EX.NO:08

Date :

WAN Configuration

Aim:

To simulate and configure a Wide Area Network (WAN) using Cisco Packet Tracer by interconnecting multiple LANs through routers, and verify communication between end devices across geographically distributed networks.

Theory: WAN (Wide Area Network)

A **Wide Area Network (WAN)** interconnects multiple Local Area Networks (LANs) across large geographical distances using routers and communication links such as leased lines, DSL, or serial links.

Key Features of WANs:

1. **Geographic Coverage:** Connects networks across cities, states, or even globally.
2. **Routers as Backbone:** Routers provide routing between LANs in different locations.
3. **WAN Links:** Serial connections, Frame Relay, MPLS, or modern broadband are used.
4. **Protocols:** Static Routing, Dynamic Routing (RIP, OSPF, EIGRP, BGP) can be used for WAN communication.
5. **Applications:** Used by enterprises, ISPs, and institutions for inter-branch connectivity.

Required Equipment:

1. **Routers (e.g., Cisco 2911 / 2811):** Connect LANs over WAN.
2. **Switches:** Provide LAN connectivity in each branch.
3. **End Devices (PCs):** For communication testing.

4. **Serial DCE/DTE Connections or Copper Cables:** To simulate WAN links.
5. **Cisco Packet Tracer Software.**

Procedure: WAN Configuration in Cisco Packet Tracer

1. Build the Topology

- Place 2 routers (Router0 and Router1).
- Connect them using a **Serial DCE/DTE link** to simulate a WAN.
- Attach a switch and PC to each router to form two separate LANs:
  - **LAN A:** Network 192.168.1.0/24.
  - **LAN B:** Network 192.168.2.0/24.

2. Assign IP Addresses

- Router0 (LAN A interface): 192.168.1.1/24.
- PC0 (LAN A): 192.168.1.2/24, Gateway = 192.168.1.1.
- Router1 (LAN B interface): 192.168.2.1/24.
- PC1 (LAN B): 192.168.2.2/24, Gateway = 192.168.2.1.
- Serial link (WAN):
  - Router0 Serial0/0/0 = 10.0.0.1/30.
  - Router1 Serial0/0/0 = 10.0.0.2/30.

3. Configure Routing (Static Routing Example)
On Router0:

```
Router0(config)# ip route 192.168.2.0 255.255.255.0 10.0.0.2
```

On Router1:

```
Router1(config)# ip route 192.168.1.0 255.255.255.0 10.0.0.1
```

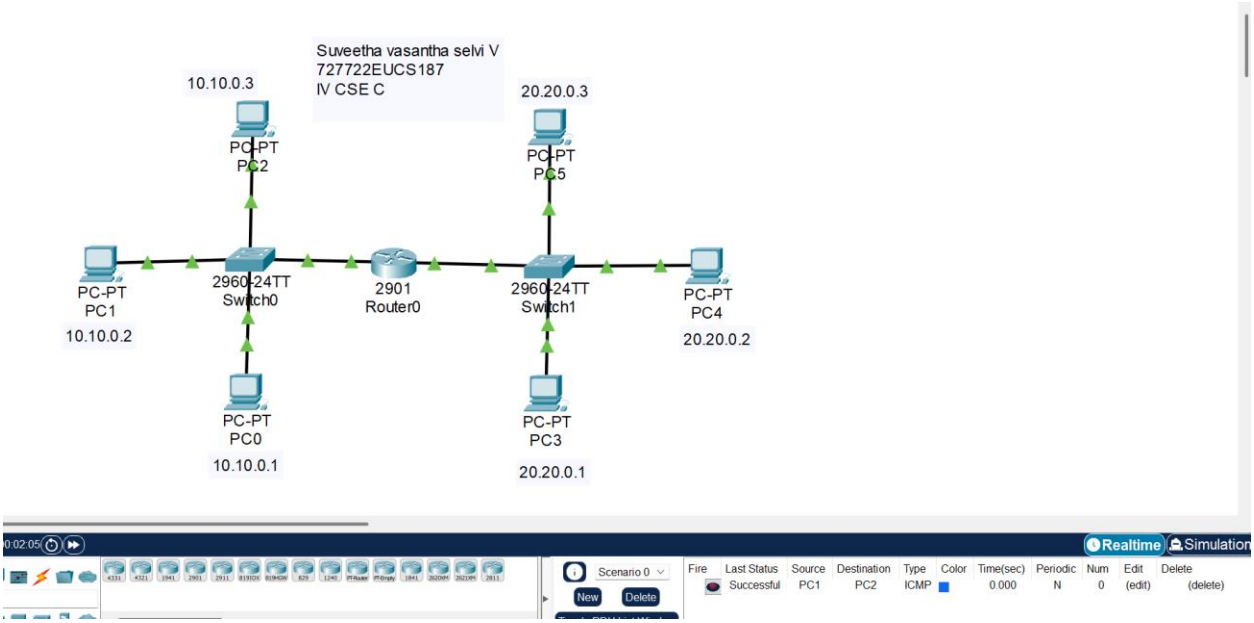
4. Verify WAN Link

- Use show ip route to check static routes.
- Use ping between routers to ensure WAN serial connectivity.

5. Test End Device Communication

- From PC0 (192.168.1.2), ping PC1 (192.168.2.2).
- Verify successful replies.

Model Output:



Results:

A Wide Area Network (WAN) was successfully simulated using Cisco Packet Tracer. Routers interconnected two LANs via a serial WAN link, and static routing enabled communication between PCs in different networks. The simulation verified WAN configuration and demonstrated inter-branch connectivity.