

Aim:

Implementation of IP Subnetting & Cisco  
Packet tracer simulator.

Classless IP:

- Technique that allows more efficient use of IP addresses by dividing IP address space into smaller, equal subnet as per requirement.

- Helps in optimization of IP addresses, improved network management, enhanced route efficiency.

Creating a Network Topology:

- First step in implementing classless IP subnetting is to create a network topology in Packet tracer.

- To create a network topology, select 'New' button in top left corner, select "Network" & "Generic".

- This creates a blank network topology to add device.

Devices used:

i) 2 Routers (CISCO 2811)

ii) 4 switches (CISCO 2960-24TT)

iii) 8 PCs

iv) Copper straight through cable & serial cable.

# Network design:

i) LAN 1:

Subnet ID	Subnet mask	Gateway	Device connected
192.168.10.0	255.255.255.0 (128)	192.168.1.1	PC0, PC1

ii) LAN 2:

192.168.2.0	255.255.255.128 (125)	192.168.2.1	PC2, PC3
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iii) LAN 3:

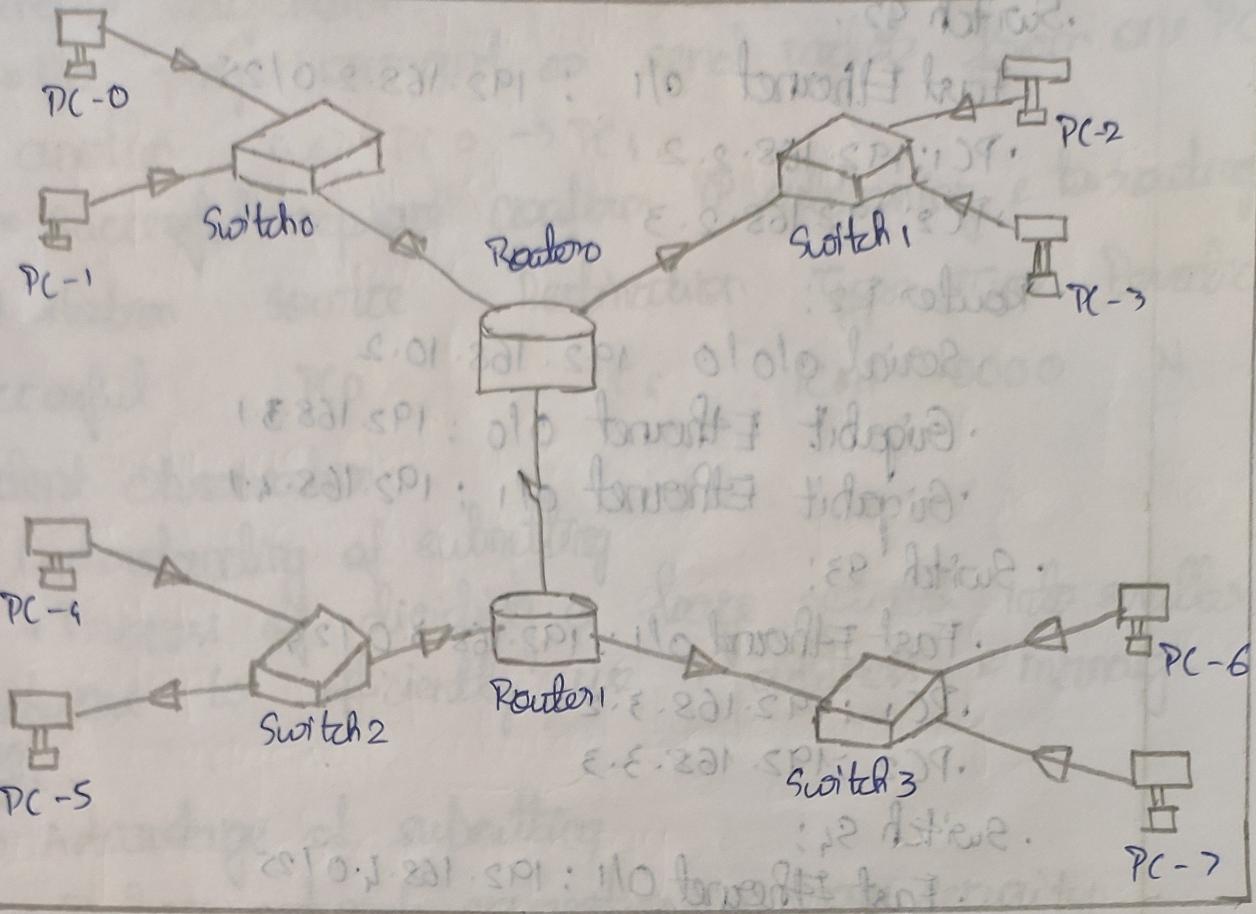
192.168.3.0	255.255.255.0 (128)	192.168.3.1	PC4, PC5
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iv) LAN 4:

192.168.4.0	255.255.255.0 (128)	192.168.4.1	PC6, PC7
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v) Router link:

192.168.10.0	255.255.255.252 (130)	Router 0 → 192.168.10.1	WAN connects between routers
		Router 1 → 192.168.10.2	



Configuration steps:

Router R1:

- GigabitEthernet 0/0 : 192.168.1.1

- GigabitEthernet 0/1 : 192.168.2.1

Switch S1:

- FastEthernet 0/1 : 192.168.1.2

- PC1 : 192.168.1.2

- PC2 : 192.168.1.3

Switch S2:

- Fast Ethernet 0/1 : 192.168.2.0/25
- PC1: 192.168.2.2
- PC2: 192.168.2.3

Router R2:

- Serial 0/0/0 : 192.168.10.2
- Gigabit Ethernet 0/0 : 192.168.3.1
- Gigabit Ethernet 0/1 : 192.168.4.1

Switch S3:

- Fast Ethernet 0/1 : 192.168.3.0/25
- PC1 : 192.168.3.2
- PC2 : 192.168.3.3

Switch S4:

- Fast Ethernet 0/1 : 192.168.4.0/25
- PC1 : 192.168.4.2
- PC2 : 192.168.4.3

Configuring Network:

enable

configure terminal

\* configure Router 0, Router

\* Configure Switches

\* Configure PCs

Desktop  $\rightarrow$  IP config  $\rightarrow$  IP Address / Subnet mask / Default Gateway

exit

## Testing & Verification:

- \* Use 'ping' command to send packets from one PC to another i.e.) PC 0 → PCs.
- \* Successful replace confirm IP addressing & routing.

Last station	source	Destination	Type	Time	Periodic
successful	PC 0	PC 4	ICMP	0000	N

## Student Observation:

### 1) Understanding of subnetting

- \* Process of dividing a large network into smaller subnetwork to efficiently use IP address & manage traffic.

### 2) Advantage of subnetting

- \* Reduces network congestion, improves security.
- \* Allows better management.
- \* Isolates network segments.

### 3) Subnetting in College

- \* Yes, subnetting is implemented to separate department. Ex: CSE - 192.168.10.0/26, IT-192.168.10.64/26, Admin - 192.168.10.128/26

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Result:

Classless IP subnetting was implemented in Cisco Packet Tracer successfully.