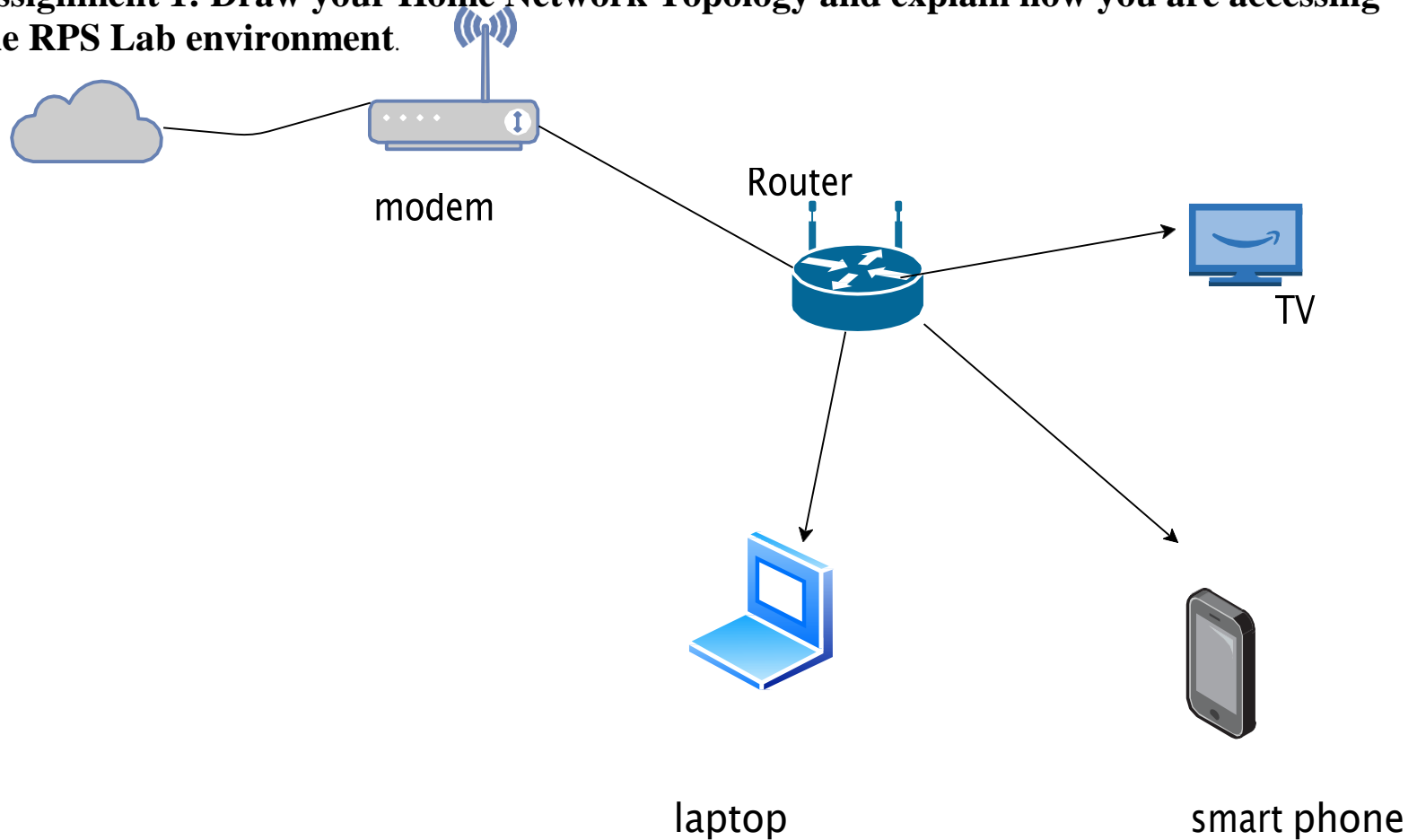**Assignment 1: Draw your Home Network Topology and explain how you are accessing the RPS Lab environment**.

modem

Router

TV

laptop

smart phone

Home Network Topology:
- Router (R): The central device that connects all devices to the internet.
- Modem (M): Connects the router to the internet service provider (ISP).
- Switch (S): Connects multiple devices to the router.
- Devices (D): Computers, laptops, smartphones, smart TVs, and other devices connected to the network.

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.

Real-world Application for Parallel Computing: Weather Forecasting

Weather forecasting requires massive computational power to process vast amounts of data collected from various sources such as satellites, weather stations, and radar systems. Parallel computing plays a crucial role in this domain by distributing the computational workload across multiple processors or nodes, allowing for faster and more accurate weather predictions.

Parallel computing enables weather forecasting models to run complex simulations in parallel, breaking down the problem into smaller tasks that can be processed simultaneously. This approach significantly reduces the time required to generate forecasts, as the workload is distributed across multiple computing resources.

Moreover, parallel computing facilitates ensemble forecasting, where multiple simulations with slightly different initial conditions are run simultaneously to account for uncertainties in the weather prediction. By running these simulations in parallel, meteorologists can generate probabilistic forecasts, providing valuable information about the likelihood of different weather scenarios.

Real-world Application for Networked Systems: Online Banking

Online banking relies on networked systems to provide customers with secure access to their financial accounts and perform transactions remotely. Networked systems enable customers to access their accounts via web browsers or mobile applications, interacting with banking servers and databases over the internet.

In the context of online banking, networked systems ensure seamless communication

between various components, including client devices, web servers, application servers, and databases. Customers can securely authenticate themselves, view account balances, transfer funds, pay bills, and perform other banking transactions through a user-friendly interface.

Networked systems also play a crucial role in ensuring the security of online banking applications. Secure communication protocols such as HTTPS encrypt data transmitted between the client and server, protecting sensitive information from interception by malicious parties. Additionally, network security measures such as firewalls, intrusion detection systems, and encryption help safeguard online banking systems from cyber threats.

Overall, networked systems enable banks to offer convenient and secure online banking services to their customers, allowing them to manage their finances from anywhere with an internet connection while ensuring the integrity and confidentiality of their data.