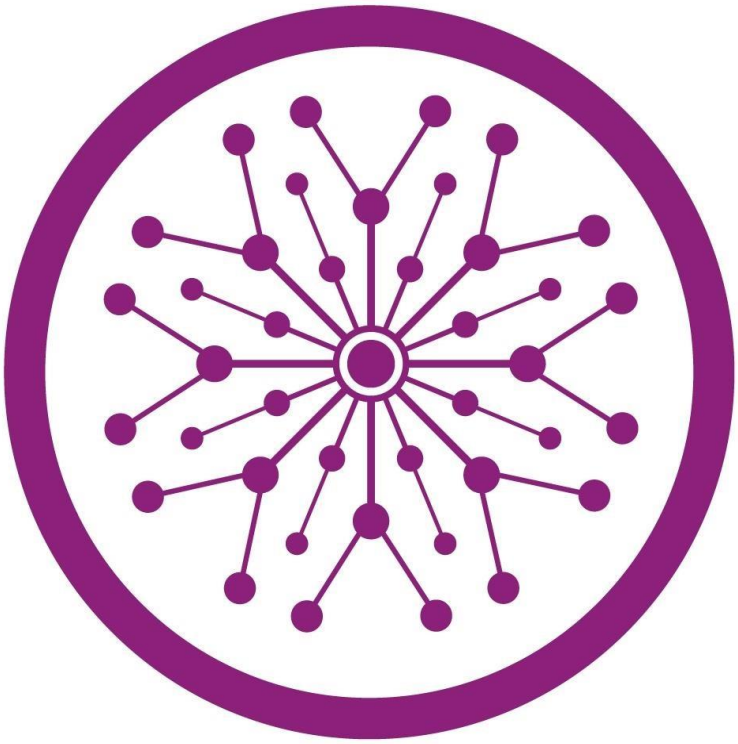
Computer Network



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Section (5-B**)**

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Difference All the Routers in Cisco.

1. Cisco 819 H1G Router

- **Purpose**: Compact IoT/M2M device with integrated 3G/4G support.
- **Key Features**: IOx support for edge computing, cellular connectivity (3G/4G LTE), rugged design.
- **Use Case**: Ideal for mobile, transportation, or remote industrial deployments.

2. PT-Router (Packet Tracer Router)

- **Purpose**: Generic, customizable router model used within Packet Tracer for simulation purposes.
- **Key Features**: Allows you to add and configure modules/interfaces in simulation.
- **Use Case**: Primarily for learning and simulation in Cisco Packet Tracer.

3. PT-Empty 2901

- **Purpose**: An empty router chassis used in Packet Tracer where modules (interfaces like Ethernet, Serial) can be manually inserted.
- **Key Features**: Provides flexibility to simulate different network configurations.
- **Use Case**: Teaching and simulation purposes where you customize the router's hardware.

4. Cisco 1841 Router

- **Purpose**: Entry-level branch office router.
- **Key Features**: Supports WAN and LAN connectivity, security features like VPN, firewall.
- **Use Case**: Small businesses or branch offices requiring basic routing and security.

5. Cisco 1941 Router

- **Purpose**: Integrated Services Router (ISR) for small-to-medium business (SMB) networks.
- **Key Features**: Modular design, support for security features (VPN, firewall), better performance than the 1841.
- **Use Case**: Small branch deployments needing more versatility and security.

6. Cisco 2620XM & 2621XM Routers

- **Purpose**: Multi-service routers for small and branch offices.

- **Key Features**: Modular slots for adding interfaces, limited support for security and voice services.
- **Differences**: The 2620XM supports one Ethernet port, while the 2621XM has two.
- **Use Case**: Small branch networks with basic connectivity needs.

7. Cisco 2811 Router

- **Purpose**: Part of the Cisco 2800 series ISR, providing enhanced performance and versatility.
- **Key Features**: Modular, with support for voice, security, and wireless services.
- **Use Case**: Small-to-medium branch offices requiring more advanced services like VoIP or VPN.

8. Cisco 2911 Router

- **Purpose**: Mid-range ISR for small-to-medium-sized offices.
- **Key Features**: Supports data, voice, video, security, and wireless services, higher throughput compared to 2811.
- **Use Case**: Organizations needing integrated voice, data, and security solutions in one platform.

9. Cisco 819 Router

- **Purpose**: Same as the 819 H1G, focused on IoT and M2M solutions.
- **Key Features**: Integrated 3G/4G, designed for remote sites and machine-to-machine applications.
- **Use Case**: IoT and edge computing environments where cellular connectivity is key.

10. Cisco 4331 ISR Router

- **Purpose**: High-performance ISR router for large branch offices.
- **Key Features**: Modular, supporting high-speed WAN connectivity, SD-WAN, and cloud services.
- **Use Case**: Large offices or branch deployments needing fast WAN services and cloud integration.

11. Cisco 4321 ISR Router

- **Purpose**: Similar to 4331 but slightly lower performance and scalability.
- **Key Features**: Compact ISR for medium-to-large branch offices with modularity.
- **Use Case**: Branch networks needing solid performance with scalability for future needs.

12. Cisco 4221 ISR Router

- **Purpose**: Entry-level model of the Cisco ISR 4000 series.
- **Key Features**: Compact size, supports advanced features like SD-WAN, cloud connectivity.
- **Use Case**: Small branch offices needing advanced services with moderate performance

Difference Between all the Switches in Cisco

1. Cisco 2960 Switch

- **Type**: Layer 2 switch
- **Key Features**: Supports VLANs, STP (Spanning Tree Protocol), port security, and basic QoS.
- **Use Case**: Ideal for small to medium-sized networks requiring only Layer 2 switching without routing. Suitable for basic LAN segmentation and security.

2. Cisco 2950 Switch

- **Type**: Layer 2 switch
- **Key Features**: Supports basic VLANs, STP, and basic port security but lacks advanced features.
- **Use Case**: Used in small networks or for learning purposes when advanced Layer 2 features are not needed.

3. Cisco 3560 Switch

- **Type**: Layer 3 switch (Multi-layer)
- **Key Features**: Provides both Layer 2 switching and Layer 3 routing capabilities. Supports routing protocols (OSPF, EIGRP), inter-VLAN routing, QoS, and advanced security features.
- **Use Case**: Suitable for medium to large networks where routing between VLANs or subnets is required. Typically used in enterprise networks or campus environments.

4. Cisco 3650 Switch

- **Type**: Layer 3 switch (Multi-layer)
- **Key Features**: Advanced Layer 3 capabilities, with support for routing protocols (OSPF, EIGRP, BGP), high-performance inter-VLAN routing, extensive QoS, and PoE (Power over Ethernet).

- **Use Case**: Used in larger networks where both high-performance switching and routing are needed. Ideal for enterprise environments requiring advanced routing, QoS, and PoE for IP phones or wireless access points.

5. PT-Switch

- **Type**: Layer 2 switch (Generic in Packet Tracer)
- **Key Features**: Basic switch functionality with support for VLANs and basic Layer 2 operations. Limited in advanced features compared to the Cisco-specific models.
- **Use Case**: Used for simple network simulations or for beginners learning basic network concepts in Cisco Packet Tracer.

6. PT-Empty Switch

- **Type**: Empty switch chassis (Customizable)
- **Key Features**: Allows users to add and configure their own modules and interfaces.
- **Use Case**: Used when simulating custom-built switches with specific interface needs. Ideal for simulations that require flexibility in terms of hardware configuration.

7. Cisco IE 2000 Switch

- **Type**: Industrial Ethernet Switch (Layer 2)
- **Key Features**: Rugged design, designed for harsh environments, supports VLANs, STP, and advanced security features.
- **Use Case**: Best used in industrial networks, transportation, and energy sectors where rugged, reliable connectivity is required in challenging environments.

8. Cisco 2950T Switch

- **Type**: Layer 2 switch (with gigabit uplink)
- **Key Features**: Similar to the 2950 but includes Gigabit Ethernet uplink ports for faster backbone connectivity.
- **Use Case**: Suitable for small networks needing basic VLANs and STP, with the added need for high-speed uplink to the core network or backbone.

9. PT Bridge

- **Type**: Basic bridge device (Layer 2)
- **Key Features**: Simplistic device used to connect different network segments, no VLAN support or advanced switching capabilities.

- **Use Case**: Used in very basic network simulations for connecting small segments or devices. Rarely used in modern simulations as switches offer more functionality

Difference Between all the Cables in Cisco

1. Console Cable

- **Use**: Connects a computer (PC or laptop) to a router or switch for configuration via CLI.
- **Purpose**: Primarily used for device management and configuration via the console port.

2.Straight-Through Cable

- **Use**: Connects different types of devices (e.g., PC to switch, switch to router).
- **Purpose**: Commonly used for connecting end devices (like computers) to networking devices like switches and routers.

3.Copper Crossover Cable

- **Use**: Connects similar devices (e.g., PC to PC, switch to switch, router to router).
- **Purpose**: Used when connecting two devices of the same type without the need for a switch.

4.Fiber Cable

- **Use**: Connects devices over long distances, typically in a WAN environment or backbone connections.
- **Purpose**: Used for high-speed, long-distance communication, often between switches or routers in large networks.

5.Phone Cable

- **Use**: Connects VoIP phones to switches or voice-enabled routers.
- **Purpose**: Specifically for voice communication in VoIP setups.

6.Coaxial Cable

- **Use**: Used in WAN emulation scenarios, particularly when simulating older broadband technologies.
- **Purpose**: Provides a physical medium for cable-based WAN connections or legacy network setups.

7.Serial DCE Cable

- **Use**: Connects routers via serial interfaces in a WAN setup where one side provides the clocking signal (DCE).
- **Purpose**: Required for WAN links where the router needs to control the clock rate (commonly used in simulations for point-to-point WAN connections).

8.Serial DTE Cable

- **Use**: Connects routers via serial interfaces in a WAN setup where no clock rate is required (DTE side).
- **Purpose**: Used in WAN links where the device receiving the data (DTE) does not control the clocking rate.