Lab 2 - Task

Task 1;

Why are we using 2911 router and not the others?

The Cisco 2911 router is part of the Cisco Integrated Services Router Generation 2 (ISR G2) series, designed for small to medium-sized businesses and branch offices. It is chosen for its blend of performance, scalability, security, and modularity, making it an ideal choice for growing networks with diverse demands.

1. **Modularity and Flexibility**:
   One of the key reasons for choosing the 2911 router over others is its modular architecture. It supports a variety of network modules, service modules, and interface cards that can be tailored to specific needs. This modularity allows for flexible configurations to support different types of connections, such as WAN, voice, and data services. Additionally, the router can be upgraded or expanded as network demands increase, making it a future-proof solution.

2. **Performance and Scalability**:
   The 2911 router is designed to handle high traffic loads with ease. It supports up to 25 Mbps of throughput and can be upgraded with a performance license to provide more capacity as the network grows. The router also supports Cisco's IOS software, which allows for advanced routing protocols, quality of service (QoS), and VPN support, ensuring that the router can manage a wide range of network tasks efficiently. This scalability makes the 2911 suitable for growing businesses or branch offices that need to expand their networks without replacing existing hardware.

3. **Security Features**:
   Cisco's 2911 router comes equipped with a comprehensive set of security features. It includes an integrated firewall, VPN, and intrusion prevention system (IPS) to protect the network from external threats. Additionally, the router supports Secure Sockets Layer (SSL) and IP Security (IPsec) VPNs, allowing remote workers to securely connect to the network. These advanced security features help businesses maintain the integrity and confidentiality of their data while ensuring secure connectivity across multiple sites or for remote employees.

4. **Unified Communications**:
   The Cisco 2911 router supports unified communications, including voice and video over IP (VoIP). This is particularly beneficial for businesses that rely on voice or video communication as part of their operations. The router supports the Cisco Unified Communications Manager Express (CUCME) and Cisco Survivable Remote Site Telephony (SRST), ensuring that communication services remain operational even during network disruptions.

5. **Energy Efficiency and Cost Savings**:
   Another reason for choosing the 2911 router is its energy-efficient design. The router is compliant with Cisco's EnergyWise technology, which helps manage power consumption and reduce energy costs. In addition, the router's modular nature means that businesses can add features as needed, avoiding the upfront costs associated with purchasing more

hardware than necessary. This leads to long-term cost savings and ensures that network investments align with business growth.

In conclusion, the Cisco 2911 router is chosen for its modularity, performance, security, and ability to support unified communications. Its scalability and future-proof design make it a versatile solution for businesses that need a robust network infrastructure that can adapt to growing demands without sacrificing security or performance.

Task 2;

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

The Cisco 2950T and 2960 series switches are part of Cisco's family of fixed-configuration switches, commonly used in small to medium-sized enterprise networks. They are chosen for their simplicity, reliability, and ability to handle essential Layer 2 switching tasks with efficiency and security.

1. **Layer 2 Switching and VLAN Support**:
   Both the Cisco 2950T and 2960 switches are Layer 2 switches, which means they primarily deal with MAC addresses and handle data switching at the data link layer. They are ideal for segmenting networks into Virtual LANs (VLANs), allowing for better traffic management and enhanced security within the network. The ability to create multiple VLANs helps businesses isolate traffic between departments or services, reducing congestion and improving overall performance.

2. **Cost-Effectiveness**:
   One reason the 2950T and 2960 switches are widely used is their cost-effectiveness. These switches offer essential networking features without the high cost associated with Layer 3 switches or more advanced models. For small to medium-sized businesses that do not need advanced routing capabilities within the switch, these models provide a solid balance between performance and affordability. They offer all the necessary features required for efficient network management while being budget-friendly.

3. **Reliability and Durability**:
   Cisco switches, including the 2950T and 2960 series, are known for their reliability and durability. These switches are designed for continuous operation in demanding environments, minimizing downtime and ensuring stable network performance. With robust build quality and long-term support from Cisco, they are a reliable choice for businesses that require a stable and predictable network infrastructure.

4. **Security Features**:
   The 2960 series, in particular, offers enhanced security features compared to older models like the 2950T. Cisco's Identity-Based Networking Services (IBNS) enable more control over who can access the network and how it is used. These switches support 802.1x authentication, port security, and Access Control Lists (ACLs), ensuring that only authorized devices can access specific parts of the network. For businesses handling sensitive data, these security features are critical for protecting against unauthorized access and potential breaches.

5. **Energy Efficiency**:
   The 2960 series includes Cisco's EnergyWise technology, which optimizes power usage across the network. By reducing unnecessary energy consumption, these switches contribute to lowering operational costs and promoting a more sustainable business environment. Energy efficiency is increasingly important for companies aiming to reduce their carbon footprint and achieve cost savings through greener technology solutions.

6. **Enhanced Management and Troubleshooting**:
   The Cisco 2960 switches offer improved management and troubleshooting capabilities compared to the older 2950T. With Cisco's Smart Install and Auto Smartports features, the 2960 switches simplify the deployment and management of the network. These switches can be monitored and managed remotely using Cisco's Network Assistant or through a command-line interface (CLI), making them easier to maintain and troubleshoot. The 2960 series also supports dynamic routing protocols when operating in Layer 3 mode, though this is not typically their primary function.

7. **Gigabit Ethernet and Enhanced Performance**:
   One of the key distinctions between the 2950T and the 2960 series is that the latter supports Gigabit Ethernet, allowing for faster data transfer rates across the network. This makes the 2960 series a better option for businesses that require higher bandwidth for applications like video streaming, large file transfers, or heavy cloud-based services. In contrast, the 2950T is limited to Fast Ethernet speeds, making it more suitable for less bandwidth-intensive applications.

8. **Scalability**:
   The 2960 series is designed with scalability in mind. As businesses grow and require more advanced networking features, the 2960 switches can support a range of configurations and expansions. Their ability to stack switches and create larger networks without requiring significant infrastructure changes makes them an attractive option for businesses that expect future growth.

In conclusion, the Cisco 2950T and 2960 switches are chosen for their simplicity, cost-effectiveness, and ability to handle essential Layer 2 switching tasks with added security features. While the 2950T is suitable for basic network needs, the 2960 series offers enhanced performance, scalability, and management capabilities, making it a more future-proof option for growing businesses.

Task 3;

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