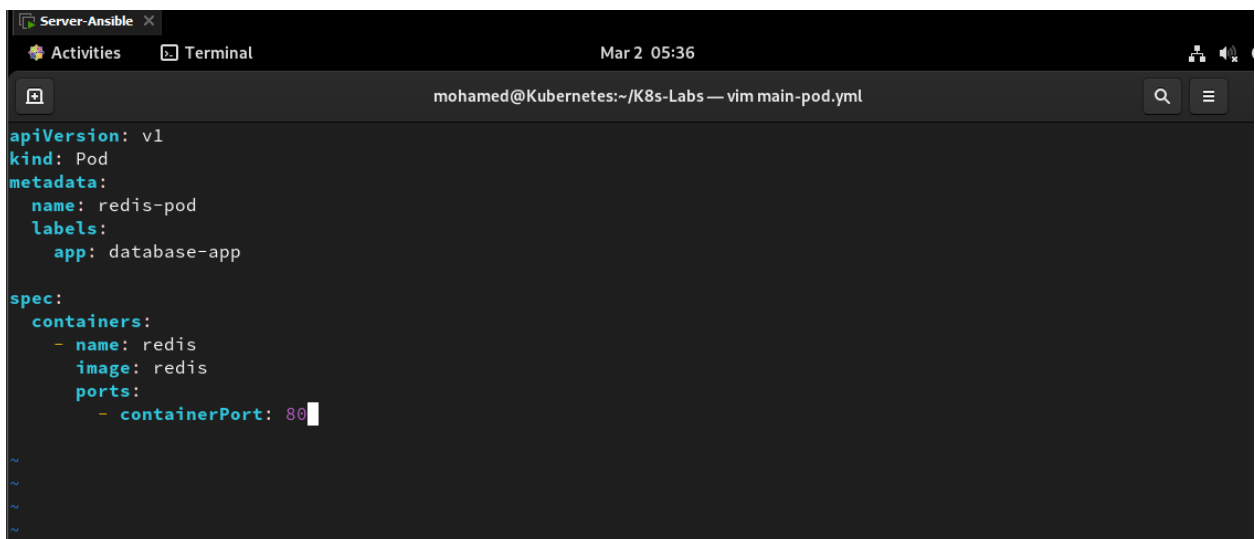


K8S-Lab1

Mohamed Reda Doda

1- Install k8s cluster (minikube)

2- Create a pod with the name redis and with the image redis.

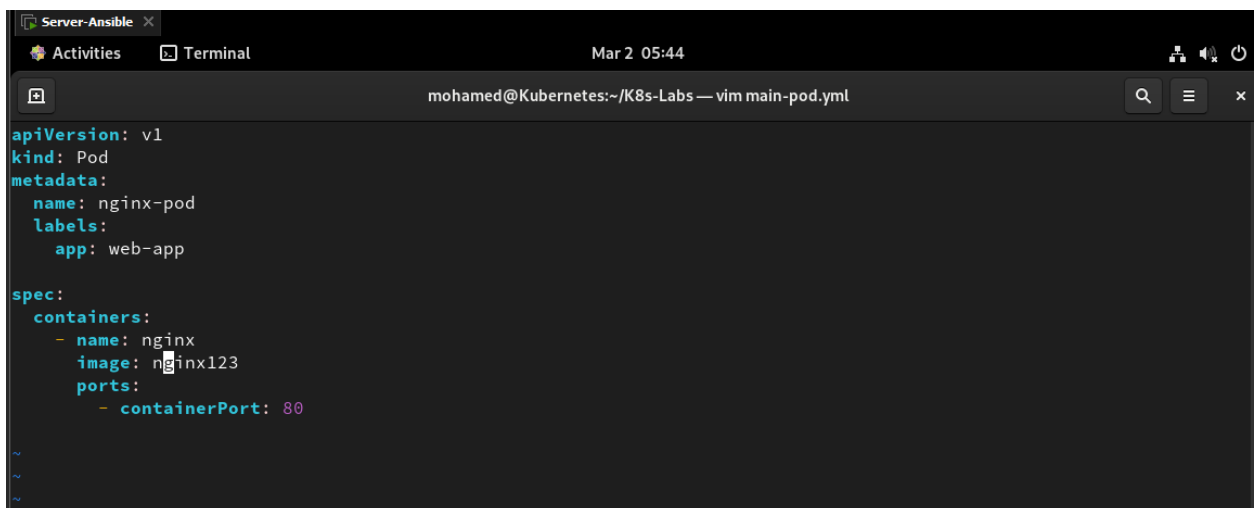


The screenshot shows a terminal window titled "Server-Ansible" with a sub-window "Terminal" open. The terminal prompt is "mohamed@Kubernetes:~/K8s-Labs — vim main-pod.yml". The content of the file is a Kubernetes pod definition for Redis:

```
apiVersion: v1
kind: Pod
metadata:
  name: redis-pod
  labels:
    app: database-app
spec:
  containers:
    - name: redis
      image: redis
      ports:
        - containerPort: 80
```

3- Create a pod with the name nginx and with the image “nginx123”

Use a pod-definition YAML file.



The screenshot shows a terminal window titled "Server-Ansible" with a sub-window "Terminal" open. The terminal prompt is "mohamed@Kubernetes:~/K8s-Labs — vim main-pod.yml". The content of the file is a Kubernetes pod definition for Nginx:

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
  labels:
    app: web-app
spec:
  containers:
    - name: nginx
      image: nginx123
      ports:
        - containerPort: 80
```

4- What is the nginx pod status?

```
Activities Terminal Mar 2 05:46
mohamed@Kubernetes:~/K8s-Labs

[mohamed@Kubernetes ~]$ cd K8s-Labs/
[mohamed@Kubernetes K8s-Labs]$ ls
main-pod.yml
[mohamed@Kubernetes K8s-Labs]$ kubectl create -f main-pod.yml
pod/redis-pod created
[mohamed@Kubernetes K8s-Labs]$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
redis-pod     1/1     Running   0           50s
[mohamed@Kubernetes K8s-Labs]$ vim main-pod.yml
[mohamed@Kubernetes K8s-Labs]$ kubectl apply -f main-pod.yml
pod/nginx-pod created
[mohamed@Kubernetes K8s-Labs]$ kubectl get pods
NAME          READY   STATUS             RESTARTS   AGE
nginx-pod     0/1     ImagePullBackOff   0           19s
redis-pod     1/1     Running            0           4m8s
[mohamed@Kubernetes K8s-Labs]$
```

5- Change the nginx pod image to “nginx” check the status again

```
[mohamed@Kubernetes K8s-Labs]$ kubectl apply -f main-pod.yml
pod/nginx-pod configured
[mohamed@Kubernetes K8s-Labs]$ kubectl get pods
NAME          READY   STATUS             RESTARTS   AGE
nginx-pod     0/1     ImagePullBackOff   0           2m51s
redis-pod     1/1     Running            0           6m40s
[mohamed@Kubernetes K8s-Labs]$ kubectl get pods
NAME          READY   STATUS             RESTARTS   AGE
nginx-pod     0/1     ImagePullBackOff   0           3m10s
redis-pod     1/1     Running            0           6m59s
[mohamed@Kubernetes K8s-Labs]$ vim main-pod.yml
[mohamed@Kubernetes K8s-Labs]$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx-pod     1/1     Running   0           4m20s
redis-pod     1/1     Running   0           8m9s
[mohamed@Kubernetes K8s-Labs]$
```

6- How many ReplicaSets exist on the system?

```
[mohamed@Kubernetes K8s-Labs]$ kubectl get rs
No resources found in default namespace.
[mohamed@Kubernetes K8s-Labs]$
```

7- create a ReplicaSet with

name= replica-set-1

image= busybox

replicas= 3

```
apiVersion: apps/v1
kind: ReplicaSet
metadata:
  name: replicaset1
  labels:
    app: traffic-app
spec:
  replicas: 3
  selector:
    matchLabels:
      app: myapp
  template:
    metadata:
      labels:
        app: myapp
    spec:
      containers:
        - name: busybox-container
          image: busybox
          command: ["sh", "-c", "while true; do sleep 3600; done"]
          ports:
            - containerPort: 80
```

```
[mohamed@Kubernetes K8s-Labs]$ vim myreplicaset.yml
[mohamed@Kubernetes K8s-Labs]$ kubectl create -f myreplicaset.yml
replicaset.apps/replicaset1 created
[mohamed@Kubernetes K8s-Labs]$ kubectl get rs
NAME          DESIRED   CURRENT   READY   AGE
replicaset1   3         3         2       12s
```

8- Scale the ReplicaSet replica-set-1 to 5 PODs.

9- How many PODs are READY in the replica-set-1?

```
[mohamed@Kubernetes K8s-Labs]$ kubectl scale rs replicaset1 --replicas=5
replicaset.apps/replicaset1 scaled
[mohamed@Kubernetes K8s-Labs]$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx-pod     1/1     Running   0           37m
redis-pod     1/1     Running   0           41m
replicaset1-6rzsc 1/1     Running   0           38s
replicaset1-7lnbj 1/1     Running   0           3m59s
replicaset1-c6rcn 1/1     Running   0           3m59s
replicaset1-fcjjr 1/1     Running   0           3m59s
replicaset1-tvh4k 1/1     Running   0           38s
[mohamed@Kubernetes K8s-Labs]$ kubectl get rs replicaset1
NAME          DESIRED   CURRENT   READY   AGE
replicaset1   5         5         5       4m31s
[mohamed@Kubernetes K8s-Labs]$
```

10- Delete any one of the 5 PODs then check How many PODs exist now?

Why are there still 5 PODs, even after you deleted one?

The ReplicaSet ensures high availability by maintaining the desired state, recreating a pod if one is deleted

```
[mohamed@Kubernetes K8s-Labs]$ kubectl get pods
NAME                READY   STATUS    RESTARTS   AGE
nginx-pod            1/1     Running   0           37m
redis-pod            1/1     Running   0           41m
replicaset1-6rzsc    1/1     Running   0           38s
replicaset1-7lnbj    1/1     Running   0           3m59s
replicaset1-c6rcn    1/1     Running   0           3m59s
replicaset1-fcjrr    1/1     Running   0           3m59s
replicaset1-tvh4k    1/1     Running   0           38s
[mohamed@Kubernetes K8s-Labs]$ kubectl get rs replicaset1
NAME                DESIRED   CURRENT   READY   AGE
replicaset1         5         5         5       4m31s
[mohamed@Kubernetes K8s-Labs]$ kubectl delete pod replicaset1-tvh4k
pod "replicaset1-tvh4k" deleted
[mohamed@Kubernetes K8s-Labs]$ kubectl get pods
NAME                READY   STATUS    RESTARTS   AGE
nginx-pod            1/1     Running   0           41m
redis-pod            1/1     Running   0           45m
replicaset1-6rzsc    1/1     Running   0           4m28s
replicaset1-7lnbj    1/1     Running   0           7m49s
replicaset1-89x75    1/1     Running   0           90s
replicaset1-c6rcn    1/1     Running   0           7m49s
replicaset1-fcjrr    1/1     Running   0           7m49s
```

11- How many Deployments and ReplicaSets exist on the system?

```
[mohamed@Kubernetes K8s-Labs]$ kubectl get rs
NAME                DESIRED   CURRENT   READY   AGE
replicaset1         5         5         5       12m
[mohamed@Kubernetes K8s-Labs]$ kubectl get deployments
No resources found in default namespace.
```

12- create a Deployment with

name= deployment-1

image= busybox

replicas= 3

```
[mohamed@Kubernetes K8s-Labs]$ vim deployment-1.yml
[mohamed@Kubernetes K8s-Labs]$ kubectl create -f deployment-1.yml
deployment.apps/deployment-1 created
[mohamed@Kubernetes K8s-Labs]$ kubectl get deployments
NAME          READY    UP-TO-DATE    AVAILABLE    AGE
deployment-1   3/3      3             3            17s
[mohamed@Kubernetes K8s-Labs]$ kubectl get rs
NAME          DESIRED    CURRENT    READY    AGE
deployment-1-7bdb8f99f  3          3          3        22s
replicaset1   5          5          5        17m
[mohamed@Kubernetes K8s-Labs]$
```

13- How many Deployments and ReplicaSets exist on the system now?

14- How many pods are ready with the deployment-1?

15- Update deployment-1 image to nginx then check the ready pods again

```
[mohamed@Kubernetes K8s-Labs]$ kubectl set image deployment/deployment-1 busybox-container=nginx --record
Flag --record has been deprecated, --record will be removed in the future
deployment.apps/deployment-1 image updated
```

```
[mohamed@Kubernetes K8s-Labs]$ kubectl get pods
NAME          READY    STATUS    RESTARTS    AGE
deployment-1-795f7b6649-2tv6s  1/1      Running   0            24s
deployment-1-795f7b6649-9mldp  1/1      Running   0            31s
deployment-1-795f7b6649-b8tht  1/1      Running   0            28s
deployment-1-7bdb8f99f-n9dzm   1/1      Terminating 0            9m30s
deployment-1-7bdb8f99f-r26bh   1/1      Terminating 0            9m30s
deployment-1-7bdb8f99f-vgvwm   1/1      Terminating 0            9m30s
nginx-pod      1/1      Running   0            60m
redis-pod      1/1      Running   0            63m
replicaset1-6rzsc  1/1      Running   0            23m
replicaset1-7lnbj  1/1      Running   0            26m
replicaset1-89x75  1/1      Running   0            20m
replicaset1-c6rcn  1/1      Running   0            26m
replicaset1-fcjrr  1/1      Running   0            26m
[mohamed@Kubernetes K8s-Labs]$ kubectl get pods
NAME          READY    STATUS    RESTARTS    AGE
deployment-1-795f7b6649-2tv6s  1/1      Running   0            117s
deployment-1-795f7b6649-9mldp  1/1      Running   0            2m4s
deployment-1-795f7b6649-b8tht  1/1      Running   0            2m1s
nginx-pod      1/1      Running   0            61m
redis-pod      1/1      Running   0            65m
replicaset1-6rzsc  1/1      Running   0            24m
replicaset1-7lnbj  1/1      Running   0            28m
replicaset1-89x75  1/1      Running   0            21m
replicaset1-c6rcn  1/1      Running   0            28m
```

16- Run kubectl describe deployment deployment-1 and check events

```

Progressing      True      NewReplicaSetAvailable
OldReplicaSets:  deployment-1-7bdb8f99f (0/0 replicas created)
NewReplicaSet:   deployment-1-795f7b6649 (3/3 replicas created)
Events:
  Type      Reason      Age      From      Message
  ----      -
Normal     ScalingReplicaSet  13m      deployment-controller  Scaled up replica set deployment-1-7bdb8f99f from 0 to 3
Normal     ScalingReplicaSet  4m21s     deployment-controller  Scaled up replica set deployment-1-795f7b6649 from 0 to 1
Normal     ScalingReplicaSet  4m18s     deployment-controller  Scaled down replica set deployment-1-7bdb8f99f from 3 to 2
Normal     ScalingReplicaSet  4m18s     deployment-controller  Scaled up replica set deployment-1-795f7b6649 from 1 to 2
Normal     ScalingReplicaSet  4m14s     deployment-controller  Scaled down replica set deployment-1-7bdb8f99f from 2 to 1
Normal     ScalingReplicaSet  4m14s     deployment-controller  Scaled up replica set deployment-1-795f7b6649 from 2 to 3
Normal     ScalingReplicaSet  4m9s      deployment-controller  Scaled down replica set deployment-1-7bdb8f99f from 1 to 0
[mohamed@Kubernetes K8s-Labs]$

```

What is the deployment strategy used to upgrade the deployment-1?

The deployment strategy used is RollingUpdate

17- Rollback the deployment-1

What is the used image with the deployment-1?

The image reverts to busybox because the previous revision used it before switching to nginx.

```

[mohamed@Kubernetes K8s-Labs]$ kubectl rollout undo deployment deployment-1
deployment.apps/deployment-1 rolled back

```

```

[mohamed@Kubernetes K8s-Labs]$ kubectl get replicaset.apps
NAME                                DESIRED    CURRENT    READY    AGE
deployment-1-795f7b6649             0          0          0        24m
deployment-1-7bdb8f99f              3          3          3        33m
replicaset1                          5          5          5        50m

```

18- Create a deployment using nginx image with latest tag only and remember to

mention tag i.e nginx:latest and name it as nginx-deployment. App labels should be

app: nginx-app and type: front-end. The container should be named as nginx-container; also make sure replica counts are 3.

```
mohamed@Kubernetes:~/K8s-Labs — vim nginx-deployment.yml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment
  labels:
    app: nginx-app
    type: front-end
spec:
  replicas: 3
  selector:
    matchLabels:
      app: nginx-app
  template:
    metadata:
      labels:
        app: nginx-app
    spec:
      containers:
        - name: nginx-container
          image: nginx:latest
          ports:
            - containerPort: 80
~
-- INSERT --
```

```
[mohamed@Kubernetes K8s-Labs]$ vim nginx-deployment.yml
[mohamed@Kubernetes K8s-Labs]$ kubectl create -f nginx-deployment.yml
deployment.apps/nginx-deployment created
[mohamed@Kubernetes K8s-Labs]$ kubectl get deployments.apps
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
deployment-1        3/3     3            3           41m
nginx-deployment    3/3     3            3           35s
[mohamed@Kubernetes K8s-Labs]$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
deployment-1-7bdb8f99f-6mhgt        1/1     Running   0          21m
deployment-1-7bdb8f99f-m4zj2        1/1     Running   0          22m
deployment-1-7bdb8f99f-t4ksw        1/1     Running   0          21m
nginx-deployment-79f9d4bcf5-8bzbt   1/1     Running   0          48s
nginx-deployment-79f9d4bcf5-lcp8x   1/1     Running   0          48s
nginx-deployment-79f9d4bcf5-qrjtl   1/1     Running   0          48s
nginx-pod                        1/1     Running   0          91m
redis-pod                        1/1     Running   0          95m
replicaset1-6rzsc                  1/1     Running   0          55m
replicaset1-7lnbj                  1/1     Running   0          58m
replicaset1-89x75                  1/1     Running   0          52m
replicaset1-c6rcn                  1/1     Running   0          58m
replicaset1-fcjrr                  1/1     Running   0          58m
[mohamed@Kubernetes K8s-Labs]$
```