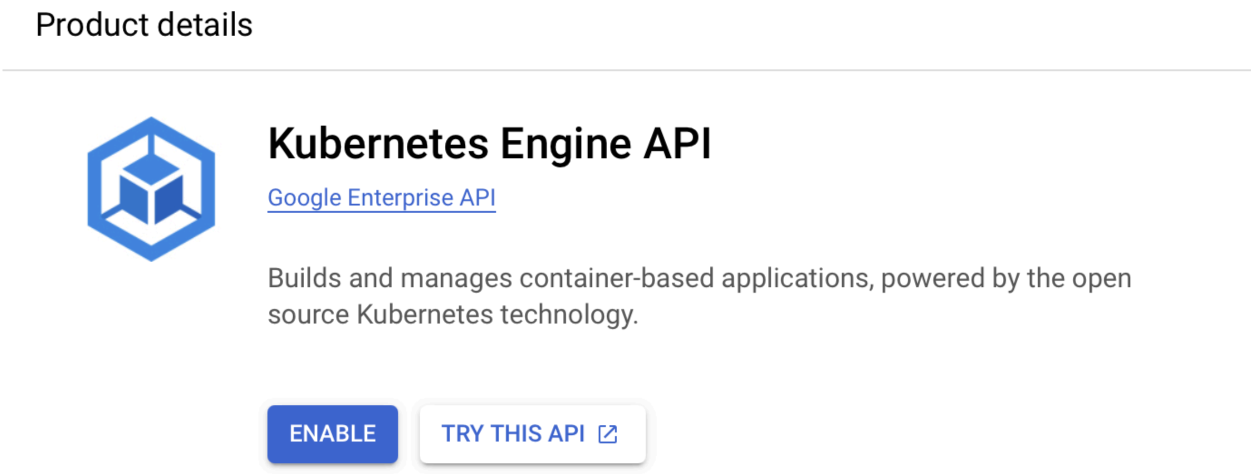
Rashmi Purandare 20177

Week 4: Homework 2: Chapter 2

First Step: Running your first app on Kubernetes

1. Login to your GCP.
2. Enable the Kubernetes Engine.



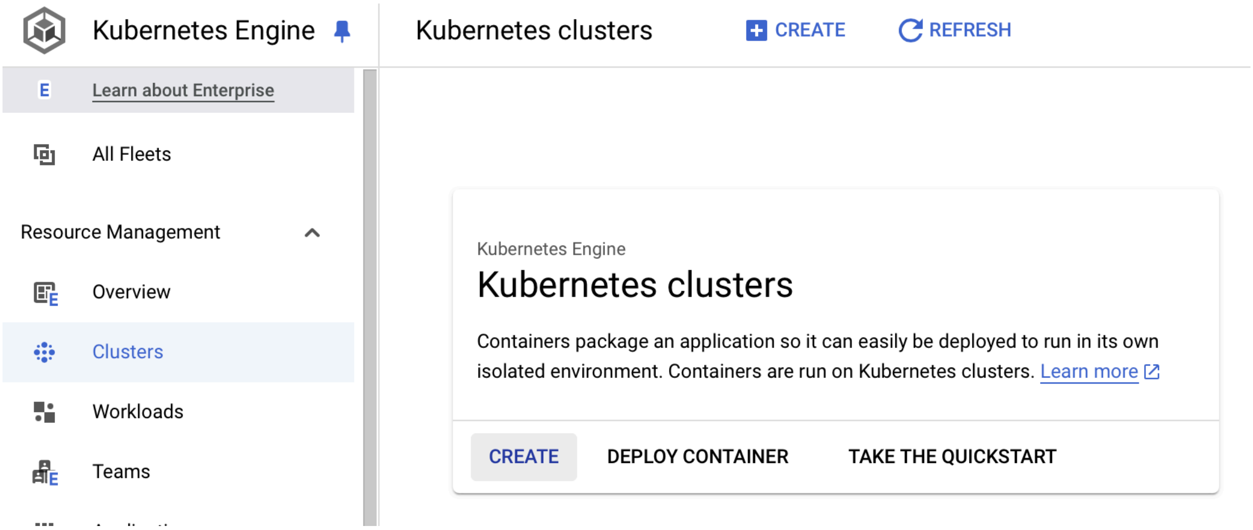
Product details

Kubernetes Engine API

Google Enterprise API

Builds and manages container-based applications, powered by the open source Kubernetes technology.

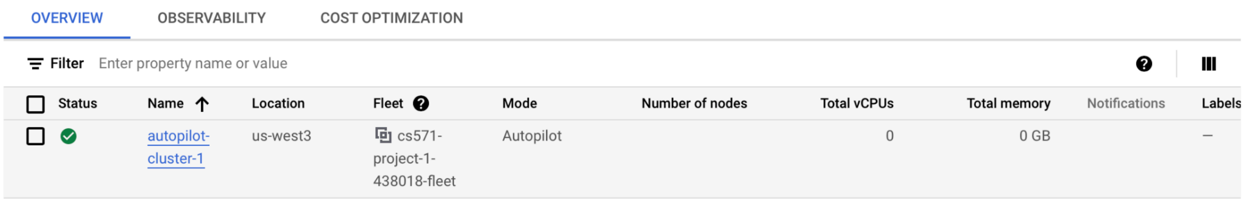
3. Create a Kubernetes cluster with three nodes by clicking the create button.



Kubernetes Engine

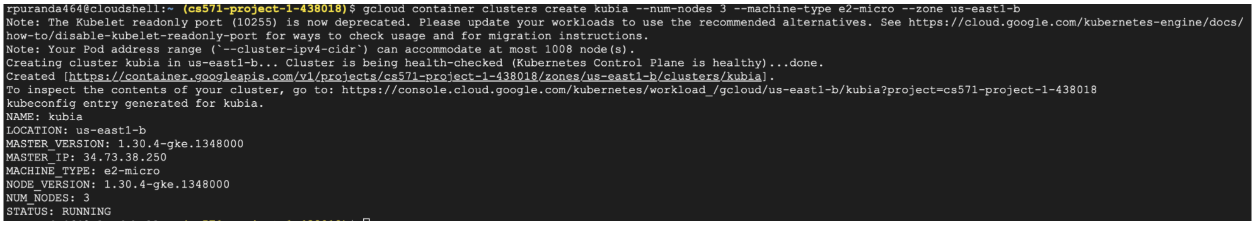
Kubernetes clusters

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



☐	Status	Name ↑	Location	Fleet	Mode	Number of nodes	Total vCPUs	Total memory	Notifications	Labels
☐	✓	autopilot-cluster-1	us-west3	cs571-project-1-438018-fleet	Autopilot		0	0 GB		—

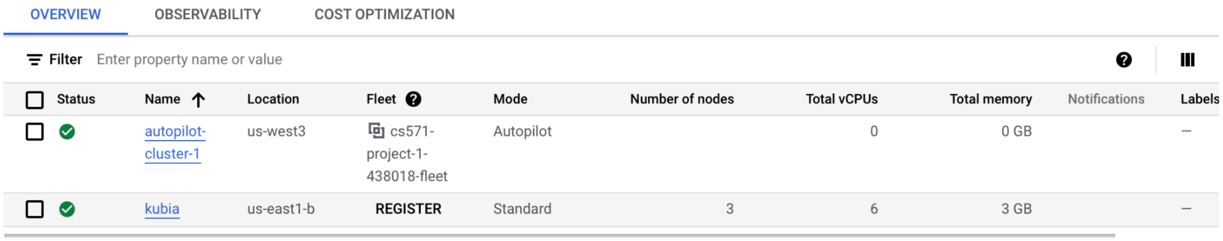
4. Create Kubernetes 3 node cluster by typing the below command line in the terminal.
   $ gcloud container clusters create kubia --num-nodes 3 --machine-type e2-micro –zone Us-east1-b



```
rpuranda464@cloudshell:~ (cs571-project-1-438018)$ gcloud container clusters create kubia --num-nodes 3 --machine-type e2-micro --zone us-east1-b
Note: The Kubelet readonly port (10255) is now deprecated. Please update your workloads to use the recommended alternatives. See https://cloud.google.com/kubernetes-engine/docs/
how-to/disable-kubelet-readonly-port for ways to check usage and for migration instructions.
Note: Your Pod address range (`--cluster-ipv4-cidr`) can accommodate at most 1008 node(s).
Creating cluster kubia in us-east1-b... Cluster is being health-checked (Kubernetes Control Plane is healthy)...done.
Created [https://container.googleapis.com/v1/projects/cs571-project-1-438018/zones/us-east1-b/clusters/kubia].
To inspect the contents of your cluster, go to: https://console.cloud.google.com/kubernetes/workload_/gcloud/us-east1-b/kubia?project=cs571-project-1-438018
kubeconfig entry generated for kubia.
NAME: kubia
LOCATION: us-east1-b
MASTER_VERSION: 1.30.4-gke.1348000
MASTER_IP: 34.73.38.250
MACHINE_TYPE: e2-micro
NODE_VERSION: 1.30.4-gke.1348000
NUM_NODES: 3
STATUS: RUNNING
```

   Note: You can specify any name of the cluster here it is “kubia” and you can select your preferred zone nearest to your location. I have selected “us-east1-b".
   Cluster creation will take a few minutes before being in the READY state.

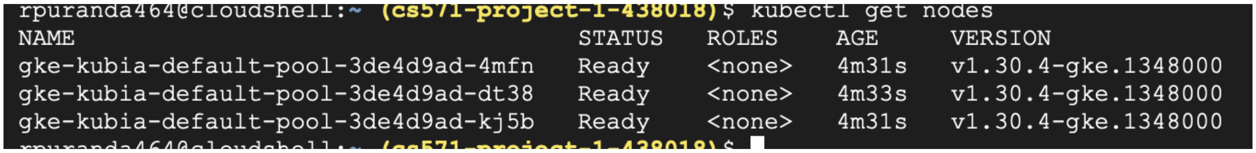
5. Verify if the cluster named “kubia” has been created with 3 nodes in the us-east1-b zone.



☐	Status	Name ↑	Location	Fleet	Mode	Number of nodes	Total vCPUs	Total memory	Notifications	Labels
☐	✓	autopilot-cluster-1	us-west3	cs571-project-1-438018-fleet	Autopilot		0	0 GB		—
☐	✓	kubia	us-east1-b	REGISTER	Standard	3	6	3 GB		—

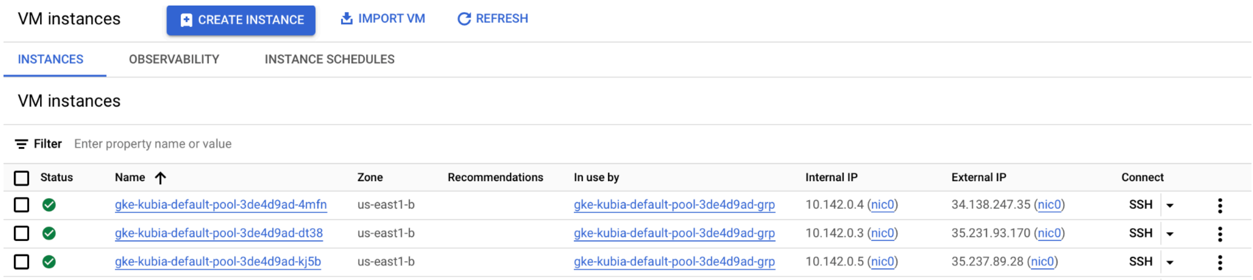
6. For the autopilot-cluster-1 there were no details provided. The number of nodes and location details can be provided at the time of creation from the console.
   Deleted the autopilot-cluster-1. Working further steps on the kubia cluster.

7. Using the below command verify if there are 3 nodes running in the kubia cluster.
   $ kubectl get nodes



```
rpuranda464@cloudshell:~ (cs571-project-1-438018)$ kubectl get nodes
NAME                                   STATUS   ROLES    AGE     VERSION
gke-kubia-default-pool-3de4d9ad-4mfn   Ready    <none>   4m31s   v1.30.4-gke.1348000
gke-kubia-default-pool-3de4d9ad-dt38   Ready    <none>   4m33s   v1.30.4-gke.1348000
gke-kubia-default-pool-3de4d9ad-kj5b   Ready    <none>   4m31s   v1.30.4-gke.1348000
rpuranda464@cloudshell:~ (cs571-project-1-438018)$
```

8. Verify in the Compute engine if there are 3 VM instances created with the same name as seen from the above command.

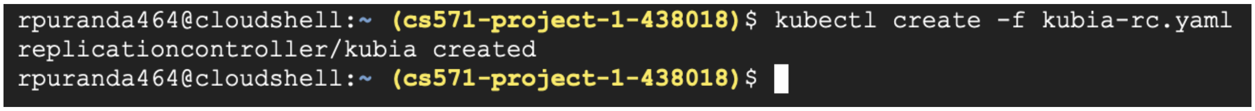


□	Status	Name ↑	Zone	Recommendations	In use by	Internal IP	External IP	Connect	
□	✓	gke-kubia-default-pool-3de4d9ad-4mfn	us-east1-b		gke-kubia-default-pool-3de4d9ad-grp	10.142.0.4 (nic0)	34.138.247.35 (nic0)	SSH ▾	⋮
□	✓	gke-kubia-default-pool-3de4d9ad-dt38	us-east1-b		gke-kubia-default-pool-3de4d9ad-grp	10.142.0.3 (nic0)	35.231.93.170 (nic0)	SSH ▾	⋮
□	✓	gke-kubia-default-pool-3de4d9ad-kj5b	us-east1-b		gke-kubia-default-pool-3de4d9ad-grp	10.142.0.5 (nic0)	35.237.89.28 (nic0)	SSH ▾	⋮

9. Create a YAML file named kubia-rc.yaml for Replication-Controller.
   $ nano kubia-rc.yaml

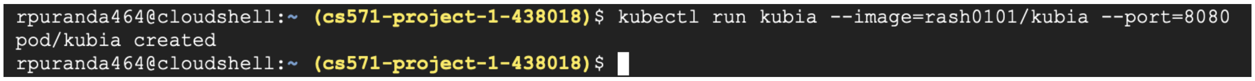
```
apiVersion: v1
kind: ReplicationController
metadata:
  name: kubia
spec:
  replicas: 3
  selector:
    app: kubia
  template:
    metadata:
      labels:
        app: kubia
    spec:
      containers:
      - name: kubia
        image: rash0101/kubia
        ports:
        - containerPort: 8080
```

10. Create the Replication Controller using below command
    $ kubectl create -f kubia-rc.yaml



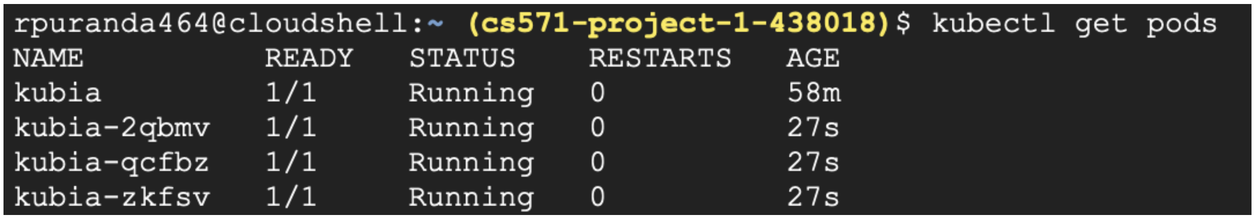
```
rpuranda464@cloudshell:~ (cs571-project-1-438018)$ kubectl create -f kubia-rc.yaml
replicationcontroller/kubia created
rpuranda464@cloudshell:~ (cs571-project-1-438018)$
```

11. Deploy the app.js - use your docker hub image name
    $ kubectl run kubia --image=rash0101/kubia --port=8080



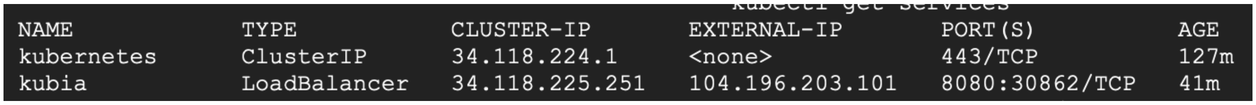
```
rpuranda464@cloudshell:~ (cs571-project-1-438018)$ kubectl run kubia --image=rash0101/kubia --port=8080
pod/kubia created
rpuranda464@cloudshell:~ (cs571-project-1-438018)$
```

12. Verify if there are 3 replica pods created.
    $ kubectl get pods



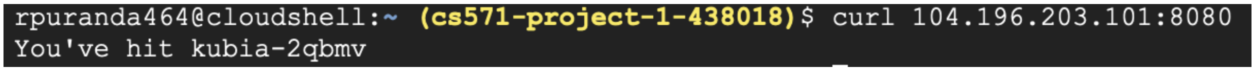
```
rpuranda464@cloudshell:~ (cs571-project-1-438018)$ kubectl get pods
NAME           READY   STATUS    RESTARTS   AGE
kubia          1/1     Running   0          58m
kubia-2qbmv    1/1     Running   0          27s
kubia-qcfbz    1/1     Running   0          27s
kubia-zkfsv    1/1     Running   0          27s
```

13. Create a service and expose the app with an external IP
    $ kubectl expose pod kubia --type=LoadBalancer --name=kubia-service --port=80 --target-port=8080
    $ kubectl get service



```
                                           kubectl get services
NAME          TYPE           CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
kubernetes    ClusterIP      34.118.224.1    <none>           443/TCP          127m
kubia         LoadBalancer   34.118.225.251  104.196.203.101  8080:30862/TCP   41m
```

14. Accessing the app.js via external IP and exposed service.
    $ curl 104.196.203.101:8080



```
rpuranda464@cloudshell:~ (cs571-project-1-438018)$ curl 104.196.203.101:8080
You've hit kubia-2qbmv
```