

# **INFRASTRUCTURE CREATION AND DEPLOYMENT OF WEB- APPLICATION ON K8S**

**By**

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## Introduction:

A setup of a web-application and with MongoDB database over the Kubernetes cluster.

MongoDB pod – Runs MongoDB database.

Internal Service to talk to MongoDB so no external request.

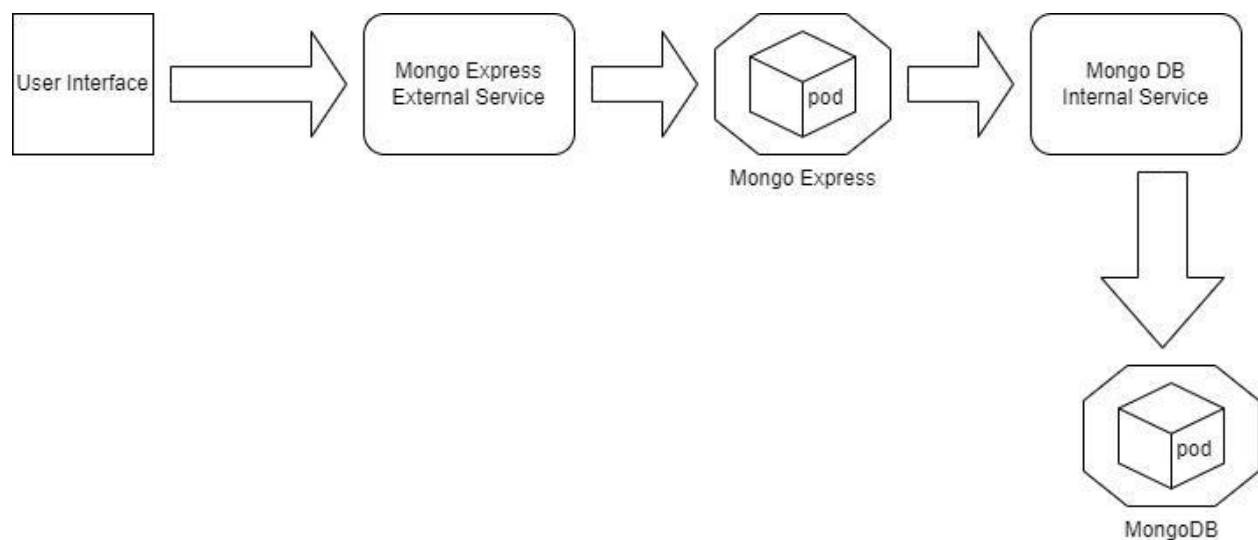
Mongo express deployment is created, and it has references of secrets and Configmap.

In the deployment file only external service is created so that mongo express can be accessed by external users. A public facing Load Balancer is created to serve the external request.

Username, password are kept Secret.

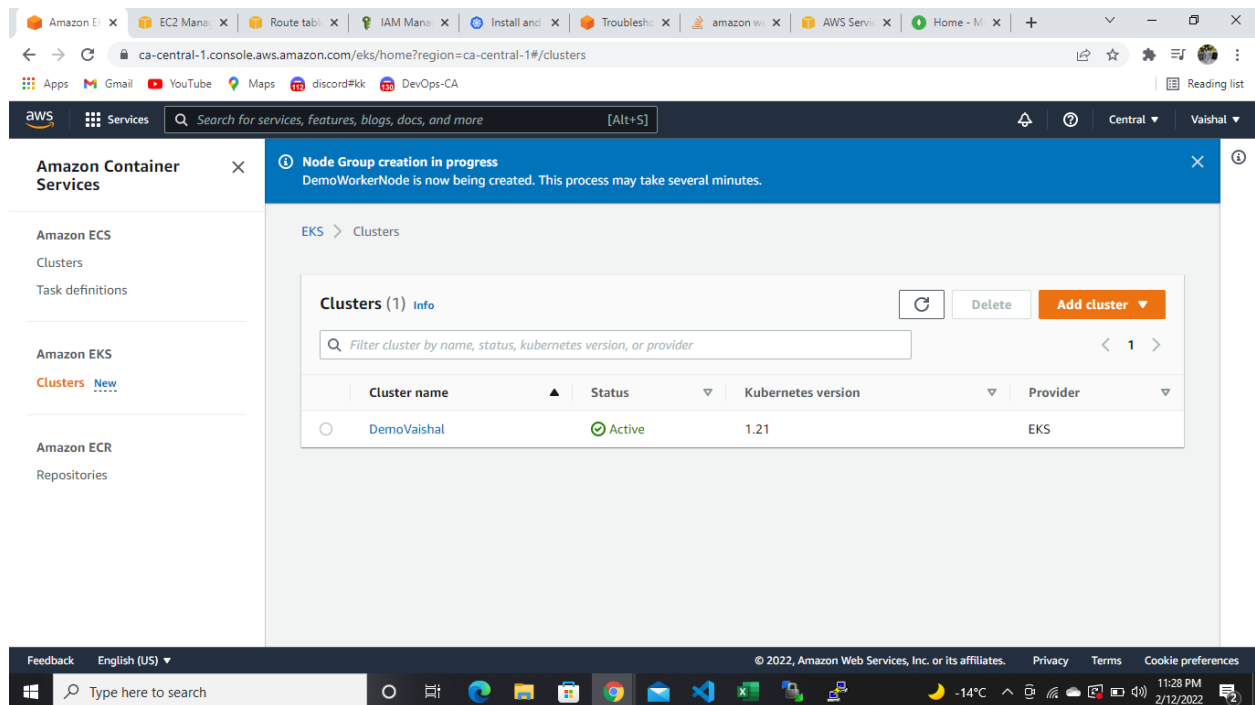
Configmap is created which stores the db url.

## High Level Architecture:

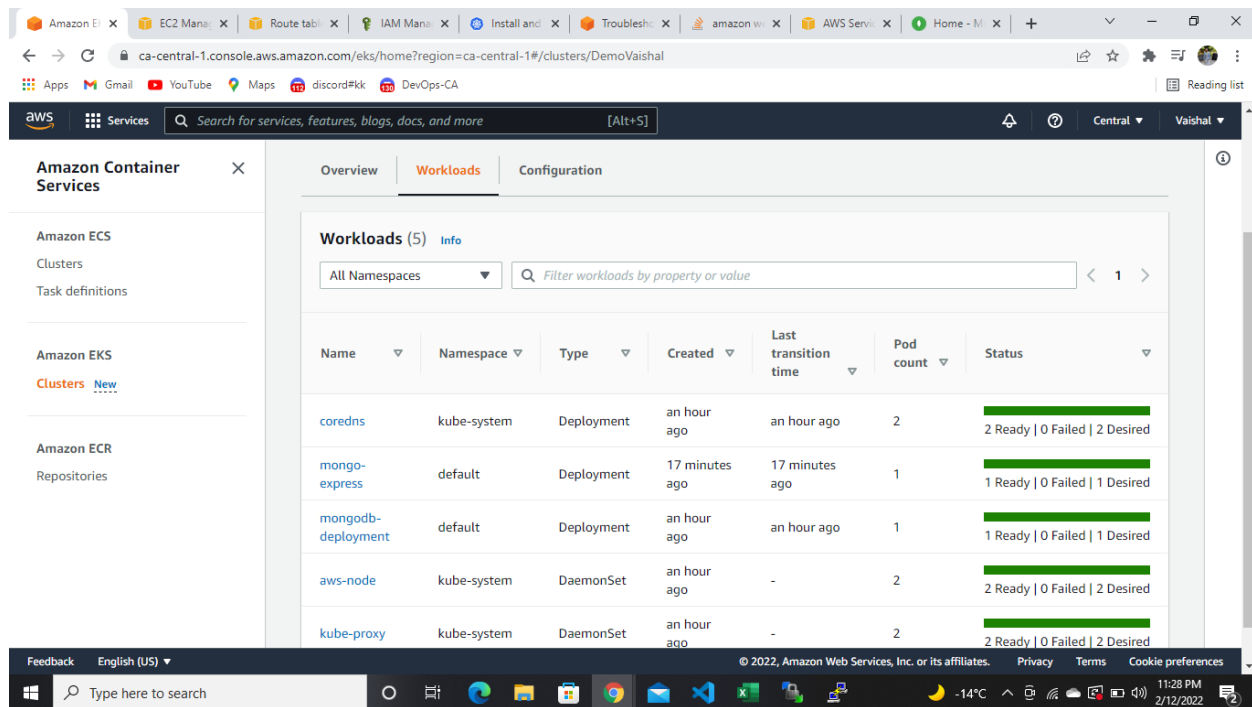


## AWS EKS:

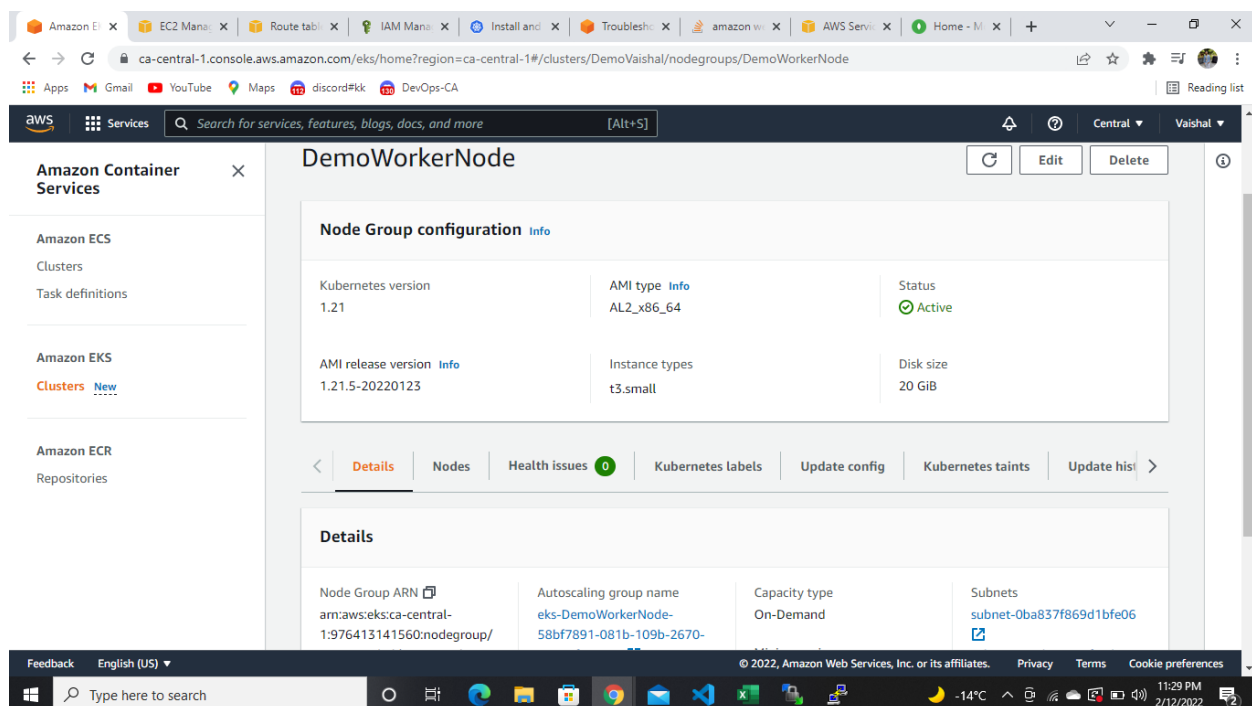
Firstly, created Amazon EKS cluster over the cloud as shown in the image below. Creation was quite simple; I have made two different roles. First, for the eks cluster to grant the permission of the entire cluster and its resource. Second, the role for worker nodes permitting required access over the resources.

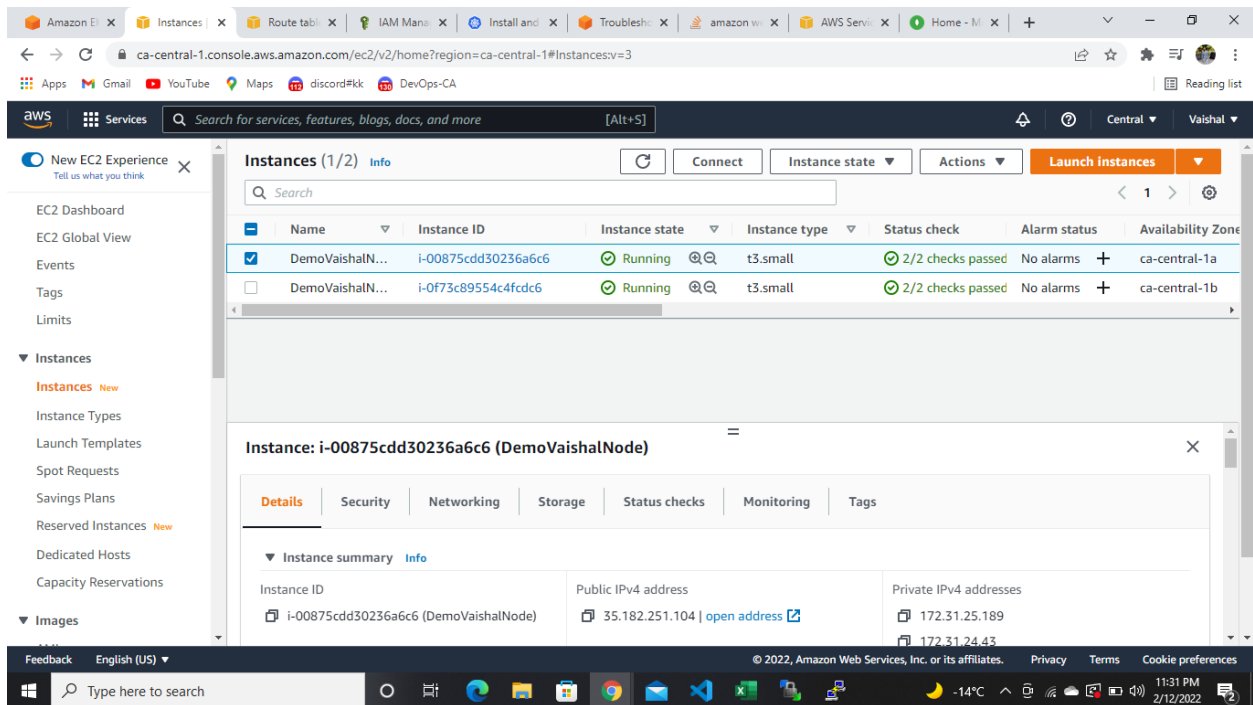


As you can see, cluster is created and resources of the normally called master nodes are created by Amazon EKS as shown in the image below.

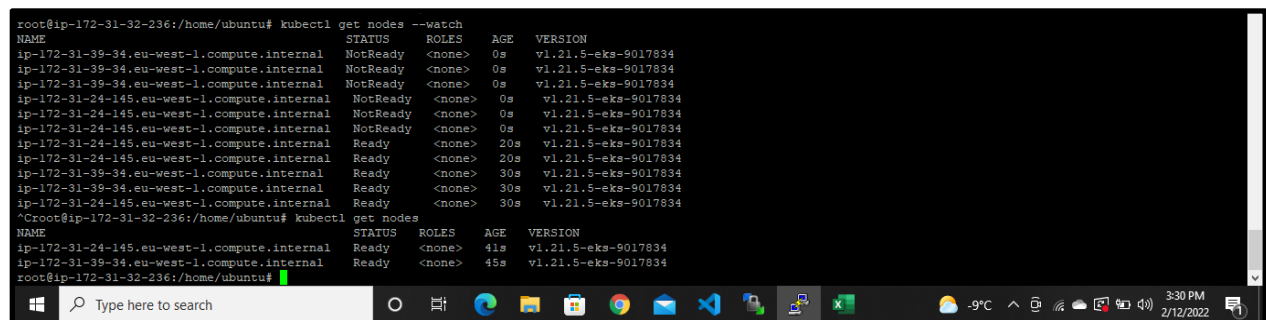


Afterwards, I created the Node Group having on demand Nodes, with desired and minimum requirement of 2 compute machines. As shown in the images below, Nodes are established, join the cluster and are healthy.





As we can see, from the remote machine by configuring our EKS access. Nodes are being ready and joining the cluster. As shown in the image below.

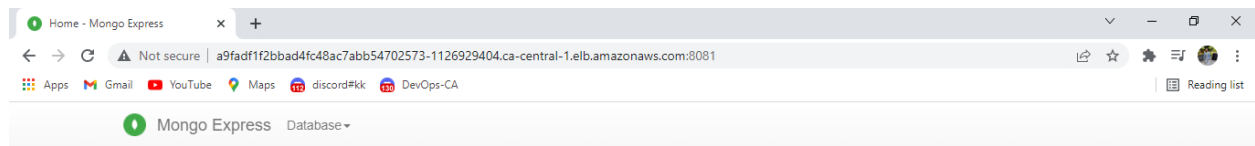


A mongo application is hosted over the K8s cluster using the YAML files. Along with it, all the commands fired during the entire setup are shown in the image below.

```
root@ip-172-31-32-236:/home/ubuntu
Updated context arn:aws:eks:ca-central-1:576413141560:cluster/DemoVaishal in /root/.kube/config
root@ip-172-31-32-236:/home/ubuntu/k8s# kubectl get nodes
NAME                                STATUS    ROLES    AGE   VERSION
ip-172-31-2-123.ca-central-1.compute.internal Ready    <none>   55m   v1.21.5-eks-9017834
ip-172-31-25-189.ca-central-1.compute.internal Ready    <none>   55m   v1.21.5-eks-9017834
root@ip-172-31-32-236:/home/ubuntu/k8s# kubectl get po
NAME                                READY    STATUS    RESTARTS   AGE
mongo-express-78fcf796b8-4rpn8      1/1      Running   0           16m
mongodb-deployment-8f6675bc5-q6pjj  1/1      Running   0           49m
root@ip-172-31-32-236:/home/ubuntu/k8s# kubectl get svc
NAME                                TYPE                CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
kubernetes                         ClusterIP           10.100.0.1      <none>           443/TCP          60m
mongo-express-service              LoadBalancer       10.100.18.175   a9fadf1f2bbad4fc48ac7abb54702573-1126929404.ca-central-1.elb.amazonaws.com 8081:30000/TCP  16m
mongodb-service                   ClusterIP           10.100.69.5     <none>           27017/TCP        49m
root@ip-172-31-32-236:/home/ubuntu/k8s# kubectl get all
NAME                                READY    STATUS    RESTARTS   AGE
pod/mongo-express-78fcf796b8-4rpn8  1/1      Running   0           16m
pod/mongodb-deployment-8f6675bc5-q6pjj 1/1      Running   0           49m
root@ip-172-31-32-236:/home/ubuntu/k8s# kubectl get all
NAME                                TYPE                CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
service/kubernetes                 ClusterIP           10.100.0.1      <none>           443/TCP          60m
service/mongo-express-service      LoadBalancer       10.100.18.175   a9fadf1f2bbad4fc48ac7abb54702573-1126929404.ca-central-1.elb.amazonaws.com 8081:30000/TCP  16m
service/mongodb-service            ClusterIP           10.100.69.5     <none>           27017/TCP        49m
root@ip-172-31-32-236:/home/ubuntu/k8s# kubectl get all
NAME                                READY    UP-TO-DATE    AVAILABLE    AGE
deployment.apps/mongo-express      1/1      1              1            16m
deployment.apps/mongodb-deployment 1/1      1              1            49m
root@ip-172-31-32-236:/home/ubuntu/k8s# kubectl get all
NAME                                DESIRED    CURRENT    READY    AGE
replicaset.apps/mongo-express-78fcf796b8 1          1          1        16m
replicaset.apps/mongodb-deployment-8f6675bc5 1          1          1        49m
root@ip-172-31-32-236:/home/ubuntu/k8s# cd ..
root@ip-172-31-32-236:/home/ubuntu# tree k8s
k8s
├── ingress.yaml
├── k8s-commands.md
├── mongo-configmap.yaml
├── mongo-express.yaml
├── mongo-secret.yaml
└── mongo.yaml
0 directories, 6 files
root@ip-172-31-32-236:/home/ubuntu#
```

Once the application is deployed, it can be accessed by the load balancer url we get from the “Kubectl get svc” command.

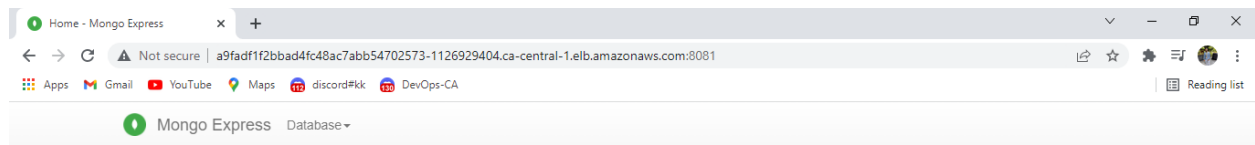
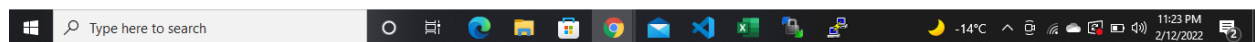
The images shown below depicts how different operations can be performed on the application deployed. A new database can be created, deleted, and can perform various function from the web-app only.



Databases			<input type="text" value="NewDB"/>	+ Create Database
	View	admin		Del
	View	config		Del
	View	local		Del
	View	test		Del

## Server Status

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



Databases			<input type="text" value="Database Name"/>	+ Create Database
	View	NewDB		Del
	View	admin		Del
	View	config		Del
	View	local		Del
	View	test		Del

## Server Status

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



NewDB - Mongo Express x +

Not secure | a9fadb1f2bbad4fc48ac7abb54702573-1126929404.ca-central-1.elb.amazonaws.com:8081/db/NewDB/

Apps Gmail YouTube Maps discord#kk DevOps-CA Reading list

Mongo Express Database: NewDB

## Viewing Database: NewDB

Collections

Collection Name  [+ Create collection](#)

[View](#)

[Export](#)

[\[JSON\]](#)

[Import](#)

delete\_me

[Del](#)

Database Stats

Collections (incl. system.namespaces)	1
Data Size	0 Byte
Storage Size	4.10 KB
Avg Obj Size #	0 Byte
Indexes #	1
Index Size	4.10 KB

Thank you,  
Vaishal Shah