CCA-102: Data Communications

ASSIGNMENT-2

1. **Types of Networks**:
   - ➢ LAN (Local Area Network)
   - ➢ WAN (Wide Area Network)
   - ➢ MAN (Metropolitan Area Network)
   - ➢ PAN (Personal Area Network)
2. **Shielded Twisted Pair (STP) vs. Unshielded Twisted Pair (UTP)**:
   - **STP**: Uses a protective shield around the twisted pairs of copper wires to reduce electromagnetic interference (EMI) and crosstalk. It is more expensive and less flexible than UTP.
   - **UTP**: Does not have a protective shield, making it more flexible and less expensive than STP. However, it is more susceptible to EMI and crosstalk.
3. **Baseband vs. Broadband Transmission**:
   - **Baseband**: Uses the entire bandwidth of a medium for a single transmission. It is typically used in digital communications where the entire capacity of the medium is dedicated to a single channel.
   - **Broadband**: Divides the bandwidth of a medium into multiple channels, allowing multiple transmissions to occur simultaneously. It is commonly used in analog communications like cable television.
4. **Difference between a Hub, Modem, Router, and Switch**:
   - **Hub**: A basic networking device that connects multiple devices in a network and forwards data to all devices connected to it.
   - **Modem**: A device that modulates and demodulates digital signals to enable communication between a computer or network and the internet service provider.
   - **Router**: A device that forwards data packets between computer networks. It is used to connect multiple networks together and route data to its destination.
   - **Switch**: A networking device that connects devices within a network and forwards data only to the intended recipient, reducing network traffic.
5. **Moving NIC Cards and MAC Address**: When you move a NIC card from one PC to another, the MAC address stays with the NIC card. It does not get transferred to the new PC unless you physically move the NIC card to the new PC.
6. **Common Hardware-related Network Problems**:
   - ➢ Faulty cables or connectors
   - ➢ Network interface card (NIC) failure
   - ➢ Power supply issues
   - ➢ Overheating of networking equipment
   - ➢ Improperly configured hardware settings
7. **Best Place to Install Anti-virus Program**: The best place to install an anti-virus program in a network with two servers and twenty workstations is on each workstation. This ensures that each device is protected from malware and viruses.

8. **Static IP vs. Dynamic IP**:
    - **Static IP**: A fixed IP address assigned to a device that does not change over time. It is manually configured and is often used for servers or devices that require a consistent IP address.
    - **Dynamic IP**: An IP address that is automatically assigned to a device by a DHCP server. It can change over time as the device connects to different networks.
9. **TCP/IP Model**: The TCP/IP model is a networking model that describes the functions of a networking system. It consists of four layers:
    - **Application Layer**: Provides network services directly to end-users. Examples include HTTP, SMTP, and FTP.
    - **Transport Layer**: Manages end-to-end communication and ensures data reliability. Examples include TCP and UDP.
    - **Internet Layer**: Handles addressing, routing, and packaging of data packets. Examples include IP.
    - **Link Layer**: Handles the physical connection to the network and the transmission of data frames. Examples include Ethernet and Wi-Fi.
10. **Web Browser**: A web browser, or browser, is a software application used to access and view websites on the internet. Examples include Google Chrome, Mozilla Firefox, and Microsoft Edge.
11. **Search Engine**: A search engine is a web-based tool that allows users to search for information on the internet. Examples include Google, Bing, and Yahoo.
12. **Internet & WWW**:
- **Internet**: A global network of interconnected computers that communicate using standard protocols. It allows people to access and share information across the world.
- **World Wide Web (WWW)**: An information space on the internet where documents and other web resources are identified by URLs and can be accessed via the internet.

Uses of Internet in Daily Life:
- Communication (email, social media)
- Information access (research, news)
- Entertainment (streaming, gaming)
- Online shopping and banking
- Education and learning
13. **Internet Service Provider (ISP)**: An ISP is a company that provides individuals and organizations with access to the internet. Examples of ISPs in India include Airtel, Jio, and ACT Fibernet.
14. **MAC Address vs. IP Address vs. Port Address**:
- **MAC Address**: A unique identifier assigned to network interfaces for communications on the physical network segment. It is assigned by the manufacturer and is used for communication within the local network.
- **IP Address**: A numerical label assigned to each device connected to a computer network that uses the Internet Protocol for communication. It identifies the device's location on the network.
- **Port Address**: A number used to uniquely identify a specific process or application on a computer in a networked environment. It helps in routing data to the correct destination within a device.
15. **Viewing Internet Browser History**: The method to view internet browser history varies depending on the browser you are using. In general, you can access the history by pressing Ctrl + H or Command + H on your keyboard, or by clicking on the menu icon (three vertical dots or lines) in the browser and selecting "History."