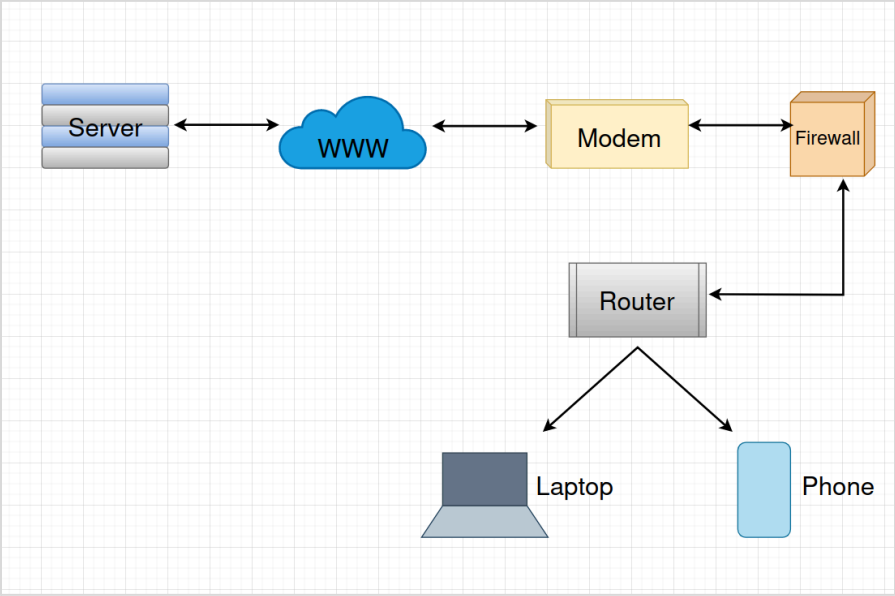
Assignment 1: Draw your Home Network Topology and explain how you are accessing the RPS Lab environment.

Home Network Topology:



When we try to access a website from a device on our home network, such as a laptop or smartphone, the process typically involves the following steps:

1. Device sends a request: We open a web browser (e.g., Chrome) on our device and type in the URL (Uniform Resource Locator) or click on a link to the website we want to visit.

2. DNS resolution: Our device sends a Domain Name System (DNS) query to a DNS server to translate the human-readable domain name (e.g., www.rpsconsulting.in) into an IP address that the network can understand.

3. Routing: Once our device has the IP address of the website's server, it sends a request to the router. The router determines the best path for the request to reach the destination server, which may involve routing the request through your ISP's network and the wider internet.

4. Request reaches the server: The request travels through various network devices, including routers and switches, until it reaches the server hosting the website.

5. Server processes the request: The web server hosting the website receives the request, retrieves the requested web page or content, and sends it back to your device through the same path.

6. Content is displayed: Our web browser receives the response from the server and renders the web page, allowing you to view and interact with the content of the website.

Throughout this process, data packets containing information about the request and response are transmitted between our device and the website's server over the internet, using various network protocols such as TCP/IP (Transmission Control Protocol/Internet Protocol).

Assignment 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.

A real-world application that combines parallel computing and networked systems is weather forecasting.

Parallel Computing: Weather forecasting involves processing vast amounts of data, including historical weather patterns, current atmospheric conditions, and various meteorological models. Parallel computing allows weather forecast models to be run concurrently across multiple processors or computer nodes. Each processor or node handles a portion of the data and computations simultaneously, speeding up the overall process.

Networked Systems: Weather forecasting also relies on networked systems to gather real-time data from various sources, such as weather stations, satellites, radar systems, and ocean buoys. These data sources continuously collect information on temperature, humidity, wind speed, atmospheric pressure, and other relevant variables, which is transmitted over networks to central data centers for processing.

By combining parallel computing and networked systems, weather forecasting agencies can harness the power of distributed computing resources to process large volumes of data efficiently and produce high-resolution weather forecasts with greater accuracy and speed. This integration enables meteorologists to leverage the latest advancements in computational technology and data communication to improve the reliability and effectiveness of weather prediction, ultimately enhancing public safety and resilience in the face of changing weather conditions.