Module : CCNA- Routing And Switching

1. Explain Switch

Ans. A **switch** is a **network device** used to connect multiple devices (PCs, printers, servers) within a **Local Area Network (LAN)**.

Main functions:

- Works at **Layer 2 (Data Link Layer)** of OSI model
- Uses **MAC addresses** to forward data
- Sends data **only to the correct device**, not to all (unlike hub)

Advantages:

- Faster communication
- Reduces network traffic
- More secure than hub

Example:
PC1 → Switch → PC2 (data goes only to PC2)

2. Explain Switch Boot Sequence

Ans. When a **Cisco switch is powered ON**, it follows a fixed startup process called **Boot Sequence**.

Switch Boot Steps:

1. **POST (Power On Self Test)**
    - Checks hardware (RAM, Flash, CPU)
2. **Boot Loader**
    - Small program stored in ROM
    - Initializes flash file system
3. **Load IOS**
    - Cisco IOS loaded from **Flash memory** into RAM
4. **Load Startup Configuration**
    - Configuration file loaded from **NVRAM**

- If not found → switch enters **setup mode**

📌 **Memory used:**

- ROM → Boot Loader
- Flash → IOS
- RAM → Running IOS & config
- NVRAM → Startup config

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

Ans. You can access the **Switch Command Line Interface (CLI)** in **3 ways**:

1. Console Access (Local)

- Using **console cable**
- Direct physical connection
- Used for **initial configuration**

Command example:

Switch>

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2. Telnet (Remote – insecure)

- Access switch over network
- Needs **IP address configured**
- Password is sent in **plain text**

telnet 192.168.1.1

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3. SSH (Remote – secure)

- Encrypted communication
- Most recommended
- Needs:
  - IP address

- Username & password
- Crypto key

ssh -l admin 192.168.1.1

📌 **Best practice:** Use **SSH**

4. Explain and Configuring the Cisco Internet Operating System

Ans. **What is Cisco IOS?**

Cisco IOS (Internetwork Operating System) is the **software** that runs on Cisco switches and routers.

Functions:

- Device configuration
- Network security
- Routing & switching
- Interface management

Basic Cisco IOS Configuration (Switch)

Switch> enable

Switch# configure terminal

Switch(config)# hostname S1

S1(config)# enable password cisco

S1(config)# line console 0

S1(config-line)# password console123

S1(config-line)# login

S1(config)# exit

S1# copy running-config startup-config

📌 Modes in IOS:

- User mode >

- Privileged mode #
- Global config (config)#
- Interface config (config-if)#

5. Explain Switch Port

Ans. A **switch port** is a **physical interface** used to connect end devices.

Types of Switch Ports:

1. Access Port

- Connects to **end devices**
- Carries **single VLAN**

Switch(config)# interface fa0/1

Switch(config-if)# switchport mode access

Switch(config-if)# switchport access vlan 10

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2. Trunk Port

- Connects **switch to switch**
- Carries **multiple VLANs**

Switch(config)# interface fa0/24

Switch(config-if)# switchport mode trunk

Port Status:

- **Up / Down**
- Can be enabled or disabled

Switch(config-if)# shutdown

Switch(config-if)# no shutdown
