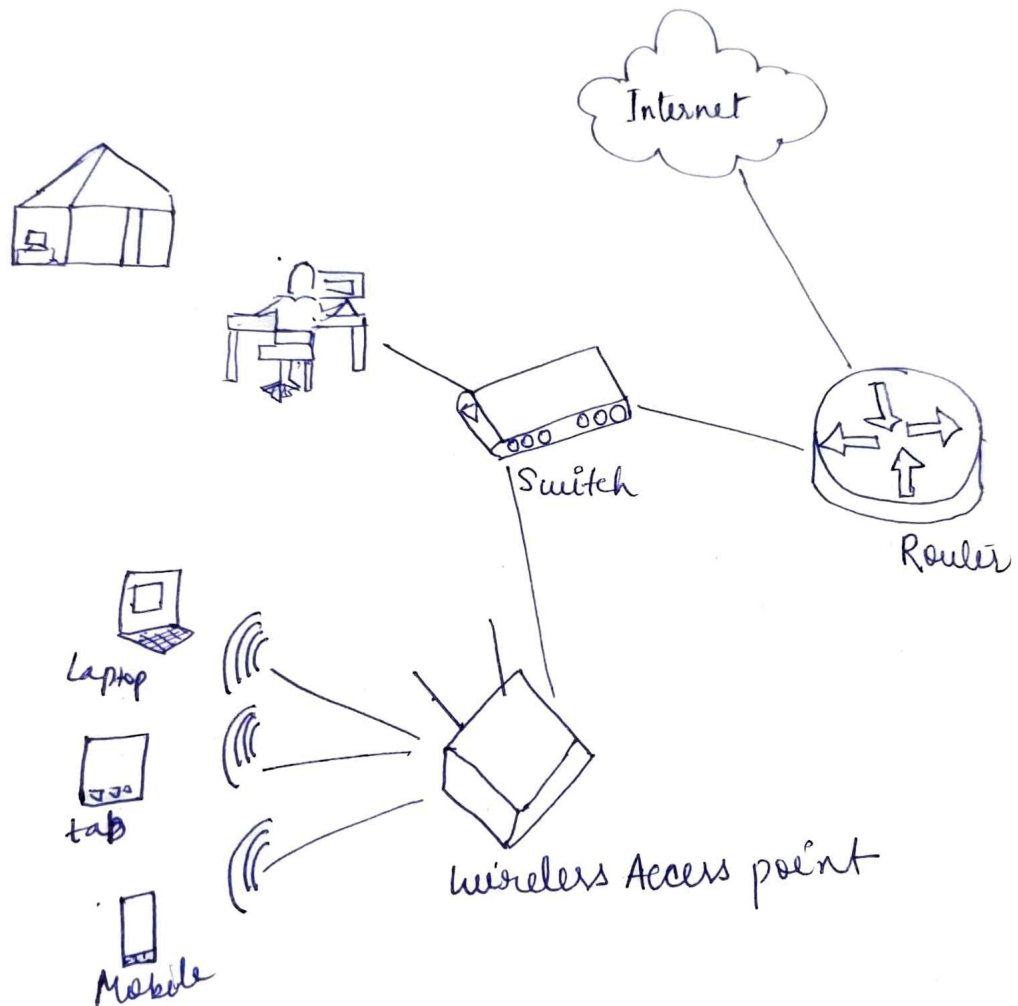


1. Draw your Home Network Topology and explain how you are accessing the RPS Lab environment.

Answer:



#### Explanation of how we can access the RPS Lab environment -

**1. Internet Connection:** Our home network connects to the internet through your ISP (Internet Service Provider). This connection allows us to communicate with remote servers or cloud platforms where the RPS lab environment is hosted.

**2.Lab Provider's Network:** The RPS lab provider hosts the lab environment on their servers or cloud infrastructure, which are connected to the internet via their own network. This network infrastructure may include routers, switches, firewalls, and other networking equipment.

**3. Authentication and Authorization:** Before accessing the RPS lab environment, we will need to authenticate ourselves using our credentials, such as a username and password, provided by the lab provider. Once authenticated, the lab provider's system verifies our identity and authorizes access to the lab resources based on our permission and privileges.

By following this network topology, we can securely access RPS labs from our home network.

**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.**

**Answer : Real-World Application: Weather Forecasting**

Scenario: A weather forecasting agency needs to process a massive amount of data from various sources (satellites, radars, ground stations) to create accurate and timely weather forecasts.

**How this technologies are used:**

**Parallel Computing:**

1. **Data Processing:** The large datasets from different sources can be divided into smaller chunks and processed simultaneously on multiple processors within a single computer or across a cluster of computers. This significantly reduces the overall processing time compared to using a single processor.
2. **Model Simulations:** Complex weather models involve numerous calculations. Parallel computing allows for breaking down these models into smaller, independent tasks that can be run concurrently on multiple processors. This accelerates the simulation process, leading to faster forecasts.

**Networked Systems:**

1. **Data Collection:** A global network of weather stations and satellites continuously collects real-time data on temperature, pressure, humidity, wind speed, etc. Networked systems enable the efficient transmission of this data from various locations to a central processing facility.
2. **Model Distribution:** Once the weather models are generated or updated, they can be distributed to different regional forecasting centres and user applications through networked systems. This ensures everyone has access to the latest predictions.

3. Collaboration: Networked systems allow meteorologists from different regions to share data, collaborate on model development, and exchange expertise, ultimately leading to better forecasts.

#### **Importance of Parallel Computing and Networked Systems:**

- **Faster and More Accurate Forecasts:** Parallel computing speeds up data processing and model simulations, enabling weather agencies to generate forecasts more quickly and with increased accuracy.
- **Improved Decision-Making:** Timely and accurate forecasts are crucial for various sectors like agriculture, aviation, disaster management, and personal planning. Networked systems ensure the dissemination of this information to relevant stakeholders for informed decision-making.
- **Cost-Effectiveness:** Parallel computing optimizes resource utilization by distributing tasks across multiple processors. Networked systems allow sharing resources and data, reducing redundancy and cost.