Module 2 CS- Fundamental of Operating Systems & Networks

1.  Hardware refers to the physical components of a computer or electronic system. These are tangible parts that you can touch and see.

 Software refers to the programs and applications that run on hardware. It is intangible and consists of code and instructions that tell the hardware what to do.

2. An **IP address range** refers to a set of IP addresses that fall within a specific numeric sequence

**Private address ranges** are specific blocks of IP addresses designated for use within private networks.

3. A **network protocol** is a set of rules and conventions that define how data is transmitted over a network

A **port number** is a numerical identifier in networking that is used to distinguish different services or applications running on a single device.

4. Router

Function: Connects different networks and directs data packets between them. It routes traffic based on IP addresses and can manage traffic within a local network as well as between multiple networks.

Switch

Function: Connects multiple devices within a single network and uses MAC addresses to forward data to the appropriate device. Unlike routers, switches operate at the data link layer (Layer 2) of the OSI model.

Hub

Function: A basic networking device that connects multiple Ethernet devices in a network, acting as a central point. It broadcasts incoming data packets to all connected devices, regardless of the destination.

Access Point (AP)

Function: Extends a wired network by allowing wireless devices to connect. Access points can serve as bridges between wired and wireless networks.

Modem

Function: Modulates and demodulates signals for data transmission over telephone lines, cable systems, or satellite links. It converts digital data from a computer to analog for transmission and vice versa.

Network Interface Card (NIC)

Function: A hardware component that allows devices to connect to a network. NICs can be wired (Ethernet) or wireless (Wi-Fi) and are installed in computers and other devices.

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5. **File Backup Software**

**Cloud Backup Services**

**Disk Imaging Software**

NAS (Network-Attached Storage) Solutions

6. **HTTP** is the foundation of data communication on the World Wide Web. It is an application-layer protocol used for transmitting hypertext (web pages) and is essential for web browsing.

**HTTPS** is an extension of HTTP that incorporates security features to protect data transmitted between clients and servers. It uses encryption to secure the communication channel.

7. **SSL** is a protocol developed to provide secure communication over a computer network.

**TLS** is the successor to SSL and has largely replaced it. While TLS retains the core functions of SSL, it introduces more robust encryption methods and improved security features.

8. A MAC address is a unique identifier assigned to network interfaces for communication on a local area network (LAN).