Kubernetes Day 2 Tasks

1. How many Namespaces exist on the system?

Answer: 4

```
SNOW@DESKTOP-QJU2QB7 MINGW64 /d/Muhammad/kubernates
$ kubectl get namespaces
NAME              STATUS   AGE
default           Active   25h
kube-node-lease   Active   25h
kube-public       Active   25h
kube-system       Active   25h
```

2. How many pods exist in the kube-system namespace?

Answer: 7

```
SNOW@DESKTOP-QJU2QB7 MINGW64 /d/Muhammad/kubernates
$ kubectl get pods -n kube-system
NAME                               READY   STATUS    RESTARTS      AGE
coredns-674b8bbfcf-4fts5           1/1     Running   1 (24h ago)   25h
etcd-minikube                      1/1     Running   1 (24h ago)   25h
kube-apiserver-minikube            1/1     Running   1 (24h ago)   25h
kube-controller-manager-minikube   1/1     Running   1 (24h ago)   25h
kube-proxy-t7g79                   1/1     Running   1 (24h ago)   25h
kube-scheduler-minikube            1/1     Running   1 (24h ago)   25h
storage-provisioner                1/1     Running   1 (24h ago)   25h
```

3. Create a deployment with

- **Name:** `beta`
- **Image:** `redis`
- **Replicas:** 2
- **Namespace:** `finance`
- **Resources Requests:**
  - CPU: 0.5 vCPU
  - Memory: 1G
- **Resources Limits:**
  - CPU: 1 vCPU
  - Memory: 2G

```
SNOW@DESKTOP-QJU2QB7 MINGW64 /d/Muhammad/kubernates
$ kubectl create namespace finance
namespace/finance created

SNOW@DESKTOP-QJU2QB7 MINGW64 /d/Muhammad/kubernates
$ kubectl get namespaces
NAME              STATUS   AGE
default           Active   25h
finance           Active   3s
kube-node-lease   Active   25h
kube-public       Active   25h
kube-system       Active   25h
```

```
SNOW@DESKTOP-QJU2QB7 MINGW64 /d/Muhammad/kubernates
$ kubectl apply -f 3nsdeploy.yaml
deployment.apps/beta created

SNOW@DESKTOP-QJU2QB7 MINGW64 /d/Muhammad/kubernates
$ kubectl get pods
No resources found in default namespace.

SNOW@DESKTOP-QJU2QB7 MINGW64 /d/Muhammad/kubernates
$ kubectl get pods -n finance
NAME                    READY   STATUS    RESTARTS   AGE
beta-76549c7d7c-m6dsb   1/1     Running   0          29s
beta-76549c7d7c-zxndr   1/1     Running   0          29s
```

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4. How many Nodes exist on the system?

```
SNOW@DESKTOP-QJU2QB7 MINGW64 /d/Muhammad/kubernates
$ kubectl get nodes
NAME       STATUS   ROLES           AGE   VERSION
minikube   Ready    control-plane   25h   v1.33.1
```

> **Note:** For questions 5 to 7, use the following cluster: KillerCoda Kubernetes Playground

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5. Do you see any taints on master?

```
controlplane:~$ kubectl describe node | grep -i taints
Taints:             <none>
Taints:             <none>
controlplane:~$ kubectl get nodes -o wide
NAME           STATUS   ROLES           AGE   VERSION   INTERNAL-IP   EXTERNAL-IP   OS-IMAGE             KERNEL-VERSION     CONTAINER-RUNTIME
controlplane   Ready    control-plane   27h   v1.33.2   172.30.1.2    <none>        Ubuntu 24.04.1 LTS   6.8.0-51-generic   containerd://1.7.27
node01         Ready    <none>          27h   v1.33.2   172.30.2.2    <none>        Ubuntu 24.04.1 LTS   6.8.0-51-generic   containerd://1.7.27
controlplane:~$ kubectl describe node controlplane | grep -i taints
Taints:             <none>
controlplane:~$ kubectl describe node controlplane
Name:               controlplane
Roles:              control-plane
Labels:             beta.kubernetes.io/arch=amd64
                    beta.kubernetes.io/os=linux
                    kubernetes.io/arch=amd64
                    kubernetes.io/hostname=controlplane
                    kubernetes.io/os=linux
                    node-role.kubernetes.io/control-plane=
                    node.kubernetes.io/exclude-from-external-load-balancers=
Annotations:        flannel.alpha.coreos.com/backend-data: {"VNI":1,"VtepMAC":"a6:6d:3e:a1:63:10"}
                    flannel.alpha.coreos.com/backend-type: vxlan
                    flannel.alpha.coreos.com/kube-subnet-manager: true
                    flannel.alpha.coreos.com/public-ip: 172.30.1.2
                    kubeadm.alpha.kubernetes.io/cri-socket: unix:///var/run/containerd/containerd.sock
                    node.alpha.kubernetes.io/ttl: 0
                    projectcalico.org/IPv4Address: 172.30.1.2/24
                    projectcalico.org/IPv4IPIPTunnelAddr: 192.168.0.1
                    volumes.kubernetes.io/controller-managed-attach-detach: true
CreationTimestamp:  Tue, 19 Aug 2025 09:03:52 +0000
Taints:             <none>
Unschedulable:      false
Lease:
  HolderIdentity:  controlplane
  AcquireTime:     <unset>
  RenewTime:       Wed, 20 Aug 2025 12:46:36 +0000
Conditions:
  Type                 Status  LastHeartbeatTime                 LastTransitionTime                Reason                       Message
  ----                 ------  -----------------                 ------------------                ------                       -------
  NetworkUnavailable   False   Wed, 20 Aug 2025 12:38:07 +0000   Wed, 20 Aug 2025 12:38:07 +0000   FlannelIsUp                  Flannel is runnin
  MemoryPressure       False   Wed, 20 Aug 2025 12:42:12 +0000   Tue, 19 Aug 2025 09:03:51 +0000   KubeletHasSufficientMemory   kubelet has suffi
  DiskPressure         False   Wed, 20 Aug 2025 12:42:12 +0000   Tue, 19 Aug 2025 09:03:51 +0000   KubeletHasNoDiskPressure     kubelet has no di
```

---

6. Apply a label `color=blue` to the master node

```
controlplane:~$ kubectl label node controlplane color=blue
node/controlplane labeled
controlplane:~$ kubectl get nodes --show-labels
NAME           STATUS   ROLES           AGE   VERSION   LABELS
controlplane   Ready    control-plane   27h   v1.33.2   beta.kubernetes.io/arch=amd64,beta.kubernetes.io/os=linux,color=blue,kubernetes.io/arch=amd64,kubernetes.io/hostname
=controlplane,kubernetes.io/os=linux,node-role.kubernetes.io/control-plane=,node.kubernetes.io/exclude-from-external-load-balancers=
node01         Ready    <none>          27h   v1.33.2   beta.kubernetes.io/arch=amd64,beta.kubernetes.io/os=linux,kubernetes.io/arch=amd64,kubernetes.io/hostname=node01,kub
ernetes.io/os=linux
controlplane:~$ kubectl get nodes
NAME           STATUS   ROLES           AGE   VERSION
controlplane   Ready    control-plane   27h   v1.33.2
node01         Ready    <none>          27h   v1.33.2
controlplane:~$ kubectl get labels
error: the server doesn't have a resource type "labels"
controlplane:~$ kubectl get nodes --show-labels | grep color
controlplane   Ready    control-plane   27h   v1.33.2   beta.kubernetes.io/arch=amd64,beta.kubernetes.io/os=linux,color=blue,kubernetes.io/arch=amd64,kubernetes.io/hostname
=controlplane,kubernetes.io/os=linux,node-role.kubernetes.io/control-plane=,node.kubernetes.io/exclude-from-external-load-balancers=
controlplane:~$
```

---

7. Create a new deployment named `blue` with the nginx image and 3 replicas

- Set Node Affinity to the deployment to place the pods on master only
- **NodeAffinity:** `requiredDuringSchedulingIgnoredDuringExecution`
- **Key:** `color`
- **Values:** `blue`

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: blue
spec:
  replicas: 3
  selector:
    matchLabels:
      app: blue
  template:
    metadata:
      labels:
        app: blue
    spec:
      affinity:
        nodeAffinity:
          requiredDuringSchedulingIgnoredDuringExecution:
            nodeSelectorTerms:
            - matchExpressions:
              - key: color
                operator: In
                values:
                - blue
      containers:
      - name: nginx
        image: nginx
```

```
controlplane:~$ vi 7bluedeploy.yaml
controlplane:~$ kubectl apply -f 7bluedeploy.yaml
deployment.apps/blue created
controlplane:~$ kubectl get pods -o wide
NAME                    READY   STATUS    RESTARTS   AGE   IP            NODE           NOMINATED NODE   READINESS GATES
blue-7bd99994c-m5pfp    1/1     Running   0          11s   192.168.0.5   controlplane   <none>           <none>
blue-7bd99994c-n9psq    1/1     Running   0          11s   192.168.0.4   controlplane   <none>           <none>
blue-7bd99994c-tnrwj    1/1     Running   0          11s   192.168.0.6   controlplane   <none>           <none>
controlplane:~$
```