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Cs430p
1/12/25

ARP 1.1

Use the `ip address` command to find the IPv4 address and hardware address of the local ethernet card interface (Typically beginning with `eth`, `ens`, or `enp`).

Ipv4:131.252.208.85

Hardware address:52:54:00:f2:09:bc

```
francoer@ruby:~$ id address
id: 'address': no such user
francoer@ruby:~$ 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 noprefixroute
        valid_lft forever preferred_lft forever
2: ens3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 52:54:00:f2:09:bc brd ff:ff:ff:ff:ff:ff
    altname enp0s3
    inet 131.252.208.85/24 metric 100 brd 131.252.208.255 scope global dynamic ens3
        valid_lft 11731sec preferred_lft 11731sec
francoer@ruby:~$
```

-What is the default router's IP address (e.g. the gateway address for the default route 0.0.0.0/0)
131.252.208.1

```
francoer@ruby:~$ netstat -rn
Kernel IP routing table
Destination        Gateway            Genmask           Flags        MSS Window  irtt Iface
0.0.0.0            131.252.208.1     0.0.0.0           UG           0 0        0 ens3
10.218.208.100     131.252.208.1     255.255.255.255   UGH          0 0        0 ens3
10.218.208.108     131.252.208.1     255.255.255.255   UGH          0 0        0 ens3
131.252.110.102    131.252.208.1     255.255.255.255   UGH          0 0        0 ens3
131.252.110.103    131.252.208.1     255.255.255.255   UGH          0 0        0 ens3
131.252.208.0      0.0.0.0           255.255.255.0     U            0 0        0 ens3
131.252.208.1      0.0.0.0           255.255.255.255   UH           0 0        0 ens3
131.252.208.53     0.0.0.0           255.255.255.255   UH           0 0        0 ens3
francoer@ruby:~$ ^C
francoer@ruby:~$
```

-What is the name of the default router and its hardware address?

Default address name: router.seas.pdx.edu

Hardware address: 00:00:5e:00:01:01

```
francoer@ruby:~$ arp
Address          HWtype  HWaddress      Flags Mask    Iface
quizorpractice.cs.pdx.e ether 52:54:00:46:37:69 C          ens3
destiny.cat.pdx.edu ether cc:aa:77:50:b9:5d C          ens3
ada.cs.pdx.edu   ether 52:54:00:13:a0:c6 C          ens3
router.seas.pdx.edu ether 00:00:5e:00:01:01 C          ens3
simirror.cat.pdx.edu ether 52:54:00:5f:45:5f C          ens3
expn.cat.pdx.edu ether cc:aa:77:5f:de:0e C          ens3
rdns.cat.pdx.edu ether 00:00:5e:00:01:35 C          ens3
quizor6.cs.pdx.edu ether 52:54:00:a3:46:7f C          ens3
focal.cecs.pdx.edu ether 52:54:00:78:73:00 C          ens3
reaver.cat.pdx.edu ether cc:aa:77:e4:5f:30 C          ens3
glados.cat.pdx.edu ether 3c:08:cd:4a:26:a0 C          ens3
rita.cecs.pdx.edu ether 52:54:00:eb:9a:42 C          ens3
tanto.cs.pdx.edu ether 52:54:00:87:21:c4 C          ens3
babbage.cs.pdx.edu ether 52:54:00:5c:6f:6e C          ens3
vhost-users.cat.pdx.edu ether 52:54:00:1a:16:f0 C          ens3
silverfish.cat.pdx.edu ether cc:aa:77:0b:76:be C          ens3
stargate.cat.pdx.edu ether cc:aa:77:ed:72:3e C          ens3
omr-rdns-01.cat.pdx.edu ether 52:54:00:30:e3:f2 C          ens3
jammy.cecs.pdx.edu ether 52:54:00:59:3e:39 C          ens3
serenity.cat.pdx.edu ether cc:aa:77:a9:65:dd C          ens3
gitlab.cecs.pdx.edu ether 52:54:00:c2:05:63 C          ens3
mirapo.cat.pdx.edu ether cc:aa:77:f1:d3:21 C          ens3
mircle.cat.pdx.edu ether 52:54:00:f6:f8:54 C          ens3
mirrors.cat.pdx.edu ether 52:54:00:5f:45:5f C          ens3
warpgate.cat.pdx.edu ether cc:aa:77:b9:a1:fc C          ens3
dc-rdns-01.cat.pdx.edu ether 52:54:00:a9:30:9f C          ens3
francoer@ruby:~$ arp -n
Address          HWtype  HWaddress      Flags Mask    Iface
131.252.208.119 ether 52:54:00:46:37:69 C          ens3
131.252.208.17  ether cc:aa:77:50:b9:5d C          ens3
131.252.208.103 ether 52:54:00:13:a0:c6 C          ens3
131.252.208.1   ether 00:00:5e:00:01:01 C          ens3
131.252.208.121 ether 52:54:00:5f:45:5f C          ens3
131.252.208.110 ether cc:aa:77:5f:de:0e C          ens3
131.252.208.53  ether 00:00:5e:00:01:35 C          ens3
131.252.208.60  ether 52:54:00:a3:46:7f C          ens3
131.252.208.94  ether 52:54:00:78:73:00 C          ens3
131.252.208.37  ether cc:aa:77:e4:5f:30 C          ens3
131.252.208.21  ether 3c:08:cd:4a:26:a0 C          ens3
131.252.208.28  ether 52:54:00:eb:9a:42 C          ens3
131.252.208.5   ether 52:54:00:87:21:c4 C          ens3
131.252.208.23  ether 52:54:00:5c:6f:6e C          ens3
131.252.208.59  ether 52:54:00:1a:16:f0 C          ens3
131.252.208.77  ether cc:aa:77:0b:76:be C          ens3
131.252.208.43  ether cc:aa:77:ed:72:3e C          ens3
131.252.208.118 ether 52:54:00:30:e3:f2 C          ens3
131.252.208.11  ether 52:54:00:59:3e:39 C          ens3
131.252.208.18  ether cc:aa:77:a9:65:dd C          ens3
131.252.208.138 ether 52:54:00:c2:05:63 C          ens3
131.252.208.63  ether cc:aa:77:f1:d3:21 C          ens3
131.252.208.54  ether 52:54:00:f6:f8:54 C          ens3
131.252.208.20  ether 52:54:00:5f:45:5f C          ens3
131.252.208.4   ether cc:aa:77:b9:a1:fc C          ens3
131.252.208.117 ether 52:54:00:a9:30:9f C          ens3
francoer@ruby:~$
```

-How many entries are there in the ARP table?

26

```
francoer@ruby:~$ arp -a
quizorpractice.cs.pdx.edu (131.252.208.119) at 52:54:00:46:37:69 [ether] on ens3
destiny.cat.pdx.edu (131.252.208.17) at cc:aa:77:50:b9:5d [ether] on ens3
ada.cs.pdx.edu (131.252.208.103) at 52:54:00:13:a0:c6 [ether] on ens3
router.seas.pdx.edu (131.252.208.1) at 00:00:5e:00:01:01 [ether] on ens3
simirror.cat.pdx.edu (131.252.208.121) at 52:54:00:5f:45:5f [ether] on ens3
expn.cat.pdx.edu (131.252.208.110) at cc:aa:77:5f:de:0e [ether] on ens3
rdns.cat.pdx.edu (131.252.208.53) at 52:54:00:30:e3:f2 [ether] on ens3
quizor6.cs.pdx.edu (131.252.208.60) at 52:54:00:a3:46:7f [ether] on ens3
focal.cecs.pdx.edu (131.252.208.94) at 52:54:00:78:73:00 [ether] on ens3
reaver.cat.pdx.edu (131.252.208.37) at cc:aa:77:e4:5f:30 [ether] on ens3
glados.cat.pdx.edu (131.252.208.21) at 3c:08:cd:4a:26:a0 [ether] on ens3
rita.cecs.pdx.edu (131.252.208.28) at 52:54:00:eb:9a:42 [ether] on ens3
tanto.cs.pdx.edu (131.252.208.5) at 52:54:00:87:21:c4 [ether] on ens3
oabbage.cs.pdx.edu (131.252.208.23) at 52:54:00:5c:6f:6e [ether] on ens3
vhost-users.cat.pdx.edu (131.252.208.59) at 52:54:00:1a:16:f0 [ether] on ens3
silverfish.cat.pdx.edu (131.252.208.77) at cc:aa:77:0b:76:be [ether] on ens3
stargate.cat.pdx.edu (131.252.208.43) at cc:aa:77:ed:72:3e [ether] on ens3
omr-rdns-01.cat.pdx.edu (131.252.208.118) at 52:54:00:30:e3:f2 [ether] on ens3
jammy.cecs.pdx.edu (131.252.208.11) at 52:54:00:59:3e:39 [ether] on ens3
serenity.cat.pdx.edu (131.252.208.18) at cc:aa:77:a9:65:dd [ether] on ens3
gitlab.cecs.pdx.edu (131.252.208.138) at 52:54:00:c2:05:63 [ether] on ens3
mirapo.cat.pdx.edu (131.252.208.63) at cc:aa:77:f1:d3:21 [ether] on ens3
mircle.cat.pdx.edu (131.252.208.54) at 52:54:00:f6:f8:54 [ether] on ens3
mirrors.cat.pdx.edu (131.252.208.20) at 52:54:00:5f:45:5f [ether] on ens3
warpgate.cat.pdx.edu (131.252.208.4) at cc:aa:77:b9:a1:fc [ether] on ens3
dc-rdns-01.cat.pdx.edu (131.252.208.117) at 52:54:00:a9:30:9f [ether] on ens3
francoer@ruby:~$ ^[[200~arp -a | wc -l
arp: command not found
0
francoer@ruby:~$ arp -a | wc -l
26
francoer@ruby:~$ █
```

ARP 1.2

- List any IP addresses that share the same hardware address
mirrors.cat.pdx.edu (131.252.208.20) at 52:54:00:5f:45:5f [ether] on ens3
simirror.cat.pdx.edu (131.252.208.121) at 52:54:00:5f:45:5f [ether] on ens3

```
francoer@ruby:~$ arp -a | sort -k 26
ada.cs.pdx.edu (131.252.208.103) at 52:54:00:13:a0:c6 [ether] on ens3
babbage.cs.pdx.edu (131.252.208.23) at 52:54:00:5c:6f:6e [ether] on ens3
dc-rdns-01.cat.pdx.edu (131.252.208.117) at 52:54:00:a9:30:9f [ether] on ens3
destiny.cat.pdx.edu (131.252.208.17) at cc:aa:77:50:b9:5d [ether] on ens3
expn.cat.pdx.edu (131.252.208.110) at cc:aa:77:5f:de:0e [ether] on ens3
focal.cecs.pdx.edu (131.252.208.94) at 52:54:00:78:73:00 [ether] on ens3
gitlab.cecs.pdx.edu (131.252.208.138) at 52:54:00:c2:05:63 [ether] on ens3
glados.cat.pdx.edu (131.252.208.21) at 3c:08:cd:4a:26:a0 [ether] on ens3
jammy.cecs.pdx.edu (131.252.208.11) at 52:54:00:59:3e:39 [ether] on ens3
mirapo.cat.pdx.edu (131.252.208.63) at cc:aa:77:f1:d3:21 [ether] on ens3
miracle.cat.pdx.edu (131.252.208.54) at 52:54:00:f6:f8:54 [ether] on ens3
mirrors.cat.pdx.edu (131.252.208.20) at 52:54:00:5f:45:5f [ether] on ens3
omr-rdns-01.cat.pdx.edu (131.252.208.118) at 52:54:00:30:e3:f2 [ether] on ens3
quizzor6.cs.pdx.edu (131.252.208.60) at 52:54:00:a3:46:7f [ether] on ens3
quizzorpractice.cs.pdx.edu (131.252.208.119) at 52:54:00:46:37:69 [ether] on ens3
rdns.cat.pdx.edu (131.252.208.53) at <incomplete> on ens3
reaver.cat.pdx.edu (131.252.208.37) at cc:aa:77:e4:5f:30 [ether] on ens3
rita.cecs.pdx.edu (131.252.208.28) at 52:54:00:eb:9a:42 [ether] on ens3
router.seas.pdx.edu (131.252.208.1) at 00:00:5e:00:01:01 [ether] on ens3
serenity.cat.pdx.edu (131.252.208.18) at cc:aa:77:a9:65:dd [ether] on ens3
silverfish.cat.pdx.edu (131.252.208.77) at cc:aa:77:0b:76:be [ether] on ens3
simirror.cat.pdx.edu (131.252.208.121) at 52:54:00:5f:45:5f [ether] on ens3
stargate.cat.pdx.edu (131.252.208.43) at cc:aa:77:ed:72:3e [ether] on ens3
tanto.cs.pdx.edu (131.252.208.5) at 52:54:00:87:21:c4 [ether] on ens3
vhost-users.cat.pdx.edu (131.252.208.59) at 52:54:00:1a:16:f0 [ether] on ens3
warpgate.cat.pdx.edu (131.252.208.4) at cc:aa:77:b9:a1:fc [ether] on ens3
francoer@ruby:~$
```

- How many less hardware addresses are there than IP addresses in the ARP table?

-25

```
francoer@ruby:~$ arp -a | sort -k 26
ada.cs.pdx.edu (131.252.208.103) at 52:54:00:13:a0:c6 [ether] on ens3
babbage.cs.pdx.edu (131.252.208.23) at 52:54:00:5c:6f:6e [ether] on ens3
dc-rdns-01.cat.pdx.edu (131.252.208.117) at 52:54:00:a9:30:9f [ether] on ens3
destiny.cat.pdx.edu (131.252.208.17) at cc:aa:77:50:b9:5d [ether] on ens3
expn.cat.pdx.edu (131.252.208.110) at cc:aa:77:5f:de:0e [ether] on ens3
focal.cecs.pdx.edu (131.252.208.94) at 52:54:00:78:73:00 [ether] on ens3
gitlab.cecs.pdx.edu (131.252.208.138) at 52:54:00:c2:05:63 [ether] on ens3
glados.cat.pdx.edu (131.252.208.21) at 3c:08:cd:4a:26:a0 [ether] on ens3
jammy.cecs.pdx.edu (131.252.208.11) at 52:54:00:59:3e:39 [ether] on ens3
mirapo.cat.pdx.edu (131.252.208.63) at cc:aa:77:f1:d3:21 [ether] on ens3
mircle.cat.pdx.edu (131.252.208.54) at 52:54:00:f6:f8:54 [ether] on ens3
mirrors.cat.pdx.edu (131.252.208.20) at 52:54:00:5f:45:5f [ether] on ens3
omr-rdns-01.cat.pdx.edu (131.252.208.118) at 52:54:00:30:e3:f2 [ether] on ens3
quizzor6.cs.pdx.edu (131.252.208.60) at 52:54:00:a3:46:7f [ether] on ens3
quizzorpractice.cs.pdx.edu (131.252.208.119) at 52:54:00:46:37:69 [ether] on ens3
rdns.cat.pdx.edu (131.252.208.53) at 52:54:00:30:e3:f2 [ether] on ens3
reaver.cat.pdx.edu (131.252.208.37) at cc:aa:77:e4:5f:30 [ether] on ens3
rita.cecs.pdx.edu (131.252.208.28) at 52:54:00:eb:9a:42 [ether] on ens3
router.seas.pdx.edu (131.252.208.1) at 00:00:5e:00:01:01 [ether] on ens3
serenity.cat.pdx.edu (131.252.208.18) at cc:aa:77:a9:65:dd [ether] on ens3
silverfish.cat.pdx.edu (131.252.208.77) at cc:aa:77:0b:76:be [ether] on ens3
simirror.cat.pdx.edu (131.252.208.121) at 52:54:00:5f:45:5f [ether] on ens3
stargate.cat.pdx.edu (131.252.208.43) at cc:aa:77:ed:72:3e [ether] on ens3
tanto.cs.pdx.edu (131.252.208.5) at 52:54:00:87:21:c4 [ether] on ens3
vhost-users.cat.pdx.edu (131.252.208.59) at 52:54:00:1a:16:f0 [ether] on ens3
warpgate.cat.pdx.edu (131.252.208.4) at cc:aa:77:b9:a1:fc [ether] on ens3
francoer@ruby:~$ arp -a | sort -k 26 | awk '{print $26}' | uniq | wc -l
1
francoer@ruby:~$
```

- What network prefix do most of the IP addresses in the ARP table share?

-131.252.208

```
francoer@ruby:~$ arp -an | awk -F '[( )]' '{print $2}' > arp_entries
francoer@ruby:~$
```


ARP 1.3

f2:97:cc:08:29:8d

10.88.0.3

```
francoer@cloudshell:~ (cloud-franco-francoer)$ 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
2: eth0@if7: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1460 qdisc noqueue state UP group default
    link/ether f2:97:cc:08:29:8d brd ff:ff:ff:ff:ff:ff link-netnsid 0
    inet 10.88.0.3/16 brd 10.88.255.255 scope global eth0
        valid_lft forever preferred_lft forever
3: docker0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1460 qdisc noqueue state DOWN group default
    link/ether 02:42:62:23:a3:b0 brd ff:ff:ff:ff:ff:ff
    inet 172.17.0.1/16 brd 172.17.255.255 scope global docker0
        valid_lft forever preferred_lft forever
```

-What is the default router's IP address (e.g. the gateway address for the default route 0.0.0.0/0)

10.88.0.1

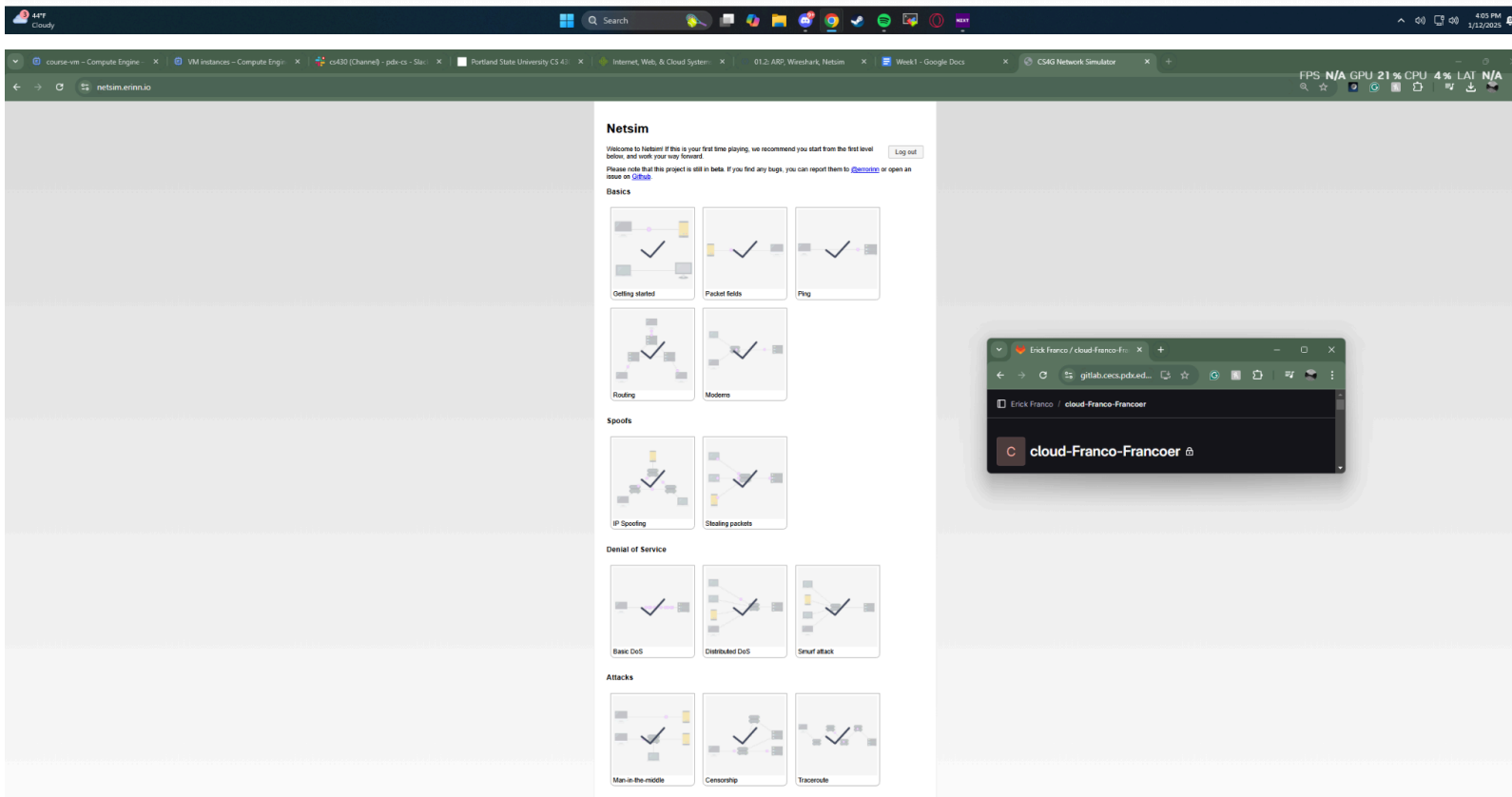
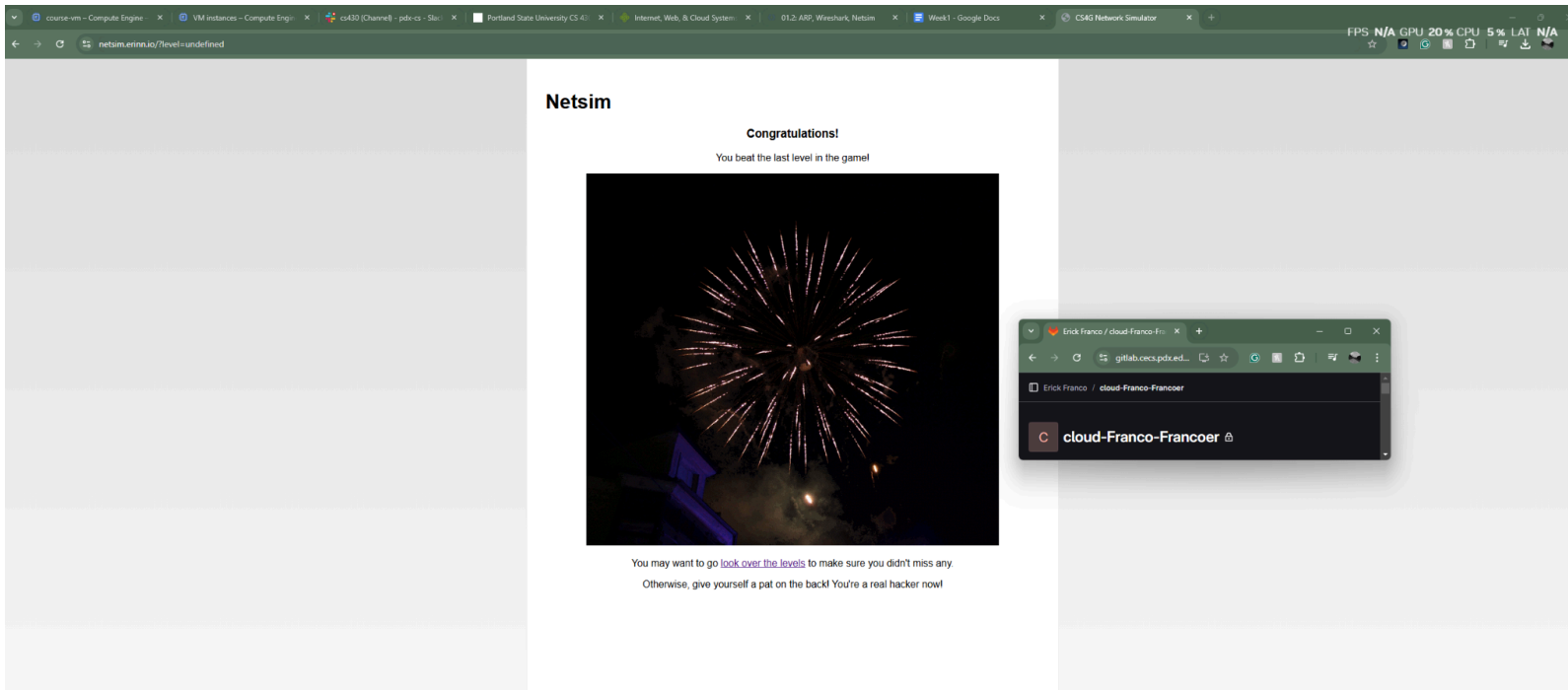
```
francoer@cloudshell:~ (cloud-franco-francoer)$ netstat -rn
Kernel IP routing table
Destination      Gateway          Genmask          Flags   MSS Window  irtt Iface
0.0.0.0          10.88.0.1        0.0.0.0          UG        0 0          0 eth0
10.88.0.0        0.0.0.0          255.255.0.0      U          0 0          0 eth0
172.17.0.0       0.0.0.0          255.255.0.0      U          0 0          0 docker0
francoer@cloudshell:~ (cloud-franco-francoer)$
```

- What is the default router's hardware address?

ba:57:32:0c:26:90

```
francoer@cloudshell:~ (cloud-franco-francoer)$ arp 10.88.0.1
Address          HWtype  HWaddress          Flags Mask          Iface
10.88.0.1        ether   ba:57:32:0c:26:90  C                   eth0
francoer@cloudshell:~ (cloud-franco-francoer)$ ^C
francoer@cloudshell:~ (cloud-franco-francoer)$
```

Netsim Screenshots



Lab 1.3

```
francoer@cloudshell:~ (cloud-franco-francoer)$ nmap 10.138.0.0/24
Starting Nmap 7.94SVN ( https://nmap.org ) at 2025-01-13 00:46 UTC
Nmap done: 256 IP addresses (0 hosts up) scanned in 104.22 seconds
francoer@cloudshell:~ (cloud-franco-francoer)$ nmap 10.138.0.2/24
Starting Nmap 7.94SVN ( https://nmap.org ) at 2025-01-13 00:49 UTC
Nmap done: 256 IP addresses (0 hosts up) scanned in 104.22 seconds
francoer@cloudshell:~ (cloud-franco-francoer)$
```

```
francoer@course-vm:~$ nmap 10.138.0.0/24
Starting Nmap 7.93 ( https://nmap.org ) at 2025-01-13 02:46 UTC
Nmap scan report for course-vm.c.cloud-franco-francoer.internal (10.138.0.2)
Host is up (0.00032s latency).
Not shown: 998 closed tcp ports (conn-refused)
PORT      STATE SERVICE
22/tcp    open  ssh
3389/tcp   open  ms-wbt-server

Nmap scan report for wordpress-1-vm.c.cloud-franco-francoer.internal (10.138.0.4)
Host is up (0.00042s latency).
Not shown: 997 closed tcp ports (conn-refused)
PORT      STATE SERVICE
22/tcp    open  ssh
80/tcp    open  http
443/tcp    open  https

Nmap scan report for django-1-vm.c.cloud-franco-francoer.internal (10.138.0.5)
Host is up (0.00082s latency).
Not shown: 997 filtered tcp ports (no-response)
PORT      STATE SERVICE
22/tcp    open  ssh
80/tcp    open  http
443/tcp    open  https

Nmap done: 256 IP addresses (3 hosts up) scanned in 7.36 seconds
francoer@course-vm:~$
```

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

-82 default networks/ subnetworks
 - 82 regions
 - I believe it supports 4096

- Which CIDR subnetworks are these instances brought up in? Do they correspond to the appropriate region based on the prior commands?
 -Central: 10.128.0.2
 -west: 10.138.0.2
 -East: 10.150.0.2
 -Yeah they correspond to the region based on the prior commands

```
francoer@cloudshell:~ (cloud-franco-francoer)$ gcloud compute instances list
NAME: instance-1
ZONE: us-central1-a
MACHINE_TYPE: n1-standard-1
PREEMPTIBLE:
INTERNAL_IP: 10.128.0.2
EXTERNAL_IP: 34.31.200.107
STATUS: RUNNING

NAME: course-vm
ZONE: us-west1-b
MACHINE_TYPE: e2-medium
PREEMPTIBLE:
INTERNAL_IP: 10.138.0.2
EXTERNAL_IP: 34.83.255.145
STATUS: RUNNING
```

```
NAME: instance-2
ZONE: us-east4-b
MACHINE_TYPE: n1-standard-1
PREEMPTIBLE:
INTERNAL_IP: 10.150.0.2
EXTERNAL_IP: 34.85.167.97
STATUS: RUNNING
```

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

```
francoer@instance-1:~$ ping 10.150.0.2
PING 10.150.0.2 (10.150.0.2) 56(84) bytes of data.
64 bytes from 10.150.0.2: icmp_seq=1 ttl=64 time=24.9 ms
64 bytes from 10.150.0.2: icmp_seq=2 ttl=64 time=24.1 ms
64 bytes from 10.150.0.2: icmp_seq=3 ttl=64 time=24.1 ms
64 bytes from 10.150.0.2: icmp_seq=4 ttl=64 time=30.1 ms
64 bytes from 10.150.0.2: icmp_seq=5 ttl=64 time=35.9 ms
64 bytes from 10.150.0.2: icmp_seq=6 ttl=64 time=36.0 ms
64 bytes from 10.150.0.2: icmp_seq=7 ttl=64 time=36.1 ms
64 bytes from 10.150.0.2: icmp_seq=8 ttl=64 time=35.9 ms
64 bytes from 10.150.0.2: icmp_seq=9 ttl=64 time=35.8 ms
64 bytes from 10.150.0.2: icmp_seq=10 ttl=64 time=35.9 ms
64 bytes from 10.150.0.2: icmp_seq=11 ttl=64 time=35.9 ms
64 bytes from 10.150.0.2: icmp_seq=12 ttl=64 time=35.9 ms
64 bytes from 10.150.0.2: icmp_seq=13 ttl=64 time=35.9 ms
64 bytes from 10.150.0.2: icmp_seq=14 ttl=64 time=35.9 ms
64 bytes from 10.150.0.2: icmp_seq=15 ttl=64 time=36.0 ms
64 bytes from 10.150.0.2: icmp_seq=16 ttl=64 time=35.9 ms
64 bytes from 10.150.0.2: icmp_seq=17 ttl=64 time=35.9 ms
64 bytes from 10.150.0.2: icmp_seq=18 ttl=64 time=35.9 ms
64 bytes from 10.150.0.2: icmp_seq=19 ttl=64 time=36.1 ms
64 bytes from 10.150.0.2: icmp_seq=20 ttl=64 time=36.0 ms
64 bytes from 10.150.0.2: icmp_seq=21 ttl=64 time=36.0 ms
64 bytes from 10.150.0.2: icmp_seq=22 ttl=64 time=36.0 ms
64 bytes from 10.150.0.2: icmp_seq=23 ttl=64 time=35.9 ms
64 bytes from 10.150.0.2: icmp_seq=24 ttl=64 time=35.9 ms
64 bytes from 10.150.0.2: icmp_seq=25 ttl=64 time=36.0 ms
64 bytes from 10.150.0.2: icmp_seq=26 ttl=64 time=36.0 ms
64 bytes from 10.150.0.2: icmp_seq=27 ttl=64 time=36.0 ms
64 bytes from 10.150.0.2: icmp_seq=28 ttl=64 time=35.9 ms
64 bytes from 10.150.0.2: icmp_seq=29 ttl=64 time=36.0 ms
^C
--- 10.150.0.2 ping statistics ---
29 packets transmitted, 29 received, 0% packet loss, time 28035ms
rtt min/avg/max/mdev = 24.116/34.555/36.115/3.616 ms
```

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

```
francoer@cloudshell:~ (cloud-franco-francoer)$ gcloud compute networks subnets list --regions=us-central1,europe-west1
NAME: default
REGION: europe-west1
NETWORK: default
RANGE: 10.132.0.0/20
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:

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:
francoer@cloudshell:~ (cloud-franco-francoer)$
```

- Explain why the result of this ping is different from when you performed the ping to `instance-2`.
I think because instance 3 and 4 were on a different network, or subnetwork, while instance 2 was on the same network and easier to reach.

```
francoer@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 ---
21 packets transmitted, 0 received, 100% packet loss, time 20455ms

francoer@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 ---
8 packets transmitted, 0 received, 100% packet loss, time 7152ms
```

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

VM instances

Instance templates

Sole-tenant nodes

Machine images

TPUs

Committed use discounts

Reservations

Marketplace

Release Notes

<|

Filter Enter property name or value

<input type="checkbox"/>	Status	Name ↑	Zone	Recommendations	In use by	Internal IP	External IP	Connect
<input type="checkbox"/>	✓	course-vm	us-west1-b			10.138.0.2 (nic0)	34.83.255.145 (nic0)	SSH ▾
<input type="checkbox"/>	✓	instance-1	us-central1-a			10.128.0.2 (nic0)	34.31.200.107 (nic0)	SSH ▾
<input type="checkbox"/>	✓	instance-2	us-east4-b			10.150.0.2 (nic0)	34.85.167.97 (nic0)	SSH ▾
<input type="checkbox"/>	✓	instance-3	us-central1-a			192.168.1.2 (nic0)	35.223.18.9 (nic0)	SSH ▾
<input type="checkbox"/>	✓	instance-4	europa-west1-d			192.168.5.2 (nic0)	34.77.158.22 (nic0)	SSH ▾

Related actions

CLOUD SHELL

Terminal

(cloud-franco-francoer) × + ▾

Open Editor

- Take a screenshot of the subnetworks created for the **custom-network1** network and some of the subnetworks of the **default** network showing their regions, internal IP ranges and Gateways.

I did the best I could to follow the instructions Then visit "**VPC Network**" and visit each network, so this what I found

<input type="checkbox"/>	Name ↓	Region	VPC network	IP stack type	Primary IPv4 range	Secondary IPv4 ranges	IPv6 ranges	Gateways	Flow logs
<input type="checkbox"/>	subnet-us-central-192	us-central1	custom-network1	IPv4	192.168.1.0/24			192.168.1.1	Off
<input type="checkbox"/>	subnet-europe-west-192	europe-west1	custom-network1	IPv4	192.168.5.0/24			192.168.5.1	Off
<input type="checkbox"/>	default	africa-south1	default	IPv4	10.218.0.0/20			10.218.0.1	Off
<input type="checkbox"/>	default	asia-east1	default	IPv4	10.140.0.0/20			10.140.0.1	Off
<input type="checkbox"/>	default	asia-east2	default	IPv4	10.170.0.0/20			10.170.0.1	Off
<input type="checkbox"/>	default	asia-northeast1	default	IPv4	10.146.0.0/20			10.146.0.1	Off
<input type="checkbox"/>	default	asia-northeast2	default	IPv4	10.174.0.0/20			10.174.0.1	Off
<input type="checkbox"/>	default	asia-northeast3	default	IPv4	10.178.0.0/20			10.178.0.1	Off
<input type="checkbox"/>	default	asia-south1	default	IPv4	10.160.0.0/20			10.160.0.1	Off
<input type="checkbox"/>	default	asia-south2	default	IPv4	10.190.0.0/20			10.190.0.1	Off
<input type="checkbox"/>	default	asia-southeast1	default	IPv4	10.148.0.0/20			10.148.0.1	Off
<input type="checkbox"/>	default	asia-southeast2	default	IPv4	10.184.0.0/20			10.184.0.1	Off
<input type="checkbox"/>	default	australia-southeast1	default	IPv4	10.152.0.0/20			10.152.0.1	Off
<input type="checkbox"/>	default	australia-southeast2	default	IPv4	10.192.0.0/20			10.192.0.1	Off
<input type="checkbox"/>	default	europe-central2	default	IPv4	10.186.0.0/20			10.186.0.1	Off
<input type="checkbox"/>	default	europe-north1	default	IPv4	10.166.0.0/20			10.166.0.1	Off
<input type="checkbox"/>	default	europe-north2	default	IPv4	10.226.0.0/20			10.226.0.1	Off
<input type="checkbox"/>	default	europe-southwest1	default	IPv4	10.204.0.0/20			10.204.0.1	Off
<input type="checkbox"/>	default	europe-west1	default	IPv4	10.132.0.0/20			10.132.0.1	Off
<input type="checkbox"/>	default	europe-west10	default	IPv4	10.214.0.0/20			10.214.0.1	Off
<input type="checkbox"/>	default	europe-west12	default	IPv4	10.210.0.0/20			10.210.0.1	Off
<input type="checkbox"/>	default	europe-west2	default	IPv4	10.154.0.0/20			10.154.0.1	Off
<input type="checkbox"/>	default	europe-west3	default	IPv4	10.156.0.0/20			10.156.0.1	Off
<input type="checkbox"/>	default	europe-west4	default	IPv4	10.164.0.0/20			10.164.0.1	Off
<input type="checkbox"/>	default	europe-west6	default	IPv4	10.172.0.0/20			10.172.0.1	Off
<input type="checkbox"/>	default	europe-west8	default	IPv4	10.198.0.0/20			10.198.0.1	Off
<input type="checkbox"/>	default	europe-west9	default	IPv4	10.200.0.0/20			10.200.0.1	Off
<input type="checkbox"/>	default	me-central1	default	IPv4	10.212.0.0/20			10.212.0.1	Off
<input type="checkbox"/>	default	me-west1	default	IPv4	10.208.0.0/20			10.208.0.1	Off
<input type="checkbox"/>	default	northamerica-northeast1	default	IPv4	10.162.0.0/20			10.162.0.1	Off
<input type="checkbox"/>	default	northamerica-northeast2	default	IPv4	10.188.0.0/20			10.188.0.1	Off
<input type="checkbox"/>	default	northamerica-south1	default	IPv4	10.224.0.0/20			10.224.0.1	Off
<input type="checkbox"/>	default	southamerica-east1	default	IPv4	10.158.0.0/20			10.158.0.1	Off
<input type="checkbox"/>	default	southamerica-west1	default	IPv4	10.194.0.0/20			10.194.0.1	Off
<input type="checkbox"/>	default	us-central1	default	IPv4	10.128.0.0/20			10.128.0.1	Off
<input type="checkbox"/>	default	us-east1	default	IPv4	10.142.0.0/20			10.142.0.1	Off
<input type="checkbox"/>	default	us-east4	default	IPv4	10.150.0.0/20			10.150.0.1	Off
<input type="checkbox"/>	default	us-east5	default	IPv4	10.202.0.0/20			10.202.0.1	Off
<input type="checkbox"/>	default	us-south1	default	IPv4	10.206.0.0/20			10.206.0.1	Off
<input type="checkbox"/>	default	us-west1	default	IPv4	10.138.0.0/20			10.138.0.1	Off
<input type="checkbox"/>	default	us-west2	default	IPv4	10.168.0.0/20			10.168.0.1	Off
<input type="checkbox"/>	default	us-west3	default	IPv4	10.180.0.0/20			10.180.0.1	Off
<input type="checkbox"/>	default	us-west4	default	IPv4	10.182.0.0/20			10.182.0.1	Off