

Computer Networks Laboratory

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SRN: PES1UG20CS825

SEC: 'H'

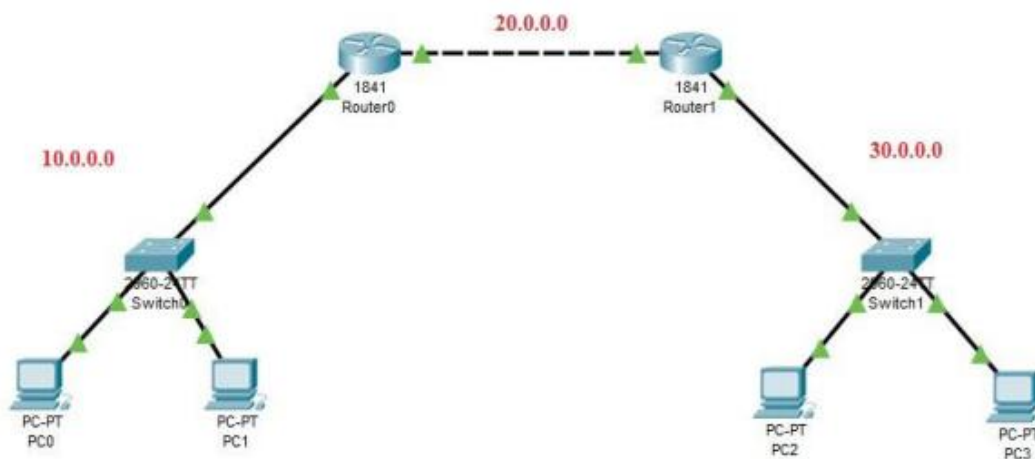
Lab #2

Designing and Simulation of Network Topology using Cisco Packet Tracer

Task 1 (Demo)

Network Topology:

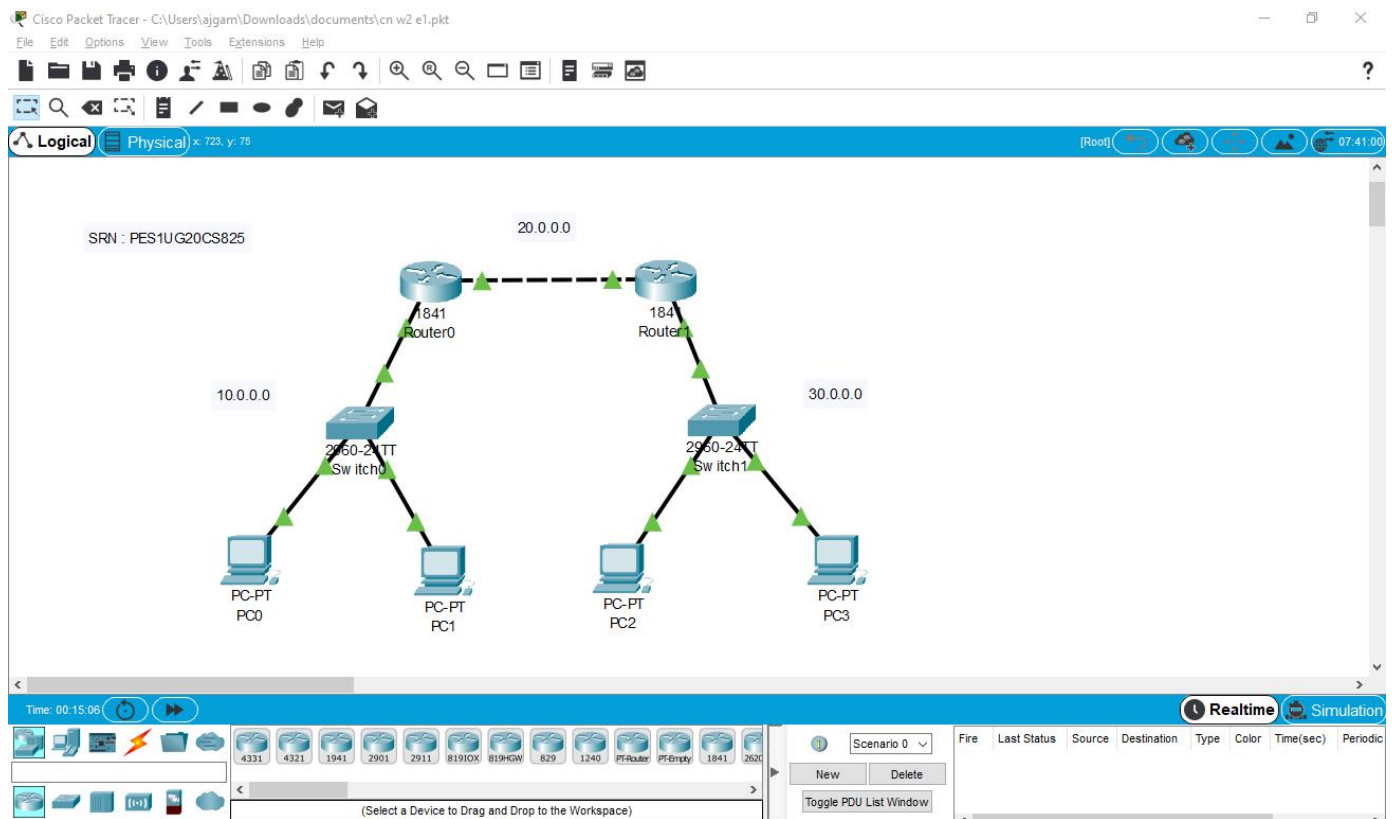
To replicate given scenario, create a topology in packet tracer, as shown in following image.



Execution Procedure:

Task 1:

Design a network topology with desktops, switches and routers like the network depicted in the above diagram.

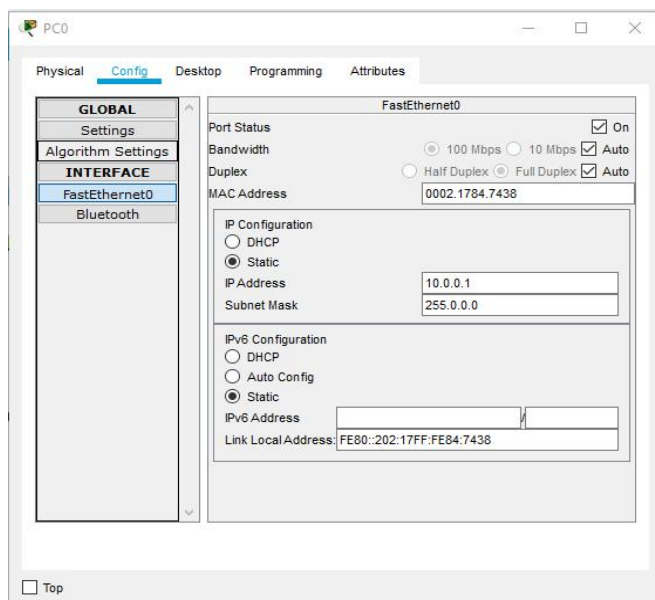


Task 2:

Configure the PCs and routers with the details provided above.

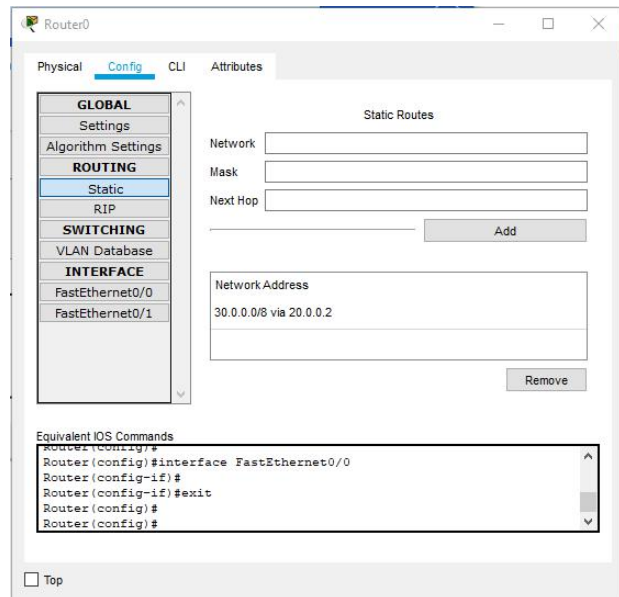
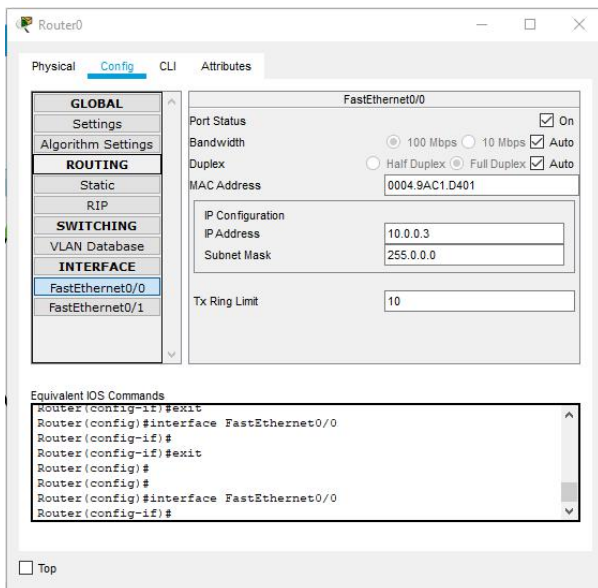
PC & Router Configured as above Topology:

PC0:



Router0:

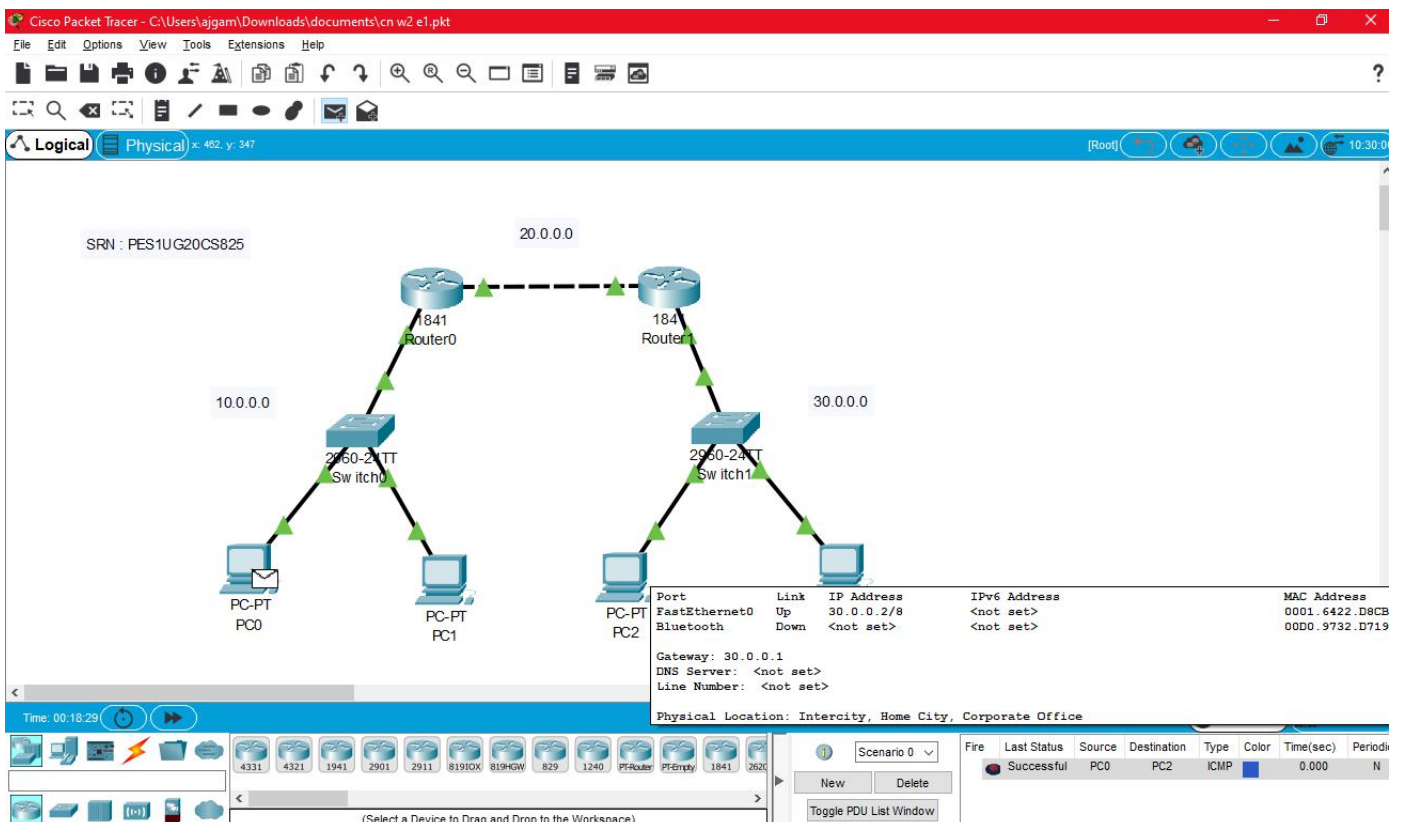
FastEthernet0/0 and Routing:



Task 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.

Sending a Simple PDU from PC0 on Network 10.0.0.0 to PC2 on the Network 30.0.0.0.



Task 4:

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

Packet Flow from PC0 on Network 10.0.0.0 to PC2 on the Network 30.0.0.0

Packet at PC0 (source):

The network diagram shows two interconnected networks. Network 10.0.0.0 contains PC0 and PC1 connected to Sw itch0 (2960-24TT). Network 30.0.0.0 contains PC2 and PC3 connected to Sw itch1 (2960-24TT). The two switches are connected to Router0 and Router1 (1841) respectively, which are also connected to each other. The packet flow is from PC0 to PC2.

Simulation Panel:

Vis.	Time(sec)	Last Device	At Device	Type
<input checked="" type="checkbox"/>	0.000	--	PC0	ICMP

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, NDP, NETFLOW, NTP, OSPF, OSPFv6, PaGP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP

Event List:

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic
<input checked="" type="checkbox"/>	In Progress	PC0	PC2	ICMP	Blue	0.000	N

Packet at Router0:

The network diagram is the same as the previous one, showing the packet flow from PC0 to PC2.

PDU Information at Device: Router0

OSI Model Inbound PDU Details Outbound PDU Details

At Device: Router0
Source: PC0
Destination: PC2

In Layers

Layer7
Layer6
Layer5
Layer4
Layer3: IP Header Src. IP: 10.0.0.1, Dest. IP: 30.0.0.2 ICMP Message Type: 8
Layer2: Ethernet II Header 0002.1784.7438 >> 0004.9AC1.D401
Layer1: Port FastEthernet0/0

Out Layers

Layer7
Layer6
Layer5
Layer4
Layer3: IP Header Src. IP: 10.0.0.1, Dest. IP: 30.0.0.2 ICMP Message Type: 8
Layer2: Ethernet II Header 0004.9AC1.D402 >> 0009.7CC6.8D01
Layer1: Port(s): FastEthernet0/1

1. FastEthernet0/0 receives the frame.

Challenge Me << Previous Layer Next Layer >>

Event List:

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic
<input checked="" type="checkbox"/>	In Progress	PC0	PC2	ICMP	Blue	0.000	N

Packet at PC2 (destination):

SRN : PES1UG20CS825

20.0.0.0

10.0.0.0

30.0.0.0

Router0

Router1

Switch0

Switch1

PC-PT PC0

PC-PT PC1

PC-PT PC2

PC-PT PC3

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC0	ICMP
	0.002	PC0	Switch0	ICMP
	0.004	Switch0	Router0	ICMP
	0.005	Router0	Router1	ICMP
	0.007	Router1	Switch1	ICMP
	0.009	Switch1	PC2	ICMP

Reset Simulation ☐ Constant Delay Captured to: 0.009 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, NDP, NETFLOW, NTP, OSPF, OSPFv6, PaGP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP

Edit Filters Show All/None

Time: 00:21:20.692 PLAY CONTROLS

Scenario 0

New Delete

Toggle PDU List Window

Fire Last Status Source Destination Type Color Time(sec) Periodic

In Progress PC0 PC2 ICMP 0.000 N

Packet successfully sent and Acknowledgement received from PC2:

SRN : PES1UG20CS825

20.0.0.0

10.0.0.0

30.0.0.0

Router0

Router1

Switch0

Switch1

PC-PT PC0

PC-PT PC1

PC-PT PC2

PC-PT PC3

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.002	PC0	Switch0	ICMP
	0.004	Switch0	Router0	ICMP
	0.005	Router0	Router1	ICMP
	0.007	Router1	Switch1	ICMP
	0.009	Switch1	PC2	ICMP
	0.010	PC2	Switch1	ICMP
	0.012	Switch1	Router1	ICMP
	0.014	Router1	Router0	ICMP
	0.016	Router0	Switch0	ICMP
	0.018	Switch0	PC0	ICMP

Reset Simulation ☐ Constant Delay Captured to: 0.018 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, NDP, NETFLOW, NTP, OSPF, OSPFv6, PaGP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP

Edit Filters Show All/None

Time: 00:21:20.701 PLAY CONTROLS

Scenario 0

New Delete

Toggle PDU List Window

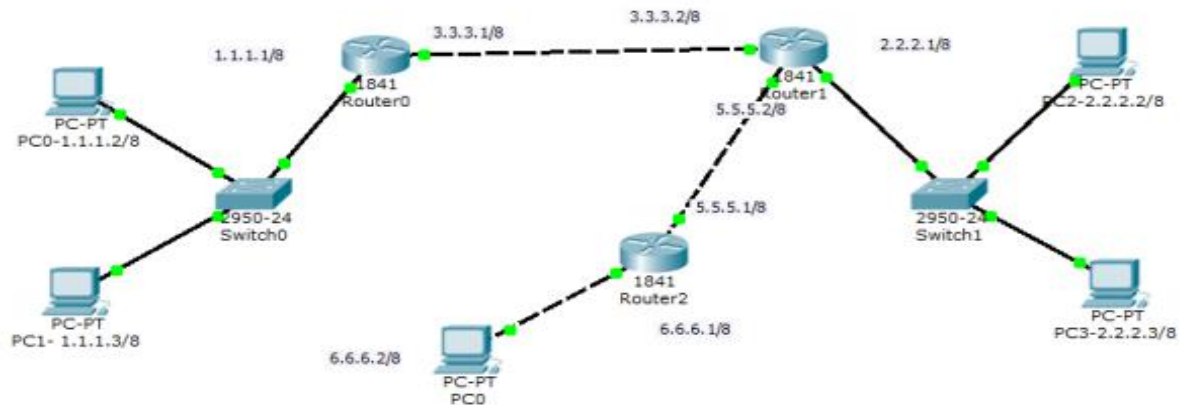
Fire Last Status Source Destination Type Color Time(sec) Periodic

Successful PC0 PC2 ICMP 0.000 N

Task 2:

Network Topology:

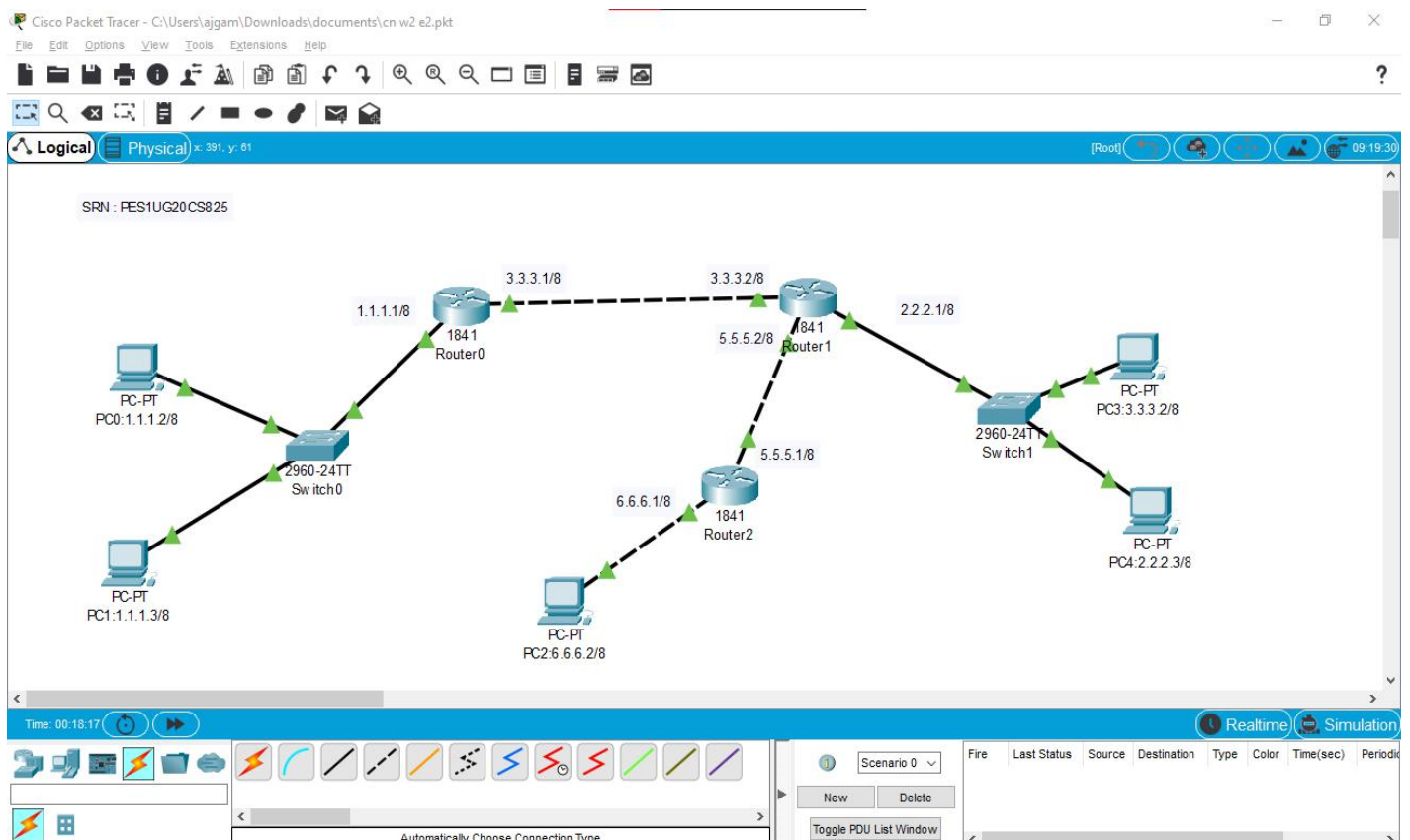
To replicate given scenario, create a topology in packet tracer, as shown in following image.



Execution Procedure:

Task 1:

Design a network topology with desktops, switches and routers like the network depicted in the above diagram.



Task 2:

Configure the PCs and routers.

PC0:

The screenshot shows the configuration window for PC0 (1.1.1.2/8). The 'Config' tab is active. On the left, the 'INTERFACE' section is expanded, showing 'FastEthernet0' selected. The main configuration area for 'FastEthernet0' includes:

- Port Status:** ☒ On
- Bandwidth:** ☒ 100 Mbps ☐ 10 Mbps ☒ Auto
- Duplex:** ☐ Half Duplex ☒ Full Duplex ☒ Auto
- MAC Address:** 0010.115C.053E
- IP Configuration:** ☐ DHCP ☒ Static
 - IP Address:** 1.1.1.2
 - Subnet Mask:** 255.255.255.0
- IPv6 Configuration:** ☐ DHCP ☐ Auto Config ☒ Static
 - IPv6 Address:** (empty field)
 - Link Local Address:** FE80::210:11FF:FE5C:53E

A 'Top' button is located at the bottom left of the window.

Router0:

Static Routing:

The screenshot shows the configuration window for Router0. The 'Config' tab is active. On the left, the 'ROUTING' section is expanded, showing 'Static' selected. The main configuration area for 'Static Routes' includes:

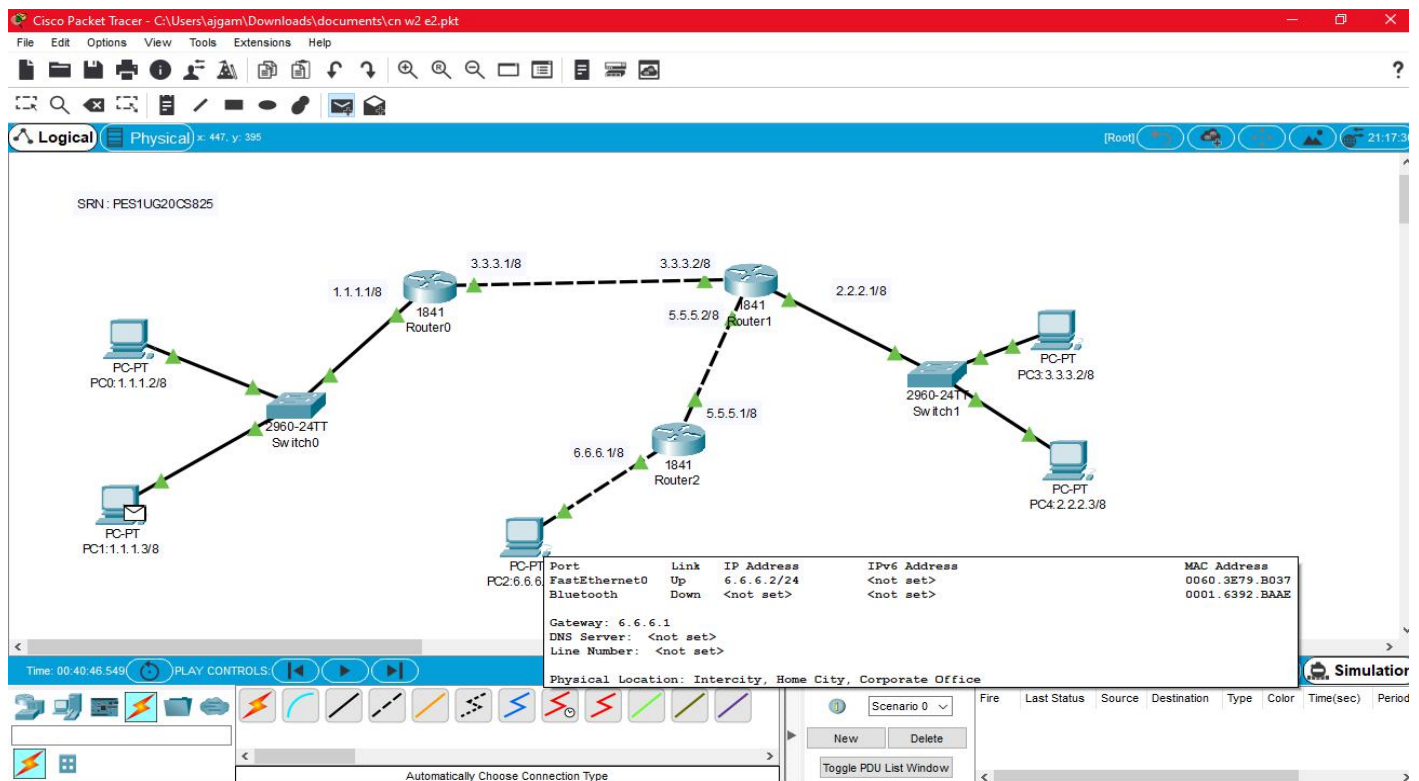
- Static Routes:** Fields for Network, Mask, and Next Hop, with an 'Add' button.
- Network Address:** A list of configured static routes:
 - 2.2.2.0/24 via 3.3.3.2
 - 6.6.6.0/24 via 3.3.3.2
 - 5.5.5.0/24 via 3.3.3.2with a 'Remove' button.
- Equivalent IOS Commands:** A text area showing the following commands:

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#
Router(config-router)#end
Router#configure terminal
```

A 'Top' button is located at the bottom left of the window.

Task 3:

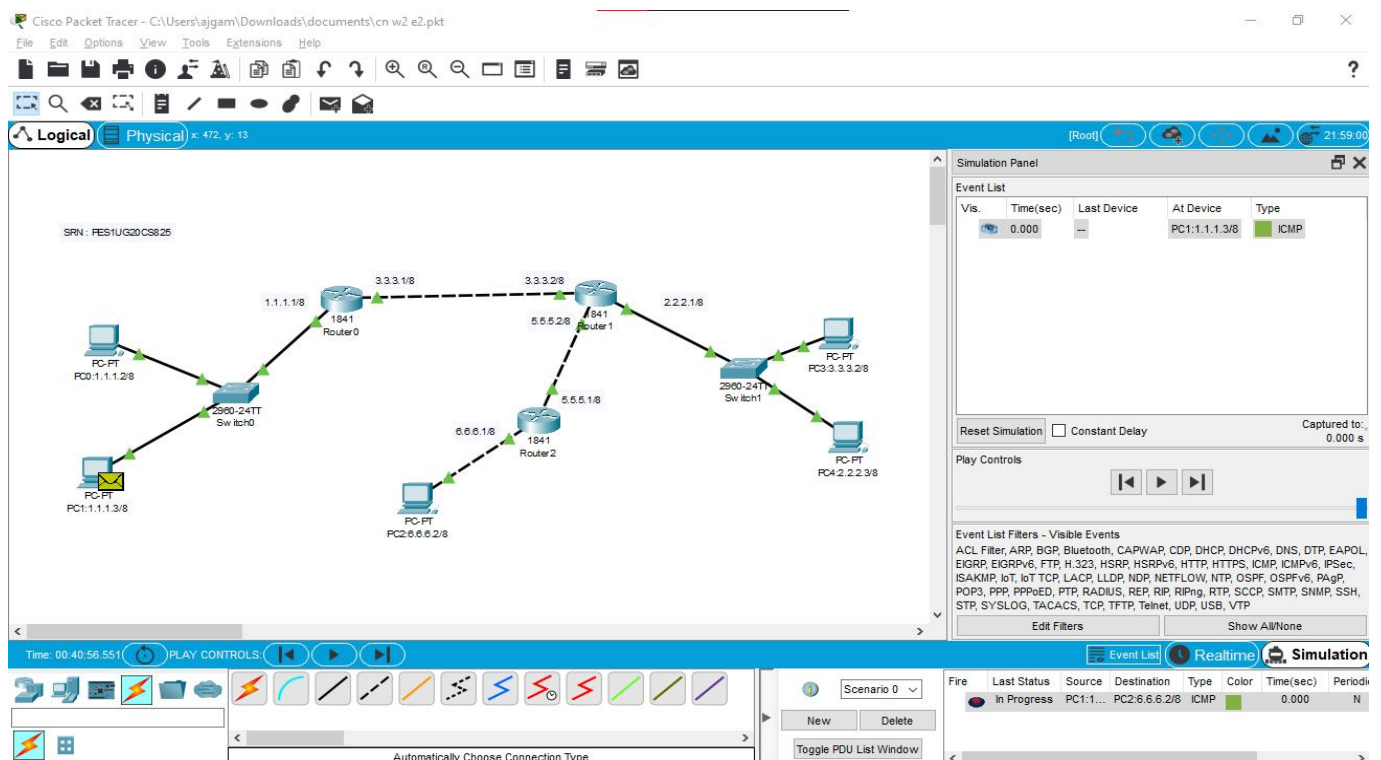
Send a simple PDU from any PC on network 1.1.1.0 to any other PC on other network 6.6.6.0 and vice-versa.



Task 4:

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

Packet at PC1 (source):



Packet at Router0:

Cisco Packet Tracer - C:\Users\ajgam\Downloads\documents\cn w2 e2.pkt

File Edit Options View Tools Extensions Help

Logical Physical x: 471, y: 4

SRN: FES1UG20CS8.25

PC-PT PC0: 1.1.1.2/8
PC-PT PC1: 1.1.1.3/8
2960-24TT Switch0
1841 Router0
1841 Router1
1841 Router2
2960-24TT Switch1
PC-PT PC3: 3.3.3.2/8
PC-PT PC4: 2.2.2.3/8
PC-PT PC2: 6.6.6.2/8

PDU Information at Device: Router0

OSI Model Inbound PDU Details Outbound PDU Details

At Device: Router0
Source: PC1: 1.1.1.3/8
Destination: PC2: 6.6.6.2/8

In Layers
Layer7
Layer6
Layer5
Layer4
Layer3: IP Header Src. IP: 1.1.1.3, Dest. IP: 6.6.6.2 ICMP Message Type: 8
Layer2: Ethernet II Header 0001.642D.8C67 >> 0000.0CE8.E001
Layer1: Port FastEthernet0/0

Out Layers
Layer7
Layer6
Layer5
Layer4
Layer3: IP Header Src. IP: 1.1.1.3, Dest. IP: 6.6.6.2 ICMP Message Type: 8
Layer2: Ethernet II Header 0000.0CE8.E002 >> 0001.96A6.2801
Layer1: Port(s): FastEthernet0/1

1. FastEthernet0/0 receives the frame.

Challenge Me << Previous Layer Next Layer >>

Time: 00:40:56.556 PLAY CONTROLS

Event List Realtime Simulation

Fire Last Status Source Destination Type Color Time(sec) Periodic

In Progress PC1:1... PC2:6.6.6.2/8 ICMP 0.000 N

Packet at PC2(destination):

Cisco Packet Tracer - C:\Users\ajgam\Downloads\documents\cn w2 e2.pkt

File Edit Options View Tools Extensions Help

Logical Physical x: 516, y: 1

SRN: FES1UG20CS8.25

PC-PT PC0: 1.1.1.2/8
PC-PT PC1: 1.1.1.3/8
2960-24TT Switch0
1841 Router0
1841 Router1
1841 Router2
2960-24TT Switch1
PC-PT PC3: 3.3.3.2/8
PC-PT PC4: 2.2.2.3/8
PC-PT PC2: 6.6.6.2/8

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC1: 1.1.1.3/8	ICMP
	0.003	PC1: 1.1.1.3/8	Switch0	ICMP
	0.005	Switch0	Router0	ICMP
	0.008	Router0	Router1	ICMP
	0.010	Router1	Router2	ICMP
	0.013	Router2	PC2: 6.6.6.2/8	ICMP

Reset Simulation ☐ Constant Delay Captured to: 0.013 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, NDP, NETFLOW, NTP, OSPF, OSPFv6, PaGP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIP, RIPv2, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP

Edit Filters Show All/None

Time: 00:40:56.564 PLAY CONTROLS

Event List Realtime Simulation

Fire Last Status Source Destination Type Color Time(sec) Periodic

In Progress PC1:1... PC2:6.6.6.2/8 ICMP 0.000 N

Packet successfully sent and Acknowledgement received from PC2:

Cisco Packet Tracer - C:\Users\ajgam\Downloads\documents\cn w2 e2.pkt

File Edit Options View Tools Extensions Help

Logical Physical x: 881, y: 204 [Root] 00:34:30

SRV: PES1UG20CS825

PC-PT PC0:1.1.1.2/8

2960-24TT Switch0

PC-PT PC1:1.1.1.3/8

1841 Router0

1.1.1.1/8

3.3.3.1/8

3.3.3.2/8

1841 Router1

5.5.5.2/8

5.5.5.1/8

1841 Router2

6.6.6.1/8

PC-PT PC2:6.6.6.2/8

2960-24TT Switch1

2.2.2.1/8

PC-PT PC3:3.3.3.2/8

PC-PT PC4:2.2.2.3/8

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.005	Switch0	Router0	ICMP
	0.008	Router0	Router1	ICMP
	0.010	Router1	Router2	ICMP
	0.013	Router2	PC2:6.6.6.2/8	ICMP
	0.014	PC2:6.6.6.2/8	Router2	ICMP
	0.015	Router2	Router1	ICMP
	0.018	Router1	Router0	ICMP
	0.019	Router0	Switch0	ICMP
	0.021	Switch0	PC1:1.1.1.3/8	ICMP

Reset Simulation ☐ Constant Delay Captured to: 0.021 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, NDP, NETFLOW, NTP, OSPF, OSPFv6, PaGP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP

Edit Filters Show All/None

Time: 00:40:56.572 PLAY CONTROLS

Scenario 0

New Delete

Toggle PDU List Window

Automatically Choose Connection Type

Simulation

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic
	Successful	PC1:1...	PC2:6.6.6.2/8	ICMP		0.000	N