

CS571_Cloud Computing Infrastructure

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Homework04

Step 2: Running your first app on Kubernetes

1. On your GCP control panel, in the search bar, type “GKE” and enable Google Kubernetes Engine

The image consists of two screenshots from the Google Cloud Platform (GCP) console.

The top screenshot shows the GCP console with the search bar at the top. The search term "GKE" is entered, and a dropdown menu displays search results. Under "PRODUCTS & PAGES", "Kubernetes Engine" is listed. Under "DOCUMENTATION & TUTORIALS", "Deploy Containerized Web Application (Gcloud)" is listed. On the right side, a "Start your project" tutorial is visible, along with a "DISMISS" button and an "ACTIVATE" button.

The bottom screenshot shows the "Kubernetes Engine" overview page. The left sidebar lists various Kubernetes Engine components: Clusters, Workloads, Services & Ingress, Applications, Secrets & ConfigMaps, Storage, Object Browser, Migrate to containers, Backup for GKE, and Config Management. The main content area is titled "Kubernetes clusters" and includes a "CREATE" button and a "REFRESH" button. Below the title, there is a description: "Containers package an application so it can easily be deployed to run in its own isolated environment. Containers are run on Kubernetes clusters. [Learn more](#)". At the bottom of the main content area, there are three buttons: "CREATE", "DEPLOY CONTAINER", and "TAKE THE QUICKSTART".

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🏠

console.cloud.google.com/kubernetes/add?project=cs-571-demo-project&isCreateAndRegist...

📌

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Create a Kubernetes cluster

+ ADD NODE POOL

🗑️ REMOVE NODE POOL

📖 USE A SETUP GUIDE

• Cluster basics

NODE POOLS

• default-pool

CLUSTER

• Automation

• Networking

• Security

• Metadata

• Features

Cluster basics

The new cluster will be created with the name, version, and in the location you specify here. After the cluster is created, name and location can't be changed.

❗

To experiment with an affordable cluster, try **My first cluster** in the **Cluster set-up guides**

Name

cluster-1

?

Location type

☒ Zonal

☐ Regional

Zone

us-east1-b

▼

?

☒ Specify default node locations

?

The same number of nodes will be deployed to each selected zone

☒ us-east1-b (control plane zone)

☐ us-east1-c

☐ us-east1-d

Control plane version

Choose a release channel for automatic management of your cluster's version and upgrade

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📌 Zonal

Regional

Zone

us-east1-b

☒ Specify default node locations

The same number of nodes will be deployed to each selected zone

☒ us-east1-b (control plane zone)

☐ us-east1-c

☐ us-east1-d

Control plane version

Choose a release channel for automatic management of your cluster's version and upgrade cadence. Choose a static version for more direct management of your cluster's version. [Learn more.](#)

☐ Static version

☒ Release channel

Release channel

Regular channel (default)

Version

1.21.6-gke.1500 (default)

These versions have passed internal validation and are considered production-quality, but don't have enough historical data to guarantee their stability. Known issues generally have known workarounds. [Release notes](#)

CREATE

CANCEL

Equivalent

REST

or

COMMAND LINE

📁 Start your Free Trial with \$300 in credit. Don't worry—you won't be charged if you run out of credits. [Learn more](#) DISMISS **ACTIVATE**

Kubernetes Engine

Kubernetes cl...
+ CREATE
⋮
🔄 OPERATIONS ▾

- Clusters**
- Workloads
- Marketplace
- Release Notes

OVERVIEW COST OPTIMIZATION

Filter Enter property name or value ⓘ ⋮

<input type="checkbox"/> Status	Name ↑	Location	Number of nodes
<input checked="" type="checkbox"/> ✓	cluster-1	us-east1-b	3

CLOUD SHELL

Terminal (cs-571-demo-project) × + ▾ 🔗 Open Editor

```

Welcome to Cloud Shell! Type "help" to get started.
Your Cloud Platform project in this session is set to cs-571-demo-project.
Use "gcloud config set project [PROJECT_ID]" to change to a different project.
kolekar19615@cloudshell:~$ gcloud container clusters create kubia --num-nodes 3
The connection to the server could not be established.
kolekar19615@cloudshell:~$ gcloud container clusters create kubia --num-nodes 3
--machine-type e2-micro
ERROR: (gcloud.container.clusters.create) Error 401: Account selected.
Please run:

$ gcloud auth login

to obtain new credentials.

If you have already logged in, run:

$ gcloud config set auth/credentials-user "$(gcloud auth login --list-credentials --filter 'user:me' --format 'value(email)')"
```

Authorize Cloud Shell

gcloud is requesting your credentials to make a GCP API call.

Click to authorize this and future calls that require your credentials.

REJECT **AUTHORIZE**

```

..
Creating cluster kubia in us-east1... Cluster is being health-checked (master is healthy)...working.
..
Creating cluster kubia in us-east1... Cluster is being health-checked (master is healthy)...done.
Created [https://container.googleapis.com/v1/projects/cs-571-demo-project/zones/us-east1/clusters/kubia].
To inspect the contents of your cluster, go to: https://console.cloud.google.com/kubernetes/workload/_gcloud/us-east1/kubia?project=cs-571-demo-project
kubeconfig entry generated for kubia.
NAME: kubia
LOCATION: us-east1
MASTER_VERSION: 1.21.6-gke.1500
MASTER_IP: 35.185.42.233
MACHINE_TYPE: e2-micro
NODE_VERSION: 1.21.6-gke.1500
NUM_NODES: 3
STATUS: RUNNING
```

5. double check if nodes are correctly created

Kubectl get nodes

You should see three nodes being created

```
kolekar19615@cloudshell:~ (cs-571-demo-project) $ kubectl get nodes
NAME                                STATUS    ROLES    AGE   VERSION
gke-kubia-default-pool-2be64bf7-x37c Ready     <none>    3m12s v1.21.6-gke.1500
gke-kubia-default-pool-4ec48f0f-qxr1 Ready     <none>    3m13s v1.21.6-gke.1500
gke-kubia-default-pool-6dc7a5c9-9tsf Ready     <none>    3m12s v1.21.6-gke.1500
```

```
kolekar19615@cloudshell:~ (cs-571-demo-project) $ alias k=kubectl
kolekar19615@cloudshell:~ (cs-571-demo-project) $ source <(kubectl completion bash)
kolekar19615@cloudshell:~ (cs-571-demo-project) $ source <(kubectl completion bash | sed s/kubectl
/k/g)
```

6. Create a kubia-rc.yaml with the following contents.

apiVersion: v1

kind: ReplicationController

metadata:

name: kubia-rc

spec:

replicas: 3

selector:

app: kubia-rc

template:

metadata:

name: kubia-rc

labels:

app: kubia-rc

spec:

containers:

- name: kubia-rc

image: 19539zq/myrep

ports:

- containerPort: 80

```
7/79)
kolekar19615@cloudshell:~ (cs-571-demo-project)$ nano kuba-rc.yaml
```

7. Create replicationController with the above file

Kubectl create -f kuba-rc.yaml

```
kolekar19615@cloudshell:~ (cs-571-demo-project)$ nano kuba-rc.yaml
kolekar19615@cloudshell:~ (cs-571-demo-project)$ kubectl create -f kuba-rc.yaml
replicationcontroller/kuba created
```

8. Wait for couple minutes and list all the pods created

Kubectl get pods

```
kolekar19615@cloudshell:~ (cs-571-demo-project)$ kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
kuba-2jgmr    1/1     Running   0           2m13s
kuba-ldmmj    1/1     Running   0           2m13s
kuba-s5vw9    1/1     Running   0           2m13s
```

9. Create a service and expose the app with an external IP

Kubectl expose rc kuba --type=LoadBalancer --name kuba-http

```
kolekar19615@cloudshell:~ (cs-571-demo-project)$ kubectl expose rc kuba --type=LoadBalancer --name kuba-http
service/kuba-http exposed
```

10. Get the service running

Kubectl get service

```
kolekar19615@cloudshell:~ (cs-571-demo-project)$ kubectl get service
NAME          TYPE          CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
kubernetes    ClusterIP     10.112.0.1   <none>        443/TCP   29m
```

11. You have finished, please stop the vm while you are not using it.

The screenshot shows the Google Cloud Platform console for the 'cs-571-demo-project'. The 'VM instances' page is active, displaying a table of instances. Two instances are listed: 'instance-1' and 'nested-vm-image1', both in the 'us-east1-b' zone and 'Running' status. A 'STOP' button is visible in the 'OPERATIONS' menu. The right sidebar shows '2 instances selected' and a 'PERMISSIONS' section with a table of roles and principals.

Role / Principal	Applies to	Inheritance
Editor (2)		
Kubernetes Engine Service Agent (1)		
Owner (1)		