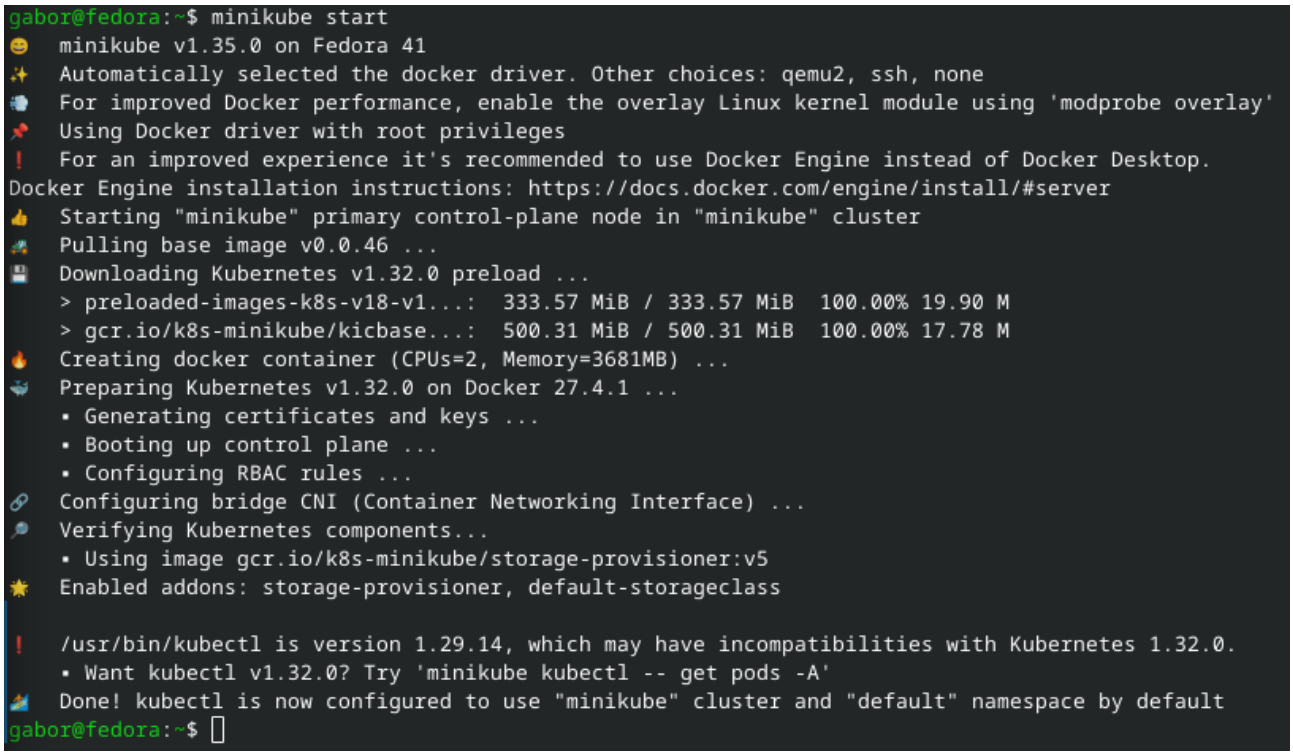
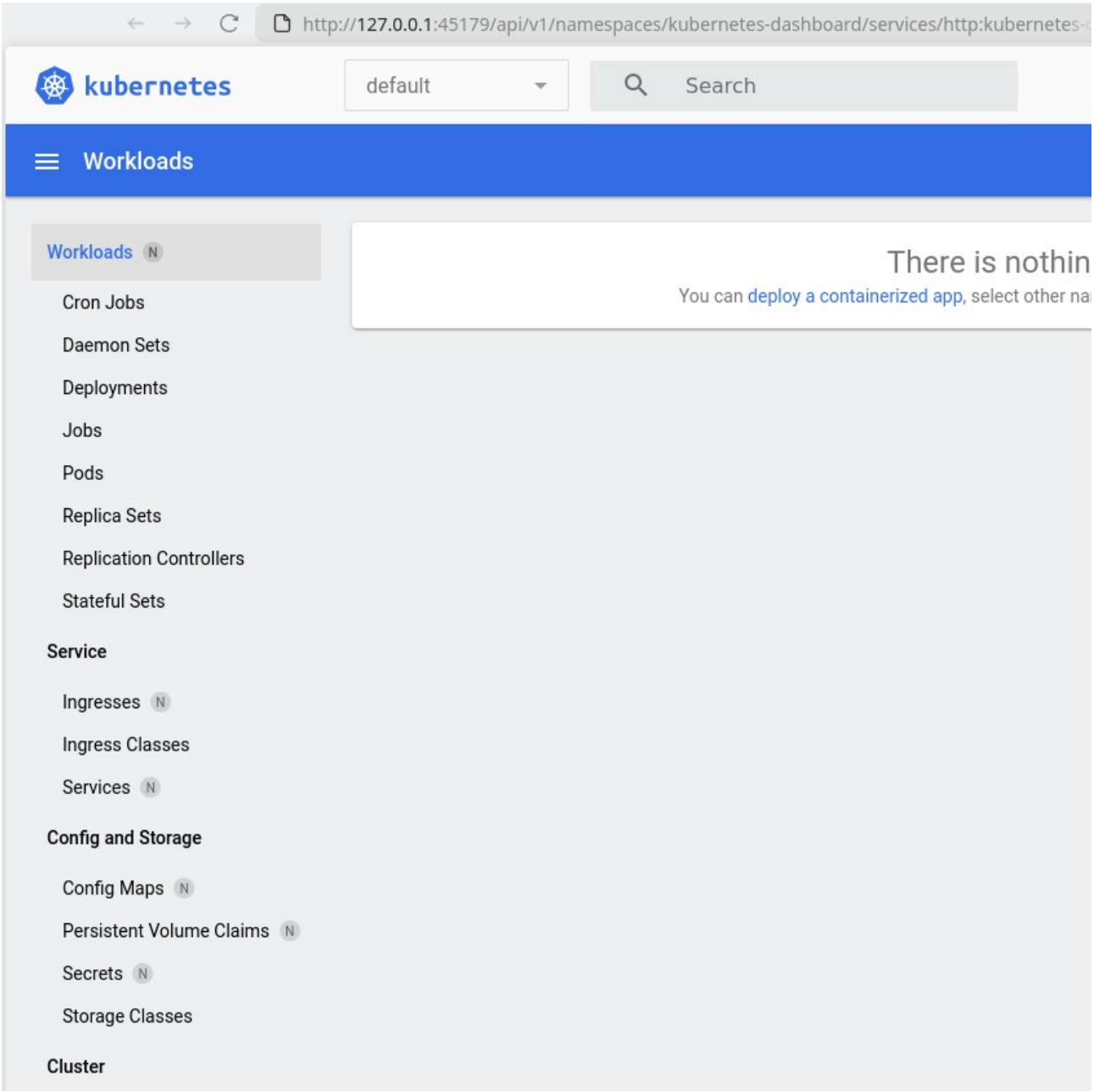
Lab 3 Kubernetes

1. Using Minikube to Create a Cluster

Start **Hello Minikube** tutorial.

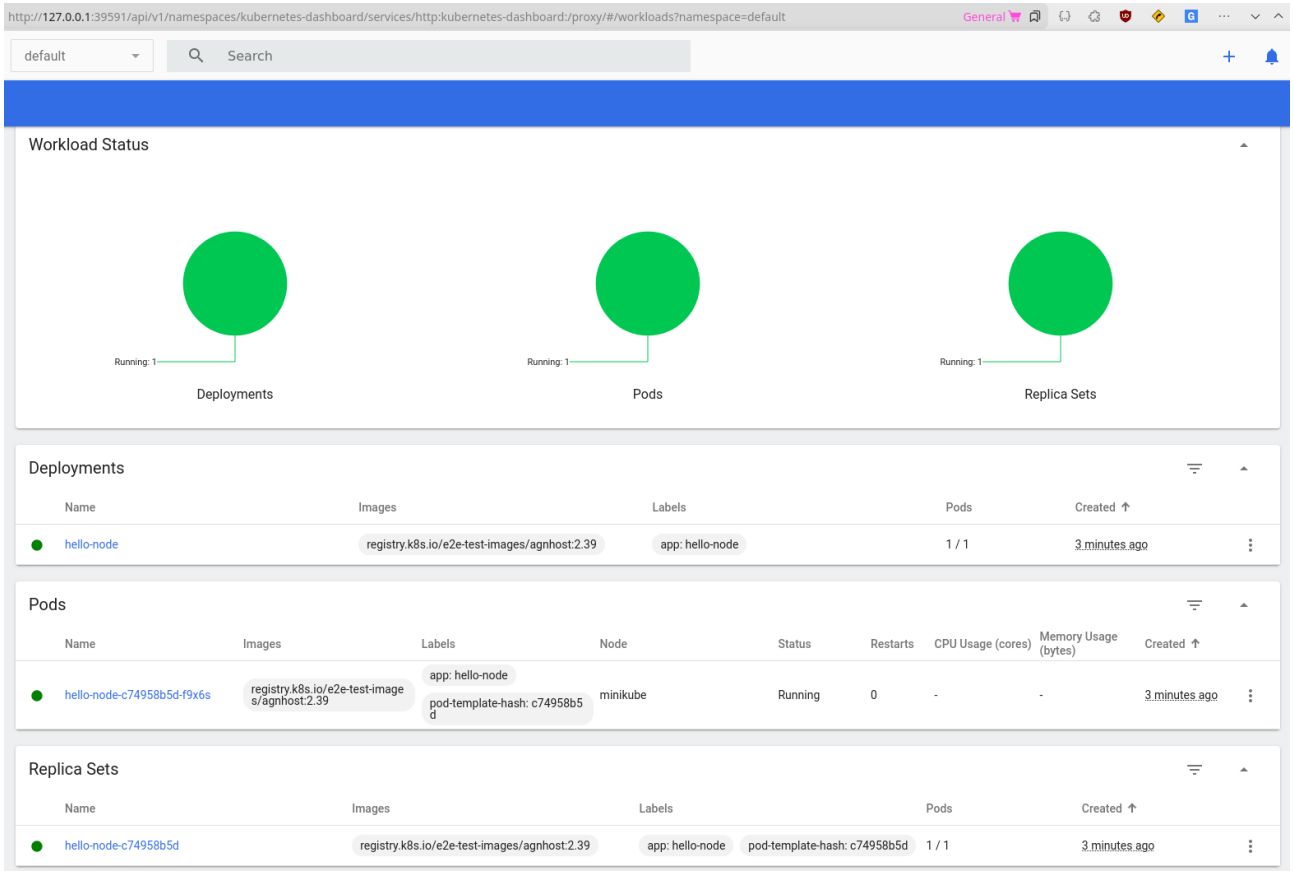
Install Minikube and kubectl, and open dashboard.




http://127.0.0.1:45179/api/v1/namespaces/kubernetes-dashboard/services/http:kubernetes-
kubernetes
default
Search
Workloads
Workloads N
Cron Jobs
Daemon Sets
Deployments
Jobs
Pods
Replica Sets
Replication Controllers
Stateful Sets
Service
Ingresses N
Ingress Classes
Services N
Config and Storage
Config Maps N
Persistent Volume Claims N
Secrets N
Storage Classes
Cluster
There is nothin
You can deploy a containerized app, select other na

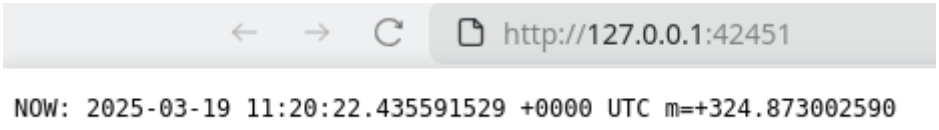
Create a Deployment

Creating the hello-node deployment.



Create a Service

Create the hello-node service for external use.



Enable Addons

Enable the metrics addon.

```
gabor@fedora:~$ kubectl get pod,svc -n kube-system
NAME                                   READY   STATUS    RESTARTS        AGE
pod/coredns-668d6bf9bc-2ldmz           1/1     Running   1 (4d22h ago)   4d22h
pod/etcd-minikube                      1/1     Running   1 (4d22h ago)   4d22h
pod/kube-apiserver-minikube            1/1     Running   1 (12m ago)     4d22h
pod/kube-controller-manager-minikube   1/1     Running   1 (4d22h ago)   4d22h
pod/kube-proxy-ghb4h                   1/1     Running   1 (4d22h ago)   4d22h
pod/kube-scheduler-minikube            1/1     Running   1 (4d22h ago)   4d22h
pod/metrics-server-7fbb699795-chlmt    1/1     Running   0               2m7s
pod/storage-provisioner                1/1     Running   3 (12m ago)     4d22h

NAME                     TYPE        CLUSTER-IP      EXTERNAL-IP   PORT(S)                  AGE
service/kube-dns         ClusterIP   10.96.0.10      <none>        53/UDP,53/TCP,9153/TCP   4d22h
service/metrics-server   ClusterIP   10.100.28.202   <none>        443/TCP                  2m7s
gabor@fedora:~$ kubectl top pods
NAME                          CPU(cores)   MEMORY(bytes)
hello-node-c74958b5d-f9x6s    1m           14Mi
```

2. Using kubectl to Create a Deployment

Deploy an app

Use kubectl to deploy.

View the app

View the app from an external system.

```
gabor@fedora:~$ curl http://localhost:8001/version
{
  "major": "1",
  "minor": "32",
  "gitVersion": "v1.32.0",
  "gitCommit": "70d3cc986aa8221cd1dfb1121852688902d3bf53",
  "gitTreeState": "clean",
  "buildDate": "2024-12-11T17:59:15Z",
  "goVersion": "go1.23.3",
  "compiler": "gc",
  "platform": "linux/amd64"
}gabor@fedora:~$export POD_NAME=$(kubectl get pods -o go-template --template '{{range .items}}{{.metadata.name}}{{
"\n"}}{{end}}')
echo Name of the Pod: $POD_NAME
Name of the Pod: kubernetes-bootcamp-9bc58d867-df42l
gabor@fedora:~$ curl http://localhost:8001/api/v1/namespaces/default/pods/$POD_NAME:8080/proxy/
Hello Kubernetes bootcamp! | Running on: kubernetes-bootcamp-9bc58d867-df42l | v=1
```

3. Viewing Pods and Nodes

Check application configuration

Using the get and describe commands.

```
gabor@fedora:~$ kubectl get pods
NAME                                   READY   STATUS    RESTARTS   AGE
kubernetes-bootcamp-9bc58d867-df42l   1/1     Running   0          15m
gabor@fedora:~$ kubectl describe pods
Name:             kubernetes-bootcamp-9bc58d867-df42l
Namespace:        default
Priority:         0
Service Account:  default
Node:             minikube/192.168.49.2
Start Time:       Thu, 20 Mar 2025 08:52:38 +0000
Labels:           app=kubernetes-bootcamp
                  pod-template-hash=9bc58d867
Annotations:      <none>
Status:           Running
IP:               10.244.0.15
IPs:
  IP:           10.244.0.15
Controlled By:  ReplicaSet/kubernetes-bootcamp-9bc58d867
```

```
Containers:
  kubernetes-bootcamp:
    Container ID:   docker://17dd4b933b72db65a035ab1e42a99ae4201ac2ab4fd7e47d131b3aed6a51a9ba
    Image:          gcr.io/google-samples/kubernetes-bootcamp:v1
    Image ID:       docker-pullable://gcr.io/google-samples/kubernetes-bootcamp@sha256:0d6b8ee63bb57c5f5b6156f446b
3bc3b3c143d233037f3a2f00e279c8fcc64af
    Port:           <none>
    Host Port:      <none>
    State:          Running
      Started:      Thu, 20 Mar 2025 08:53:26 +0000
    Ready:          True
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-fhsql (ro)
Conditions:
  Type                        Status
  PodReadyToStartContainers   True
  Initialized                 True
  Ready                       True
  ContainersReady             True
  PodScheduled                True
Volumes:
  kube-api-access-fhsql:
    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  15m   default-scheduler  Successfully assigned default/kubernetes-bootcamp-9bc58d867-df42l to
 minikube
  Normal  Pulling    15m   kubelet            Pulling image "gcr.io/google-samples/kubernetes-bootcamp:v1"
  Normal  Pulled     14m   kubelet            Successfully pulled image "gcr.io/google-samples/kubernetes-bootcamp
:v1" in 47.357s (47.357s including waiting). Image size: 211336459 bytes.
  Normal  Created    14m   kubelet            Created container: kubernetes-bootcamp
  Normal  Started    14m   kubelet            Started container kubernetes-bootcamp
```

View the container logs

Use the log command.

```
gabor@fedora:~$ kubectl logs "$POD_NAME"
Kubernetes Bootcamp App Started At: 2025-03-20T08:53:26.890Z | Running On:  kubernetes-bootcamp-9bc58d867-df42l

Running On: kubernetes-bootcamp-9bc58d867-df42l | Total Requests: 1 | App Uptime: 221.711 seconds | Log Time: 2025
-03-20T08:57:08.601Z
```

Executing commands on the container

Use the exec command to run commands in the pod.

```
gabor@fedora:~$ kubectl exec "$POD_NAME" -- env
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
HOSTNAME=kubernetes-bootcamp-9bc58d867-df42l
KUBERNETES_PORT_443_TCP_ADDR=10.96.0.1
KUBERNETES_SERVICE_HOST=10.96.0.1
KUBERNETES_SERVICE_PORT=443
KUBERNETES_SERVICE_PORT_HTTPS=443
KUBERNETES_PORT=tcp://10.96.0.1:443
KUBERNETES_PORT_443_TCP=tcp://10.96.0.1:443
KUBERNETES_PORT_443_TCP_PROTO=tcp
KUBERNETES_PORT_443_TCP_PORT=443
NPM_CONFIG_LOGLEVEL=info
NODE_VERSION=6.3.1
HOME=/root
gabor@fedora:~$ kubectl exec -ti $POD_NAME -- bash
root@kubernetes-bootcamp-9bc58d867-df42l:/# cat server.js
var http = require('http');
var requests=0;
var podname= process.env.HOSTNAME;
var startTime;
var host;
var handleRequest = function(request, response) {
  response.setHeader('Content-Type', 'text/plain');
  response.writeHead(200);
  response.write("Hello Kubernetes bootcamp! | Running on: ");
  response.write(host);
  response.end(" | v=1\n");
  console.log("Running On:" ,host, "| Total Requests:", ++requests,"| App Uptime:", (new Date() - startTime)/1000
, "seconds", "| Log Time:",new Date());
}
var www = http.createServer(handleRequest);
www.listen(8080,function () {
    startTime = new Date();;
    host = process.env.HOSTNAME;
    console.log ("Kubernetes Bootcamp App Started At:",startTime, "| Running On: " ,host, "\n" );
});
root@kubernetes-bootcamp-9bc58d867-df42l:/# curl http://localhost:8080
Hello Kubernetes bootcamp! | Running on: kubernetes-bootcamp-9bc58d867-df42l | v=1
```

4. Using a Service to Expose Your App

Creating a new Service

Expose the service to the outside system.

```
gabor@fedora:~$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
kubernetes-bootcamp-9bc58d867-df42l   1/1     Running   0          29m
gabor@fedora:~$ kubectl get services
NAME         TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
kubernetes   ClusterIP   10.96.0.1    <none>        443/TCP   5d20h
gabor@fedora:~$ kubectl expose deployment/kubernetes-bootcamp --type="NodePort" --port 8080
service/kubernetes-bootcamp exposed
gabor@fedora:~$ kubectl get services
NAME                  TYPE        CLUSTER-IP    EXTERNAL-IP   PORT(S)          AGE
kubernetes            ClusterIP   10.96.0.1     <none>        443/TCP          5d20h
kubernetes-bootcamp   NodePort    10.97.204.5   <none>        8080:31043/TCP   5s
gabor@fedora:~$ kubectl describe services/kubernetes-bootcamp
Name:                     kubernetes-bootcamp
Namespace:                default
Labels:                   app=kubernetes-bootcamp
Annotations:              <none>
Selector:                 app=kubernetes-bootcamp
Type:                     NodePort
IP Family Policy:         SingleStack
IP Families:              IPv4
IP:                       10.97.204.5
IPs:                      10.97.204.5
Port:                     <unset>  8080/TCP
TargetPort:               8080/TCP
NodePort:                 <unset>  31043/TCP
Endpoints:                10.244.0.15:8080
Session Affinity:         None
External Traffic Policy:  Cluster
Events:                   <none>
gabor@fedora:~$ export NODE_PORT="$(kubectl get services/kubernetes-bootcamp -o go-template='{{(index .spec.ports
0).nodePort}}')"
echo "NODE_PORT=$NODE_PORT"
NODE_PORT=31043
gabor@fedora:~$ curl http://"$(minikube ip):$NODE_PORT"
^C
gabor@fedora:~$ curl http://127.0.0.1:42689
Hello Kubernetes bootcamp! | Running on: kubernetes-bootcamp-9bc58d867-df42l | v=1
```

Using labels

Use labels to query different pods and services.

```
gabor@fedora:~$ kubectl describe deployment
Name:                   kubernetes-bootcamp
Namespace:              default
CreationTimestamp:      Thu, 20 Mar 2025 08:52:38 +0000
Labels:                 app=kubernetes-bootcamp
Annotations:            deployment.kubernetes.io/revision: 1
Selector:               app=kubernetes-bootcamp
Replicas:               1 desired | 1 updated | 1 total | 1 available | 0 unavailable
StrategyType:           RollingUpdate
MinReadySeconds:        0
RollingUpdateStrategy:  25% max unavailable, 25% max surge
Pod Template:
  Labels:  app=kubernetes-bootcamp
  Containers:
   kubernetes-bootcamp:
    Image:        gcr.io/google-samples/kubernetes-bootcamp:v1
    Port:         <none>
    Host Port:    <none>
    Environment:  <none>
    Mounts:       <none>
  Volumes:        <none>
Conditions:
  Type           Status  Reason
  ----           ------  ------
  Available      True    MinimumReplicasAvailable
  Progressing    True    NewReplicaSetAvailable
OldReplicaSets:  <none>
NewReplicaSet:   kubernetes-bootcamp-9bc58d867 (1/1 replicas created)
Events:
  Type    Reason             Age   From                   Message
  ----    ------             ----  ----                   -------
  Normal  ScalingReplicaSet  40m   deployment-controller  Scaled up replica set kubernetes-bootcamp-9bc58d867 from
 0 to 1
gabor@fedora:~$ kubectl get pods -l app=kubernetes-bootcamp
NAME                                  READY   STATUS    RESTARTS   AGE
kubernetes-bootcamp-9bc58d867-df42l   1/1     Running   0          40m
gabor@fedora:~$ kubectl get services -l app=kubernetes-bootcamp
NAME                  TYPE       CLUSTER-IP    EXTERNAL-IP   PORT(S)          AGE
kubernetes-bootcamp   NodePort   10.97.204.5   <none>        8080:31043/TCP   10m
gabor@fedora:~$ export POD_NAME="$(kubectl get pods -o go-template --template '{{range .items}}{{.metadata.name}}{
{"\n"}}{{end}}')"
echo "Name of the Pod: $POD_NAME"
Name of the Pod: kubernetes-bootcamp-9bc58d867-df42l
gabor@fedora:~$ kubectl label pods "$POD_NAME" version=v1
pod/kubernetes-bootcamp-9bc58d867-df42l labeled
```

And assign a new label.

```
gabor@fedora:~$ kubectl describe pods "$POD_NAME"
Name:             kubernetes-bootcamp-9bc58d867-df42l
Namespace:        default
Priority:         0
Service Account:  default
Node:             minikube/192.168.49.2
Start Time:       Thu, 20 Mar 2025 08:52:38 +0000
Labels:           app=kubernetes-bootcamp
                  pod-template-hash=9bc58d867
                  version=v1
Annotations:      <none>
Status:           Running
IP:               10.244.0.15
IPs:
  IP:           10.244.0.15
Controlled By:  ReplicaSet/kubernetes-bootcamp-9bc58d867
Containers:
  kubernetes-bootcamp:
    Container ID:   docker://17dd4b933b72db65a035ab1e42a99ae4201ac2ab4fd7e47d131b3aed6a51a9ba
    Image:          gcr.io/google-samples/kubernetes-bootcamp:v1
    Image ID:       docker-pullable://gcr.io/google-samples/kubernetes-bootcamp@sha256:0d6b8ee63bb57c5f5b6156f446b
3bc3b3c143d233037f3a2f00e279c8fcc64af
    Port:           <none>
    Host Port:      <none>
    State:          Running
      Started:      Thu, 20 Mar 2025 08:53:26 +0000
    Ready:          True
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-fhsql (ro)
```

```
Conditions:
  Type                        Status
  PodReadyToStartContainers   True
  Initialized                 True
  Ready                       True
  ContainersReady             True
  PodScheduled                True
Volumes:
  kube-api-access-fhsql:
    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  41m   default-scheduler  Successfully assigned default/kubernetes-bootcamp-9bc58d867-df42l to
 minikube
  Normal  Pulling    41m   kubelet            Pulling image "gcr.io/google-samples/kubernetes-bootcamp:v1"
  Normal  Pulled     40m   kubelet            Successfully pulled image "gcr.io/google-samples/kubernetes-bootcamp
:v1" in 47.357s (47.357s including waiting). Image size: 211336459 bytes.
  Normal  Created    40m   kubelet            Created container: kubernetes-bootcamp
  Normal  Started    40m   kubelet            Started container kubernetes-bootcamp
gabor@fedora:~$ kubectl get pods -l version=v1
NAME                                  READY   STATUS    RESTARTS   AGE
kubernetes-bootcamp-9bc58d867-df42l   1/1     Running   0          41m
```

Deleting a service

Delete the service that is exposing the app, but it is still running inside the pod.

```
gabor@fedora:~$ kubectl delete service -l app=kubernetes-bootcamp
service "kubernetes-bootcamp" deleted
gabor@fedora:~$ kubectl get services
NAME         TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
kubernetes   ClusterIP   10.96.0.1    <none>        443/TCP   5d20h
gabor@fedora:~$ curl http://"$(minikube ip):$NODE_PORT"
^C
gabor@fedora:~$ curl http://127.0.0.1:42689
^C
gabor@fedora:~$ kubectl exec -ti $POD_NAME -- curl http://localhost:8080
Hello Kubernetes bootcamp! | Running on: kubernetes-bootcamp-9bc58d867-df42l | v=1
```

5. Running Multiple Instances of Your App

Scaling a Deployment

Create a load balancer, then change the desired deployment amount.

```
gabor@fedora:~$ kubectl expose deployment/kubernetes-bootcamp --type="LoadBalancer" --port 8080
service/kubernetes-bootcamp exposed
gabor@fedora:~$ kubectl get deployments
NAME                  READY   UP-TO-DATE   AVAILABLE   AGE
kubernetes-bootcamp   1/1     1            1           51m
gabor@fedora:~$ kubectl get rs
NAME                             DESIRED   CURRENT   READY   AGE
kubernetes-bootcamp-9bc58d867    1         1         1       51m
gabor@fedora:~$ kubectl scale deployments/kubernetes-bootcamp --replicas=4
deployment.apps/kubernetes-bootcamp scaled
gabor@fedora:~$ kubectl get deployments
NAME                  READY   UP-TO-DATE   AVAILABLE   AGE
kubernetes-bootcamp   4/4     4            4           53m
gabor@fedora:~$ kubectl get pods -o wide
NAME                                  READY   STATUS    RESTARTS   AGE   IP            NODE       NOMINATED NODE
 READINESS GATES
kubernetes-bootcamp-9bc58d867-7z52c   1/1     Running   0          13s   10.244.0.17   minikube   <none>
 <none>
kubernetes-bootcamp-9bc58d867-df42l   1/1     Running   0          53m   10.244.0.15   minikube   <none>
 <none>
kubernetes-bootcamp-9bc58d867-wsrfj   1/1     Running   0          13s   10.244.0.16   minikube   <none>
 <none>
kubernetes-bootcamp-9bc58d867-wvsx5   1/1     Running   0          13s   10.244.0.18   minikube   <none>
 <none>
```

```
gabor@fedora:~$ kubectl describe deployments/kubernetes-bootcamp
Name:                   kubernetes-bootcamp
Namespace:              default
CreationTimestamp:      Thu, 20 Mar 2025 08:52:38 +0000
Labels:                 app=kubernetes-bootcamp
Annotations:            deployment.kubernetes.io/revision: 1
Selector:               app=kubernetes-bootcamp
Replicas:               4 desired | 4 updated | 4 total | 4 available | 0 unavailable
StrategyType:           RollingUpdate
MinReadySeconds:        0
RollingUpdateStrategy:  25% max unavailable, 25% max surge
Pod Template:
  Labels:  app=kubernetes-bootcamp
  Containers:
   kubernetes-bootcamp:
    Image:        gcr.io/google-samples/kubernetes-bootcamp:v1
    Port:         <none>
    Host Port:    <none>
    Environment:  <none>
    Mounts:       <none>
  Volumes:        <none>
Conditions:
  Type           Status  Reason
  ----           ------  ------
  Progressing    True    NewReplicaSetAvailable
  Available      True    MinimumReplicasAvailable
OldReplicaSets:  <none>
NewReplicaSet:   kubernetes-bootcamp-9bc58d867 (4/4 replicas created)
Events:
  Type    Reason             Age   From                   Message
  ----    ------             ----  ----                   -------
  Normal  ScalingReplicaSet  53m   deployment-controller  Scaled up replica set kubernetes-bootcamp-9bc58d867 from
 0 to 1
  Normal  ScalingReplicaSet  21s   deployment-controller  Scaled up replica set kubernetes-bootcamp-9bc58d867 from
 1 to 4
```

Load Balancing

Check that the load balancer is working.

```
gabor@fedora:~$ kubectl describe services/kubernetes-bootcamp
Name:                     kubernetes-bootcamp
Namespace:                default
Labels:                   app=kubernetes-bootcamp
Annotations:              <none>
Selector:                 app=kubernetes-bootcamp
Type:                     LoadBalancer
IP Family Policy:         SingleStack
IP Families:              IPv4
IP:                       10.99.168.230
IPs:                      10.99.168.230
Port:                     <unset>  8080/TCP
TargetPort:               8080/TCP
NodePort:                 <unset>  30497/TCP
Endpoints:                10.244.0.15:8080,10.244.0.16:8080,10.244.0.17:8080 + 1 more...
Session Affinity:         None
External Traffic Policy:  Cluster
Events:                   <none>
gabor@fedora:~$ export NODE_PORT="$(kubectl get services/kubernetes-bootcamp -o go-template='{{(index .spec.ports
0).nodePort}}')"

echo NODE_PORT=$NODE_PORT
NODE_PORT=30497
gabor@fedora:~$ curl http://"$(minikube ip):$NODE_PORT"
^C
gabor@fedora:~$ curl http://127.0.0.1:39963
Hello Kubernetes bootcamp! | Running on: kubernetes-bootcamp-9bc58d867-wvsx5 | v=1
gabor@fedora:~$ curl http://127.0.0.1:39963
Hello Kubernetes bootcamp! | Running on: kubernetes-bootcamp-9bc58d867-7z52c | v=1
gabor@fedora:~$ curl http://127.0.0.1:39963
Hello Kubernetes bootcamp! | Running on: kubernetes-bootcamp-9bc58d867-7z52c | v=1
gabor@fedora:~$ curl http://127.0.0.1:39963
Hello Kubernetes bootcamp! | Running on: kubernetes-bootcamp-9bc58d867-wvsx5 | v=1
gabor@fedora:~$ curl http://127.0.0.1:39963
Hello Kubernetes bootcamp! | Running on: kubernetes-bootcamp-9bc58d867-7z52c | v=1
```

Scale Down

Scale down to only 2 replicas.

```
gabor@fedora:~$ kubectl scale deployments/kubernetes-bootcamp --replicas=2
deployment.apps/kubernetes-bootcamp scaled
gabor@fedora:~$ kubectl get deployments
NAME                  READY   UP-TO-DATE   AVAILABLE   AGE
kubernetes-bootcamp   2/2     2            2           58m
gabor@fedora:~$ kubectl get pods -o wide
NAME                                  READY   STATUS        RESTARTS   AGE     IP            NODE       NOMINATED
NODE   READINESS GATES
kubernetes-bootcamp-9bc58d867-7z52c   1/1     Terminating   0          5m42s   10.244.0.17   minikube   <none>
       <none>
kubernetes-bootcamp-9bc58d867-df42l   1/1     Running       0          58m     10.244.0.15   minikube   <none>
       <none>
kubernetes-bootcamp-9bc58d867-wsrfj   1/1     Terminating   0          5m42s   10.244.0.16   minikube   <none>
       <none>
kubernetes-bootcamp-9bc58d867-wvsx5   1/1     Running       0          5m42s   10.244.0.18   minikube   <none>
       <none>
gabor@fedora:~$ kubectl get pods -o wide
NAME                                  READY   STATUS    RESTARTS   AGE    IP            NODE       NOMINATED NODE
  READINESS GATES
kubernetes-bootcamp-9bc58d867-df42l   1/1     Running   0          59m    10.244.0.15   minikube   <none>
  <none>
kubernetes-bootcamp-9bc58d867-wvsx5   1/1     Running   0          6m7s   10.244.0.18   minikube   <none>
  <none>
```

6. Performing a Rolling Update

Update the version of the app

Check old version.

```
gabor@fedora:~$ kubectl get deployments
NAME                  READY   UP-TO-DATE   AVAILABLE   AGE
kubernetes-bootcamp   2/2     2            2           62m
gabor@fedora:~$ kubectl get pods
NAME                                  READY   STATUS    RESTARTS   AGE
kubernetes-bootcamp-9bc58d867-df42l   1/1     Running   0          62m
kubernetes-bootcamp-9bc58d867-wvsx5   1/1     Running   0          9m4s
gabor@fedora:~$ kubectl describe pods
Name:             kubernetes-bootcamp-9bc58d867-df42l
Namespace:        default
Priority:         0
Service Account:  default
Node:             minikube/192.168.49.2
Start Time:       Thu, 20 Mar 2025 08:52:38 +0000
Labels:           app=kubernetes-bootcamp
                  pod-template-hash=9bc58d867
                  version=v1
Annotations:      <none>
Status:           Running
IP:               10.244.0.15
IPs:
  IP:           10.244.0.15
Controlled By:  ReplicaSet/kubernetes-bootcamp-9bc58d867
Containers:
  kubernetes-bootcamp:
    Container ID:   docker://17dd4b933b72db65a035ab1e42a99ae4201ac2ab4fd7e47d131b3aed6a51a9ba
    Image:          gcr.io/google-samples/kubernetes-bootcamp:v1
    Image ID:       docker-pullable://gcr.io/google-samples/kubernetes-bootcamp@sha256:0d6b8ee63bb57c5f5b6156f446b
3bc3b3c143d233037f3a2f00e279c8fcc64af
    Port:           <none>
    Host Port:      <none>
    State:          Running
      Started:      Thu, 20 Mar 2025 08:53:26 +0000
    Ready:          True
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-fhsql (ro)
```

Update version and start rolling update.

```
gabor@fedora:~$ kubectl set image deployments/kubernetes-bootcamp kubernetes-bootcamp=docker.io/jocatalin/kubernet
es-bootcamp:v2
deployment.apps/kubernetes-bootcamp image updated
gabor@fedora:~$ kubectl get pods
NAME                                  READY   STATUS              RESTARTS   AGE
kubernetes-bootcamp-5c4f7cb664-dtjqp  0/1     ContainerCreating   0          10s
kubernetes-bootcamp-9bc58d867-df42l   1/1     Running             0          62m
kubernetes-bootcamp-9bc58d867-wvsx5   1/1     Running             0          9m31s
gabor@fedora:~$ kubectl get pods
NAME                                  READY   STATUS        RESTARTS   AGE
kubernetes-bootcamp-5c4f7cb664-4pwtg  1/1     Running       0          15s
kubernetes-bootcamp-5c4f7cb664-dtjqp  1/1     Running       0          28s
kubernetes-bootcamp-9bc58d867-df42l   1/1     Terminating   0          62m
kubernetes-bootcamp-9bc58d867-wvsx5   1/1     Terminating   0          9m49s
gabor@fedora:~$ kubectl get pods
NAME                                  READY   STATUS    RESTARTS   AGE
kubernetes-bootcamp-5c4f7cb664-4pwtg  1/1     Running   0          95s
kubernetes-bootcamp-5c4f7cb664-dtjqp  1/1     Running   0          108s
```

Verify an update

Check that version 2 is now running.

```
gabor@fedora:~$ curl http://127.0.0.1:39009
Hello Kubernetes bootcamp! | Running on: kubernetes-bootcamp-5c4f7cb664-4pwtg | v=2
gabor@fedora:~$ curl http://127.0.0.1:39009
Hello Kubernetes bootcamp! | Running on: kubernetes-bootcamp-5c4f7cb664-4pwtg | v=2
gabor@fedora:~$ curl http://127.0.0.1:39009
Hello Kubernetes bootcamp! | Running on: kubernetes-bootcamp-5c4f7cb664-dtjqp | v=2
gabor@fedora:~$ kubectl rollout status deployments/kubernetes-bootcamp
deployment "kubernetes-bootcamp" successfully rolled out
gabor@fedora:~$ kubectl describe pods
Name:             kubernetes-bootcamp-5c4f7cb664-4pwtg
Namespace:        default
Priority:         0
Service Account:  default
Node:             minikube/192.168.49.2
Start Time:       Thu, 20 Mar 2025 09:55:20 +0000
Labels:           app=kubernetes-bootcamp
                  pod-template-hash=5c4f7cb664
Annotations:      <none>
Status:           Running
IP:               10.244.0.20
IPs:
  IP:           10.244.0.20
Controlled By:  ReplicaSet/kubernetes-bootcamp-5c4f7cb664
Containers:
  kubernetes-bootcamp:
    Container ID:   docker://f9abaf1400b673f27c3a6f6eece0e5272737f60f158784a1591c5da850dccc39
    Image:          docker.io/jocatalin/kubernetes-bootcamp:v2
    Image ID:       docker-pullable://jocatalin/kubernetes-bootcamp@sha256:fb1a3ced00cecfc1f83f18ab5cd14199e30adc1
b49aa4244f5d65ad3f5feb2a5
    Port:           <none>
    Host Port:      <none>
    State:          Running
      Started:      Thu, 20 Mar 2025 09:55:20 +0000
    Ready:          True
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-r5r2t (ro)
```

Roll back an update

Update to version 10.

```
gabor@fedora:~$ kubectl set image deployments/kubernetes-bootcamp kubernetes-bootcamp=gcr.io/google-samples/kubern
etes-bootcamp:v10
deployment.apps/kubernetes-bootcamp image updated
gabor@fedora:~$ kubectl get deployments
NAME                  READY   UP-TO-DATE   AVAILABLE   AGE
kubernetes-bootcamp   2/2     1            2           68m
gabor@fedora:~$ kubectl get pods
NAME                                  READY   STATUS             RESTARTS   AGE
kubernetes-bootcamp-5c4f7cb664-4pwtg   1/1     Running            0          5m58s
kubernetes-bootcamp-5c4f7cb664-dtjqp   1/1     Running            0          6m11s
kubernetes-bootcamp-75bd5fd495-xts7z   0/1     ImagePullBackOff   0          21s
```

View event log, and roll back as update doesn’t exist.

```
Events:
  Type     Reason     Age                From               Message
  ----     ------     ----               ----               -------
  Normal   Scheduled  29s                default-scheduler  Successfully assigned default/kubernetes-bootcamp-75bd
5fd495-xts7z to minikube
  Normal   Pulling    16s (x2 over 29s)  kubelet            Pulling image "gcr.io/google-samples/kubernetes-bootca
mp:v10"
  Warning  Failed     14s (x2 over 27s)  kubelet            Failed to pull image "gcr.io/google-samples/kubernetes
-bootcamp:v10": Error response from daemon: manifest for gcr.io/google-samples/kubernetes-bootcamp:v10 not found:
manifest unknown: Failed to fetch "v10"
  Warning  Failed     14s (x2 over 27s)  kubelet            Error: ErrImagePull
  Normal   BackOff    2s (x2 over 27s)   kubelet            Back-off pulling image "gcr.io/google-samples/kubernet
es-bootcamp:v10"
  Warning  Failed     2s (x2 over 27s)   kubelet            Error: ImagePullBackOff
gabor@fedora:~$ kubectl rollout undo deployments/kubernetes-bootcamp
deployment.apps/kubernetes-bootcamp rolled back
gabor@fedora:~$ kubectl get pods
NAME                                  READY   STATUS    RESTARTS   AGE
kubernetes-bootcamp-5c4f7cb664-4pwtg   1/1     Running   0          6m33s
kubernetes-bootcamp-5c4f7cb664-dtjqp   1/1     Running   0          6m46s
```