ASSIGNMENT -1

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A typical home network topology usually involves a few key components and connections. Here's a breakdown of a common setup:

Components:

1. Modem:

- Connects to the Internet Service Provider (ISP) and provides access to the internet.
- Often combines with a router in a single device, especially in residential setups.

2. **Router:**

- Distributes the internet connection to various devices in the home.
- Can be wired (Ethernet) or wireless (Wi-Fi).
- Manages local network traffic and provides network security features like firewalls.

3. **Switch :**

- Used to expand the number of wired connections.
- Typically used if there are more wired devices than the router's Ethernet ports can accommodate.

4. **Access Points :**--

- Extend Wi-Fi coverage in larger homes or areas with poor signal strength.
- Can be separate devices or built into the router.

5. Devices:

Wired Devices:---- Desktop computers, smart TVs, gaming consoles, network-attached storage (NAS).

Wireless Devices:---- Laptops, smartphones, tablets, smart home devices (e.g., thermostats, security cameras, smart speakers).

Typical Topology:

1. Internet to Modem:

- The internet connection from the ISP enters the home and connects to the modem.

2. Modem to Router:

- The modem connects to the router, either as a separate device or combined.

3. Router to Devices:

-**Wired Connections:**

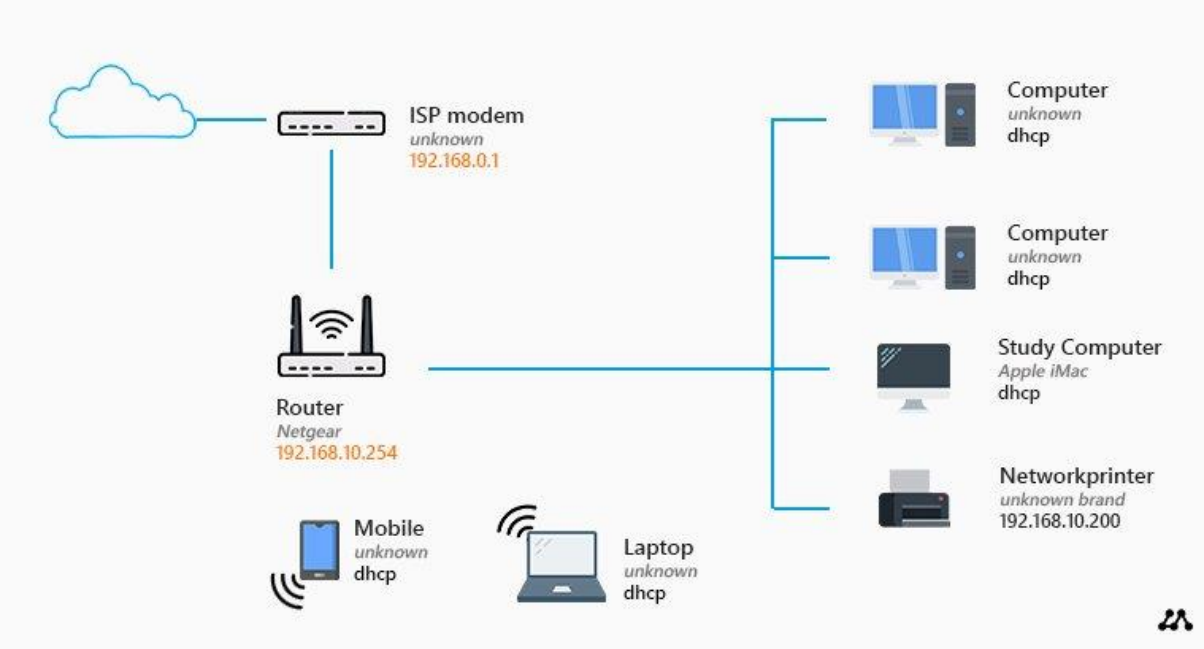
- Ethernet cables run from the router to wired devices like desktop computers, gaming consoles, and smart TVs.
- If additional ports are needed, a switch is connected to the router, and devices are connected to the switch.

- **Wireless Connections:**

- The router provides Wi-Fi coverage for wireless devices throughout the home.
- Access points can be added to extend Wi-Fi range and improve signal strength in larger homes.

Example Layout:

```
      Internet
        |
       Modem
        |
      Router
     /  |  \
    /   |   \
PC  Smart TV  Switch
          / | \
        NAS  Printer  Gaming Console
          |
        Access Point
          |
       Smartphone, Laptop, Tablet
```



Enhancements:

- Mesh Wi-Fi Systems: Consist of multiple nodes that work together to cover the entire home with Wi-Fi. They replace the traditional single router setup and are beneficial for larger homes with multiple floors or areas with weak signals.

- Powerline Adapters: Use electrical wiring in the home to extend network coverage to areas where Wi-Fi signals are weak or unreliable.

-Range Extenders: Amplify the existing Wi-Fi signal to cover more area, though they might reduce overall network performance compared to mesh systems.

This topology ensures that all devices in a home, whether wired or wireless, can connect to the internet efficiently and reliably.