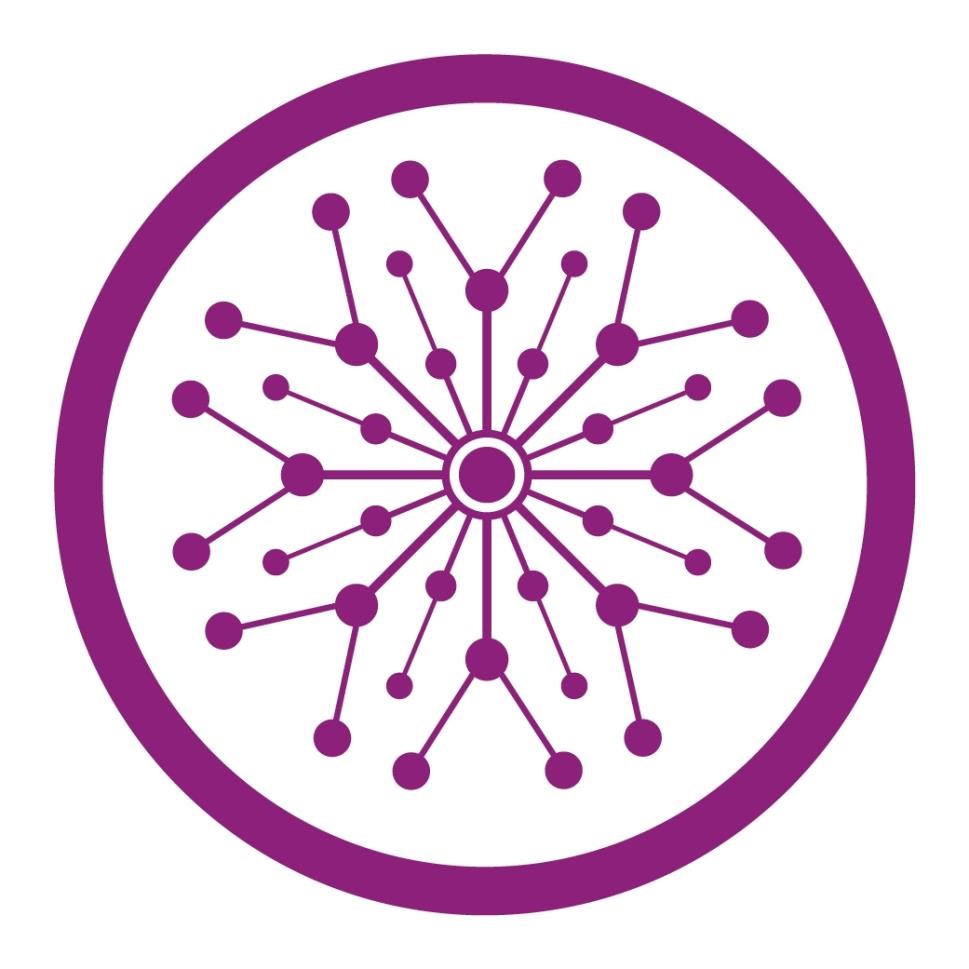
**Assignment 1**

**Computer Networks (Lab)**



**Submitted to Rasikh Ali**

**Submitted by Talha Nadeem**

**Roll #: F22-070**

**Section: SE-5B**

**Submitted on Sept 21, 2024**

**DEPARTMENT OF SOFTWARE ENGINEERING**

**SUPERIOR UNIVERSITY, LAHORE**

**What is the difference between all the routers, and when to use them?**

**Cisco Router Models: A Comparative Overview**

**Introduction**

Cisco routers are network structures, which provide connectivity and routing services. Different models cater to varying needs, from small offices to large enterprises.

**Router Models and Their Applications**

|  |  |  |
| --- | --- | --- |
| **Cisco 4331 Router** | A high-performance ISR with advanced features. | Medium to large businesses requiring robust routing, security, and integrated services. |
| **Cisco 4321 Router** | A less powerful ISR, suitable for branch offices needing reliable performance. | Branch offices needing reliable performance with some advanced features. |
| **Cisco 1941 Router** | A versatile ISR for small to medium-sized networks, offering basic routing and modularity. | Smaller businesses or remote offices needing fundamental routing and additional services. |
| **Cisco 2901 Router** | A modular ISR supporting various WAN interfaces. | Small to medium enterprises needing flexible options for connecting different network types. |
| **Cisco 2911 Router** | A robust ISR with integrated services. | Small to medium businesses requiring multifunctionality and enhanced features. |
| **Cisco 819 IoX Router** | A compact ISR designed for IoT applications. | Edge deployments where space is limited, such as in IoT scenarios. |
| **Cisco 819 HGW Router** | A home gateway router combining WAN and LAN functionality. | Home or small office environments needing reliable internet access. |
| **Cisco 829 Router** | A versatile router for various deployments, especially in branch offices. | Organizations looking for a cost-effective solution that supports a range of services. |
| **Cisco 1240 Router** | A wireless router supporting both wired and wireless connectivity. | Environments requiring integrated wireless and wired network capabilities. |
| **PT-Router** | A generic router model in Packet Tracer for simulation purposes. | Basic learning and experimentation with routing concepts. |
| **PT-Empty** | An empty router model for customized network simulations. | Creating unique scenarios and exploring various networking concepts. |
| **Cisco 1841 Router** | A modular ISR offering basic routing and limited WAN capabilities. | Small businesses needing reliable routing without advanced features. |
| **Cisco 2620XM Router** | An older ISR model with modular capabilities. | Educational purposes or small networks needing basic connectivity. |
| **Cisco 2811 Router** | A modular ISR designed for small to medium-sized businesses. | Small to medium-sized businesses needing integrated services and WAN options. |

**What is the difference between all the switches, and when to use them?**

Cisco switches are essential components of a network providing connectivity and data forwarding. Different models have different needs, from small offices to large enterprises.

**Switch Models and Their Applications**

|  |  |  |
| --- | --- | --- |
| Model | Description | Use Case |
| **Cisco 2960 Series Switch** | Layer 2 switch with basic switching functionalities, VLAN support, and some security features. | Small to medium-sized networks requiring basic connectivity and VLAN segmentation. |
| **Switch PT** | A generic switch model is used in Packet Tracer for simulations. | Simple networking exercises and scenarios when you want to focus on basic concepts without needing specific switch features. |
| **Switch PT Empty** | An empty switch model that allows for more flexibility in simulations. | You are creating custom scenarios or learning environments where you want to build a network from scratch without predefined features. |
| **Cisco 3560-24PS Switch** | Layer 3 switch with built-in routing capabilities. | Networks requiring inter-VLAN routing and support for VoIP solutions. |
| **Cisco 3650-24PS Switch** | Advanced Layer 3 switch with built-in wireless controller capabilities and enhanced support. | Larger networks need robust features for both wired and wireless devices. |
| **Cisco IE-2000 Switch** | They are designed for industrial environments, featuring ruggedized hardware. | Industrial automation and IoT applications where environmental resilience is critical. |
| **Bridge-PT** | A simple bridging device used in Packet Tracer, primarily for learning about bridging concepts. | Educational purposes are to understand bridging and how to connect different network segments. |
| **Cisco 2950-24 Switch** | Layer 2 switch designed for small networks, offering basic features with 24 Ethernet ports. | Small to medium-sized networks where basic switching capabilities are required without the need for advanced features. |
| **Cisco 2950T-24 Switch** | Similar to the 2950-24 but supports Gigabit Ethernet on some ports. | Small to medium-sized networks requiring Gigabit Ethernet connectivity. |

**What is the difference between all the connection wires, and when to use them?**

**Introduction**

Network cables are essential components of the network connecting devices and enabling data transmission. Different cable types of cables have specific purposes based on their physical characteristics.

**Cable Types and Their Applications**

|  |  |  |
| --- | --- | --- |
| Cable Type | Description | Use Case |
| **Console Cable** | Connects a computer's serial port to a network device's console port. | Initial setup and troubleshooting of network devices. |
| **Straight-Through Cable** | Connects different types of devices (e.g., PC to switch). | Ethernet networks for connecting computers and networking hardware. |
| **Copper Crossover Cable** | Connects similar types of devices directly (e.g., switch to switch). | Connecting two devices of the same kind without needing a hub or switch. |
| **Fiber Optic Cable** | High-speed, long-distance data transmission using light signals. | Backbone connections between network switches, routers, or across buildings. |
| **Phone Cable** | Used for connecting telephones to wall jacks or for DSL. | Residential telephone systems and data services. |
| **Coaxial Cable** | Transmits cable television signals and Internet data. | Cable TV and broadband Internet connections. |
| **Serial DCE Cable** | Connects a data source (e.g., modem) to a data terminal (e.g., computer). | Serial communication setups where the DCE provides the clock signal. |
| **Serial DTE Cable** | Connects a data terminal (e.g., computer) to a data communications equipment (e.g., modem). | Serial communication setups where the DTE is the data source. |