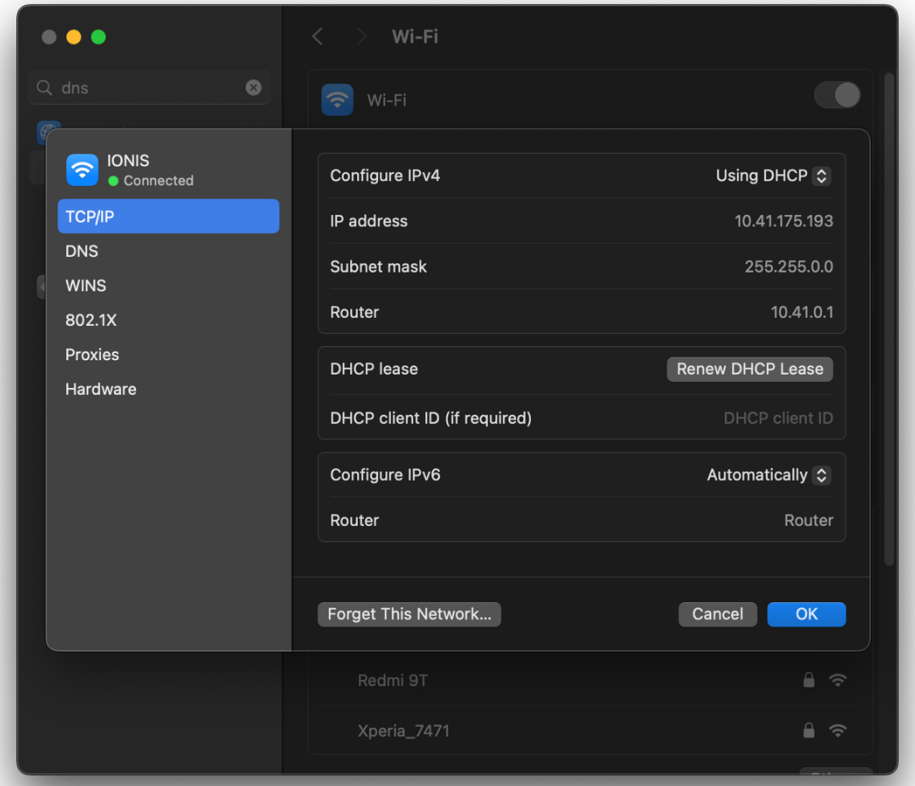
Exercise 1

1. Parameters of my TCP/IP connection configuration

IP Address: 10.41.175.193
Subnet Mask: 255.255.0.0
Router: 10.41.0.1
DNS Server: 8.8.8.8
Default Gateway: 10.41.0.1 (obtained from terminal using '`route -n get default`')



2. Multiple IP assignments

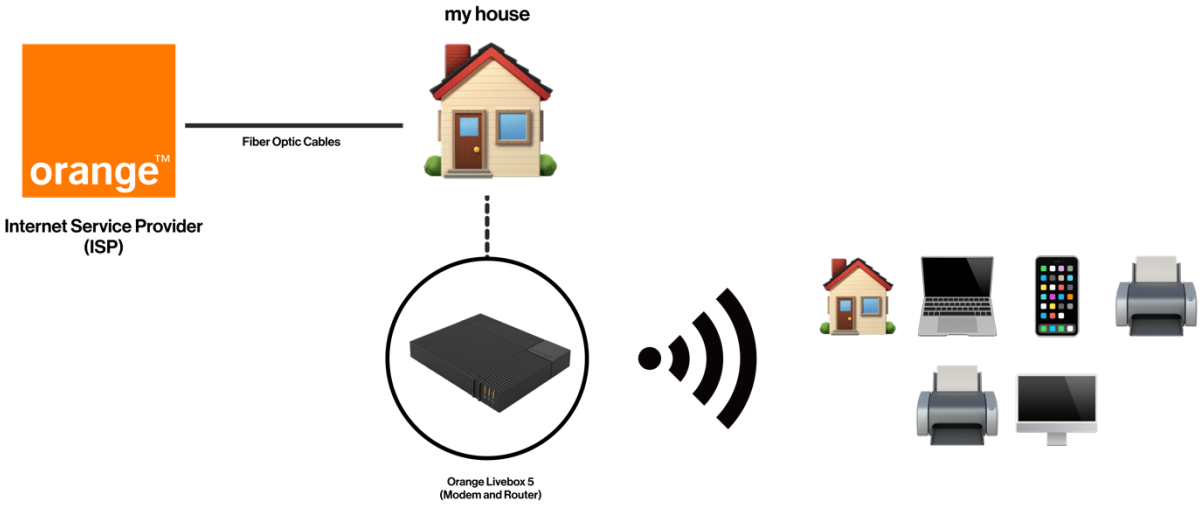
No, my computer does not have multiple IP assignments.

3. DNS Server

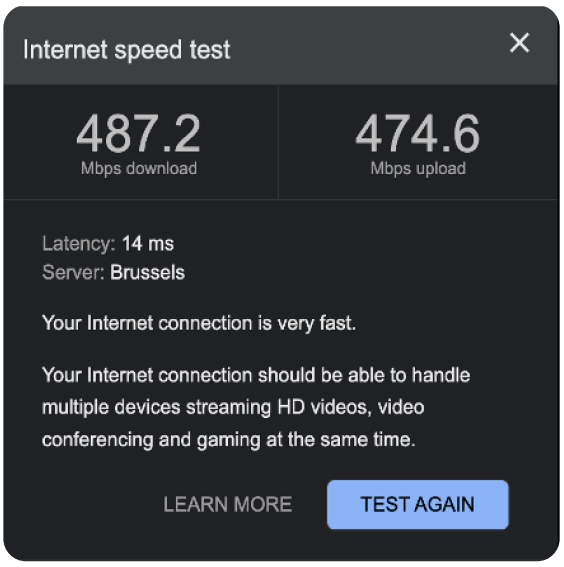
i) DNS Server: 8.8.8.8
ii) It is preferable to protect DNS traffic to ensure that the address mapped to an IP address is legitimate and safe to connect to

4. Connection setup and Visualization.

I am connected to A Digital Subscriber Line (DSL) setup.



No, I would not change to another connection setup as my current connection setup provides excellent connection speeds (as shown below) and offers the advantage of mobility (not possible with an Ethernet cable)

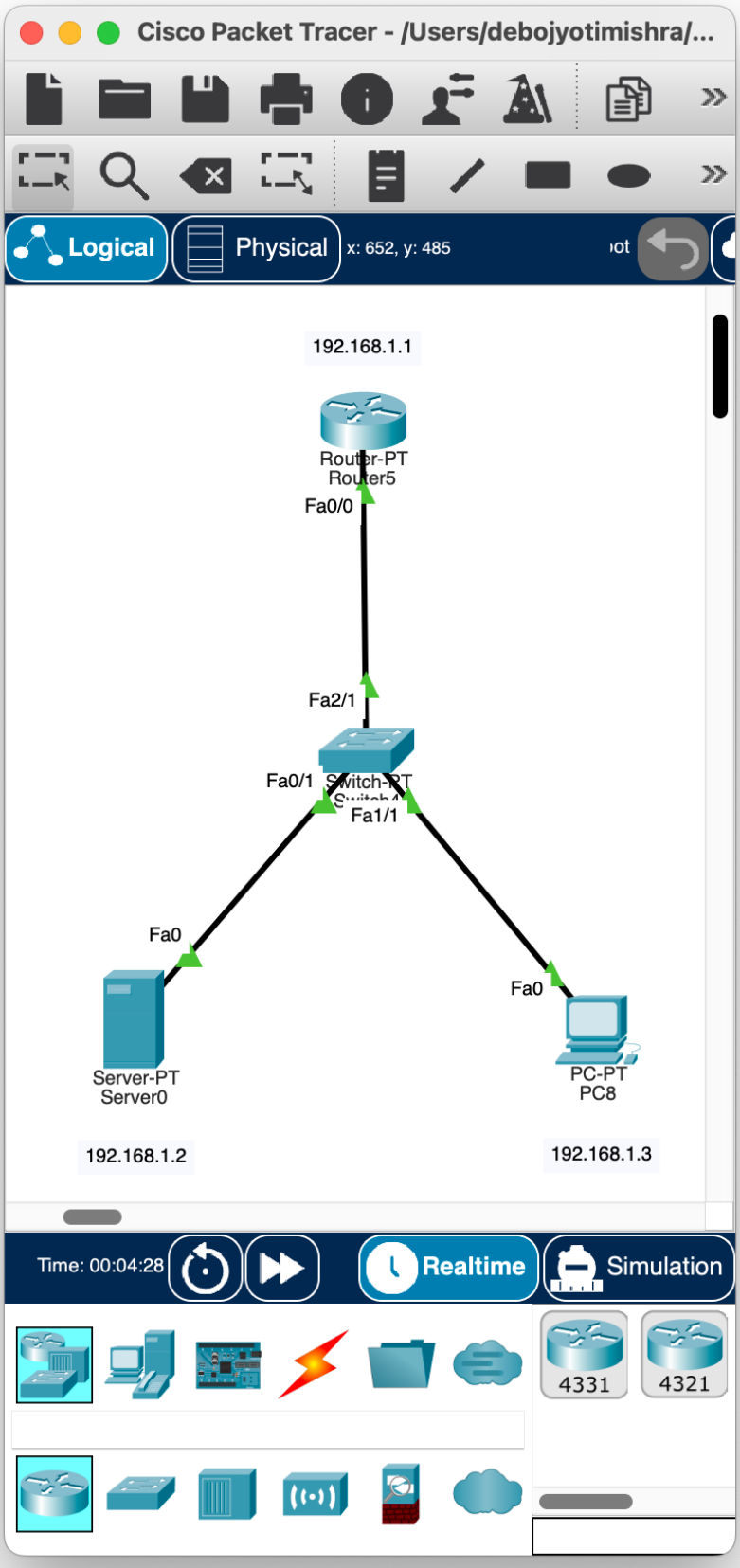


Exercise 2

1. I am using TCP/IP to connect to the internet
2. My connection most likely has a star topology
    Reasoning:
    I have a central router (the Orange Livebox 5) located in my living room and all devices (Phones, Laptops, TVs connect to it via Wi-Fi) so I most likely have a star topology
3. The logical network architecture of my internet connection is a ‘client-server’ architecture

Exercise 3

The setup:



Action logs:

- [2024-05-10 15:23:47] Connected to FTP server (IP: 192.168.1.2) using username: cisco.
- [2024-05-10 15:27:05] Downloading file: hello.txt from the FTP server using **'get hello.txt'.**
- [2024-05-10 15:27:09] File transfer complete. hello.txt successfully downloaded to local directory.

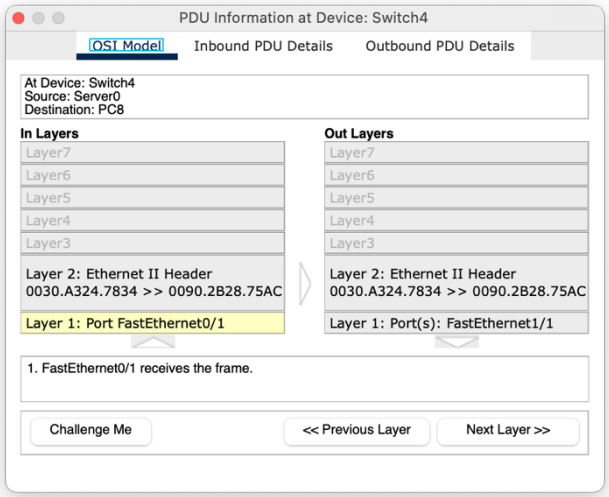
Mapping each connection with the respective TCP/IP layer

Simulation

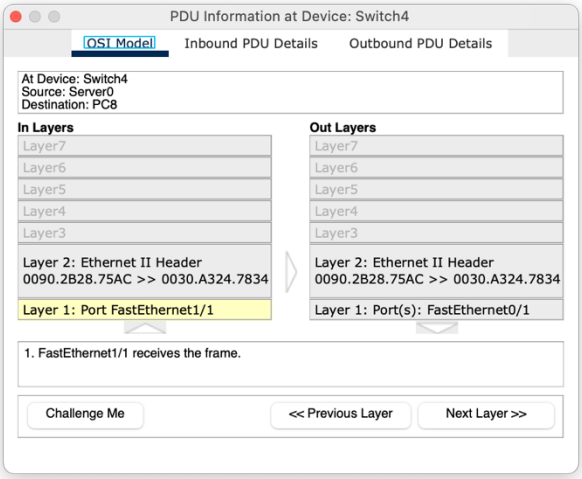
Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	Server0	ICMP
	0.001	Server0	Switch4	ICMP
	0.002	Switch4	PC8	ICMP
	0.003	PC8	Switch4	ICMP
	0.004	Switch4	Server0	ICMP

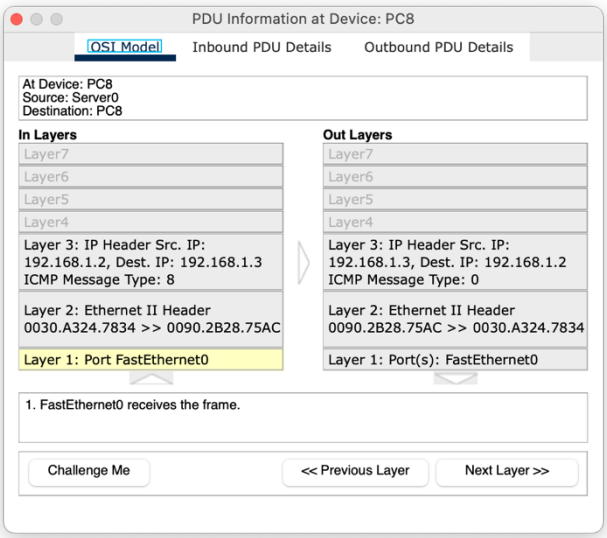
1. Server0 to Switch4



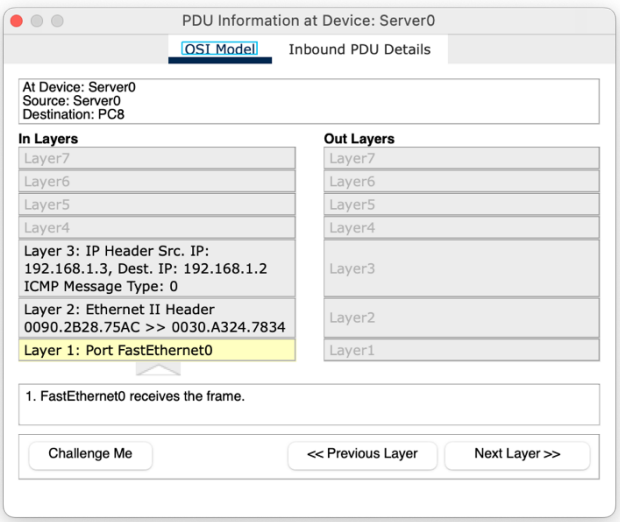
3. PC8 to Switch4



2. Switch4 to PC8



4. Switch4 to Server0



Exercise 4

Judging by the colors present in the sample given to us, it was a T568A pinout.

1. **Color Code:**
    2. Brown
        a. Brown (solid)
        b. Brown and white
    3. Green
        a. Green (solid)
        b. Green and white
    4. Blue
        a. Blue (solid)
        b. Blue and white
    5. Yellow
        a. Yellow (solid)
        b. Yellow and white

    Reasons for these specific colors:
        1. **Clear Visibility:** Brown, Green, Blue, and Yellow are easily distinguishible and perhaps that was one of the reasons for them being used in the T568A pinout.

2. **Their purposes:**

```
# Source: htt s://www.genuinemodules.com/what-are-the-colors-of-ethernet_a2504
```

- **Orange/White:** Transmits positive data signals in 1000BASE-T and 100BASE-TX Ethernet connections.
- **Orange:** Transmits negative data signals in 1000BASE-T and 100BASE-TX Ethernet connections.
- **Green/White:** Receives positive data signals in 1000BASE-T and 100BASE-TX Ethernet connections.
- **Blue:** Transmits positive data signals in 10BASE-T Ethernet connections.
- **Blue/White:** Transmits negative data signals in 10BASE-T Ethernet connections.
- **Green:** Receives data signals in 1000BASE-T and 100BASE-TX Ethernet connections.
- **Brown/White:** Receives power in Power over Ethernet (PoE) connections.
- **Brown:** Receives power in Power over Ethernet (PoE) connections.

3. **The effect of Crosstalk and Electromagnetic Interference:**
    a. **Crosstalk:** Electromagnetic fields of adjacent pairs of wires interfere with each other, leading to signal distortion or noise.
        i. **Mitigation:** Since the wires are made of a twisted pair of cables, the two wires are nearly equally affected by external electromagnetic fields, and thus cancelling out the effect of the crosstalk.

    b. **Electromagnetic Interference (EMI):** External sources of electromagnetic radiation (such as microwaves, motors, phones, etc.) can interfere with the signals of cables.
        i. **Mitigation:** Twisted pair cables fight interference by sending signals in pairs: one wire carries a signal, while the other carries its opposite. So, if there is any external signal that tries to induce a voltage on the wires, it induces the same voltage on them, and hence the voltage difference remains the same.