Kubernetes Day-6 With Amazon Q and MCP servers

ConfigMaps and secrets

Configmaps - are used to store non-sensitive information like (config files)

Secrets - are used to store sensitive information like (passwords, API keys)

ConfigMaps

```yaml
apiVersion: v1
kind: ConfigMap
metadata:
    name: mysql-config-map
    namespace: mysql
data:
    MYSQL_DATABASE: devops
```

Secrets

```yaml
apiVersion: v1
kind: Secret
metadata:
  name: mysql-secrets
  namespace: mysql
data:
  type: Opaque
  # Values must be base64 encoded
  # These are example values - in production, never commit actual secrets to version control
  # echo "cm9vdAo= " | base64 encoded "password123"
  # echo "cm9vdHBhc3N3b3JkCg==" | base64 encoded
```

Service Quotas: Resource requests and limits

Resource requests: ensures that each pod gets guaranteed minimum amount of cpu and

memory.

Limits: prevent a pod from using more than specified **maximum** amount of cpu and memory.

```
resources:
  requests:
    cpu: 100m
    memory: 128Mi
  limits:
    cpu: 200m
    memory: 256Mi
```

Taints and Tolerance

- Taints: is a way of telling k8s cluster that on this particular node the pod will not be created/scheduled
- Tolerance: means even if the server is tainted and we still want to run the pod on it that is known as tolerance.

```
NAME                         STATUS   ROLES           AGE   VERSION
tws-cluster-control-plane    Ready    control-plane   28h   v1.31.2
tws-cluster-worker           Ready    <none>          28h   v1.31.2
tws-cluster-worker2          Ready    <none>          28h   v1.31.2
tws-cluster-worker3          Ready    <none>          28h   v1.31.2
ubuntu@ip-172-31-12-22:~/kubernetes-in-one-shot/nginx$ kubectl taint node tws-c
luster-worker prod=true:NoSchedule
node/tws-cluster-worker tainted
ubuntu@ip-172-31-12-22:~/kubernetes-in-one-shot/nginx$ kubectl taint node tws-c
luster-worker2 prod=true:NoSchedule
node/tws-cluster-worker2 tainted
ubuntu@ip-172-31-12-22:~/kubernetes-in-one-shot/nginx$ kubectl taint node tws-c
luster-worker3 prod=true:NoSchedule
node/tws-cluster-worker3 tainted
```

```
ubuntu@ip-172-31-12-22:~/kubernetes-in-one-shot/nginx$ kubectl get pods -n ngin
x
NAME        READY   STATUS     RESTARTS   AGE
nginx-pod   0/1     Pending    0          7s
```

```
ubuntu@ip-172-31-12-22:~/kubernetes-in-one-shot/nginx$ kubectl taint node tws-c
luster-worker2 prod=true:NoSchedule-
node/tws-cluster-worker2 untainted
```

```
ubuntu@ip-172-31-12-22:~/kubernetes-in-one-shot/nginx$ kubectl get pods -n ngin
x
NAME         READY   STATUS    RESTARTS   AGE
nginx-pod    1/1     Running   0          102s
```

```yaml
kind: Pod
apiVersion: v1
metadata:
  name: nginx-pod
  namespace: nginx
spec:
  containers:
  - name: nginx
    image: nginx:latest
    ports:
    - containerPort: 80
  tolerations:
    - key: "prod"
      operator: "Equal"
      value: "true"
      effect: "NoSchedule"
```