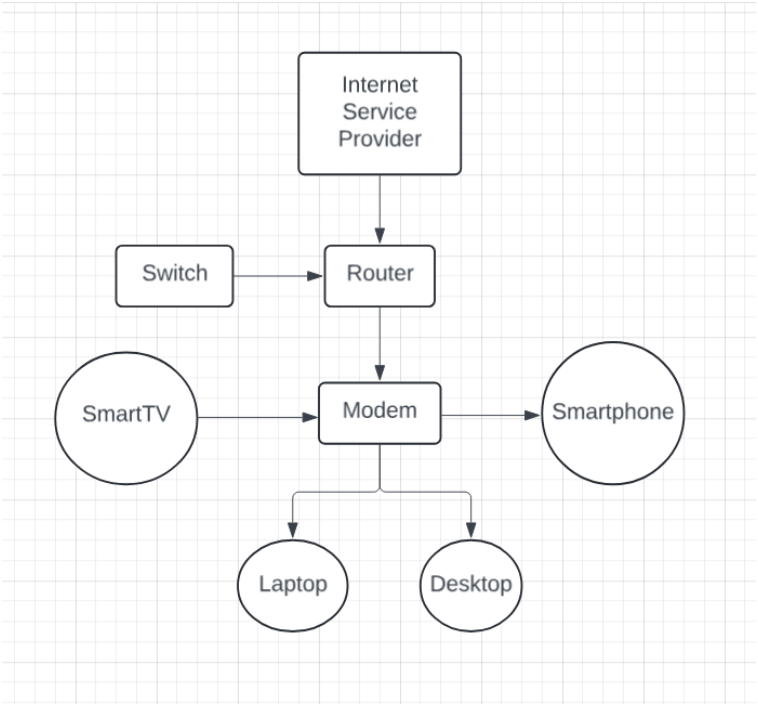
Kanchan Wagh

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

Answer:



A home network diagram is a schematic drawing of a home network layout. It helps you plan your home network, and figuring the best layout for it.

This is the most basic home network diagram that we have a router with a built-in modem and an access point that we got from our ISP (Internet Service Provider). These kinds of routers typically allow you to connect up to four devices using a network (UTP) cable.

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:

Parallel computing refers to the process of executing several processors an application or computation simultaneously. Generally, it is a kind of computing architecture where the large problems break into independent, smaller, usually similar parts that can be processed in one go. It is done by multiple CPUs communicating via shared memory, which combines results upon completion. It helps in performing large computations as it divides the large problem between more than one processor.

Parallel computing also helps in faster application processing and task resolution by increasing the available computation power of systems. The parallel computing principles are used by most supercomputers employ to operate. The operational scenarios that need massive processing power or computation, generally, parallel processing is commonly used there.

Example:

Parallel Processing in Entertainment

Parallel computing also has roots in the entertainment world no surprise given that GPUs were first designed for heavy graphics loads. It's also a boon to industries that rely on computational fluid dynamics, a mechanical analysis that has big commercial applications in gaming, sports and film.

This all starts in these games' productions, specifically by the help of the Unity game engine. Unity's software supports multithreaded programming and parallel processing capabilities, meaning it can take on the creation of highly detailed environments and models without slowing down the overall experience. In development, rendering and algorithm processes can be distributed across different cores simultaneously and at a faster rate, making for more realistic physics in water waves or running through terrain.

Networked System:

Network system combines hardware, software, and communication techniques to develop and sustain computer networks. It ensures smooth digital information flow, resource sharing, and application accessibility between computers.Network system is a family of technologies used to send and receive data across a computer network.

It enables data transmission between two or more computers, allowing them to communicate with each other over the Internet or other networks. Network system includes routers, switches, cables, wireless access points, and hubs. It also includes protocols such as Ethernet and TCP/IP that are used to set up connections between different types of devices on the network.

Example:

Traffic management

- Real-time Traffic Updates: Social media platforms can be used to disseminate real-time traffic updates to users. Local authorities or transportation agencies can post updates on traffic conditions, accidents, road closures, and alternative routes, allowing drivers to make informed decisions about their routes.
- Crowdsourced Data Collection: Social networks enable crowdsourcing of traffic data. Users can share their experiences of traffic conditions, such as heavy congestion or smooth flow, through posts, tweets, or dedicated apps. This data can be aggregated and analyzed to identify traffic patterns and optimize traffic management strategies.
- Community Engagement and Feedback: Social networks provide a platform for community engagement and feedback. Transportation agencies can interact with the public, address concerns, and gather feedback on transportation infrastructure and policies. This feedback can inform decision-making processes and help improve traffic management initiatives.