Data Communications and Networking CW1

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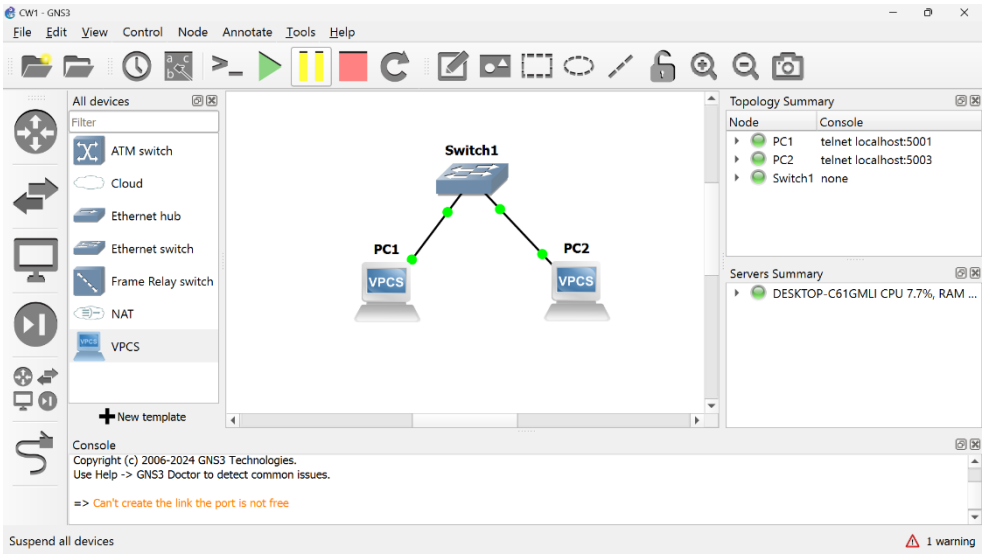
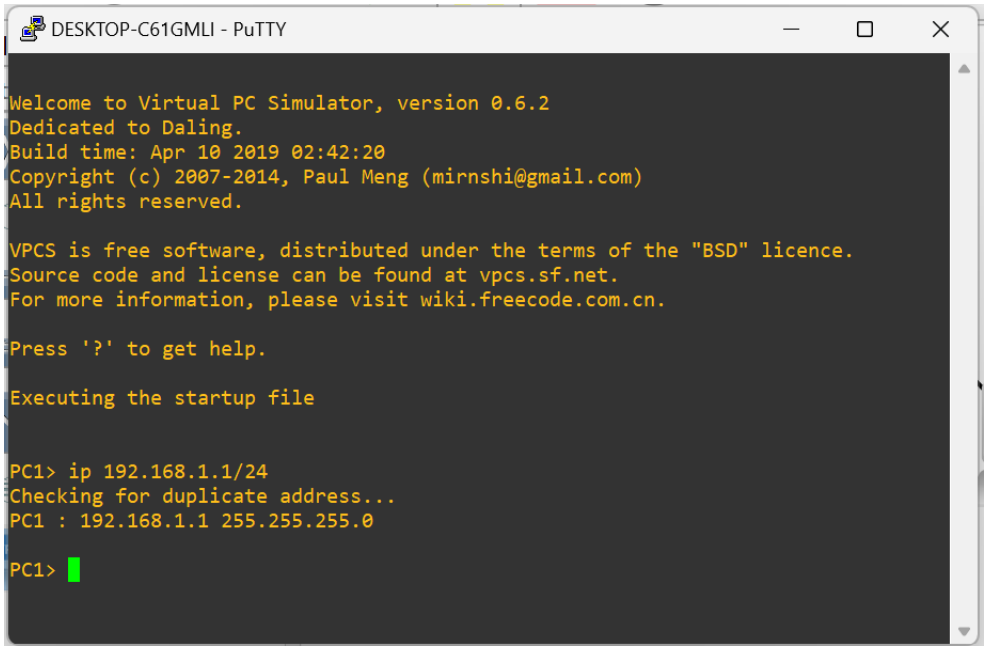
BSc Computer Science

Part 1: Connectivity and Virtual PCs (VPCs):

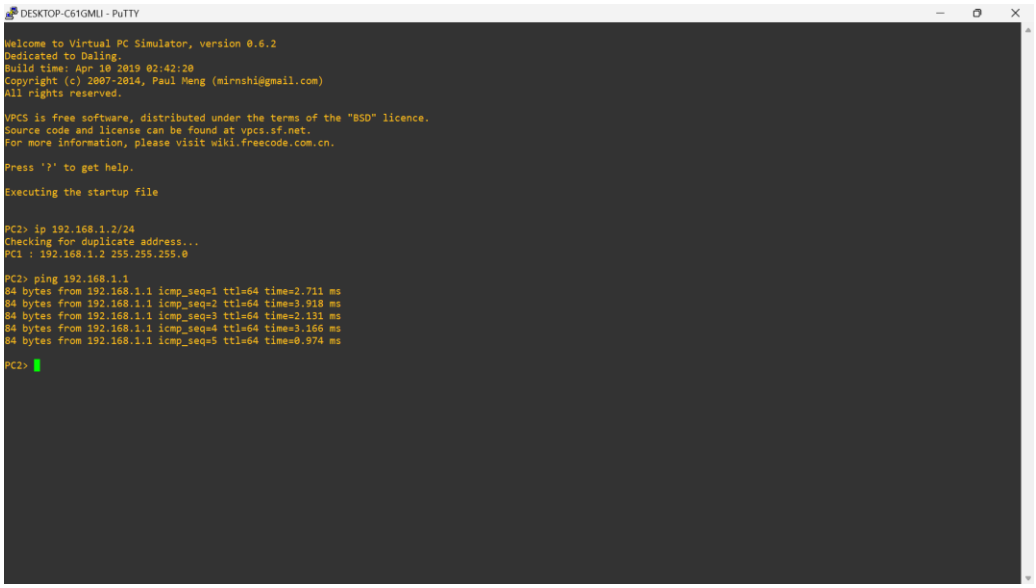
Topology



PC1 Console

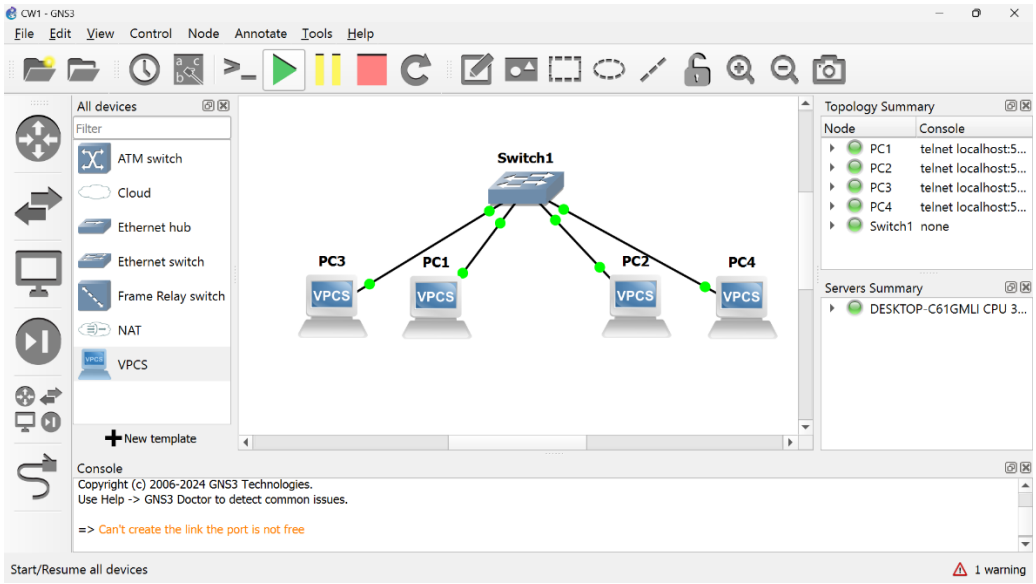


PC2 Console



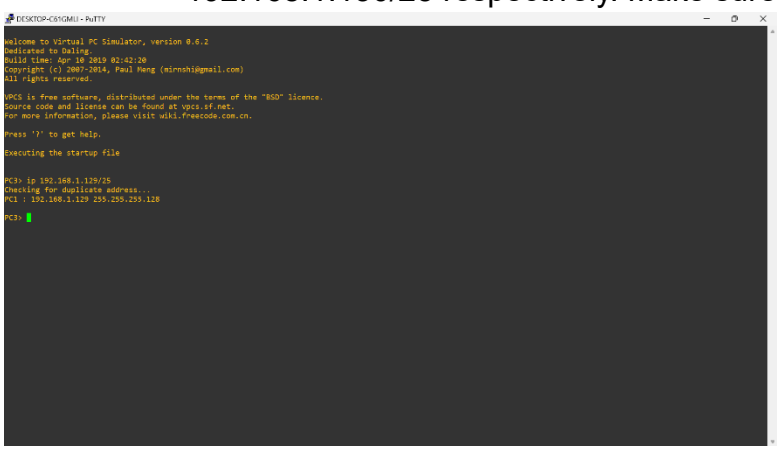
Part 2: Subnets:

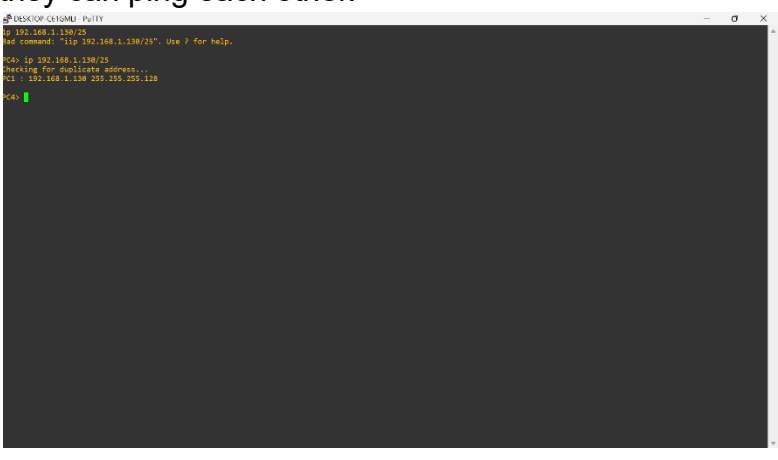
Topology



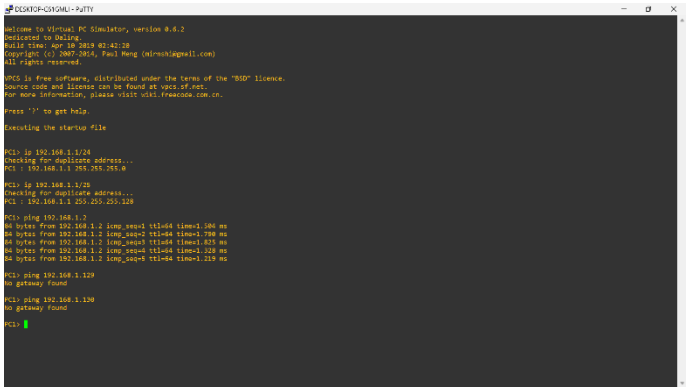
PC3 Console

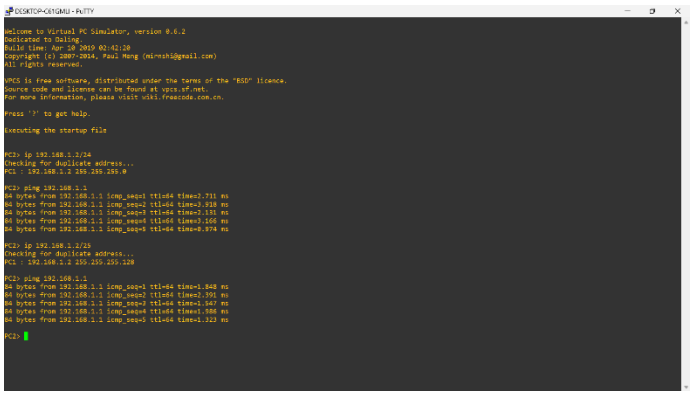
Add two VPCs, PC3 and PC4. Set their IP address to 192.168.1.129/25 and 192.168.1.130/25 respectively. Make sure they can ping each other.





Change the network mask of the first two PCs from /24 to /25. Can they ping each other?

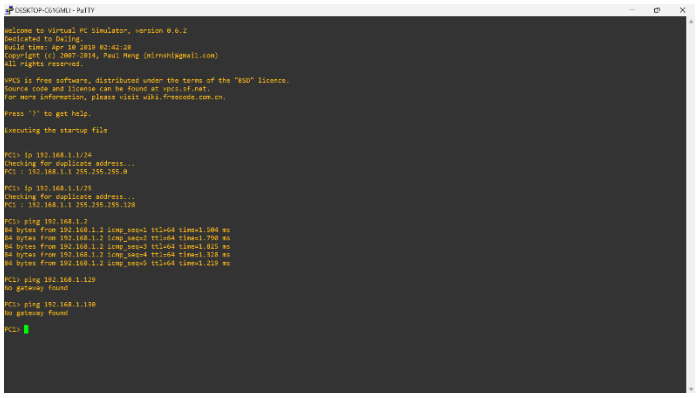




Ping from PC2 to PC1 is successful even after changing the mask to 25.

Ping from PC1 to PC2 is successful even after changing the mask to 25.

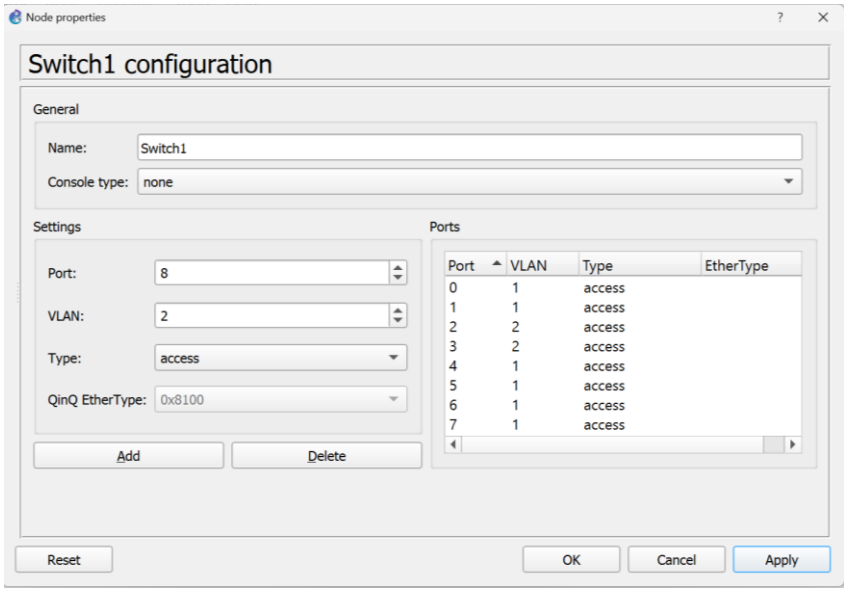
Can you ping PC3 or PC4 from PC1? Why?



Ping from PC1 to PC3 failed because there was no gateway found.

Ping from PC1 to PC4 failed because there was no gateway found.

Part 3: VLANs:

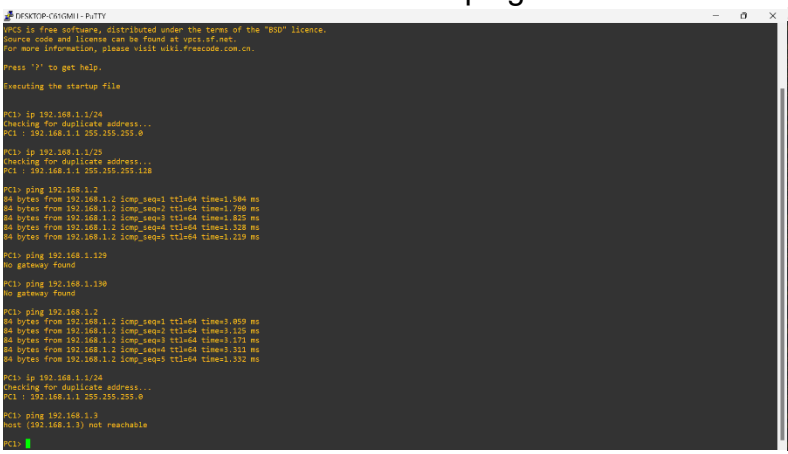


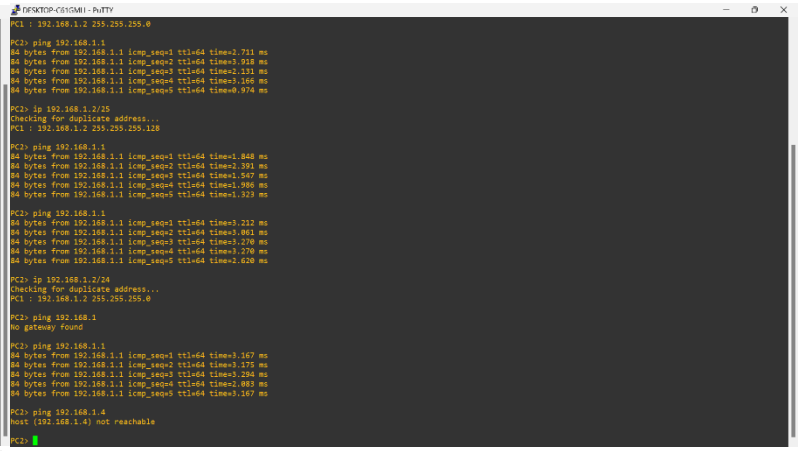
Pings between PC1 and PC2

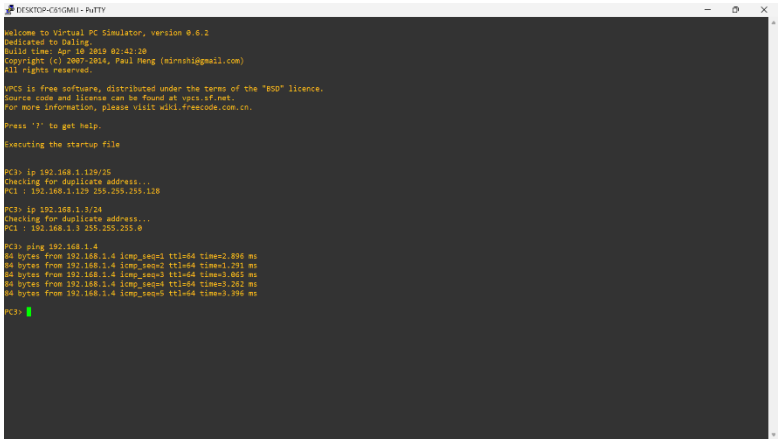
```
PC1> ping 192.168.1.2
84 bytes from 192.168.1.2 icmp_seq=1 ttl=64 time=3.059 ms
84 bytes from 192.168.1.2 icmp_seq=2 ttl=64 time=3.125 ms
84 bytes from 192.168.1.2 icmp_seq=3 ttl=64 time=3.171 ms
84 bytes from 192.168.1.2 icmp_seq=4 ttl=64 time=3.311 ms
84 bytes from 192.168.1.2 icmp_seq=5 ttl=64 time=1.332 ms
```

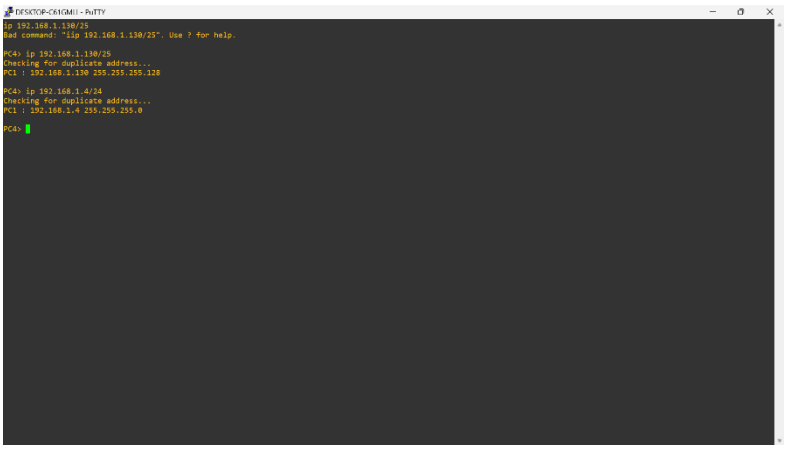
```
PC2> ping 192.168.1.1
84 bytes from 192.168.1.1 icmp_seq=1 ttl=64 time=3.212 ms
84 bytes from 192.168.1.1 icmp_seq=2 ttl=64 time=3.061 ms
84 bytes from 192.168.1.1 icmp_seq=3 ttl=64 time=3.270 ms
84 bytes from 192.168.1.1 icmp_seq=4 ttl=64 time=3.270 ms
84 bytes from 192.168.1.1 icmp_seq=5 ttl=64 time=2.620 ms
```

Same network and pings









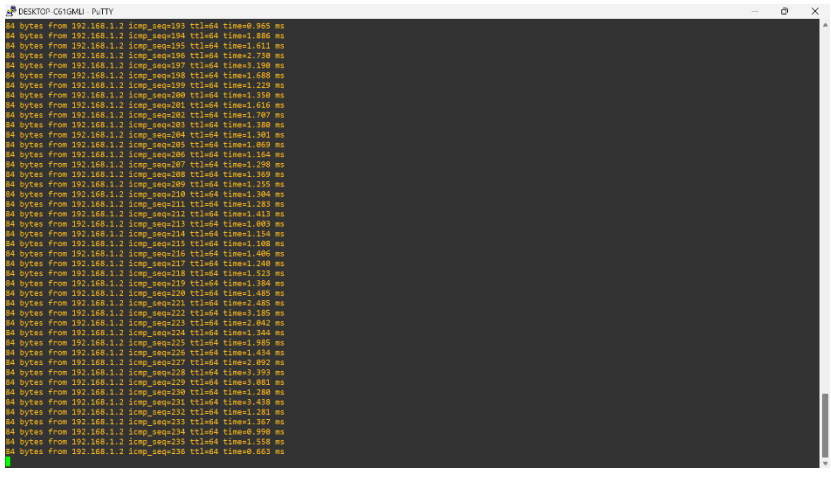
PC1 from PC2: Working PC3 from PC1: Host not reachable

PC4 from PC2: Host not reachable PC4 from PC3: Working

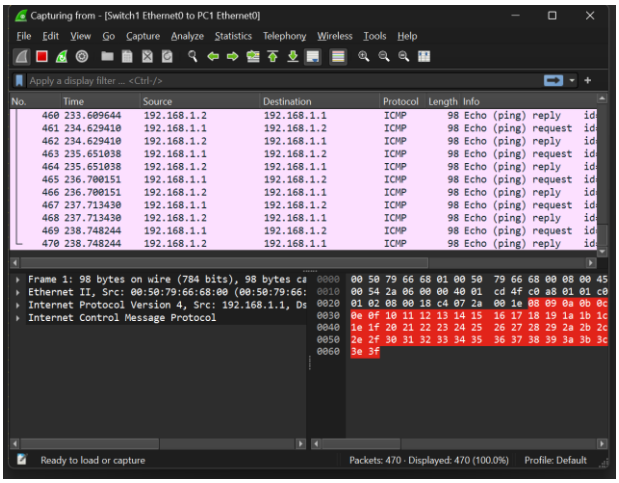
The switch delivers traffic to the port which belongs to the same VLAN.

Part 4: Wireshark:

Continuous ping

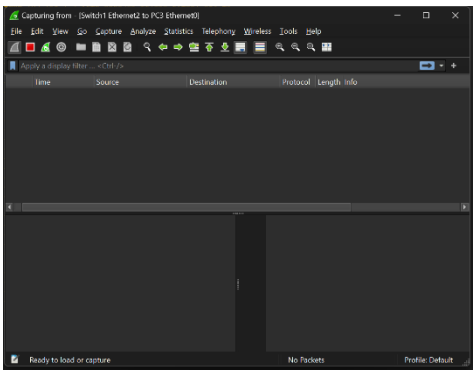


Sniffing on PC1's link using Wireshark. Which protocol is used for pings?

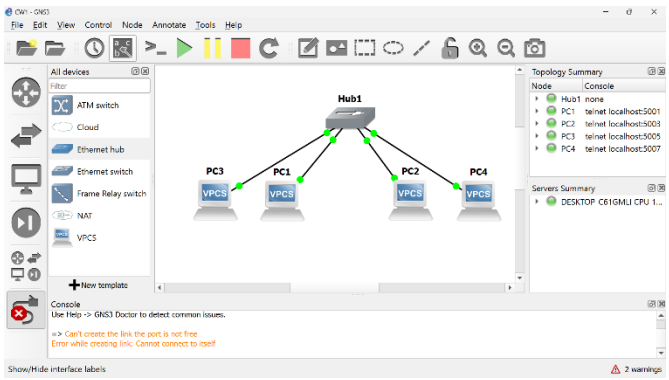


ICMP is the protocol used for pings.

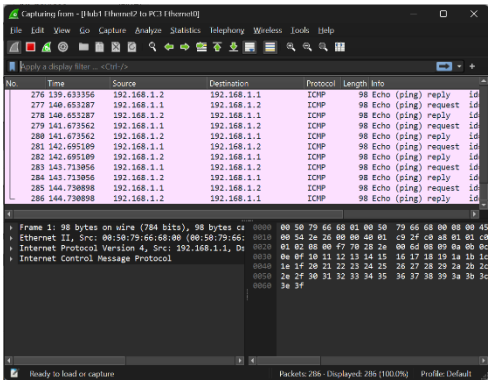
Start sniffing on PC3's link using Wireshark. Can you see the pings from there? Why?



You cannot see the pings from there because in an ethernet switch since it is not the same connection you are looking at and a switch only looks at its own connection.



Replacing the switch by a hub



The protocol being used is still ICMP, but the difference is that now using the hub, you can see the pings between PC1 and PC2 on the link of PC3 since it is a hub being used.