**Lab Task: 01**

**Computer Network Lab.**

**Submitted by: Maheen Kashif**

**Rollno:SU92-BSSEM-F22-080**

**Section:5(B)**

**Submitted to: Sir Rasikh**

**DEPARTMENT OF SOFTWARE ENGINEERING**



Superior University, Lahore.

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# **Question#1:**

## **All routers difference in CISCO**

**What is the difference between all the routers, and when to use them (mentioned in cisco packet tracer)**

**Answer:**

In Cisco Packet Tracer, you'll typically encounter several types of routers, each suited for different scenarios. Here’s a breakdown of some common routers and their ideal use cases:

**1.Cisco 184**

**Overview:** A modular router with basic capabilities.

**Use Case:** Suitable for small to medium-sized networks. Good for learning about routing protocols and basic configurations.

**2.Cisco 2811**

**Overview:** Offers more features and supports a higher throughput than the 1841.

**Use Case:** Ideal for medium-sized businesses needing more services, such as security and voice over IP (VoIP).

**3.Cisco 2911**

**Overview:** More powerful and with greater expansion options compared to the 2811.

**Use Case:** Best for branch offices that require advanced features like WAN optimization and higher bandwidth.

**4. Cisco 3925**

**Overview:** High-performance router with multiple slots for modules.

**Use Case:** Suitable for enterprise environments needing high throughput and extensive features, including advanced security.

**5.Cisco 7200**

**Overview:** Designed for large enterprise or service provider networks.

**Use Case:** Ideal for complex network topologies and high-performance routing needs.

**6.Cisco ISR (Integrated Services Routers)**

**Overview:** Combines routing, security, and application services.

**Use Case:** Great for companies looking for an all-in-one solution, including services like VPN, firewall, and VoIP.

**7.Cisco ASR (Aggregation Services Routers)**

**Overview:** Designed for WAN aggregation and high-capacity needs.

**Use Case:** Best for service providers and large organizations focusing on efficient traffic management.

**When to Use Each Router:**

**Basic Learning:** Start with the 1841 or 2811 to grasp basic routing concepts.

**Medium Networks:** Use the 2911 or 3925 for more features and better performance.

**Enterprise Needs:** Choose the 7200 or ASR for complex, high-capacity requirements.

**Integrated Services:** Opt for ISRs when you need multiple services in one device.

**Conclusion:**

Understanding the specific needs of your network environment will help you choose the appropriate router. Each model has its strengths, so aligning those with your requirements is key to effective network design.

Question:02

What is the difference between all the switches, and when to use them (mentioned in cisco packet tracer)

**Answer:**

In Cisco Packet Tracer, you typically encounter a few types of switches, each serving different purposes in anetwork. Here’s a breakdown of the common types of switches and their uses:

# **Question#2:**

## **All switches difference in CISCO**

**1. Unmanaged Switches**

**Description:** Simple plug-and-play devices without configuration options.

**Use Case:** Ideal for small networks or home environments where minimal management is needed. They work well for connecting devices without any complex networking requirements.

**2. Managed Switches**

**Description:** Switches that allow for configuration, management, and monitoring of the network.

**Use Case:** Used in larger networks where performance and security are critical. They allow for VLAN support, Quality of Service (QoS) settings, and remote management. Useful in enterprise environments.

**3. Layer 2 Switches**

**Description:** Operate at the data link layer (Layer 2) of the OSI model and make forwarding decisions based on MAC addresses.

**Use Case:** Common in LANs for switching traffic between devices. They’re suitable for networks that don’t require advanced routing capabilities.

**4. Layer 3 Switches**

**Description**: Capable of routing traffic between different VLANs and can operate at both Layer 2 and Layer 3 of the OSI model.

**Use Case:** Useful in networks where routing is needed between VLANs, combining the functions of a switch and a router. They are often used in large enterprise networks.

**5. PoE (Power over Ethernet) Switches**

**Description:** Can deliver power and data over the same Ethernet cable.

**Use Case:** Ideal for powering devices like IP cameras, VoIP phones, and wireless access points without needing separate power sources.

**6. Stackable Switches:**

**Description:** Can be stacked together to function as a single unit, allowing for easier management and scalability.

**Use Case:** Great for growing networks where additional ports may be needed without a complete overhaul of the existing infrastructure.

**Summary of Use Cases:**

**Unmanaged Switches:** Small/home networks.

**Managed Switches:** Larger enterprise networks requiring control and monitoring.

**Layer 2 Switches:** Standard LANs without routing.

**Layer 3 Switches:** Networks needing inter-VLAN routing.

**PoE Switches:** Situations requiring power and data delivery.

**Stackable Switches:** Networks anticipating growth or needing centralized management.

Choosing the right switch depends on your specific network needs, size, and complexity.

**Question:03**

What is the difference between all the connection wires, and when to use them (mentioned in cisco packet tracer)

**Answer:**

In Cisco Packet Tracer, different types of connection cables are used for various networking scenarios. Here’s a breakdown of the main types of cables and their appropriate uses:

**1.Straight-Through Cable:**

**Description:** This cable has the same wiring on both ends (1-1, 2-2, etc.).

**Use Case**: Used to connect different devices, such as:

**PC to Switch**

**Router to Switch**

**Hub to Switch**

**2. Crossover Cable:**

**Description:** This cable has different wiring on each end (1-3, 2-6, etc.), allowing for direct device communication.

**Use Case:** Used to connect similar devices directly, such as:

**PC to PC**

**Switch to Switch**

**Router to Router**

**3. Rollover Cable:**

**Description:** A special type of cable used for connecting a computer’s serial port to a console port on a router or switch.

**Use Case:** Used for console access to network devices for configuration and management. Typically used in:

**PC to Router Console Port**

**PC to Switch Console Port**

**4. Fiber Optic Cable:**

**Description:** Uses light to transmit data, providing high-speed connections over long distances with minimal loss.

**Use Case:** Ideal for high-bandwidth, long-distance connections between network devices or for connecting to backbone infrastructure.

**Summary of Use Cases:**

**Straight-Through Cable:** Different devices (PC to switch, router to switch).

**Crossover Cable:** Similar devices (PC to PC, switch to switch).

**Rollover Cable:** Console access for configuration (PC to router/switch console).

**Fiber Optic Cable:** High-speed, long-distance connections.

When selecting the right cable, consider the devices being connected and the specific networking scenario to ensure optimal performance and connectivity.