

## Lab : Minikube Kubernetes Basics

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### 1. Start Minikube

```
minikube start
```

```
kubectl get nodes
```

```
PS C:\WINDOWS\system32> kubectl get nodes
NAME      STATUS    ROLES      AGE      VERSION
minikube  Ready     control-plane  25d     v1.34.0
PS C:\WINDOWS\system32> -
```

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### 2. Create Deployment

```
kubectl create deployment hello-minikube --image=k8s.gcr.io/echoserver:1.10
```

```
kubectl get pods
```

#### Notes:

- Deployment created.
- Pod status: Running.

```
PS C:\WINDOWS\system32> kubectl create deployment hello-minikube --image=k8s.gcr.io/echoserver:1.4
deployment.apps/hello-minikube created
PS C:\WINDOWS\system32> kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
hello-minikube  0/1       1           0          11s
PS C:\WINDOWS\system32> kubectl get pods
NAME      READY   STATUS      RESTARTS   AGE
hello-minikube-7fd55c845c-xfmsf  0/1   ErrImagePull   0          21s
PS C:\WINDOWS\system32> -
```

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### 3. Expose Service

```
kubectl expose deployment hello-minikube --type=NodePort --port=8080
```

```
minikube service hello-minikube
```

```
kubectl get services
```

#### Notes:

- Service created with NodePort.
- Application accessible via browser.

```

Priority:          0
Service Account: default
Node:             minikube/192.168.49.2
Start Time:        Sun, 09 Nov 2025 17:27:14 +0800
Labels:           app=hello-minikube
Annotations:      pod-template-hash=858b7b9984
Status:            Running
IP:               10.244.0.7
IPs:              IP:       10.244.0.7
Controlled By:    ReplicaSet/hello-minikube-858b7b9984
Containers:
  echoserver:
    Container ID:   docker://a23980cb4c133e039319c214f1066984321f65a4d4a9a4e3bc73b9eaabe03998
    Image:          k8s.gcr.io/echoserver:1.10
    Image ID:       docker-pullable://k8s.gcr.io/echoserver@sha256:cb5c1bdd1b5665e1867a7fa1b5fa843a47ee433bbb75d4293888b71def53229
    Port:           <none>
    Host Port:     <none>
    State:          Running
    Started:        Sun, 09 Nov 2025 17:27:41 +0800
    Ready:          True
    Restart Count:  0
    Environment:   <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-kq195 (ro)
Conditions:
  Type  Status
  PodReadyToStartContainers  True
  Initialized                True
  Ready                      True
  ContainersReady            True
  PodScheduled               True
Volumes:
  kube-api-access-kq195:
    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 2m4s  default-scheduler  Successfully assigned default/hello-minikube-858b7b9984-rd2zp to minikube
  Normal Pulling   2m3s  kubelet        Pulling image "k8s.gcr.io/echoserver:1.10"
  Normal Pulled    97s   kubelet        Successfully pulled image "k8s.gcr.io/echoserver:1.10" in 25.979s (25.979s including waiting). Image size: 95361986 bytes.
  Normal Created   97s   kubelet        Created container: echoserver
  Normal Started   97s   kubelet        Started container echoserver
PS C:\WINDOWS\system32> kubectl logs hello-minikube-858b7b9984-rd2zp
Generating self-signed cert
Generating a 2048 bit RSA private key
.....+++
writing new private key to '/certs/privateKey.key'
-----
Starting nginx
PS C:\WINDOWS\system32>
```

```

Hostname: hello-minikube-858b7b9984-rd2zp

Pod Information:
    -no pod information available-

Server values:
    server_version=nginx: 1.13.3 - lua: 10008

Request Information:
    client_address=10.244.0.1
    method=GET
    real_path=/
    query=
    request_version=1.1
    request_scheme=http
    request_uri=http://127.0.0.1:8080/ 
```

Request Headers:

```

accept=text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7
accept-encoding=gzip, deflate, br, zstd
accept-language=zh-CN,zh;q=0.9,en;q=0.8,en-GB;q=0.7,en-US;q=0.6
connection=keep-alive
cookie=r1_page_init_referrer=RudderEncrypt%3AU2FsdGVkX1%2FUncv5aP3uhcIrZL5SyIpuKXOMekCknyU4%3D;
r1_page_init_referring_domain=RudderEncrypt%3AU2FsdGVkX1%2BnDjhfvMbhkhYx%2F6%2B%2BiLdJgsM78amiTzo%3D;
ph_phc_4URIAMluYfJ07j8kWse0J81c81qnsrRLS7Jx8NcakHo_posthog-%7B%22distinct_id%22%3A%2249327bc3b6fcce8329016ddfe46110ee217237de10
d03ad1d661619763d723e6%237b22cf08-39e1-4a6c-85d0-c604183a624d%22%2C%22%24sesid%22%3A%5B1758609149802%2C%2201997537-ae93-7247-
b43f-
4558b3e89f8f%22%2C1758608207507%5D%2C%22%24epp%22%3Atrue%2C%22%24initial_person_info%22%3A%7B%22r%22%3A%22%24direct%22%2C%22u%2
%3A%22http%3A%2F%2F127.0.0.1%3A5678%2Fsetup%22%7D%7D;
r1_anonymous_id=RudderEncrypt%3AU2FsdGVkX1%2BcSvB6zSNJEDZqGv47L1TPIG3xNreq%2FsQQo6brR0mx8RYdFlvZVT7MHVoNb%2FtDxViBYFFmkffVtQ%3D
%3D;
r1_session=RudderEncrypt%3AU2FsdGVkX1%2BUap7lMviYeyFWiRd4fH9mDxYP6s6yIj%2FcnnZ8XLZI2AZxeMxEIb%2F6ifgfynyDJg4hUyLdNaIvVS8t%2FHgtotAdjHJx3CHGKQY6VzbvTNp0YhKYMcQHxask0hUa04Zo6%2Bwtug0qD610dqg%3D%3D
host=127.0.0.1:7576
sec-ch-ua="Chromium";v="142"; "Microsoft Edge";v="142"; "Not_A
Brand";v="99";
sec-ch-ua-mobile=?0
sec-ch-ua-platform="Windows";
sec-fetch-dest=document
sec-fetch-mode=navigate
sec-fetch-site=none
sec-fetch-user=?1
upgrade-insecure-requests=1
user-agent=Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0
Safari/537.36 Edg/142.0.0.0
```

Request Body:

```
-no body in request-
```

## 4. Scale Deployment

```
kubectl scale deployment hello-minikube --replicas=4
```

```
kubectl get pods
```

### Notes:

- Deployment scaled to 4 replicas.
- All pods running.

```
PS C:\WINDOWS\system32> kubectl scale deployment hello-minikube --replicas=4
deployment.apps/hello-minikube scaled
PS C:\WINDOWS\system32> kubectl get pods
NAME                      READY   STATUS    RESTARTS   AGE
hello-minikube-858b7b9984-5j41g  1/1     Running   0          12s
hello-minikube-858b7b9984-cwsph  1/1     Running   0          12s
hello-minikube-858b7b9984-rd2zp  1/1     Running   0          7m52s
hello-minikube-858b7b9984-z7z6z  1/1     Running   0          12s
PS C:\WINDOWS\system32>
```

---

## 5. Update Deployment

```
kubectl set image deployment/hello-minikube echoserver=k8s.gcr.io/echoserver:1.11
```

```
kubectl rollout status deployment/hello-minikube
```

```
kubectl get pods
```

### Notes:

- Deployment image updated.
- Pods gradually replaced with new version.

```
>> kubectl rollout status deployment/hello-minikube
>> kubectl get pods
deployment.apps/hello-minikube image updated
Waiting for deployment spec update to be observed...
Waiting for deployment "hello-minikube" rollout to finish: 1 out of 4 new replicas have been updated...
Waiting for deployment "hello-minikube" rollout to finish: 1 out of 4 new replicas have been updated...
Waiting for deployment "hello-minikube" rollout to finish: 2 out of 4 new replicas have been updated...
```