EX NO: 09
DATE:
30/09/24

Practical - 09.

AIM:-

Implementation of SUBNETTING in CISCO PACKET TRACER SIMULATOR.

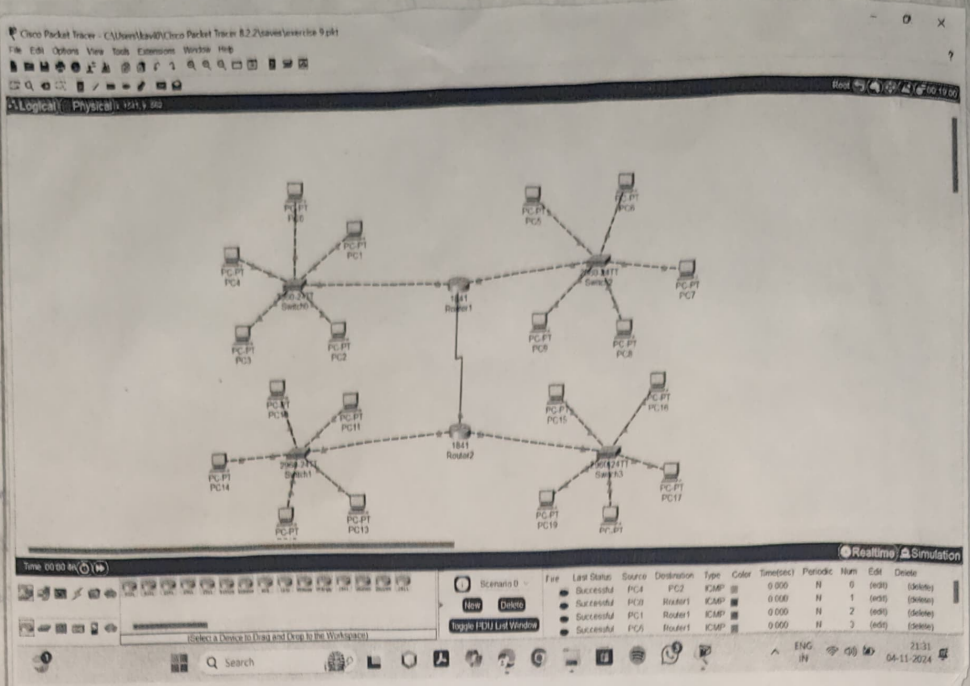
Classless IP subnetting is a technique that allows for more efficient use of IP addresses by allowing for subnet masks that are not just the default masks for each IP class. This mean that we can avoide our IP address space into smaller subnets, which can be useful when we have a limited number of IP address but need to create multiple networks.

CREATING A NETWORK TOPOLOGY:-

The first step is implementing classless IP subnetting is to create a network topology in Packet Tracer. To create a network topology in Packet Tracer, select the New button in Top left corner then select "Network" and "Generic". This will create a blank network topology that we can use to add devices.

ADDING THE DEVICES:-

once we have created our network topology we can add devices to it. Here, we will be adding routers, switches, PC's. To add a device, select the device from the bottom left corner and drag it onto network Topology. Then connect the device by dragging a cable from one device's port to another device's port.



The IP addressing for network shown

- Router R1
- Gigabit ethernet 0/0 : 192.168.1.1
- Gigabit ethernet 0/1 : 192.168.2.1
- Switch S1 :
- FastEthernet 0/1 : 192.168.1.0/27
- PC 1-5 : 192.168.1.1 - 192.168.1.5
- Fast Ethernet 0/2 : 192.168.2.0/27
- PC 6-10 : 192.168.2.1 - 192.168.2.5
- FastEthernet 0/0 : 192.168.3.1
- Fast Ethernet 0/1 : 192.168.4.1
- Switch S2 :
- Fast Ethernet 0/1 : 192.168.3.0/27
- PC 11-15 : 192.168.3.11 - 192.168.3.15.
- Fast Ethernet 0/2 : 192.168.4.0/27
- PC 16-20 : 192.168.4.11 - 192.168.4.15

CONFIGURING THE DEVICES:-

Configure the device using CLI. This will open the command Line interface (CLI) for router. In the CLI, enter the following commands.

```
# enable
# configure Terminal
# interface FastEthernet 0/0
# ip address {IP address} {subnet mask}
# no shutdown
# exit
interface FastEthernet 0/1
ip address {IP address} {subnet mask}
no shutdown
exit
```

Next we will configure the switch. Right click on switch and select "CLI" in the CLI, enter the following commands:-

```
enable
configure terminal
interface FastEthernet 0/1
switchport mode access
exit
interface FastEthernet 0/2
switchport mode access
exit
```

To configure the Gigabit Ethernet interface on the router, you can follow these steps.

1. Right click on the router and select "CLI"
2. Enter the following commands.

```
enable
configure terminal
interface Gigabit Ethernet 0/0
ip address {IP address} {subnet mask}
no shutdown
exit
```

TESTING THE NETWORK:-

If the ping is successful. Then the network is functioning properly. We can also use the "ping" command to test connectivity between the router and the PC's.

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
●	Successful	PC4	PC2	ICMP	■	0.000	N	0	(edit)	(delete)
●	Successful	PC0	Router1	ICMP	■	0.000	N	1	(edit)	(delete)
●	Successful	PC1	Router1	ICMP	■	0.000	N	2	(edit)	(delete)
●	Successful	PC6	Router1	ICMP	■	0.000	N	3	(edit)	(delete)

Student observation:-

a] write down your understandings of subnetting.

Subnetting divides a large network into smaller subnetworks (subnets) to efficiently allocate IP addresses, manage traffic, and enhance security within each segment.

b] what is security key in wireless router?

1] Efficient IP: Prevents IP waste by assign range per subnet.

2] Enhanced security: Isolate segments to control.

3] Reduced Congestion: Limit broadcast traffic

4] Easier Troubleshooting: simplifies identifying and fixing issues by narrowing down network segments.

Result:-

Thus implementation of subnetting is CISCO Packet tracer is executed.