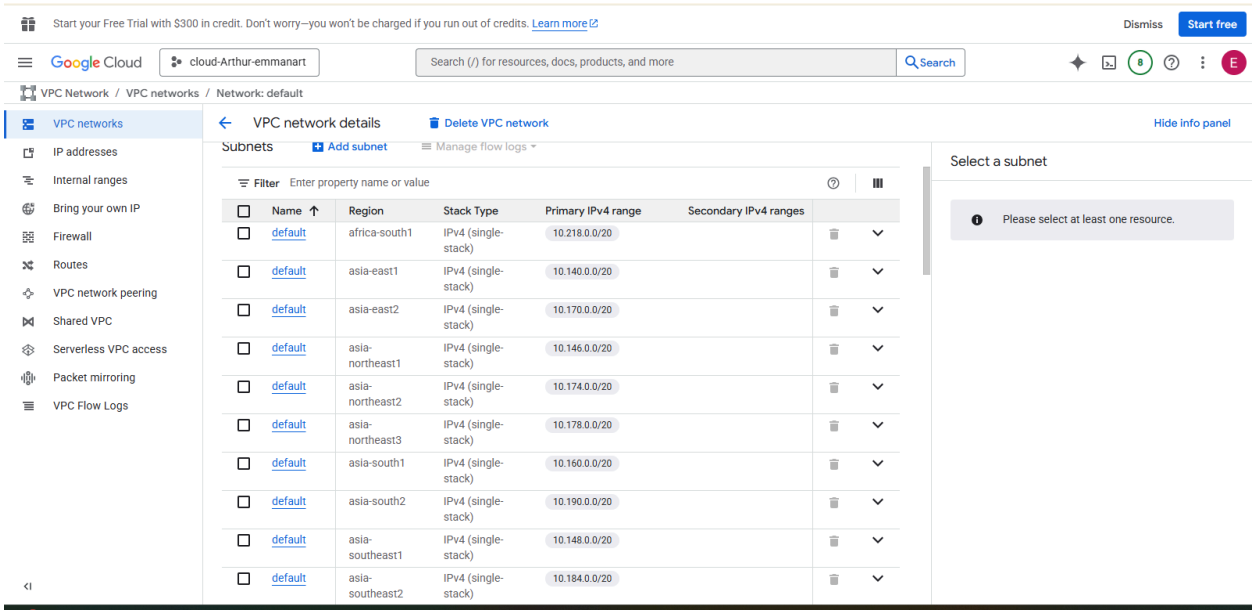
LAB 1.2
ip address of remote host: 131.252.208.103/24
hardware address of remote host: 52:54:00:13:a0:c6
ip address of default router(0.0.0.0/0): 131.252.208.1
default router hardware address: 00:00:5e:00:01:01
default router name: router.seas.pdx.edu
number of entries in the ARP table: 24
ip addresses that have the same hardware address:
mirrors.cat.pdx.edu (131.252.208.20) at 52:54:00:5f:45:5f [ether] on enp1s0
simirror.cat.pdx.edu (131.252.208.121) at 52:54:00:5f:45:5f [ether] on enp1s0
how many less hardware addresses are there than IP addresses in the ARP table? : 3
command for getting all ip address from arp table and putting them in the arp_entries file: arp -an | awk -F ' ' '{print $2}' > arp_entries
network prefix that most ip address in arp_entries file use: 131.252.208
vm ip address: 10.138.0.2
vm hardware address: 42:01:0a:8a:00:02
default router's ip address for vm: 10.138.0.1
default router's hardware address for vm: 42:01:0a:8a:00:0

LAB 1.3
How many subnetworks are created initially on the default network? How many regions does this correspond to?: The number of subnetworks is 43 and the number of regions it corresponds to is 43
Given the CIDR prefix associated with each subnetwork, how many hosts does each subnetwork support? Each subnetwork in the list is /20 so it would be 2**32 - 2**20
Regional instances used: europe-north1-a and asia-east1-a
Which CIDR subnetworks are these instances brought up in? Do they correspond to the appropriate region based on the prior commands? : Each instance lines up with the /20 subnet for each region
From the figure in the previous step. What facilitates this connectivity: the virtual switch or the VPN Gateway? it is a virtual switch both the source and destination IPs are internal IPs that belong to the same default VPC network (10.0.0.0/8 range).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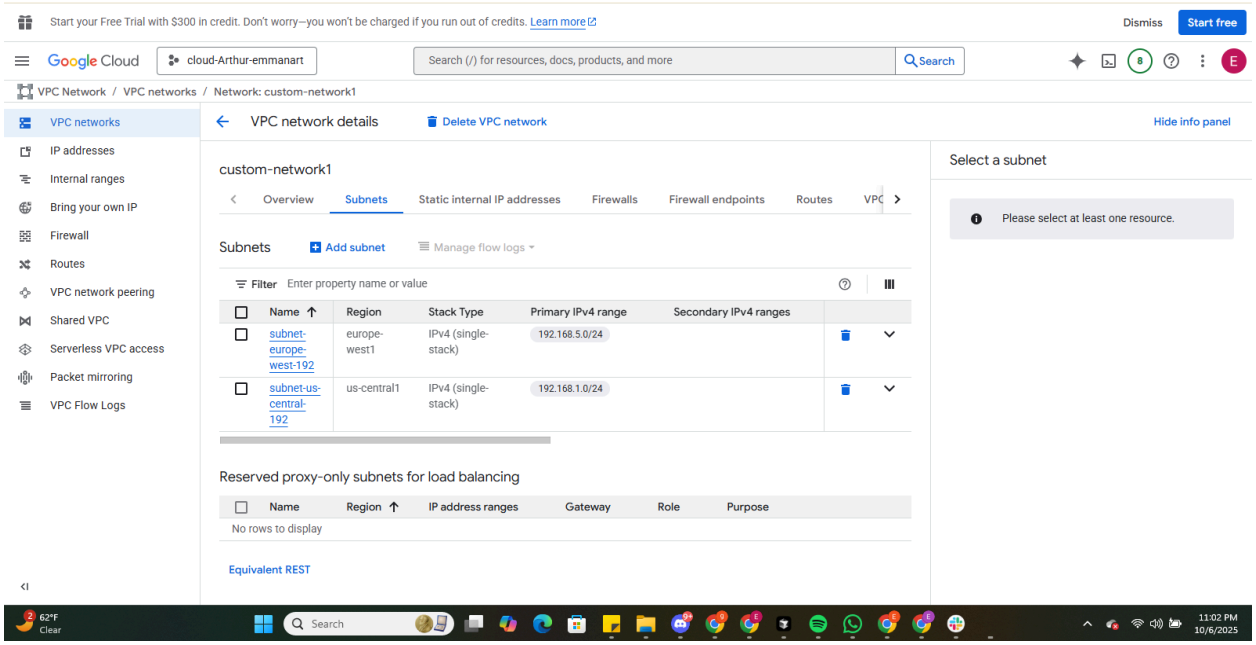
VPC Flow Logs
VPC network details
Delete VPC network
Hide info panel
Subnets
Add subnet
Manage flow logs
Filter
Enter property name or value
Name
Region
Stack Type
Primary IPv4 range
Secondary IPv4 ranges
default
africa-south1
IPv4 (single-stack)
10.218.0.0/20
asia-east1
10.140.0.0/20
asia-east2
10.170.0.0/20
asia-northeast1
10.146.0.0/20
asia-northeast2
10.174.0.0/20
asia-northeast3
10.178.0.0/20
asia-south1
10.160.0.0/20
asia-south2
10.190.0.0/20
asia-southeast1
10.148.0.0/20
asia-southeast2
10.184.0.0/20
Select a subnet
Please select at least one resource.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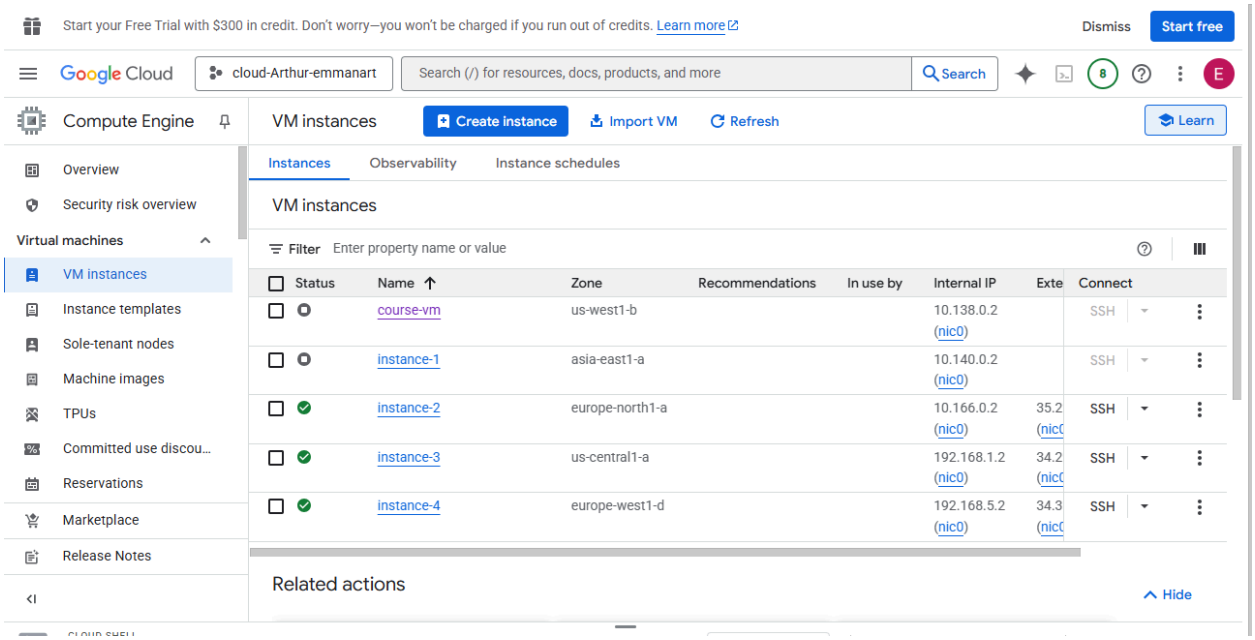
VPC Flow Logs
VPC network details
Delete VPC network
Hide info panel
custom-network1
Overview
Subnets
Static internal IP addresses
Firewalls
Firewall endpoints
Routes
Subnets
Add subnet
Manage flow logs
Filter
Enter property name or value
Name
Region
Stack Type
Primary IPv4 range
Secondary IPv4 ranges
subnet-europe-west-192
europe-west1
IPv4 (single-stack)
192.168.5.0/24
subnet-us-central-192
us-central1
192.168.1.0/24
Reserved proxy-only subnets for load balancing
Name
Region
IP address ranges
Gateway
Role
Purpose
No rows to display
Equivalent REST
Select a subnet
Please select at least one resource.
62°F
Clear
Search
11:02 PM
10/6/2025



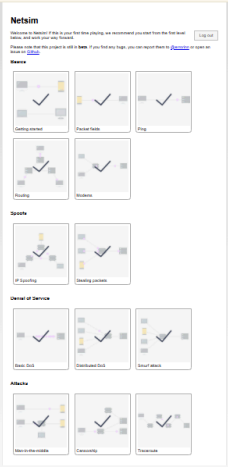

```
emmanart@cloudshell:~ (cloud-arthur-emmanart)$ gcloud compute networks subnets list --network custom-network1
NAME: subnet-us-central-192
REGION: us-central1
NETWORK: custom-network1
RANGE: 192.168.1.0/24
STACK_TYPE: IPV4_ONLY
IPV6_ACCESS_TYPE:
INTERNAL_IPV6_PREFIX:
EXTERNAL_IPV6_PREFIX:

NAME: subnet-europe-west-192
REGION: europe-west1
NETWORK: custom-network1
RANGE: 192.168.5.0/24
STACK_TYPE: IPV4_ONLY
IPV6_ACCESS_TYPE:
INTERNAL_IPV6_PREFIX:
EXTERNAL_IPV6_PREFIX:
emmanart@cloudshell:~ (cloud-arthur-emmanart)$ gcloud compute networks subnets list --regions=us-central1,europe-west
WARNING: Some requests did not succeed.
 - Invalid value for field 'region': 'europe-west'. Unknown region.

NAME: default
REGION: us-central1
NETWORK: default
RANGE: 10.128.0.0/20
STACK_TYPE: IPV4_ONLY
IPV6_ACCESS_TYPE:
INTERNAL_IPV6_PREFIX:
EXTERNAL_IPV6_PREFIX:

NAME: subnet-us-central-192
REGION: us-central1
NETWORK: custom-network1
RANGE: 192.168.1.0/24
STACK_TYPE: IPV4_ONLY
IPV6_ACCESS_TYPE:
INTERNAL_IPV6_PREFIX:
EXTERNAL_IPV6_PREFIX:
```

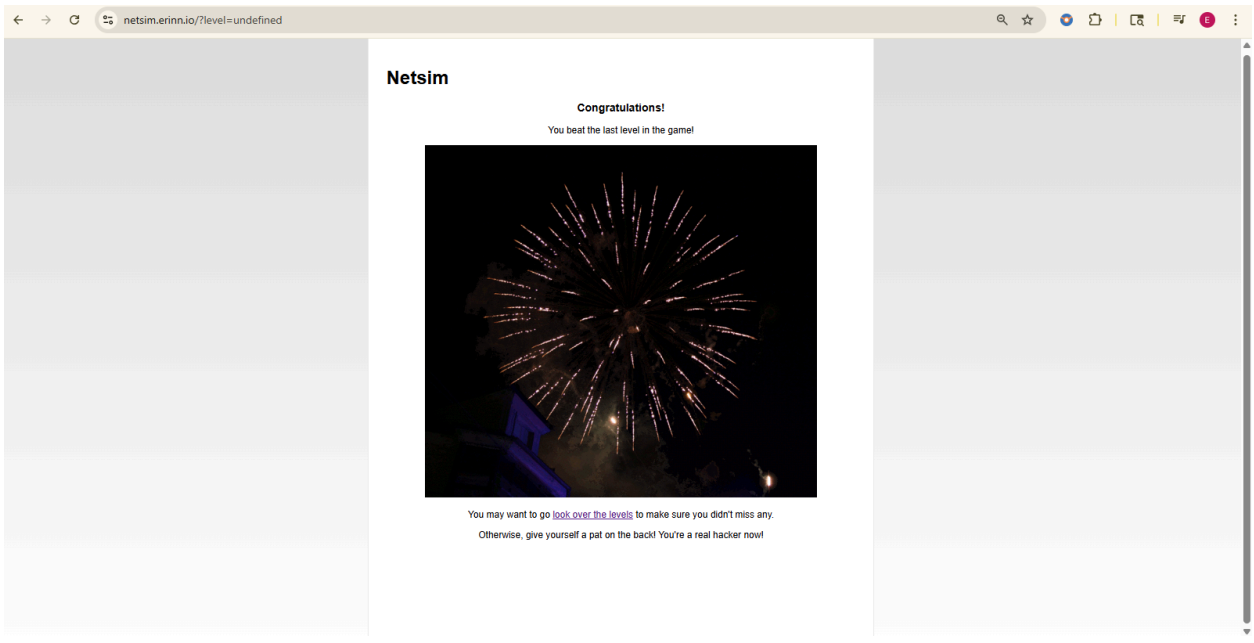
```
emmanart@instance-1:~$ ping 10.166.0.2
PING 10.166.0.2 (10.166.0.2) 56(84) bytes of data.
64 bytes from 10.166.0.2: icmp_seq=1 ttl=64 time=290 ms
64 bytes from 10.166.0.2: icmp_seq=2 ttl=64 time=289 ms
64 bytes from 10.166.0.2: icmp_seq=3 ttl=64 time=289 ms
64 bytes from 10.166.0.2: icmp_seq=4 ttl=64 time=289 ms
64 bytes from 10.166.0.2: icmp_seq=5 ttl=64 time=289 ms
64 bytes from 10.166.0.2: icmp_seq=6 ttl=64 time=289 ms
64 bytes from 10.166.0.2: icmp_seq=7 ttl=64 time=289 ms
64 bytes from 10.166.0.2: icmp_seq=8 ttl=64 time=289 ms
64 bytes from 10.166.0.2: icmp_seq=9 ttl=64 time=289 ms
64 bytes from 10.166.0.2: icmp_seq=10 ttl=64 time=289 ms
64 bytes from 10.166.0.2: icmp_seq=11 ttl=64 time=289 ms
64 bytes from 10.166.0.2: icmp_seq=12 ttl=64 time=289 ms
64 bytes from 10.166.0.2: icmp_seq=13 ttl=64 time=289 ms
```

```
NAME: instance-2
ZONE: europe-north1-a
MACHINE_TYPE: n1-standard-1
PREEMPTIBLE:
INTERNAL_IP: 10.166.0.2
EXTERNAL_IP: 35.228.109.185
STATUS: RUNNING
emmanart@cloudshell:~ (cloud-arthur-emmanart)$ ^C
emmanart@cloudshell:~ (cloud-arthur-emmanart)$ gcloud compute instances list
NAME: course-vm
ZONE: us-west1-b
MACHINE_TYPE: e2-medium
PREEMPTIBLE:
INTERNAL_IP: 10.138.0.2
EXTERNAL_IP:
STATUS: TERMINATED

NAME: instance-1
ZONE: asia-east1-a
MACHINE_TYPE: n1-standard-1
PREEMPTIBLE:
INTERNAL_IP: 10.140.0.2
EXTERNAL_IP: 104.199.237.22
STATUS: RUNNING

NAME: instance-2
ZONE: europe-north1-a
MACHINE_TYPE: n1-standard-1
PREEMPTIBLE:
INTERNAL_IP: 10.166.0.2
EXTERNAL_IP: 35.228.109.185
STATUS: RUNNING
emmanart@cloudshell:~ (cloud-arthur-emmanart)$ ^C
emmanart@cloudshell:~ (cloud-arthur-emmanart)$
```

```
NAME: default
REGION: asia-east1
NETWORK: default
RANGE: 10.140.0.0/20
STACK_TYPE: IPV4_ONLY
IPV6_ACCESS_TYPE:
INTERNAL_IPV6_PREFIX:
EXTERNAL_IPV6_PREFIX:

NAME: default
REGION: us-east1
NETWORK: default
RANGE: 10.142.0.0/20
STACK_TYPE: IPV4_ONLY
IPV6_ACCESS_TYPE:
INTERNAL_IPV6_PREFIX:
EXTERNAL_IPV6_PREFIX:

NAME: default
REGION: asia-northeast1
NETWORK: default
RANGE: 10.146.0.0/20
STACK_TYPE: IPV4_ONLY
IPV6_ACCESS_TYPE:
INTERNAL_IPV6_PREFIX:
EXTERNAL_IPV6_PREFIX:

NAME: default
REGION: asia-southeast1
NETWORK: default
RANGE: 10.148.0.0/20
STACK_TYPE: IPV4_ONLY
IPV6_ACCESS_TYPE:
INTERNAL_IPV6_PREFIX:
EXTERNAL_IPV6_PREFIX:
```

```
emmanart@course-vm:~$ nmap 10.138.0.0/24
Starting Nmap 7.80 ( https://nmap.org ) at 2025-10-07 05:04 UTC
Nmap scan report for course-vm.c.cloud-arthur-emmanart.internal (10.138.0.2)
Host is up (0.00019s latency).
Not shown: 998 closed ports
PORT     STATE SERVICE
22/tcp   open  ssh
3389/tcp open  ms-wbt-server

Nmap done: 256 IP addresses (1 host up) scanned in 3.10 seconds
```






```
Last login: Mon Oct  6 18:01:43 2025 from 35.247.113.40
emmanart@course-vm:~$ netstat -rn
Kernel IP routing table
Destination     Gateway         Genmask         Flags   MSS Window  irtt Iface
0.0.0.0         10.138.0.1      0.0.0.0         UG        0 0          0 ens4
10.138.0.1      0.0.0.0         255.255.255.255 UH        0 0          0 ens4
169.254.169.254 10.138.0.1      255.255.255.255 UGH       0 0          0 ens4
emmanart@course-vm:~$
```

```
emmanart@course-vm:~$ 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: ens4: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1460 qdisc mq state UP group default qlen 1000
    link/ether 42:01:0a:8a:00:02 brd ff:ff:ff:ff:ff:ff
    inet 10.138.0.2/32 metric 100 scope global dynamic ens4
       valid_lft 85781sec preferred_lft 85781sec
    inet6 fe80::4001:aff:fe8a:2/64 scope link
       valid_lft forever preferred_lft forever
```