**Task 01**

**Why Are We Using the 2911 Router?**

**Answer**

**Overview of the 2911 Router**

The Cisco 2911 router is a versatile device designed to meet the needs of small to medium-sized networks. It provides a combination of features, performance, and cost-effectiveness that make it a popular choice.

**Key Reasons for Using the 2911 Router**

1. **Modularity**:
   * The Cisco 2911 supports modularity with multiple interface slots, allowing for the installation of various interface cards. This flexibility enables the router to adapt to changing network requirements.
2. **Performance**:
   * With a dual-core processor and improved memory, the 2911 offers enhanced performance for handling multiple data flows. This is crucial for businesses that require fast and reliable data processing.
3. **Security Features**:
   * The 2911 router comes equipped with built-in security features, such as advanced firewalls and VPN support. This helps ensure the protection of sensitive data and secure remote access for employees.
4. **Scalability**:
   * As a growing business requires more bandwidth and features, the 2911 can scale up with additional modules and services, making it a future-proof solution.
5. **Integrated Services**:
   * The router supports various integrated services, including voice, video, and data, allowing for a consolidated approach to networking. This reduces the need for separate devices and simplifies network management.

**Conclusion**

The Cisco 2911 router is chosen over other routers due to its modularity, performance, security features, scalability, and integrated services. These characteristics make it an ideal choice for organizations that need a reliable and adaptable routing solution.

**Task 02**

**\Why Are We Using the 2950T or 2960 Switch?**

**Answer**

**Overview of the 2950T and 2960 Switches**

The Cisco 2950T and 2960 switches are designed to provide reliable Layer 2 switching capabilities, making them suitable for small to medium-sized networks.

**Key Reasons for Using the 2950T or 2960 Switches**

1. **Layer 2 Switching**:
   * Both switches operate at Layer 2 of the OSI model, which allows for efficient data transfer within a local area network (LAN). They forward frames based on MAC addresses, ensuring smooth communication between devices.
2. **Port Density**:
   * The 2950T and 2960 switches come with various port configurations, typically ranging from 24 to 48 ports. This allows organizations to connect multiple end devices, such as PCs and printers, without requiring additional switches.
3. **Quality of Service (QoS)**:
   * These switches support QoS features, enabling the prioritization of critical network traffic. This is particularly important in environments where voice and video applications are used, ensuring that they receive the necessary bandwidth.
4. **VLAN Support**:
   * Both switches support Virtual Local Area Networks (VLANs), which allow for better network segmentation and improved security. By segmenting traffic, organizations can reduce congestion and enhance performance.
5. **User-Friendly Management**:
   * The 2950T and 2960 switches offer easy-to-use management interfaces, making it simpler for network administrators to configure and monitor the network. This reduces the complexity of managing a network.

**Conclusion**

The choice of the Cisco 2950T or 2960 switch is based on their Layer 2 switching capabilities, port density, QoS support, VLAN functionality, and user-friendly management. These features make them well-suited for small to medium-sized networks.

**Task 03**

**Design the Network of Lab-7 or Lab-8**

**Answer**

**Network Design Overview**

For the network design of "Lab-7" or "Lab-8," we will incorporate a router, a switch, and end devices such as laptops or PCs. This layout will facilitate effective communication and resource sharing within the lab environment.

**Network Components**

1. **Router**: Cisco 2911
   * Connects the internal network to external networks (e.g., the internet).
   * Provides routing capabilities and security features.
2. **Switch**: Cisco 2960
   * Connects multiple end devices within the lab.
   * Supports VLANs and QoS for efficient data handling.
3. **End Devices**:
   * **Computers/Laptops**: 6 PCs/Laptops (in 2-3 rows)
   * Each device will connect to the switch for network access.

**Network Layout Diagram**

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| Cisco 2911 |

| Router |

+---------+---------+

|

|

+---------+---------+

| Cisco 2960 |

| Switch |

+---------+---------+

| | |

+------+------+ +------+------+ +------+

| PC1 | | PC2 | | PC3 |

| PC4 | | PC5 | | PC6 |

+--------------+ +--------------+ +--------------+

**Description of Network Design**

* The **Cisco 2911 router** connects to the **Cisco 2960 switch**, providing internet access and routing capabilities.
* The **Cisco 2960 switch** connects to six end devices (PCs/Laptops), allowing them to communicate with each other and access network resources.
* The layout consists of two to three rows of computers to maximize space and facilitate ease of access.

**Conclusion**

This network design effectively incorporates a router, switch, and end devices to create a functional lab environment. The use of Cisco equipment ensures reliable performance and scalability as future needs arise.