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**SECTION: 5-D**

**COMPUTER NETWORK (LAB)**

### Task 1: ****Difference Between Routers in Cisco Packet Tracer & When to Use Them****

Cisco Packet Tracer offers different router models, each suited for specific network environments:

**Generic Routers** (e.g., **1841, 1941, 2811, 2911**):

* 1. **Purpose**: General-purpose routers for small to medium-sized networks.
  2. **Use Case**: Suitable for small offices or branches, connecting internal networks to ISPs.

**ISR (Integrated Services Routers)** (e.g., **ISR 4321, ISR 4431**):

* 1. **Purpose**: Combines routing with additional services like security, VoIP, and WAN optimization.
  2. **Use Case**: Used in enterprises requiring advanced services such as security or voice communications.

**Modular Routers** (e.g., **2811, 3825**):

* 1. **Purpose**: Modular, allowing for flexibility by adding interface cards for different connections.
  2. **Use Case**: Suitable for networks needing customizable interfaces, such as additional Ethernet or fiber ports.

**High-End Enterprise Routers** (e.g., **ASR 1001, ASR 9000**):

* 1. **Purpose**: High-performance routers for large-scale operations.
  2. **Use Case**: Ideal for ISPs or large enterprises needing high-speed, high-volume data processing.

**Home or Small Office Routers** (e.g., **819 ISR**):

* 1. **Purpose**: Low-cost routers for small networks.
  2. **Use Case**: Best for home offices or small businesses needing basic internet connectivity.

### Task 2: ****Difference Between Switches in Cisco Packet Tracer & When to Use Them****

Cisco Packet Tracer offers different switch models tailored to various network demands:

**Unmanaged Switches**:

* 1. **Purpose**: Basic switches providing simple Ethernet connectivity.
  2. **Use Case**: Small offices or home networks where advanced configurations aren't necessary.

**Managed Switches** (e.g., **2960** series):

* 1. **Purpose**: Allows control over traffic, VLANs, and other advanced settings.
  2. **Use Case**: Enterprise networks needing traffic segmentation, monitoring, or QoS.

**Multilayer Switches** (e.g., **3560, 3650** series):

* 1. **Purpose**: Combines Layer 2 switching with Layer 3 routing capabilities.
  2. **Use Case**: Suitable for large networks requiring both switching and routing, often used in core or distribution layers.

**Core Switches** (e.g., **6500** series):

* 1. **Purpose**: High-performance switches used in the core of large networks.
  2. **Use Case**: Backbone for large enterprises or data centers, handling high-volume traffic.

### Task 3: ****Difference Between Connection Wires in Cisco Packet Tracer & When to Use Them****

**Copper Straight-through Cable**:

* 1. **Purpose**: Connects different devices, like a PC to a switch.
  2. **Use Case**: Commonly used for connecting a host to a switch or a switch to a router.

**Copper Cross-over Cable**:

* 1. **Purpose**: Connects similar devices, like switch to switch or PC to PC.
  2. **Use Case**: Used when connecting two similar devices that don’t support auto-crossover.

**Fiber Optic Cable**:

* 1. **Purpose**: Provides high-speed, long-distance connections using light.
  2. **Use Case**: For high-speed connections between routers or switches over long distances.

**Serial Cable**:

* 1. **Purpose**: Used for point-to-point WAN connections.
  2. **Use Case**: Simulates WAN links between routers in a lab or older WAN setups.

**Console Cable (Roll-over Cable)**:

* 1. **Purpose**: Connects a PC to the console port for configuring routers and switches.
  2. **Use Case**: When accessing a device's configuration through a terminal.

**Coaxial Cable**:

* 1. **Purpose**: Used in older networks or broadband connections.
  2. **Use Case**: Found in older broadband setups or legacy networks.

**Wireless (Signal)**:

* 1. **Purpose**: Provides wireless connections for devices like laptops or access points.
  2. **Use Case**: Used in wireless networking or to connect access points for network coverage.