
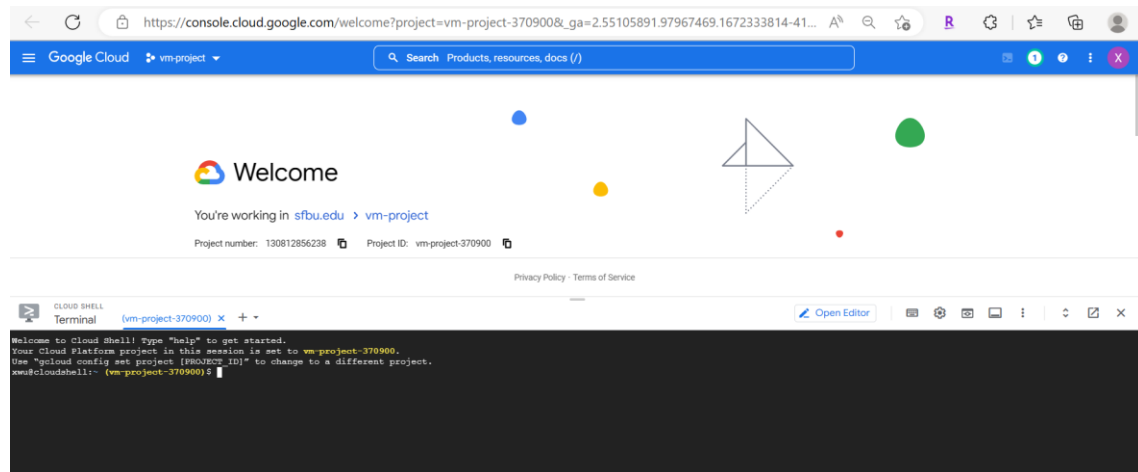


Using Kubernetes to send JSON data from node.js server

1. On your GCP, open a project, and then create a compute engine instance using command lines.

Step1. Launch a Cloud Shell in Google Cloud Console, click  the Activate Cloud Shell.
Enter [link](#) in browser



Step2. Check the
\$ gcloud compute zones describe us-west1-a

```
xwu@cloudshell:~ (vm-project-370900)$ gcloud compute zones describe us-west1-a
availableCpuPlatforms:
- Intel Ice Lake
- Intel Cascade Lake
- Intel Skylake
- Intel Broadwell
- Intel Haswell
- Intel Ivy Bridge
- Intel Sandy Bridge
- AMD Milan
- AMD Rome
creationTimestamp: '1969-12-31T16:00:00.000-08:00'
description: us-west1-a
id: '2210'
kind: compute#zone
name: us-west1-a
region: https://www.googleapis.com/compute/v1/projects/vm-project-370900/regions/us-west1
selfLink: https://www.googleapis.com/compute/v1/projects/vm-project-370900/zones/us-west1-a
status: UP
supportsPzs: false
xwu@cloudshell:~ (vm-project-370900)$
```

Step3. Create a boot staging disk

\$ gcloud compute disks create stagingdisk --image-project ubuntu-os-cloud --image-family ubuntu-minimal-2004-lts --zone us-west1-a

```
xwu@cloudshell:~ (vm-project-370900) $ gcloud compute disks create stagingdisk --image-pro
ject ubuntu-os-cloud --image-family ubuntu-minimal-2004-lts --zone us-west1-a
Created [https://www.googleapis.com/compute/v1/projects/vm-project-370900/zones/us-west1-
a/disks/stagingdisk].
NAME: stagingdisk
ZONE: us-west1-a
SIZE_GB: 10
TYPE: pd-standard
STATUS: READY
xwu@cloudshell:~ (vm-project-370900) $
```

Step4. Create an image

```
$ gcloud compute images create nested-vm-image --source-disk=stagingdisk
--source-disk-zone=us-west1-a
--licenses=https://www.googleapis.com/compute/v1/projects/vm-options/glob
al/licenses/enable-vmx
```

```
xwu@cloudshell:~ (vm-project-370900) $ gcloud compute images create nested-vm-image --sour
ce-disk=stagingdisk --source-disk-zone=us-west1-a --licenses=https://www.googleapis.com/c
ompute/v1/projects/vm-options/global/licenses/enable-vmx
Created [https://www.googleapis.com/compute/v1/projects/vm-project-370900/global/images/n
ested-vm-image].
NAME: nested-vm-image
PROJECT: vm-project-370900
FAMILY:
DEPRECATED:
STATUS: READY
xwu@cloudshell:~ (vm-project-370900) $
```

Step5. Create a vm instance

```
$ gcloud compute instances create nested-vm-image1 --zone us-west1-b
--min-cpu-platform "Intel Haswell" --machine-type n1-standard-4 --image
nested-vm-image
```

```
xwu@cloudshell:~ (vm-project-370900) $ gcloud compute instances create nested-vm-image1 --
zone us-west1-a --min-cpu-platform "Intel Haswell" --machine-type n1-standard-4 --image n
ested-vm-image
Created [https://www.googleapis.com/compute/v1/projects/vm-project-370900/zones/us-west1-
a/instances/nested-vm-image1].
NAME: nested-vm-image1
ZONE: us-west1-a
MACHINE_TYPE: n1-standard-4
PREEMPTIBLE:
INTERNAL_IP: 10.138.0.5
EXTERNAL_IP: 34.168.74.96
STATUS: RUNNING
xwu@cloudshell:~ (vm-project-370900) $
```

Step6. Verify the compute engine vm instance is available on the Google Cloud Console.

← ↻ 🔒 <https://console.cloud.google.com/compute/instances?cloudshell=true&project=vm-project-370900&supportedpurvi...> 🔍

Google Cloud vm-project 🔍 Search Products, resources, docs (/)

Compute Engine VM instances CREATE INSTANCE IMPORT VM REFRESH START / RESUME OPERATIONS

Virtual machines

- VM instances
- Instance templates
- Sole-tenant nodes
- Machine images
- TPUs
- Committed use discounts

INSTANCES INSTANCE SCHEDULES

VM instances are highly configurable virtual machines for running workloads on Google infrastructure. [Learn more](#)

Filter Enter property name or value

| <input type="checkbox"/> | Status | Name ↑ | Zone | Recommendations | In use by | Internal IP | External IP | Connect |
|--------------------------|--------|----------------------------------|------------|-----------------|-----------|--|--|---------|
| <input type="checkbox"/> | ✓ | nested-vm-image1 | us-west1-a | | | 10.138.0.5 (nic0) | 34.168.74.96 (nic0) | SSH ⌵ |

SSH → Open in browser window

\$ lsb_release -a

🔒 <https://ssh.cloud.google.com/v2/ssh/projects/vm-project-370900/zones/us-west1-a/instances/nested-vm-image1?>

🔒 <https://ssh.cloud.google.com/v2/ssh/projects/vm-project-370900/zones/us-west1-a/instances/r>

SSH-in-browser

```
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-1025-gcp x86_64)

* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage

This system has been minimized by removing packages and content that are
not required on a system that users do not log into.

To restore this content, you can run the 'unminimize' command.

0 updates can be applied immediately.

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

xwu@nested-vm-image1:~$ lsb_release -a
No LSB modules are available.
Distributor ID: Ubuntu
Description:   Ubuntu 20.04.5 LTS
Release:      20.04
Codename:     focal
xwu@nested-vm-image1:~$
```

2. Install kubectl and Minikube (Please refer to this [link](#))

Install kubectl:

```
$ sudo apt-get update
```

```
$ sudo apt-get install -y ca-certificates curl
```

```
$ curl https://packages.cloud.google.com/apt/doc/apt-key.gpg | sudo apt-key --keyring
```

```
/usr/share/keyrings/cloud.google.gpg add -
```

```
$ echo "deb [signed-by=/etc/apt/keyrings/kubernetes-archive-keyring.gpg]
```

```
https://apt.kubernetes.io/ kubernetes-xenial main" | sudo tee
```

```
/etc/apt/sources.list.d/kubernetes.list
```

```
$ sudo snap install kubectl --classic
```

```
$ kubectl version --client
```

```
xwu@nested-vm-image1:~$ sudo snap install kubectl --classic
kubectl 1.26.0 from Canonical✓ installed
xwu@nested-vm-image1:~$ kubectl version --client
WARNING: This version information is deprecated and will be replaced with the output from
kubectl version --short. Use --output=yaml|json to get the full version.
Client Version: version.Info{Major:"1", Minor:"26", GitVersion:"v1.26.0", GitCommit:"b46
a3f887ca979b1a5d14fd39cblaf43e7e5d12d", GitTreeState:"clean", BuildDate:"2022-12-09T16:2
3:44Z", GoVersion:"go1.19.4", Compiler:"gc", Platform:"linux/amd64"}
Kustomize Version: v4.5.7
```

Check that kubectl is properly configured by getting the cluster state:

```
$ kubectl cluster-info
```

```
xwu@nested-vm-image1:~$ kubectl cluster-info
Kubernetes control plane is running at https://192.168.59.100:8443
CoreDNS is running at https://192.168.59.100:8443/api/v1/namespaces/kube-system/services
/kube-dns:dns/proxy

To further debug and diagnose cluster problems, use 'kubectl cluster-info dump'.
xwu@nested-vm-image1:~$
```

Install minikube:

```
$ curl -Lo minikube https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64
```

```
$ chmod +x minikube
```

Move minikube to /usr/bin

```
$ sudo cp minikube /usr/bin/
```

Install Docker

```
$ sudo apt-get install curl wget apt-transport-https virtualbox virtualbox-ext-pack -y
```

```
$ sudo apt-get install docker.io -y
```

```
$ docker --version
```

```
xwu@nested-vm-image1:~$ docker --version
Docker version 20.10.12, build 20.10.12-0ubuntu2~20.04.1
xwu@nested-vm-image1:~$
```

Start Docker, install contrack and set permission

```
$ sudo service docker start
```

\$ sudo apt-get install conntrack

\$ sudo chown -R \$USER \$HOME/minikube; chmod -R u+wxr \$HOME/minikube

Start minikube

\$ cd /usr/bin

\$ minikube start

```
xwu@nested-vm-image1:/usr/bin$ minikube start
😄 minikube v1.28.0 on Ubuntu 20.04 (kvm/amd64)
🌟 Automatically selected the virtualbox driver. Other choices: ssh, none
📦 Downloading VM boot image ...
  > minikube-v1.28.0-amd64.iso....: 65 B / 65 B [-----] 100.00% ? p/s 0s
  > minikube-v1.28.0-amd64.iso: 274.45 MiB / 274.45 MiB 100.00% 288.81 MiB
👍 Starting control plane node minikube in cluster minikube
📦 Downloading Kubernetes v1.25.3 preload ...
  > preloaded-images-k8s-v18-v1...: 385.44 MiB / 385.44 MiB 100.00% 264.79
🔥 Creating virtualbox VM (CPUs=2, Memory=3700MB, Disk=20000MB) ...
🐳 Preparing Kubernetes v1.25.3 on Docker 20.10.20 ...
  ▪ Generating certificates and keys ...
  ▪ Booting up control plane ...
  ▪ Configuring RBAC rules ...
🔍 Verifying Kubernetes components...
  ▪ Using image gcr.io/k8s-minikube/storage-provisioner:v5
🌟 Enabled addons: default-storageclass, storage-provisioner
🏠 Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
xwu@nested-vm-image1:/usr/bin$
```

3. Run application

Install vim editor,

\$ cd

\$ sudo apt-get install vim

```
xwu@nested-vm-image1:~$ sudo apt-get install vim
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libpolkit-gobject-1-0
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  libcanberra0 libltdl7 libtdb1 libvorbisfile3 vim-common vim-runtime
```

Create application files

\$ cd

\$ mkdir dockerimg

\$ vi student_info.js

```
const os = require ( 'os' );
var http = require('http');
//console.log( "Kubia server starting..." );

function parseStudentInfo(id) {
  if (id == "11111")
    return {"id": 11111, "name":"Bruce Lee", "score":84}
  else if (id == "22222")
    return {"id": 22222, "name":"Jackie Chen", "score":93}
  else if (id == "33333")
    return {"id": 33333, "name":"Jet Li", "score":88}
  else
    return {}
}

http.createServer(function (req, res) {
  res.writeHead(200, {'Content-Type': 'text/json'});
  let myURL = req.url;
  const urlArray = myURL.split("=");
  let stdId = urlArray[1];
  let stdInfo = parseStudentInfo(stdId);
  res.write(JSON.stringify(stdInfo));
  res.end("\nYou've hit " + os.hostname() + "\n");
}).listen(8000);
```

\$ vi Dockerfile

```
FROM node:7
ADD student_info.js /student_info.js
ENTRYPOINT ["node", "student_info.js"]
```

\$ sudo docker build -t kuba .

```
xwu@nested-vm-image1:~/dockerimg$ sudo docker build -t kuba .
Sending build context to Docker daemon 3.072kB
Step 1/3 : FROM node:7
7: Pulling from library/node
ad74af05f5a2: Pull complete
2b032b8bbe8b: Pull complete
a9a5b35f6ead: Pull complete
3245b5a1c52c: Pull complete
afa075743392: Pull complete
9fb9f21641cd: Pull complete
3f40ad2666bc: Pull complete
49c0ed396b49: Pull complete
Digest: sha256:af5c2c6ac8bc3fa372ac031ef60c45a285eeba7bce9ee9ed66dad3a01e29ab8d
Status: Downloaded newer image for node:7
--> d9aed20b68a4
Step 2/3 : ADD student_info.js /student_info.js
--> 03f6b01a8cc2
Step 3/3 : ENTRYPOINT ["node", "student_info.js"]
--> Running in db1d2c1443c0
Removing intermediate container db1d2c1443c0
--> 0638ff2345a0
Successfully built 0638ff2345a0
Successfully tagged kuba:latest
```

\$ sudo docker run --name kuba-container -p 8000:8000 -d kuba

```
xwu@nested-vm-image1:~/dockerimg$ sudo docker run --name kuba-container -p 8000:8000 -d
kuba
30a8576113c0ef25cef5f1818a6fccd492a6938570069b52b8c41807fae06281
```

Check if it's running correctly

\$ curl localhost:8000/api/score?student_id=11111

```
xwu@nested-vm-image1:~/dockerimg$ curl localhost:8000/api/score?student_id=11111
{"id":11111,"name":"Bruce Lee","score":84}
You've hit 1a28eb35ca9e
xwu@nested-vm-image1:~/dockerimg$ curl localhost:8000/api/score?student_id=33333
{"id":33333,"name":"Jet Li","score":88}
You've hit 1a28eb35ca9e
xwu@nested-vm-image1:~/dockerimg$ curl localhost:8000/api/score?student_id=22222
{"id":22222,"name":"Jackie Chen","score":93}
You've hit 1a28eb35ca9e
xwu@nested-vm-image1:~/dockerimg$ curl localhost:8000/api/score?student_id=00000
{}
You've hit 1a28eb35ca9e
```

Stop the container

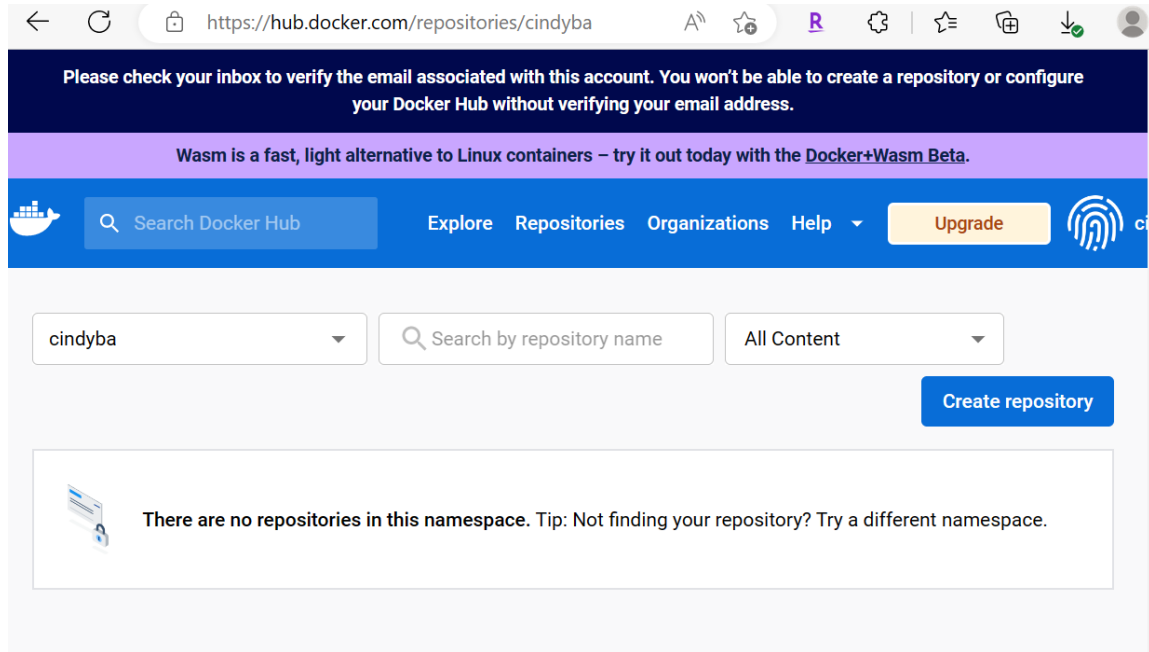
\$ sudo docker stop kuba-container


Other possible useful commands you may need:

\$ sudo docker rm /kuba-container


\$ sudo docker build --no-cache -t kuba .

4. Upload the docker image into the docker Hub Container Image Library
Create an account by link [Docker Hub Container Image Library | App Containerization](#), and create repository.



 cindyba / myrep

Description

This repository does not have a description 



Last pushed: a few seconds ago

[Public View](#)

Docker commands

To push a new tag to this repository,

```
docker push cindyba/myrep:tagname
```

Tag the kubia docker image we just created

```
$ sudo docker tag kubia cindyba/myrep
```

```
$ sudo docker login -u=cindyba -p=123456789
```

```
$ sudo docker push cindyba/myrep
```



```
xwu@nested-vm-image1:~/dockerimg$ sudo docker tag kubia cindyba/myrep
xwu@nested-vm-image1:~/dockerimg$ sudo docker login -u=cindyba -p=1234Qwer!
WARNING! Using --password via the CLI is insecure. Use --password-stdin.
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store


Login Succeeded
xwu@nested-vm-image1:~/dockerimg$ sudo docker push cindyba/myrep
Using default tag: latest
The push refers to repository [docker.io/cindyba/myrep]
0c7989f6ec09: Pushed
ab90d83fa34a: Mounted from library/node
8ee318e54723: Mounted from library/node
e6695624484e: Mounted from library/node
da59b99bbd3b: Mounted from library/node
5616a6292c16: Mounted from library/node
f3ed6cb59ab0: Mounted from library/node
654f45ecb7e3: Mounted from library/node
2c40c66f7667: Mounted from library/node
latest: digest: sha256:240afdd86b75640ec1e294e13b3c62db5f0f44fee5334eea4c8d89ab7876a17f
size: 2213
xwu@nested-vm-image1:~/dockerimg$
```

Back to the browser


[←](#)
[↻](#)
[🔒](#)
<https://hub.docker.com/repository/docker/cindyba/myrep>


i Add a short description for this repository


The short description is used to index your content on Docker Hub and in search engines. It's visible to users in search results.

 **cindyba / myrep**



Description

This repository does not have a description 

 Last pushed: a few seconds ago

Tags and scans  VULNERABILITY SCANNING - DISABLED [Enable](#)

This repository contains 1 tag(s).

| Tag | OS | Type | Pulled | Pushed |
|--|---|-------|--------|-------------------|
|  latest |  | Image | --- | a few seconds ago |

[See all](#) [Go to Advanced Image Management](#)

DONE!!!