***THE SUPERIOR UNIVERSITY***

***COMPUTER NETWORKS (LAB)***

***LAB # 2***

**SUBMITTED TO**

***Sir Rasikh Ali***

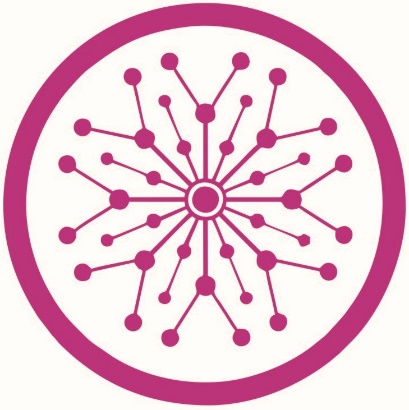
**SUBMITTED BY**

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***(SU92-BSSEM-F22-199)***

**Section-(5D)**

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***GOLD CAMPUS, 7 KM MAIN RAIWIND ROAD LAHORE***

***Task 1:***

***Why are we using 2911 router and not the others?***

***Answer:***

The Cisco 2911 router is a popular choice for various networking scenarios, especially in educational settings like Cisco Packet Tracer and real-world labs. Here are some reasons why you might choose the 2911 over other routers:

### 1. ****Versatility****

* **Multi-functional:** The 2911 supports a variety of WAN interfaces and can be used for routing, security, and voice applications, making it suitable for diverse network requirements.

### 2. ****Modular Design****

* **Flexibility:** It features modular slots for adding various interface cards, allowing you to customize the router to meet specific needs, such as adding more Ethernet ports or WAN connectivity.

### 3. ****Performance****

* **Adequate Processing Power:** The 2911 is designed for small to medium-sized businesses, offering sufficient CPU and memory resources to handle routing and security tasks efficiently.

### 4. ****Advanced Features****

* **Support for Advanced Protocols:** The router supports a wide range of protocols and features, including VPNs, quality of service (QoS), and advanced security options, making it ideal for more complex networking scenarios.

### 5. ****Educational Use****

* **Widely Used in Training:** The 2911 is commonly included in Cisco's training programs, such as CCNA and CCNP, making it a familiar choice for students and professionals preparing for certifications.

### 6. ****Cost-Effective****

* **Balanced Price-Performance Ratio:** It provides a good balance between cost and performance, making it accessible for many organizations while offering the necessary features for a variety of applications.

### Conclusion

While other routers may offer higher performance or specialized features, the Cisco 2911 is often selected for its versatility, modularity, and balance of capabilities, making it an excellent choice for a wide range of networking tasks.

***Task 2:***

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

***Answer:***

The Cisco 2950T and 2960 switches are popular choices for various networking environments, particularly in education and small to medium-sized businesses. Here are some reasons why these switches are often selected over others:

### 1. ****Layer 2 Switching****

* **Basic Switching Needs:** Both the 2950T and 2960 are Layer 2 switches, making them suitable for environments that primarily require VLAN support and efficient traffic management without complex Layer 3 routing.

### 2. ****Cost-Effectiveness****

* **Affordability:** These switches provide a good balance between price and functionality, making them accessible for organizations that need reliable performance without a significant investment.

### 3. ****Ease of Configuration****

* **User-Friendly Interface:** Both models offer straightforward management interfaces (like the Cisco IOS command line), making them easier for network administrators to configure and maintain.

### 4. ****VLAN Support****

* **Segmentation:** The 2960, in particular, supports advanced VLAN configurations, allowing for efficient traffic segmentation and improved security in larger networks.

### 5. ****Power over Ethernet (PoE) Options****

* **PoE Capability:** The 2960 series can offer Power over Ethernet (PoE) features, enabling the switch to supply power to devices like IP phones and wireless access points, simplifying cabling requirements.

### 6. ****Educational Use****

* **Training and Certification:** These switches are commonly used in Cisco training programs (like CCNA), making them familiar to students and professionals. This widespread use helps prepare learners for real-world networking environments.

### 7. ****Reliability and Performance****

* **Proven Track Record:** Both switches are known for their reliability and performance in handling typical network traffic, making them suitable for a variety of applications.

### Conclusion

While there are more advanced switches available (like Layer 3 switches), the Cisco 2950T and 2960 models are favored for their cost-effectiveness, ease of use, and sufficient features for many typical networking needs. Their popularity in educational settings also contributes to their selection for real-world applications.

***Task 1:***

***Why are we using 2911 router and not the others?***

***Answer:***

1. ****Straight-Through Cable****

* **Description:** A cable where the pinouts are the same on both ends. Typically, it uses T568A or T568B wiring standards.
* **Use Case:**
  + Connecting devices of different types, such as a computer to a switch or router.
  + Connecting switches to routers.

### 2. ****Cross-Over Cable****

* **Description:** A cable where the transmit and receive pins are crossed. It uses T568A on one end and T568B on the other.
* **Use Case:**
  + Connecting similar devices directly, such as switch-to-switch or computer-to-computer.
  + Useful in older equipment where Auto-MDI/MDI-X is not supported.

### 3. ****Rolled Cable (Console Cable)****

* **Description:** A specialized cable that has a serial connection on one end (typically a DB-9 or RJ-45) and connects to the console port of networking devices.
* **Use Case:**
  + Connecting a computer's serial port to the console port of routers and switches for configuration and management.

### 4. ****Fiber Optic Cable****

* **Description:** A cable that uses light to transmit data over long distances. It can be single-mode or multi-mode.
* **Use Case:**
  + Connecting devices over long distances, such as between buildings.
  + Used in high-speed, high-bandwidth environments where electromagnetic interference is a concern.

### 5. ****Coaxial Cable****

* **Description:** A cable with a central conductor, insulating layer, and outer conductive shield. Typically used for cable internet and television.
* **Use Case:**
  + Connecting to broadband modems or television systems.
  + Not commonly used in standard networking but may be relevant in specific legacy setups.

### Summary of Cable Uses:

* **Straight-Through Cable:** Computer to switch/router, switch to router.
* **Cross-Over Cable:** Switch to switch, computer to computer.
* **Rolled Cable:** Computer to console port of network devices for configuration.
* **Fiber Optic Cable:** Long-distance connections, high-speed networks.
* **Coaxial Cable:** Broadband connections, television systems.

### Choosing the Right Cable

When selecting a cable, consider the types of devices you are connecting and their respective needs. Understanding the specific roles of each cable type will ensure effective and efficient network connections.

***Task 3:***

***Design the network of "Lab-7" or “Lab-8” (2-3 rows of computers)***

***Use: Switch, Router, & End-Devices like Laptop/PC***

***Answer:***

