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# COMPUTER NETWORKS LAB FOUR REPORT

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B. TECH COMPUTER SCIENCE AND ENGINEERING (SEC-C 3RD YEAR, 5TH SEMESTER)  
(FROM SRM INSTITUTE OF SCIENCE AND TECHNOLOGY – TRICHY)

# Objective

The goal of this experiment is to configure IP addressing for a network using Variable Length Subnet Masking (VLSM). VLSM allows for efficient IP address allocation by creating subnets of varying sizes based on the needs of the network. By configuring routers and PCs with VLSM subnets.

## Procedure

### Network Design and Subnetting

#### 1. Design the Network Topology:

- Determine the IP address requirements for each subnet based on host requirements.

#### 2. Calculate Subnets Using VLSM:

- **Major Network Address:** 192.168.0.0/24
- Subnet the network into four smaller subnets:
  - **Subnet 1:** 50 hosts → Network Address: 192.168.0.0/26 (Subnet Mask: 255.255.255.192)
  - **Subnet 2:** 30 hosts → Network Address: 192.168.0.64/27 (Subnet Mask: 255.255.255.224)
  - **Subnet 3:** 10 hosts → Network Address: 192.168.0.96/28 (Subnet Mask: 255.255.255.240)
  - **Subnet 4:** 5 hosts → Network Address: 192.168.0.112/29 (Subnet Mask: 255.255.255.248)

### Step 1: Subnetting the Network

#### 1. Identify Major Network Address:

- Example: 192.168.0.0/24

#### 2. Divide into Subnets Based on Hosts:

- Subnet 1: 50 hosts → 192.168.0.0/26
- Subnet 2: 30 hosts → 192.168.0.64/27
- Subnet 3: 10 hosts → 192.168.0.96/28
- Subnet 4: 5 hosts → 192.168.0.112/29

## Step 2: Configuring Router1

### 1. Access CLI:

- Select the router and open the CLI interface. Press ENTER to start configuring.

### 2. Activate Privileged Mode:

- Type enable to enter privileged mode.

### 3. Access Configuration Terminal:

- Type config t (to enter configuration mode).

### 4. Configure Router Interfaces:

#### ○ FastEthernet0/0:

- Enter the command interface FastEthernet0/0.
- Assign IP address 192.168.0.1 with subnet mask 255.255.255.192.

#### ○ FastEthernet0/1:

- Enter the command interface FastEthernet0/1.
- Assign IP address 192.168.0.65 with subnet mask 255.255.255.224.

### 5. Activate Interfaces:

- Type no shutdown to bring both interfaces up.

## Step 3: Configuring PCs

### 1. PC0 Configuration:

- Go to the desktop of PC0, select **IP Configuration**, and assign:
  - IP address: 192.168.0.2
  - Subnet Mask: 255.255.255.192
  - Default Gateway: 192.168.0.1

## 2. PC1 Configuration:

- Go to the desktop of PC1, select **IP Configuration**, and assign:
  - IP address: 192.168.0.66
  - Subnet Mask: 255.255.255.224
  - Default Gateway: 192.168.0.65

## Step 4: Connecting PCs with Router

### 1. Connect PC0:

- Use a copper straight-through cable to connect **FastEthernet0** of PC0 to **FastEthernet0/0** of Router1.

### 2. Connect PC1:

- Use a copper straight-through cable to connect **FastEthernet0** of PC1 to **FastEthernet0/1** of Router1.

# Simulation of Designed Network Topology

### 1. Simulation Mode:

- Open simulation mode in Cisco Packet Tracer to observe data flow between devices.

### 2. Send PDU:

- Send a PDU from PC0 to PC1 and monitor the packet's journey through the router.

### 3. Acknowledgment Packet:

- Verify that an acknowledgment packet travels back from PC1 to PC0, confirming successful communication between the devices.

# Screenshots





