RKE2 Kubernetes Cluster Setup on Google Cloud Platform

RKE2

Objective

Set up a two-node Kubernetes cluster using RKE2 (Rancher Kubernetes Engine 2) on GCP:

- One control-plane (master) node
- One worker node
- Firewall rules to allow required traffic

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1. Prerequisites

- A Google Cloud Platform account
- A GCP project with billing enabled
- Basic Linux and terminal knowledge
- (Optional) `gcloud` CLI installed

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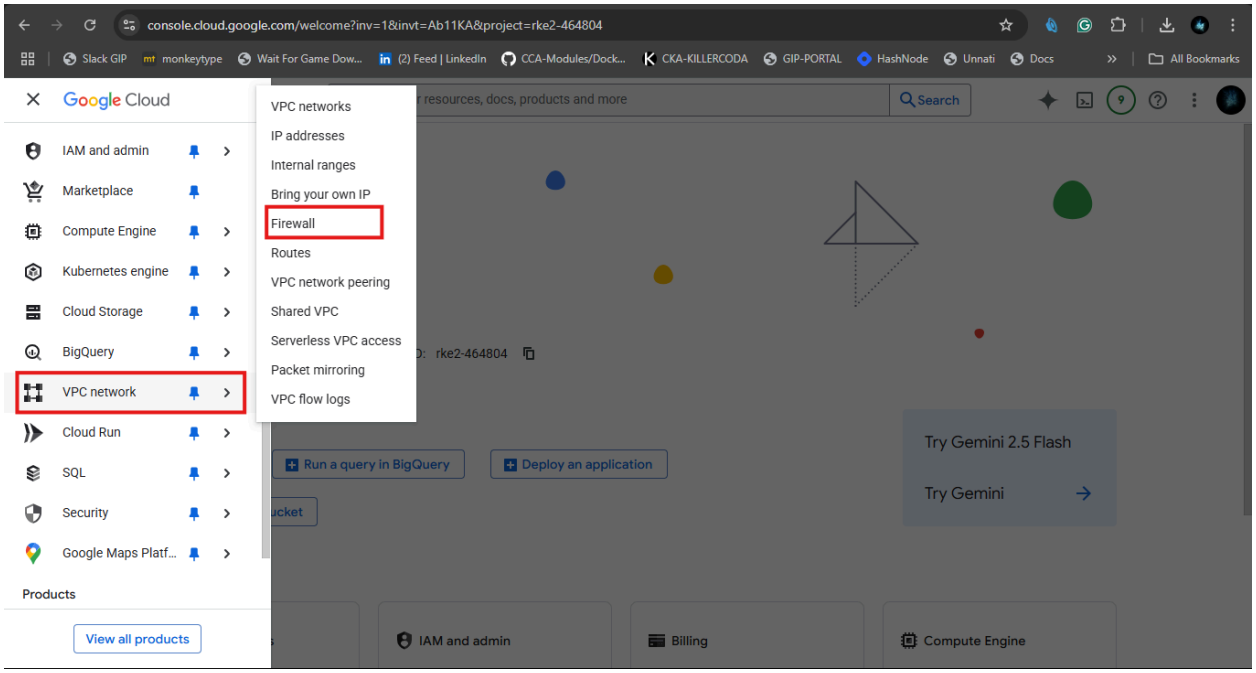
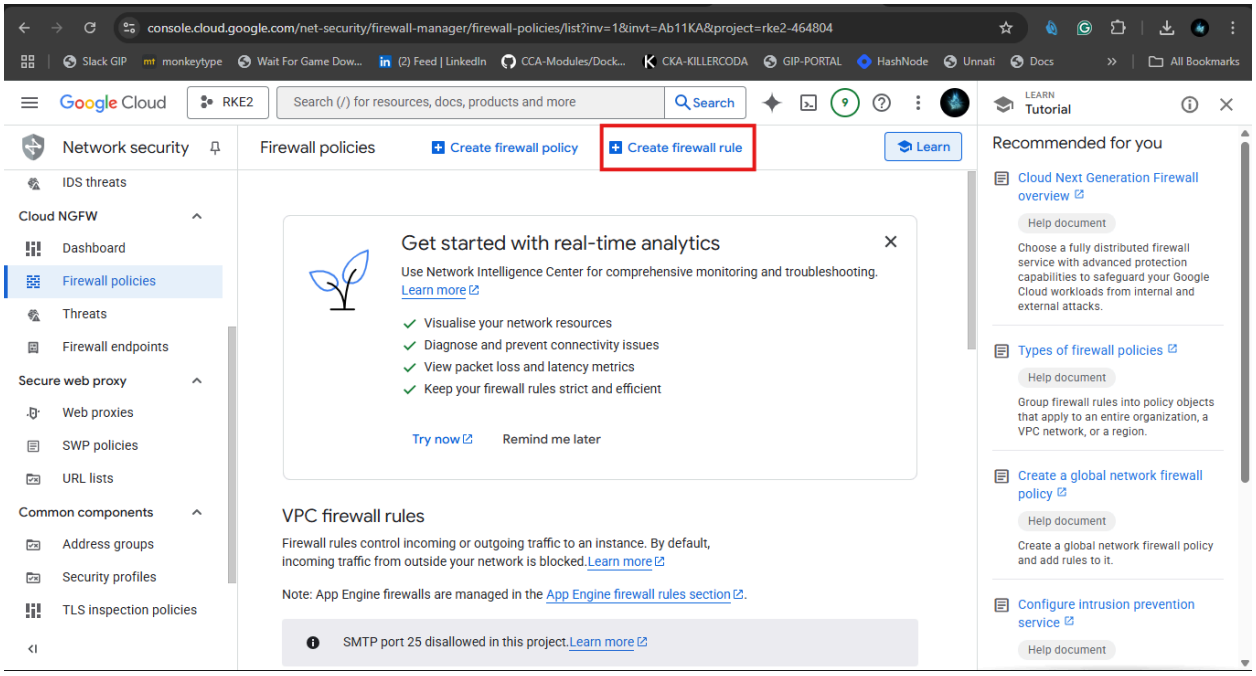
2. Create a Firewall Rule in GCP

Option A: Using Google Cloud Console

1. Go to: **VPC Network > Firewall > Create Firewall Rule**



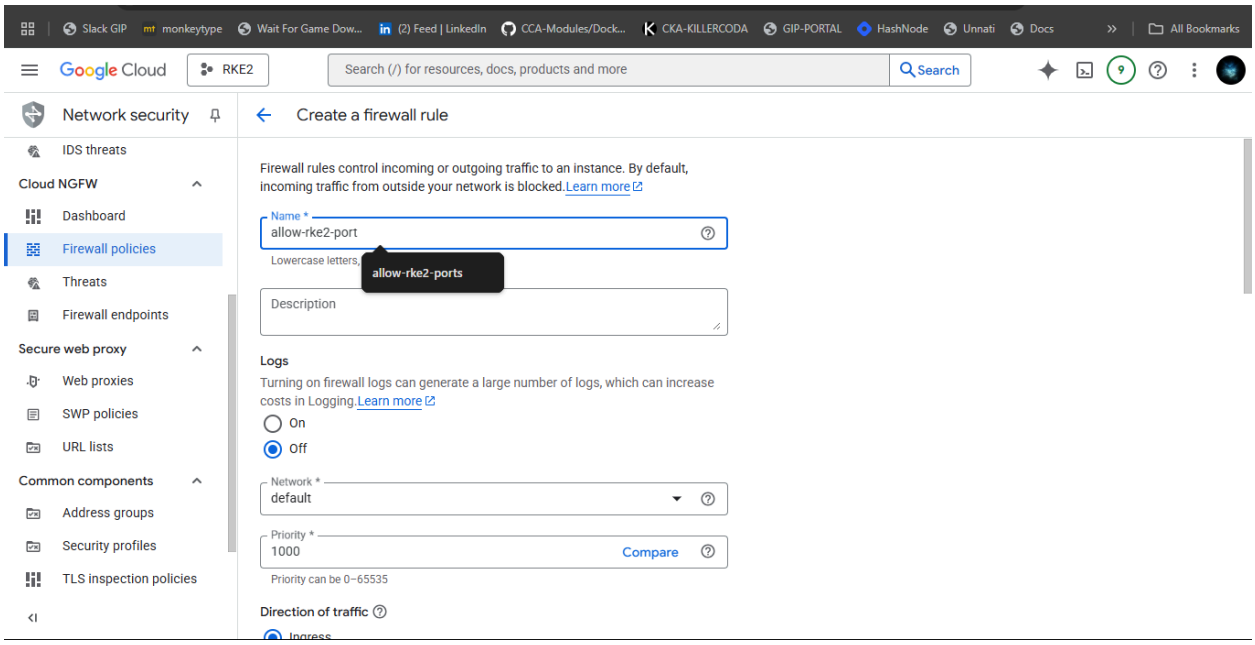


2. Use these values:
    - Name: `allow-rke2-ports`
    - Direction: **Ingress**
    - Action: **Allow**
    - Targets: All instances in the network
    - Source IP ranges: `0.0.0.0/0`

Protocols and Ports:

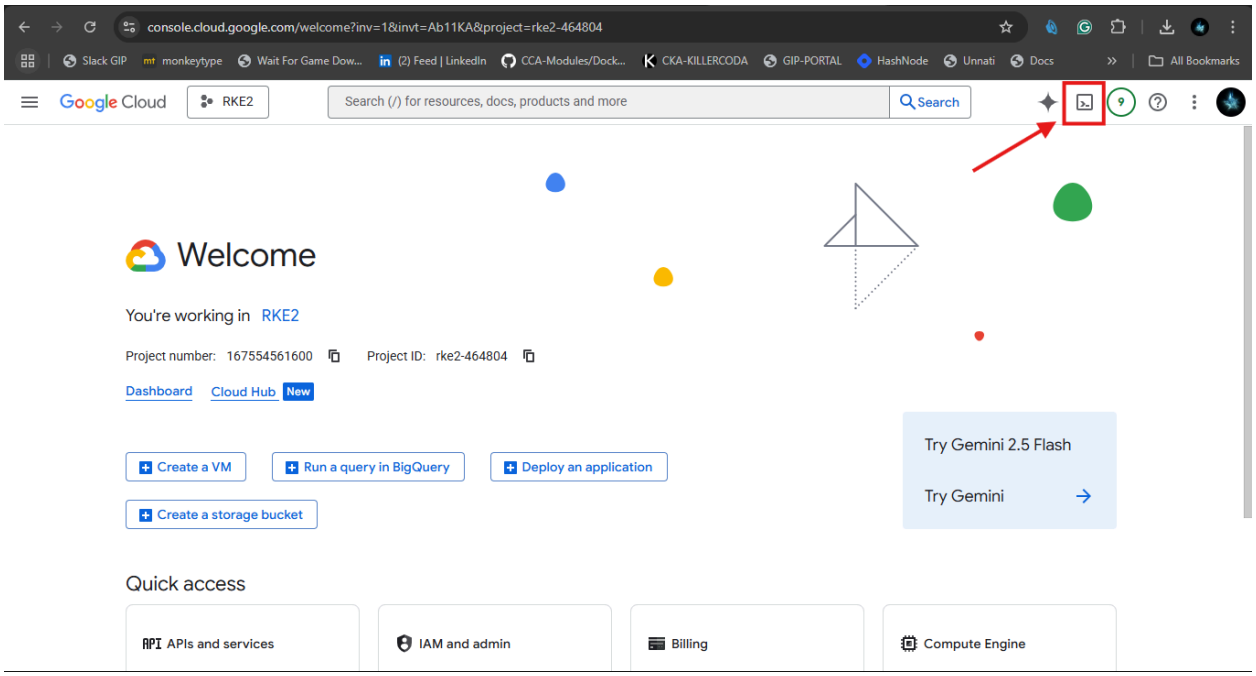
`tcp:22,6443,9345,10250,8472,30000-32767`

3. Click "Create"

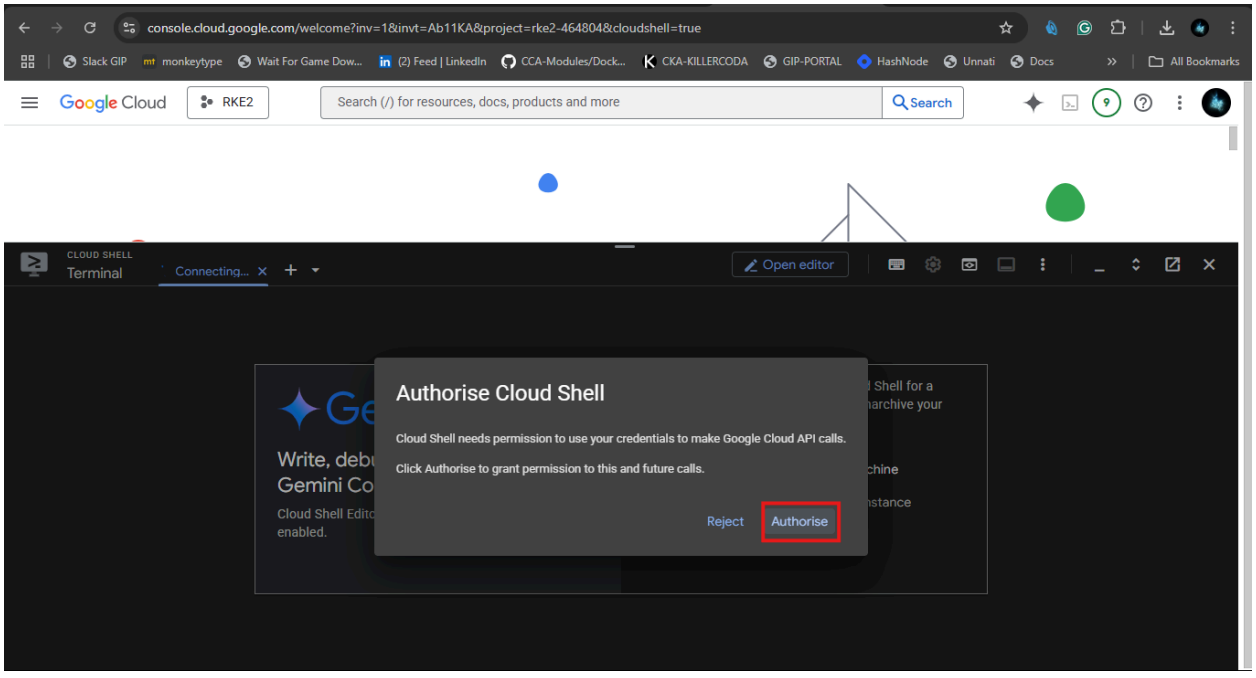


Option B: Using gcloud CLI

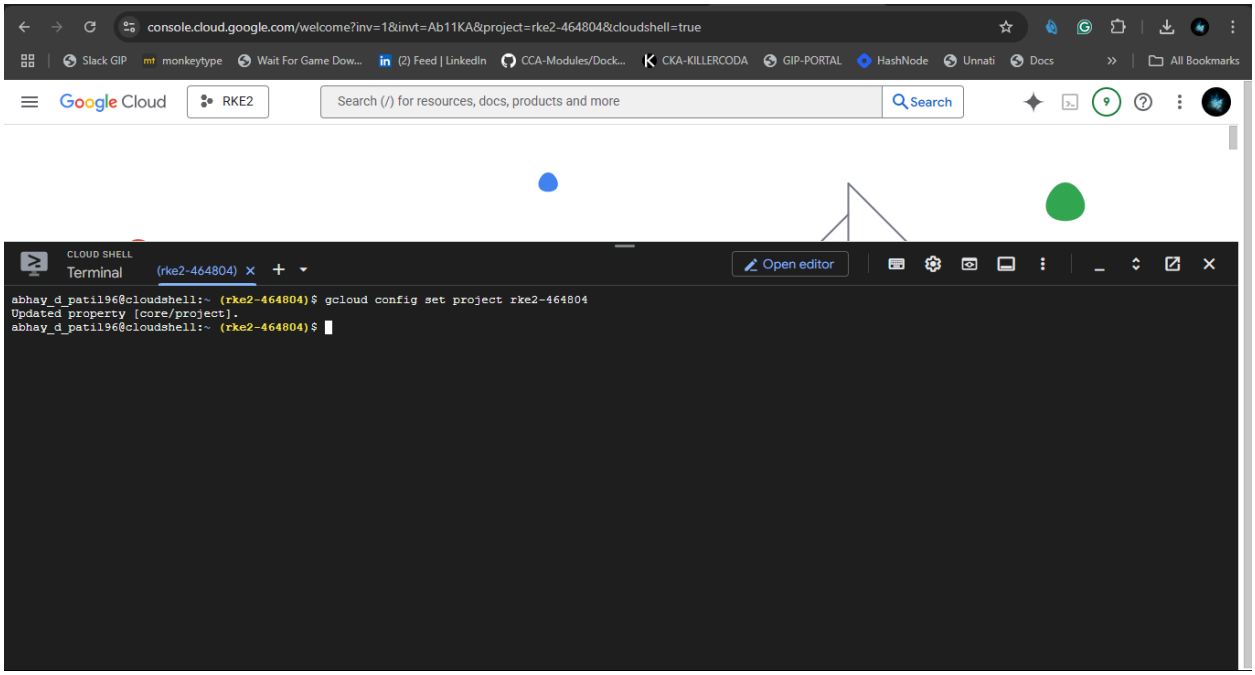
1) Open gcloud CLI console.



2) Authorise the cloud shell.

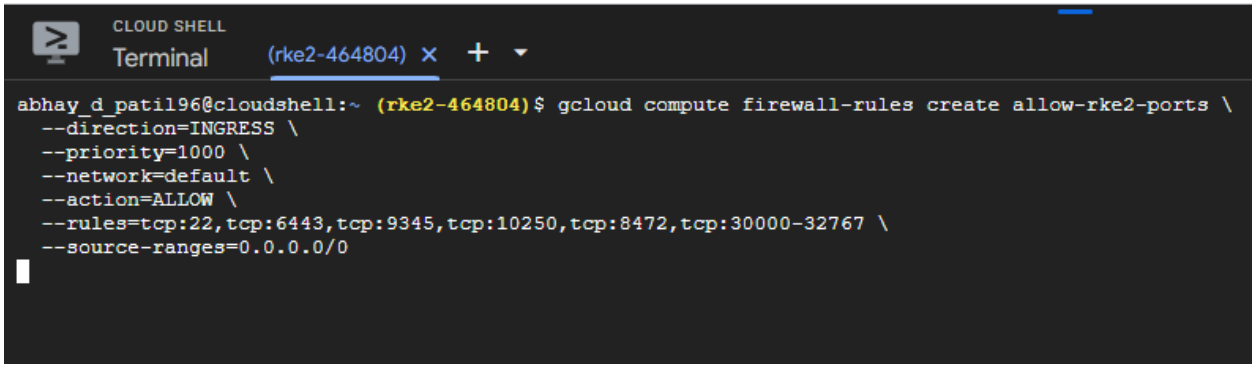


3) Set Project Use `gcloud config set project [PROJECT_ID]` to change to a different project.



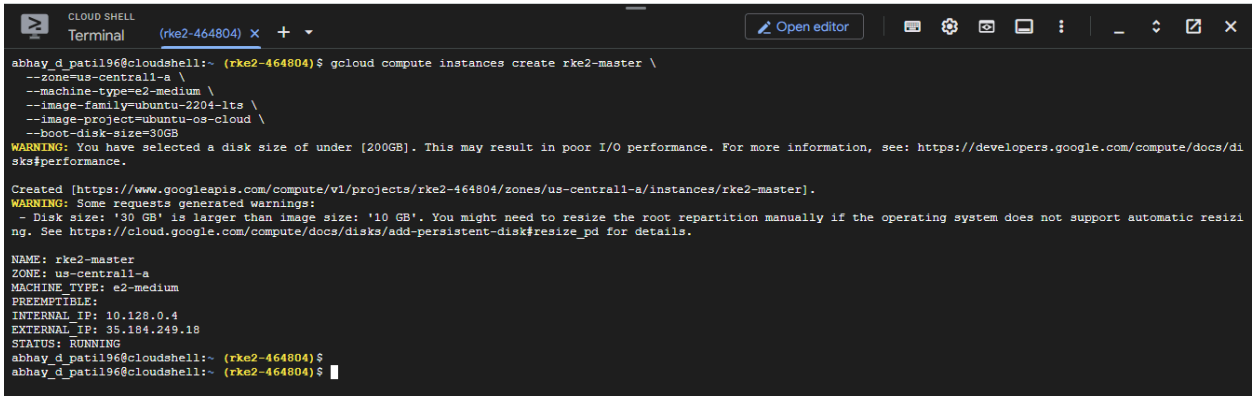
4) Insert following command in gcloud CLI.

```
gcloud compute firewall-rules create allow-rke2-ports \
  --direction=INGRESS \
  --priority=1000 \
  --network=default \
  --action=ALLOW \
  --rules=tcp:22,tcp:6443,tcp:9345,tcp:10250,tcp:8472,tcp:30000-32767
\
  --source-ranges=0.0.0.0/0
```



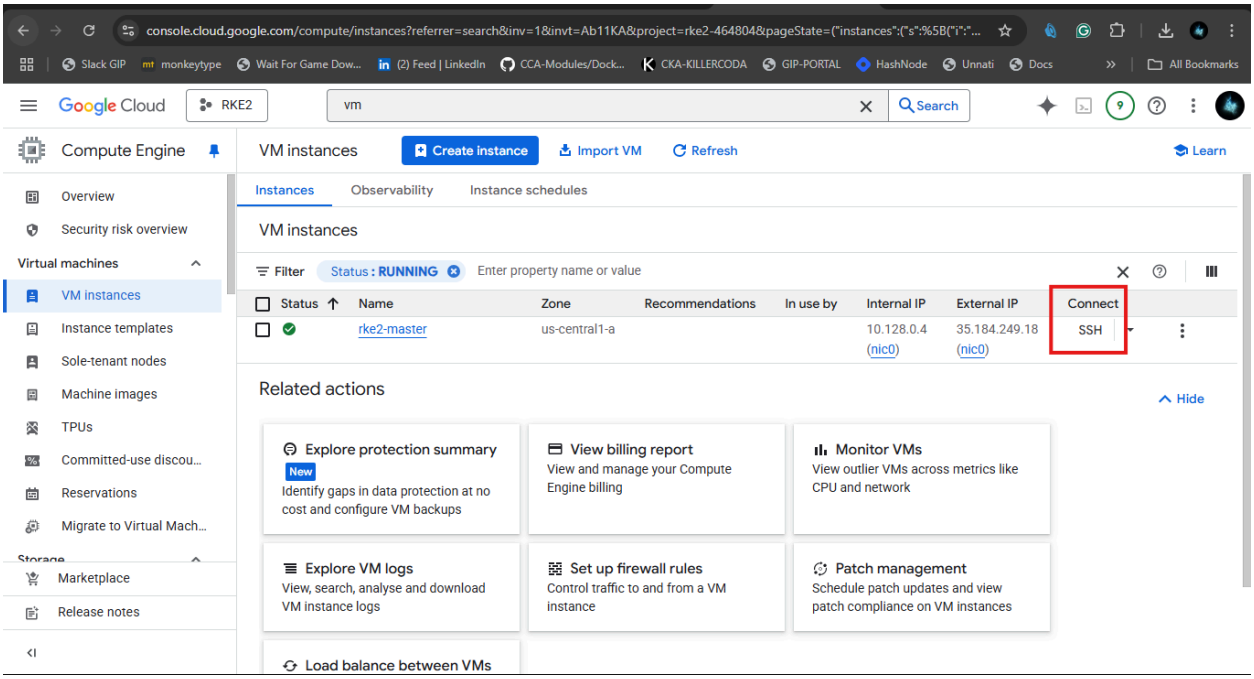
3. Launch the RKE2 Master Node

```
gcloud compute instances create rke2-master \
  --zone=us-central1-a \
  --machine-type=e2-medium \
  --image-family=ubuntu-2204-lts \
  --image-project=ubuntu-os-cloud \
  --boot-disk-size=30GB
```



SSH into the VM:

```
gcloud compute ssh rke2-master
```



4. Install RKE2 (Server) on the Master Node

```
curl -sfL https://get.rke2.io | sudo sh -
sudo systemctl enable rke2-server.service
sudo systemctl start rke2-server.service
```

Add RKE2 binary path:

```
echo 'export PATH=$PATH:/var/lib/rancher/rke2/bin' >> ~/.bashrc
source ~/.bashrc
```

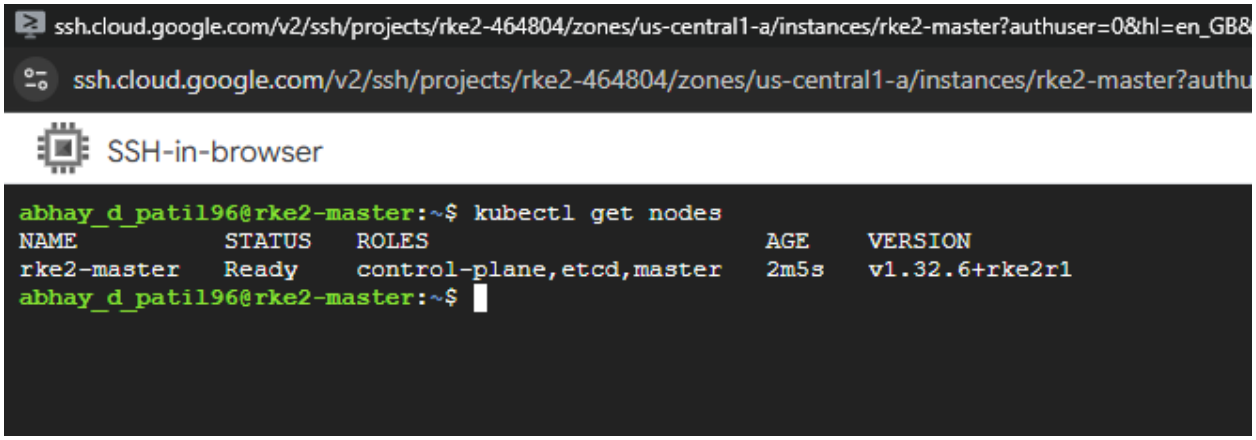
---

5. Configure kubectl on the Master Node

```
mkdir -p ~/.kube
sudo cp /etc/rancher/rke2/rke2.yaml ~/.kube/config
sudo chown $USER:$USER ~/.kube/config
```

Verify:

```
kubectl get nodes
```



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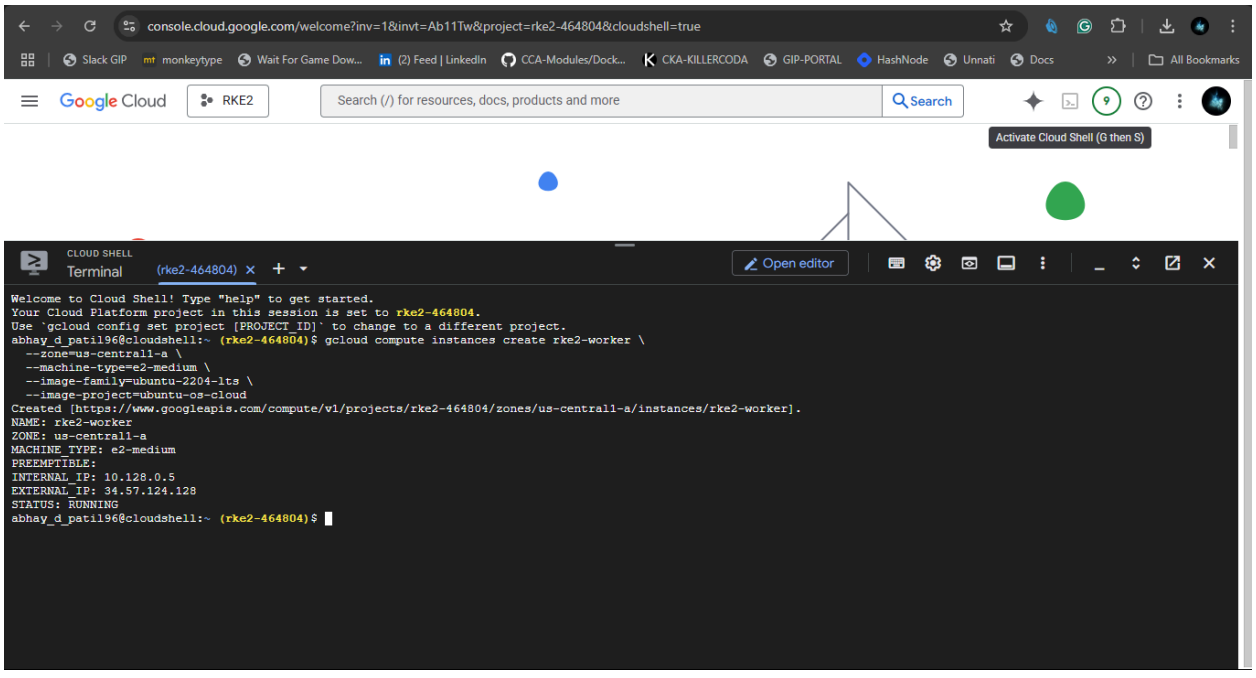
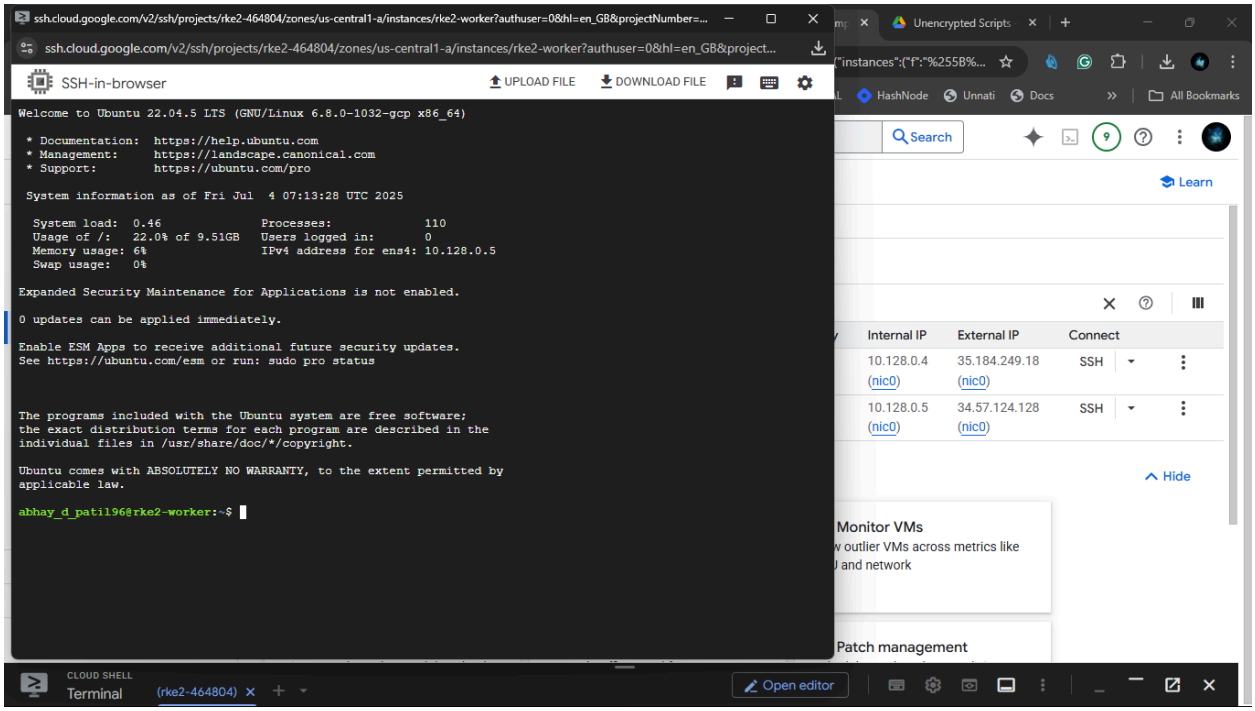
6. Launch the RKE2 Worker Node

```
gcloud compute instances create rke2-worker \
  --zone=us-central1-a \
  --machine-type=e2-medium \
  --image-family=ubuntu-2204-lts \
  --image-project=ubuntu-os-cloud
```



SSH into it:

```
gcloud compute ssh rke2-worker
```

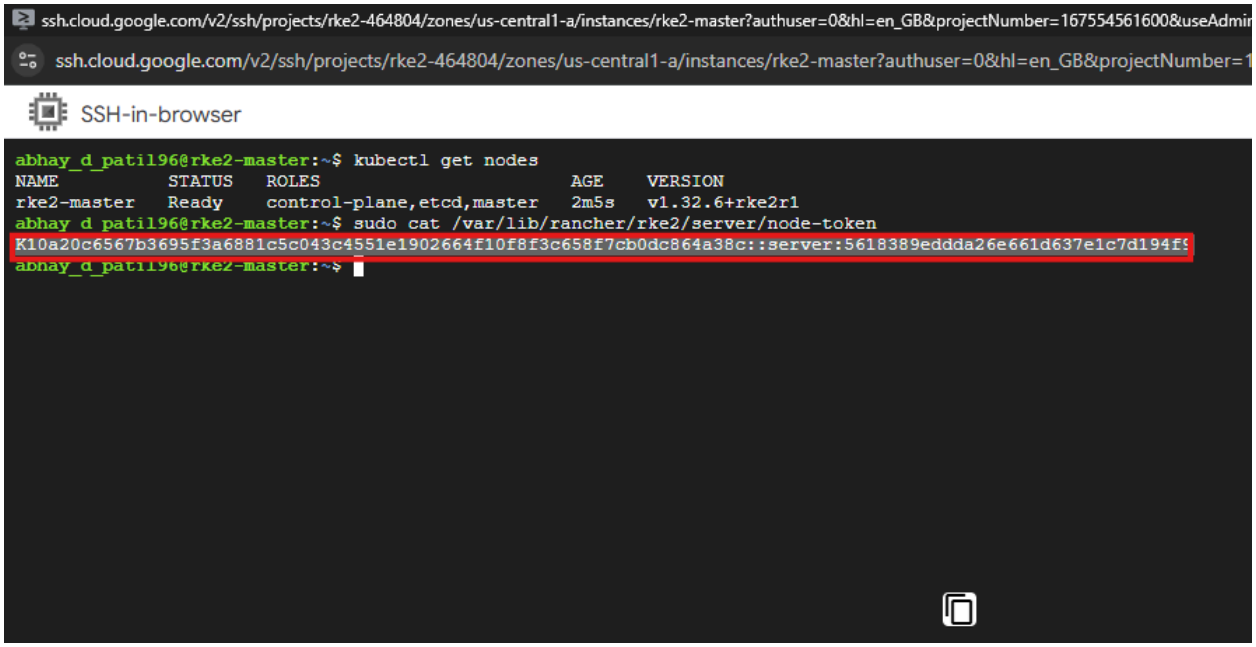


7. Install RKE2 (Agent) on the Worker Node

Step 1: Get the Join Token from the Master

On the **master node**, run:

```
sudo cat /var/lib/rancher/rke2/server/node-token
```



Copy this token.

Step 2: Create Agent Config on the Worker Node

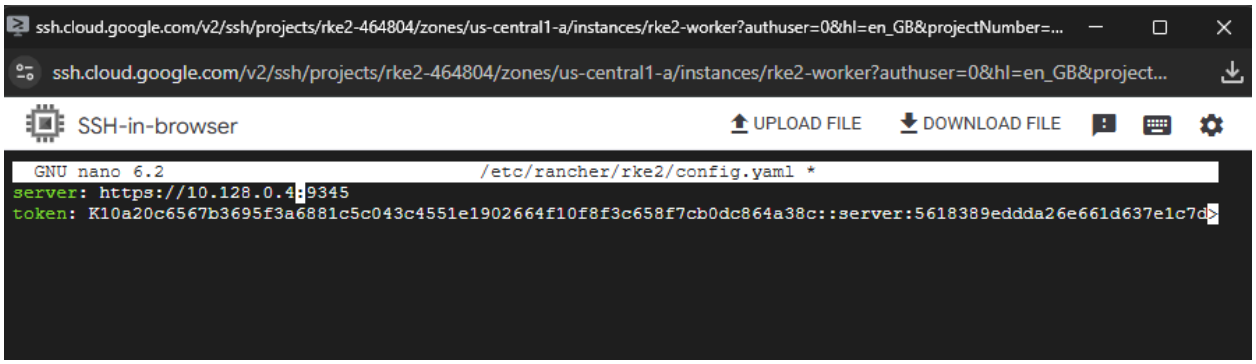
```
sudo mkdir -p /etc/rancher/rke2
```

Then:

```
sudo nano /etc/rancher/rke2/config.yaml
```

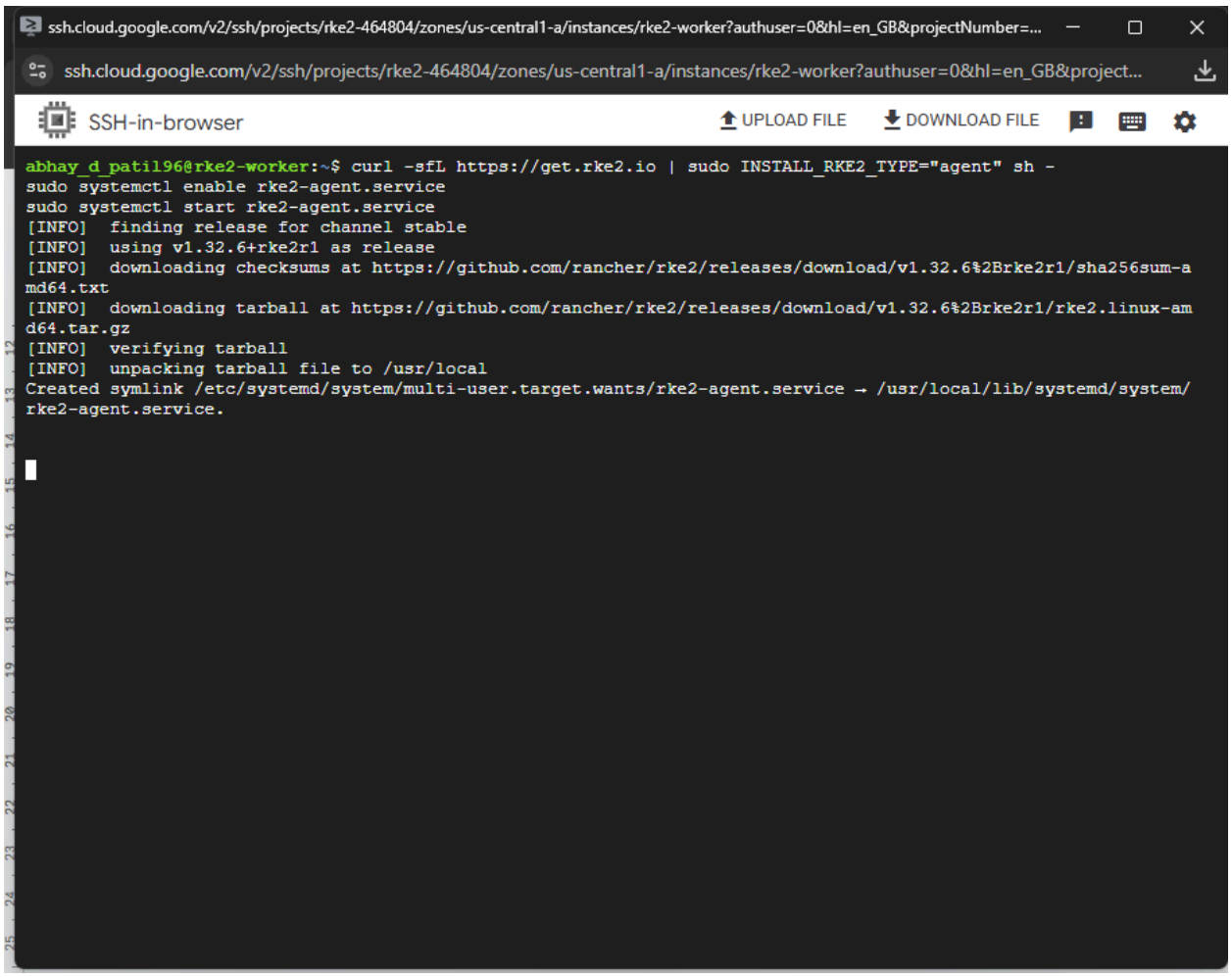
Paste:

```
server: https://<MASTER_INTERNAL_IP>:9345
token: <PASTE_TOKEN_HERE>
```



Step 3: Install and Start the Agent

```
curl -sfL https://get.rke2.io | sudo INSTALL_RKE2_TYPE="agent" sh -
sudo systemctl enable rke2-agent.service
sudo systemctl start rke2-agent.service
```



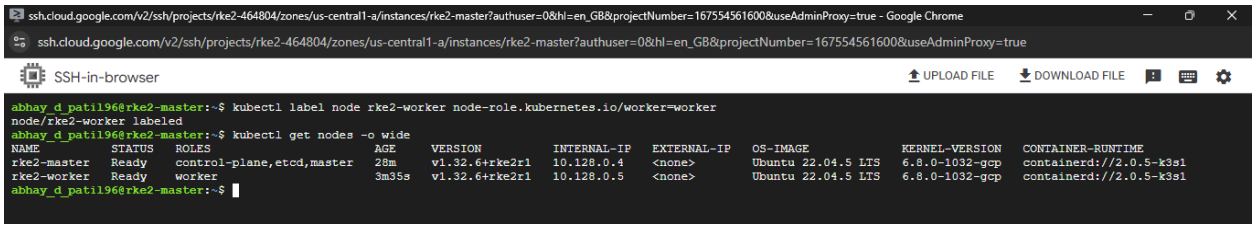
8. Label the Worker Node (Optional but Recommended)

Run this on the master:

```
kubectl label node rke2-worker node-role.kubernetes.io/worker=worker
```

Verify:

```
kubectl get nodes -o wide
```



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9) Clean-Up (Optional)

bash
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```
gcloud compute instances delete rke2-master rke2-worker
gcloud compute firewall-rules delete allow-rke2-ports
```

References

- Official RKE2 Docs
- GCP Compute Engine Docs