FENI UNIVERSITY
Center for Learning and Development

Lab Report

Lab No : 01

Lab Name : Connecting Two Different LANs Using Router

Course Title	Computer Networks Lab
Course Code	CSE-316

Prepared For	
Name	Mr. Omar Faruk
Designation	Associate Professor
Department	CSE
Faculty	Faculty of Science & Engineering

Prepared By	
Name	Md. Abdul Al Noman
ID	232031044
Batch	31st(UG)
Term	5th
Semester	Autumn
Department	Computer Science & Engineering
Date of Submission	2025-12-02

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Title: Connecting Two Different LANs Using Router

Objectives

- To design and implement a network topology that connects two different LANs using a router.
- To assign IP addresses, subnet masks, and gateways to all hosts and router interfaces.
- To verify successful connectivity between hosts in separate LANs using commands like ping and show ip route.
- To understand how routers act as gateways between different subnets and enable inter-network communication.
- To gain practical experience in network design, configuration, and verification using simulation tools like Cisco Packet Tracer

Theory

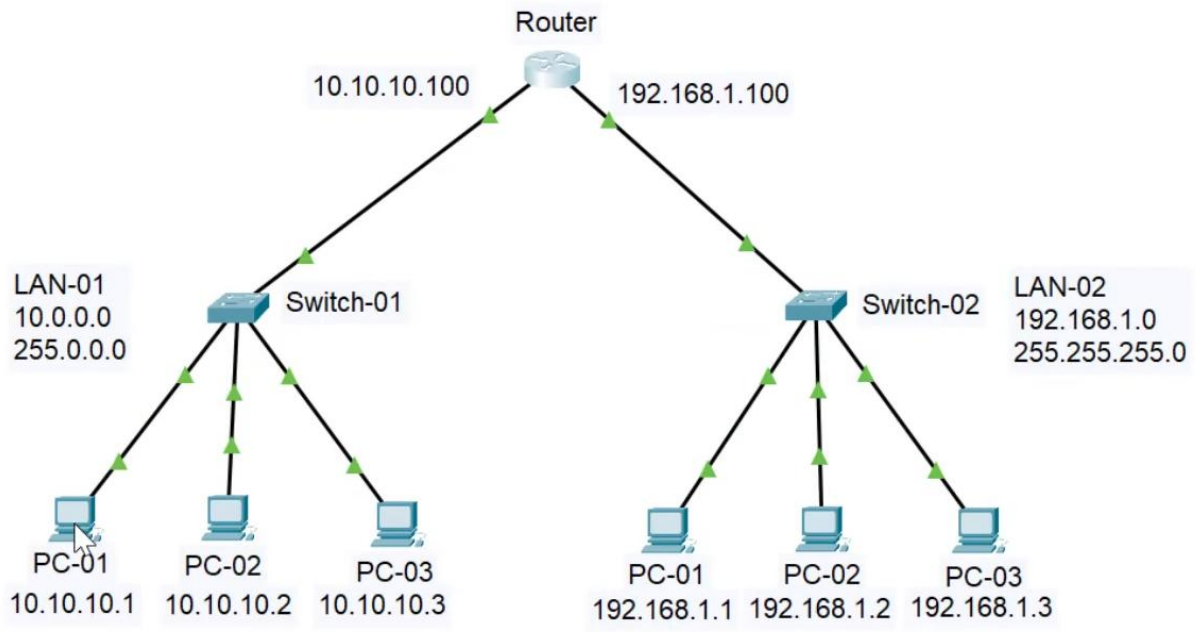
A Local Area Network (LAN) is a group of devices connected within a limited area, sharing the same subnet. When two LANs use different IP subnets, they cannot communicate directly through switches alone. A router is required to connect these LANs, as it forwards packets between different networks based on IP addressing.

Each router interface must be configured with an IP address belonging to the subnet it connects to, acting as the default gateway for that LAN. Once configured, the router maintains a routing table and ensures that packets from one LAN are delivered to the correct destination in the other LAN.

Requirements

- 1 Router with two interfaces
- 2 Switches (Switch-01 and Switch-02)
- 6 PCs (3 per LAN)
- Ethernet cables
- Network simulator (Cisco Packet Tracer)

Topology Diagram



- LAN-01: Subnet 10.10.10.0/8
  - Router IP: 10.10.10.100
  - PCs: 10.10.10.1, 10.10.10.2, 10.10.10.3
- LAN-02: Subnet 192.168.1.0/24
  - Router IP: 192.168.1.100
  - PCs: 192.168.1.1, 192.168.1.2, 192.168.1.3

IP Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
PC-01 (LAN-01)	NIC	10.10.10.1	255.0.0.0	10.10.10.100
PC-02 (LAN-01)	NIC	10.10.10.2	255.0.0.0	10.10.10.100
PC-03 (LAN-01)	NIC	10.10.10.3	255.0.0.0	10.10.10.100
Router	Fa0/0 (LAN-01)	10.10.10.100	255.0.0.0	—
PC-01 (LAN-02)	NIC	192.168.1.1	255.255.255.0	192.168.1.100
PC-02 (LAN-02)	NIC	192.168.1.2	255.255.255.0	192.168.1.100
PC-03 (LAN-02)	NIC	192.168.1.3	255.255.255.0	192.168.1.100
Router	Fa0/1 (LAN-02)	192.168.1.100	255.255.255.0	—

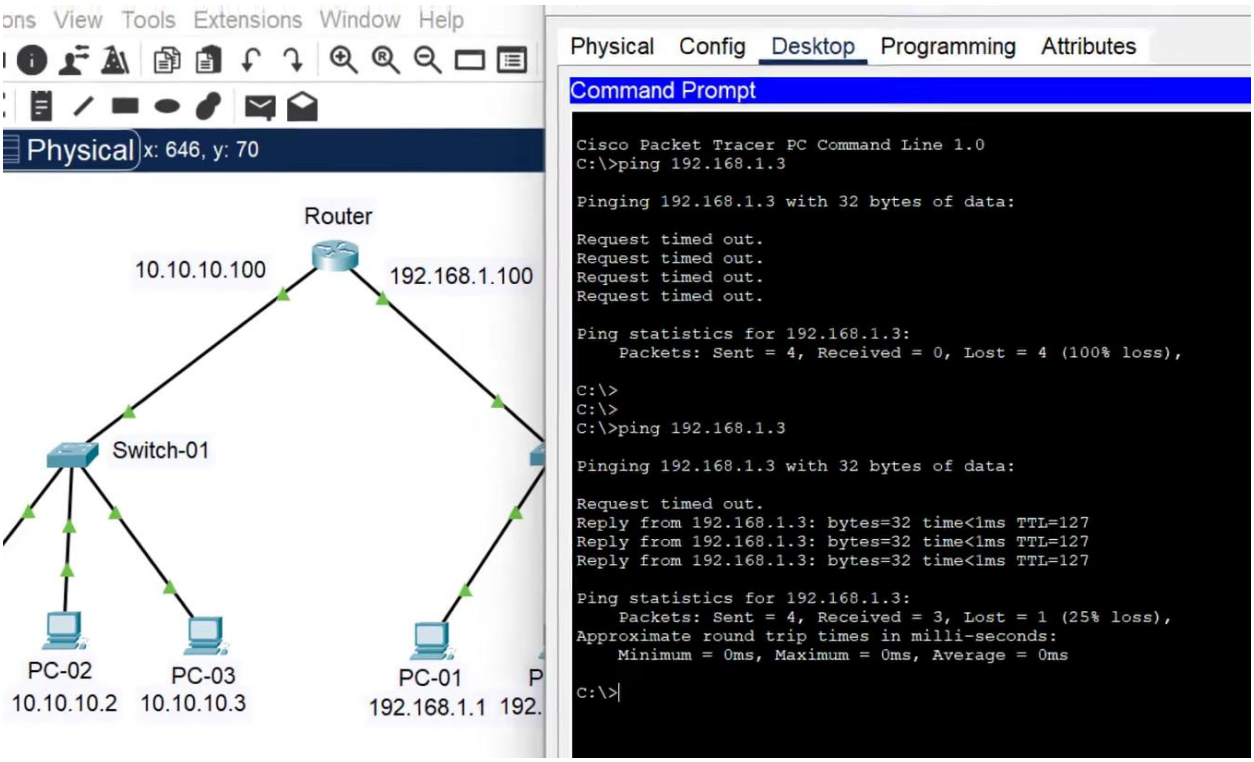
Procedure

1. Design the topology: Place one router, two switches, and connect three PCs to each switch (LAN-01 and LAN-02).
2. Connect devices: Use straight-through cables for PC–Switch connections and switch–router connections.
3. Assign IP addresses: Configure each PC with the IPs and subnet masks from the addressing table.
4. Configure router interfaces:
    - Enter configuration mode.
    - Assign IP addresses to each router interface (Fa0/0 → LAN-01, Fa0/1 → LAN-02).
    - Enable interfaces with no shutdown.
5. Set default gateways: On each PC, set the router interface IP as the default gateway.
6. Save configuration: Use write memory or copy running-config startup-config to store settings.
7. Verify connectivity: Test communication between PCs in different LANs using ping.

8. Check router status: Use show ip interface brief and show ip route to confirm active interfaces and routing table entries.

Verification Commands & Output

Ping from 192.168.1.102 to 192.168.1.3: Successful (0% packet loss, replies received)



Results & Observations

- Devices in LAN-01 successfully pinged devices in LAN-02.
- Router interfaces acted as gateways and routed packets between subnets.
- IP configuration and cabling were verified to be correct.
- Misconfigured IPs or shutdown interfaces prevented communication until corrected.

Conclusion

The experiment successfully demonstrated inter-LAN communication using a router. Proper IP addressing and interface configuration enabled seamless data exchange.

References

- Cisco Networking Academy materials
- Lecture notes from Computer Science & Engineering Department
- **Cisco Packet Tracer Tutorial- Computer Network**