

Lab : Minikube Kubernetes Basics

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> _
```

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> _
```

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
        pod-template-hash=858b7b9984
Annotations: <none>
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:cb5c1bddd1b5665e1867a7fa1b5fa843a47ee433bbb75d429388b71def53229
    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-kql95 (ro)
Conditions:
  Type                               Status
  PodReadyToStartContainers         True
  Initialized                       True
  Ready                             True
  ContainersReady                   True
  PodScheduled                       True
Volumes:
  kube-api-access-kql95:
    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-rd
2zp 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=r_l_page_init_referrer=RudderEncrypt%3AU2FsdGVkX1%2FUcv5aP3uhcIrZL5SyIpuKXOMekCknyU4%3D;
r_l_page_init_referring_domain=RudderEncrypt%3AU2FsdGVkX1%2BnDJhfvMbhhYx%2F6%2B%2BiLdJgsM78amiTzo%3D;
ph_phc_4URIamluYfJ07j8kWS0J81c8IqnstRLS7Jx8NcakHo_posthog=%7B%22distinct_id%22%3A%2249327bc3b6fccc8329016ddfe46110ee217237de10d03ad1d661619763d723e6%237b22cf08-39e1-4a6c-85d0-c604183a624d%22%2C%22%24sesid%22%3A%5B1758609149802%2C%2201997537-ae93-7247-b43f-4558b3e89f8f%22%2C%221758608207507%5D%2C%22%24epp%22%3Atrue%2C%22%24initial_person_info%22%3A%7B%22%22%3A%22%24direct%22%2C%22u%22%3A%22http%3A%2F%2F127.0.0.1%3A5678%2Fsetup%22%7D%7D;
r_l_anonymous_id=RudderEncrypt%3AU2FsdGVkX1%2BcSvB6zSNJEDZqGv47L1TPIG8xNreq%2FsQQo6brROmx8RYdF1vZVT7MHVoNb%2FtDxViBYFfmkffvtQ%3D%3D;
r_l_session=RudderEncrypt%3AU2FsdGVkX1%2BUap7lMviYeyFWiRd4H9mDxYP6s6yIj%2FcnZ8XLZT2AZxeMxEib%2F6ifgfynyDJg4hUyLdNaIvVS8t%2FHGgt0tAdjHJx3CHGKQY6VzbvTNp0YhKYM0HxasK0hUa04Zo6%2BwtugOqD610dqg%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-858b7b9984-5j4lg    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...
```