Module 8: Network Access Basic routing and advance routing concept, Switching concept-

1.Explain Switch

Ans:- a switch is a device that connects multiple devices together, allowing them to communicate. When a device (like a computer) is connected to a switch, it sends out a broadcast message. The switch records the MAC address of the device and the port it's connected to in its internal address table. When a device wants to send data to another device on the network, it sends a data packet containing the destination MAC address. The switch consults its address table to determine the correct output port for that destination MAC address and forwards the packet only to that port. There are three types of switches 1. L2 switch 2. L3 switch 3. Poe switch

2.Explain Switch Boot Sequence

Ans:-The switch boot sequence refers to the process a network switch follows when it is powered on or rebooted. This sequence ensures the switch initializes correctly, loads its operating system, and becomes ready to forward traffic. Here's an overview of the typical boot sequence:

1. Power-On Self-Test (POST)

- The switch performs hardware diagnostics to verify that all critical components (CPU, memory, interfaces) are functional.
- If the POST fails, the switch generates an error and halts the boot process.

2. Load the Bootloader

- The bootloader is a small program stored in the switch's non-volatile memory.
- It initializes the hardware, prepares the system to load the operating system, and provides basic diagnostic and recovery functions.

3. Locate and Load the IOS or Operating System

- The bootloader looks for the IOS image (Internetwork Operating System) or operating system stored in flash memory (default).
- If multiple IOS images are present, the switch loads the one specified in the configuration register or the one defined in the BOOT environment variable.
- If no image is found, the switch enters ROMMON mode (a recovery mode).

4. Expand the Operating System to RAM

- The selected IOS or operating system is decompressed and loaded into RAM for execution.

5. Load the Configuration File

- After the IOS is loaded, the switch looks for the startup-config file stored in NVRAM:
    - If the configuration file is found, it is loaded into RAM as the running-config, which configures the switch.
    - If no configuration file is found, the switch enters setup mode, prompting the user to configure the device interactively.

3.Explain Three Methods to access Switch Command Line Interface

Ans:- Here are three ways to access a switch's Command Line Interface (CLI):

- Console port: A physical port on the switch that allows direct access to the CLI. This is usually the first method used when configuring a switch.
- Telnet: A remote access method that requires the switch's hostname or IP address. Telnet sessions automatically disconnect after a period of inactivity, which is usually set to 10 minutes.
- SSH: A remote access method that requires the switch's hostname or IP address.

Before accessing a switch's CLI remotely, the Telnet and SSH services must be enabled on the switch.

A CLI allows users to interact with a computer using direct text commands. This can be faster and more accurate than a Graphical User Interface (GUI), which is more user-friendly but can be slower for complex tasks

4.Explain and Configuring the Cisco Internet Operating System

Ans:-The Cisco Internetwork Operating System (Cisco IOS) is a proprietary operating system that runs on Cisco hardware, such as routers and switches.

Configuration tasks-

Some tasks you can perform when configuring Cisco IOS include: Assigning a host name for the RPM using the hostname command .Entering an enable secret using the enable secret command .Entering an enable password using the enable password command .Assigning addresses to the interfaces using the protocol address command .Specifying which protocols to support on the interfaces

5.Explain Switch Port

Ans:- A switch port is a physical opening on a network switch that allows devices to connect and communicate with each other. Switch ports can be physical or virtual, and they can have various configuration options.

There are different types of switch ports, including:

Access port:-

Connects devices like desktops, laptops, and printers to the network. Access ports are part of a specific VLAN and send and receive Ethernet frames in an untagged form.

Trunk port:-

Allows communication between multiple VLANs. Trunk ports connect switches to other switches, routers, and servers.

3-enable secret [password] is hashed using the___algorithm.

A. MD5
B. AH
C. PSK
D. ESP
E. WPA2

Ans:- (E) WPA2

4- An engineer connects to Router R1 and issues a show ip ospf neighbor command. The status of neighbor 2.2.2.2 lists FULL/BDR. What does the BDR mean?

A. R1 is an Area Border Router.
B. R1 is a backup designated router.
C. Router 2.2.2.2 is an Area Border Router. D. Router 2.2.2.2 is a backup designated router.

Ans:- (B) R1 is a backup designated router.

5- Which command is used to view the neighbor discovery table on a PC?

A. show ipv6 neighbor
B. show ipv6 neighbors
C. netsh interface ipv6 show neighbor

D. netsh interface ipv6 show neighbors

Ans:- (D) netsh interface ipv6 show neighbors

6- What type of variable is being shown? Routers = [R1,R2,R3]

A. List
B. Dictionary
C. Simple
D. Unsigned integers

Ans:- (A) List

7- Identify the fields in an IPv4 header. (Choose three)

A. Host component
B. Time to Live
C. Source address
D. Destination address
E. Network address

Ans:- B. Time to Live

C. Source address

D. Destination address