

>> Practiced Kubernetes on KodeKloud labs
<<

Pods :

1.

The screenshot shows the KodeKloud lab interface. The top bar includes the KodeKloud logo, the lab title "KUBERNETES CONCEPTS - PODS, REPLICASETS, DEPLOYME...", a "Complete" button, and navigation icons. The left sidebar has tabs for "Task", "Hint", and "Solution". The "Task" tab is active, showing a progress bar with 13 steps, a timer at 59:05, and a question: "How many pods exist on the system? In the current(default) namespace." Below the question are five radio button options: 5, 4, 1, 2, and 0. The option "0" is selected and marked with a green checkmark. The right pane is a terminal window titled "Terminal 1" showing the command `kubectl get pods` and its output: "No resources found in default namespace."

2.

KodeKloud

KUBERNETES CONCEPTS – PODS, REPLICASETS, DEPLOYME... Complete

My Account

Task

Hint

Solution

57:16

1 2 3 4 5 6 7 8 9 10 11 12 13

Create a new pod with the `nginx` image.

Complete

Next

Image name: nginx

Terminal 1

```

controlplane ~ → kubectl run nginx --image=nginx
pod/nginx created

controlplane ~ → kubectl get pods
NAME      READY   STATUS    RESTARTS   AGE
nginx     1/1     Running   0           11s

controlplane ~ →
```

3.

KodeKloud

KUBERNETES CONCEPTS – PODS, REPLICASETS, DEPLOYME... Complete

My Account

Task

Hint

Solution

52:58

1 2 3 4 5 6 7 8 9 10 11 12 13

What is the image used to create the new pods?

You must look at one of the new pods in detail to figure this out.

NGINX

BUSYBOX

NEWPOD

JENKINS

Terminal 1

```

controlplane ~ → kubectl get pods
NAME      READY   STATUS    RESTARTS   AGE
nginx     1/1     Running   0           2m59s
newpods-h58fh 1/1     Running   0           2m5s
newpods-qwbrg 1/1     Running   0           2m5s
newpods-td24h 1/1     Running   0           2m5s

controlplane ~ → kubectl describe pod newpods-td24h
Name:      newpods-td24h
Namespace: default
Priority:   0
Service Account: default
Node:      controlplane/172.25.0.55
Start Time: Thu, 27 Apr 2023 08:40:09 +0000
Labels:    tier=busybox
Annotations: <none>
Status:    Running
IP:        10.42.0.11
IPs:
  IP:      10.42.0.11
Controlled By: ReplicaSet/newpods
Containers:
  busybox:
    Container ID:  containerd://9f959b8d1c6be0ee1856291fdda52626631484409b4633474daef0dbca3d2c31
    Image:         busybox
    Image ID:      docker.io/library/busybox@sha256:b5d6fe0712636ceb7430189de28819e195e8966372edfc2d9409d79402a0dc16
    Port:         <none>
    Host Port:    <none>
    Command:
      sleep
```

4.

KodeKloud

KUBERNETES CONCEPTS - PODS, REPLICASETS, DEPLOYME...

Complete

< >

⚙️ ↗️

My Account

Task

Hint

Solution

51:54

1 2 3 4 5 6 7 8 9 10 11

12 13

▶

Which nodes are these pods placed on?

You must look at all the pods in detail to figure this out.

MASTER & NODE-1

MASTER

CONTROLPLANE

NODE-1

NODE-2

Terminal 1

+

controlplane ~ → kubectl get nodes

NAME	STATUS	ROLES	AGE	VERSION
controlplane	Ready	control-plane,master	16m	v1.26.0+k3s1

controlplane ~ →

6.

KodeKloud

KUBERNETES CONCEPTS - PODS, REPLICASETS, DEPLOYME...

Complete

< >

⚙️ ↗️

My Account

Task

Hint

Solution

49:27

1 2 3 4 5 6 7 8

9 10 11 12 13

▶

How many containers are part of the pod `webapp`?

Note: We just created a new POD. Ignore the state of the POD for now.

0

2

3

1

4

Terminal 1

+

controlplane ~ → kubectl get pods

NAME	READY	STATUS	RESTARTS	AGE
nginx	1/1	Running	0	7m9s
newpods-h58fh	1/1	Running	0	6m15s
newpods-qwtrg	1/1	Running	0	6m15s
newpods-td24h	1/1	Running	0	6m15s
webapp	1/2	ImagePullBackOff	0	89s

controlplane ~ → kubectl get pods -o wide

NAME	READY	STATUS	RESTARTS	AGE	IP	NCDE	NCMINATED NCCE
nginx	1/1	Running	0	7m29s	10.42.0.9	controlplane	<none>
newpods-h58fh	1/1	Running	0	6m35s	10.42.0.12	controlplane	<none>
newpods-qwtrg	1/1	Running	0	6m35s	10.42.0.10	controlplane	<none>
newpods-td24h	1/1	Running	0	6m35s	10.42.0.11	controlplane	<none>
webapp	1/2	ImagePullBackOff	0	109s	10.42.0.13	controlplane	<none>

controlplane ~ →

7.

KodeKloud

KUBERNETES CONCEPTS - PODS, REPLICASETS, DEPLOYME... Complete

My Account

Task

Hint

Solution

48:09

1 2 3 4 5 6 7 8

9 10 11 12 13

What images are used in the new **webapp** pod?

You must look at all the pods in detail to figure this out.

agentx

nginx & agentx

busybox

nginx

nginx & busybox

Terminal 1

+

```

controlplane ~ → kubectl describe pod webapp
Name:          webapp
Namespace:     default
Priority:       0
Service Account: default
Node:          controlplane/172.25.0.55
Start Time:    Thu, 27 Apr 2023 08:44:55 +0000
Labels:        <none>
Annotations:   <none>
Status:        Pending
IP:            10.42.0.13
IPs:
  IP: 10.42.0.13
Containers:
  nginx:
    Container ID:  containerd://9a7ea854e942c803bcc55eebda19bffb9793f51f3c4f62bb6b505b38ab6a78f
    Image:         nginx
    Image ID:      docker.io/library/nginx@sha256:63b44e8ddb83d5dd8020327c1f40436e37a6fffd3ef2498a6204df23be6e7e94
    Port:          <none>
    Host Port:     <none>
    State:         Running
      Started:     Thu, 27 Apr 2023 08:44:56 +0000
    Ready:         True
    Restart Count: 0
    Environment:   <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-5kmjw (ro)
  agentx:
    Container ID:
    Image: agentx

```

8.

KodeKloud

KUBERNETES CONCEPTS - PODS, REPLICASETS, DEPLOYME... Complete

My Account

Task

Hint

Solution

45:48

1 2 3 4 5 6 7 8

9 10 11 12 13

What is the state of the container **agentx** in the pod **webapp** ?

Wait for it to finish the **ContainerCreating** state

Ready

Success

Running

Error or Waiting

Terminal 1

+

```

Image ID:      docker.io/library/nginx@sha256:63b44e8ddb83d5dd8020327c1f40436e37a6fffd3ef2498a6204df23be6e7e94
Port:          <none>
Host Port:     <none>
State:         Running
  Started:     Thu, 27 Apr 2023 08:44:56 +0000
  Ready:       True
  Restart Count: 0
  Environment: <none>
  Mounts:
    /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-5kmjw (ro)
agentx:
  Container ID:
  Image: agentx
  Image ID:
  Port:      <none>
  Host Port: <none>
  State:     Waiting
    Reason:   ImagePullBackOff
  Ready:     False
  Restart Count: 0
  Environment: <none>
  Mounts:
    /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-5kmjw (ro)
Conditions:
  Type           Status
  Initialized    True
  Ready          False
  ContainersReady False
  PodScheduled   True
Volumes:
  kube-api-access-5kmjw:

```

9.

KodeCloud

KUBERNETES CONCEPTS – PODS, REPLICASETS, DEPLOYME... Complete

My Account

Task

Hint

Solution

44:51

1 2 3 4 5 6 7 8

9 10 11 12 13

Why do you think the container `agentx` in pod `webapp` is in error?

Try to figure it out from the events section of the pod.

Faulty Kubernetes cluster

NGINX application isn't configured to communicate to this image

A Docker image with this name doesn't exist on Docker Hub

The application inside this image is faulty

Terminal 1

```

PodScheduled      True
Volumes:
  kube-api-access-5kmjw:
    Type:              Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds: 3607
    ConfigMapName:      kube-root-ca.crt
    ConfigMapOptional:  <nil>
    DownwardAPI:        true
QoS Class:          BestEffort
Node-Selectors:     <none>
Tolerations:        node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                    node.kubernetes.io/unreachable:NoExecute op=Exists for 300s

Events:
  Type     Reason      Age    From          Message
  ----     -
Normal    Scheduled   6m45s  default-scheduler  Successfully assigned default/webapp to controlplane
Normal    Pulling     6m45s  kubelet        Pulling image "nginx"
Normal    Pulled      6m45s  kubelet        Successfully pulled image "nginx" in 448.805937ms (448.826639ms including waiting)
Normal    Created     6m45s  kubelet        Created container nginx
Normal    Started     6m45s  kubelet        Started container nginx
Normal    Pulling     6m2s (x3 over 6m44s)  kubelet        Pulling image "agentx"
Warning   Failed      6m1s (x3 over 6m44s)  kubelet        Failed to pull image "agentx": rpc error: code = Unknown desc = failed to pull and unpack image "docker.io/library/agentx:latest": failed to resolve reference "docker.io/library/agentx:latest": pull access denied, repository does not exist or may require authorization: server message: insufficient_scope: authorization failed
Warning   Failed      6m1s (x3 over 6m44s)  kubelet        Error: ErrImagePull
Warning   Failed      5m22s (x6 over 6m44s)  kubelet        Error: ImagePullBackOff
Normal    BackOff     93s (x21 over 6m44s)  kubelet        Back-off pulling image "agentx"

```

10.

KodeCloud

KUBERNETES CONCEPTS – PODS, REPLICASETS, DEPLOYME... Complete

My Account

Task

Hint

Solution

43:38

1 2 3 4 5 6 7 8

9 10 11 12 13

What does the `READY` column in the output of the `kubectl get pods` command indicate?

Total Containers in POD/Running Containers in POD

Total Pods/Running Pods

Running Pods/Total Pods

Running Containers in POD/Total Containers in POD

Terminal 1

```

controlplane ~ → kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx          1/1     Running   0           13m
newpods-h58fh  1/1     Running   0           12m
newpods-qwbrg  1/1     Running   0           12m
newpods-td24h  1/1     Running   0           12m
webapp         1/2     ImagePullBackOff  0           7m32s

```

11.

KodeKloud KUBERNETES CONCEPTS – PODS, REPLICASETS, DEPLOYME... Complete

Task Hint Solution 42:51

1 2 3 4 5 6 7 8
9 10 11 12 13

Delete the **webapp** Pod.
Once deleted, wait for the pod to fully terminate.

Complete Next

✓ Name: webapp

Terminal 1

```
controlplane ~ → kubectl delete pod webapp
pod "webapp" deleted

controlplane ~ →
```

12.

KodeKloud KUBERNETES CONCEPTS – PODS, REPLICASETS, DEPLOYME... Complete

Task Hint Solution 31:10

1 2 3 4 5 6 7 8
9 10 11 12 13

Create a new pod with the name **redis** and with the image **redis123**
Use a pod-definition YAML file. And yes the image name is wrong!

Complete Next

✓ Name: redis
✓ Image Name: redis123

Terminal 1

```
controlplane ~ → vi pod-definition.yaml
controlplane ~ → cat pod-definition.yaml
---
apiVersion: v1
kind: Pod
metadata:
  name: redis
spec:
  containers:
  - name: redis
    image: redis123

controlplane ~ → kubectl apply -f pod-definition.yaml
pod/redis created

controlplane ~ → kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx         1/1     Running   0           26m
newpods-h58fh 1/1     Running   1 (8m35s ago) 25m
newpods-qwbrg 1/1     Running   1 (8m35s ago) 25m
newpods-td24h 1/1     Running   1 (8m35s ago) 25m
redis         0/1     ImagePullBackOff 0           18s

controlplane ~ →
```

13.

KodeCloud

KUBERNETES CONCEPTS – PODS, REPLICASETS, DEPLOYME... Complete

My Account

Task

Hint

Solution

27:33

1 2 3 4 5 6 7 8

9 10 11 12 13

Now change the image on this pod to `redis`.

Once done, the pod should be in a `running` state.

Check

Name: redis

Image Name: redis

Terminal 1

```
# Please edit the object below. Lines beginning with a '#' will be ignored,
# and an empty file will abort the edit. If an error occurs while saving this file will be
# reopened with the relevant failures.
#
apiVersion: v1
kind: Pod
metadata:
  annotations:
    kubectl.kubernetes.io/last-applied-configuration: |
      {"apiVersion":"v1","kind":"Pod","metadata":{"annotations":{},"name":"redis","namespace":"default"},"
spec":{"containers":[{"image":"redis123","name":"redis"}]}}
creationTimestamp: "2023-04-27T09:05:10Z"
name: redis
namespace: default
resourceVersion: "1479"
uid: 85683478-0b7f-4472-aa15-0a5c7632d41b
spec:
  containers:
    - image: redis
      imagePullPolicy: Always
      name: redis
      resources: {}
      terminationMessagePath: /dev/termination-log
      terminationMessagePolicy: File
      volumeMounts:
        - mountPath: /var/run/secrets/kubernetes.io/serviceaccount
          name: kube-api-access-d4st2
          readOnly: true
  dnsPolicy: ClusterFirst
  enableServiceLinks: true
  nodeName: controlplane
-- INSERT --
```

11,17 Top

Replica Sets :

1.

KodeCloud

KUBERNETES CONCEPTS – PODS, REPLICASETS, DEPLOYME... Complete

My Account

Task

Hint

Solution

58:29

1 2 3 4 5 6 7 8 9 10

11 12 13 14 15 16

How about now? How many ReplicaSets do you see?

We just made a few changes!

3

2

1

0

4

Terminal 1

```
controlplane ~ → kubectl get replicaset
NAME          DESIRED  CURRENT  READY  AGE
new-replica-set  4        4        0      31s

controlplane ~ →
```

2.

KodeKloud

KUBERNETES CONCEPTS - PODS, REPLICASETS, DEPLOYME... Complete

My Account

Task

Hint

56:53

1 2 3 4 5 6 7 8 9 10

11 12 13 14 15 16

How many PODs are DESIRED in the new-replica-set?

1

0

5

2

Terminal 1

```

controlplane ~ → kubectl get replicaset
NAME          DESIRED  CURRENT  READY  AGE
new-replica-set 4         4        0      31s

controlplane ~ → kubectl get pods
NAME          READY  STATUS             RESTARTS  AGE
new-replica-set-79bw9  0/1    ImagePullBackCff    0         2m5s
new-replica-set-f9slx  0/1    ImagePullBackCff    0         2m5s
new-replica-set-w6mw9  0/1    ImagePullBackCff    0         2m5s
new-replica-set-vcftf  0/1    ImagePullBackCff    0         2m5s

controlplane ~ → 

```

3.

KodeKloud

KUBERNETES CONCEPTS - PODS, REPLICASETS, DEPLOYME... Complete

My Account

Task

Hint

55:36

1 2 3 4 5 6 7 8 9 10

11 12 13 14 15 16

What is the image used to create the pods in the new-replica-set?

BUSYBOX-POD

NGINX

BUSYBOX777

NEWPOD

BUSYBOX-CONTAINER

Terminal 1

```

controlplane ~ → kubectl describe rs new-replica-set
Name:          new-replica-set
Namespace:     default
Selector:      name=busybox-pod
Labels:        <none>
Annotations:   <none>
Replicas:      4 current / 4 desired
Pods Status:   0 Running / 4 Waiting / 0 Succeeded / 0 Failed
Pod Template:
  Labels:  name=busybox-pod
  Containers:
    busybox-container:
      Image:   busybox777
      Port:    <none>
      Host Port: <none>
      Command:
        sh
        -c
        echo Hello Kubernetes! && sleep 3600
  Environment: <none>
  Mounts:       <none>
  Volumes:      <none>

Events:
  Type      Reason      Age    From          Message
  ----      -
Normal    SuccessfulCreate  3m21s  replicaset-controller  Created pod: new-replica-set-w6mw9
Normal    SuccessfulCreate  3m21s  replicaset-controller  Created pod: new-replica-set-vcftf
Normal    SuccessfulCreate  3m21s  replicaset-controller  Created pod: new-replica-set-f9slx
Normal    SuccessfulCreate  3m21s  replicaset-controller  Created pod: new-replica-set-79bw9

controlplane ~ → 

```

4.

KodeKloud

KUBERNETES CONCEPTS - PODS, REPLICASETS, DEPLOYMENTS

Complete

<>⚙️🔖My Account

TaskHint54:45🕒🗖

12345678910111213141516▶

How many PODs are READY in the `new-replica-set`?

4

0✔

2

5

1

Terminal 1+

```
controlplane ~ → kubectl get pods
```

NAME	READY	STATUS	RESTARTS	AGE
new-replica-set-79bw9	0/1	ImagePullBackCff	0	4m10s
new-replica-set-w6mw9	0/1	ImagePullBackCff	0	4m10s
new-replica-set-f9slx	0/1	ImagePullBackCff	0	4m10s
new-replica-set-vcftf	0/1	ImagePullBackCff	0	4m10s

```
controlplane ~ →
```

5.

6.

KodeCloud

KUBERNETES CONCEPTS – PODS, REPLICASETS, DEPLOYME...

Complete

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⚙️ 🔍

My Account

Task

51:56

⌕

1 2 3 4 5 6 7 8 9 10

11 12 13 14 15 16

▶

Why are there still 4 PODs, even after you deleted one?

ReplicaSet ensures that desired number of PODs always run

I didn't delete it properly

You cannot delete a POD from a ReplicaSet

⏪ ⏩

Terminal 1

+

⌵ ⌶ ⌷ ⌸ ⌹ ⌺

```

controlplane ~ → kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
new-replica-set-79bw9               0/1     ImagePullBackCff    0           6m10s
new-replica-set-vcftf               0/1     ErrImagePull        0           6m10s
new-replica-set-f9slx               0/1     ErrImagePull        0           6m10s
new-replica-set-w6mw9               0/1     ImagePullBackCff    0           6m10s

controlplane ~ → kubectl delete pod new-replica-set-vcftf
pod "new-replica-set-vcftf" deleted

controlplane ~ → kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
new-replica-set-79bw9               0/1     ImagePullBackCff    0           7m
new-replica-set-w6mw9               0/1     ImagePullBackCff    0           7m
new-replica-set-f9slx               0/1     ImagePullBackCff    0           7m
new-replica-set-tj8xd               0/1     ErrImagePull        0           30s

controlplane ~ →

```

7.

KodeCloud

KUBERNETES CONCEPTS – PODS, REPLICASETS, DEPLOYME...

Complete

< >

⚙️ 🔍

My Account

Task

Hint

Solution

48:06

⌕

1 2 3 4 5 6 7 8 9 10

11 12 13 14 15 16

▶

Create a ReplicaSet using the `replicaset-definition-1.yaml` file located at `/root/`.

There is an issue with the file, so try to fix it.

Complete ✓

Next

✓ Name: replicaset-1

Terminal 1

+

⌵ ⌶ ⌷ ⌸ ⌹ ⌺

```

controlplane ~ → ls
replicaset-definition-1.yaml replicaset-definition-2.yaml sample.yaml

controlplane ~ → vi replicaset-definition-1.yaml

controlplane ~ → kubectl create -f replicaset-definition-1.yaml
-bash: kubectl: command not found

controlplane ~ ✗ kubectl create -f replicaset-definition-1.yaml
replicaset.apps/replicaset-1 created

controlplane ~ →

```

8.

KodeKloud KUBERNETES CONCEPTS – PODS, REPLICASETS, DEPLOYME... Complete

Task Hint Solution 38:51

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Delete the two newly created ReplicaSets - `replicaset-1` and `replicaset-2`

Complete Next

- ✓ Delete: replicaset-2
- ✓ Delete: replicaset-1

Terminal 1

```
controlplane ~ → kubectl get rs
NAME                DESIRED  CURRENT  READY  AGE
new-replica-set      4         4         0      19m
replicaset-1         2         2         2      8m44s
replicaset-2         2         2         2      4m54s

controlplane ~ → kubectl delete rs replicaset-1 replicaset-2
replicaset.apps "replicaset-1" deleted
replicaset.apps "replicaset-2" deleted

controlplane ~ →
```

34°C Sunny 15:01 27-04-2023

9.

KodeKloud KUBERNETES CONCEPTS – PODS, REPLICASETS, DEPLOYME... Complete

Task Hint Solution 53:10

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Scale the ReplicaSet to 5 PODs.
Use `kubectl scale` command or edit the replicaset using `kubectl edit replicaset`.

Complete Next

- ✓ Replicas: 5

Terminal 1

```
controlplane ~ → kubectl scale rs new-replica-set --replicas=5
replicaset.apps/new-replica-set scaled

controlplane ~ → kubectl get pods
NAME                READY  STATUS    RESTARTS  AGE
new-replica-set-dx76z 0/1    ImagePullBackOff  0          6m2s
new-replica-set-p6vwz 0/1    ImagePullBackOff  0          6m2s
new-replica-set-hqzmb 1/1    Running      0          19s
new-replica-set-f76dt 0/1    ErrImagePull     0          6m2s
new-replica-set-r89hj 0/1    ErrImagePull     0          6m2s

controlplane ~ →
```

10.

KodeKloud

KUBERNETES CONCEPTS – PODS, REPLICASETS, DEPLOYME...

Complete

Task

Hint

Solution

51:03

1234567891011121314

1516

Now scale the ReplicaSet down to 2 PODs.
Use the `kubectl scale` command or edit the replicaset using `kubectl edit replicaset`.

Complete

Next

Replicas: 2

Terminal 1

controlplane ~ → kubectl get pods

NAME	READY	STATUS	RESTARTS	AGE
new-replica-set-hqzmb	1/1	Running	0	2m3s
new-replica-set-f76dt	0/1	ImagePullBackCff	0	7m46s
new-replica-set-r89hj	0/1	ImagePullBackCff	0	7m46s
new-replica-set-dx76z	0/1	ImagePullBackCff	0	7m46s
new-replica-set-p6vwz	0/1	ImagePullBackCff	0	7m46s

controlplane ~ → kubectl scale rs new-replica-set --replicas=2

replicaset.apps/new-replica-set scaled

controlplane ~ → kubesct get pods

-bash: kubesct: command not found

controlplane ~ ✗ kubectl get pods

NAME	READY	STATUS	RESTARTS	AGE
new-replica-set-hqzmb	1/1	Running	0	2m37s
new-replica-set-f76dt	0/1	ImagePullBackCff	0	8m20s

controlplane ~ →