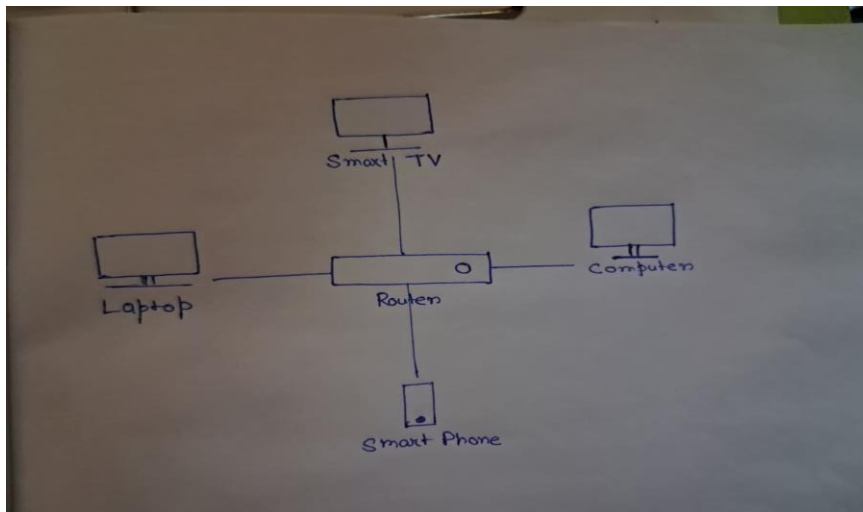


Assignment 1: Draw your Home Network Topology and explain how you are accessing the RPS Lab environment.

Answer: The star topology is very popular with home networks. In a star network, all devices connect to a central hub, typically a router.

Star networks using Router look like—what else—a star, with a center and several spokes reaching out from the center to the different PCs on the network. As shown in below diagram, the network hub is the center of the star, with the different PCs connected through the hub.



Accessing the RPS Lab Environment:

To access the RPS lab environment from this home network, we should typically follow these steps:

Connect to the Internet: I ensure that my home network is connected to the internet, either through a wired or wireless connection.

Remote Desktop Connection: Once connected to the internet we would likely use a remote desktop client or similar software to connect to a computer or server within the RPS lab environment. This would allow us to interact with the lab's systems as if you were physically present, enabling tasks such as running experiments, accessing data, or controlling equipment remotely.

Authentication and Authorization: Depending on the lab's security protocols, we may need to authenticate ourselves using credentials (e.g., username/password) and be authorized to access specific resources within the lab environment.

By following these steps, we can access and utilize the resources available in the RPS lab environment from the comfort of my home 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.

Answer: Imagine a large e-commerce company that needs to process millions of transactions per day. To handle this massive amount of data efficiently, they employ parallel computing and networked systems.

Parallel Computing:

In parallel computing, tasks are divided among multiple processors or computing units, allowing them to work simultaneously on different parts of the problem. For our example, let's say the e-commerce company uses parallel computing to process incoming orders.

Instead of processing each order sequentially on a single server, they divide the workload among multiple servers or CPU cores. Each server or core processes a subset of orders independently and simultaneously. This significantly reduces the time required to process all orders compared to sequential processing.

Importance of Parallel Computing:

Speed: Parallel computing allows tasks to be completed faster by leveraging multiple computing resources simultaneously.

Scalability: As the workload increases, more computing resources can be added to handle the load without sacrificing performance.

Efficiency: By distributing tasks efficiently, parallel computing optimizes resource usage, leading to cost savings and improved performance.

Networked Systems:

Networked systems involve multiple computers or devices connected through a network, enabling communication and data exchange between them. In our example, the e-commerce company utilizes networked systems for various purposes such as managing inventory, processing payments, and communicating with customers.

For instance, when a customer places an order on the company's website, the order information needs to be transmitted to different systems for processing. This includes updating inventory databases, processing payment transactions, and sending order confirmation emails.

Importance of Networked Systems:

Data Sharing: Networked systems facilitate seamless sharing of data and resources among different components of a system.

Communication: They enable real-time communication between different parts of a system, allowing for efficient coordination and collaboration.

Scalability: Networked systems can scale horizontally by adding more nodes or devices to the network, allowing the system to handle increased loads and traffic.

Combining parallel computing with networked systems allows the e-commerce company to efficiently process a large volume of transactions, manage inventory in real-time, and provide a seamless shopping experience for customers.