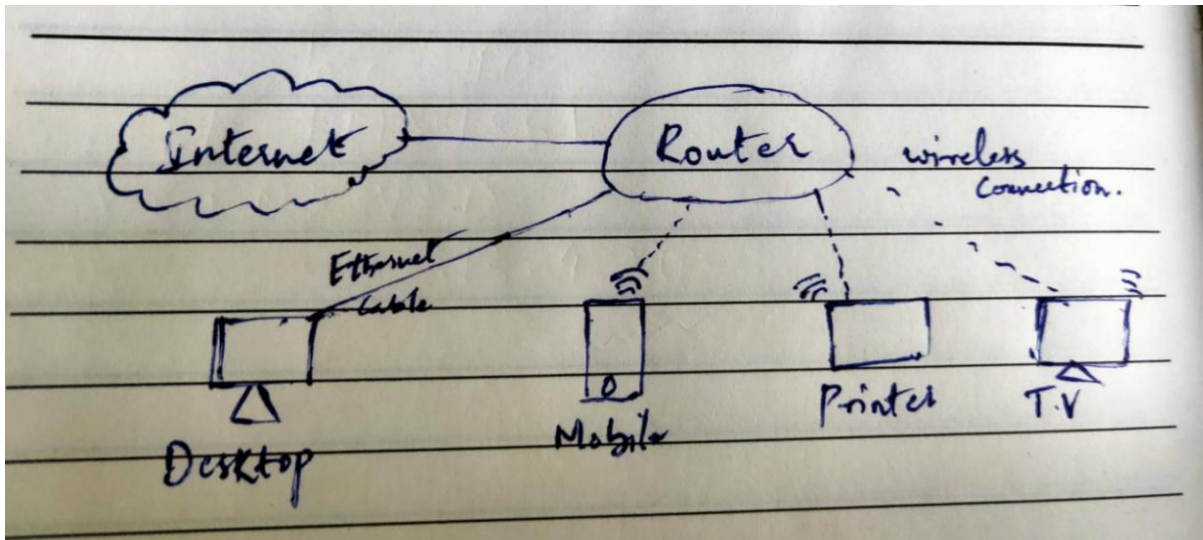


Computer Architecture - Assignment1

Assignment 1: Draw your Home Network Topology and explain how you are accessing the RPS Lab environment.0

Home Network Topology :



Accessing the RPS Lab Environment: To access the RPS Lab environment from your home network, you would typically follow these steps:

1. **Connectivity:** Ensure that your home network has an active internet connection.
2. **Remote Access Tools:** Use remote access tools such as SSH (Secure Shell), Remote Desktop Protocol (RDP), or a Virtual Private Network (VPN) client to establish a secure connection to the RPS Lab servers or virtual machines.
3. **Authentication:** Provide the necessary credentials (username, password, SSH key, etc.) to authenticate and access the RPS Lab environment securely.
4. **Access and Work:** Once connected, you can access and work on projects, experiments, or tasks within the RPS Lab environment using command-line interfaces, graphical user interfaces, or development environments installed on the lab servers or virtual machines.

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: Online Video Streaming (Netflix)

Parallel Computing: In online video streaming platforms like Netflix, parallel computing is used extensively for video processing and streaming. Parallel algorithms are employed to encode, decode, and compress video files, as well as to distribute video data efficiently across servers for streaming to multiple users simultaneously. This parallel processing allows the platforms to handle large volumes of video data and serve high-quality streaming experiences to users worldwide without significant latency or buffering issues.

1. **Video Processing:** Parallel computing helps make videos suitable for streaming by dividing the work into smaller tasks and doing them simultaneously. This makes the process faster and more efficient.
2. **Adaptive Streaming:** It adjusts video quality based on your internet speed. Parallel computing helps quickly decide the best quality to show you, so you get smooth playback without waiting.
3. **Personalized Recommendations:** Parallel processing quickly looks at what you like to watch and suggests similar videos. This makes your experience more enjoyable by showing you content you're interested in.

Importance of Parallel Computing:

1. **Scalability:** Parallel computing helps video streaming platforms handle more users and higher-quality videos without slowing down. It's like adding more lanes to a highway to accommodate more traffic.
2. **Efficiency:** By working on different parts of the video at the same time, parallel computing makes everything faster. It's like having multiple chefs cooking different parts of a meal simultaneously to serve it quicker.
3. **Quality of Service:** Parallel computing ensures that videos load quickly and play smoothly, even on different devices and internet connections. It's like having a reliable friend who always finds the best route to avoid traffic jams when driving together.

Networked Systems: Networked systems play a crucial role in online video streaming by providing the infrastructure for content delivery and distribution. Content delivery networks use networked systems to cache and replicate video files across distributed servers located in various geographic regions. When a user requests a video, the CDN identifies the nearest

server with the requested content and delivers the video stream efficiently over the network to the user's device.

1. **Content Delivery Networks:** They store videos in many places worldwide, so when you watch, the video comes from a server nearby, making it faster to load.
2. **Balancing Traffic:** Network systems make sure the servers aren't overloaded by spreading out the people watching videos.
3. **Checking Quality:** They keep an eye on how fast videos load and how clear they look to make sure you have a good experience watching.

Importance of Networked Systems:

1. **Content Distribution:** Networked systems make sure videos reach people all over the world quickly by using smart ways to send data and store copies of videos in many places.
2. **Scalability and Reliability:** They help video platforms handle lots of people watching at once by adjusting to changes in how many people are using the service. It's like having a store that can quickly open more checkout lanes when there are lots of customers.
3. **Global Reach:** Networked systems ensure that no matter where you are, you can watch videos without problems. It's like having a friend who always knows the best way to get you where you want to go, no matter how far away it is.

Overall Importance: In the context of online video streaming, both parallel computing and networked systems are essential components of the underlying technology stack, working together to deliver high-quality streaming experiences to users worldwide. Parallel computing optimizes video processing and encoding, while networked systems ensure efficient content delivery and distribution, ultimately enhancing the scalability, performance, and reliability of online video streaming platforms.