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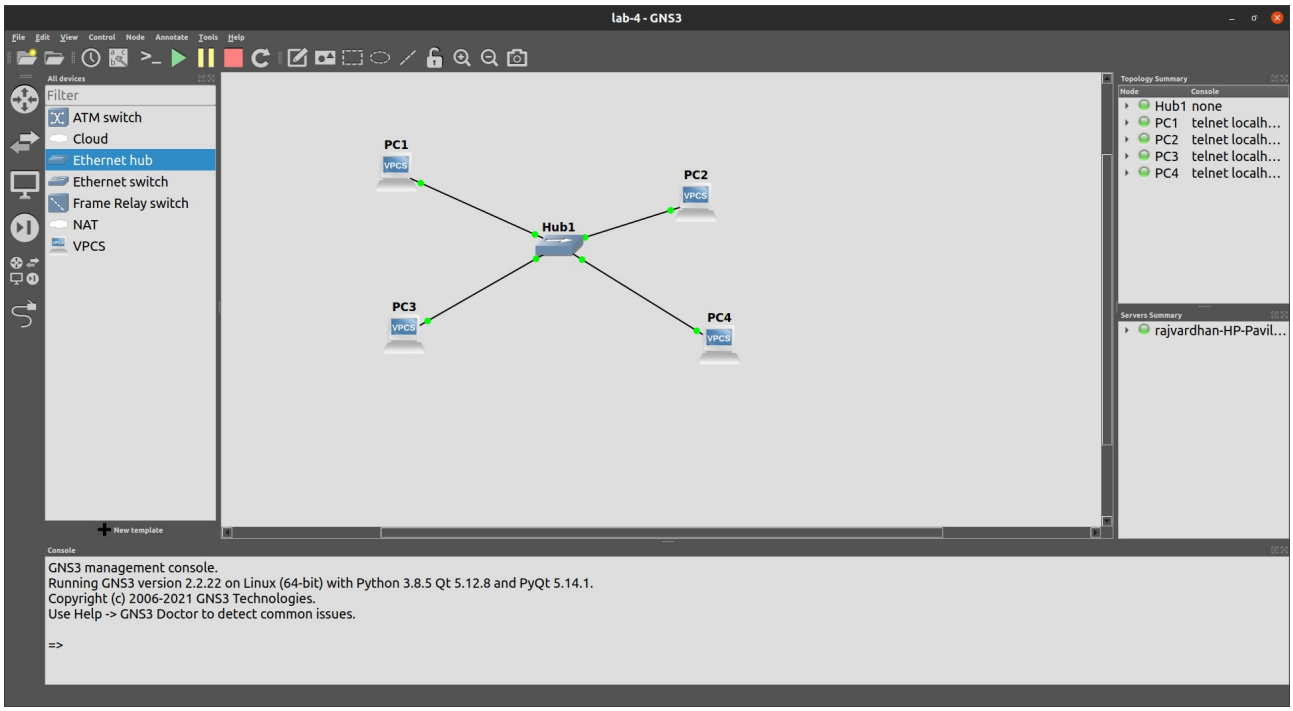
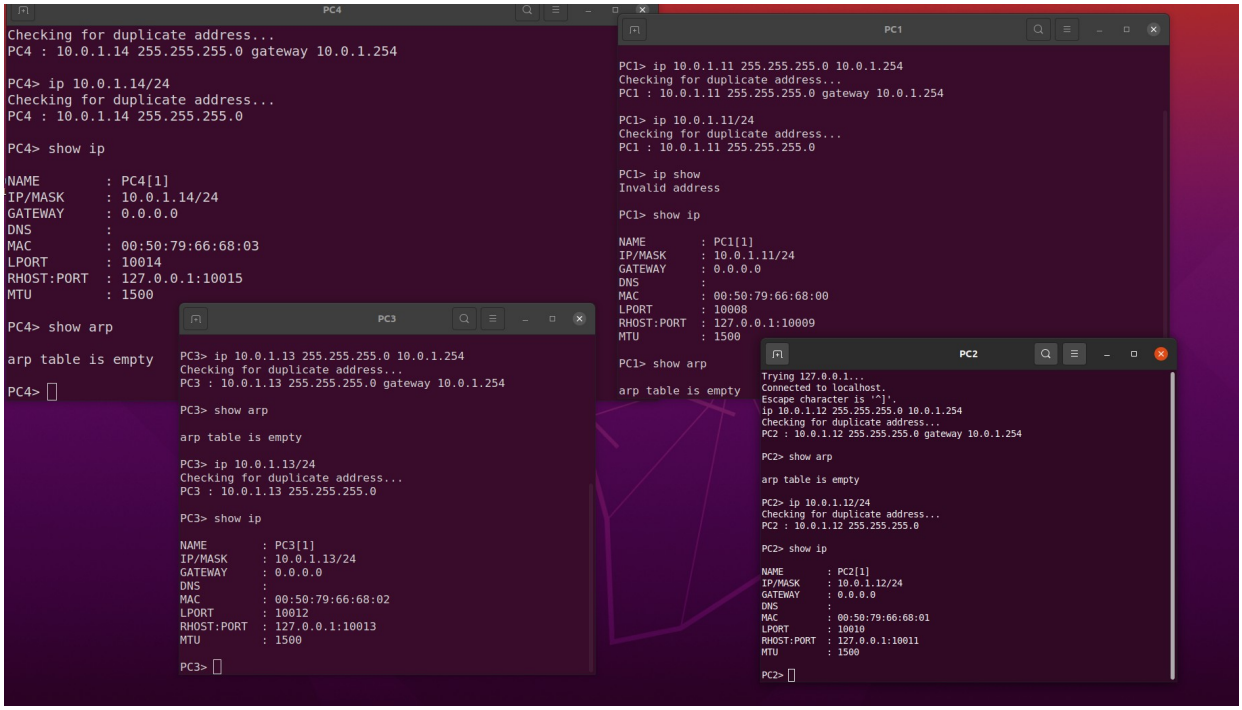
CN LAB - 4 : STUDY OF NETWORK DEVICES IN GNS3

P4.1)

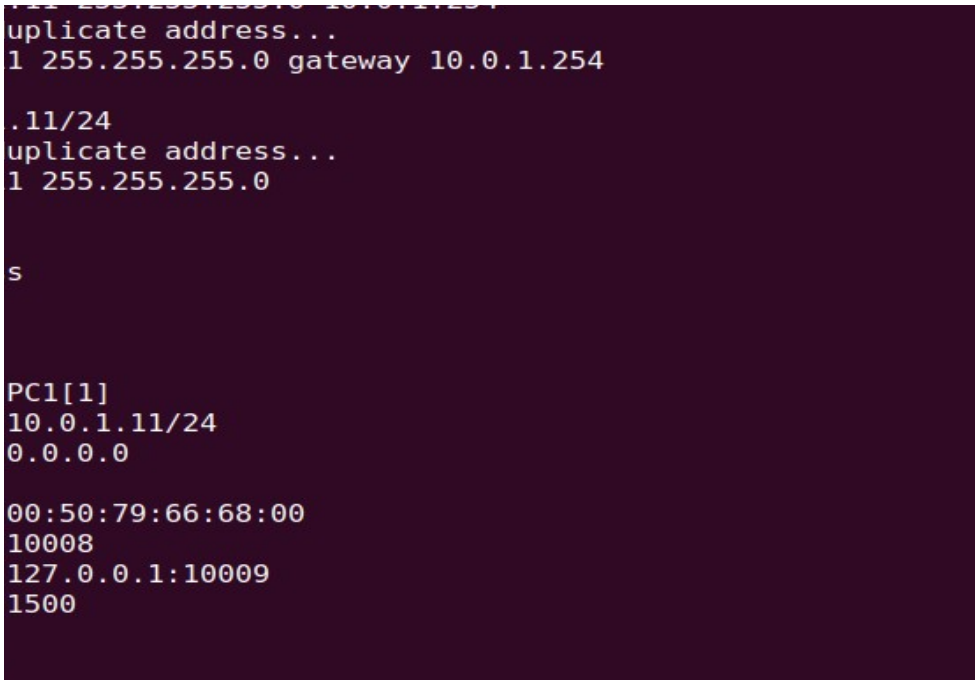
Design network configuration shown in Figure 4.1 for all parts. Connect all four VMs to a single Ethernet segment via a single hub as shown in Figure 4.1. Configure the IP addresses for the PCs as shown in Table 4.1.



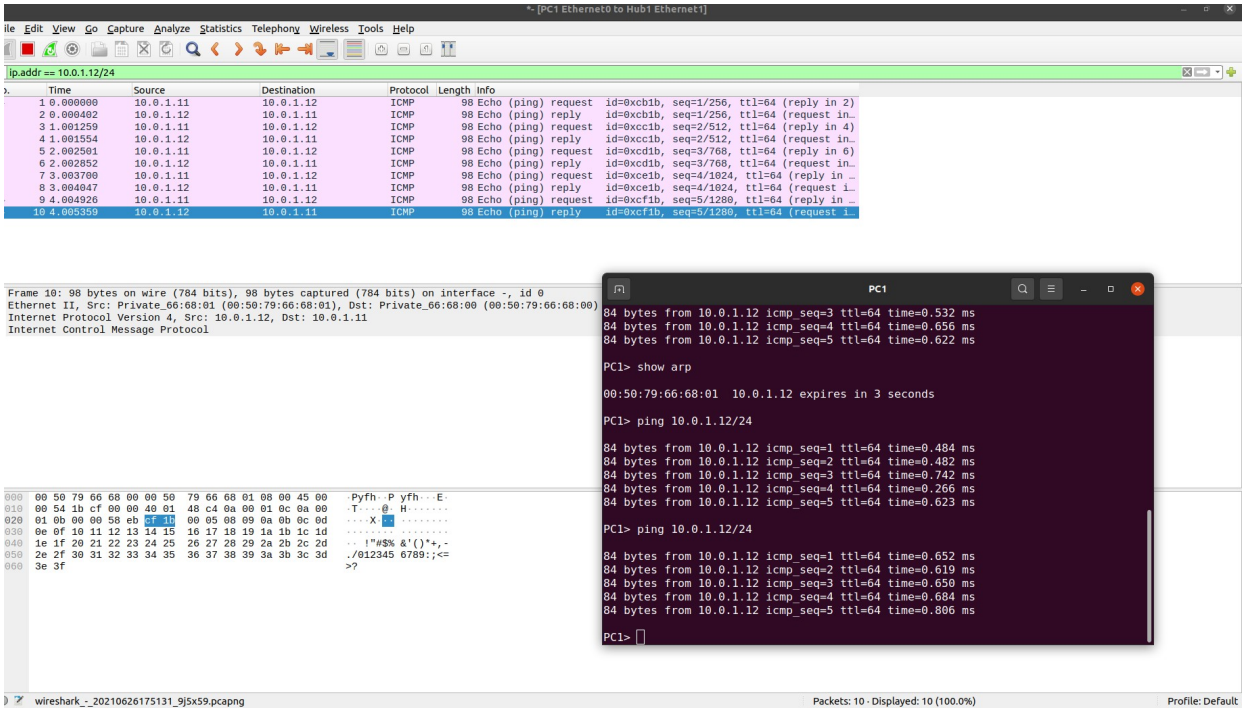
IP address configuration FOR THE 4 pcs and show arp:



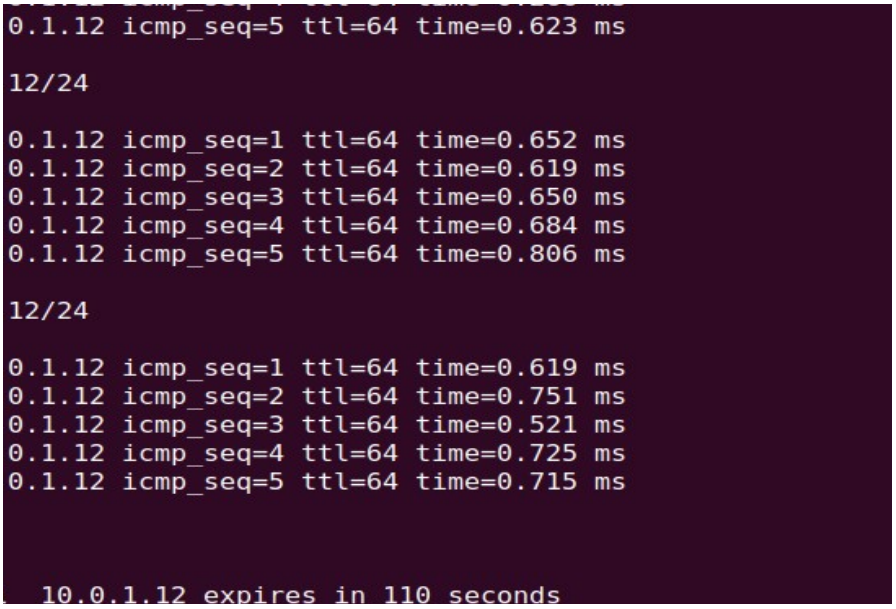
a. On PC1, view the ARP cache with showarp



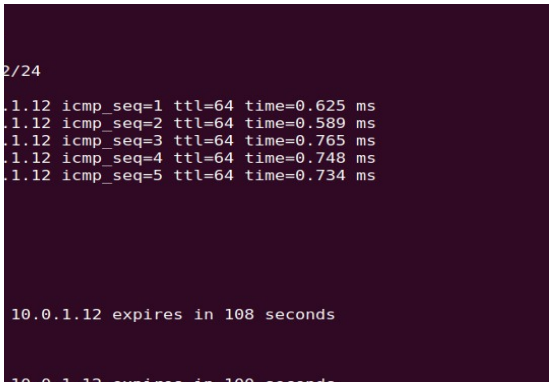
b) Start Wireshark on PC1-Hub1 link with a capture filter set to the IP address:



C) Issue a ping command from PC1toPC2:



d. View the ARP cache again with the command arp -a. Note that ARP cache

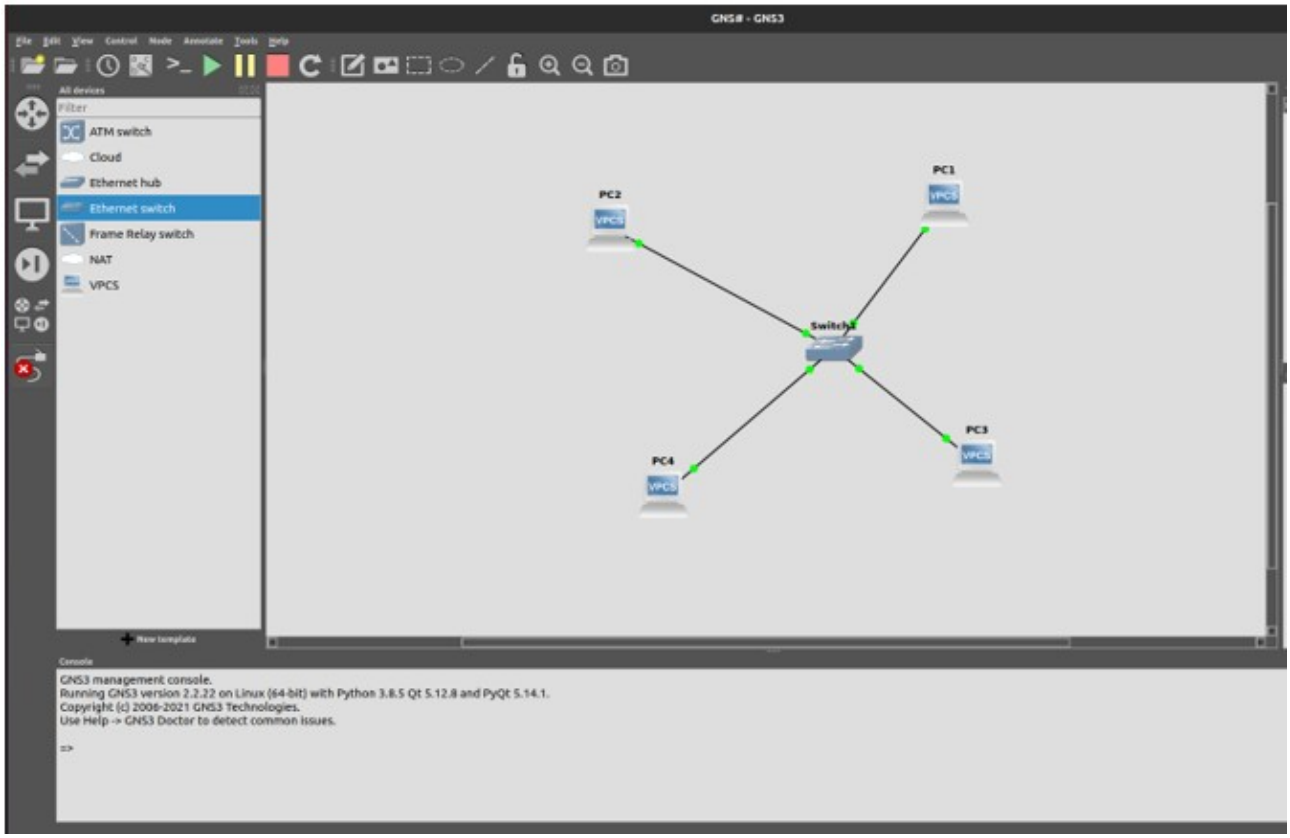


***e)*Saved the results of Wireshark and**

uploaded the file on teams

Q 4.2

To test the effects of changing the netmask of a network configuration. Design the configuration as Q4.1 and replace the hub with a switch, two hosts (PC2 and PC4) have been assigned different network prefixes.

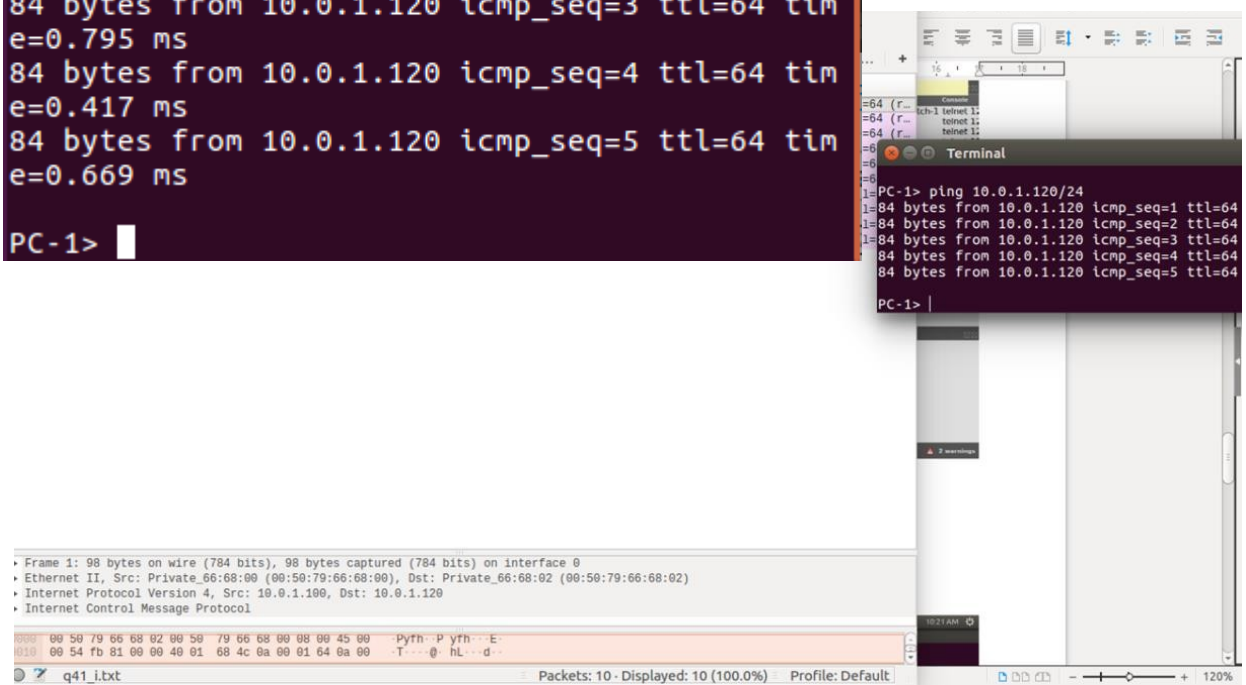


Run Wireshark on PC1-Switch1 link and capture the packets for the following scenarios

i. From PC1 ping PC3.

Ping was successful

```
PC-1> ip 10.0.1.100/24 255.255.255.0
Checking for duplicate address...
PC1 : 10.0.1.100 255.255.255.0

PC-1> ping 10.0.1.120 -c3
84 bytes from 10.0.1.120 icmp_seq=1 ttl=64 tim
e=0.389 ms
84 bytes from 10.0.1.120 icmp_seq=2 ttl=64 tim
e=0.425 ms
84 bytes from 10.0.1.120 icmp_seq=3 ttl=64 tim
e=0.795 ms
84 bytes from 10.0.1.120 icmp_seq=4 ttl=64 tim
e=0.417 ms
84 bytes from 10.0.1.120 icmp_seq=5 ttl=64 tim
e=0.669 ms

PC-1>
```

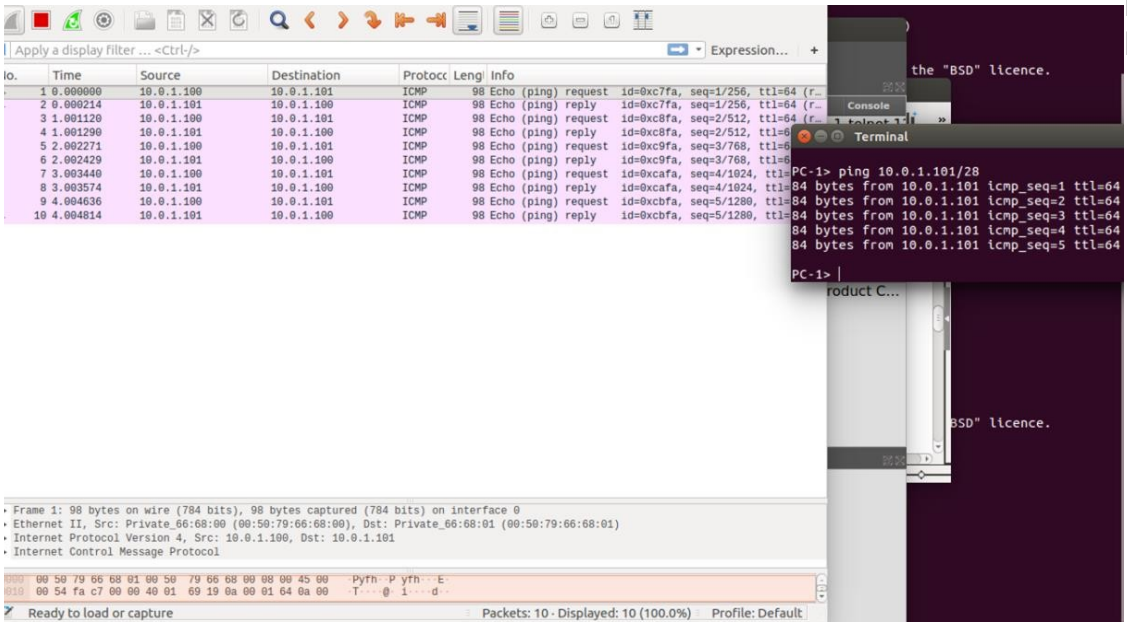


ii. From PC1 pingPC2.

Ping was successful

```
PC-1> ping 10.0.1.101 -c2
84 bytes from 10.0.1.101 icmp_seq=1 ttl=64 tim
e=0.277 ms
84 bytes from 10.0.1.101 icmp_seq=2 ttl=64 tim
e=0.391 ms
84 bytes from 10.0.1.101 icmp_seq=3 ttl=64 tim
e=0.412 ms
84 bytes from 10.0.1.101 icmp_seq=4 ttl=64 tim
e=0.318 ms
84 bytes from 10.0.1.101 icmp_seq=5 ttl=64 tim
e=0.322 ms

PC-1>
```

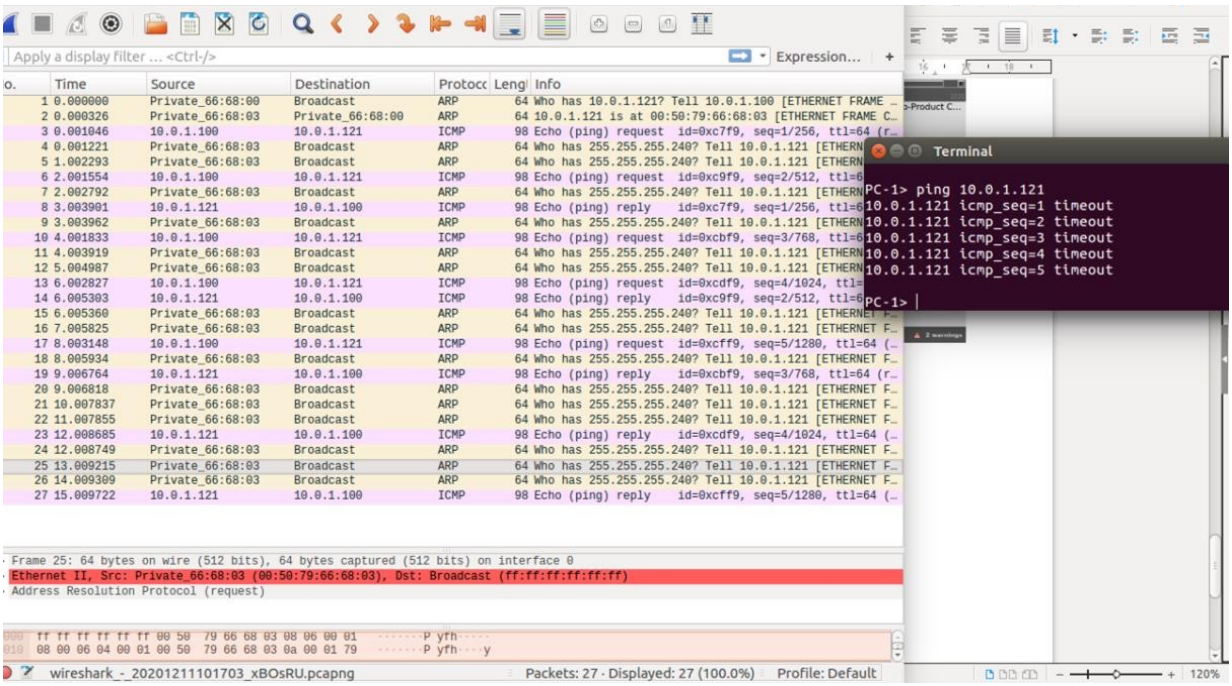
iii. From PC1 pingPC4.



The pings was not successful

```
PC-1> ping 10.0.1.121 -c4
10.0.1.121 icmp_seq=1 timeout
10.0.1.121 icmp_seq=2 timeout
10.0.1.121 icmp_seq=3 timeout
10.0.1.121 icmp_seq=4 timeout
10.0.1.121 icmp_seq=5 timeout

PC-1>
```

iv.



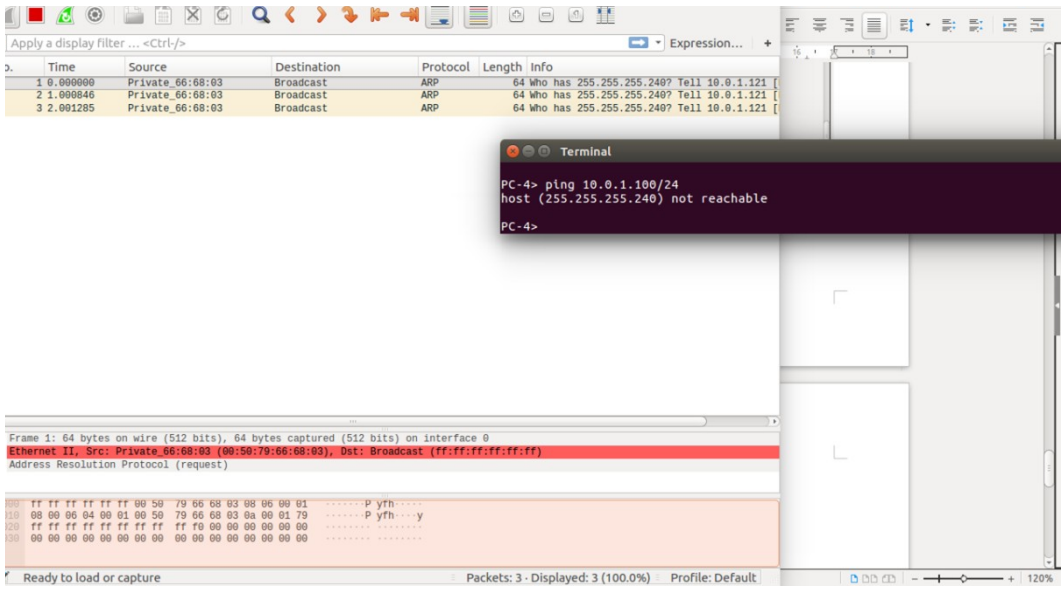
From PC4 pingPC1.

Shows error message.

host not

```
PC-4> ip 10.0.1.121/28 255.255.255.240
Checking for duplicate address...
PC1 : 10.0.1.121 255.255.255.240

PC-4> ping 10.0.1.100 -c1
host (255.255.255.240) not reachable

PC-4>
```

(255.255.255.240) reachable



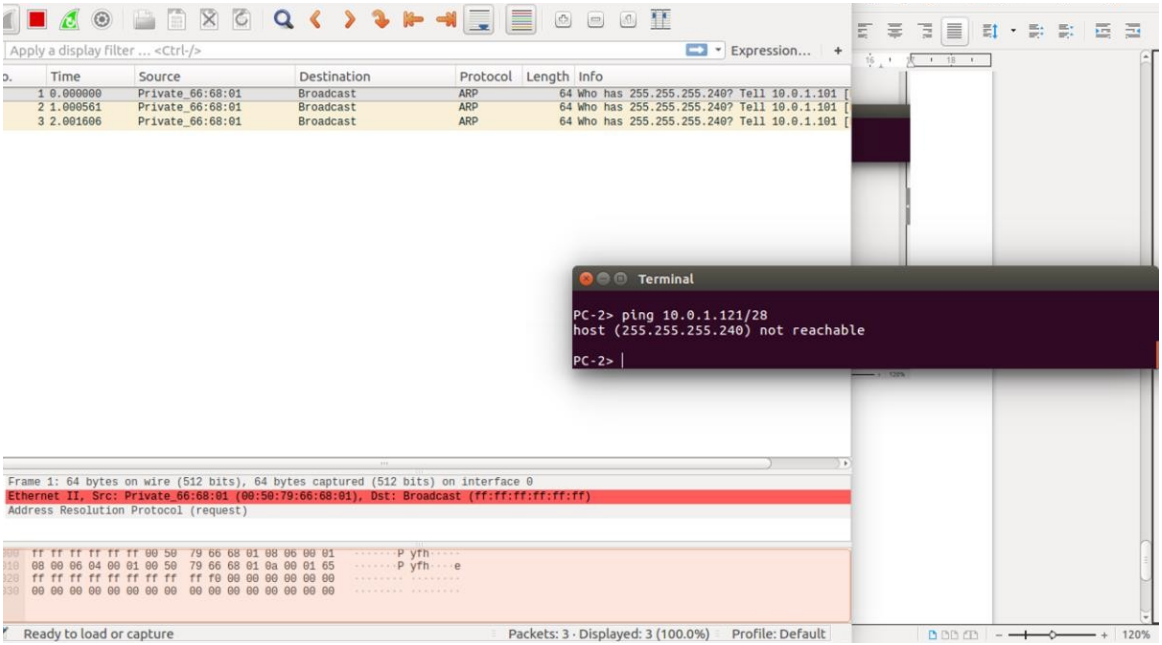
v. From PC2 ping PC4.

From PC2 ping PC4.

host (255.255.255.240) not reachable

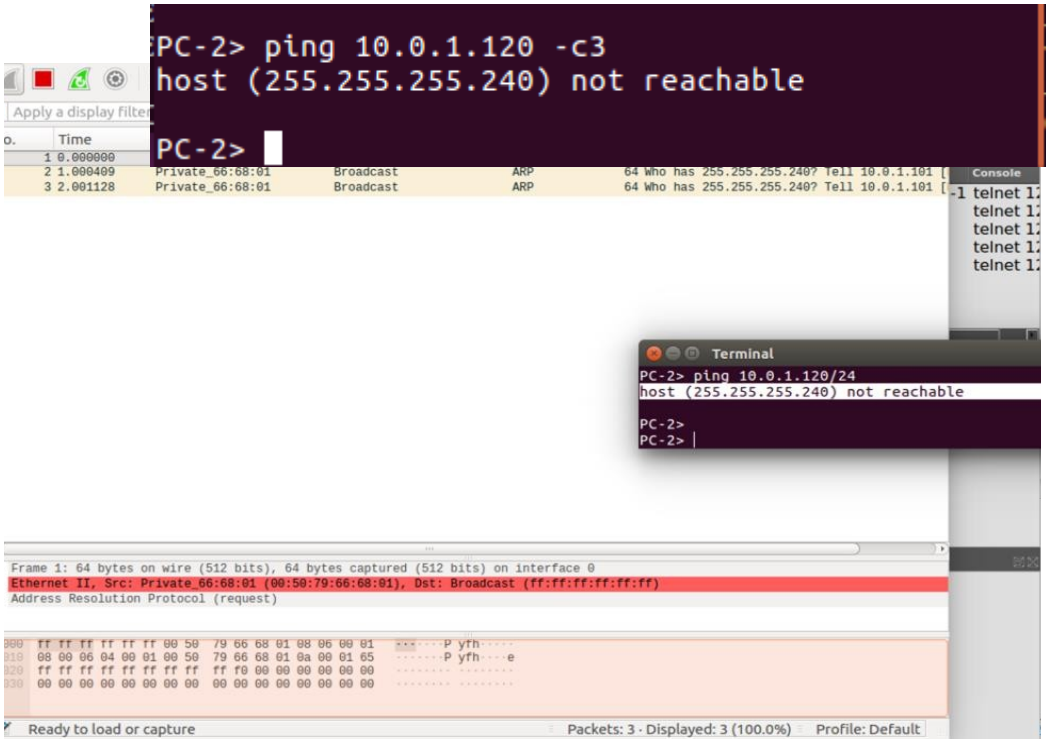
```
PC-2> ip 10.0.1.101/28 255.255.255.240
Checking for duplicate address...
PC1 : 10.0.1.101 255.255.255.240

PC-2> ping 10.0.1.121
host (255.255.255.240) not reachable
```

vi.

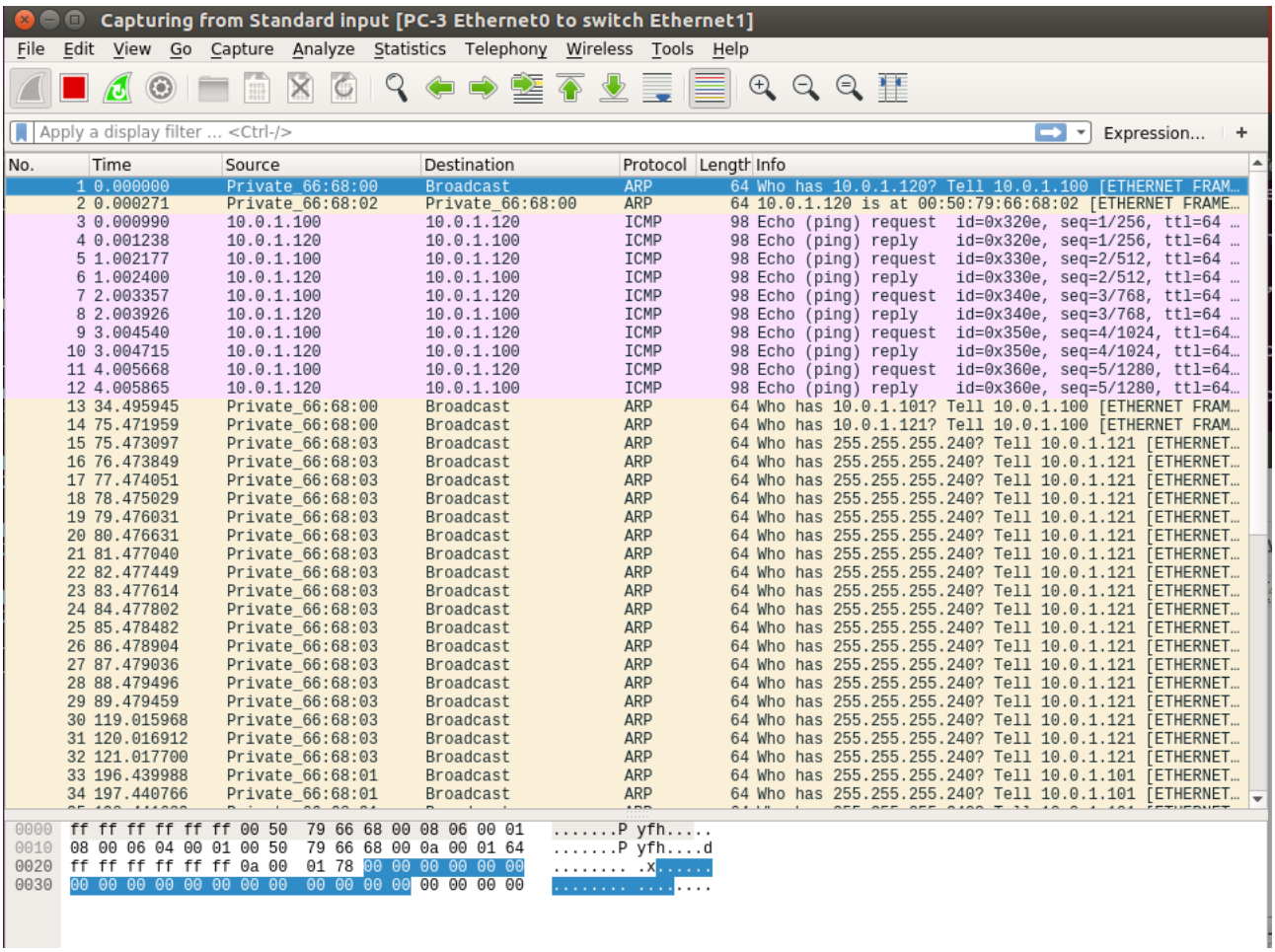


From PC2 ping PC3.

host (255.255.255.240) not reachable

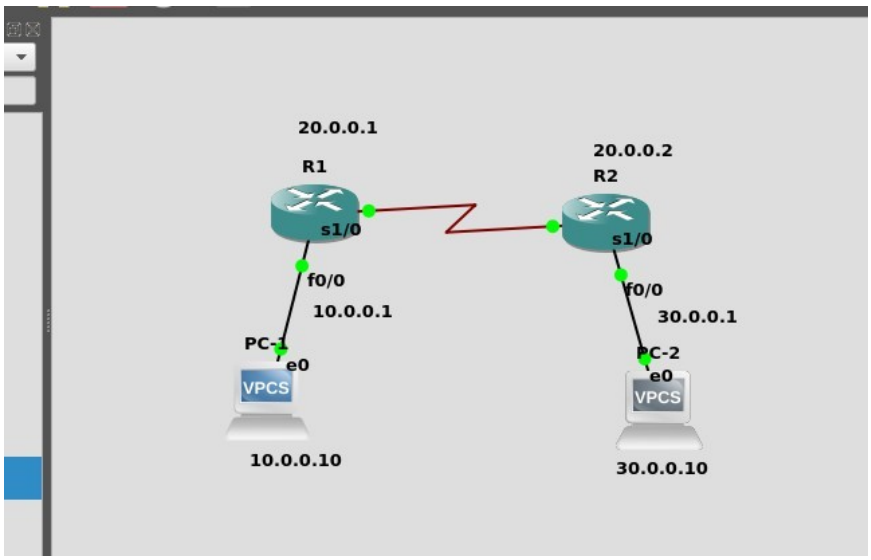


Wireshark output: Overall



P4.6)

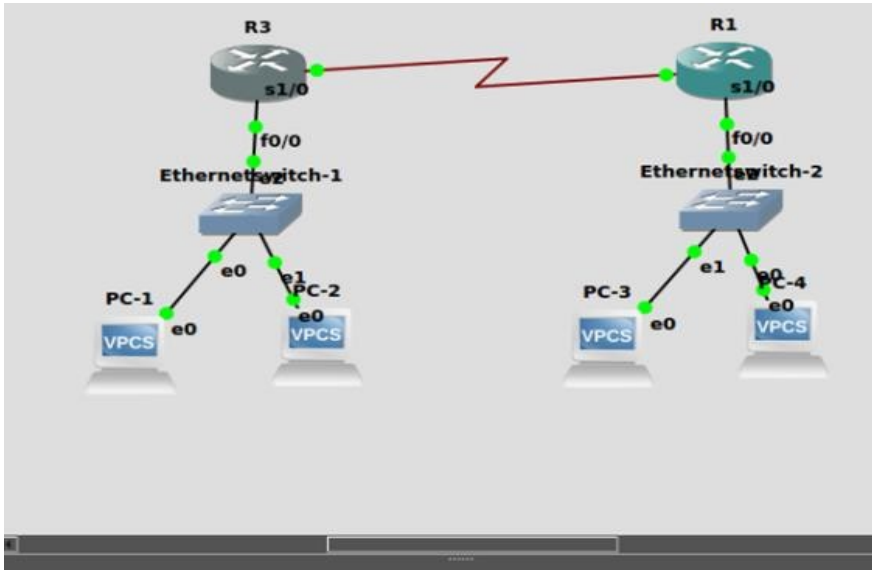
i. check the connectivity by pinging from PC1 toPC2.



No gateway found for pings. And ARP table was empty.

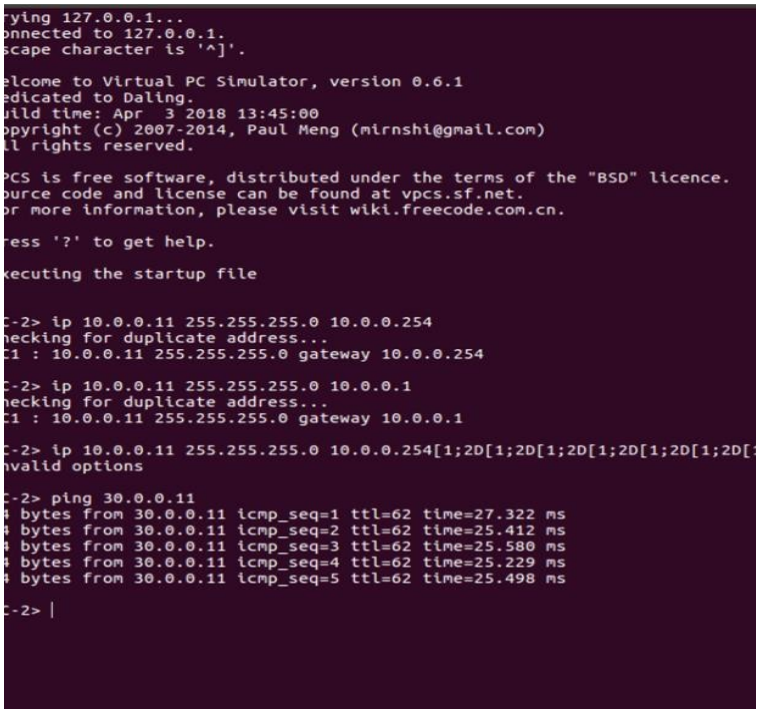
```
PC-1> ping 30.0.0.10
*10.0.0.1 icmp_seq=1 ttl=255 time=9.683 ms (ICMP type:3, code:1, Destination host unreachable)
*10.0.0.1 icmp_seq=2 ttl=255 time=4.752 ms (ICMP type:3, code:1, Destination host unreachable)
*10.0.0.1 icmp_seq=3 ttl=255 time=5.737 ms (ICMP type:3, code:1, Destination host unreachable)
*10.0.0.1 icmp_seq=4 ttl=255 time=5.662 ms (ICMP type:3, code:1, Destination host unreachable)
*10.0.0.1 icmp_seq=5 ttl=255 time=5.123 ms (ICMP type:3, code:1, Destination host unreachable)
```

ii. Analyse ARP exchanges between various network components.



ping from pc2 on router 3 to pc 3 on router 1.

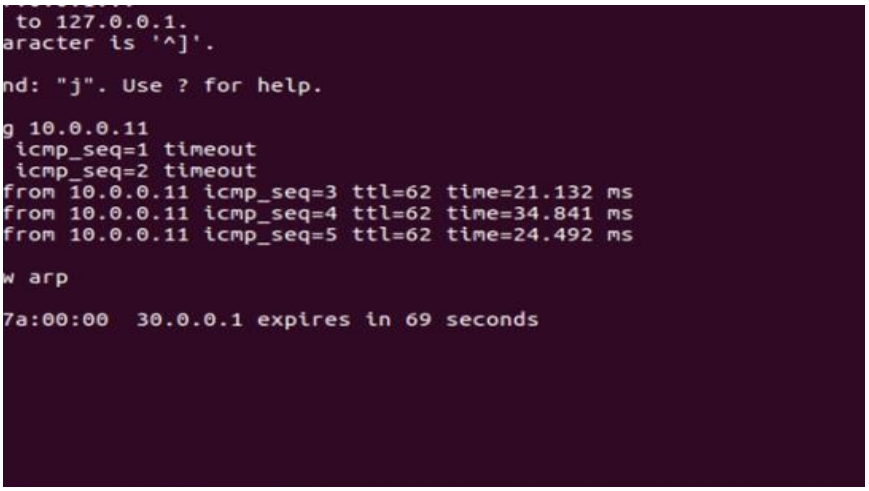
ping success full.



Ping from pc4 on router1 to pc1 on router 3

ping successfull

b)show arp for both cases:



All the ping requests were succesful.

This is because, the IP address provided by P1 for the ping request was found by ARP by the process of Broadcasting. Hence, every subsequent request has been forwarded to the correct destination and hence we also got the right responses as well.