Assignment-1

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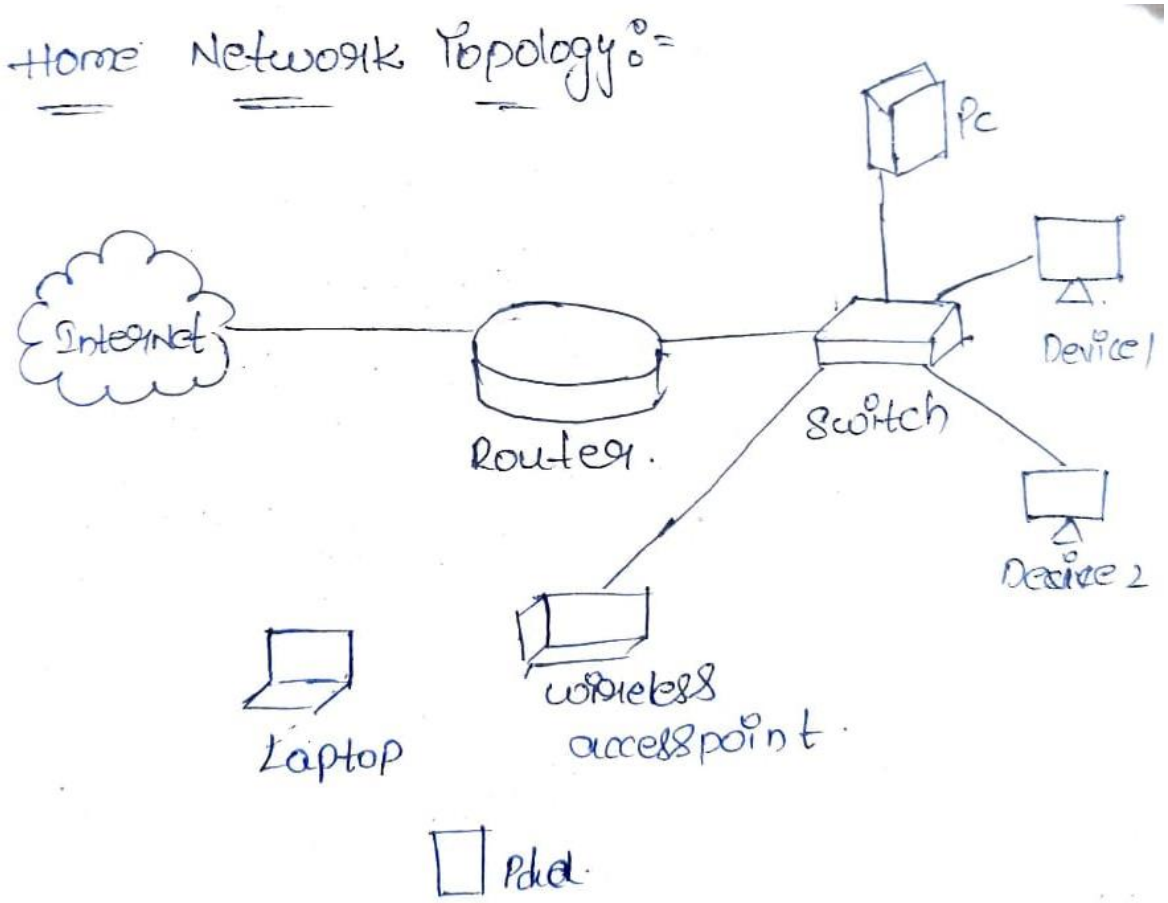
1. **Draw your Home Network Topology and explain how you are accessing the RPS Lab environment.**



To access the RPS Lab environment, there is a dedicated virtual machine (VM) that serves as a gateway to access the RPS (Remote Processing Service) Lab environment. This VM is configured with appropriate security measures to ensure secure access to the lab environment.

I connect to this VM using secure protocols such as SSH (Secure Shell) or VPN (Virtual Private Network). This allows me to interact with the resources and services hosted in the RPS Lab environment from the comfort of my home network, ensuring a seamless and secure workflow.

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 example of both parallel computing and networked systems working together is weather forecasting.

How it works:

Data Collection: A vast network of weather stations, satellites, and buoys across the globe continuously collect real-time data on atmospheric conditions like temperature, pressure, humidity, and wind speed. This data is fed into a central system.

Parallel Processing: The massive amount of collected data is too much for a single computer to handle efficiently. Here's where parallel computing comes in. The data is distributed across a network of powerful computers working together. Each computer performs calculations on a specific portion of the data simultaneously. This significantly reduces the time it takes to process the data.

Modeling and Simulation: Using complex weather models, the computers simulate various atmospheric scenarios based on the processed data. These models take into account factors like physics, chemistry, and fluid dynamics.

Networked Communication: The distributed computers constantly communicate with each other, exchanging results and intermediate calculations. This ensures all the simulations are running consistently and consider the complete global picture.

Forecasting and Dissemination: The final simulations produce a forecast for future weather conditions. This information is then disseminated through various networked channels like weather websites, mobile apps, and TV broadcasts.

Importance:

Faster and More Accurate Forecasts: Parallel computing allows for processing massive amounts of data quickly, leading to faster and more accurate weather forecasts. This is crucial for making informed decisions, like preparing for severe weather events or planning agricultural activities.

Improved Global Coverage: Networked systems allow for data collection from a vast global network, leading to more comprehensive weather models that consider large-scale weather patterns.

Scalability and Adaptability: The combined power of parallel computing and networked systems allows for continuous improvement of weather models by incorporating new data sources and more complex simulations.

In conclusion, parallel computing tackles the immense data processing requirements, while networked systems enable global data collection and communication, making weather forecasting faster, more accurate, and adaptable to a changing environment.