

# Connecting Multiple LANs and Static Routing

## 1 Objective

The purpose of this lab is to understand and implement **static routing** for interconnecting multiple Local Area Networks (LANs). By manually configuring routes, we enable communication between different subnets, demonstrating the fundamental principles of network layer routing.

## 2 Hardware and Software Requirements

### 2.1 Hardware

- Two Cisco 1841 Routers
- Two Cisco 2950 Switches
- Four Personal Computers (PCs)
- Ethernet cables

### 2.2 Software

- Cisco Packet Tracer

## 3 Lab Procedure

### 3.1 Step 1: Network Setup

The network consists of two separate LANs, each connected to a router. The routers are interconnected through a dedicated link, forming a static routing environment.

### 3.2 Step 2: Assigning IP Addresses

Each device in the network is assigned an IP address based on its subnet:

- **LAN 1 (Connected to Router0)**
  - Router0: 192.168.1.1
  - PC0: 192.168.1.2

- PC1: 192.168.1.3
- **LAN 2 (Connected to Router1)**
  - Router1: 192.168.2.1
  - PC2: 192.168.2.2
  - PC3: 192.168.2.3
- **Router-to-Router Link**
  - Router0: 192.168.3.2
  - Router1: 192.168.3.4

### 3.3 Step 3: Configuring Static Routes

Since routers do not automatically learn routes in static routing, manual configuration is required.

**On Router0:**

```
Router0(config)# ip route 192.168.2.0 255.255.255.0 192.168.3.4
```

**On Router1:**

```
Router1(config)# ip route 192.168.1.0 255.255.255.0 192.168.3.2
```

### 3.4 Step 4: Connectivity Testing

After configuring the routes, **\*\*ping commands\*\*** were executed between PCs across different LANs to verify proper communication.

## 4 Result and Discussion

The configuration was successful, and static routing enabled seamless connectivity between the two LANs. ICMP packets were sent from one subnet to another, and responses were received, confirming proper routing. Below is an image showing the network topology and the results of the connectivity tests:

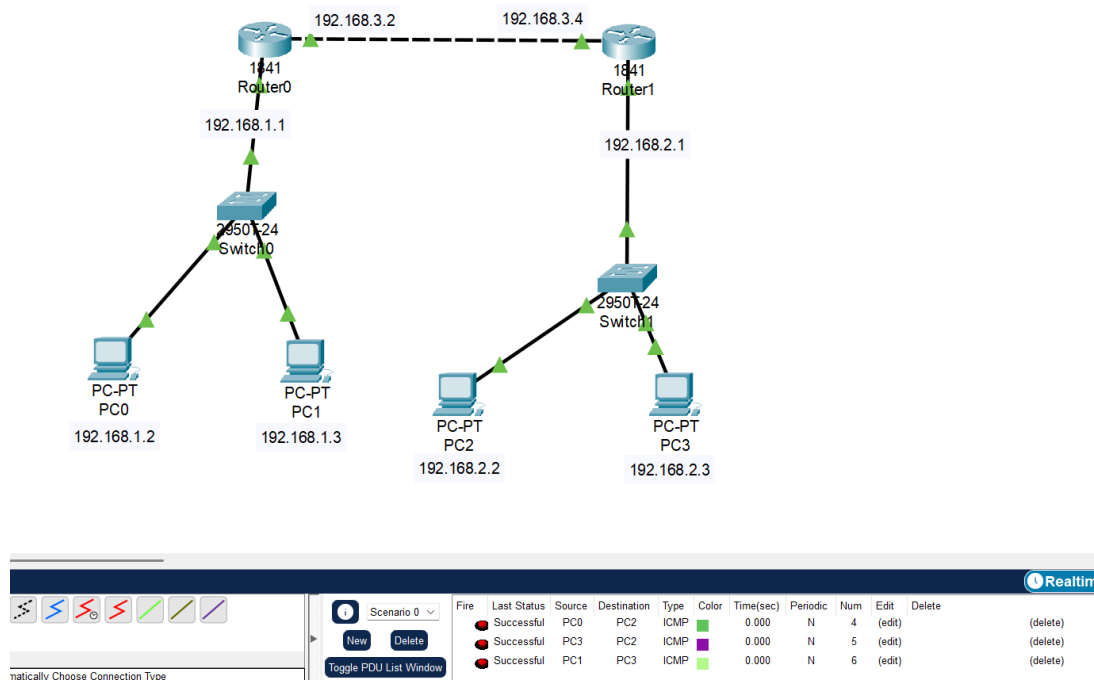


Figure 1: Network topology and successful ICMP test results

### Key Observations:

- **\*\*Static routing provides full control\*\*** over packet forwarding but requires manual updates.
- **\*\*Misconfigured routes can disrupt communication\*\***, highlighting the need for accuracy.
- **\*\*Dynamic routing protocols (e.g., OSPF, RIP) offer scalability\*\***, making them better suited for large networks.

## 5 Conclusion

This lab successfully demonstrated the implementation of **\*\*static routing\*\*** for inter-connecting multiple LANs. The setup allowed communication between subnets using predefined routing entries. While static routing is simple and reliable for small networks, **\*\*dynamic routing\*\*** should be considered for larger and more complex environments.