Assignment 2, Cloud Computing

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Topic: Exploring Google Cloud Services

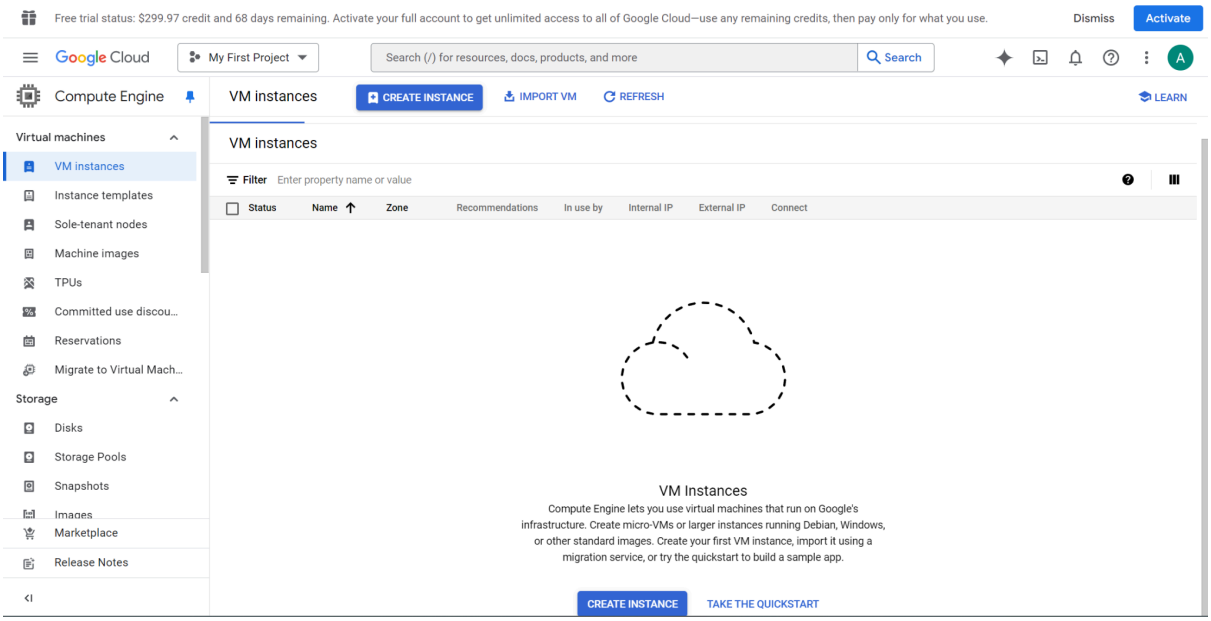
Objectives

To adjust existing network interface configurations, including changing IP addresses and subnet assignments. To verify that the VM instance maintains connectivity to external networks and can communicate with other resources within the Google Cloud environment. To enhance the networking capabilities of a Virtual Machine (VM) instance by adding one or more secondary network interfaces

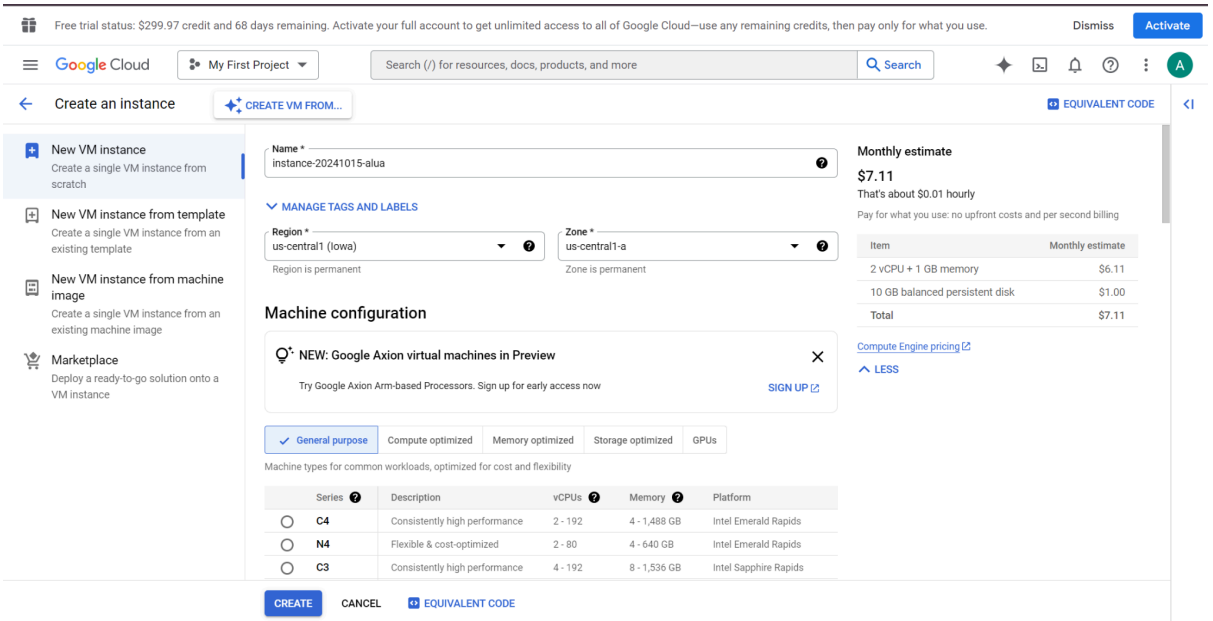
1. Virtual Machines in Google Cloud

- **Create a Virtual Machine (VM) Instance**
  - Use the Google Cloud Console to create a VM instance.
  - Select an appropriate machine type, operating system, and region.
  - Configure the firewall to allow SSH traffic.

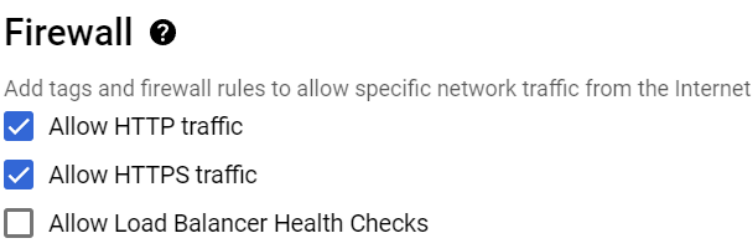
Steps:
Creating VM instance



Editing configurations, choosing **E2-micro** machine type and Iowa region(by default).



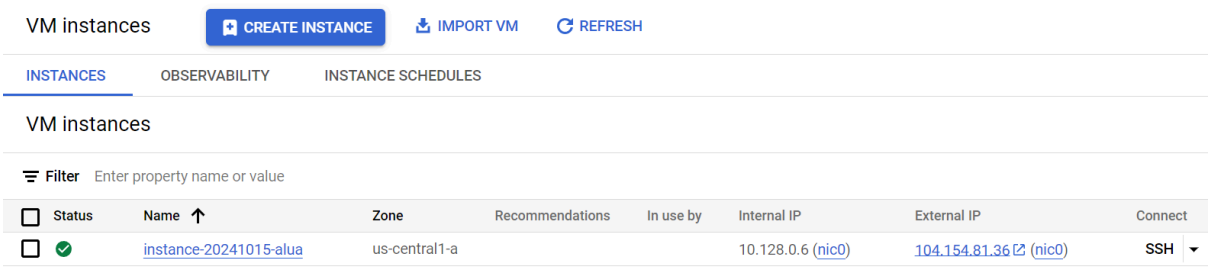
Allowing HTTP and HTTPS traffics



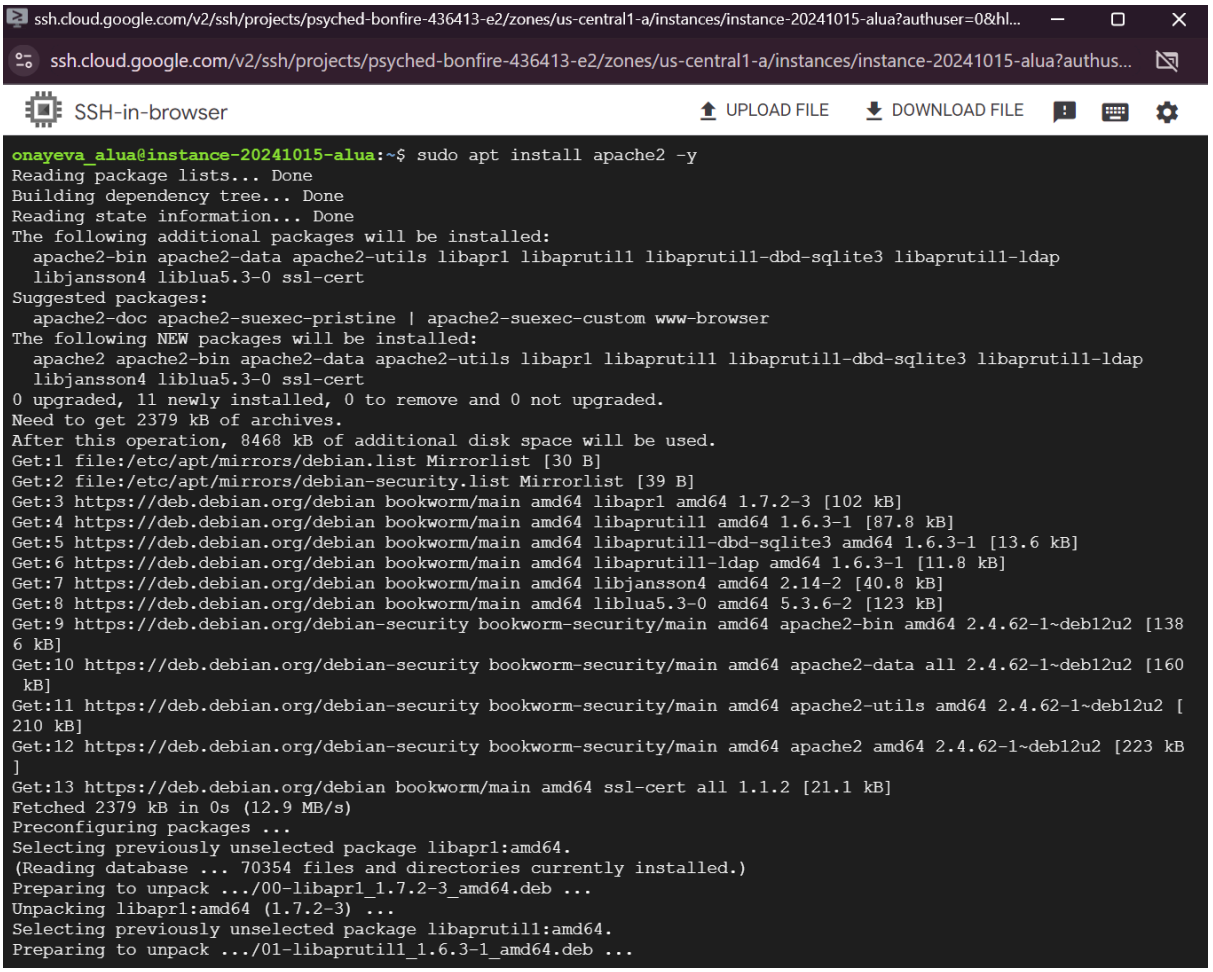
- **Connect to the VM**
  - Use the SSH option from the Cloud Console to connect to your VM.
  - Install a web server (e.g., Apache or Nginx) on the VM.
  - Create a simple HTML page to serve as a test.

Steps:

VM is created, and I am connecting through SSH on the right

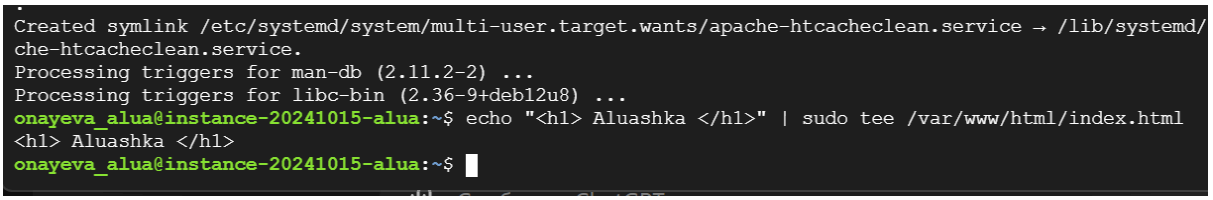


Installing apache
sudo apt install apache2 -y



We use **Apache** if we need something easy to set up, especially for dynamic sites like those using PHP, or if we're working with older systems. **Nginx** is better if we're dealing with high traffic and want faster handling of static files.

HTML text:

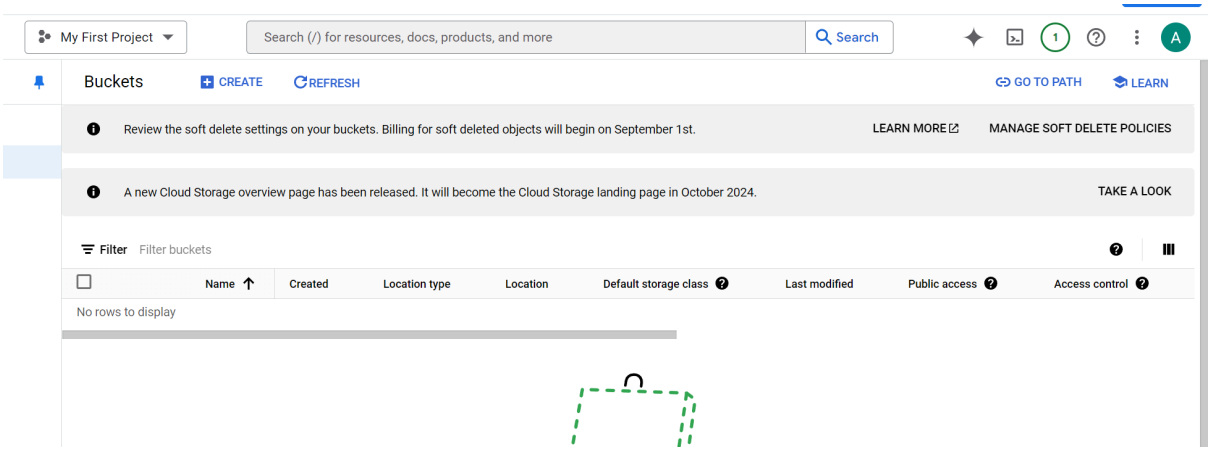


2. Storage Solutions in Google Cloud

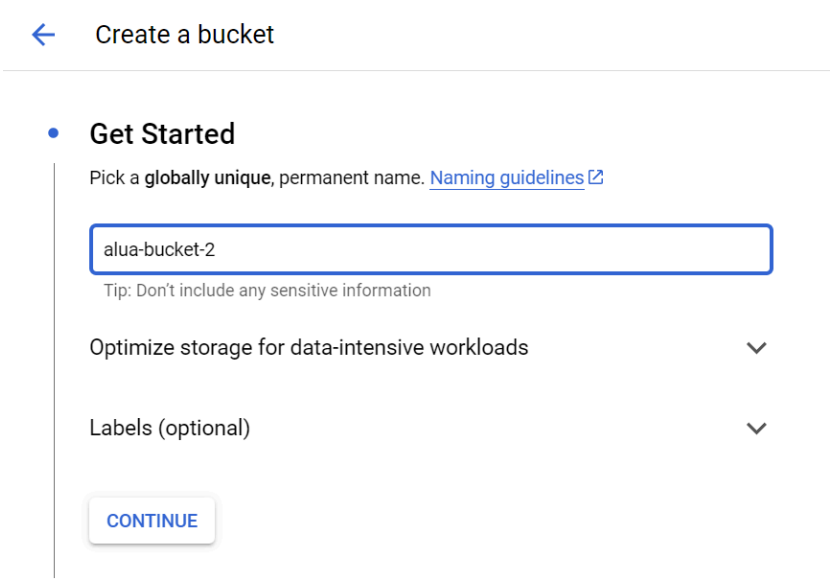
- **Create a Cloud Storage Bucket**
  - Use the Google Cloud Console to create a Cloud Storage bucket.
  - Set the bucket's access controls (public/private).
  - Upload a sample file (e.g., image or document) to the bucket.

Steps:

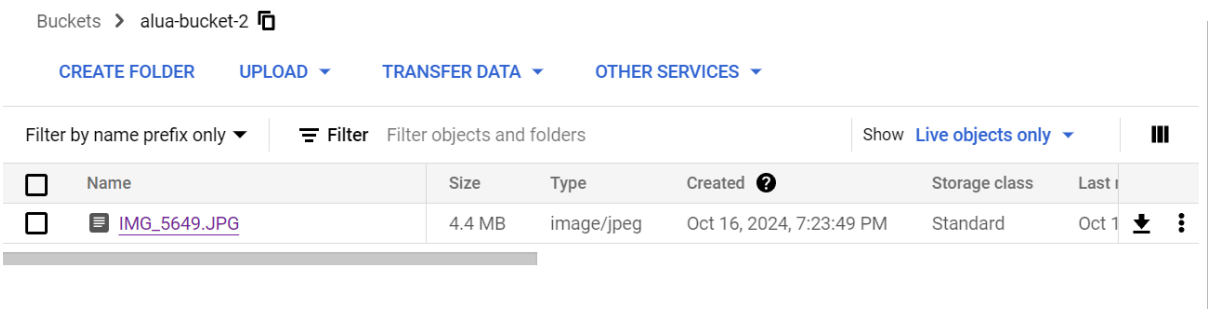
I go to **Cloud Storage** and press create button



Naming bucket



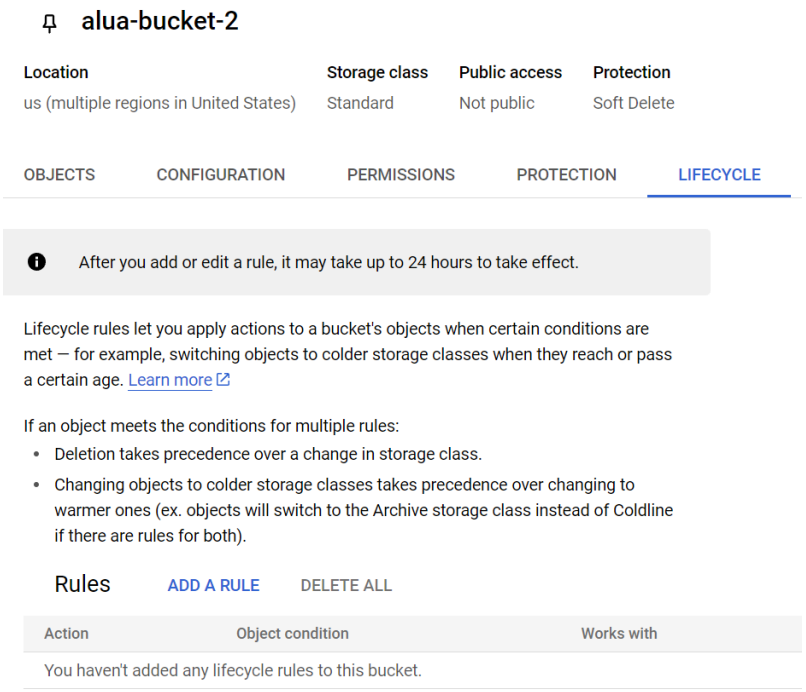
Uploaded image into the bucket



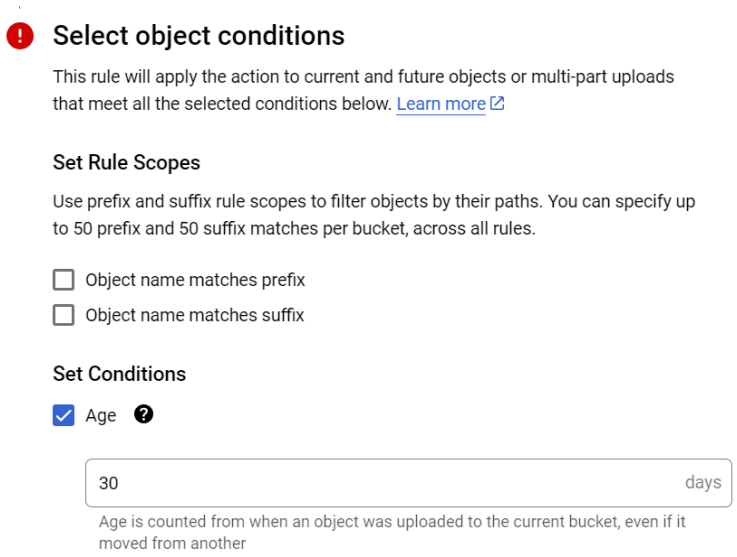
- **Implement Object Lifecycle Management**
    - Set up a lifecycle rule for your bucket to automatically delete objects after a certain period (e.g., 30 days).

Steps:

So I go to *'Lifecycle'* Tab and create new rule.



In conditions I am setting age as 30 days for the bucket.



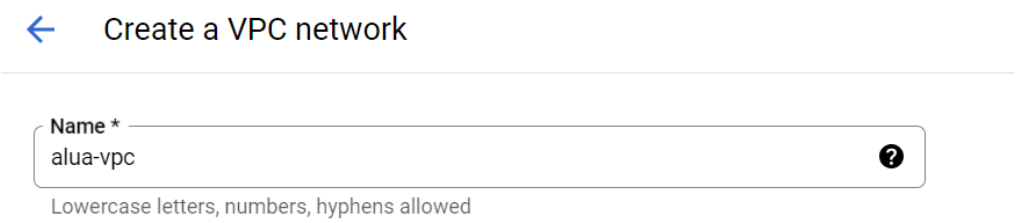
Lifecycle Management is used for backups in cases of accidents or cost optimization to delete objects after a certain period of time, ensuring unneeded or old data is removed.

3. Networking in Google Cloud

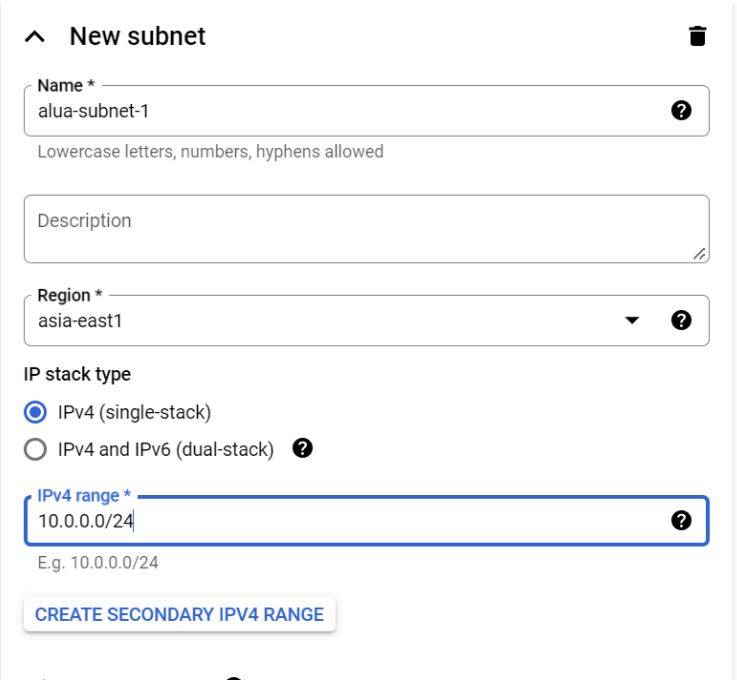
- **Set Up a Virtual Private Cloud (VPC)**
    - Create a new VPC network with subnets.
    - Configure firewall rules to allow traffic between your VM and the internet.

Steps:

Creating VPC after **alua-vpc**

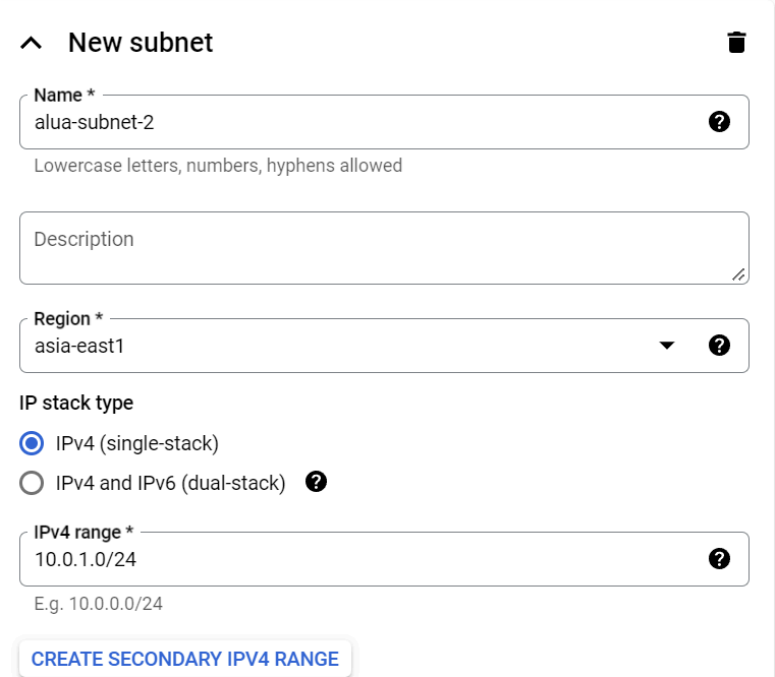


And adding Subnets to it

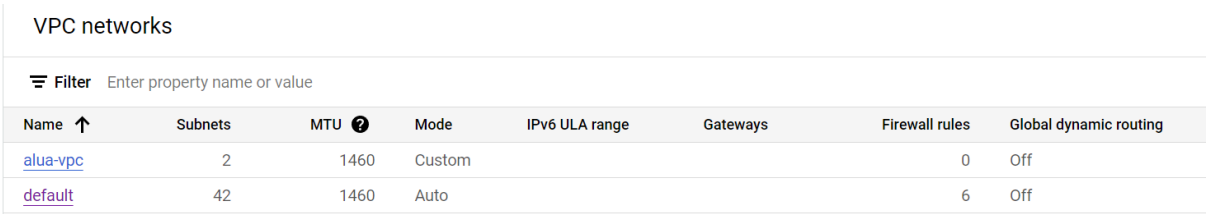


We should note that even if we are choosing different regions, their subnet ranges should be different.

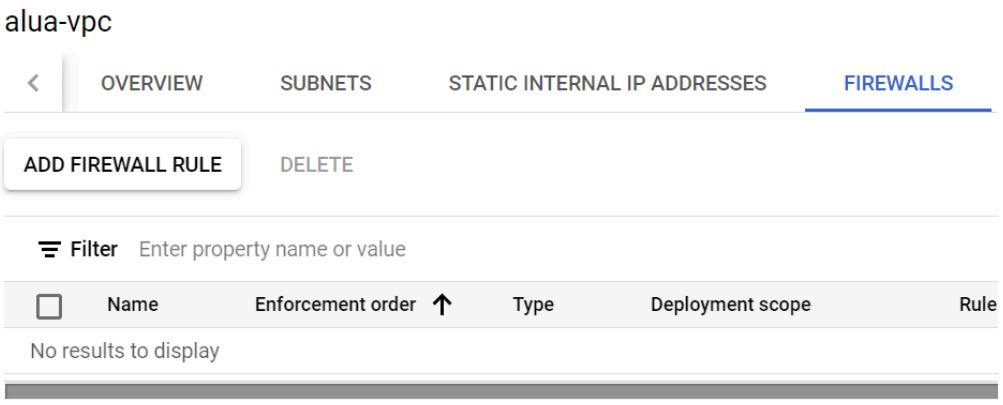
In the second subnet I am choosing 10.0.1.0/24

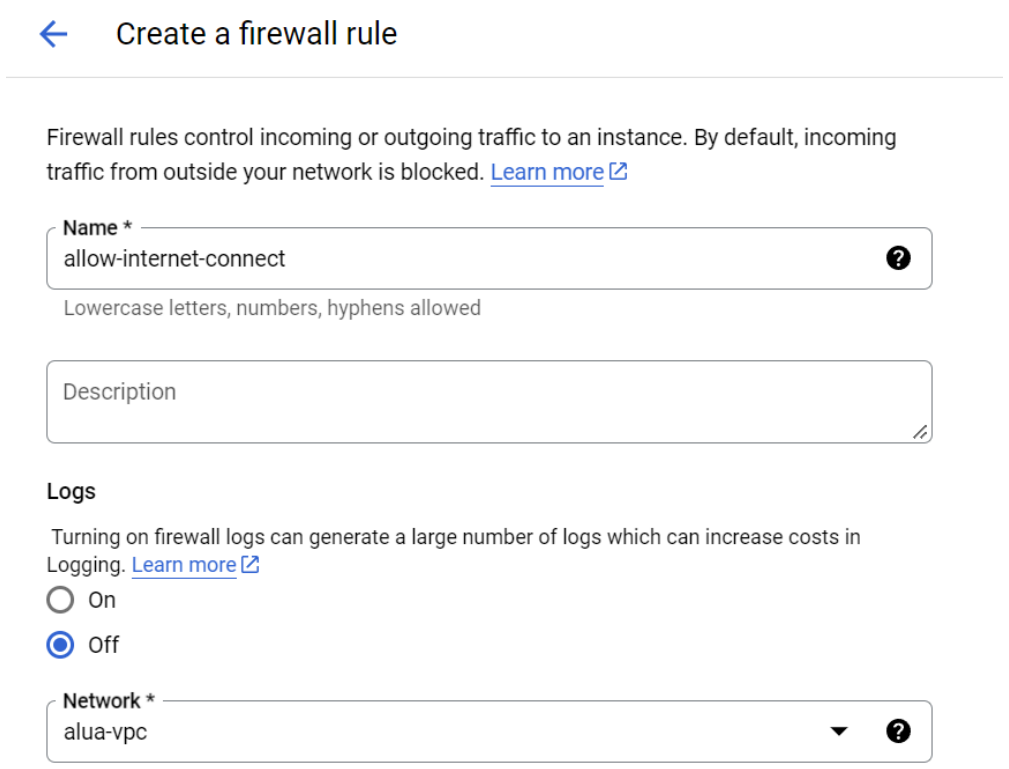


VPC is created

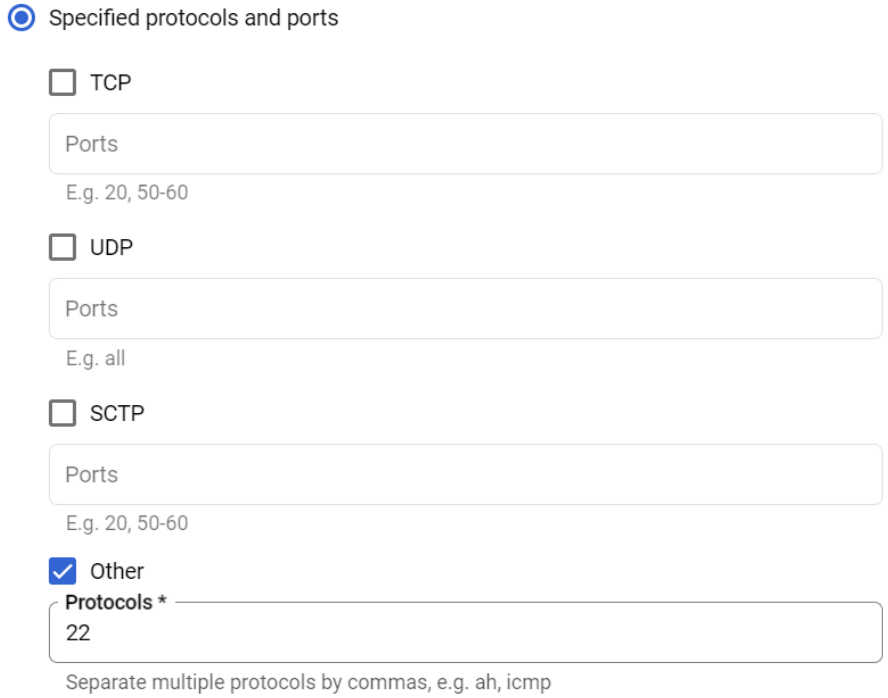


In order to create Firewall rule, I choose *'Firewalls'* tab





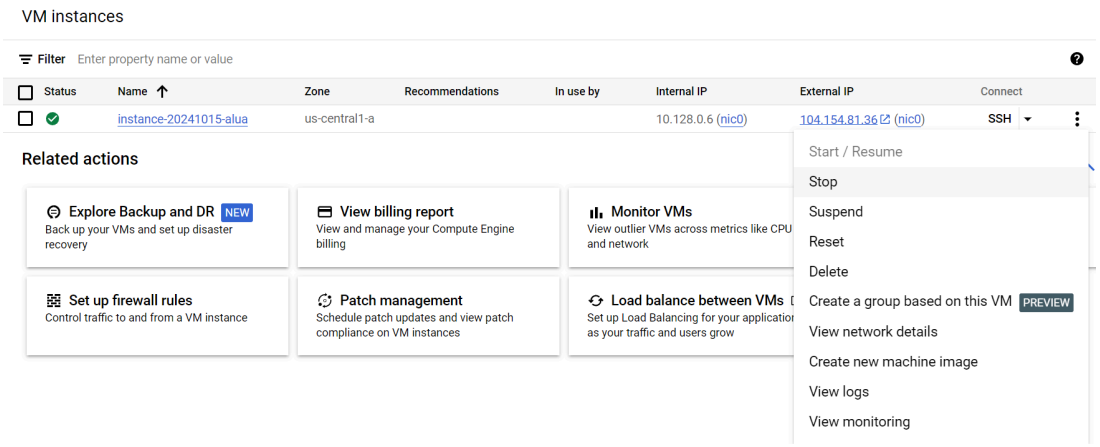
To allow SSH, am using port 22



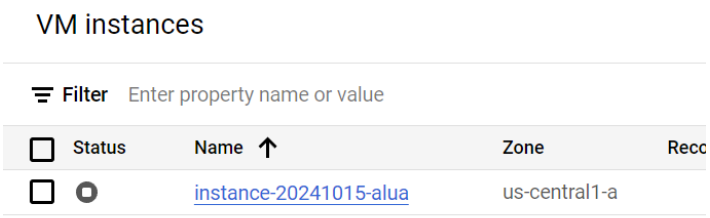
- **Connect VM to VPC**
    - Ensure the VM created in the previous section is connected to the new VPC.
    - Use the VM to ping an external server to verify connectivity.

Steps:

First of all, I need to stop VM instance

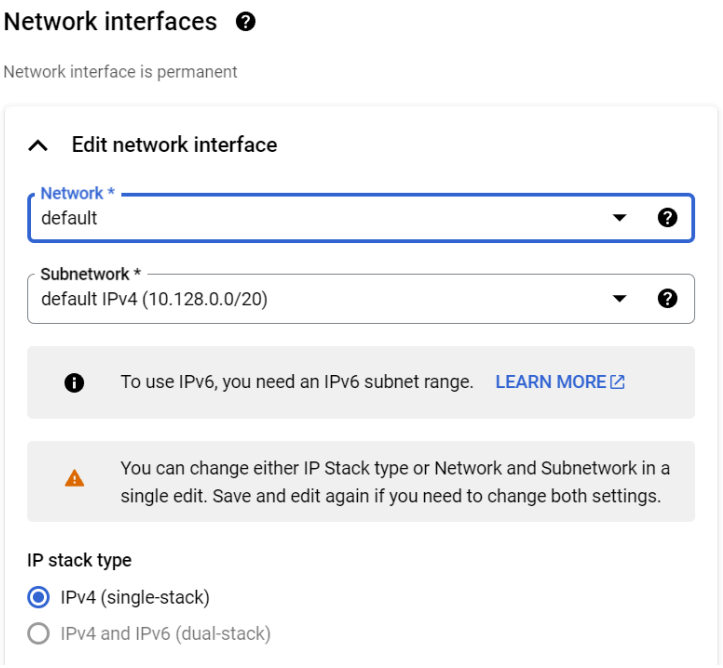


VM is stopped

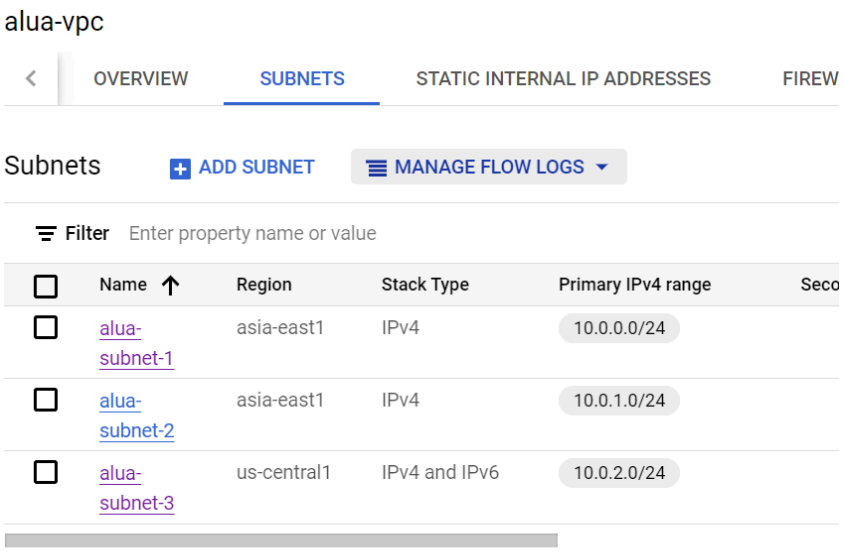


Go to the instance, and press Edit and go to Network Interfaces

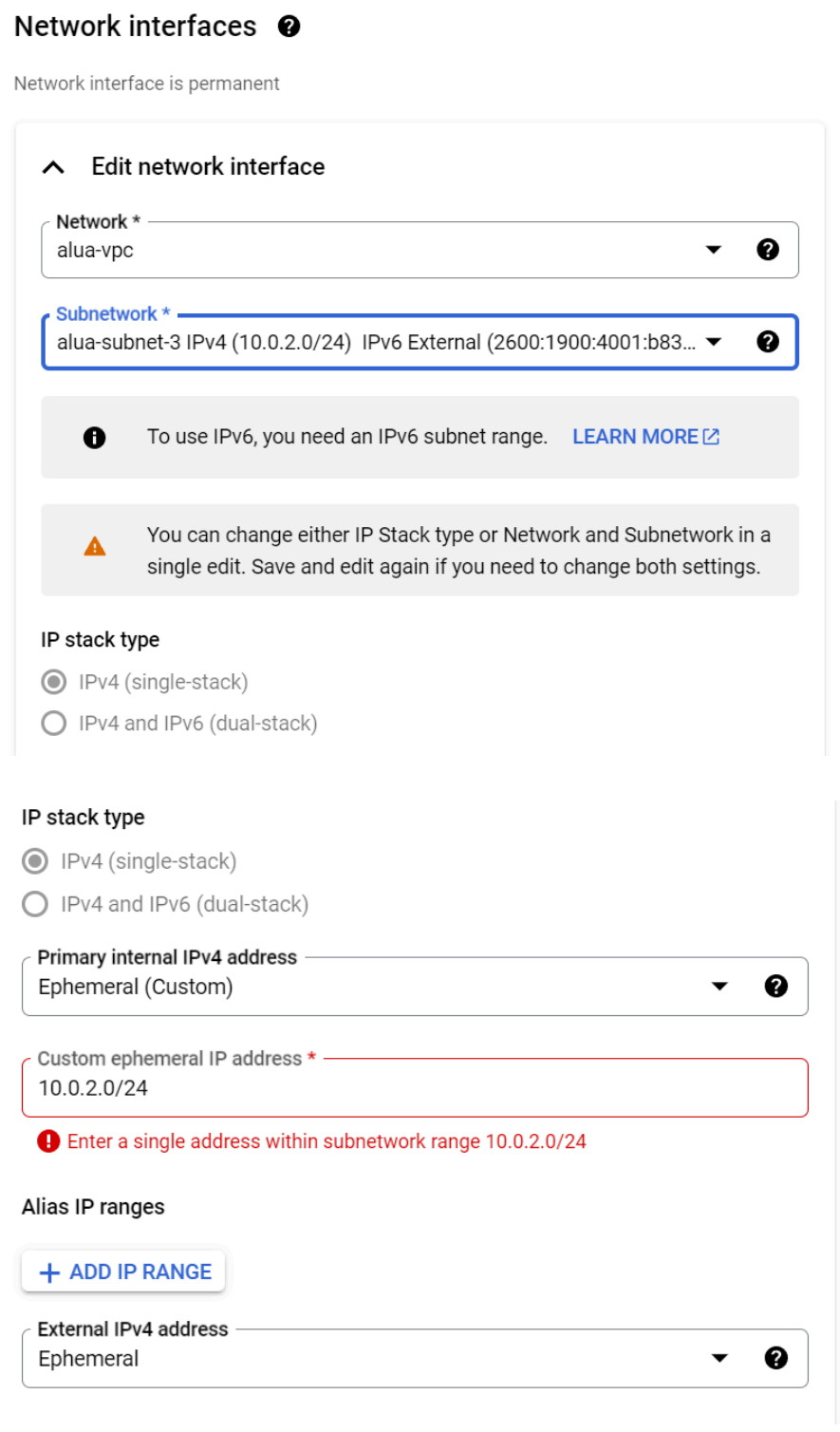
So I can use the default one or use created VPC



So I need to note that one of the VPC subnets and VM region's need to be the same, that's why I created third subnet



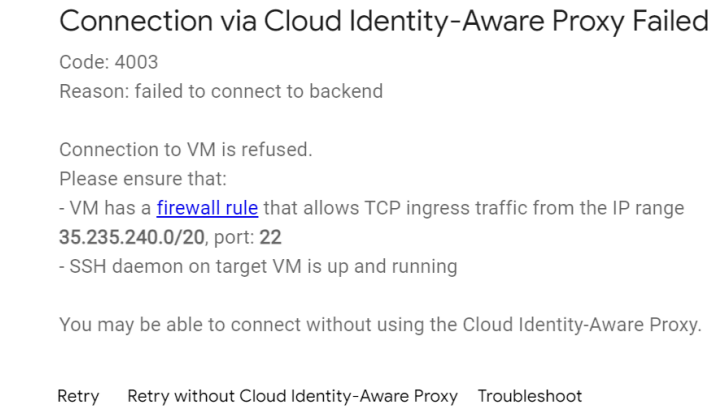
And now I can choose my VPC, previously I had an error choosing Subnetwork (there were no available ones).



so i enter 10.0.2.2

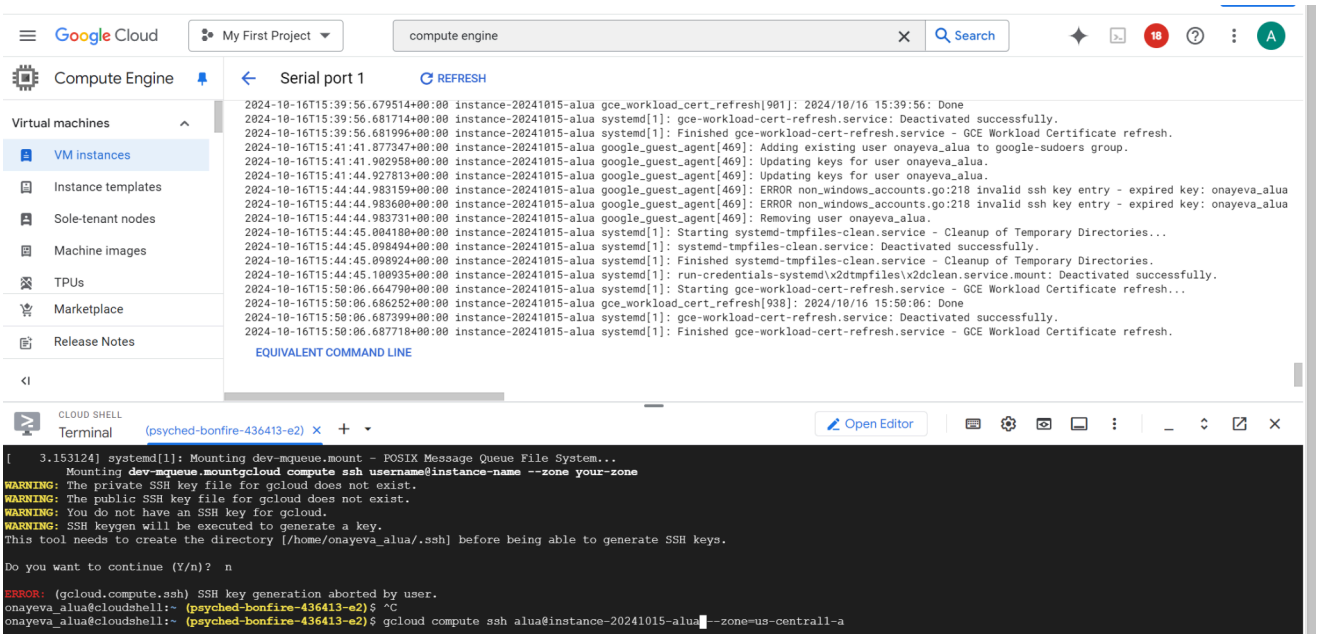
And after changing, I am starting VM instance

I faced this kind of error.



Created a new Firewall rule with above requirements, but it didn't work so now I connect to the serial console.

gcloud compute ssh alua@instance-20241510 --zone=us-central1-a



But at the end, it didn’t worked out, so I connect to the default VPC, instead of VPC previously created by me and going to SSH terminal

and i am pinging external server

ping 8.8.8.8
As we can now it’s connected