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Module - 8 Routing and Switching

1. Explanation of Switch.

A network switch is a hardware device used in computer networks to connect multiple devices (like computers, printers, servers) within the same Local Area Network (LAN) and allow them to communicate efficiently.

2. Explanation of switch boot sequence

1. Power-On Self Test (POST)

The switch performs POST to check hardware components (CPU, memory, interfaces).

If POST fails, the switch will display error messages and stop booting.

2. Load the Boot Loader

The boot loader is a small program stored in ROM.

It initializes low-level hardware and locates the IOS (Internetwork Operating System).

3. Locate and Load the IOS (Operating System)

The switch searches for the IOS image (usually stored in flash memory).

If a valid IOS image is found, it is loaded into RAM.

4. Locate and Load the Startup Configuration

The switch looks for a file named `startup-config` in NVRAM.

If found, it loads the configuration into RAM (called running-config).

5. Switch Becomes Operational

The switch is now ready to:

- Forward traffic,
- Communicate with other devices,
- Be accessed by administrators (via CLI, SSH, Telnet, etc.).

3. Explain Three Methods to Access Switch Command Line Interface.

Ans.

1. **Console Access**: Connect directly to the switch using a console cable and a

terminal emulator (e.g., PuTTY).

2. **Telnet Access:** Use the Telnet protocol to remotely access the switch CLI over

the network. Telnet requires the switch to have an IP address configured.

3. **SSH Access:** Secure Shell (SSH) provides a secure method to remotely access

the CLI. It encrypts all communications and is preferred over Telnet.

4. Explain and Configuring the Cisco Internet Operating System.

Cisco IOS is the software used to manage Cisco devices. To configure a Cisco IOS

device:

1. Access the device using the console, Telnet, or SSH.

2. Enter privileged EXEC mode by typing enable.

3. Access global configuration mode by typing configure terminal.

4. Apply configurations (e.g., IP address, VLANs, security settings).

5. Save the configuration using the command write memory or copy running-

config startup-config.

5. Explain Switch Port

A switch port is a physical interface on a switch where devices such as computers

printers, or other network devices can connect. Switch ports can be configured as:

Access Ports: Used to connect end devices to a single VLAN.

Trunk Ports: Used to carry traffic for multiple VLANs between switches.

Dynamic Ports: Can automatically negotiate their mode (access or trunk).

6. Enable secret [password] is hashed using the algorithm.

MD5

7. 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?

R1 is a backup designated router.

8. Which command is used to view the neighbor discovery table on a PC?

netsh interface ipv6 show neighbors

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

List

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

Time to Live, Source address, Destination address