

Assignment (4.3)

Daily Assignment



Display logs of a running MongoDB container. Add a document to the DB via Mongo Express frontend. Get into the pod and verify the document's existence via *mongosh*.

Solution

Minikube start command is used to launch a single node Kubernetes cluster locally in our machine for development and testing purposes.

```
muhammadhumza@all-Latitude-3490:~/Desktop/DEG COURSE/data_engineering_bootcamp_2303/tasks/4_microservices_developm
ent/day_3_kubernetes/hands-on$ minikube start
🐳 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: default-storageclass, storage-provisioner
🏁 Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
```

Peer Assignment

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Here we created yaml files.

[illegible]

Kubectl get pods is used to restore information about the running pods in a kubernetes clusters.

Kubectyl get deployments is used to object and manage the life cycle of replica sets and pods.

Kubectl get services is used to provide a stable network endpoint for access set of pods.

Kubectrl get configmaps is used to store configuration data in key pairs.

```

muhammadhunza@all-Latitude-3490:~/Desktop/DEG COURSE/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$
kubectl get pods
NAME                                READY    STATUS    RESTARTS      AGE
mongo-deployment-85bbdc6549-clvq2   1/1      Running   2 (5m ago)    2d
mongo-express-5bcd46fcff-nvq4r      1/1      Running   7 (4m29s ago) 2d
muhammadhunza@all-Latitude-3490:~/Desktop/DEG COURSE/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$
kubectl get deployments
NAME                                UP-TO-DATE    AVAILABLE    AGE
mongo-deployment                    1/1           1            2d
mongo-express                       1/1           1            2d
muhammadhunza@all-Latitude-3490:~/Desktop/DEG COURSE/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$
kubectl get servers
error: the server doesn't have a resource type "servers"
muhammadhunza@all-Latitude-3490:~/Desktop/DEG COURSE/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
kubernetes                          ClusterIP      10.96.0.1      <none>          443/TCP           2d18h
mongo-express-service               LoadBalancer  10.98.58.255   192.168.0.10   8080:30001/TCP    2d
mongo-service                       ClusterIP      10.102.157.235 <none>          27017/TCP         2d
muhammadhunza@all-Latitude-3490:~/Desktop/DEG COURSE/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$
kubectl get configmaps
NAME                                DATA    AGE
kube-root-ca.crt                   1        2d18h
mongodb-configmap                  1        2d
muhammadhunza@all-Latitude-3490:~/Desktop/DEG COURSE/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$
kubectl get configmaps
NAME                                DATA    AGE
kube-root-ca.crt                   1        2d18h
mongodb-configmap                  1        2d

```

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Kubectl get all is used to restore information about many kubernetes like Pods,Services,Deployment and Confirmaps and many more.

```
muhammadhumza@all-Latitude-3490:~/Desktop/DEG COURSE/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$ kubectl get all
```

NAME	READY	STATUS	RESTARTS	AGE
pod/mongo-deployment-85bbdc6549-clvq2	1/1	Running	2 (6m23s ago)	2d
pod/mongo-express-5bcd46fcff-mvq4r	1/1	Running	7 (5m52s ago)	2d

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
service/kubernetes	ClusterIP	10.96.0.1	<none>	443/TCP	2d18h
service/mongo-express-service	LoadBalancer	10.98.58.255	192.168.0.10	8080:30001/TCP	2d
service/mongo-service	ClusterIP	10.102.157.235	<none>	27017/TCP	2d

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
deployment.apps/mongo-deployment	1/1	1	1	2d
deployment.apps/mongo-express	1/1	1	1	2d

NAME	DESIRED	CURRENT	READY	AGE
replicaset.apps/mongo-deployment-85bbdc6549	1	1	1	2d
replicaset.apps/mongo-express-5bcd46fcff	1	1	1	2d

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Minikube Service Mongo-Express-Service: minikube is a tool that create a way to access the web application. Minikube setup a special route to the mongo express web application.when we run this command it will open the browser.

```
muhammadhumza@all-Latitude-3490:~/Desktop/DEG COURSE/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$
minikube service mongo-express-service
|-----|-----|-----|-----|
| 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...
muhammadhumza@all-Latitude-3490:~/Desktop/DEG COURSE/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$
Opening in existing browser session.
muhammadhumza@all-Latitude-3490:~/Desktop/DEG COURSE/data_engineering_bootcamp_2303/tasks/4_
muhammadhumza@all-Latitude-3490:~/Desktop/DEG COURSE/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$
muhammadhumza@all-Latitude-3490:~/Desktop/DEG COURSE/data_engineering_bootcamp_2303/tasks/4_
microservices_development/day_3_kubernetes/hands-on$ kubectl exec -it mongo-deployment-85bbdc6549-clvq2 -- /bin/bash
root@mongo-deployment-85bbdc6549-clvq2:/# mongosh -u $MONGO_INITDB_ROOT_USERNAME -p $MONGO_INITDB_ROOT_PASSWORD
Current Mongosh Log ID: 6461b6a7059dcd5ba0a23d07
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/mongosh-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
2023-05-15T04:20:09.781+00:00: Using the XFS filesystem is strongly recommended with the WiredTiger storage engine. See http://dochub.mongodb.org/core/prodnotes-filesystem
2023-05-15T04:20:10.518+00:00: vm.max_map_count is too low
-----
```

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





M Humza Moeen (2303.KHI.DEG.019)

Here we created Database Name CLASSDATA_ID:

 Mongo Express Database ▾

Databases

Database Name [+ Create Database](#)

 View	CLASSDATA_ID	 Del
 View	admin	 Del
 View	config	 Del
 View	local	 Del

Server Status

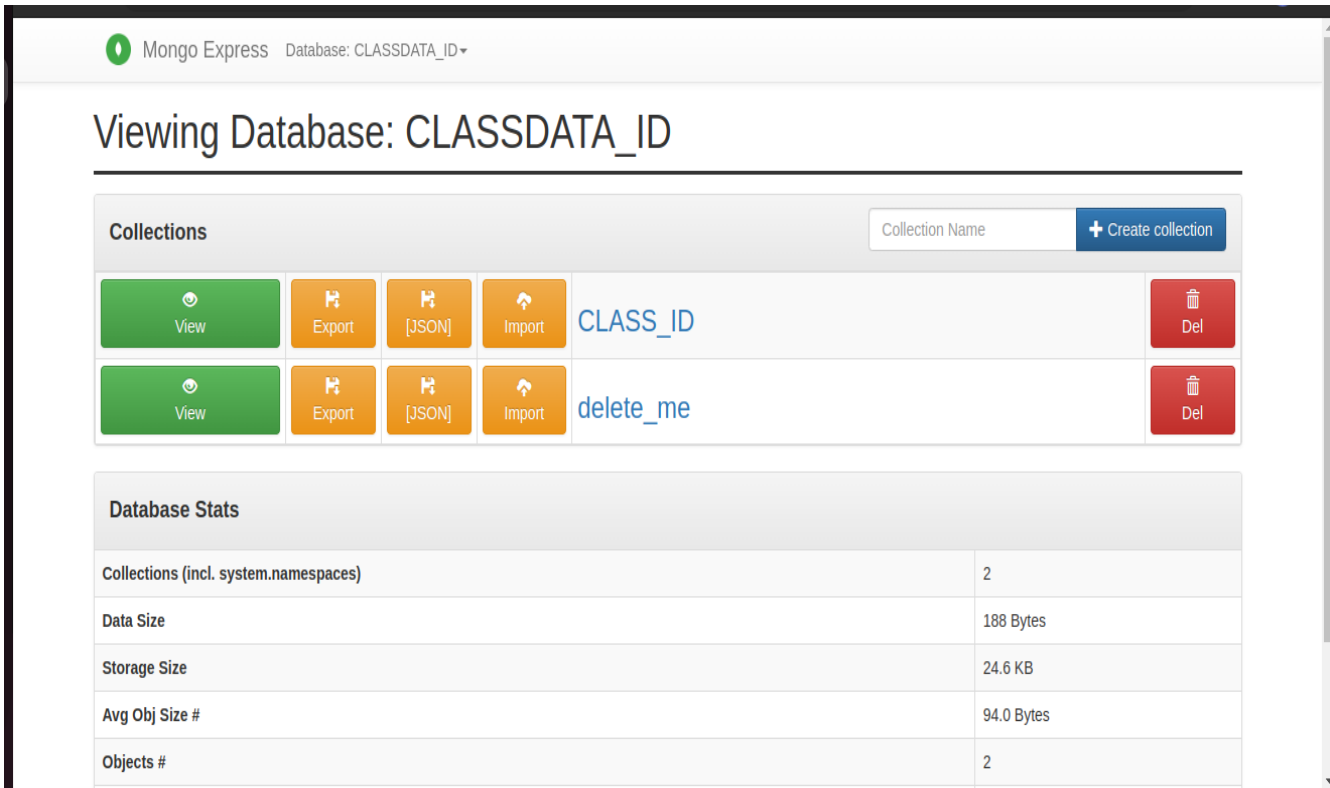
Turn on admin in config.js to view server stats!

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Here we created Collection Name CLASS_ID:



The screenshot shows the Mongo Express web interface for a database named CLASSDATA_ID. The main heading is "Viewing Database: CLASSDATA_ID". Below this, there is a "Collections" section with a search bar and a "+ Create collection" button. Two collections are listed: "CLASS_ID" and "delete_me". Each collection has a "View" button (green), "Export" (orange), "[JSON]" (orange), "Import" (orange), and "Del" (red) buttons. Below the collections, there is a "Database Stats" section with a table showing the following data:

Database Stats	
Collections (incl. system.namespaces)	2
Data Size	188 Bytes
Storage Size	24.6 KB
Avg Obj Size #	94.0 Bytes
Objects #	2

Add Document

```
1  [  
2    {  
3      "_id":1,  
4      "Name":"Humza",  
5      "Qualification":"Graduation",  
6      "University":"Iqra University"  
7    },  
8    {  
9      "_id":2,  
10     "Name":"Sabih",  
11     "Qualification":"Graduation",  
12     "University":"Sir Syed University"  
13   }  
14 ]
```

We added **JSON** code over Mongo Db.

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Mongo Express

Database: CLASSDATA_ID ▾

Collection: CLASS_ID ▾

Viewing Collection: CLASS_ID

New Document

New Index

Simple

Advanced

Key

Value

String ▾

Find

Delete all 2 documents retrieved

_id	Name	Qualification	University
1	Humza	Graduation	Iqra University
2	Sabih	Graduation	Sir Syed University

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```
muhammadhumza@all-Latitude-3490:~/Desktop/DEG COURSE/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands-on$  
kubectl logs mongo-deployment-85bbdc6549-clvq2  
about to fork child process, waiting until server is ready for connections.  
forked process: 28  
  
{ "t": { "$date": "2023-05-15T04:20:00.900+00:00" }, "s": "I", "c": "CONTROL", "id": 20698, "ctx": "-", "msg": "***** SERVER RESTARTED *****" }  
{ "t": { "$date": "2023-05-15T04:20:00.902+00:00" }, "s": "I", "c": "CONTROL", "id": 23285, "ctx": "-", "msg": "Automatically disabling TLS 1.0, to forc  
e-enable TLS 1.0 specify --sslDisabledProtocols 'none'" }  
{ "t": { "$date": "2023-05-15T04:20:00.903+00:00" }, "s": "I", "c": "NETWORK", "id": 4915701, "ctx": "-", "msg": "Initialized wire specification", "attr": {  
"spec": { "incomingExternalClient": { "minWireVersion": 0, "maxWireVersion": 17 }, "incomingInternalClient": { "minWireVersion": 0, "maxWireVersion": 17 }, "out  
going": { "minWireVersion": 6, "maxWireVersion": 17 }, "isInternalClient": true } } }  
{ "t": { "$date": "2023-05-15T04:20:00.903+00:00" }, "s": "I", "c": "NETWORK", "id": 4648601, "ctx": "main", "msg": "Implicit TCP FastOpen unavailable. If  
TCP FastOpen is required, set tcpFastOpenServer, tcpFastOpenClient, and tcpFastOpenQueueSize." }  
{ "t": { "$date": "2023-05-15T04:20:00.905+00:00" }, "s": "I", "c": "REPL", "id": 5123008, "ctx": "main", "msg": "Successfully registered PrimaryOnlySe  
rvice", "attr": { "service": "TenantMigrationDonorService", "namespace": "config.tenantMigrationDonors" } }  
{ "t": { "$date": "2023-05-15T04:20:00.905+00:00" }, "s": "I", "c": "REPL", "id": 5123008, "ctx": "main", "msg": "Successfully registered PrimaryOnlySe  
rvice", "attr": { "service": "TenantMigrationRecipientService", "namespace": "config.tenantMigrationRecipients" } }  
{ "t": { "$date": "2023-05-15T04:20:00.905+00:00" }, "s": "I", "c": "REPL", "id": 5123008, "ctx": "main", "msg": "Successfully registered PrimaryOnlySe  
rvice", "attr": { "service": "ShardSplitDonorService", "namespace": "config.tenantSplitDonors" } }  
{ "t": { "$date": "2023-05-15T04:20:00.905+00:00" }, "s": "I", "c": "CONTROL", "id": 5945603, "ctx": "main", "msg": "Multi threading initialized" }  
{ "t": { "$date": "2023-05-15T04:20:00.905+00:00" }, "s": "I", "c": "CONTROL", "id": 4615611, "ctx": "initandlisten", "msg": "MongoDB starting", "attr": { "p  
id": 28, "port": 27017, "dbPath": "/data/db", "architecture": "64-bit", "host": "mongo-deployment-85bbdc6549-clvq2" } }  
{ "t": { "$date": "2023-05-15T04:20:00.905+00:00" }, "s": "I", "c": "CONTROL", "id": 23403, "ctx": "initandlisten", "msg": "Build Info", "attr": { "buildIn  
fo": { "version": "6.0.5", "gitVersion": "c9a99c120371d4d4c52cbb15dac34a36ce8d3b1d", "opensslVersion": "OpenSSL 3.0.2 15 Mar 2022", "modules": [], "alloca  
tor": "tcmalloc", "environment": { "distmod": "ubuntu2204", "distarch": "x86_64", "target_arch": "x86_64" } } } }  
{ "t": { "$date": "2023-05-15T04:20:00.905+00:00" }, "s": "I", "c": "CONTROL", "id": 51765, "ctx": "initandlisten", "msg": "Operating System", "attr": { "o  
s": { "name": "Ubuntu", "version": "22.04" } } }  
{ "t": { "$date": "2023-05-15T04:20:00.905+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/doc  
ker-entrypoint-temp-mongod.pid" }, "systemLog": { "destination": "file", "logAppend": true, "path": "/proc/1/fd/1" } } } }  
{ "t": { "$date": "2023-05-15T04:20:00.906+00:00" }, "s": "I", "c": "STORAGE", "id": 22297, "ctx": "initandlisten", "msg": "Using the XFS filesystem is  
strongly recommended with the WiredTiger storage engine. See http://dochub.mongodb.org/core/prodnotes-filesystem", "tags": [ "startupWarnings" ] }  
{ "t": { "$date": "2023-05-15T04:20:00.906+00:00" }, "s": "I", "c": "STORAGE", "id": 22315, "ctx": "initandlisten", "msg": "Opening WiredTiger", "attr": {  
"config": { "create,cache_size=7435M,session_max=33000,eviction=(threads_min=4,threads_max=4),config_base=false,statistics=(fast),log=(enabled=true  
,remove=true,path=journal,compressor=snappy),builtin_extension_config=(zstd=(compression_level=6)),file_manager=(close_idle_time=600,close_scan_  
interval=10,close_handle_minimum=2000),statistics_log=(wait=0),json_output=(error,message),verbose=[recovery_progress:1,checkpoint_progress:1,co  
mpact_progress:1,backup:0,checkpoint:0,compact:0,evict:0,history_store:0,recovery:0,fts:0,salvage:0,tiered:0,timestamp:0,transaction:0,verify:0
```

Kubectl log command is used to view the logs of specific pods of kubernetes .

Peer Assignment

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Firstly we used Mongosh command and MongoDB allow to interact with MongoDB database and perform various database .

Here we added Database and Collection those we created .

```
test> use CLASSDATA_ID
switched to db CLASSDATA_ID
CLASSDATA_ID> db.CLASS_ID.find()
[
  {
    _id: 1,
    Name: 'Humza',
    Qualification: 'Graduation',
    University: 'Iqra University'
  },
  {
    _id: 2,
    Name: 'Sabih',
    Qualification: 'Graduation',
    University: 'Sir Syed University'
  }
]
CLASSDATA_ID> db.CLASS_ID.find({ "_id": 1 })
[
  {
    _id: 1,
    Name: 'Humza',
    Qualification: 'Graduation',
    University: 'Iqra University'
  }
]
CLASSDATA_ID> db.CLASS_ID.find({ "_id": 2 })
[
  {
    _id: 2,
    Name: 'Sabih',
    Qualification: 'Graduation',
    University: 'Sir Syed University'
  }
]
CLASSDATA_ID>
(To exit, press Ctrl+C again or Ctrl+D or type .exit)
CLASSDATA_ID>
```

Peer Assignment

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This command provide detail information about specific pod name.

```
muhammadhumza@all-Latitude-3490: ~/Desktop/DEG COURSE/data_engineering_bootcamp_2303/tasks/4_microservices_development/day_3_kubernetes/hands
kubect describe pod mongo-deployment-
Name: mongo-deployment-85bbdc6549-clvq2
Namespace: default
Priority: 0
Service Account: default
Node: minikube/192.168.49.2
Start Time: Sat, 13 May 2023 08:49:45 +0500
Labels: app=mongodb
        pod-template-hash=85bbdc6549
Annotations: <none>
Status: Running
IP: 10.244.0.13
IPs:
  IP: 10.244.0.13
Controlled By: ReplicaSet/mongo-deployment-85bbdc6549
Containers:
  mongodb:
    Container ID: docker://47c96f8ce48d0f1598940533756ca4f5d60c85e5cc3196b0429c2adfb3570e47
    Image: mongo
    Image ID: docker-pullable://mongo@sha256:928347070dc089a596f869a22a4204c0feace3eb03470a6a2de6814f11fb7309
    Port: 27017/TCP
    Host Port: 0/TCP
    State: Running
      Started: Mon, 15 May 2023 09:20:00 +0500
    Last State: Terminated
      Reason: Completed
      Exit Code: 0
      Started: Sun, 14 May 2023 15:53:27 +0500
      Finished: Mon, 15 May 2023 09:19:31 +0500
    Ready: True
    Restart Count: 2
    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-vkgmm (ro)
```