*Module 8: Network Access, Basic Routing And Advance Routing Concept, Switching Concept*

*1. Explain Switch*

*ANS: A switch is a network device that connects devices within a LAN and uses MAC addresses to forward data only to the device it’s intended for, enhancing network performance and reducing collisions.*

*2. Explain Switch Boot Sequence*

*ANS: The switch boot sequence is the process that a network switch undergoes during startup, ensuring it initializes and configures itself properly. Here’s a breakdown of the typical steps involved in a switch boot sequence:*

*1. Power On: When the switch is powered on, it receives electricity, and the internal hardware components begin to initialize.*

*2. POST (Power-On Self Test): The switch performs a POST to check the integrity of its hardware components, such as the CPU, memory, and interfaces. If any hardware issues are detected, the switch may fail to boot and display error messages.*

*3. Loading the Bootstrap Program: After successful POST, the switch loads a small bootstrap program from its ROM (Read-Only Memory). This program is responsible for locating and loading the operating system (OS) for the switch.*

*4. Locating the Operating System: The bootstrap program searches for the switch's operating system image in designated storage locations (like flash memory or an external server). It may use a default location or a configured location based on the previous setup.*

*5. Loading the Operating System: Once the OS image is found, the switch loads it into RAM (Random Access Memory) for execution. The OS is crucial for the switch’s functionality, managing the network operations and features.*

*6. Initializing the Operating System: The switch OS initializes various components, including routing protocols, VLAN configurations, and other features based on the saved configuration files.*

*7. Applying the Configuration: The switch reads its configuration file (often stored in NVRAM) to apply the user-defined settings. If no configuration file is found, it may enter a default or setup mode.*

*8. Running Diagnostics: Some switches may perform additional diagnostics at this stage to ensure all features are functioning as expected.*

*9. Ready State: Once all steps are successfully completed, the switch enters an operational state, ready to forward traffic and respond to network requests.*

*10. Management Access: The switch becomes accessible for management, allowing administrators to configure settings, monitor performance, and troubleshoot issues.*

*3. Explain Three Methods to access Switch Command Line Interface*

*ANS: 1. Console Access: 1. Connect a serial cable from your computer to the switch’s console port.*

*2. Open a terminal emulator (e.g., PuTTY) on your computer.*

*3. Set the correct serial settings.*

*4. Access the CLI through the terminal window.*

*2. Telnet Access: 1. Ensure the switch has an IP address and Telnet is enabled.*

*2. Open a command prompt or terminal on your computer.*

*3. Type telnet [switch IP address] and press Enter.*

*4. Enter your credentials to access the CLI.*

*3. SSH Access: 1. Ensure the switch has an IP address and SSH is enabled.*

*2. Open a command prompt or terminal on your computer.*

*3. Type ssh [username]@[switch IP address] and press Enter.*

*4. Enter your password to access the CLI*

*4. Explain and Configuring the Cisco Internet Operating System*

*ANS:*

*5. Explain Switch Port*

*ANS: A switch port is a physical interface on a network switch that connects devices like computers and printers within a local area network (LAN).*

*Types of Switch Ports*

*1. Access Ports:*

*- Connect end devices.*

*- Assigned to a single VLAN.*

*2. Trunk Ports:*

*- Connect switches to carry multiple VLANs.*

*- Use VLAN tagging to identify traffic.*

*Key Features*

*- Speed: Supports various speeds (e.g., 10/100/1000 Mbps).*

*- Duplex Modes: Can be half-duplex (one direction) or full-duplex (both directions).*

*- Power over Ethernet (PoE): Supplies power to devices over the same cable.*

*- Security: Can implement port security features to control access.*

*Basic Configuration Steps*

*1. Access the switch via console or SSH.*

*2. Enter configuration mode:*

*enable*

*configure terminal*

*3. Configure an access port:*

*interface [interface\_id]*

*switchport mode access*

*switchport access vlan [vlan\_id]*

*no shutdown*

*4. Configure a trunk port:*

*interface [interface\_id]*

*switchport mode trunk*

*switchport trunk allowed vlan [vlan\_list]*

*no shutdown*

*5. Verify configuration: show interface status*

*Switch ports are essential for facilitating communication and managing network traffic efficiently.*

*4. R1, R2, R3, and R4 have their Fast Ethernet 0/0 interfaces attached to the same VLAN. A network engineer has typed a configuration for each router by using a word processor. He will later copy and paste the configuration into the routers. Examine the following exhibit, which lists configuration for the four routers, as typed by the network engineer. Assuming that all four routers can ping each other’s LAN IP addresses after the configuration has been applied, choose the routers that will be able to form a neighbor relationship with the other routers on the LAN. (You can assume that, if not shown in the exhibit, all other related parameters are still set to their defaults.) (Choose two)*

*Ans: A.R1 and B.R2*

*Choose the correct options*

*1. Enable secret [password] is hashed using the algorithm.*

*Ans: MD5*

*2. 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?*

*Ans: Router 2.2.2.2 is a backup designated router*

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

*Ans: netsh interface ipv6 show neighbor*

*4. What type of variable is being shown?*

*Ans: List*

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

*Ans: B. Time to Live C. Source address D. Destination addres*