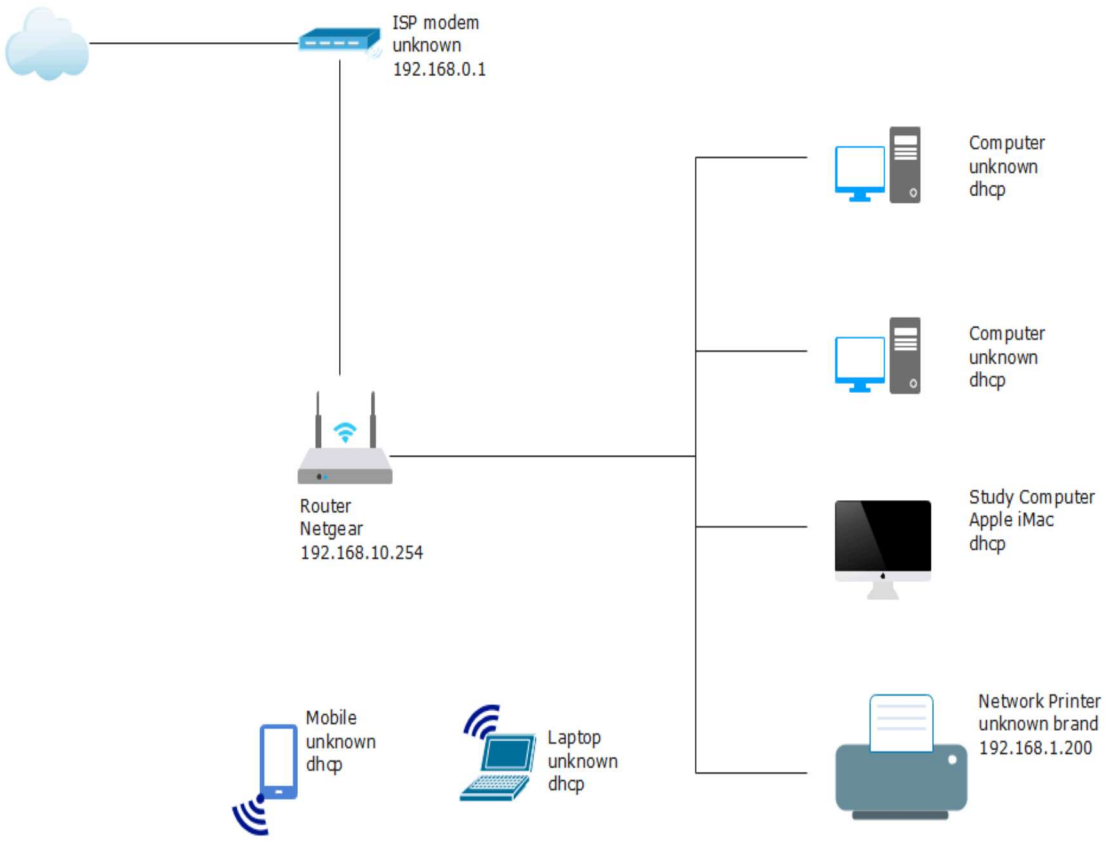
1. **Draw your Home Network Topology and explain how you are accessing the RPS Lab environment.**



1. Internet Service Provider (ISP):

- This is where your internet connection comes from. It's usually a cable or DSL connection.

2. Modem:

- This is the device provided by your ISP. It connects to the internet and converts the signal for use by your network.

3. Router:

- This device connects to your modem and distributes the internet connection to your devices. It also acts as a firewall, protecting your network from unauthorized access.

4. Switch:

- If you have multiple wired devices (like computers, game consoles, etc.), they are often connected to a switch. It allows multiple devices to connect to the network with cables.

5. Wireless Access Point (WAP):-

- If you have wireless devices (like laptops, smartphones, tablets), they connect to your network via a wireless access point, which is often integrated into the router.

6. Devices:

- Your devices connect to the network via wired Ethernet connections or wirelessly through Wi-Fi. These can be computers, smartphones, smart TVs, gaming consoles, smart home devices, etc.

7. Network Attached Storage (NAS):

- If you have a NAS, it's connected to the network to store files and media that can be accessed by other devices on the network.

8. Printer:

- If you have a network printer, it connects directly to the network, allowing all devices on the network to print to it.

2. Identify a real-world application for both parallel computing and networked systems. Explain how these technologies are used and why they are important in that context.

Parallel computing is an architecture in computing where a problem is split into smaller tasks and processed simultaneously. It can handle multiple tasks at once, making it much faster than a regular computer that processes tasks one after another. Parallel computing is especially useful for solving big, complex problems quickly.

For instance, it's used in weather forecasting.

Parallel computing is crucial for weather forecasting, which involves running complex numerical models to simulate atmospheric conditions. These models demand significant computational power to process large amounts of data rapidly. Parallel computing enables weather forecasters to break down these intricate simulations into smaller tasks and distribute them across multiple processors or computing nodes. This speeds up the computation process because each processor works on its task simultaneously. Once all tasks are finished, their results are combined to generate the final forecast.

Network Systems: Weather forecasting relies heavily on data from various sources like weather stations, satellites, and ocean buoys, which are located across different regions. Networked systems allow the smooth transmission of this data to central forecasting centers. With networks, meteorologists can access real-time observations and incorporate them into their models to enhance prediction accuracy. Additionally, networked systems promote collaboration among meteorological agencies worldwide, enabling them to share data, models, and expertise. This collaboration improves the quality and scope of weather forecasts, benefiting local communities and supporting global efforts to understand and mitigate the impacts of extreme weather events.

In brief, parallel computing and networked systems are essential in weather forecasting for their capacity to efficiently process large-scale simulations and integrate real-time data from various sources. These technologies empower meteorologists to deliver timely and precise forecasts, assisting communities in preparing for and responding to weather-related challenges effectively.