Cloud Lab

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1 Create a Cluster

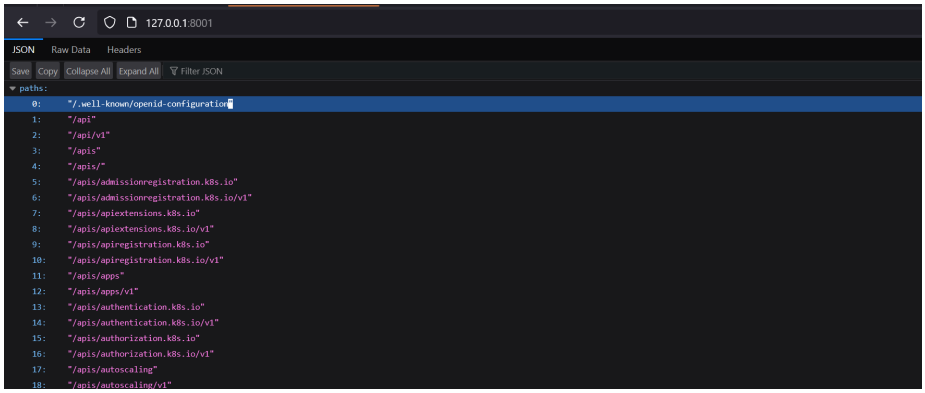
```
ise 10.0.26100.3476 Build 26100.3476                                    E0319 12:53:12.000987   21284 start.go:812] api.Load failed for m
inikube: filestore "minikube": Docker machine "minikube" does not exist. Use "docker-machine ls" to list machines. Use "docker-machin
e create" to add a new one.
✨  Using the hyperv driver based on existing profile
👍  Starting "minikube" primary control-plane node in "minikube" cluster
🔥  Creating hyperv VM (CPUs=2, Memory=3900MB, Disk=20000MB) ...
❗  Failing to connect to https://registry.k8s.io/ from inside the minikube VM
💡  To pull new external images, you may need to configure a proxy: https://minikube.sigs.k8s.io/docs/reference/networking/proxy/
🌏  Preparing Kubernetes v1.32.0 on Docker 27.4.0 ...
    ▪ Generating certificates and keys ...
    ▪ Booting up control plane ...
    ▪ Configuring RBAC rules ...
🔗  Configuring bridge CNI (Container Networking Interface) ...
🔎  Verifying Kubernetes components...
    ▪ Using image gcr.io/k8s-minikube/storage-provisioner:v5
🌟  Enabled addons: storage-provisioner, default-storageclass
🏄  Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
PS C:\Users\mjcul> minikube status
minikube
type: Control Plane
host: Running
kubelet: Running
apiserver: Running
kubeconfig: Configured

PS C:\Users\mjcul> kubectl cluster-info
Kubernetes control plane is running at https://172.23.171.176:8443
CoreDNS is running at https://172.23.171.176:8443/api/v1/namespaces/kube-system/services/kube-dns:dns/proxy

To further debug and diagnose cluster problems, use 'kubectl cluster-info dump'.
PS C:\Users\mjcul> kubectl get nodes
NAME       STATUS   ROLES           AGE   VERSION
minikube   Ready    control-plane   46s   v1.32.0
```

2 Deploy an Application

```
PS C:\Users\mjcul> kubectl create deployment kubernetes-bootcamp --image=gcr.io/google-samples/kubernetes-bootcamp:v1
deployment.apps/kubernetes-bootcamp created
PS C:\Users\mjcul> kubectl get pods
NAME                                  READY   STATUS    RESTARTS   AGE
kubernetes-bootcamp-9bc58d867-8r4bl   1/1     Running   0          2s
PS C:\Users\mjcul>
```




```
PS C:\Users\mjcul> $POD_NAME = (kubectl get pods -o jsonpath="{.items[0].metadata.name}")
PS C:\Users\mjcul> echo Name of the Pod: $POD_NAME
Name
of
the
Pod:
kubernetes-bootcamp-9bc58d867-8r4bl
```

3 Explore your app

```
kubernetes-bootcamp-9bc58d867-8r4bl
PS C:\Users\mjcul> kubectl get nodes
NAME       STATUS   ROLES           AGE   VERSION
minikube   Ready    control-plane   49m   v1.32.0
PS C:\Users\mjcul> kubectl get pods
NAME                                  READY   STATUS    RESTARTS   AGE
kubernetes-bootcamp-9bc58d867-8r4bl   1/1     Running   0          21m
PS C:\Users\mjcul> kubectl get deployments
NAME                  READY   UP-TO-DATE   AVAILABLE   AGE
kubernetes-bootcamp   1/1     1            1           21m
PS C:\Users\mjcul>
```

```
PS C:\Users\mjcul> curl "http://127.0.0.1:8001/api/v1/namespaces/default/pods/$POD_NAME/"


StatusCode        : 200
StatusDescription : OK
Content           : {
                      "kind": "PodList",
                      "apiVersion": "v1",
                      "metadata": {
                        "resourceVersion": "2784"
                      },
                      "items": [
                        {
                          "metadata": {
                            "name": "kubernetes-bootcamp-9bc58d867-8r4bl",
                            "g...
RawContent        : HTTP/1.1 200 OK
                    Audit-Id: 4b951b73-2168-4420-9850-a7e9c9839449
                    X-Kubernetes-Pf-Flowschema-Uid: 36a42f6f-d80e-4ba3-88f6-21b86e6604de
                    X-Kubernetes-Pf-Prioritylevel-Uid: 40ba29ad-1d51-451b-9d68-8aebfe...
Forms             : {}
Headers           : {[Audit-Id, 4b951b73-2168-4420-9850-a7e9c9839449], [X-Kubernetes-Pf-Flowschema-Uid,
                    36a42f6f-d80e-4ba3-88f6-21b86e6604de], [X-Kubernetes-Pf-Prioritylevel-Uid,
                    40ba29ad-1d51-451b-9d68-8aebfe8ebd5c], [Transfer-Encoding, chunked]...}
Images            : {}
InputFields       : {}
Links             : {}
ParsedHtml        : mshtml.HTMLDocumentClass
RawContentLength  : 9006
```

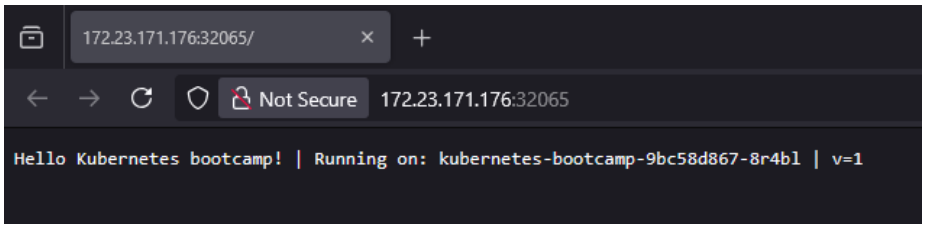
```
PS C:\Users\mjcul> kubectl proxy
Starting to serve on 127.0.0.1:8001
PS C:\Users\mjcul> kubectl logs $POD_NAME
Kubernetes Bootcamp App Started At: 2025-03-19T13:22:13.442Z | Running On:  kubernetes-bootcamp-9bc58d867-8r4bl

PS C:\Users\mjcul> kubectl exec -it $POD_NAME -- /bin/sh
# ls
bin  boot  core  dev  etc  home  lib  lib64  media  mnt  opt  proc  root  run  sbin  server.js  srv  sys  tmp  usr  var
#
```

4 Expose your app

```
PS C:\Users\mjcul> kubectl expose deployment kubernetes-bootcamp --type=NodePort --port=8080
service/kubernetes-bootcamp exposed
PS C:\Users\mjcul> minikube service kubernetes-bootcamp --url
http://172.23.171.176:32065
```

```
PS C:\Users\mjcul> kubectl rollout status deployments/kubernetes-bootcamp
deployment "kubernetes-bootcamp" successfully rolled out
PS C:\Users\mjcul> kubectl set image deployments/kubernetes-bootcamp kubernetes-bootcamp=gcr.io/google-samples/kubernetes-bootcamp:v1
0
deployment.apps/kubernetes-bootcamp image updated
PS C:\Users\mjcul> kubectl rollout undo deployments/kubernetes-bootcamp
deployment.apps/kubernetes-bootcamp rolled back
PS C:\Users\mjcul> kubectl delete deployments/kubernetes-bootcamp services/kubernetes-bootcamp
deployment.apps "kubernetes-bootcamp" deleted
service "kubernetes-bootcamp" deleted
PS C:\Users\mjcul>
```



5 Scale your app

```
PS C:\Users\mjcul> kubectl scale deployment kubernetes-bootcamp --replicas=4
deployment.apps/kubernetes-bootcamp scaled
PS C:\Users\mjcul> kubectl get pods
NAME                                  READY   STATUS    RESTARTS   AGE
kubernetes-bootcamp-9bc58d867-5h5nj   1/1     Running   0          6s
kubernetes-bootcamp-9bc58d867-8972f   1/1     Running   0          7s
kubernetes-bootcamp-9bc58d867-8r4bl   1/1     Running   0          45m
kubernetes-bootcamp-9bc58d867-ctsbt   1/1     Running   0          7s
PS C:\Users\mjcul>
```

6 Update your app

```
PS C:\Users\mjcul> kubectl set image deployments/kubernetes-bootcamp kubernetes-bootcamp=docker.io/jocatalin/kubernetes-bootcamp:v2
PS C:\Users\mjcul> kubectl expose deployment/kubernetes-bootcamp --type="NodePort" --port 8080
Error from server (AlreadyExists): services "kubernetes-bootcamp" already exists
PS C:\Users\mjcul> $Env:NODE_PORT = kubectl get service kubernetes-bootcamp -o go-template='{{(index .spec.ports 0).nodePort}}'
PS C:\Users\mjcul> Write-Host "NODE_PORT=$Env:NODE_PORT"
NODE_PORT=32065
PS C:\Users\mjcul> curl "http://$(minikube ip):$Env:NODE_PORT"


StatusCode        : 200
StatusDescription : OK
Content           : Hello Kubernetes bootcamp! | Running on: kubernetes-bootcamp-845669f8cd-wbdc7 | v=2

RawContent        : HTTP/1.1 200 OK
                    Connection: keep-alive
                    Transfer-Encoding: chunked
                    Content-Type: text/plain
                    Date: Wed, 19 Mar 2025 14:37:51 GMT

                    Hello Kubernetes bootcamp! | Running on: kubernetes-bootcamp-84566...
Forms             : {}
Headers           : {[Connection, keep-alive], [Transfer-Encoding, chunked], [Content-Type, text/plain], [Date, Wed, 19 Mar 2025
                    14:37:51 GMT]}
Images            : {}
InputFields       : {}
Links             : {}
ParsedHtml        : mshtml.HTMLDocumentClass
RawContentLength  : 84
```