*Assignment*

*Module -7: Network fundamental*

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

*ANS. Request, Offer*

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

*ANS. permit tcp any any eq 80.*

*3-Explain Network Topologies.*

*ANS. Network topologies refer to the physical or logical arrangement of devices and connections in a network. There are several types of network topologies, each with its own characteristics and uses.*

*1. Bus Topology:*

*- Devices are connected in a single cable (bus) that connects all devices to each other.*

*- Data travels through the bus in a single direction.*

*- If a device is malfunctioning, the entire network can be affected.*

*- Example: Ethernet networks.*

*2. Star Topology:*

*- All devices are connected to a central hub or switch.*

*- Each device has a direct connection to the central hub/switch.*

*- Data travels through the central hub/switch.*

*- If the central hub/switch fails, the entire network becomes inaccessible.*

*- Example: Wireless networks (Wi-Fi).*

*3. Ring Topology:*

*- Devices are connected in a circular fashion, with each device having a connection to the next and previous device.*

*- Data travels in a single direction around the ring.*

*- If a device is malfunctioning, it can impact the network as it only affects the devices directly connected to it.*

*- Example: Token ring networks.*

*4. Mesh Topology:*

*- Each device is connected to every other device in the network.*

*- Data can travel through any path between devices.*

*- Each device acts as a repeater, rebroadcasting data to other devices.*

*- Provides redundancy and fault tolerance.*

*- Example: Wireless mesh networks (802.11s).*

*5. Tree Topology:*

*- Devices are connected in a hierarchical manner, with a central hub or switch at the top.*

*- Devices are connected to the central hub/switch, and then to secondary hubs or switches.*

*- Data travels from the central hub/switch to the secondary hubs/switches.*

*- Provides a centralized management and fault tolerance.*

*- Example: Local area networks (LANs).*

*6. Hybrid Topology:*

*- Combination of multiple topologies, often used in large-scale networks.*

*- Devices are connected to multiple central hubs or switches.*

*- Provides flexibility and redundancy.*

*- Example: Wide area networks (WANs) that use both star and mesh topologies.*

*4-Explain TCP/IP Networking Model.*

*ANS. The TCP/IP (Transmission Control Protocol/Internet Protocol) networking model is a set of standard protocols used to interconnect network devices on the internet. It consists of four layers:*

*1. Application Layer:*

*- Provides services for network application programs, such as file transfer, email, web browsing, etc.*

*- Uses protocols like HTTP, FTP, SMTP, etc.*

*2. Transport Layer:*

*- Responsible for reliable transmission of data between end-systems.*

*- Uses protocols like TCP (Transmission Control Protocol) and UDP (User Datagram Protocol).*

*- TCP ensures data is delivered correctly and in the correct order, while UDP provides fast, unreliable delivery.*

*3. Internet Layer:*

*- Handles addressing, routing, and packet forwarding*

*- Uses protocols like IP (Internet Protocol) and ICMP (Internet Control Message Protocol).*

*- IP assigns unique addresses to network devices and routes data based on IP addresses.*

*4. Network Access Layer:*

*- Handles the physical transmission of data over the network.*

*- Uses protocols like Ethernet, Wi-Fi, or other network interface card (NIC) protocols.*

*The TCP/IP model allows for standardization and interoperability between different network devices and operating systems. It also enables the creation of complex network architectures that can handle diverse communication requirements.*

*5-Explain LAN and WAN Network.*

*ANS. LAN (Local Area Network) and WAN (Wide Area Network) are two types of computer networks:*

*1. LAN (Local Area Network):*

*- Refers to a network that connects devices within a limited geographic area, such as a home, office, or campus.*

*- Uses Ethernet or other local area network (LAN) technologies to connect devices.*

*- Examples include Ethernet cables, Wi-Fi, and optical fiber.*

*2. WAN (Wide Area Network):*

*- Refers to a network that connects devices across a larger geographic area, such as a city, state, or country.*

*- Uses leased lines or other wide area network (WAN) technologies to connect devices.*

*- Examples include satellite links, DSL (Digital Subscriber Line), and leased lines.*

*LANs are typically used for local communication, while WANs are used for communication between geographically dispersed networks. LANs are typically smaller in size and faster than WANs, but require a physical connection to a central hub or switch. WANs are typically larger in size and slower than LANs, but can provide long-distance communication between geographically dispersed networks.*

*Both LANs and WANs use protocols like TCP/IP to ensure reliable and efficient communication between devices.*

*6.Explain Operation of Switch.*

*ANS.*

*7-Describe the purpose and functions of various network devices*

*ANS. Network devices have a important role in the functioning of computer networks. They serve different purposes and perform specific functions based on their roles in the networks Some most common network devices and their functions are stated below :-*

*1. Routers - By using routing tables to find best path for data transmission based on IP address they forward packets between different networks.*

*2. Switches :- It is used to connect multiple devices within a single network. Switches learn and store the MAC addresses of connected devices and forward data packets based on their destination MAC address.*

*3. Access points:- These are used to provide wireless connection to devices. APs provide wireless access to devices, allowing them to connect to the internet or other networks wirelessly.*

*4. Hubs :- Hubs are older network devices that connect multiple devices using a single data link. They do not have any intelligence or filtering capabilities, and all data is broadcast to all connected devices and also this is not recommended for modern networks due to their limited functions.*

*5. Bridges are similar to hubs but they connect multiple devices using a single data link and they can also filter and forward data based on MAC addresses, making them more efficient than hubs.*

*6. Firewalls:- Firewalls are network security devices that monitor and control incoming and outgoing network traffic because they filter and block traffic based on predefined rules, protect against viruses and malware, and enforce security policies.*

*7. Load Balancer:- They are used to distribute network traffic evenly among multiple servers to improve performance and availability. It can handle high traffic loads and provide fault tolerance by redirecting traffic to healthy servers when one becomes unavailable.*

*8. Proxies :- These are intermediary servers that sit between clients and servers. They are used for various purposes such as caching, security, and content filtering*

*8-Make list of the appropriate media, cables, ports, and connectors to 8- 8-connect switches to other.*

*ANS.*

*9-Define Network devices and hosts.*

*ANS. Network devices and hosts are two important components of a computer network.*

*Network devices:*

*- Network devices are hardware components that allows communication between computers and other devices in a network and it operate at different layers of the OSI model.*

*- They include routers, switches, access points, hubs, bridges, firewalls, load balancers, and proxies.*

*Hosts:*

*- Hosts are end-user devices that are connected to a network, such as computers, servers, smartphones, and IoT devices. It provide the user a interface for accessing network resources and applications.*

*- Hosts can be categorized as clients or servers, depending on their role in the network.*

*- Clients request and receive data from servers, while servers provide services to clients.*

*Network devices and hosts work together to allow communication and resource sharing within a network. The network devices make possible the transmission of data between hosts, while hosts provide the end-user interface and serve as the source or destination of data.*