**Computer Network Lab**



**Lab Task 1**

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**Answer no: 1**

In Cisco Packet Tracer, various types of routers are available, each designed for specific tasks and environments.

**1. Cisco 1841 Router**

**Usage:** Small to medium-sized networks.

**Key Features:** Basic routing, firewall, NAT, VPN, and WAN interfaces.

**When to Use**: Best for small businesses or home offices where simple routing and security are required.

**2. Cisco 1941 Router**

**Usage:** Medium-sized networks.

**Key Features:** Enhanced performance, security features like VPN, firewall, and supports more interfaces than the 1841.

**When to Use**: Ideal for growing businesses that need more connectivity options and moderate security.

**3. Cisco 2811 Router**

**Usage:** Medium to large businesses.

**Key Features:** Modular, higher performance, support for advanced security, voice services, and VPNs.

**When to Use:** Use when scalability and modularity are needed for businesses with expanding network needs.

**4. Cisco 2911 Router**

**Usage:** Large businesses and enterprises.

**Key Features:** More advanced and scalable than the 2811, with high throughput, modular interfaces, and support for advanced services.

**When to Use:** When you need to handle a larger network with advanced routing, security, and VoIP.

**5. Cisco 4321 Router**

**Usage:** Large enterprises or data centers.

**Key Features:** It is high-performance, scalable, and suitable for large branch offices, and it integrates routing, security, and WAN.

**When to Use Each Router**:

**Cisco 1841/1941:** Basic routing and security are sufficient for small to medium networks.

**Cisco 2811/2911:** For medium to large businesses that need more interfaces, higher performance, and additional services like voice and video support.

**Cisco 4321:** For large enterprises or data centers requiring high throughput, advanced services, and extensive scalability.

**Answer no: 2**

In Cisco Packet Tracer, various types of switches are available, each serving different purposes in networking environments.

**1. Unmanaged Switches (e.g., 2960)**

**Usage:** Basic Layer 2 switches used for small to medium networks.

**Key Features:** Supports basic switching, VLANs, and trunking, No Layer 3 (routing) capabilities.

**When to Use:** Suitable for small networks where only basic Layer 2 switching and VLAN segmentation are needed. This is common in small businesses or branch offices.

**2. Managed Switches (e.g., 2960, 3560)**

**Usage:** More advanced Layer 2 or Layer 3 switching features for medium to large networks.

**Key Features:**

**2960:** Layer 2 switch with VLAN support, STP (Spanning Tree Protocol), and trunking.

**3560:** Layer 3 switch with routing capabilities, along with all Layer 2 features.

**When to Use:**

**2960:** When you need VLAN support and basic network segmentation in a small to medium-sized network.

**3560:** In a medium to large network where routing between VLANs is required. The 3560 has basic Layer 3 functionality (inter-VLAN routing).

**3. Layer 3 Switches (e.g., 3560, 3650)**

**Usage:** These switches provide both Layer 2 and Layer 3 functions, making them suitable for routing within a network without needing a dedicated router.

**Key Features:** Can perform routing between VLANs, Includes advanced features like QoS (Quality of Service) and security policies.

**When to Use:** Use in larger networks where you need routing capabilities along with standard switching. This is common in large campus networks or enterprise environments.

**4. Multilayer Switches (e.g., 3650)**

**Usage:** High-performance Layer 2 and Layer 3 switching for enterprise environments.

**Key Features:** Advanced routing capabilities along with switching (OSPF, EIGRP), Suitable for large networks requiring high throughput and advanced routing.

**When to Use:** In large, complex networks where both Layer 2 and Layer 3 services are needed, especially when high performance and scalability are important.

**When to Use Each Switch:**

**Cisco 2960:** For simple Layer 2 switching needs with VLAN support, used in small to medium networks.

**Cisco 3560**: For networks requiring both Layer 2 and Layer 3 functionality, such as routing between VLANs.

**Cisco 3650:** For enterprise environments needing high-performance Layer 2/3 switching and advanced routing capabilities.

**Answer no: 3**

In Cisco Packet Tracer, there are several types of connection cables used to connect devices. Each cable type serves a different purpose depending on the type of connection between devices.

**1. Console Cable (Light Blue)**

**Usage:** Used to configure devices by connecting a computer to the console port of a network device, like a router or switch.

**When to Use**: When you need to access and configure a router or switch directly via the Command Line Interface (CLI) from a terminal (like a PC or laptop).

**2. Straight-through Cable (Solid Green)**

**Usage:** This is an Ethernet cable used to connect different types of devices, such as a computer to a switch or a switch to a router.

**When to Use:** PC to Switch**,** Switch to Router**,** Switch to Hub**.** This is the most common cable used in network setup to connect devices operating on different OSI layers.

**3. Crossover Cable (Solid Red)**

**Usage:** Used to connect similar devices, such as two computers, two switches, or two routers directly.

**When to Use:**PC to PC**,** Switch to Switch**,** Router to Router**.** This cable allows data transfer between two devices of the same type.

**4. Fiber Optic Cable (Solid Light Blue)**

**Usage:** Provides high-speed and long-distance connections between network devices, typically used to connect two routers, switches, or for backbone network connections.

**When to Use:** High-speed connections over long distances.For interconnecting switches in a large enterprise network where high throughput is required.

**5. Serial DCE (Clock) Cable (Solid Light Purple)**

**Usage:** Used for WAN (Wide Area Network) connections between routers, typically in lab environments.

**When to Use:** To simulate WAN links between routers.

One router is designated as the DCE (Data Communications Equipment) and provides the clocking signal, while the other is DTE (Data Terminal Equipment).

**6. Serial DTE (No Clock) Cable (Solid Light Purple)**

**Usage:** The counterpart to the DCE cable, used in WAN simulation.

**When to Use:** When you are connecting routers in a WAN scenario.The DTE side does not provide a clock signal, but the DCE side does.

**7. Coaxial Cable (Solid Black)**

**Usage:** Primarily used in older network configurations, especially in cable broadband connections.

**When to Use:** Rarely used in modern networks but sometimes used in Packet Tracer for simulating certain older network setups like broadband internet.

**8. Phone Line (Solid Purple)**

**Usage:** Used in Packet Tracer to connect telephones or simulate a connection between a phone and a modem/router.

**When to Use:** For voice over IP (VoIP) or analog phone simulations in a network.

**9. USB Cable (Black with Red Ends)**

**Usage:** Connects devices with USB ports (e.g., PCs or laptops) to other network devices for data transfer or configuration purposes.

**When to Use:** Used for direct USB connections between devices or for simulating USB tethering.