Assignment 1

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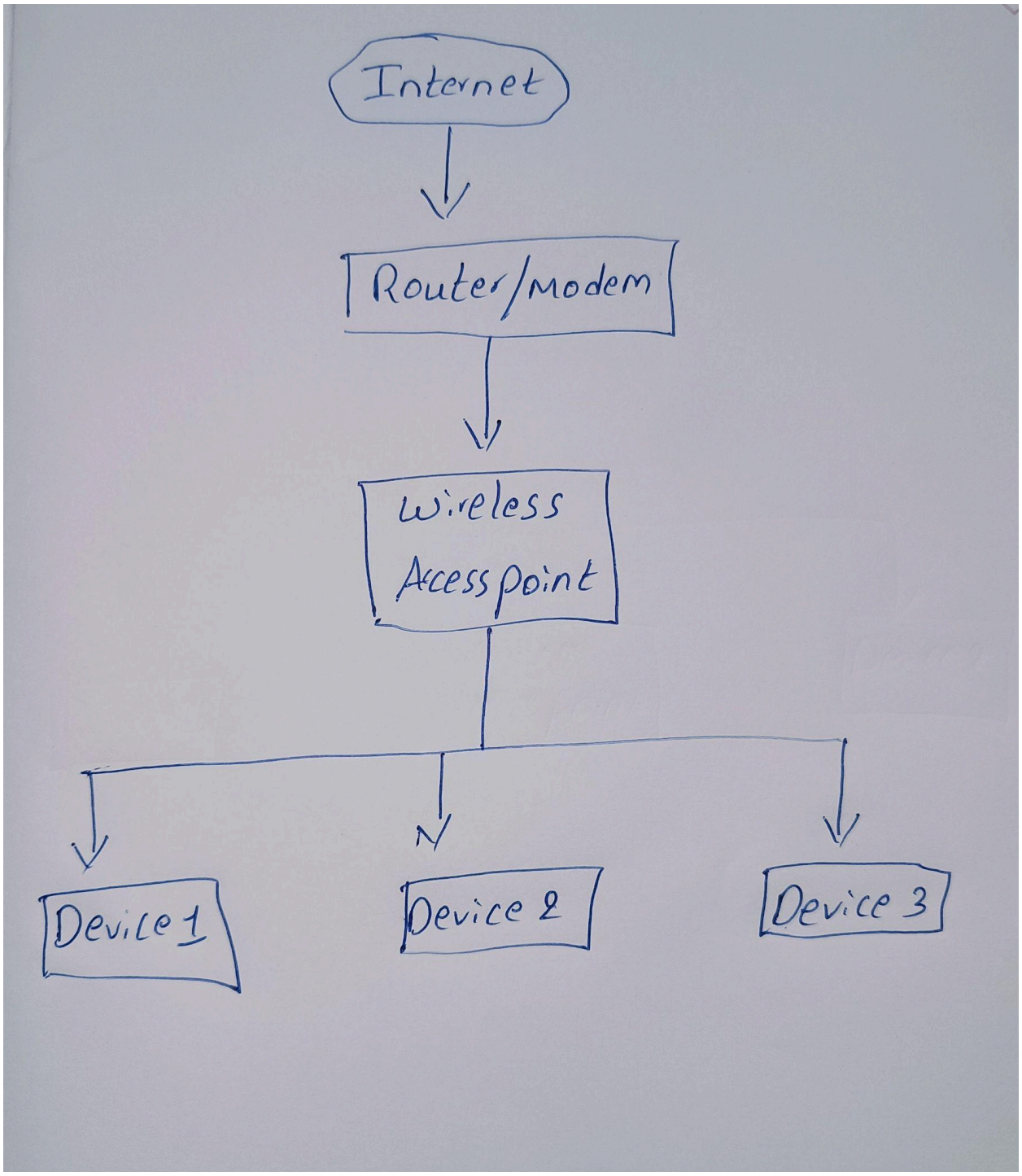
1. Draw your Home Network Topology and explain how you are accessing the RPS Lab environment.



To access the RPS Lab environment, I typically connect through a secure VPN (Virtual Private Network) connection. This VPN connection establishes a secure and encrypted tunnel between my device and the RPS Lab network, allowing me to access resources, servers, and services within the lab environment as if I were physically there. This setup ensures that the data exchanged between my device and the lab environment remains private and secure, even when traversing over the internet.

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.

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Real-World Application for Parallel Computing: Weather Forecasting

How Parallel Computing is Used:

Weather forecasting involves complex mathematical models that simulate atmospheric conditions. Parallel computing allows meteorologists to divide these models into smaller tasks that can be processed simultaneously across multiple processors or computing nodes. Each processor or node handles a portion of the computational workload independently, significantly reducing the time required for weather predictions.

Why it's Important:

1. Speed and Efficiency: Parallel computing enables weather forecasting models to run much faster, providing timely and accurate predictions crucial for disaster preparedness, agriculture, aviation, and other industries reliant on weather information.

2. Scale and Resolution: By distributing computations across multiple processors, parallel computing allows for higher-resolution weather models, capturing finer details of atmospheric phenomena and improving forecast accuracy.

3. Scalability: As computational demands increase with the need for more detailed and longer-term forecasts, parallel computing offers scalability by allowing additional processors or computing nodes to be added to the system.

Real-World Application for Networked Systems: Online Banking

How Networked Systems are Used:

Online banking relies on networked systems to enable customers to access their bank accounts, conduct transactions, and manage finances remotely through web and mobile applications. These networked systems connect users to banking servers, databases, payment gateways, and other financial services securely over the internet.

Why it's Important:

1. Accessibility and Convenience: Networked systems provide customers with convenient access to banking services anytime, anywhere, using a variety of devices with internet connectivity.

2. Security and Privacy: Robust network security measures, such as encryption, firewalls, and authentication protocols, ensure the confidentiality, integrity, and authenticity of online banking transactions, safeguarding sensitive financial information from unauthorized access or data breaches.

3. Transaction Processing: Networked systems facilitate real-time transaction processing, allowing customers to transfer funds, pay bills, deposit checks, and perform other banking activities quickly and efficiently.

4.Scalability and Reliability: With the increasing popularity of online banking, networked systems need to be scalable and reliable to handle growing volumes of user traffic and ensure uninterrupted service availability.

In both cases, parallel computing and networked systems play essential roles in enabling efficient, scalable, and reliable operations, whether it's performing complex simulations for weather forecasting or delivering secure online banking services to customers worldwide.