 mongod        mongodump     mongoexport   mongofiles    mongoimport   mongorestore  mongos        mongosh       mongostat     mongotop
 root@mongo-deployment-85bbdc6549-h9bqp:/# mongo
 mongod        mongodump     mongoexport   mongofiles    mongoimport   mongorestore  mongos        mongosh       mongostat     mongotop
 root@mongo-deployment-85bbdc6549-h9bqp:/# mongosh -u $MONGO_INITDB_ROOT_USERNAME -p $MONGO_INITDB_ROOT_PASSWORD
 Current Mongosh Log ID: 645dd6b2cccc223680bd226a
 Connecting to:          mongodb://<credentials>@127.0.0.1:27017/?directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+1.8.2
 Using MongoDB:          6.0.5
 Using Mongosh:          1.8.2

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


 To help improve our products, anonymous usage data is collected and sent to MongoDB periodically (https://www.mongodb.com/legal/privacy-policy).
 You can opt-out by running the disableTelemetry() command.

 ------
    The server generated these startup warnings when booting
    2023-05-12T04:13:55.971+00:00: Using the XFS filesystem is strongly recommended with the WiredTiger storage engine. See http://dochub.mongodb.org/core/prodnotes-filesystem
    2023-05-12T04:13:56.275+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).
```

- Finally switching to mongo express through mongosh.



```
   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()
------

test> use talhamoiz_db
switched to db talhamoiz_db
talhamoiz_db> show collections
delete_me
talhamoiz_collection
talhamoiz_db> db.talhamoiz_collection.find.pretty()
TypeError: db.talhamoiz_ ... n.find.pretty is not a function
talhamoiz_db> db.talhamoiz_collection.find().pretty()
[
  {
    _id: ObjectId("645dd37cc7a78a9087d23a8d"),
    first: 'talha',
    second: 'moiz'
  }
]
talhamoiz_db> db.talhamoiz_collection.find().pretty()
[
  {
    _id: ObjectId("645dd37cc7a78a9087d23a8d"),
    first: 'talha',
    second: 'moiz',
    gender: 'male',
    ip_address: '192.168.49.2'
  }
]
talhamoiz_db> █
```