Day 1 – Assignment 1

* Write some network topology
* Terminology of Computer Network:

**1. Node:**

* Node refers to any device or point within a network that can send, receive, or forward data.
* Here are a few examples of nodes computer, router, switch, access point.
* a node in a computer network can be any device, equipment, or point that participates in network communication, facilitating the exchange of data between different entities within the network.

**2. MAC Address:**

* A MAC (Media Access Control) address is a unique identifier assigned to network interfaces for communications at the data link layer of a network.
* It's also known as a hardware address, Ethernet address, or physical address.
* MAC addresses play a crucial role in the functioning of computer networks by uniquely identifying devices and facilitating communication between them at the data link layer.

**3. Switch:**

* Switch is a networking device that connects multiple devices within a local area network (LAN).
* Switches play a crucial role in modern computer networks by providing efficient and reliable communication between devices within a LAN, enabling the creation of interconnected networks that support various applications and services.

**4. VPN:**

* VPN stands for Virtual Private Network.
* It's a technology that allows users to establish a secure connection over a public network, typically the internet, as if they were directly connected to a private network.
* Types of VPNs:
* Remote Access VPN
* Site-to-Site VPN
* Client-to-Site VPN
* VPNs provide a secure and private way for users to access the internet, protect their online privacy, bypass censorship and geo-blocking, and securely connect to corporate networks from remote locations.

**5. Gateway:**

* Gateway refers to a network node that serves as an entry or exit point for data traffic between different networks or network segments.
* Gateways play a crucial role in connecting disparate networks, facilitating communication between devices or systems that use different protocols, addressing schemes, or communication technologies.
* Types of Gateways:
* Internet Gateway
* Firewall Gateway
* VPN Gateway
* Protocol Gateway
* Application Gateway
* In home networking, the router often functions as the gateway, connecting the home network to the internet and providing routing, address translation, and security functions.
* Gateways are essential components of computer networks, enabling connectivity, interoperability, and secure communication between diverse networks and network devices.

**6. Subnet:**

* Subnet (short for subnetwork) refers to a logical subdivision of an IP network.
* Subnetting allows a large network to be divided into smaller, more manageable segments, each with its own unique network address range.
* Subnetting is a fundamental concept in IP networking, enabling organizations to efficiently manage and organize their network infrastructure while improving performance, scalability, and security.

**7. HTTP:**

* HTTP (Hypertext Transfer Protocol) is a protocol used for transmitting data over the World Wide Web.
* HTTP is a fundamental protocol in computer networking, providing the foundation for communication between clients and servers on the World Wide Web.
* It enables the retrieval and delivery of web pages, images, videos, and other resources, forming the basis of the modern internet.

**8. DHCP:**

* DHCP (Dynamic Host Configuration Protocol) is a network management protocol used to dynamically assign IP addresses and other network configuration parameters to devices on a network.
* DHCP plays a critical role in simplifying network administration, automating IP address allocation, and ensuring efficient and reliable network connectivity for devices on a network.

**9. TLS:**

* TLS (Transport Layer Security) is a cryptographic protocol used to secure communication over a computer network, typically the internet.
* TLS plays a critical role in ensuring the security and privacy of communication over the internet, protecting sensitive information such as passwords, financial transactions, and personal data from unauthorized access and interception.

**10. Port:**

* Port is a logical construct used to identify specific communication endpoints or channels in a network or computer system.
* Ports are fundamental to network communication, enabling devices to communicate with each other and providing a mechanism for organizing and managing network traffic effectively.

**11. SMTP:**

* SMTP (Simple Mail Transfer Protocol) is a standard protocol used for sending and routing email messages between servers on a network.
* SMTP is a fundamental protocol in the email communication infrastructure, providing a standardized method for sending, relaying, and delivering email messages across networks and the internet.

**12. FTP:**

* FTP (File Transfer Protocol) is a standard network protocol used for transferring files between a client and a server on a computer network.
* FTP is a widely used protocol for transferring files over computer networks, providing a simple and efficient method for users to exchange files between systems. However, due to its lack of encryption.
* FTP is often supplemented or replaced by more secure protocols like FTPS or SFTP in environments where data security is a priority.

**13. SSL:**

* SSL (Secure Sockets Layer) is a cryptographic protocol used to secure communication over a computer network, typically the internet.
* SSL provides encryption and authentication mechanisms to ensure the confidentiality, integrity, and authenticity of data transmitted between clients and servers.
* SSL is a critical component of internet security, providing a secure and encrypted communication channel for transmitting sensitive information over computer networks.
* It helps protect against eavesdropping, data tampering, and identity spoofing, ensuring the privacy and integrity of online communication.

**14. Bandwidth:**

* Bandwidth refers to the maximum data transfer rate of a network or internet connection, typically measured in bits per second (bps), kilobits per second (kbps), megabits per second (Mbps), or gigabits per second (Gbps).
* Bandwidth is a critical factor in determining the performance and capabilities of a network or internet connection.
* It plays a crucial role in supporting various applications and services that require high-speed data transfer, such as streaming video, online gaming, file sharing, and cloud computing.

**15. Packet:**

* A packet is a fundamental unit of data transmitted over a computer network.
* It contains both the data being transmitted and control information used for routing and delivery.
* Packets are the building blocks of communication in computer networks, enabling the transmission of data across local and wide-area networks.
* They allow for efficient, flexible, and reliable communication between devices and systems connected to the network.