CCNA: Switching, Routing, and Wireless Essentials

**Module 1 – Basic Device Configuration**

**(Cấu hình thiết bị cơ bản)**

*I. Network Fundamentals*

**- OSI Model:** Understand the seven layers and their functions (Application, Presentation, Session, Transport, Network, Data Link, Physical).

**- Network Devices:** Roles of routers, switches, hubs, and end devices.

**- Network Topologies (Cấu trúc liên kết mạng):** Common topologies like star, mesh, and bus, and their advantages/disadvantages.

*II.Network Devices*

**- Routers:** Connect different networks, forward data based on network addresses and maintain routing tables.

**- Switches:** Connect devices within the same network, learn MAC addresses, and forward frames based on MAC addresses.

**- Hubs:** Simple devices that broadcast data to all connected devices.

**- End Devices:** Computers, laptops, smartphones, servers, etc.

*III. Network Topologies*

**- Star Topology:** Central device (usually a switch) connects to all other devices.

**- Mesh Topology:** Every device is connected to every other device.

**- Bus Topology:** All devices are connected to a single cable.

**- Hybrid Topology:** Combination of different topologies.

*IV. Network Protocols*

**- TCP/IP Model:** A simplified model with four layers (Application, Transport, Internet, Network Access).

**- TCP:** Reliable, connection-oriented protocol for data transmission.

**- UDP:** Unreliable, connectionless protocol for faster data transmission.

**- HTTP:** Protocol for transferring data on the World Wide Web.

*V. Network Addressing*

**- IP Addresses:** Unique identifiers for devices on a network (IPv4 and IPv6).

**- Subnetting:** Dividing a network into smaller subnets for better organization and efficiency.

**- Classful and Classless Addressing:** Different methods of assigning IP addresses.

*VI. Network Security Fundamentals*

**- Threats:** Viruses, worms, malware, phishing, denial-of-service attacks.

**- Vulnerabilities:** Weak passwords, unpatched software, open ports.

**- Basic Security Measures:** Strong passwords, firewalls, intrusion detection systems, encryption.