

COMPUTER NETWORKS LABORATORY

By:
Nitish S
PES2201800368
5 'A'

WEEK – 6- Designing and Simulation of Network Topology using Cisco Packet Tracer

Date: 28/10/2020

Objectives:

- To understand the purpose of Cisco Packet Tracer.
 - To navigate, choose network and end devices and customize them.
 - To interconnect devices and configure them using simple interface.
 - To become familiar with building topologies in Packet Tracer.
 - To simulate data interactions traveling through a network.
-

Task 1 (Demo) :

Execution Procedure:

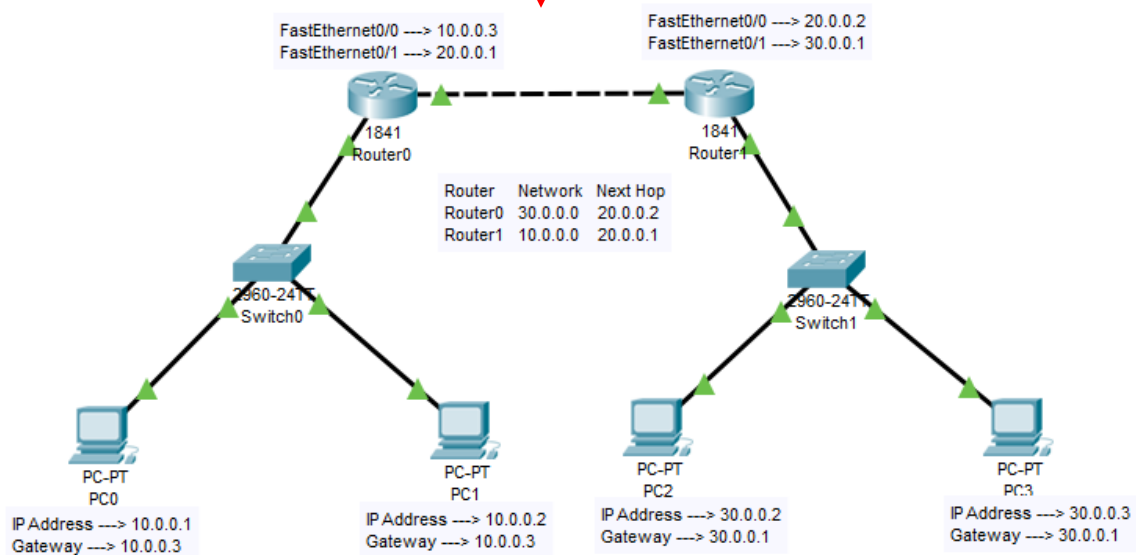
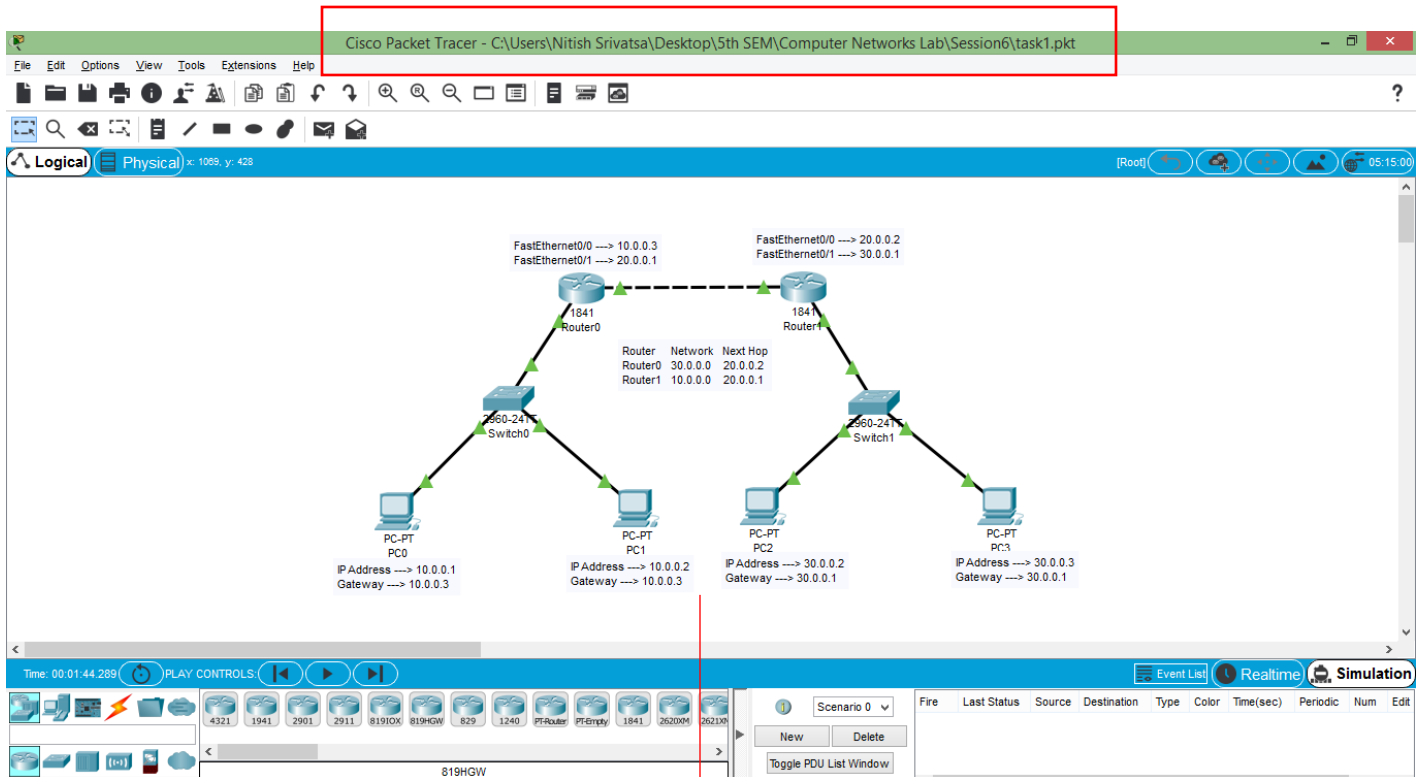
Step 1: Design a network topology with desktops, switches and routers similar to the network depicted in the above diagram.

Step 2: Configure the PCs and routers with the details provided above.

Step 3: Send a simple PDU from any PC on network 10.0.1.0 to any other PC on other network 10.0.3.0 and vice-versa.

Step 4: Simulate the network and observe the packet flow from one network to other.

Step 1: Network Topology: Created using Cisco Packet Tracer



Step 2: Configuring the PCs and routers:-

All the configurations made to the PCs and routers are shown in boxes next to each PC or router in the above topology.

PROCEDURE OF HOW THEY ARE CONFIGURED FOR A PC:

Cisco Packet Tracer - C:\Users\Nitish Srivatsa\Desktop\5th SEM\Computer Networks Lab\Session6\task1.pkt

PC0

Physical Config Desktop Programming Attributes

☐ DHCP ☒ Static

IP Address: 10.0.0.1
Subnet Mask: 255.255.255.0
Default Gateway: 10.0.0.3
DNS Server: 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address: /
Link Local Address: FE80::2D0:D3FF:FE51:6447
IPv6 Gateway:
IPv6 DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MDS

Username:
Password:

☐ Top

IP Address ----> 10.0.0.1
Gateway ----> 10.0.0.3

PROCEDURE OF HOW IP ADDRESS AND ROUTING TABLE ENTRIES ARE CONFIGURED FOR A ROUTER:

Cisco Packet Tracer - C:\Users\Nitish Srivatsa\Desktop\5th SEM\Computer Networks Lab\Session6\task1.pkt

Router0

Physical Config CLI Attributes

FastEthernet0/0

☒ On

Port Status: 100 Mbps 10 Mbps Auto

Duplex: Half Duplex Full Duplex Auto

MAC Address: 0060.2F31.D801

IP Configuration

IP Address: 10.0.0.3
Subnet Mask: 255.255.255.0

Tx Ring Limit: 10

Equivalent IOS Commands

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
```

FastEthernet0/0 ----> 10.0.0.3
FastEthernet0/1 ----> 20.0.0.1

Router

Router	Network	Next Hop
Router0	30.0.0.0	20.0.0.2
Router1	10.0.0.0	20.0.0.1

IP Address ----> 10.0.0.1
Gateway ----> 10.0.0.3

IP Address ----> 10.0.0.2
Gateway ----> 10.0.0.3

Cisco Packet Tracer - C:\Users\Nitish Srivatsa\Desktop\5th SEM\Computer Networks Lab\Session6\task1.pkt

Router0 Configuration Window:

- Physical** tab selected.
- FastEthernet0/0** and **FastEthernet0/1** interfaces are highlighted.
- FastEthernet0/1** configuration details:
 - Port Status: ☒ On
 - Bandwidth: 100 Mbps
 - Duplex: ☒ Full Duplex
 - MAC Address: 0060.2F31.D802
 - IP Address: 20.0.0.1
 - Subnet Mask: 255.255.255.0
- Equivalent IOS Commands:**

```

Router#
Router(config)#configure terminal
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
      
```

Network Diagram Details:

- Router0:** FastEthernet0/0 ---> 10.0.0.3, FastEthernet0/1 ---> 20.0.0.1
- Switch0:** 2960-24T
- PC0:** IP Address ---> 10.0.0.1, Gateway ---> 10.0.0.3
- PC1:** IP Address ---> 10.0.0.2, Gateway ---> 10.0.0.3
- PC2:** IP Address ---> 10.0.0.2, Gateway ---> 10.0.0.3

ROUTING TABLE ENTRY FOR ROUTER 0:

Cisco Packet Tracer - C:\Users\Nitish Srivatsa\Desktop\5th SEM\Computer Networks Lab\Session6\task1.pkt

Router0 Configuration Window - Static Routes:

- Static Routes** tab selected.
- Network Address:** 30.0.0.0/24 via 20.0.0.2
- Equivalent IOS Commands:**

```

Router(config)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#
      
```

Network Diagram Details (Same as above):

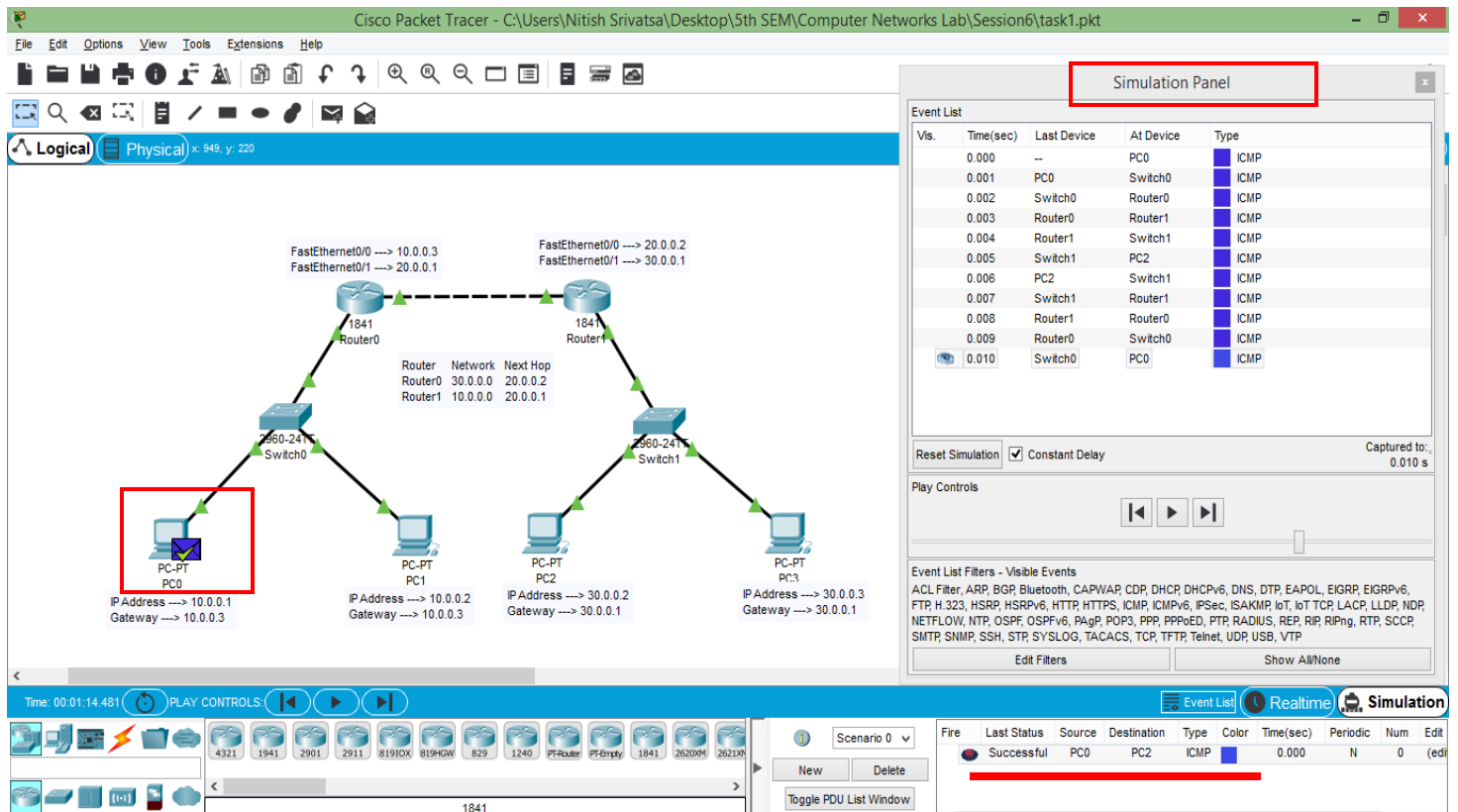
- Router0:** FastEthernet0/0 ---> 10.0.0.3, FastEthernet0/1 ---> 20.0.0.1
- Switch0:** 2960-24T
- PC0:** IP Address ---> 10.0.0.1, Gateway ---> 10.0.0.3
- PC1:** IP Address ---> 10.0.0.2, Gateway ---> 10.0.0.3
- PC2:** IP Address ---> 10.0.0.2, Gateway ---> 10.0.0.3

Similar procedure is followed for all the PCs and routers.

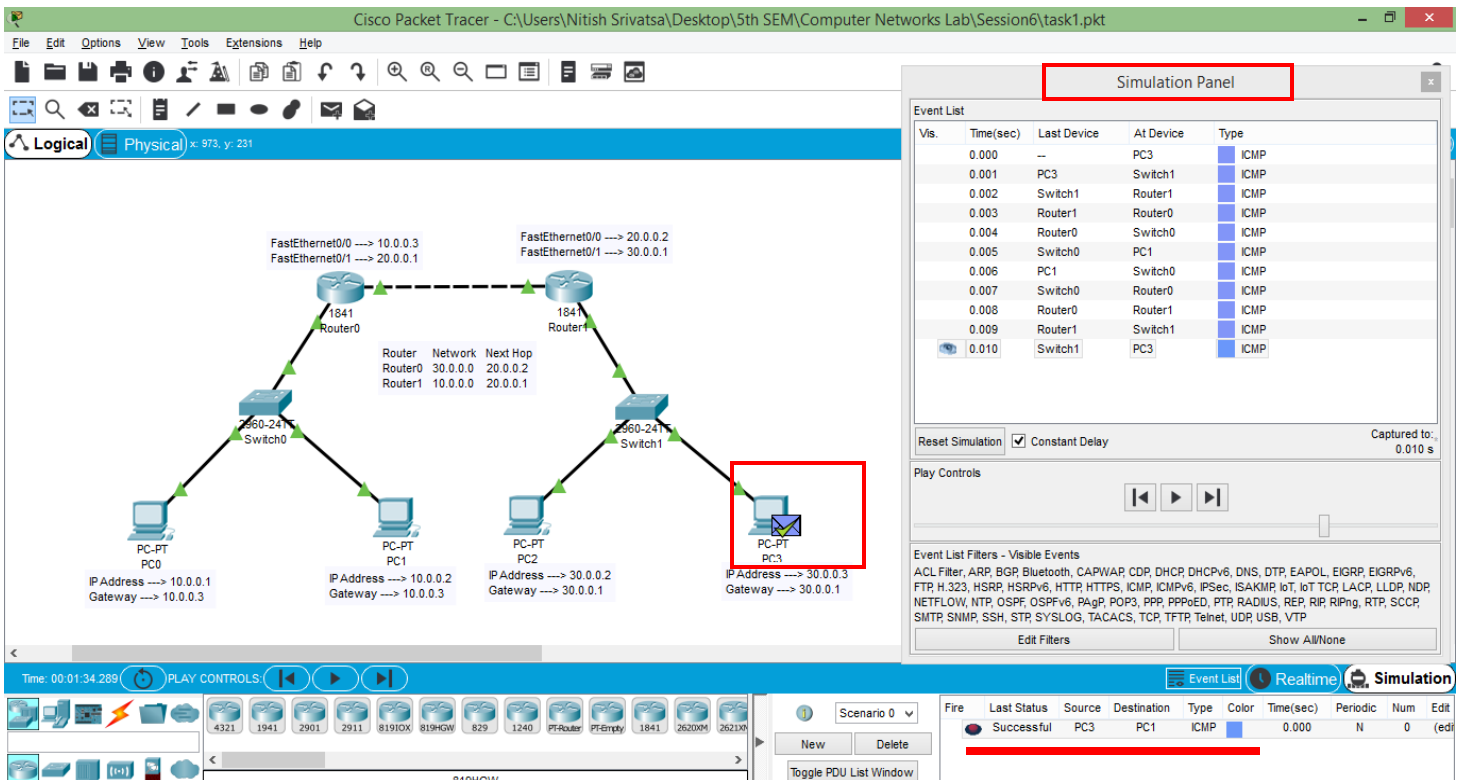
Step 3: Send a simple PDU from any PC on network 10.0.1.0 to any other PC on other network 10.0.3.0 and vice-versa.

Step 4: Simulate the network and observe the packet flow from one network to other.

Eg.1) SENDING A PACKET FROM PC0 to PC2:



Eg .2) SENDING A PACKET FROM PC3 to PC1:



TASK 2 (MANDATORY FOR WEEK-6):

Execution Procedure:

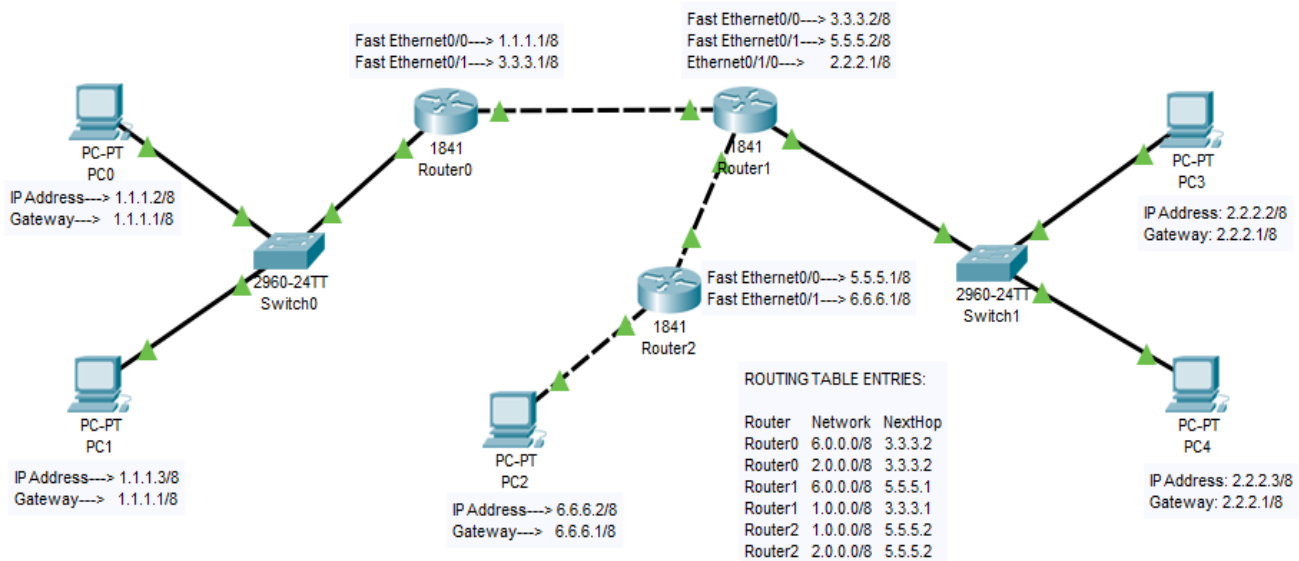
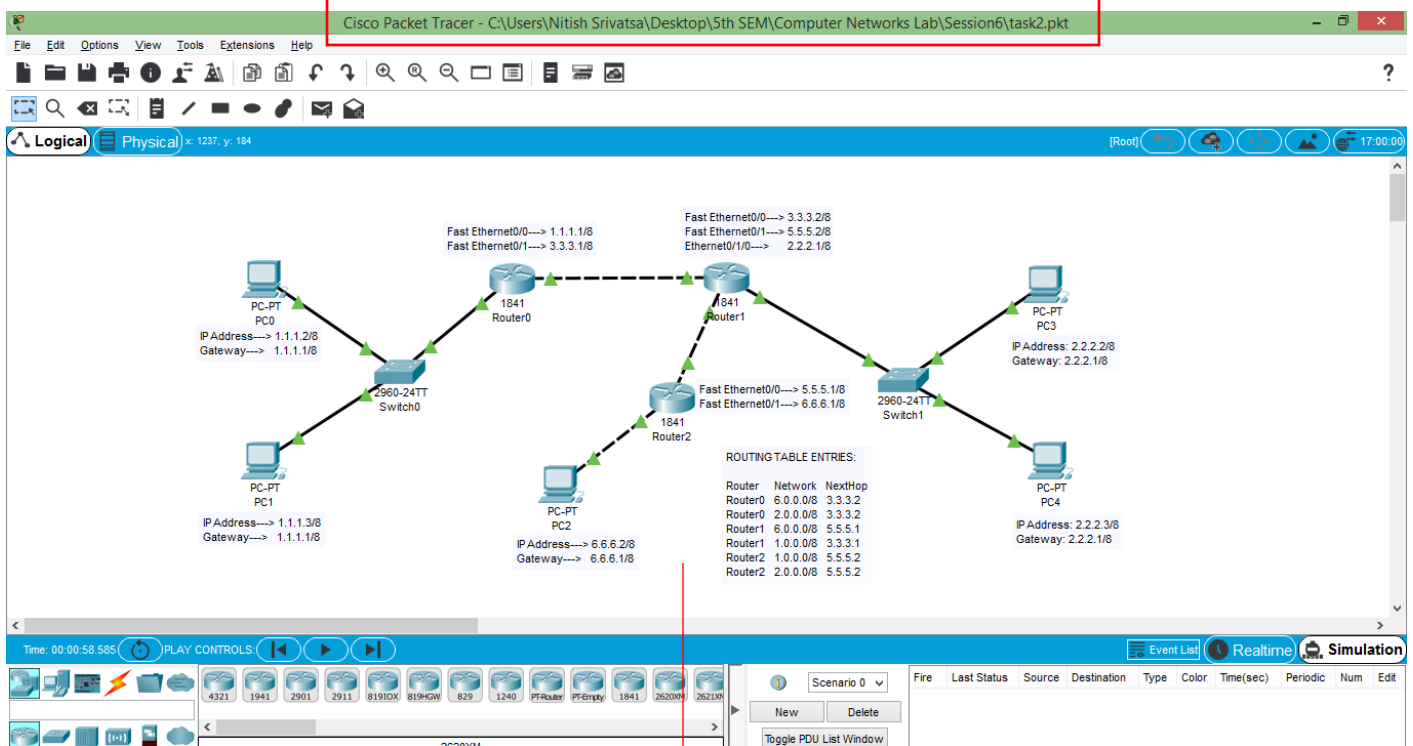
Step 1: Design a network topology with desktops, switches and routers similar to the network depicted in the above diagram.

Step 2: Configure the PCs and routers with the details provided above.

Step 3: Send a simple PDU from any PC on network 10.0.1.0 to any other PC on other network 10.0.3.0 and vice-versa.

Step 4: Simulate the network and observe the packet flow from one network to other.

Step 1: Network Topology: Created using Cisco Packet Tracer



Step 2: Configuring the PCs and routers:-

All the configurations made to the PCs and routers are shown in boxes next to each PC or router in the above topology.

PROCEDURE OF HOW THEY ARE CONFIGURED FOR A PC:

The screenshot displays the Cisco Packet Tracer interface. On the left, a network diagram shows two PCs: PC-PT PC0 and PC-PT PC1. PC0 is connected to a switch, and PC1 is connected to the same switch. Both PCs have IP addresses in the 1.1.1.0/8 range. The main window shows the configuration for PC0. The 'Static' tab is selected, and the IP Address is set to 1.1.1.2, Subnet Mask to 255.0.0.0, Default Gateway to 1.1.1.1, and DNS Server to 0.0.0.0. The 'IPv6 Configuration' tab is also visible, showing 'Static' configuration with an IPv6 Address of FE80::201:63FF:FEED:B6A and a Link Local Address of FE80::201:63FF:FEED:B6A. The '802.1X' tab is also visible, showing 'MDS' authentication and a Username field.

PROCEDURE OF HOW IP ADDRESS AND ROUTING TABLE ENTRIES ARE CONFIGURED FOR A ROUTER:

The screenshot displays the Cisco Packet Tracer interface. On the left, a network diagram shows a topology with three routers (Router0, Router1, Router2) and two PCs (PC0, PC1). Router0 is connected to Router1, and Router1 is connected to Router2. Router0 is also connected to a switch, which is connected to PC0 and PC1. The main window shows the configuration for Router0. The 'Config' tab is selected, and the 'FastEthernet0/0' interface is highlighted. The 'Port Status' is set to 'On', and the 'IP Address' is set to 1.1.1.1 with a Subnet Mask of 255.0.0.0. The 'Equivalent IOS Commands' section shows the following commands:

```
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#interface FastEthernet0/0
Router(config-if)#
```

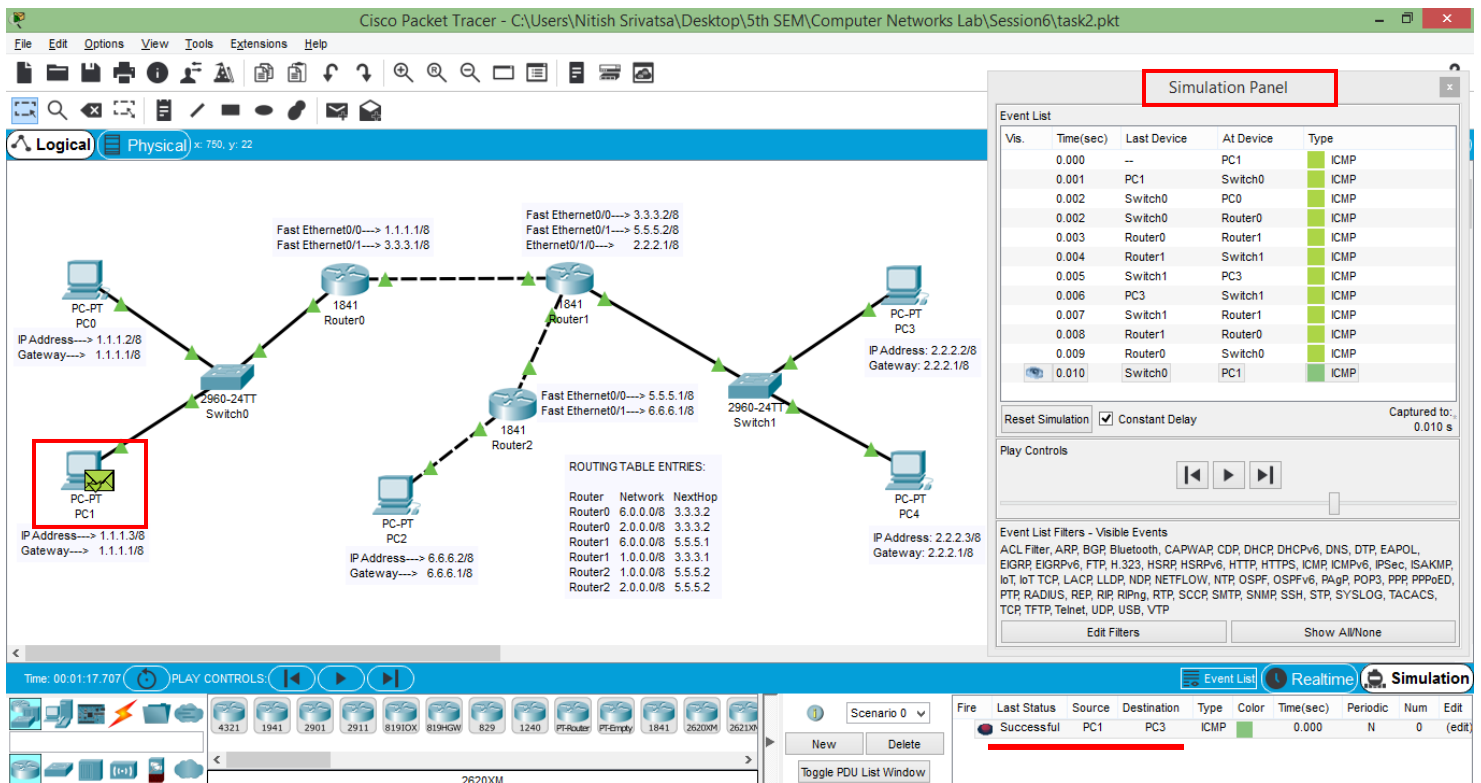
The 'ROUTING TABLE ENTRIES' section shows the following entries:

Router	Network	NextHop
Router0	6.0.0/8	3.3.2
Router0	2.0.0/8	3.3.2
Router1	6.0.0/8	5.5.1
Router1	1.0.0/8	3.3.1
Router2	1.0.0/8	5.5.2
Router2	2.0.0/8	5.5.2

Step 3: Send a simple PDU from any PC on network 10.0.1.0 to any other PC on other network 10.0.3.0 and vice-versa.

Step 4: Simulate the network and observe the packet flow from one network to other.

Eg.1) SENDING A PACKET FROM PC1 to PC3:



Eg.2) SENDING A PACKET FROM PC4 to PC2:

Cisco Packet Tracer - C:\Users\Nitish Srivatsa\Desktop\5th SEM\Computer Networks Lab\Session6\task2.pkt

File Edit Options View Tools Extensions Help

Logical Physical x 848, y: 42

Fast Ethernet0/0----> 1.1.1.1/8
Fast Ethernet0/1----> 3.3.3.1/8

Fast Ethernet0/0----> 3.3.3.2/8
Fast Ethernet0/1----> 5.5.5.2/8
Ethernet0/1/0----> 2.2.2.1/8

Fast Ethernet0/0----> 5.5.5.1/8
Fast Ethernet0/1----> 6.6.6.1/8

ROUTING TABLE ENTRIES:

Router	Network	NextHop
Router0	6.0.0.0/8	3.3.3.2
Router0	2.0.0.0/8	3.3.3.2
Router1	6.0.0.0/8	5.5.5.1
Router1	1.0.0.0/8	3.3.3.1
Router2	1.0.0.0/8	5.5.5.2
Router2	2.0.0.0/8	5.5.5.2

PC-PT PC0
IP Address----> 1.1.1.2/8
Gateway----> 1.1.1.1/8

PC-PT PC1
IP Address----> 1.1.1.3/8
Gateway----> 1.1.1.1/8

PC-PT PC2
IP Address----> 6.6.6.2/8
Gateway----> 6.6.6.1/8

PC-PT PC3
IP Address: 2.2.2.2/8
Gateway: 2.2.2.1/8

PC-PT PC4
IP Address: 2.2.2.3/8
Gateway: 2.2.2.1/8

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC4	ICMP
	0.001	PC4	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.003	Router1	Router2	ICMP
	0.004	Router2	PC2	ICMP
	0.005	PC2	Router2	ICMP
	0.006	Router2	Router1	ICMP
	0.007	Router1	Switch1	ICMP
	0.008	Switch1	PC4	ICMP

Reset Simulation ☒ Constant Delay Captured to: 0.008 s

Play Controls

Event List Filters - Visible Events

ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPsec, ISAKMP, IoT, IoT TCP, LACP, LLDP, NDR, NETFLOW, NTP, OSPF, OSPFv6, PaGP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCR, TFTP, Telnet, UDP, USB, VTP

Edit Filters Show All/None

Time: 00:01:47.705 PLAY CONTROLS

Scenario 0

New Delete

Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	PC4	PC2	ICMP		0.000	N	0	(edit)