

# Lab Notebook 1

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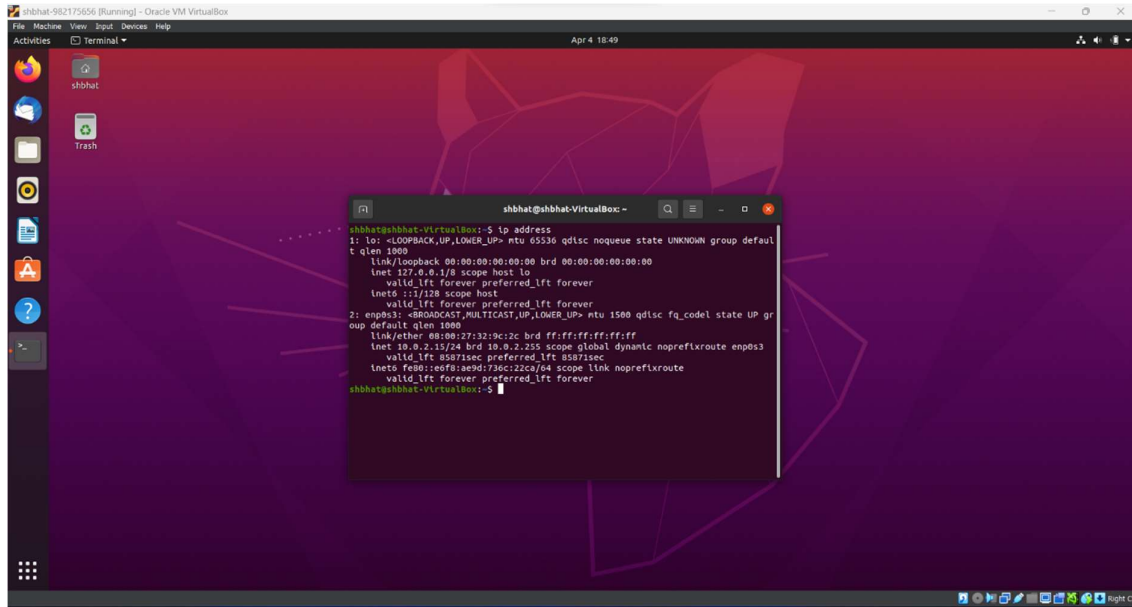
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## Section 1.2

### ARP #1

- 1) Use the ip command to find the IP address and hardware address of the local virtual ethernet card interface.

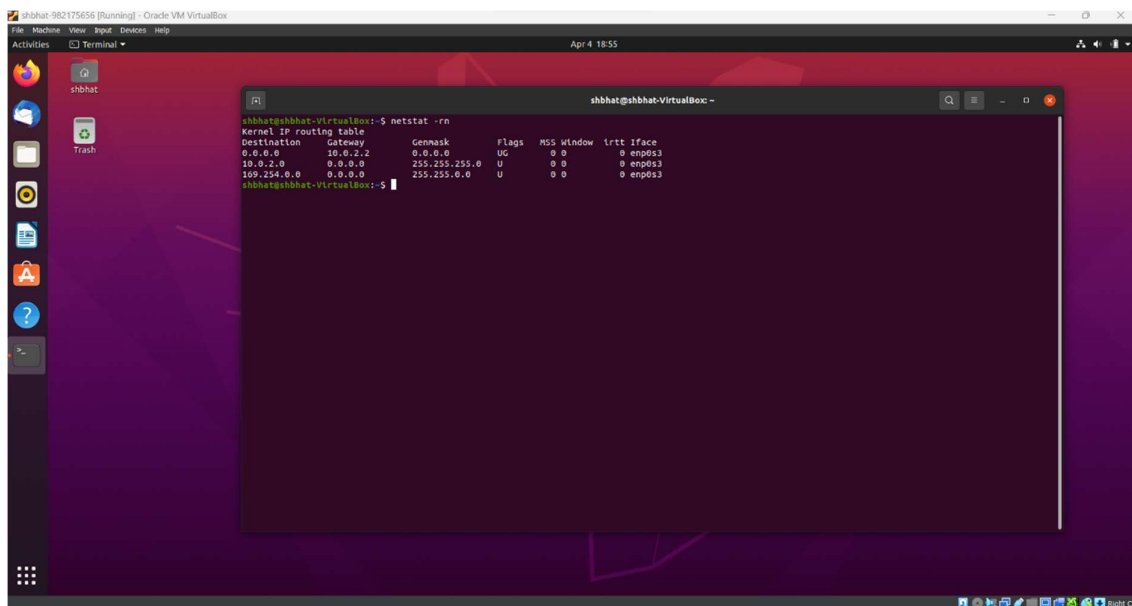
**Answer:**



```
shbhat@shbhat-VirtualBox:~$ ip address
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:32:9c:1c brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
        valid_lft 85871sec preferred_lft 85871sec
    inet6 fe80::2732:9c1c:22c3:14 scope link noprefixroute
        valid_lft forever preferred_lft forever
shbhat@shbhat-VirtualBox:~$
```

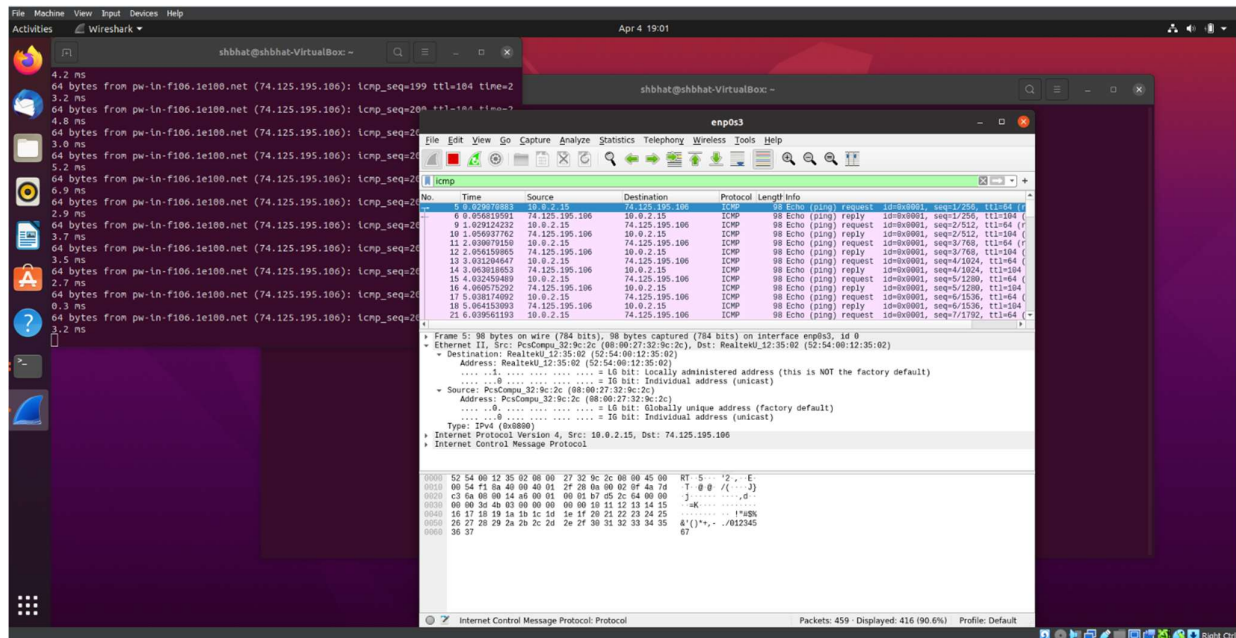
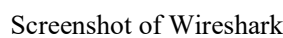
- 2) Perform a netstat -rn to find default router's IP address

**Answer:**

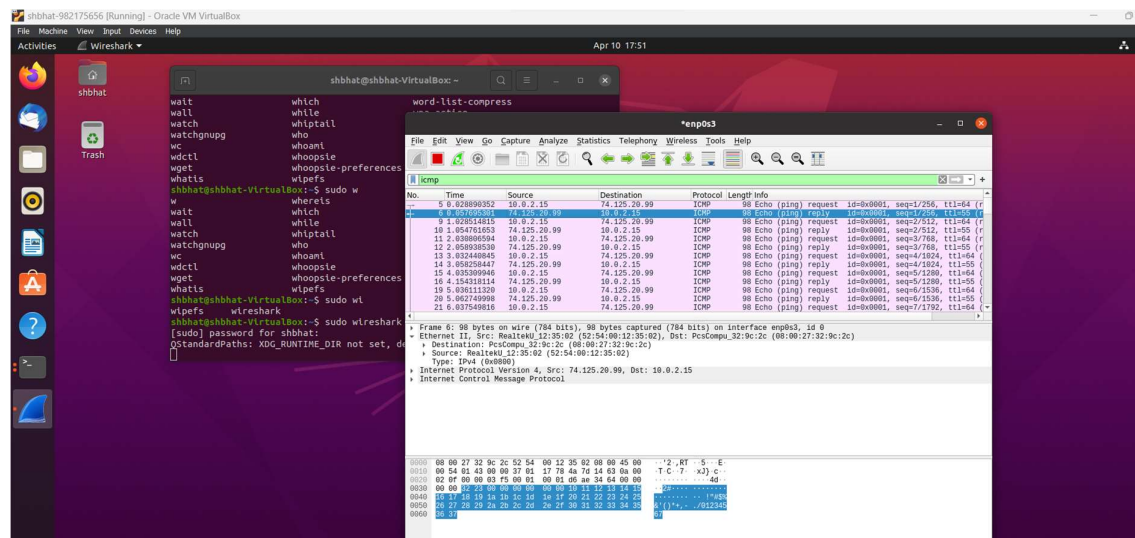


```
shbhat@shbhat-VirtualBox:~$ netstat -rn
Kernel IP routing table
Destination Gateway Genmask Flags MSS Window irtt Iface
0.0.0.0 10.0.2.2 0.0.0.0 UG 0 0 0 enp0s3
10.0.2.0 0.0.0.0 255.255.255.0 U 0 0 0 enp0s3
169.254.0.0 0.0.0.0 255.255.0.0 U 0 0 0 enp0s3
shbhat@shbhat-VirtualBox:~$
```

- Hardware Address is 52:54:00:12:35:02

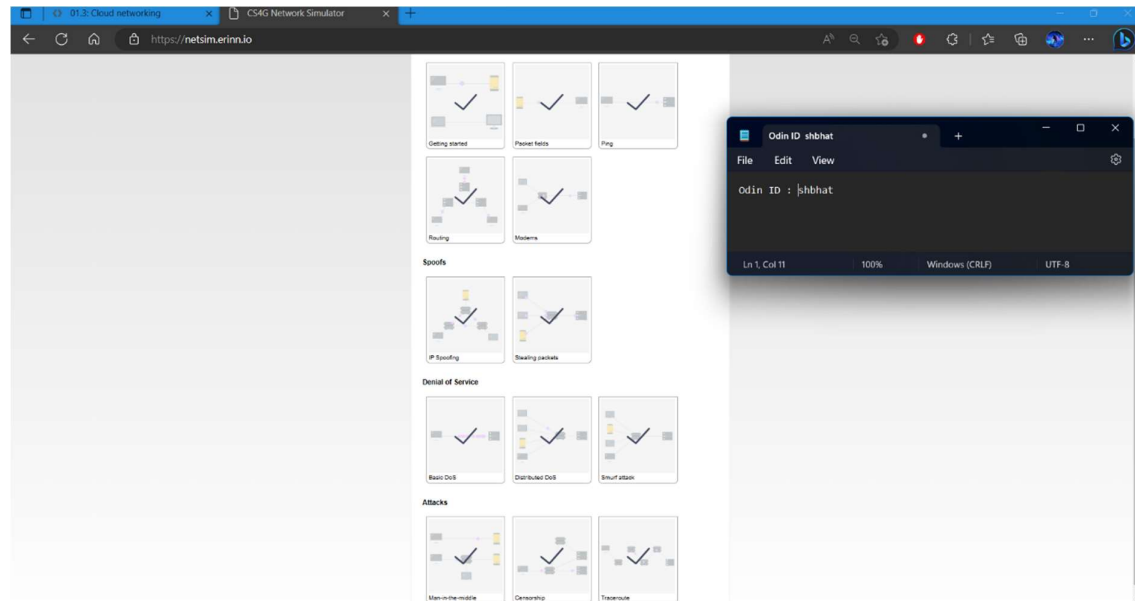


This is the reply packet



## Netsim #2

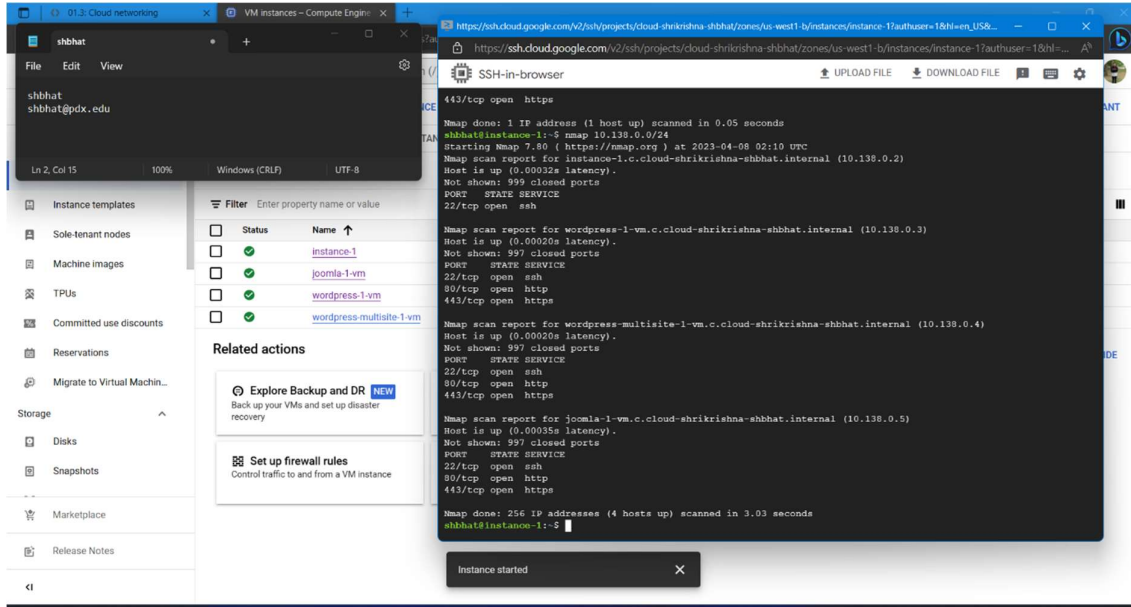
- 1) Take a screenshot of the completed list of levels including your OdinID



## Section 1.3

### Network Scanning (nmap) #1

- 1) nmap command - Show a screenshot of the output for the scan for your lab notebook.



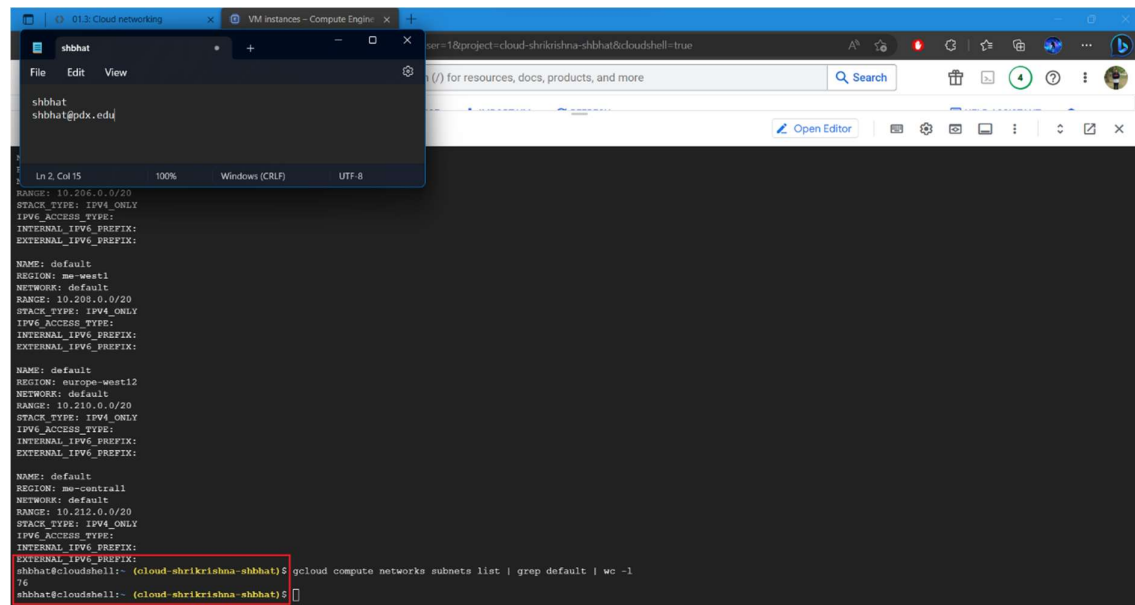
## CIDR and subnets #2

- 1) How many subnetworks are created initially on the default network? How many regions does this correspond to? (Use a pipe to pass output to grep in order to return specific lines of output and then another to pass output to wc to count them: `| grep default | wc -l` )

**Answer:**

76 subnetworks were created initially. Since 1 subnetwork is created for each region, there are 76 regions (This is the default settings.)

Added screenshot.



```
shbhat@cloudshell:~ (cloud-shrikrishna-shbhat)$ gcloud compute networks subnets list | grep default | wc -l
76
shbhat@cloudshell:~ (cloud-shrikrishna-shbhat)$ gcloud compute networks subnets list
NAME: default
REGION: us-west1
NETWORK: default
RANGE: 10.206.0.0/20
STACK_TYPE: IPV4_ONLY
IPV4_ACCESS_TYPE:
INTERNAL_IPV6_PREFIX:
EXTERNAL_IPV6_PREFIX:
NAME: default
REGION: europe-west1
NETWORK: default
RANGE: 10.208.0.0/20
STACK_TYPE: IPV4_ONLY
IPV4_ACCESS_TYPE:
INTERNAL_IPV6_PREFIX:
EXTERNAL_IPV6_PREFIX:
NAME: default
REGION: us-central1
NETWORK: default
RANGE: 10.210.0.0/20
STACK_TYPE: IPV4_ONLY
IPV4_ACCESS_TYPE:
INTERNAL_IPV6_PREFIX:
EXTERNAL_IPV6_PREFIX:
```

- 2) Given the CIDR prefix associated with each subnetwork, how many hosts does each subnetwork support?

**Answer** is 4094 hosts.

The calculation is as follows.

Prefix has /20, hence  $32 - 20$  will equal to 12. From this we can get the total number of hosts as

$$(2^{12}) - 2 = 4096 - 2 = 4094$$

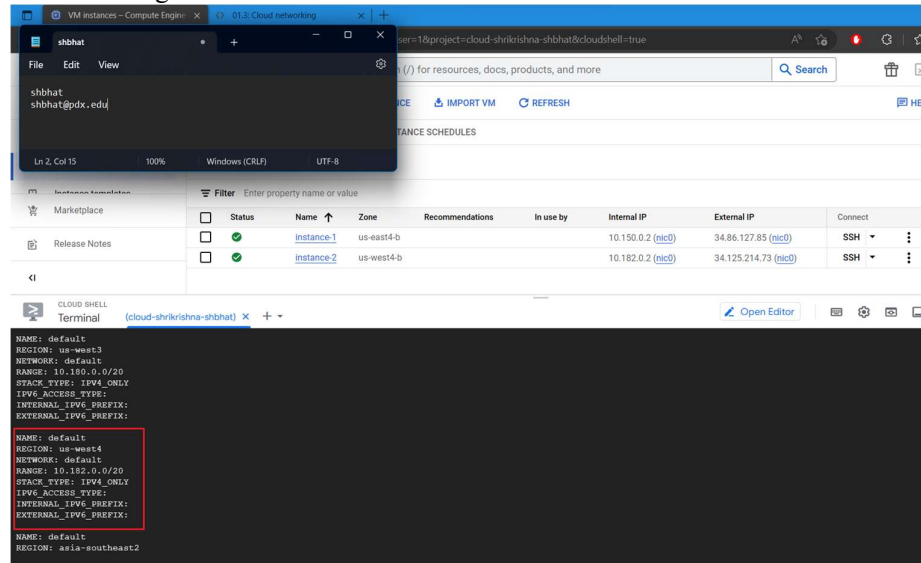
3) Which CIDR subnetworks are these instances brought up in? Do they correspond to the appropriate region based on the prior commands?

**Answer:**

Instances are: 10.150.0.0/20 and 10.182.0.0/20.

Yes, it belongs to same region as we got from the previous commands.

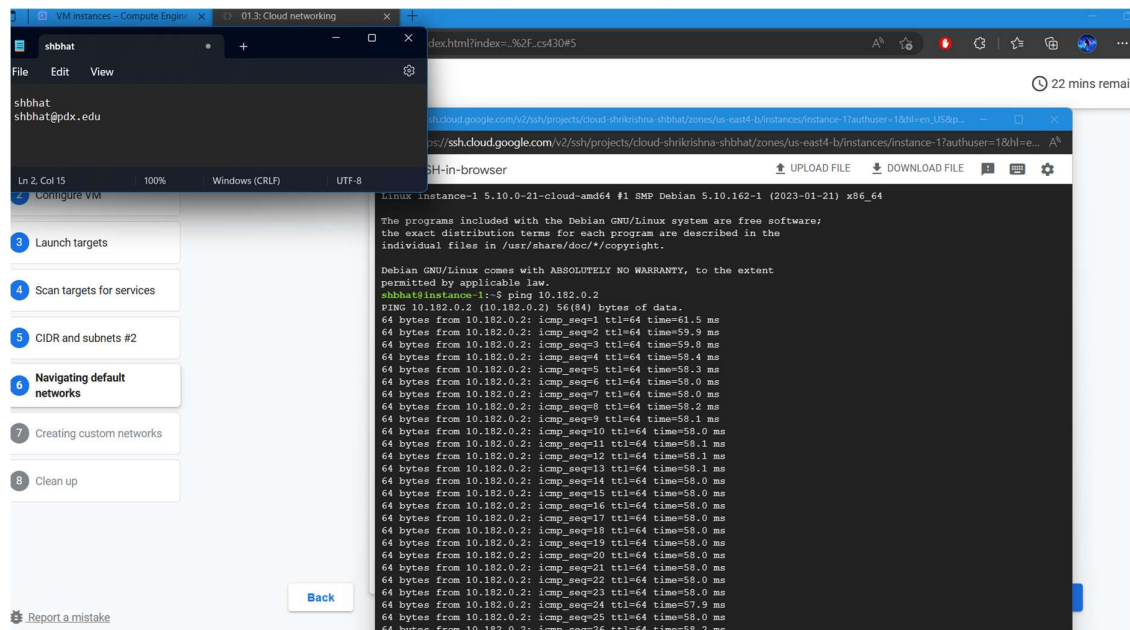
One of the region screenshot is as below



4) From instance-1, perform a ping to the Internal IP address of instance-2. Take a screenshot of the output.

**Answer:**

Screenshot of Ping





5) From the figure in the previous step. What facilitates this connectivity: the virtual switch or the VPN Gateway?

**Answer:**

Virtual Switch facilitates this connectivity.

6) Take a screenshot of the new subnets created in custom-network1 alongside the default subnetworks in those regions assigned to the default network.

Answer: Screenshots as below

The first screenshot shows the Google Cloud Platform console with a terminal window open. The terminal displays the configuration for a default network and a custom network. The custom network is named 'custom-network1' and is located in the 'us-central1' region. It has a range of '192.168.1.0/24' and is of type 'IPV4\_ONLY'. The custom network is connected to the default network via a virtual switch.

Status	Name	Zone	Internal IP	External IP	Connect
✓	Instance-1	us-east4-b	10.150.0.2 (nic0)	34.86.127.85 (nic0)	SSH
✓	Instance-2	us-west4-b	10.182.0.2 (nic0)	34.125.214.73 (nic0)	SSH

The second screenshot shows the Google Cloud Platform console with a terminal window open. The terminal displays the configuration for a default network and a custom network. The custom network is named 'custom-network1' and is located in the 'us-central1' region. It has a range of '192.168.1.0/24' and is of type 'IPV4\_ONLY'. The custom network is connected to the default network via a virtual switch.

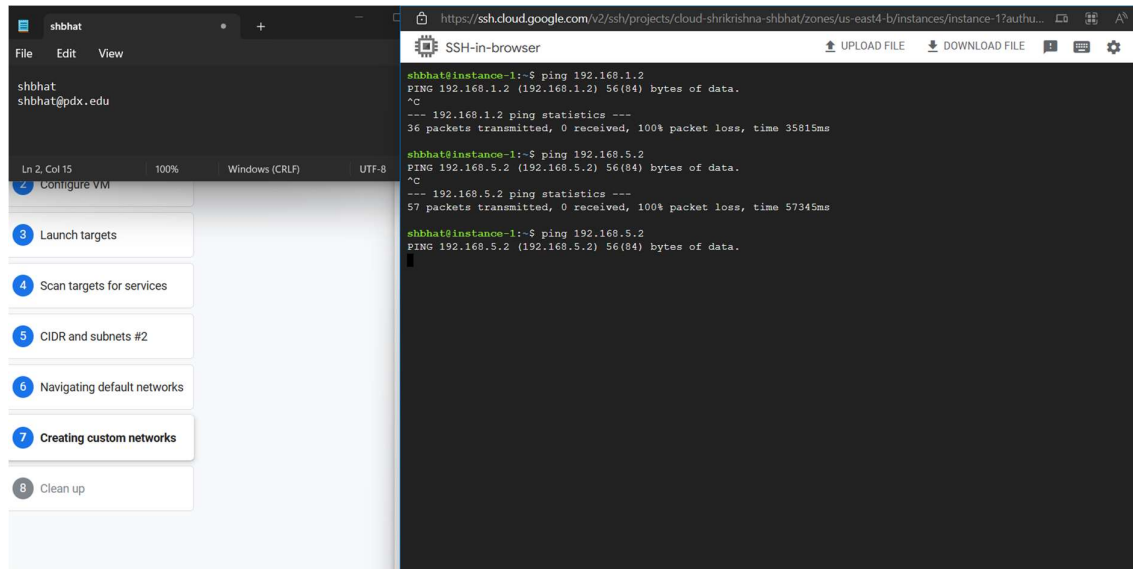
Status	Name	Zone	Internal IP	External IP	Connect
✓	Instance-1	us-east4-b	10.150.0.2 (nic0)	34.86.127.85 (nic0)	SSH
✓	Instance-2	us-west4-b	10.182.0.2 (nic0)	34.125.214.73 (nic0)	SSH

7) Explain why the result is different from instance-2

**Answer:**

The result was quite different from that of instance 2, the ping did not have any result due the network passing via VPN.

Added screenshot.



```
shbhat@instance-1:~$ ping 192.168.1.2
PING 192.168.1.2 (192.168.1.2) 56(84) bytes of data.
^C
--- 192.168.1.2 ping statistics ---
36 packets transmitted, 0 received, 100% packet loss, time 35815ms

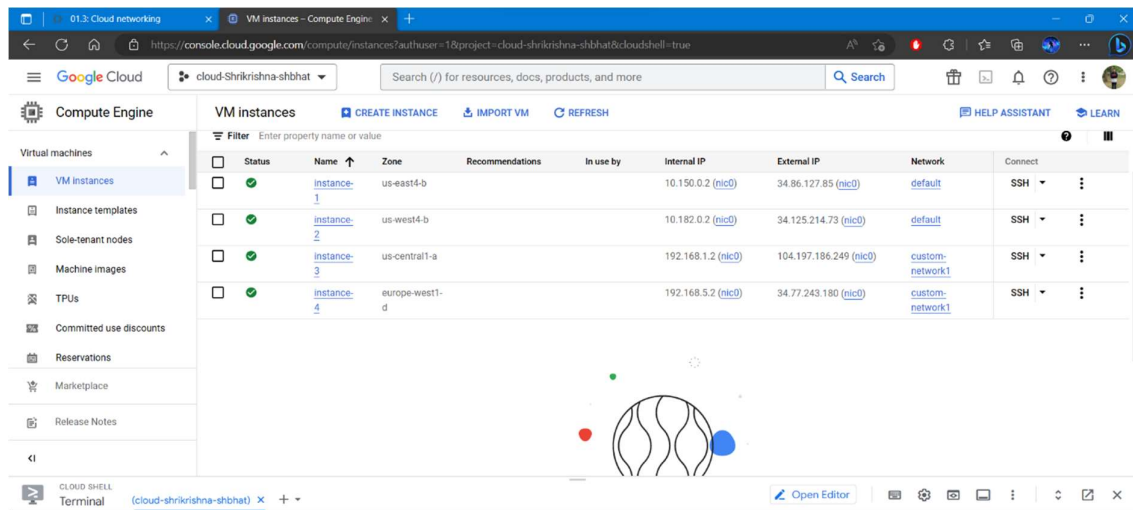
shbhat@instance-1:~$ ping 192.168.5.2
PING 192.168.5.2 (192.168.5.2) 56(84) bytes of data.
^C
--- 192.168.5.2 ping statistics ---
57 packets transmitted, 0 received, 100% packet loss, time 57345ms

shbhat@instance-1:~$ ping 192.168.5.2
PING 192.168.5.2 (192.168.5.2) 56(84) bytes of data.
```

8) Take screenshots of all 4 instances in the UI including the network they belong to.

**Answer:**

Screenshots as below



Status	Name	Zone	Internal IP	External IP	Network	Connect
✓	instance-1	us-east4-b	10.150.0.2 (nic0)	34.86.127.85 (nic0)	default	SSH
✓	instance-2	us-west4-b	10.182.0.2 (nic0)	34.125.214.73 (nic0)	default	SSH
✓	instance-3	us-central1-a	192.168.1.2 (nic0)	104.197.186.249 (nic0)	custom-network1	SSH
✓	instance-4	eu-west1-d	192.168.5.2 (nic0)	34.77.243.180 (nic0)	custom-network1	SSH

- 9) Take a screenshot of the subnetworks created for both the default and custom-network1 networks showing their regions.

**Answer:**

Screenshots as below

The first screenshot shows the 'VPC networks' page in the Google Cloud Platform console. A terminal window is open in the foreground, displaying the command 'shhbat' and the prompt 'shhbat@pdx.edu'. The table below lists the VPC networks:

Name	Subnets	MTU	Mode	Internal IP ranges	Gateways	Firewall rules	Global dynamic routing
custom-network1	2	1460	Custom			0	Off
default	38	1460	Auto			4	Off

The second screenshot shows the 'Subnets' page for 'custom-network1'. A terminal window is also open in the foreground. The table below lists the subnets:

Name	Region	Stack Type	Internal IP ranges	External IP ranges	Secondary IPv4 ranges
subnet-europe-west-192	europe-west1	IPv4	192.168.5.0/24	None	None
subnet-us-central-192	us-central1	IPv4	192.168.1.0/24	None	None

Below the subnets table, there is a section for 'Reserved proxy-only subnets for load balancing' which is currently empty.

shbhat  
shbhat@pdx.edu

Ln 2, Col 15100%Window (CRLF)UTF-8

Cloud networkingdefault - VPC network details

gcp/default?project=cloud-shrikishna-shbhat&authuser=1&cloudshell=true&pageTab=...

EDITDELETE VPC NETWORKHELP ASSISTANTHIDE INFO PANEL

Bring your own IPFirewallRoutesVPC network peeringShared VPCServerless VPC accessPacket mirroring

<input type="checkbox"/>	Name	Region	Stack Type	Internal IP ranges	External IP ranges	Secondary IPv4 range
<input type="checkbox"/>	default	us-central1	IPv4	10.128.0.0/20	None	None
<input type="checkbox"/>	default	europa-west1	IPv4	10.132.0.0/20	None	None
<input type="checkbox"/>	default	us-west1	IPv4	10.138.0.0/20	None	None
<input type="checkbox"/>	default	asia-east1	IPv4	10.140.0.0/20	None	None
<input type="checkbox"/>	default	us-east1	IPv4	10.142.0.0/20	None	None
<input type="checkbox"/>	default	asia-northeast1	IPv4	10.146.0.0/20	None	None
<input type="checkbox"/>	default	asia-southeast1	IPv4	10.148.0.0/20	None	None
<input type="checkbox"/>	default	us-east4	IPv4	10.150.0.0/20	None	None
<input type="checkbox"/>	default	australia-southeast1	IPv4	10.152.0.0/20	None	None
<input type="checkbox"/>	default	europa-west2	IPv4	10.154.0.0/20	None	None
<input type="checkbox"/>	default	europa-west3	IPv4	10.156.0.0/20	None	None

Select a subnet

Please select at least one resource.

CLOUD SHELLTerminalcloud-shrikishna-shbhat

Open Editor