DEPARTMENT OF TELECOMMUNICATION ENGINEERING
MEHRAN UNIVERSITY OF ENGINEERING & TECHNOLOGY, JAMSHORO
COMPUTER COMMUNICATION & NETWORKING
(7th Term, 4th Year) LAB EXPERIMENT # 07/1

Name: karan Roll No: 20ES62

Score: Signature of the Lab Tutor: Date:

OBJECTIVES

#	Topic	#. Of Lectures	CLO	Taxonomy level
7	To **understand** how router works and basic **configuration** of router using console connection.	3	1,2	C2, P2

OUTCOME(S)

a. An ability to apply knowledge of math, science, and engineering	**PLO1**: Engineering Knowledge:

RUBRICS:

Performance Metric	Exceeds expectation (4-5)	Meets expectations (2-3)	Does not meet expectations (0-1)	Score
Knowledge and application [PLO1]	Applies the appropriate knowledge and concepts to the problem with accuracy and proficiency; shows precise understanding of these knowledge and concepts.	Applies the relevant knowledge and concept to the problem, possibly in a roundabout way; understands the major points of the knowledge, with possible misunderstanding or failure to recall minor points;	Fails to apply relevant knowledge and concepts to the problem; misunderstands or fails to recall critical points.	
			Total Score	

PERFORMANCE OBJECTIVE

Upon successful completion of this experiment, the student will be able to learn:

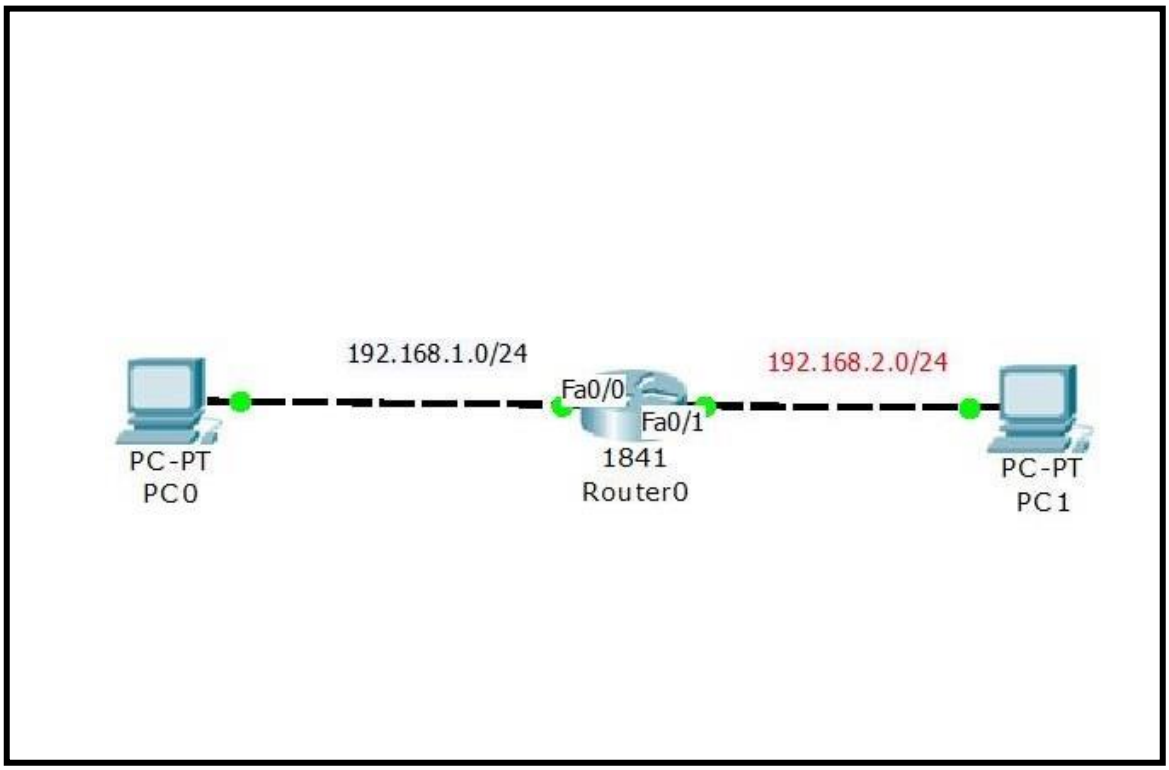
(i) To configure the interfaces of a router for communication between user of different networks.

EQUIPMENT

- Two PCs
- one Router
- Two cross-over cables

DISCUSSION

Router is a device which is used to connect different networks together. In this lab we will connect two different networks with a router using Pc and try to communicate these pcs via router.



Setup a network similar to the one in the diagram. Any router that meets the interface requirements may be used. And follow the steps required to achieve this lab activity.

Step 1: Configuring Router interfaces

For Router0

Press Enter to Start

Router>
Router>**en**
Router#**config t**
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#**hostname Router0**
Router0(config)#**^Z**
%SYS-5-CONFIG_I: Configured from console by console
Router0(config)#**int fa0/0**
Router0(config-if)#**ip address 192.168.1.254 255.255.255.0**
Router0(config-if)#**no shut**
%LINK-3-UPDOWN: Interface fastEthernet0, changed state to up
Router0(config-if)#**^Z**

a. Why we have assigned ip address of which class and how many host ip address it has?

_____

Router0#**config t**
Enter configuration commands, one per line. End with CNTL/Z.
Router0(config)#**int fa0/1**
Router0(config-if)#**ip address 192.168.2.254 255.255.255.0**
Router0(config-if)#**no shut**
%LINK-3-UPDOWN: Interface fastEthernet0, changed state to up

Step 2: Configuring the work stations

Configure the workstations with the proper IP address, subnet mask, and default gateway.
a. The configuration for the host connected to the Router0 with fa0/0 interface is:
IP Address: **192.168.1.1**
IP subnet mask: **255.255.255.0**
Default gateway: **192.168.1.254**

Configure the workstations with the proper IP address, subnet mask, and default gateway.
a. The configuration for the host connected to the Router0 with fa0/1 is:
IP Address: **192.168.2.1**
IP subnet mask: **255.255.255.0**
Default gateway: **192.168.2.254**

a. Why the hosts have been assigned the default gateway addresses?

_____

Step 3: Check the interface status

Router1#sh ip int brief

Interface	IP-Address	OK? Method Status	Protocol
Fa0/0	**192.168.1.254**	**YES unset up**	**up**
Fa0/1	**192.168.2.254**	**YES unset up**	**up**

Step 4: Check the routing table entries

Router0#sh ip route

Router1#sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP i -
IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default U
- per-user static route

Gateway of last resort is not set

192.168.1.0/24 is subnetted, 1 subnets
C 192.168.1.0 is directly connected, fa0/0
192.168.2.0/24 is subnetted, 1 subnets
C 192.168.2.0 is directly connected, fa0/1

Step 7: Check connectivity from host to host

Ping PC-0 to PC-1

C:>ping 192.168.2.1

Pinging 192.168.2.1 with 32 bytes of data:

Reply from 192.168.2.1: bytes=32 time=60ms TTL=241
Reply from 192.168.2.1: bytes=32 time=60ms TTL=241
Reply from 192.168.2.1: bytes=32 time=60ms TTL=241
Reply from 192.168.2.1: bytes=32 time=60ms TTL=241
Reply from 192.168.2.1: bytes=32 time=60ms TTL=241

Ping statistics for 192.168.2.1: Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 50ms, Maximum = 60ms, Average = 55ms

Ping PC-1 to PC-0

C:>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=60ms TTL=241
Reply from 192.168.1.1: bytes=32 time=60ms TTL=241
Reply from 192.168.1.1: bytes=32 time=60ms TTL=241
Reply from 192.168.1.1: bytes=32 time=60ms TTL=241
Reply from 192.168.1.1: bytes=32 time=60ms TTL=241

Ping statistics for 192.168.1.1: Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 50ms, Maximum = 60ms, Average = 55ms

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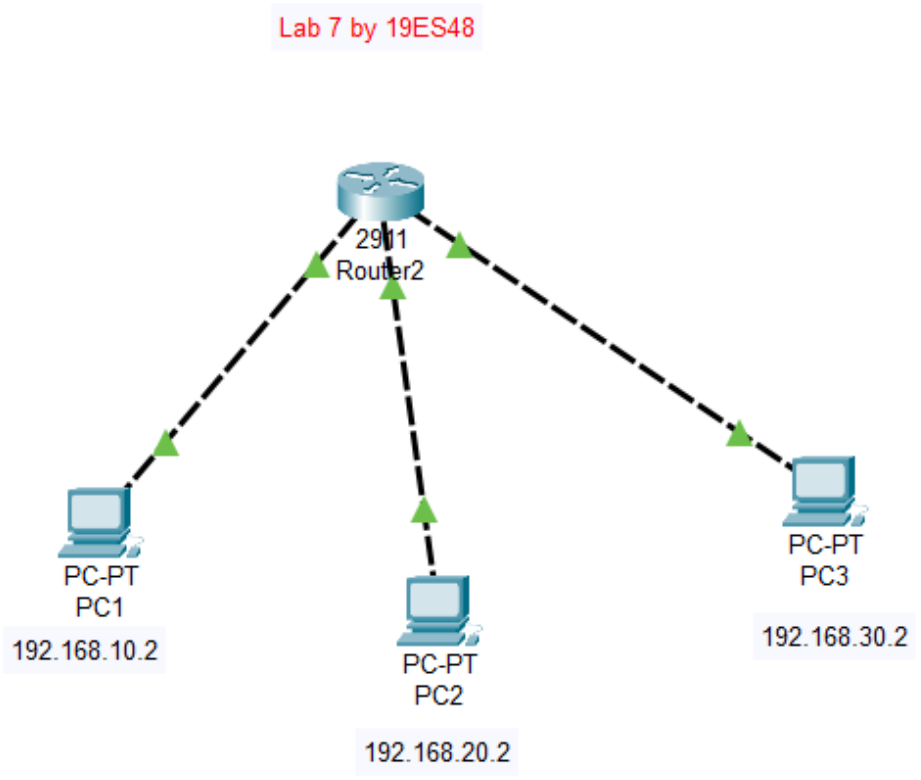
Lab Exercise:

Submit a lab by performing a simple task, details are as under:

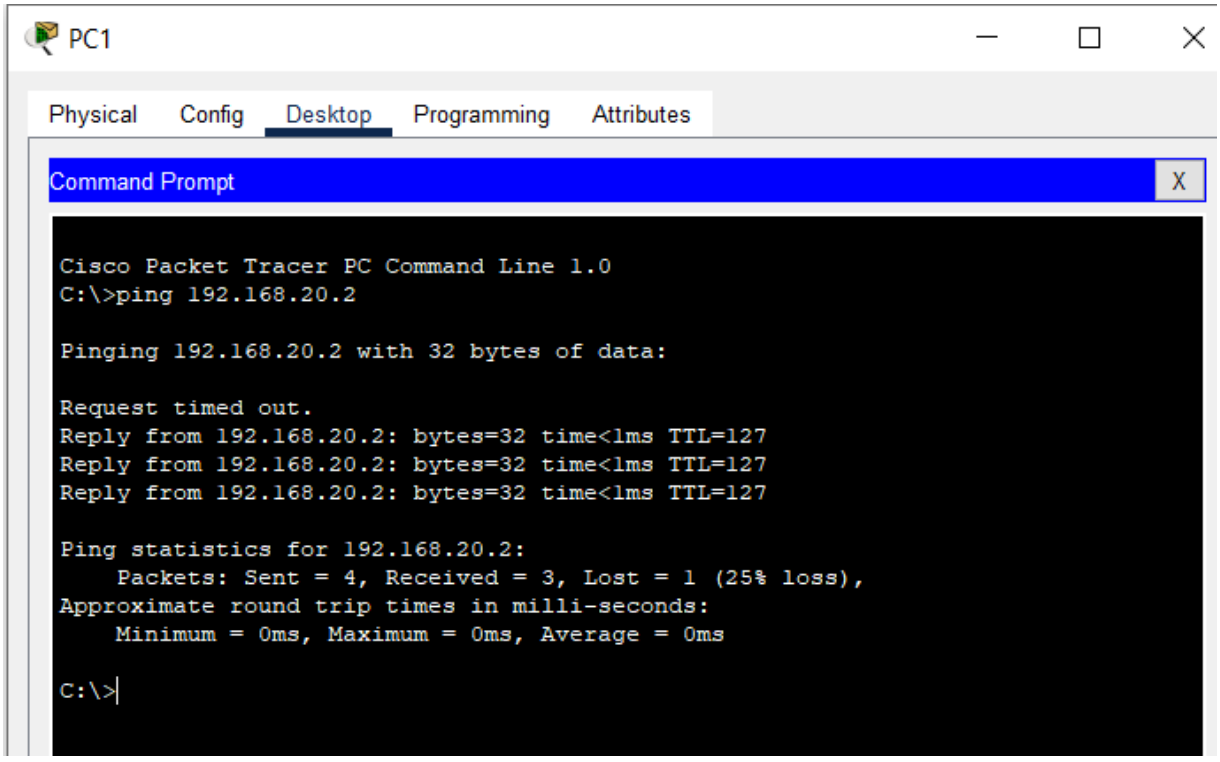
I. Connect three pcs with router using crossover cable
II. Configure router interfaces with three different networks using class C IP address scheme.



Configuring Router:

```
19es48R(config)#int gig0/1
19es48R(config-if)#ip address 192.168.20.1 255.255.255.0
19es48R(config-if)#no shutdown

19es48R(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed
state to up

19es48R(config-if)#exit
19es48R(config)#int gig0/3
%Invalid interface type and number
19es48R(config)#int gig0/2
19es48R(config-if)#ip add 192.168.30.1 255.255.255.0
19es48R(config-if)#no shutdown

19es48R(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed
state to up
```

Checking Communication Between Hosts:
PC1 to PC2:



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(6th Term, 3th Year) LAB EXPERIMENT # 07/8

PC1 to PC3:

```
C:\>ping 192.168.30.2

Pinging 192.168.30.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.30.2: bytes=32 time<1ms TTL=127
Reply from 192.168.30.2: bytes=32 time<1ms TTL=127
Reply from 192.168.30.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.30.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

PC3 to PC1:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

From PC3 to PC2:

```
C:\>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

From PC2 to PC3:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.30.2

Pinging 192.168.30.2 with 32 bytes of data:

Reply from 192.168.30.2: bytes=32 time<1ms TTL=127
Reply from 192.168.30.2: bytes=32 time<1ms TTL=127
Reply from 192.168.30.2: bytes=32 time=3ms TTL=127
Reply from 192.168.30.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.30.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 0ms

C:\>
```

PC2 to PC1:

```
Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

FINAL CHECK LIST

1. Return all equipment and materials to their proper storage area.
2. Submit your answers to questions before the next laboratory.

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