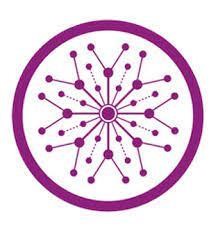
**Computer Networks Lab**



**Name: M Usman**

**Roll no: DS-014**

**Program: Data Sciences**

**Section: 5A**

**Subject: Computer Networks Lab**

**Task # 1**

**QNO:1**

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

**1. ISR 4331**

* **Type**: Integrated Services Router (ISR)
* **Features**: High performance, modular, supports various services including voice, video, and security.
* **Use Case**: Suitable for medium to large enterprises needing scalability and advanced features for branch offices.

**2. ISR 4321**

* **Type**: Integrated Services Router (ISR)
* **Features**: Lower capacity compared to 4331, modular with some features for WAN connectivity and security.
* **Use Case**: Ideal for small to medium branch offices where cost efficiency is important.

**3. Cisco 1941**

* **Type**: ISR
* **Features**: Modular, designed for small businesses; supports security and routing.
* **Use Case**: Suitable for small offices that require basic routing and security features.

**4. Cisco 2901**

* **Type**: ISR
* **Features**: Modular, supports voice, video, and data; offers a good balance of performance and features.
* **Use Case**: Appropriate for small to medium-sized businesses needing reliable routing and modularity.

**5. Cisco 2911**

* **Type**: ISR
* **Features**: Modular with enhanced performance and integrated services like security and voice.
* **Use Case**: Great for small to medium businesses that need advanced features without high costs.

**6. Cisco 819HG-4G-IOX**

* **Type**: ISR
* **Features**: Designed for mobile applications with integrated 4G LTE; lightweight and compact.
* **Use Case**: Ideal for remote sites or temporary deployments requiring mobile broadband connectivity.

**7. Cisco 819HGW**

* **Type**: ISR
* **Features**: Similar to the 819HG but may include additional features like integrated Wi-Fi.
* **Use Case**: Best for remote offices or mobile applications needing wireless connectivity.

**8. Cisco 829**

* **Type**: ISR
* **Features**: Integrated LTE for mobile connectivity; compact design.
* **Use Case**: Useful for remote or edge applications where conventional WAN access is unavailable.

**9. CGR-1240**

* **Type**: Converged Gateway Router
* **Features**: Designed for IoT applications with support for various protocols.
* **Use Case**: Ideal for industrial environments or smart city applications in which connecting numerous IoT devices is necessary.

**10. Router-PT**

* **Type**: Simulation Router in Packet Tracer
* **Features**: Basic routing capabilities, not tied to specific hardware.
* **Use Case**: Used for educational purposes and learning in Cisco Packet Tracer.

**11. Router-PT-Empty**

* **Type**: Simulation Router in Packet Tracer
* **Features**: Empty simulation router, providing a clean slate for configuration.
* **Use Case**: Good for practice and testing configurations without pre-defined settings.

**12. Cisco 1841**

* **Type**: ISR
* **Features**: Entry-level router; basic modular capabilities.
* **Use Case**: Suitable for small offices needing fundamental routing functions.

**13. Cisco 2620XM**

* **Type**: ISR
* **Features**: Older model with modular capabilities; supports basic routing and security.
* **Use Case**: Best for small legacy environments or labs for educational purposes.

**14. Cisco 2621XM**

* **Type**: ISR
* **Features**: Similar to 2620XM but offers enhanced performance.
* **Use Case**: Useful in small to medium-sized offices or for learning environments.

**15. Cisco 2811**

* **Type**: ISR
* **Features**: Modular, supports a wide range of services including voice and video.
* **Use Case**: Ideal for small to medium-sized enterprises needing versatile functionality.

**QNO:2**

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

**1. 2960-24TT**

* **Type:** Layer 2 Switch
* **Ports:** 24 Fast Ethernet ports
* **Use Case:** Ideal for small to medium-sized networks where basic switching capabilities are needed. It supports VLANs and basic Layer 2 features.

**2. Switch-PT**

* **Type:** Generic Switch (Placeholder)
* **Use Case:** This is often used for quick simulations and doesn't represent a specific model. It can help visualize basic connectivity without specific configurations.

**3. Switch-PT-Empty**

* **Type:** Empty Placeholder Switch
* **Use Case:** Similar to Switch-PT but without any pre-configured settings. It’s useful for building custom topologies from scratch.

**4. 3560-24PS**

* **Type:** Layer 3 Switch
* **Ports:** 24 Fast Ethernet ports and 4 Gigabit Ethernet ports
* **Use Case:** Suitable for more advanced networks requiring routing capabilities. Supports VLANs and inter-VLAN routing, making it great for enterprise environments.

**5. IE-2000**

* **Type:** Industrial Ethernet Switch
* **Use Case:** Designed for harsh environments, this switch is suitable for industrial automation applications. It's robust and provides extended temperature ratings.

**6. Bridge-PT**

* **Type:** Generic Bridge
* **Use Case:** Used to simulate bridging between networks. It’s helpful for demonstrating basic network segmentation and connectivity concepts.

**7. 2950-24**

* **Type:** Layer 2 Switch
* **Ports:** 24 Fast Ethernet ports
* **Use Case:** A good option for small networks, similar to the 2960 but generally has fewer features. Used for basic VLAN configurations.

**8. 2950T-24**

* **Type:** Layer 2 Switch
* **Ports:** 24 Fast Ethernet ports with additional features compared to 2950-24
* **Use Case:** Typically supports additional protocols like Rapid Spanning Tree Protocol (RSTP) and is suitable for slightly more complex networks.

**QNO:3**

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

**1. Automatically Choose Connection Type**

* **Use Case:** This option allows Packet Tracer to select the appropriate cable type based on the devices being connected. It's convenient for beginners or for quick setups.

**2. Console Cable**

* **Type:** Usually a rollover cable (RJ-45 to DB-9)
* **Use Case:** Connects a computer (or terminal) to a router or switch console port for management and configuration. It’s primarily used for initial setup or troubleshooting.

**3. Copper Straight-Through Cable**

* **Use Case:** Connects devices of different types, such as:
  + Switch to router
  + Switch to computer
  + Computer to router
* **Wiring:** Pins are arranged the same on both ends. This is the most common cable type used in networking.

**4. Copper Cross-Over Cable**

* **Use Case:** Connects devices of the same type, such as:
  + Switch to switch
  + Router to router
  + Computer to computer
* **Wiring:** Pins are crossed between ends. It's less common now due to auto-MDI/MDI-X features in modern devices.

**5. Fiber Cable**

* **Use Case:** Used for high-speed, long-distance connections between network devices, such as switches, routers, or servers. Ideal for backbone connections in larger networks.

**6. Phone Cable**

* **Type:** Typically a standard telephone cable (RJ-11)
* **Use Case:** Used to connect telephone devices. In networking, it's less common, but it might be used for older technologies like dial-up modems.

**7. Coaxial Cable**

* **Use Case:** Historically used for connecting cable modems, TVs, and some older Ethernet networks. It’s less common in modern networking but still applicable in specific scenarios (e.g., certain WAN connections).

**8. Serial-DTE Cable**

* **Use Case:** Connects a Data Terminal Equipment (DTE) device to a Data Communication Equipment (DCE) device, typically used for WAN links or point-to-point connections. Commonly used in older routers.

**9. Octal Cable**

* **Use Case:** Connects to devices with multiple ports, like connecting a single device to multiple routers or switches. It’s useful for simulations involving multiple interfaces.

**10. Custom Cable**

* **Use Case:** Allows you to configure specific cable types and pinouts manually. Useful for specialized scenarios or experiments not covered by standard cables.

**11. USB Cable**

* **Use Case:** Connects devices using USB interfaces. While not common in traditional networking, it can be used for connecting computers to some networking devices for configuration or data transfer.