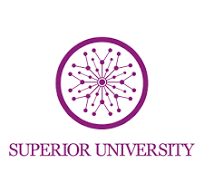
**Lab Manual**

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**SUPERIOR UNIVERSITY LAHORE PAKISTAN**

**LAB -02**

Task 1;

Why are we using 2911 router and not the others?

The **Cisco 2911 router** is often used in networks for several specific reasons, especially in comparison to other models within Cisco's Integrated Services Routers (ISR) portfolio or competitors. Here are some key reasons for choosing the 2911 router:

**1. Performance vs. Cost**

* The **2911** provides a good balance between performance and cost for **mid-sized branch offices or enterprise networks**.
* It can handle a relatively high throughput (up to 50 Mbps with services enabled) compared to smaller routers, while still being more cost-effective than higher-end models like the Cisco 4000 series.

**2. Modularity and Flexibility**

* It has **modular slots** for adding different interfaces like **WAN, voice, and security modules**, giving flexibility for scaling and adapting to different networking needs.
* This modularity is ideal for organizations that may need to support a range of functions such as **VPNs, firewalls, and voice services** in one device.

**3. Service Integration**

* The Cisco 2911 supports a variety of **Cisco IOS security, voice, and application services**, which makes it suitable for branch offices that require an all-in-one device (e.g., routing, security, unified communications, and WAN optimization).
* This level of integration reduces the need for separate hardware, lowering both **hardware and operational costs**.

**4. WAN Flexibility**

* It supports different types of WAN connectivity like **Ethernet, T1/E1, 3G/4G, and even ISDN**, which is useful for businesses needing WAN flexibility across different locations.
* The 2911 can also function in a **dual WAN configuration** for redundancy.

**5. Security Features**

* The router has integrated security services such as **Cisco IOS Firewall, VPN support, and intrusion prevention**, making it suitable for securing branch office connections.

Task 2

Why are we using 2950T or 2960 switch and not the others?

The decision to use Cisco **2950T** or **2960 series** switches over others typically comes down to factors like network requirements, cost, and specific features of these switches. Here's why these two models are often chosen:

**1. Cost Efficiency**

* The **Cisco Catalyst 2950T** and **Cisco 2960** series switches are cost-effective solutions for small to medium-sized networks. They provide essential Layer 2 switching capabilities without the added expense of more advanced models.
* For organizations with limited budgets, they offer reliable performance at a lower price compared to higher-end models like the 3650 or 3850 series.

**2. Layer 2 Capabilities**

* Both switches provide **Layer 2 switching** capabilities, which is often sufficient for many networks. Layer 2 switches handle local traffic within a VLAN or network segment, making them ideal for environments that don't need Layer 3 routing functionality.
* The **2960 series** offers some Layer 3 (basic routing) capabilities in the "S" models, providing additional flexibility for small networks.

**3. Port Density and Types**

* **2950T** and **2960** switches come in various models offering different port densities, from 8 to 48 ports, meeting the needs of different-sized networks.
* They support **Fast Ethernet (10/100)** or **Gigabit Ethernet (10/100/1000)** ports, allowing for scalability as network traffic grows.
* Some models of the **2960** series come with SFP uplink ports, which provide high-speed fiber connectivity, useful for connecting to the network backbone.

**4. Simple Network Environments**

* These switches are commonly used in **access layers** (edge switches) where the primary need is to connect end-user devices like computers, printers, and IP phones.
* The **2950T** and **2960** models are often sufficient for edge switching needs in office environments, branch locations, and other small-scale deployments.

**5. Management Features**

* The **2960 series** provides additional features like **Cisco IOS**, advanced management capabilities, **VLAN support**, **QoS**, and **security features** (e.g., 802.1X authentication, port security), making them suitable for more complex network environments.
* The **2950T** is a bit older but still offers basic management features for smaller, less complex networks.

**6. Longevity and Support**

* The **Cisco 2960** series has been widely deployed and continues to receive Cisco support and updates. Its popularity and long-standing performance record make it a reliable choice.
* While the **2950T** is an older model and may no longer be supported, many organizations continue to use it because of its durability and performance in smaller networks.

**7. Upgrade Path**

* For organizations looking to gradually upgrade their network, the **Cisco 2960** series offers a clear path with more advanced models like the **2960-X** series, which supports better performance, energy efficiency, and additional features like Layer 3 routing, making it future-proof.

In short, the **Cisco 2950T** and **2960 series** are selected because they provide reliable, cost-effective switching solutions that meet the needs of small to medium-sized businesses or simpler network environments without the additional complexity or cost of higher-end switches.

Task 3;

Design the network of "Lab-7" or “Lab-8” (2-3 rows of computers) Use: Switch, Router, & End-Devices like Laptop/PC

