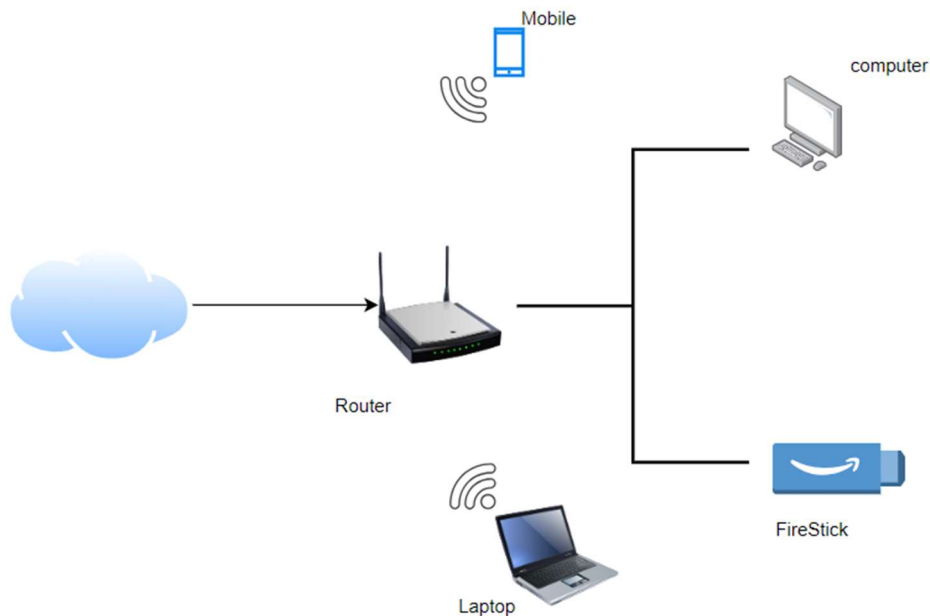


Assignment 1: Draw your Home Network Topology and explain how you are accessing the Any (College lab, office lab) Lab environment.

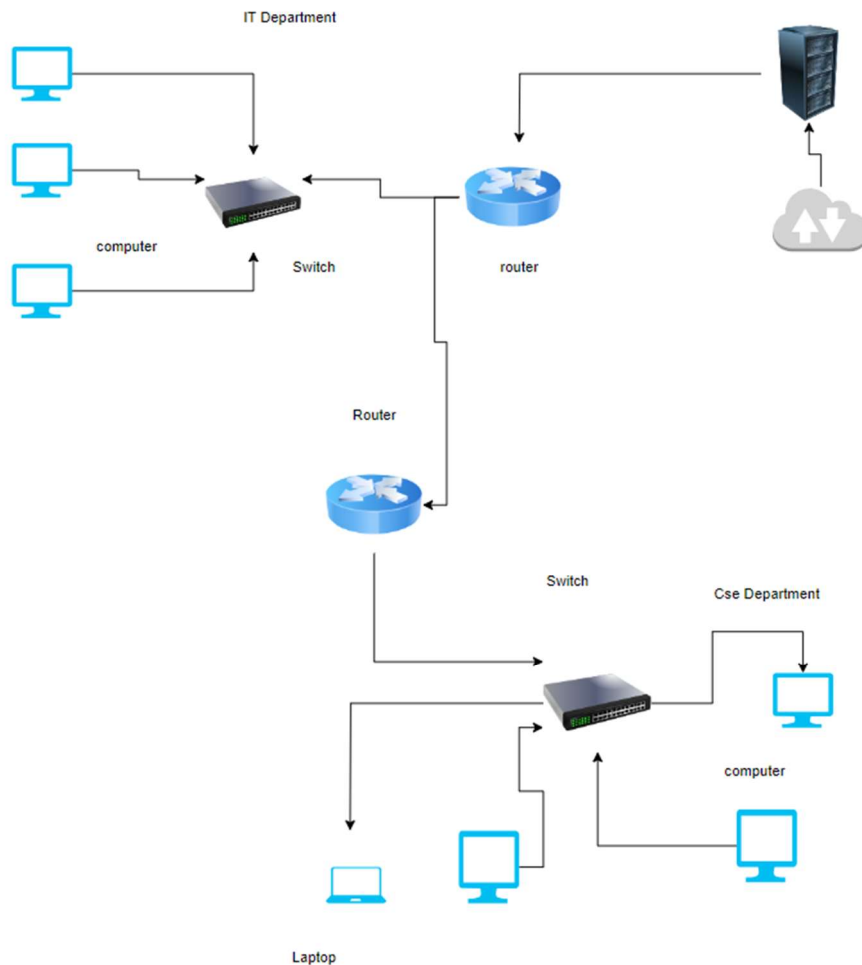


In this topology, I have my Internet Service Provider (ISP) that connects to the internet. That is connected to a router, which distributes the internet connection to all devices in my home network. I have a desktop computer, a laptop and a smartphone, all of which are connected to the router via Wi-Fi or Ethernet cables

Accessing the Any Lab Environment:

To gain access to the Any Lab environment, I utilize a Virtual Private Network (VPN) client that's installed on my laptop. This VPN client establishes a secure connection to my college's network, which enables me to access the resources on the college's network as though I were physically present in the lab.

Here's a simplified representation of my connection to the Any Lab environment:



In this network topology, my laptop is linked to the college's network via the VPN client. This client creates a secure tunnel between my laptop and the college's network, thereby allowing me to access the resources on the college's network. The Any Lab environment is a virtual lab setup provided by the college, which I can access through the college's network.

The VPN client allows me to connect to the college's network from any location that has an internet connection. This capability enables me to access the Any Lab environment and other college resources from the comfort of my home, which proves to be particularly beneficial during periods of remote learning. The VPN client ensures the security of the connection, safeguarding my data from potential interception or theft. This secure connection is a critical component in maintaining the integrity and confidentiality of my data.

To access the College lab environment, you can use the WebLabs system, which provides remote access to software and other resources on lab computers. This system can be accessed through a web browser or by using the VMWare View client. You will need to be enrolled in Two-Factor Authentication (2FA) and authenticate with your State credentials to connect to one of the computer lab devices. Once connected, you will see the exact desktop you would if you were sitting in a lab. This system is available 24/7 and is a secure environment.

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.

The Role of Parallel Computing and Networked Systems in Weather Forecasting

Weather forecasting is a complex process that involves the use of advanced mathematical models to predict atmospheric conditions based on a multitude of variables such as temperature, pressure, wind velocities, and humidity. These models involve billions of calculations and are computationally intensive. To make the process manageable, two key technologies are employed: parallel computing and networked systems.

Parallel Computing in Weather Forecasting

Parallel computing is a type of computation where many calculations or processes are carried out simultaneously. Large computational problems can be divided into smaller ones, which can then be solved at the same time. In weather forecasting, parallel computing is used to divide the complex mathematical models into smaller components that can be computed simultaneously. This significantly reduces the time required for processing and enables meteorologists to deliver timely and accurate weather forecasts.

Parallel computing is critical in weather prediction where timely information can save lives and property. By reducing the time required for processing, meteorologists can provide early warnings for severe weather conditions such as hurricanes, tornadoes, and thunderstorms. This can help authorities to take appropriate measures to ensure public safety.

Networked Systems in Weather Forecasting

Networked systems play a crucial role in collecting data from various sources. Weather stations around the world collect data and send it to central servers via networked systems. These systems enable the efficient collection of data from diverse geographical locations, which is critical in weather forecasting.

Networked systems also enable the distribution of processed information (the weather forecasts) to various platforms such as websites, mobile apps, and news stations. Without networked systems, it would be challenging to disseminate the forecasts to the end users.

The Importance of Parallel Computing and Networked Systems

Both parallel computing and networked systems are important in weather forecasting. Parallel computing allows for the quick processing of large volumes of data, while networked systems ensure the efficient collection of data from various sources and the distribution of the forecasts to the public.

Together, these technologies make modern weather forecasting possible. They enable meteorologists to provide accurate and timely weather forecasts, which can help to save lives and property. As climate change continues to impact weather patterns, the importance of these technologies will only continue to grow.

Networked Systems in Online Gaming: Networked systems play a vital role in online gaming, where multiple players from different locations interact in real-time. These systems facilitate communication and data exchange between players, servers, and game clients. They ensure smooth gameplay by minimizing latency and providing a seamless multiplayer experience. Networked systems also support matchmaking algorithms that pair players based on various factors such as skill level, location, and preferences, enhancing the overall gaming experience. Additionally, networked systems enable the distribution of game updates, patches, and downloadable content (DLC) to players worldwide, ensuring that everyone has access to the latest features and improvements.