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Subject: CN Lab  
Task 1

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### **Task 1: Difference Between Routers and Their Use Cases in Cisco Packet Tracer**

Cisco Packet Tracer includes various router models that vary in their specifications, interfaces, and use cases. Here's an overview:

#### **1. Basic Routers (e.g., 1841, 1941):**

* **Purpose**: Designed for small to medium-sized networks.
* **Features**: Limited ports (2 Fast Ethernet), modular slots for WAN/LAN cards.
* **Use Case**: Suitable for learning basic routing concepts like static routing, RIP, OSPF, etc.

#### **2. Advanced Routers (e.g., 2811, 2911):**

* **Purpose**: Support more users and advanced features like voice, security, and higher throughput.
* **Features**: More interfaces (Fast Ethernet, Serial), higher performance, voice modules.
* **Use Case**: Best for simulations involving medium enterprise networks and protocols like EIGRP and BGP.

#### **3. ISR Routers (e.g., 4321, ISR G2 series):**

* **Purpose**: Integrated Services Routers, offering robust connectivity with features like security, wireless, and advanced QoS.
* **Features**: Gigabit Ethernet, multiple modular slots, high-performance processing.
* **Use Case**: Simulating modern, high-demand networks requiring scalability.

#### **4. Modular Routers (e.g., 7200 Series):**

* **Purpose**: High-end, modular routers with extensive scalability.
* **Features**: Support for multiple modules, high-speed interfaces, and advanced routing capabilities.
* **Use Case**: Large enterprise simulations and WAN setups requiring MPLS, QoS, or VPNs.

### **Task 2: Difference Between Switches and Their Use Cases in Cisco Packet Tracer**

Switches in Cisco Packet Tracer also differ based on their layer, performance, and use cases:

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

* **Purpose**: Basic Layer 2 switching with minimal configuration.
* **Features**: Simple to use, supports VLANs, limited management options.
* **Use Case**: Ideal for basic LAN setups or learning VLANs.

#### **2. Managed Switches (e.g., 3560, 3650):**

* **Purpose**: Layer 3 capabilities with routing features.
* **Features**: VLAN routing (Inter-VLAN), QoS, and STP (Spanning Tree Protocol).
* **Use Case**: Enterprise networks requiring advanced Layer 2 and 3 capabilities.

#### **3. Multilayer Switches (e.g., 3850, 4500 Series):**

* **Purpose**: Combine Layer 2 switching with Layer 3 routing.
* **Features**: High performance, dynamic routing protocols, and QoS.
* **Use Case**: High-performance networks with dense traffic, such as campus or data centers.

#### **4. Distribution/Core Switches (e.g., Catalyst 6500):**

* **Purpose**: High-capacity switches designed for core network infrastructure.
* **Features**: High port density, redundant power supplies, and advanced traffic management.
* **Use Case**: Core/backbone of enterprise networks, handling heavy traffic.

### **Task 3: Difference Between Connection Wires and Their Use Cases in Cisco Packet Tracer**

Cisco Packet Tracer includes various cables for network connectivity, each with specific purposes:

#### **1. Copper Straight-Through Cable (Green Line):**

* **Purpose**: Connects different device types (e.g., PC to switch, switch to router).
* **Use Case**: Most commonly used for connecting devices in a LAN.

#### **2. Copper Cross-Over Cable (Red Line):**

* **Purpose**: Connects similar device types (e.g., PC to PC, switch to switch).
* **Use Case**: Required for older devices lacking auto MDI-X support.

#### **3. Fiber Optic Cable (Yellow Line):**

* **Purpose**: High-speed, long-distance connections.
* **Use Case**: Connecting switches or routers in separate buildings or over long distances.

#### **4. Serial Cable (Black Line):**

* **Purpose**: Connects routers for WAN connections.
* **Use Case**: Used in WAN simulations requiring serial interfaces (e.g., PPP, HDLC).

#### **5. Console Cable (Light Blue Line):**

* **Purpose**: Establishes direct communication with a device’s console port.
* **Use Case**: For configuring routers/switches via CLI before network deployment.

#### **6. Coaxial Cable:**

* **Purpose**: Connects legacy network devices.
* **Use Case**: Rarely used in modern setups; mainly for understanding legacy systems.

#### **7. Wireless Connections:**

* **Purpose**: Simulates wireless connectivity between access points and end devices.
* **Use Case**: Used in wireless network simulations.