# 

**Assignment:**

LAB TASK 1

**Course:**

Computer Network LAB

**Section:**

Data Science 5-A

**Submitted to:**

Sir Rasikh

**Submitted by:**

M Huzaifa

Roll No: SU92-BSDSM-F22-019

**Date:**

20/09/2024

# Lab 1 Task

**Task 1**

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

In Cisco Packet Tracer, different routers serve various purposes based on their capabilities and intended use. Here’s a brief overview of some common router models and when to use them:

**1. Cisco 1941 Router**

**- Description:** A versatile router suitable for small to medium-sized networks.

**- When to Use:** Ideal for basic routing tasks, such as connecting to the internet or managing small office networks.

**2. Cisco 2901 Router**

**- Description:** An improved version of the 1941, offering more features and better performance.

**- When to Use:** Suitable for small businesses needing additional services like security and voice over IP (VoIP).

**3. Cisco 2911 Router**

**- Description:** Similar to the 2901 but with enhanced performance and modular capabilities.

**- When to Use:** Best for medium-sized networks requiring advanced features such as VPN support and increased throughput.

**4. Cisco 4321 Router**

**- Description:** A part of the ISR (Integrated Services Router) series, designed for branch offices.

**- When to Use:** Ideal for larger enterprises needing robust security, high performance, and support for multiple WAN connections.

**5. Cisco 4331 Router**

- Description: A more powerful version of the 4321, offering better performance and scalability.

**- When to Use:** Suitable for large branch offices or enterprises that require high-speed connectivity and advanced services.

**Summary of Differences**

**- Performance:** Higher models (like the 4331) provide better performance and can handle more traffic.

**- Features:** Each router model supports different features; higher-end routers often include advanced functionalities like enhanced security protocols, VPN support, and modular interfaces.

**- Scalability:** As your network grows, you may need a router that can scale with your needs; higher models typically offer more options for expansion.

Task 2:

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

In Cisco Packet Tracer, different switches are available, each designed for specific networking needs. Here’s a brief overview of some common switches and when to use them:

**1. Cisco 2960 Switch**

**- Description:** A Layer 2 switch that supports basic switching functions and VLANs (Virtual Local Area Networks).

**- When to Use:** Ideal for small to medium-sized networks where you need to connect multiple devices and manage traffic efficiently. It’s commonly used in office environments.

**2. Cisco 3560 Switch**

**- Description:** A Layer 3 switch that combines the features of a switch and a router, allowing for routing between VLANs.

**- When to Use:** Best for larger networks that require inter-VLAN routing and more advanced features like Quality of Service (Qu’s) and security protocols.

**3. Cisco 2950 Switch**

**- Description:** An older Layer 2 switch with basic features and no support for VLAN routing.

**- When to Use:** Suitable for legacy systems or smaller networks where advanced features are not necessary.

**4. Cisco 3750 Switch**

**- Description:** A more advanced Layer 3 switch that supports stacking, allowing multiple switches to operate as a single unit.

**- When to Use:** Ideal for enterprise-level networks requiring high availability, redundancy, and advanced management features.

**Summary of Differences**

**- Layer Functionality:** The main difference between these switches is their layer functionality (Layer 2 vs. Layer 3). Layer 2 switches (like the 2960) manage data within the same network segment, while Layer 3 switches (like the 3560) can route data between different segments.

**- Features:** Higher-end models offer more features such as VLAN support, routing capabilities, and enhanced security options.

**- Use Case:** Choose a switch based on the size of your network and the specific features you need. For example, use a Cisco 2960 for simple connectivity in small networks, while a Cisco 3560 or 3750 is better for larger networks needing advanced routing and management.

By understanding these differences, you can select the appropriate switch for your networking needs in Cisco Packet Tracer.

# Task 3:

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

In Cisco Packet Tracer, different types of connection wires are used to link devices in a network. Here’s a brief overview of the main types of cables and when to use them:

**1. Copper Straight-Through Cable**

**- Description:** This cable connects devices of different types, such as a switch to a computer or a router to a switch.

**- When to Use:** Use it when connecting:

- A switch to a PC

- A router to a switch

- A router to a hub

**2. Copper Crossover Cable**

**- Description:** This cable connects similar devices directly, such as two switches or two routers.

**- When to Use:** Use it when connecting:

- Switch to switch

- Router to router

- PC to PC (for direct connections)

**3. Fiber Optic Cable**

**- Description:** This type of cable uses light signals to transmit data over long distances and provides high-speed connections.

**- When to Use:** Use it for:

- Long-distance connections where high bandwidth is required

- Connecting buildings in a campus network

**4. Serial Cable**

**- Description:** This cable is used for point-to-point connections between routers over WAN links.

**- When to Use:** Use it when connecting:

- Routers in different locations through a WAN link

**Summary of Usage**

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

**- Crossover Cable:** Similar devices (e.g., switch to switch).

**- Fiber Optic Cable:** Long-distance, high-speed connections.

**- Serial Cable:** WAN connections between routers.

By choosing the correct type of cable for your connections in Cisco Packet Tracer, you ensure that your network operates efficiently and effectively.