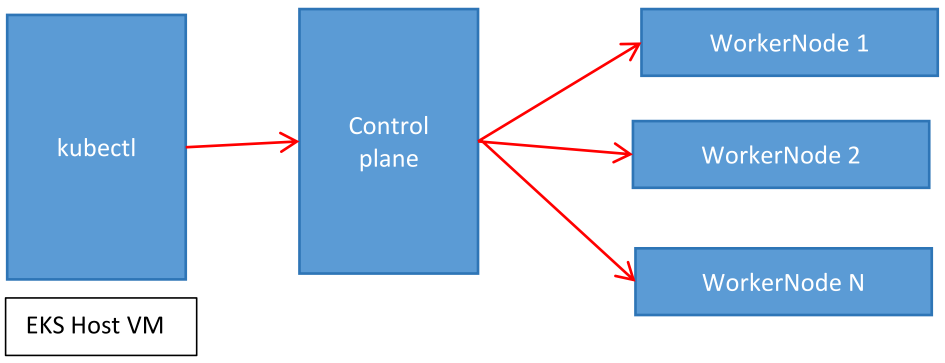
Kubernetes 6



Whenever we create a pod to deploy the application, are you sure out of all worker nodes we have which worker node our Pod will be in. No. Can you be sure your pod will be in a specific worker node? No. I want my Pods to be created in all Worker Nodes. DaemonSet (Create a Pod in each worker node). To get Logs from each of the Worker nodes, there is one concept called as Kibana, FluentD, ElasticSearch (EFK).

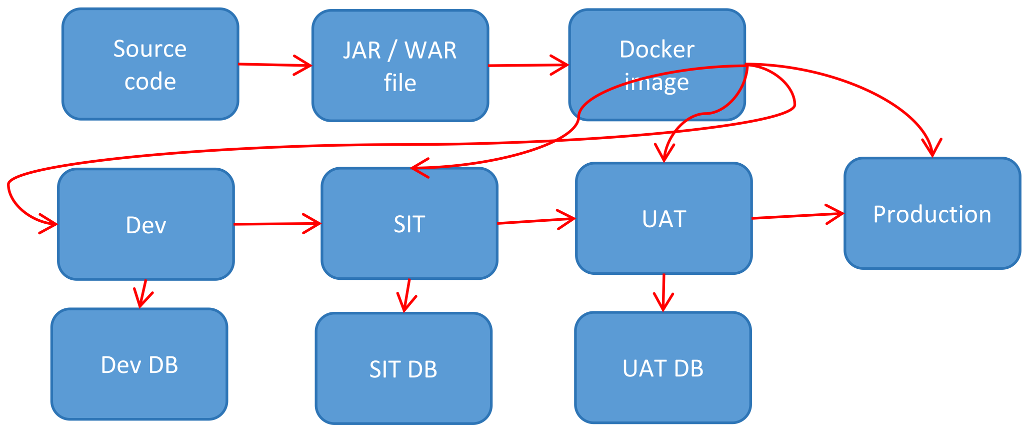
https://kubernetes.io/docs/concepts/workloads/controllers/daemonset/

A DaemonSet ensures that all (or some) Nodes run a copy of a Pod. As nodes are added to the cluster, Pods are added to them. As nodes are removed from the cluster, those Pods are garbage collected. Deleting a DaemonSet will clean up the Pods it created.

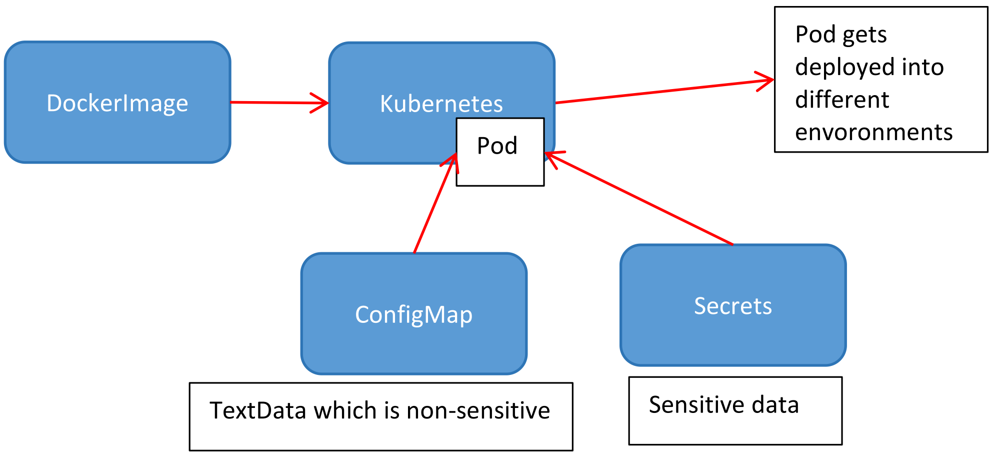
Stateless pod (no storage, no data is storage) and Stateful pod (all data will be maintained)

StatefulSet: It will create Stateful application (Ex: Database pods)
PV & PVC: Storage (Persistent Volume & Persistent Volume Clain) --> Used to manage the persistent storage --> To retain the data even if the pod is deleted or restarted (data is restored)

ConfigMap & Secrets --> To supply environment variables (Ex: DB credentials)



We package the application source code into a JAR or WAR file then we create the DockerImage. Can we use the same DockerImage in all environments? Yes if we don't hard-code. We can make application loosely coupled so the same DockerImage could be deployed in all environments. that's where ConfigMaps and Secrets come into picture. We can externalize environment-specific values like Database credentials, URLs, and keys. DockerImage gets deployed into Kubernetes Cluster Pod.

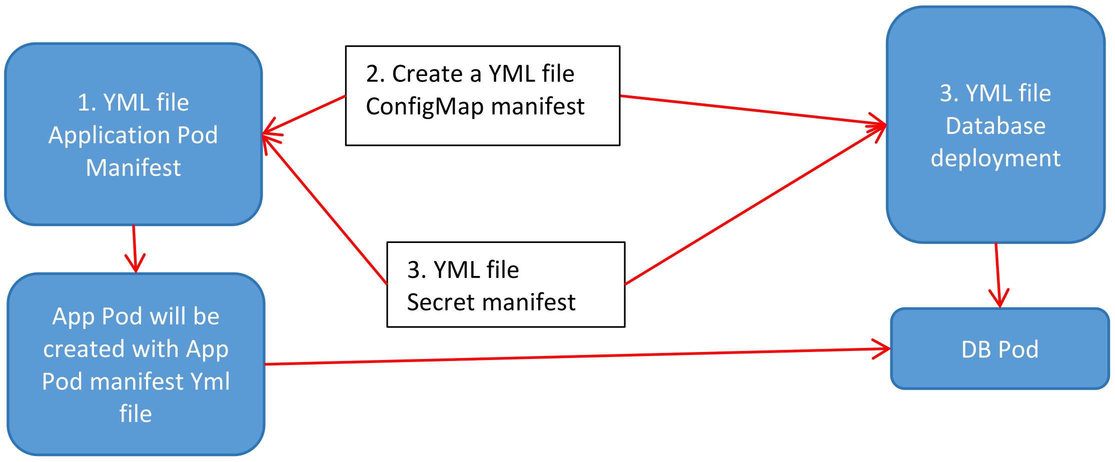

DockerImage
Kubernetes
Pod
Pod gets deployed into different envoronments
ConfigMap
Secrets
TextData which is non-sensitive
Sensitive data

We can deploy same Docker image into multiple environments (Dev, SIT, UAT etc) without modifying the image itself.

The other concept is Ingress controller:
It's like the Front controller, the one that faces the request. Ingress controller receives the request and which request should go to which Service. Basically the routing work is done by Ingress controller. To route incoming traffic to a particular service in the cluster. Readyness and Liveness probe to make sure Pods are ready and alive to receive requests.

Create K8s cluster
eksctl create cluster --name my-eks-cluster --region ca-central-1 --node-type t2.medium --zones ca-central-1a,ca-central-1b

ConfigMap manifest:


1. YML file Application Pod Manifest
2. Create a YML file ConfigMap manifest
3. YML file Database deployment
App Pod will be created with App Pod manifest Yml file
3. YML file Secret manifest
DB Pod

End goal is Application Pod must be able to connect to DB Pod. Config values are passed through ConfigMap and Secret manifests. To be able to connect App Pod with DB Pod, we require ConfigMap and Secret manifest to be passed into App Pod manifest as well. that's where our Pod will be able to make a connection with Database

If you go to this application.properties file, we can see Config values are passed dynamically. Environmental variables with default values if not passed https://github.com/Haider7214/spring-boot-mysql/blob/main/src/main/resources/application.properties

```
# Datasource settings

spring.datasource.url=${DB_URL:jdbc:mysql://mysqldb:3306/sbms}
spring.datasource.username=${DB_USERNAME:root}
spring.datasource.password=${DB_PASSWORD:root123}

# JPA settings
spring.jpa.hibernate.ddl-auto=update
spring.jpa.show-sql=true
```

```
ubuntu@ip-172-31-9-165:~$ mkdir config-map-secret-manifest
ubuntu@ip-172-31-9-165:~$ cd config-map-secret-manifest/
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ ls -l
total 0
```

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ vi 1-demo-db-configmap.yml
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ cat 1-demo-db-configmap.yml
apiVersion: v1
kind: ConfigMap
metadata:
  name: demo-db-config-map
  namespace: default  # Change if needed
  labels:
    storage: demo-db-storage
data:
  DB_HOST_SERVICE_NAME_VALUE: demo-app-db-service
  DB_PORT_VALUE: "3306"           # Or "3306" for MySQL
  DB_SCHEMA_VALUE: demo-mkdapp

ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ vi 2-demo-db-secret.yml
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ cat 2-demo-db-secret.yml
---
apiVersion: v1
kind: Secret
metadata:
  name: demo-db-config-secret
  namespace: default  # Change namespace if needed
  labels:
    secrete: demo-db-config-secrete
type: Opaque
data:
  DB_USER: cm9vdA==          # base64 for "root"
  DB_PASSWORD: cm9vdDEyMw==  # base64 for "root123"
...
```

Encoded DB credentials using Base64 only: https://www.base64encode.org/

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ cat 2-demo-db-secret.yml
---
apiVersion: v1
kind: Secret
```

```
metadata:
  name: demo-db-config-secret
  namespace: default  # Change namespace if needed
  labels:
    secrete: demo-db-config-secrete
type: Opaque
data:
  DB_USER: cm9vdA==           # base64 for "root"
  DB_PASSWORD: cm9vdDEyMw==  # base64 for "root123"
...
```

To make DB pod persistent, we add PV and PVC yml files. Even when the Pod is deleted, I want the data to be there

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ cat 3-demo-db-pv.yml
---
apiVersion: v1
kind: PersistentVolume
metadata:
  name: demo-db-pv
  labels:
    name: demo-db-pv
spec:
  capacity:
    storage: 4Gi
  accessModes:
    - ReadWriteOnce
  persistentVolumeReclaimPolicy: Retain
  storageClassName: local-storage
  hostPath:
    path: /opt/mysql

...
```

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ vi 4-demo-db-pvc.yml
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ cat 4-demo-db-pvc.yml
---
apiVersion: v1
kind: PersistentVolumeClaim
metadata:
  name: demo-db-pvc
spec:
  volumeName: demo-db-pv
  accessModes:
    - ReadWriteOnce
  resources:
    requests:
      storage: 4Gi
  storageClassName: local-storage
...
```

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ vi 5-demo-db-deployment.yml
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ cat 5-demo-db-deployment.yml
---
apiVersion: apps/v1
kind: Deployment
```

```
metadata:
  name: demo-app-db-deployment
  labels:
    app: demo-app-db
spec:
  replicas: 1
  selector:
    matchLabels:
      app: demo-app-db-pod
  template:
    metadata:
      labels:
        app: demo-app-db-pod
    spec:
      containers:
      - name: demo-app-db
        image: mysql:8.0
        ports:
        - containerPort: 3306
      volumes:
      - name: demo-app-db-volume
        persistentVolumeClaim:
          claimName: demo-db-pvc
---
apiVersion: v1
kind: Service
metadata:
  name: demo-app-db-service
  labels:
    app: demo-app-db-service
spec:
  type: ClusterIP
  selector:
    app: demo-app-db-pod
  ports:
    - protocol: TCP
      port: 3306
      targetPort: 3306
  clusterIP: None  # Headless service for stable DNS (optional, for StatefulSets or direct pod access)
...

ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ vi 5-demo-db-deployment.yml
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ cat 5-demo-db-deployment.yml
---
apiVersion: apps/v1
kind: Deployment
metadata:
  name: demo-app-db-deployment
  labels:
    app: demo-app-db
spec:
  replicas: 1
  selector:
    matchLabels:
      app: demo-app-db-pod
  template:
    metadata:
      labels:
        app: demo-app-db-pod
    spec:
      containers:
      - name: mysql
        image: mysql:8.0
        ports:
        - containerPort: 3306
        env:
        - name: MYSQL_ROOT_PASSWORD
          valueFrom:
            secretKeyRef:
              name: demo-db-config-secrete
              key: DB_PASSWORD_VALUE
        - name: MYSQL_DATABASE
          valueFrom:
            configKeyRef:
              name: demo-db-config-map
              key: DB_SCHEMA_VALUE
        volumeMounts:
        - name: demo-app-db-volume
          mountPath: /var/lib/mysql
      volumes:
      - name: demo-app-db-volume
        persistentVolumeClaim:
          claimName: demo-db-pvc
---
apiVersion: v1
kind: Service
metadata:
  name: demo-app-db-service
  labels:
    app: demo-app-db-service
spec:
  type: ClusterIP
  selector:
    app: demo-app-db-pod
  ports:
    - protocol: TCP
      port: 3306
      targetPort: 3306
  clusterIP: None  # Headless service for stable DNS (optional, for StatefulSets or direct pod access)
...

ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ vi 6-app-deployment.yml
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ cat 6-app-deployment.yml
---
apiVersion: apps/v1
kind: Deployment
metadata:
  name: spring-boot-mysql
spec:
  replicas: 1
  selector:
    matchLabels:
      app: spring-boot-mysql
  template:
    metadata:
      labels:
        app: spring-boot-mysql
    spec:
      containers:
        - name: spring-boot-mysql
          image: hacker123shiva/springboot-mysql-app:latest
          ports:
            - containerPort: 8080
          env:
            - name: DB_HOST
              valueFrom:
                configMapKeyRef:
                  name: demo-db-config-map
                  key: DB_HOST_SERVICE_NAME_VALUE

            - name: DB_NAME
              valueFrom:
                configMapKeyRef:
                  name: demo-db-config-map
                  key: DB_SCHEMA_VALUE

            - name: DB_USERNAME
              valueFrom:
                secretKeyRef:
                  name: demo-db-config-secrete
                  key: DB_USER_NAME_VALUE

            - name: DB_PASSWORD
              valueFrom:
                secretKeyRef:
                  name: demo-db-config-secrete
                  key: DB_PASSWORD_VALUE
---
apiVersion: v1
kind: Service
metadata:
  name: springboot-mysql-svc
spec:
  type: NodePort
  selector:
    app: spring-boot-mysql
  ports:
    - protocol: TCP
      port: 8080
      targetPort: 8080
      nodePort: 30785
...
```

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ ls -l
total 24
-rw-rw-r-- 1 ubuntu ubuntu  295 Jun  8 22:28 1-demo-db-configmap.yml
-rw-rw-r-- 1 ubuntu ubuntu  295 Jun  8 22:54 2-demo-db-secret.yml
-rw-rw-r-- 1 ubuntu ubuntu  284 Jun  8 23:18 3-demo-db-pv.yml
-rw-rw-r-- 1 ubuntu ubuntu  228 Jun  8 23:22 4-demo-db-pvc.yml
-rw-rw-r-- 1 ubuntu ubuntu 1258 Jun  9 00:01 5-demo-db-deployment.yml
-rw-rw-r-- 1 ubuntu ubuntu 1331 Jun  9 00:41 6-app-deployment.yml
```

Creating configMap

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl apply -f 1-demo-db-configmap.yml
configmap/demo-db-config-map created
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get cm
NAME               DATA   AGE
demo-db-config-map   3      23s
kube-root-ca.crt     1      3h18m
```

Creating secret

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl apply -f 2-demo-db-secret.yml
secret/demo-db-config-secret created
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get secret
NAME                  TYPE     DATA   AGE
demo-db-config-secret   Opaque   2      18s
```

Creating PV

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl apply -f 3-demo-db-pv.yml
persistentvolume/demo-db-pv created
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get pv
NAME         CAPACITY   ACCESS MODES   RECLAIM POLICY   STATUS      CLAIM   STORAGECLASS
VOLUMEATTRIBUTESCLASS   REASON   AGE
demo-db-pv   4Gi        RWO            Retain           Available           local-storage   <unset>                          22s
```

Creating PVC

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl apply -f 4-demo-db-pvc.yml
persistentvolumeclaim/demo-db-pvc created
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get pvc
NAME          STATUS    VOLUME       CAPACITY   ACCESS MODES   STORAGECLASS
VOLUMEATTRIBUTESCLASS   AGE
demo-db-pvc   Pending   demo-db-pv   0                         local-storage   <unset>                 11s
```

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ vi 5-demo-db-deployment.yml
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ cat 5-demo-db-deployment.yml
---
apiVersion: apps/v1
kind: Deployment
metadata:
  name: demo-app-db-deployment
  labels:
    app: demo-app-db
spec:
  replicas: 1
  selector:           # This is important and was misplaced in your YAML
    matchLabels:
      app: demo-app-db-pod
  template:
    metadata:
      labels:
        app: demo-app-db-pod
    spec:
      volumes:
        - name: demo-app-db-volume
          persistentVolumeClaim:
            claimName: demo-db-pvc
      containers:
        - name: demo-app-db
          image: mysql:8.0        # Add a version tag to ensure consistency
        ports:
          - containerPort: 3306
        volumeMounts:
          - name: demo-app-db-volume
            mountPath: /var/lib/mysql   # ✅ MySQL expects data here, not /opt/mysql
        env:
          - name: MYSQL_ROOT_PASSWORD
            valueFrom:
              secretKeyRef:
                name: demo-db-config-secrete
                key: DB_PASSWORD_VALUE
          - name: MYSQL_DATABASE
            valueFrom:
              configMapKeyRef:
                name: demo-db-config-map
                key: DB_SCHEMA_VALUE
---
apiVersion: v1
kind: Service
metadata:
  name: demo-app-db-service
  labels:
    app: demo-app-db-service
spec:
  type: ClusterIP
  ports:
    - port: 3306
      targetPort: 3306
      protocol: TCP
  selector:
    app: demo-app-db-pod
...

ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl apply -f 5-demo-db-deployment.yml
deployment.apps/demo-app-db-deployment created
service/demo-app-db-service configured
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get pods
NAME                                      READY   STATUS                       RESTARTS   AGE
demo-app-db-deployment-5667b4fdd9-wll8d   0/1     CreateContainerConfigError   0          33s
```

Some error trying to fix

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ cat 1-demo-db-configmap.yml
---
apiVersion: v1
kind: ConfigMap
metadata:
  name: demo-db-config-map       # Name of the ConfigMap
  labels:
    storage: demo-db-storage      # Optional: label for categorization or selection
data:
  DB_HOST_SERVICE_NAME_VALUE: demo-app-db-service
  DB_SCHEMA_VALUE: demo-mkdapp
  DB_PORT_VALUE: "3306"
...
```

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ cat 2-demo-db-secret.yml
---
apiVersion: v1
kind: Secret
metadata:
  name: demo-db-config-secrete  # Name of the secret
  labels:
    secrete: demo-db-config-secrete  # (Optional) label for identification
data:
  DB_USER_NAME_VALUE: cm9vdA==         # Base64 for "root"
  DB_PASSWORD_VALUE:  cm9vdDEyMw==       # Base64 for "root"
type: Opaque
...
```

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ vi 3-demo-db-pv.yml
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ cat 3-demo-db-pv.yml
---
apiVersion: v1
kind: PersistentVolume
metadata:
  name: demo-db-pv
  labels:
    name: demo-db-pv
spec:
  capacity:
    storage: 4Gi                     # 4 GiB of storage
  accessModes:
    - ReadWriteOnce                   # Only one node can mount it read-write
  persistentVolumeReclaimPolicy: Retain # Keeps the data even after PVC is deleted
  storageClassName: local-storage       # Must match with the PVC's storageClassName
  hostPath:
    path: /opt/mysql
...
```

Now everything is up and running

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl apply -f 1-demo-db-configmap.yml
configmap/demo-db-config-map unchanged
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl apply -f 2-demo-db-secret.yml
secret/demo-db-config-secrete created
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl apply -f 3-demo-db-pv.yml
persistentvolume/demo-db-pv unchanged
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl apply -f 4-demo-db-pvc.yml
persistentvolumeclaim/demo-db-pvc unchanged
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl apply -f 5-demo-db-deployment.yml
deployment.apps/demo-app-db-deployment unchanged
service/demo-app-db-service unchanged
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get pods
NAME                                      READY   STATUS    RESTARTS   AGE
demo-app-db-deployment-5667b4fdd9-wll8d   1/1     Running   0          61m
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get svc
NAME                  TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)    AGE
demo-app-db-service   ClusterIP   None         <none>        3306/TCP   68m
kubernetes            ClusterIP   10.100.0.1   <none>        443/TCP    4h36m
```

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get cm
NAME               DATA   AGE
demo-db-config-map   3      79m
kube-root-ca.crt     1      4h38m
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get secret
NAME                    TYPE     DATA   AGE
demo-db-config-secret    Opaque   2      78m
demo-db-config-secrete   Opaque   2      3m16s
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get pv
NAME         CAPACITY   ACCESS MODES   RECLAIM POLICY   STATUS   CLAIM                  STORAGECLASS
VOLUMEATTRIBUTESCLASS   REASON   AGE
demo-db-pv   4Gi        RWO            Retain           Bound    default/demo-db-pvc   local-storage   <unset>
77m
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get pvc
NAME          STATUS   VOLUME       CAPACITY   ACCESS MODES   STORAGECLASS
VOLUMEATTRIBUTESCLASS   AGE
demo-db-pvc   Bound    demo-db-pv   4Gi        RWO            local-storage   <unset>                 75m
```

To check whether MySQL is running inside this Pod

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl exec -it demo-app-db-deployment-
5667b4fdd9-wll8d -- bash
bash-5.1# mysql -h localhost -u root -p root
Enter password:
ERROR 1045 (28000): Access denied for user 'root'@'localhost' (using password: YES)
bash-5.1# mysql -u root -p
Enter password:
ERROR 1045 (28000): Access denied for user 'root'@'localhost' (using password: YES)
bash-5.1# mysql -u root -p root
Enter password:
ERROR 1049 (42000): Unknown database 'root'
bash-5.1# mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 11
Server version: 8.0.42 MySQL Community Server - GPL

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```
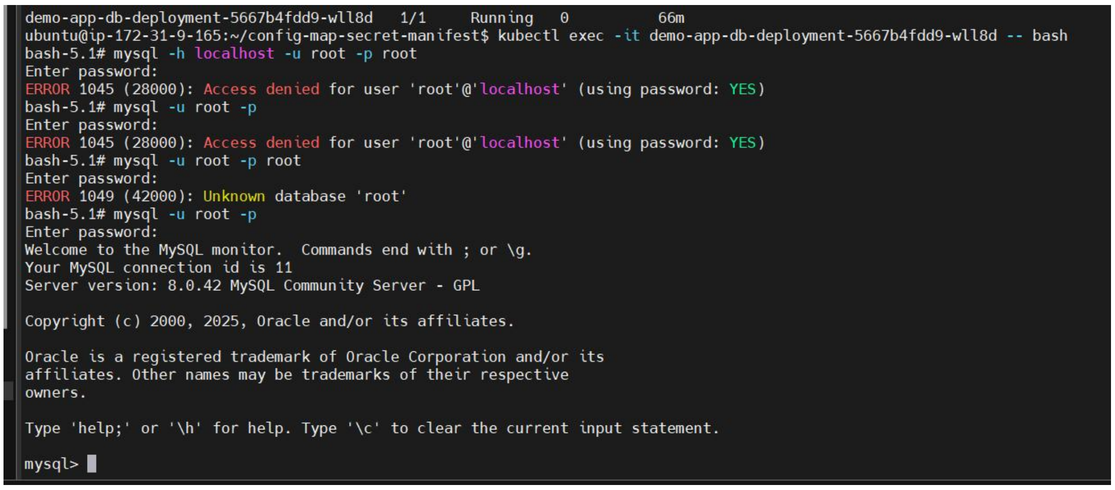

Password is root123



```
demo-app-db-deployment-5667b4fdd9-wll8d   1/1     Running   0          66m
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl exec -it demo-app-db-deployment-5667b4fdd9-wll8d -- bash
bash-5.1# mysql -h localhost -u root -p root
Enter password:
ERROR 1045 (28000): Access denied for user 'root'@'localhost' (using password: YES)
bash-5.1# mysql -u root -p
Enter password:
ERROR 1045 (28000): Access denied for user 'root'@'localhost' (using password: YES)
bash-5.1# mysql -u root -p root
Enter password:
ERROR 1049 (42000): Unknown database 'root'
bash-5.1# mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 11
Server version: 8.0.42 MySQL Community Server - GPL

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> 
```
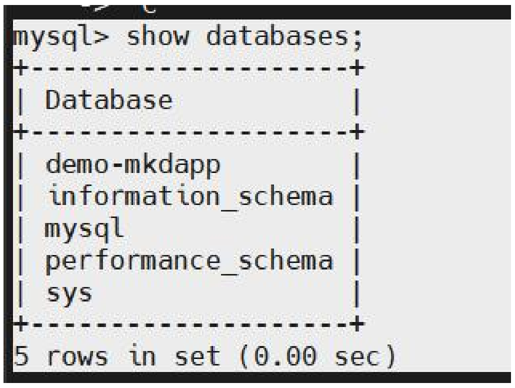
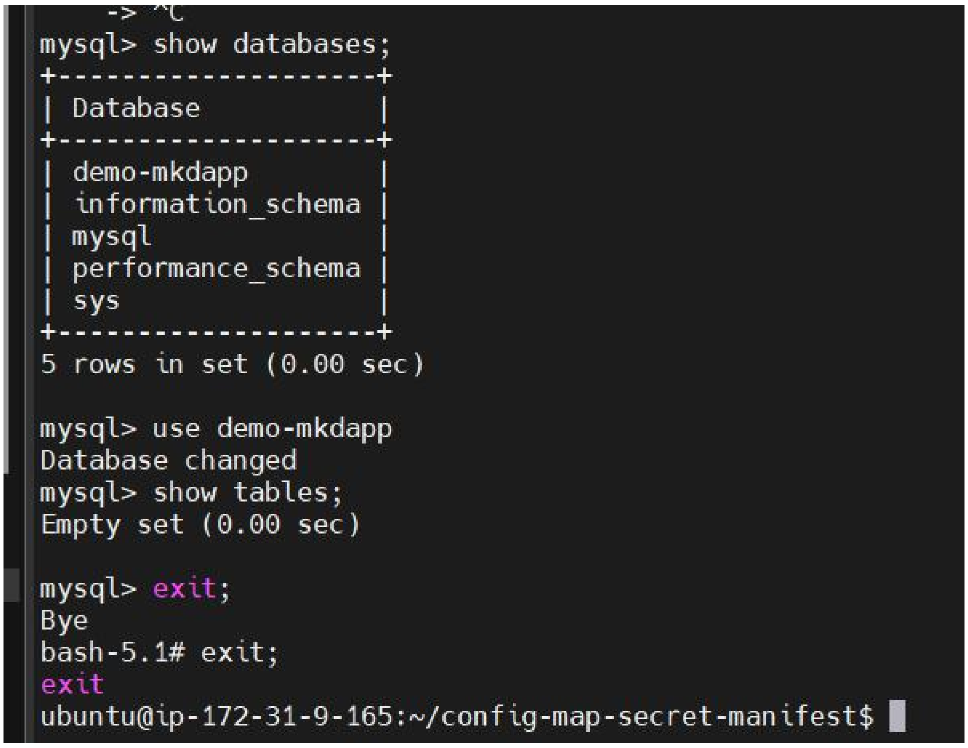

```
mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| demo-mkdapp        |
| information_schema |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
5 rows in set (0.00 sec)
```



```
mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| demo-mkdapp        |
| information_schema |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
5 rows in set (0.00 sec)
```

```
mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| demo-mkdapp        |
| information_schema |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
5 rows in set (0.00 sec)

mysql> use demo-mkdapp
Database changed
mysql> show tables;
Empty set (0.00 sec)
```

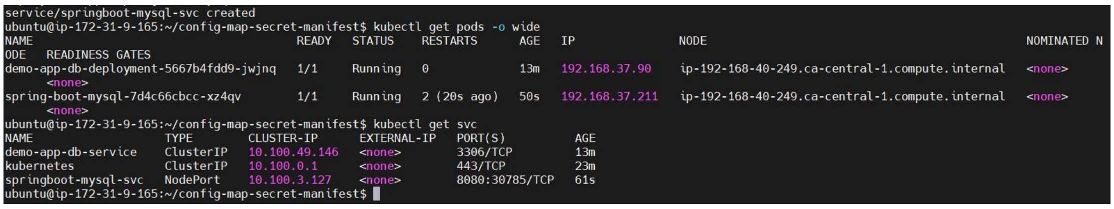


```
    -> ^C
mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| demo-mkdapp        |
| information_schema |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
5 rows in set (0.00 sec)

mysql> use demo-mkdapp
Database changed
mysql> show tables;
Empty set (0.00 sec)

mysql> exit;
Bye
bash-5.1# exit;
exit
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$
```

Delete cluster
eksctl delete cluster --name my-eks-cluster --region ca-central-1

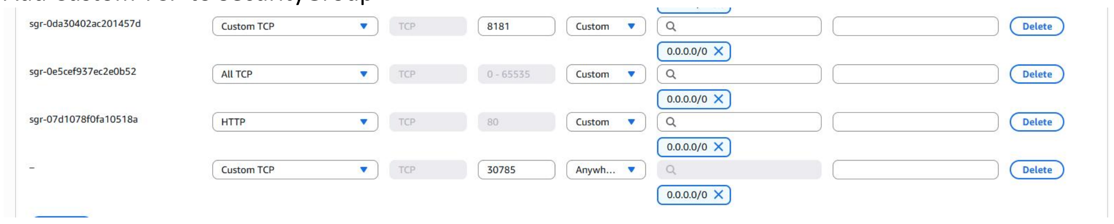
1:45:40

ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get pods -o wide
NAME   READY   STATUS   RESTARTS   AGE   IP   NODE
NOMINATED NODE   READINESS GATES
demo-app-db-deployment-5667b4fdd9-jwjnq   1/1   Running   0   109s   192.168.37.90   ip-192-168-40-249.ca-central-1.compute.internal   <none>   <none>



```
service/springboot-mysql-svc created
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get pods -o wide
NAME                                      READY   STATUS    RESTARTS      AGE   IP               NODE                                              NOMINATED N
ODE   READINESS GATES
demo-app-db-deployment-5667b4fdd9-jwjnq   1/1     Running   0             13m   192.168.37.90    ip-192-168-40-249.ca-central-1.compute.internal   <none>
      <none>
spring-boot-mysql-7d4c66cbcc-xz4qv        1/1     Running   2 (20s ago)   50s   192.168.37.211   ip-192-168-40-249.ca-central-1.compute.internal   <none>
      <none>
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get svc
NAME                   TYPE        CLUSTER-IP      EXTERNAL-IP   PORT(S)          AGE
demo-app-db-service    ClusterIP   10.100.49.146   <none>        3306/TCP         13m
kubernetes             ClusterIP   10.100.0.1      <none>        443/TCP          23m
springboot-mysql-svc   NodePort    10.100.3.127    <none>        8080:30785/TCP   61s
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$
```

Add Custom TCP to SecurityGroup

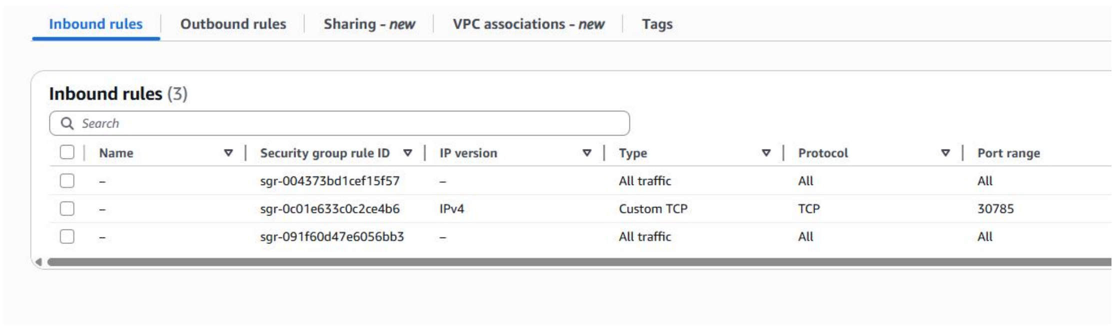


sgr-0da30402ac201457d	Custom TCP	TCP	8181	Custom	0.0.0.0/0		Delete
sgr-0e5cef937ec2e0b52	All TCP	TCP	0 - 65535	Custom	0.0.0.0/0		Delete
sgr-07d1078f0fa10518a	HTTP	TCP	80	Custom	0.0.0.0/0		Delete
–	Custom TCP	TCP	30785	Anywh...	0.0.0.0/0		Delete

spring-boot-mysql-7d4c66cbcc-xz4qv   1/1   Running   2 (20s ago)   50s   192.168.37.211   ip-192-168-40-249.ca-central-1.compute.internal

Get the Private IP: 192-168-40-249 and find the Worker node where it is deployed

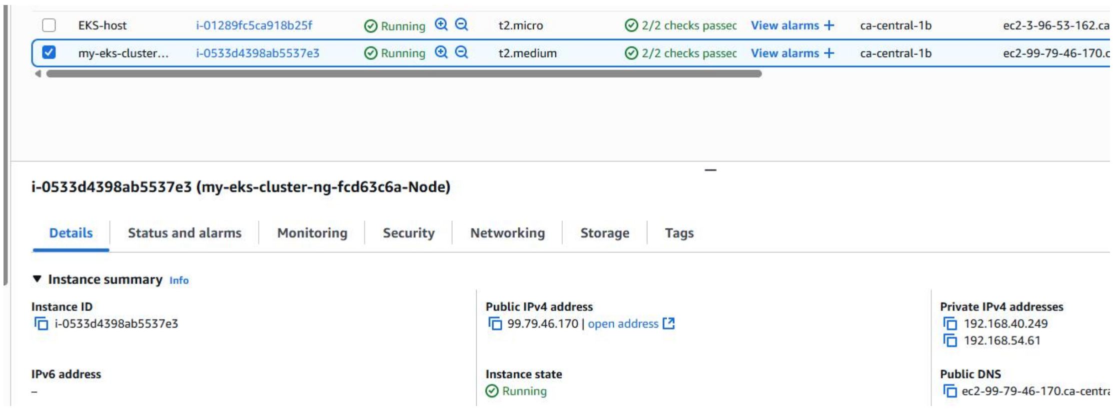
I add port: 30785 to the Security Group
http://99.79.46.170:30785/



Inbound rules | Outbound rules | Sharing - *new* | VPC associations - *new* | Tags

Inbound rules (3)

Name	Security group rule ID	IP version	Type	Protocol	Port range
–	sgr-004373bd1cef15f57	–	All traffic	All	All
–	sgr-0c01e633c0c2ce4b6	IPv4	Custom TCP	TCP	30785
–	sgr-091f60d47e6056bb3	–	All traffic	All	All



Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
EKS-host	i-01289fc5ca918b25f	Running	t2.micro	2/2 checks passec	View alarms +	ca-central-1b	ec2-3-96-53-162.ca
my-eks-cluster...	i-0533d4398ab5537e3	Running	t2.medium	2/2 checks passec	View alarms +	ca-central-1b	ec2-99-79-46-170.c

i-0533d4398ab5537e3 (my-eks-cluster-ng-fcd63c6a-Node)

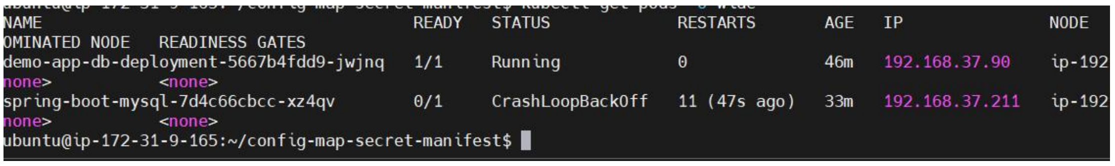
Details | Status and alarms | Monitoring | Security | Networking | Storage | Tags

Instance summary Info

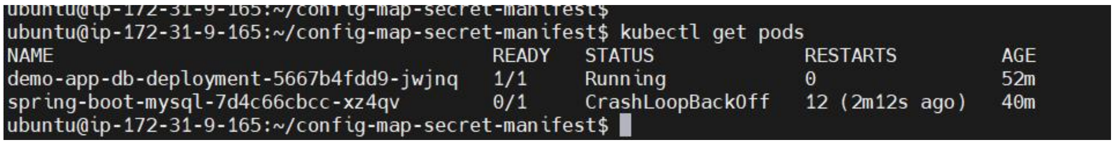
Instance ID	Public IPv4 address	Private IPv4 addresses
i-0533d4398ab5537e3	99.79.46.170 | open address	192.168.40.249 192.168.54.61
IPv6 address	**Instance state**	**Public DNS**
–	Running	ec2-99-79-46-170.ca-centr

http://99.79.46.170:30785/

Pod crashed



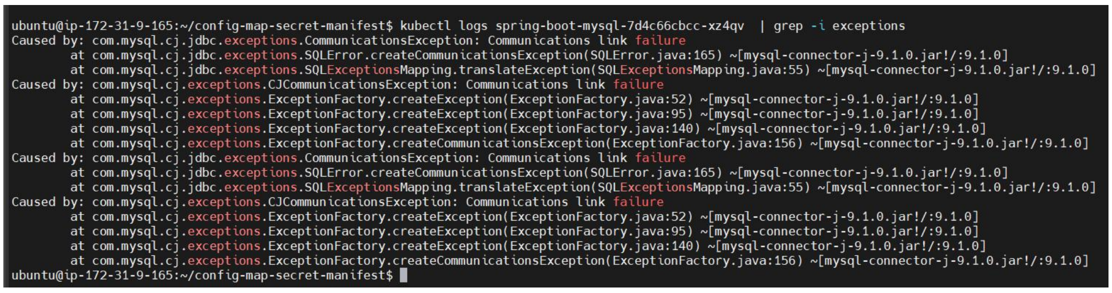
```
NAME                                  READY   STATUS             RESTARTS       AGE   IP               NODE
OMINATED NODE   READINESS GATES
demo-app-db-deployment-5667b4fdd9-jwjnq   1/1     Running            0              46m   192.168.37.90    ip-192
none>           <none>
spring-boot-mysql-7d4c66cbcc-xz4qv        0/1     CrashLoopBackOff   11 (47s ago)   33m   192.168.37.211   ip-192
none>           <none>
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$
```



```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get pods
NAME                                      READY   STATUS             RESTARTS        AGE
demo-app-db-deployment-5667b4fdd9-jwjnq   1/1     Running            0               52m
spring-boot-mysql-7d4c66cbcc-xz4qv        0/1     CrashLoopBackOff   12 (2m12s ago)   40m
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$
```

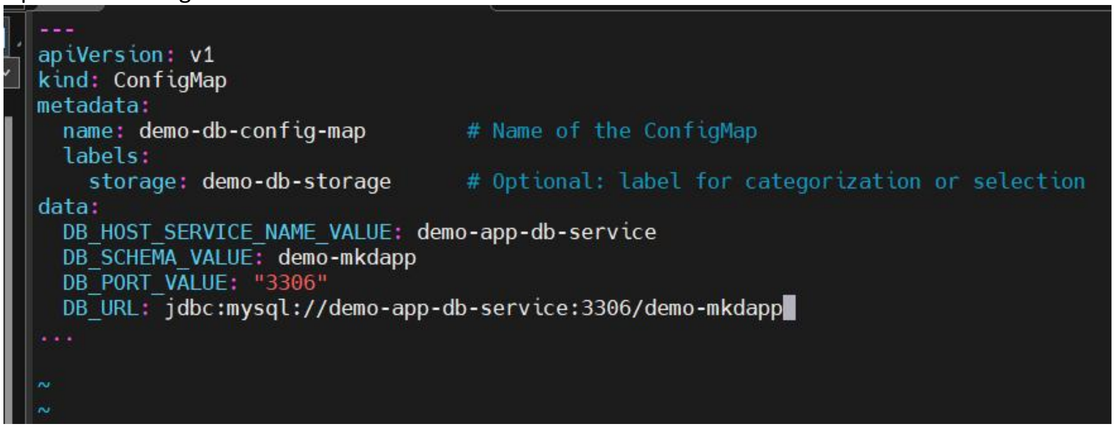
Lets debug, look into the logs

```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl logs spring-boot-mysql-7d4c66cbcc-xz4qv  | grep -i exceptions
```



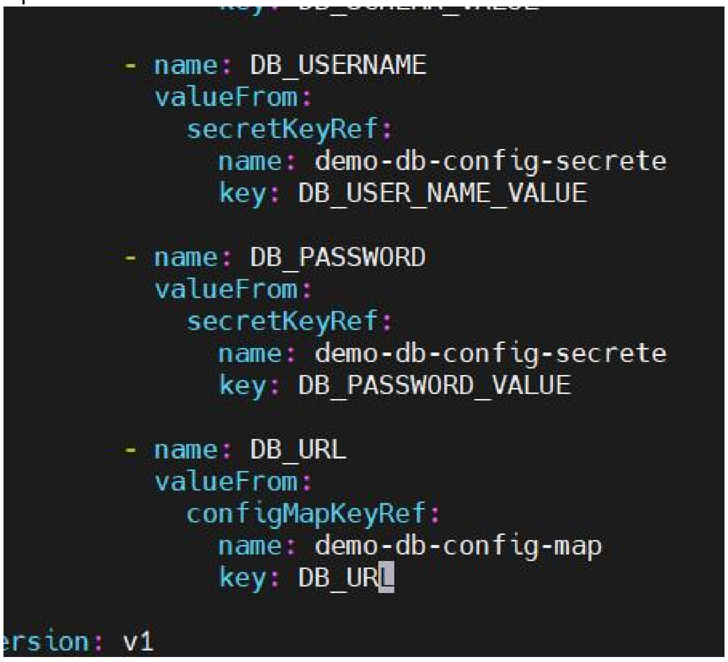
```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl logs spring-boot-mysql-7d4c66cbcc-xz4qv  | grep -i exceptions
Caused by: com.mysql.cj.jdbc.exceptions.CommunicationsException: Communications link failure
        at com.mysql.cj.jdbc.exceptions.SQLError.createCommunicationsException(SQLError.java:165) ~[mysql-connector-j-9.1.0.jar!/:9.1.0]
        at com.mysql.cj.jdbc.exceptions.SQLExceptionsMapping.translateException(SQLExceptionsMapping.java:55) ~[mysql-connector-j-9.1.0.jar!/:9.1.0]
Caused by: com.mysql.cj.exceptions.CJCommunicationsException: Communications link failure
        at com.mysql.cj.exceptions.ExceptionFactory.createException(ExceptionFactory.java:52) ~[mysql-connector-j-9.1.0.jar!/:9.1.0]
        at com.mysql.cj.exceptions.ExceptionFactory.createException(ExceptionFactory.java:95) ~[mysql-connector-j-9.1.0.jar!/:9.1.0]
        at com.mysql.cj.exceptions.ExceptionFactory.createException(ExceptionFactory.java:140) ~[mysql-connector-j-9.1.0.jar!/:9.1.0]
        at com.mysql.cj.exceptions.ExceptionFactory.createCommunicationsException(ExceptionFactory.java:156) ~[mysql-connector-j-9.1.0.jar!/:9.1.0]
Caused by: com.mysql.cj.jdbc.exceptions.CommunicationsException: Communications link failure
        at com.mysql.cj.jdbc.exceptions.SQLError.createCommunicationsException(SQLError.java:165) ~[mysql-connector-j-9.1.0.jar!/:9.1.0]
        at com.mysql.cj.jdbc.exceptions.SQLExceptionsMapping.translateException(SQLExceptionsMapping.java:55) ~[mysql-connector-j-9.1.0.jar!/:9.1.0]
Caused by: com.mysql.cj.exceptions.CJCommunicationsException: Communications link failure
        at com.mysql.cj.exceptions.ExceptionFactory.createException(ExceptionFactory.java:52) ~[mysql-connector-j-9.1.0.jar!/:9.1.0]
        at com.mysql.cj.exceptions.ExceptionFactory.createException(ExceptionFactory.java:95) ~[mysql-connector-j-9.1.0.jar!/:9.1.0]
        at com.mysql.cj.exceptions.ExceptionFactory.createException(ExceptionFactory.java:140) ~[mysql-connector-j-9.1.0.jar!/:9.1.0]
        at com.mysql.cj.exceptions.ExceptionFactory.createCommunicationsException(ExceptionFactory.java:156) ~[mysql-connector-j-9.1.0.jar!/:9.1.0]
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$
```

Updated 1-config file

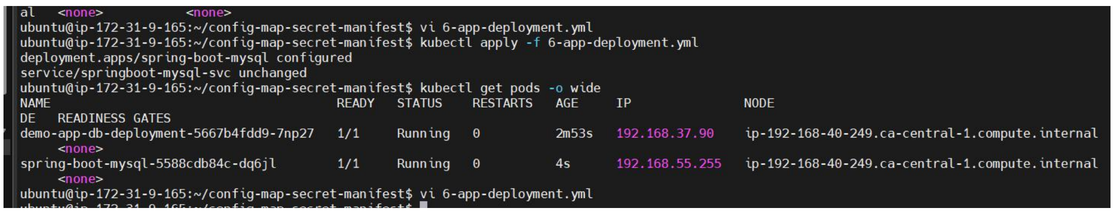


```
---
apiVersion: v1
kind: ConfigMap
metadata:
  name: demo-db-config-map         # Name of the ConfigMap
  labels:
    storage: demo-db-storage       # Optional: label for categorization or selection
data:
  DB_HOST_SERVICE_NAME_VALUE: demo-app-db-service
  DB_SCHEMA_VALUE: demo-mkdapp
  DB_PORT_VALUE: "3306"
  DB_URL: jdbc:mysql://demo-app-db-service:3306/demo-mkdapp
...

~
~
```

Update file 6 also

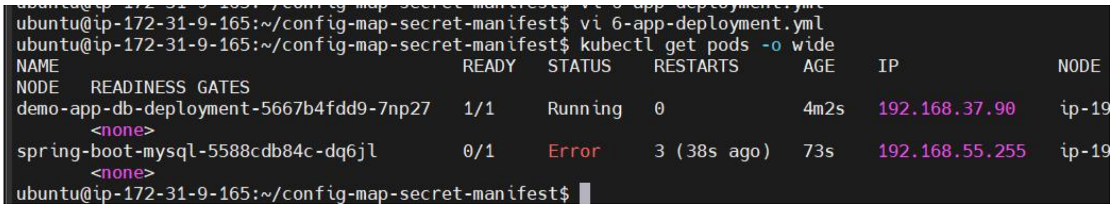


```
        - name: DB_USERNAME
          valueFrom:
            secretKeyRef:
              name: demo-db-config-secrete
              key: DB_USER_NAME_VALUE

        - name: DB_PASSWORD
          valueFrom:
            secretKeyRef:
              name: demo-db-config-secrete
              key: DB_PASSWORD_VALUE

        - name: DB_URL
          valueFrom:
            configMapKeyRef:
              name: demo-db-config-map
              key: DB_URL

ersion: v1
```



```
al   <none>           <none>
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ vi 6-app-deployment.yml
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl apply -f 6-app-deployment.yml
deployment.apps/spring-boot-mysql configured
service/springboot-mysql-svc unchanged
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get pods -o wide
NAME                                       READY   STATUS    RESTARTS   AGE     IP               NODE
DE   READINESS GATES
demo-app-db-deployment-5667b4fdd9-7np27   1/1     Running   0          2m53s   192.168.37.90    ip-192-168-40-249.ca-central-1.compute.internal
     <none>
spring-boot-mysql-5588cdb84c-dq6jl        1/1     Running   0          4s      192.168.55.255   ip-192-168-40-249.ca-central-1.compute.internal
     <none>
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ vi 6-app-deployment.yml
```

Some Env issue



```
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ vi 6-app-deployment.yml
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl get pods -o wide
NAME                                    READY   STATUS    RESTARTS      AGE    IP                NODE
NODE    READINESS GATES
demo-app-db-deployment-5667b4fdd9-7np27   1/1     Running   0             4m2s   192.168.37.90     ip-19
       <none>
spring-boot-mysql-5588cdb84c-dq6jl        0/1     Error     3 (38s ago)   73s    192.168.55.255    ip-19
       <none>
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$
```

http://99.79.46.170:30785/

Will fix in the next class
ubuntu@ip-172-31-9-165:~/config-map-secret-manifest$ kubectl delete all --all

Delete cluster
eksctl delete cluster --name my-eks-cluster --region ca-central-1