**Lab Exercise 15- Creating Secrets in Kubernetes**

Creating secrets in Kubernetes is an essential practice for managing sensitive information such as passwords, OAuth tokens, and SSH keys. Let's go through a lab exercise that demonstrates how to create different types of secrets in Kubernetes.

**Step 1: Create a Generic Secret**

Create a secret from literal values:

kubectl create secret generic my-secret --from-literal=username=admin --from-literal=password='P@ssw0rd'

Verify the secret:

kubectl get secrets my-secret -o yaml

The output will be base64 encoded. To decode, you can use:

echo -n “P@ssw0rd” | base64

**Step 2: Create a Secret from a File**

Create a file with your sensitive data:

echo -n 'my-username' > ./username.txt

echo -n 'my-password' > ./password.txt

Create a secret from the file:

kubectl create secret generic my-file-secret --from-file=username=./username.txt --from-file=password=./password.txt

Verify the secret:

kubectl get secrets my-file-secret -o yaml

**Step 3: Create a Docker Registry Secret**

Create a Docker registry secret:

kubectl create secret docker-registry my-registry-secret --docker-username=<your-username> --docker-password=<your-password> --docker-email=<your-email> --docker-server=<your-docker-server>

Verify the secret:

kubectl get secrets my-registry-secret -o yaml

**Step 4: Create a Secret Using a YAML Manifest**

Create a YAML file for the secret:

Create a file named **my-secret-pod.yaml** with the following content:

apiVersion: v1

kind: Secret

metadata:

name: my-manifest-secret

type: Opaque

data:

username: YWRtaW4= # base64 encoded value of 'admin'

password: UEBzc3cwcmQ= # base64 encoded value of 'P@ssw0rd'

Apply the YAML file:

kubectl apply -f my-manifest-secret.yaml

Verify the secret:

kubectl get secrets my-manifest-secret -o yaml

**Step 5: Use Secrets in Pods**

Create a pod that uses the secret:

Create a file named **pod-with-secret.yaml** with the following content:

apiVersion: v1

kind: Pod

metadata:

name: pod-with-secret

spec:

containers:

- name: mycontainer

image: nginx

env:

- name: USERNAME

valueFrom:

secretKeyRef:

name: my-secret

key: username

- name: PASSWORD

valueFrom:

secretKeyRef:

name: my-secret

key: password

restartPolicy: Never

Apply the YAML file:

kubectl apply -f pod-with-secret.yaml

Verify the pod is running and the secret is being used:

kubectl exec pod-with-secret -- printenv | grep -E 'USERNAME|PASSWORD'

**Step 7: Clean Up**

Delete the secrets:

kubectl delete secret my-secret

kubectl delete secret my-file-secret

kubectl delete secret my-registry-secret

kubectl delete secret my-manifest-secret

Delete the pod:

kubectl delete pod pod-with-secret