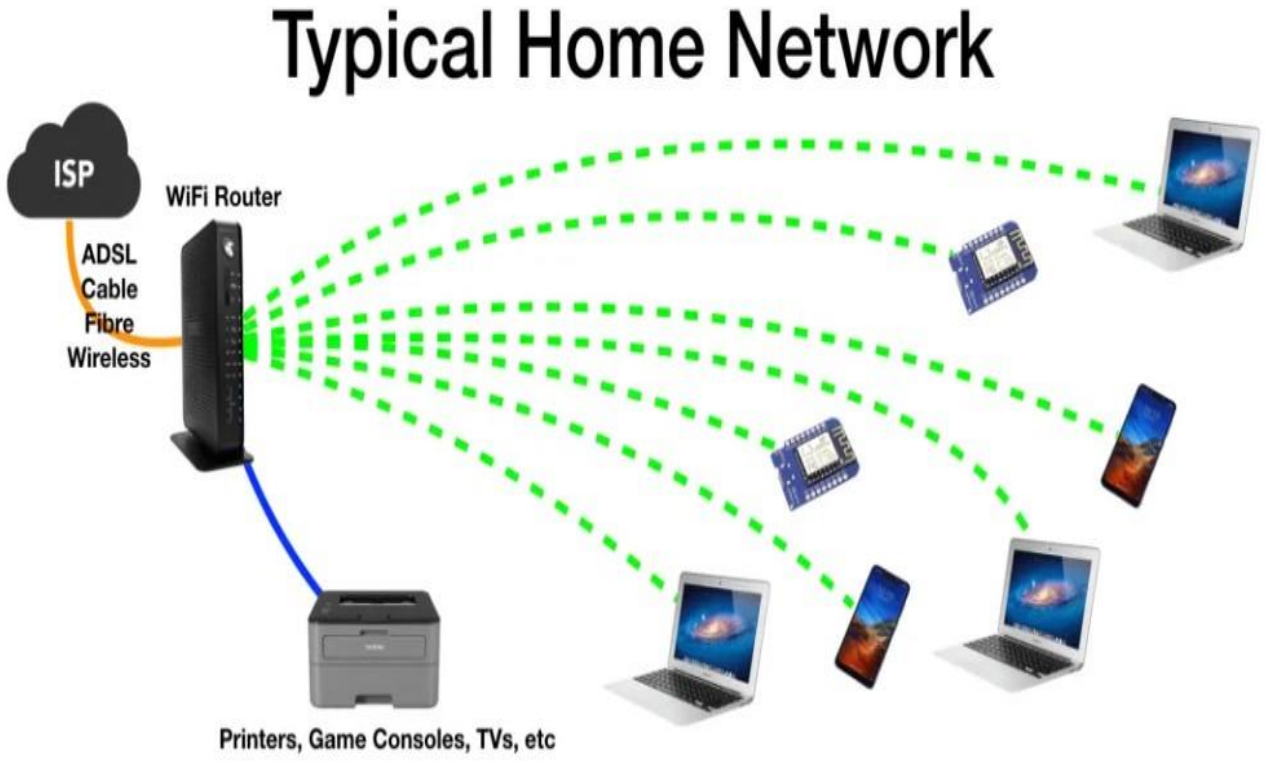
Assignment Day- 1

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

Ans:



In this diagram:

* **ISP Modem/Router**: This is our internet service provider's modem/router device, which connects our home network to the internet.
* **Switch**: This is a networking device that allows multiple devices to connect to the network. It provides additional Ethernet ports for wire connections.
* **Wireless Access Point(WAP)**: Typically integrated into the router, providing Wi-Fi access to wireless devices.
* **Devices**:

- **Wired Devices**: Computers, smart TVs, and game consoles connected via Ethernet cables to the router or switch.
- **Wireless Devices**: Laptops, smartphones, tablets, smart home devices (like smart speakers, lights, thermostats) connected to the WAP.

* When we attempt to access the cloud lab, our device sends a request to our router, which then goes out to the internet through our modem. The request travels across the internet to the cloud provider's data center and reaches the specific server hosting our lab. The server processes the request and sends the response back through the same path to our device.

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.

Ans:

A real-world application that combines parallel computing and networked systems is distributed data processing in large-scale web applications, such as social media platforms like Facebook or Twitter.

Parallel computing allows these platforms to handle the massive amounts of data generated by millions or even billions of users simultaneously. Tasks such as data processing, analysis, and recommendation algorithms can be divided into smaller sub-tasks and executed concurrently across multiple computing nodes or servers. This parallel processing significantly reduces the time it takes to analyze and process large datasets, allowing for real-time or near-real-time responses to user actions.

Networked systems play a crucial role in this context by connecting distributed computing nodes. These systems ensure efficient communication and coordination between the nodes, enabling them to work together seamlessly. Data can be exchanged between nodes quickly and reliably, allowing for efficient data sharing and synchronization across the network.

The combination of parallel computing and networked systems is important in this context for several reasons:

- Scalability: As user bases and data volumes grow, these platforms need to scale their computing resources to handle the increased load. Parallel computing allows them to distribute the workload across multiple nodes, enabling horizontal scalability without a significant drop in performance.
- Fault tolerance: By distributing tasks across multiple nodes, these systems can continue to operate even if some nodes fail or become unavailable. Networked systems facilitate fault tolerance by providing mechanisms for detecting failures, rerouting tasks to healthy nodes, and ensuring data consistency and integrity.
- Performance: Parallel computing and networked systems together enable high-performance data processing, analysis, and response times. By leveraging multiple computing nodes and efficient network communication, these platforms can deliver fast and responsive user experiences even under heavy load.

Overall, the combination of parallel computing and networked systems is essential for building scalable, fault-tolerant, and high-performance web applications that can handle the demands of modern, data-intensive environments.