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Batch Name: CPPE_Java Full Stack
Date: 9/5/2024

Assignment 1

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

Answer:- Creating a diagram of a home network topology that includes access to a lab environment, such as a college or office lab, can be helpful to understand how these connections work. I'll outline a scenario and then provide an explanation based on that scenario.

Fig. HOME NETWORK TOPOLOGY
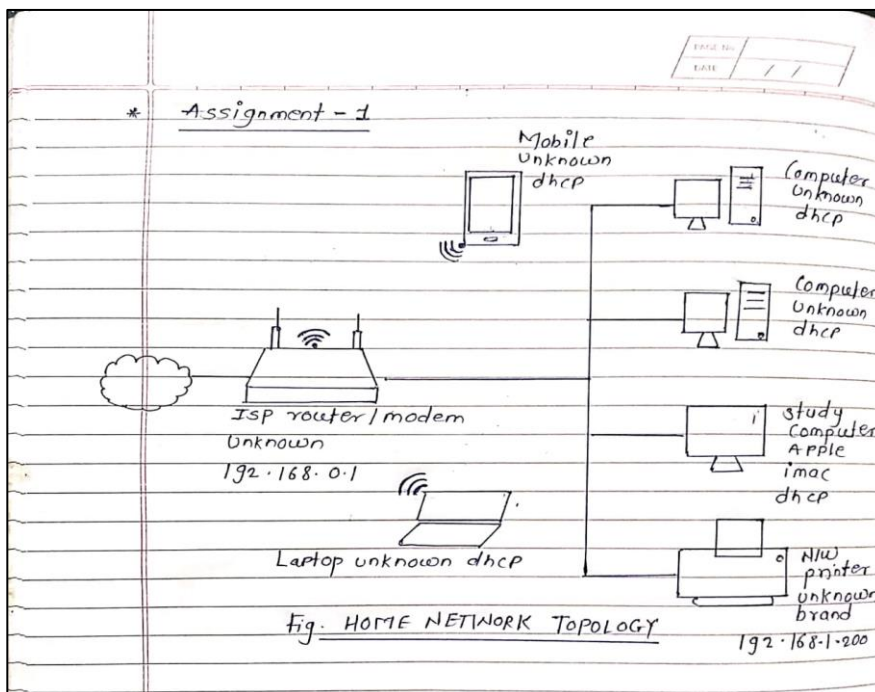
How You Access the college Lab Environment

1.**Connection Initiation:** From your computer at home, you start by connecting to your local internet through your router.

2.**VPN Use:** You initiate a VPN connection using client software configured on your computer. This VPN software establishes a secure and encrypted connection to the remote lab's network. This ensures that all data transmitted between your home and the lab is secure from eavesdropping or interception.

3.**Authentication:** As part of the VPN connection, you must authenticate yourself using credentials provided by your college or office. This might include a username, password, and possibly a second factor like a secure token or a mobile app notification.

4.**Network Access:** Once the VPN connection is established and authenticated, your computer acts as if it is directly on the lab's network. You can access resources such as servers, printers, and stored files as if you were physically present in the lab.

5.**Work as Usual:** You can operate on the lab's network, use its resources, run experiments, and access restricted databases securely from your home.

This setup is essential for professionals and students who need to access sensitive or large computational resources remotely, ensuring productivity and resource access regardless of physical location.

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Assignment 2

Q.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 and networked systems are foundational technologies that support many modern applications, each playing a crucial role in specific contexts. Here's how they are applied in real- world scenarios:

Real-World Application: Financial Trading
Parallel Computing:

1. **Algorithmic Trading:** Parallel computing is crucial in algorithmic trading, where financial institutions use complex mathematical models to analyze market data and execute trades automatically.

2. **High-Frequency Trading (HFT):** In HFT, split-second decisions can make a significant difference in profitability. Parallel computing allows trading algorithms to process vast amounts of market data and execute trades with minimal latency.

3. **Risk Management:** Financial institutions employ parallel computing for risk management tasks, such as portfolio optimization, stress testing, and scenario analysis. Parallel processing enables rapid evaluation of risk exposures across multiple asset classes and market scenarios.

Networked Systems:

1. **Market Data Distribution:** Networked systems facilitate the distribution of market data feeds to trading platforms and algorithmic engines.
2. **Order Routing:** When traders submit orders, networked systems route these orders to the appropriate exchanges or liquidity providers, taking into account factors such as price, liquidity, and order execution speed.
3. **Clearing and Settlement:** After trades are executed, networked systems handle clearing and settlement processes, ensuring timely and accurate processing of transactions.

Importance:

1. **Speed and Efficiency:** Parallel computing enables financial institutions to analyze market data, execute trades, and manage risk with unparalleled speed and efficiency.
2. **Competitive Advantage:** In the highly competitive financial markets, the ability