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Day-1 (Assignment-1)

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

Answer =>

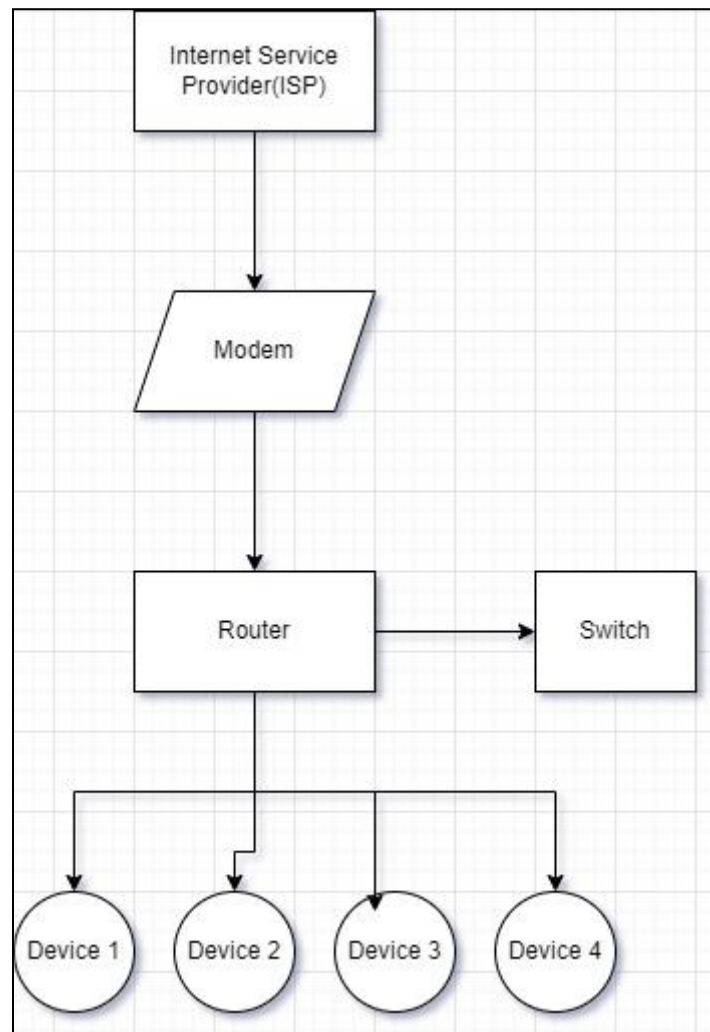


Diagram: Home Network Topology

Home Network Topology:

ISP (Internet Service Provider): This is the entry point of the internet connection into the home. It could be through fiber, cable, DSL, or other means.

Modem: The modem connects to the ISP and converts the incoming signal (usually analog) into digital data that can be understood by the router.

Router: The router distributes the internet connection to various devices within the home network. It assigns IP addresses, manages traffic, and provides a firewall for security.

Switch: In larger home networks, a switch may be used to connect multiple devices via Ethernet cables. It helps in expanding the number of wired connections available.

Wireless Access Point (Wi-Fi): This provides wireless connectivity to devices like laptops, smartphones, and smart home devices within the home network.

Accessing the XYZ Lab Environment:

To access the XYZ lab environment from my home network, I would typically do the following:

VPN (Virtual Private Network): If the XYZ lab environment is behind a corporate or university firewall, I might need to connect to a VPN provided by XYZ to access their internal resources securely.

Remote Desktop Protocol (RDP) or SSH (Secure Shell): Once connected to the VPN, I would use remote desktop software like RDP (for Windows) or SSH (for Unix-based systems) to connect to specific machines or servers within the XYZ lab environment.

Credentials: I would need appropriate login credentials provided by XYZ to authenticate myself and gain access to their systems.

Security Policies: I would need to adhere to any security policies or protocols set by XYZ, such as using multi-factor authentication (MFA) or accessing specific resources based on my role or permissions.

By following these steps, I can securely access the XYZ lab environment from my home network, allowing me to perform tasks, experiments, or research as required.

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 =>

Parallel Computing:

Real-world Application: Image Editing

Explanation:

When we are editing photos on our computer or smartphone using software like Adobe Photoshop or Snapseed, parallel computing comes into play to speed up processing tasks. Actions such as applying filters, adjusting colors, and cropping images involve complex calculations that can be parallelized across multiple CPU cores or GPU cores. This parallel processing capability allows the editing software to apply changes to the image in real-time or with minimal delay, providing a smooth and responsive user experience.

Importance:

Image editing has become a common activity for many people, whether it's enhancing personal photos, creating digital artwork, or editing images for social media posts. Parallel computing ensures that editing tasks are completed quickly and efficiently, enabling users to express their creativity without being delayed by slow processing speeds. Whether you're editing a selfie or adding filters to a vacation snapshot, parallel computing helps you achieve the desired results in less time, making image editing a seamless and enjoyable experience.

Networked Systems:

Real-world Application: Online Streaming

Explanation:

When you stream movies, TV shows, or music from platforms like Netflix, YouTube, or Spotify, networked systems play a crucial role in delivering content to your device. These platforms use content delivery networks (CDNs) to distribute media files across a network of servers located in different regions. When you select a video or song to stream, the CDN identifies the closest and most optimal server to deliver the content, ensuring fast loading times and smooth playback. Additionally, networked systems monitor your internet connection speed and adjust streaming quality to provide the best possible viewing experience without buffering or interruptions.

Importance:

Online streaming has transformed the way we consume media, offering on-demand access to a vast library of movies, TV shows, and music anytime, anywhere. Networked systems ensure reliable and high-quality streaming experiences, regardless of the device you're using or your location. By leveraging CDNs and adaptive streaming technologies, streaming platforms deliver content efficiently over the internet, catering to the preferences and viewing habits of millions of users worldwide. Whether you're binge-watching your favorite series or discovering new music, networked systems make it possible to enjoy seamless entertainment experiences on any screen.