**Name** : M Hassam Imtiaz

**Roll no** 176

**Task 1** : CN Lab

### 

**Q1.What is the difference between all the routers, and when to use them (mentioned in cisco packet tracer)**

Routers in Cisco Packet Tracer can be categorized into several types, each with its own unique characteristics and use cases.

The main difference between these routers lies in their functionality, performance, and the type of networks they support. Here's a brief overview of each type of router:

**Edge Routers**

Edge routers are used to connect multiple networks together. They are typically placed at the edge or boundary of networks and are responsible for routing traffic between them.

**Core Routers**

Core routers are high-performance routers that are used to distribute data packets within a network. They are designed to handle large amounts of traffic and are typically used in large-scale networks.

**Virtual Routers**

Virtual routers are software-based routers that allow computers and servers to operate like routers. They are flexible and can be scaled as the business grows.

**Wired and Wireless Routers**

Wired and wireless routers are used in homes and small offices to share data over cables or wirelessly. Wired routers create wired local area networks (LANs), while wireless routers create wireless local area networks (WLANs). [1]

In Cisco Packet Tracer, the following routers are available:

* Cisco 2620XM ISR router
* Cisco 2621XM ISR router
* Cisco 2811 ISR router
* Cisco 1941 ISR router
* Cisco 2901 ISR router
* Cisco 2911 ISR router
* Cisco 819 ISR router
* Cisco 829 ISR router
* Cisco CGR 1240 rugged router
* Cisco 4321 ISR router
* Cisco 4331 Integrated Services Router

Each of these routers has its own unique features and capabilities, and the choice of which one to use depends on the specific requirements of the network.

For example, the Cisco 2620XM ISR router is a one-network module slot platform with one fixed 10/100 (100BASE-TX) Ethernet port, two integrated WAN Interface Card (WIC) slots, and one Advanced Integration Module (AIM) slot.

On the other hand, the Cisco 4331 Integrated Services Router is a high-performance router that features Cisco IOS image resilience through secure boot-image and secure boot-config commands and adds network programmability support to Packet Tracer through NETCONF / YANG protocols.

When deciding which router to use, consider factors such as the size of the network, the type of traffic, and the level of security required. It's also important to consider the compatibility of the router with other network devices and the ease of configuration and management.

**Q2.What is the difference between all the switches, and when to use them (mentioned in cisco packet tracer)**

Switches in Cisco Packet Tracer can be categorized into several types, each with its own unique characteristics and use cases.

The main difference between these switches lies in their functionality, performance, and the type of networks they support. Here's a brief overview of each type of switch:

**Unmanaged Switches**

Unmanaged switches are basic, plug-and-play devices that operate at Layer 2 of the OSI model. They are simple, cost-effective, and easy to install, but they lack advanced features and management capabilities.

**Managed Switches**

Managed switches are more advanced than unmanaged switches and operate at Layer 2 and Layer 3 of the OSI model. They offer advanced features such as VLANs, Spanning Tree Protocol, and Quality of Service (QoS), and can be configured and managed through a command-line interface (CLI) or a graphical user interface (GUI).

**PoE Switches**

PoE (Power over Ethernet) switches are designed to provide power to devices over Ethernet cables, eliminating the need for separate power supplies. They are commonly used in VoIP phone systems, IP cameras, and wireless access points.

**Stackable Switches**

Stackable switches are designed to be connected together to form a single, logical switch. They offer high availability, scalability, and ease of management, and are commonly used in large-scale networks.

In Cisco Packet Tracer, the following switches are available:

* Cisco 2950-24 Switch
* Cisco 2950C-24 Switch
* Cisco 2960-24TT Switch
* Cisco 2960-48TT Switch
* Cisco 3560-24PS Switch
* Cisco 3560-48PS Switch
* Cisco 3750-24PS Switch
* Cisco 3750-48PS Switch
* Cisco 3850-24P Switch
* Cisco 3850-48P Switch

Each of these switches has its own unique features and capabilities, and the choice of which one to use depends on the specific requirements of the network.

For example, the Cisco 2950-24 Switch is a 24-port, Layer 2 switch with 24 10/100 Ethernet ports and 2 Gigabit Ethernet ports.

On the other hand, the Cisco 3850-24P Switch is a 24-port, Layer 3 switch with 24 10/100/1000 Ethernet ports, 2 Gigabit Ethernet ports, and PoE+ support.

When deciding which switch to use, consider factors such as the size of the network, the type of traffic, and the level of security required. It's also important to consider the compatibility of the switch with other network devices and the ease of configuration and management.

**Q3.What is the difference between all the connection wires, and when to use them (mentioned in cisco packet tracer)**

### **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.