

Module -7: Network fundamental -

1- Which of the following messages in the DHCP process are broadcasted? (Choose two)

- A. Request**
- B. Offer
- C. Discover**
- D. Acknowledge

2- Which command would you use to ensure that an ACL does not block web-based TCP traffic?

- A. permit any
- B. permit tcp any any eq 80**
- C. permit tcp any eq 80
- D. permit any any eq tcp

3-Explain Network Topologies

- Bus Topology: All devices are connected to a single backbone cable. It's simple and inexpensive but can have performance issues as traffic increases.

Star Topology: Each device is connected to a central hub or switch. It's easy to troubleshoot and scalable, but heavily depends on the central device.

Ring Topology: Devices are connected in a closed loop. Data flows in one direction, which can improve performance but can be disrupted if one device fails.

Hybrid Topology: Combines two or more different topologies. It's flexible and can cater to specific needs but can also be complex and costly.

4-Explain TCP/IP Networking Model

- Application Layer: Provides network services directly to user applications. Examples include HTTP, FTP, SMTP.

Transport Layer: Manages end-to-end communication between devices. TCP ensures reliable data delivery, while UDP provides connectionless, unreliable data delivery.

Internet Layer: Handles addressing, routing, and packaging data packets. IP (Internet Protocol) operates at this layer.

Link Layer: Deals with physical connections between devices. It includes protocols for local network communication, such as Ethernet.

5-Explain LAN and WAN Network

- LAN (Local Area Network): Covers a small geographic area, such as an office building or campus. Typically uses high-speed connections and Ethernet technologies.

WAN (Wide Area Network): Spans a large geographic area, often connecting multiple LANs. Uses various technologies, including leased lines, satellites, and public networks.

6-Explain Operation of Switch

- A switch operates at the Data Link Layer (Layer 2) of the OSI model and performs the following functions:

Forwards data frames to the correct destination port based on MAC addresses.
Filters and forwards frames only to the intended destination device.
Learns MAC addresses by examining the source address of incoming frames and builds a MAC address table.
Uses STP to prevent loops in redundant switch topologies.
Divides collision domains, improving overall network performance.

7-Describe the purpose and functions of various network devices

- Router: Routes data between different networks, determines the best path for data packets, and manages traffic between devices.

Switch: Connects multiple devices within the same network and forwards data only to the intended recipient (based on MAC addresses).

Hub: Basic networking device that connects multiple Ethernet devices, but it broadcasts data to all ports, which can lead to congestion.

Bridge: Connects two different network segments and filters traffic between them based on MAC addresses.

Modem: Converts digital data from a computer into a form suitable for transmission over telephone lines or cable systems

Access Point: Allows wireless devices to connect to a wired network using Wi-Fi.

7-Make list of the appropriate media, cables, ports, and connectors

- Media/Transmission medium: Ethernet (UTP/STP) cables or fiber optic cables.

Cables:

Ethernet cables: Cat5e, Cat6, Cat6a, Cat7 cables for wired connections.

Fiber optic cables: Single-mode or multimode fiber cables for long-distance and high-speed connections.

Ports:

RJ45 ports: Standard Ethernet ports for connecting Ethernet cables.

SFP ports: Small Form-factor Pluggable ports for fiber optic connections in switches.

Connectors:

RJ45 connectors: Used with Ethernet cables.

LC connectors: Common for fiber optic cables.

8-connect switches to other

- Determine whether you're connecting the switch to another switch, a computer, a server, or another network device.

Select the right type of cable and connectors based on your network setup

For connecting switches to other switches or computers/servers, Ethernet cables are commonly used.

Use Cat5e, Cat6, Cat6a, or higher-rated cables depending on your network speed requirements.

Identify the Ethernet ports on both the switch and the device you are connecting to.

Plug one end of the Ethernet cable into the Ethernet port on the switch. Ensure the connector clicks into place securely to establish a stable connection.

Plug the other end of the Ethernet cable into the Ethernet port on the other device

Check the indicator lights on the switch and the connected device to confirm a successful connection. There will be LED indicators showing link status and activity.

Depending on your network setup, you may need to configure IP addresses, VLANs, or other network settings on the devices connected to the switch.

9-Define Network devices and hosts

- Network devices: These are physical or virtual devices that facilitate communication and data transfer within a computer network. Examples include routers, switches, hubs, modems, gateways, and access points. Network devices manage network traffic, connect devices together, and ensure data reaches its destination efficiently.
- Hosts: In networking, hosts refer to devices that are connected to a network and have their own IP address. Hosts can include computers, servers, printers, and any other devices that can send or receive data over the network. They rely on network devices like switches and routers to communicate with other hosts on the same network or across different networks.