**Computer Networks Lab**



***Task 1***

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**1. Difference Between All the Routers in Cisco Packet Tracer**

In Cisco Packet Tracer, routers are differentiated based on their performance, features, and the scale of the networks they support.

* **1841 Router**:
  + **Features**: Basic routing for small-to-medium networks, supports static routes, RIP, OSPF.
  + **When to Use**: For small networks or labs with basic routing needs.
* **1941 Router**:
  + **Features**: More powerful than 1841, better security (like firewalls), supports more interfaces and more advanced routing protocols.
  + **When to Use**: For small-to-medium businesses requiring more security and interface options than 1841.
* **2811 Router**:
  + **Features**: Suitable for medium-sized enterprises, supports multiple WAN interfaces and more advanced routing protocols like BGP and advanced QoS.
  + **When to Use**: In medium-sized networks where WAN connections and advanced routing features are needed.
* **2911 Router**:
  + **Features**: High-performance router with more interfaces, supports VPNs, advanced security, and higher speeds.
  + **When to Use**: For large enterprise networks with multiple WANs and advanced security requirements.
* **ISR Routers (Integrated Services Routers)**:
  + **Features**: Combines routing with additional services like voice, video, and security. Example: ISR 4321, which supports services like VPNs, voice, and video communication along with traditional routing.
  + **When to Use**: For larger networks that need integrated services such as voice, video, and enhanced security.

**2. Difference Between All the Switches in the Cisco Packet Tracer**

Switches in Cisco Packet Tracer vary based on their layer of operation (Layer 2 or Layer 3) and their capacity for features like VLANs and routing.

* **Unmanaged Switch (PT-Switch)**:
  + **Features**: Simple plug-and-play switch, no configuration needed, no VLAN support.
  + **When to Use**: For very basic networks where simple connectivity is required without any configuration.
* **2960 Switch**:
  + **Features**: Layer 2 switch, supports VLANs, port security, spanning tree, and basic management features.
  + **When to Use**: In small to medium-sized LANs where VLAN segmentation and basic security features are required.
* **3560 Switch**:
  + **Features**: Layer 3 switch, supports VLANs, inter-VLAN routing, access control lists (ACLs), and routing protocols.
  + **When to Use**: For larger, more complex networks requiring inter-VLAN routing, typically used for networks with multiple VLANs that need to communicate with each other.
* **Multi-Layer Switch (MLS)**:
  + **Features**: Combines Layer 2 switching with Layer 3 routing, supports high-performance routing between VLANs.
  + **When to Use**: In large enterprise networks where high traffic and advanced routing features are needed for efficient inter-VLAN communication.

**3. Difference Between All the Connection Wires in Cisco Packet Tracer**

The different cables in Cisco Packet Tracer are used to represent real-world physical connections between devices. Each cable has specific use cases depending on the devices you are connecting.

* **Copper Straight-Through Cable**:
  + **Use**: To connect different types of devices (e.g., PC to switch, switch to router).
  + **When to Use**: For connecting end devices like PCs, printers to network devices such as switches and routers.
* **Copper Cross-Over Cable**:
  + **Use**: To connect similar devices (e.g., switch to switch, PC to PC, or router to router).
  + **When to Use**: When connecting devices of the same type (e.g., switch-to-switch or router-to-router without using an uplink port).
* **Fiber Optic Cable**:
  + **Use**: For high-speed, long-distance connections between devices.
  + **When to Use**: When connecting core routers, switches, or data centers over large distances or where high data transfer speeds are required.
* **Serial Cable**:
  + **Use**: For connecting routers via serial interfaces, common in WAN connections.
  + **When to Use**: When creating point-to-point WAN connections between routers, simulating WAN environments.
* **Console Cable**:
  + **Use**: For connecting a PC to the console port of a switch or router for configuration purposes.
  + **When to Use**: When manually configuring devices via the console, typically during initial setup or troubleshooting.

**4. Make and copy the network of "Lab-7" (2-3 rows of computers, or all) and assign IP (if you could) to all the systems. (User Server, Switch & End-Devices: Laptop/PC)**

