

DEPARTMENT OF ELECTRONICS ENGINEERING  
MEHRAN UNIVERSITY OF ENGINEERING & TECHNOLOGY, JAMSHORO  
COMPUTER COMMUNICATION & NETWORKING  
(2<sup>nd</sup> Semester, 3<sup>rd</sup> Year) LAB HANDOUT #

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Name: Karan Kumar Roll No: 20ES062

Score: \_\_\_\_\_ Signature of the Lab Tutor: \_\_\_\_\_ Date: \_\_\_\_\_

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**OBJECTIVES**

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

**OUTCOME(S)**

a. An ability to apply knowledge of math, science, and engineering	<b>PLO1:</b> Engineering Knowledge:
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**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.	
<b>Total Score</b>				

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**PERFORMANCE OBJECTIVE**

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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***

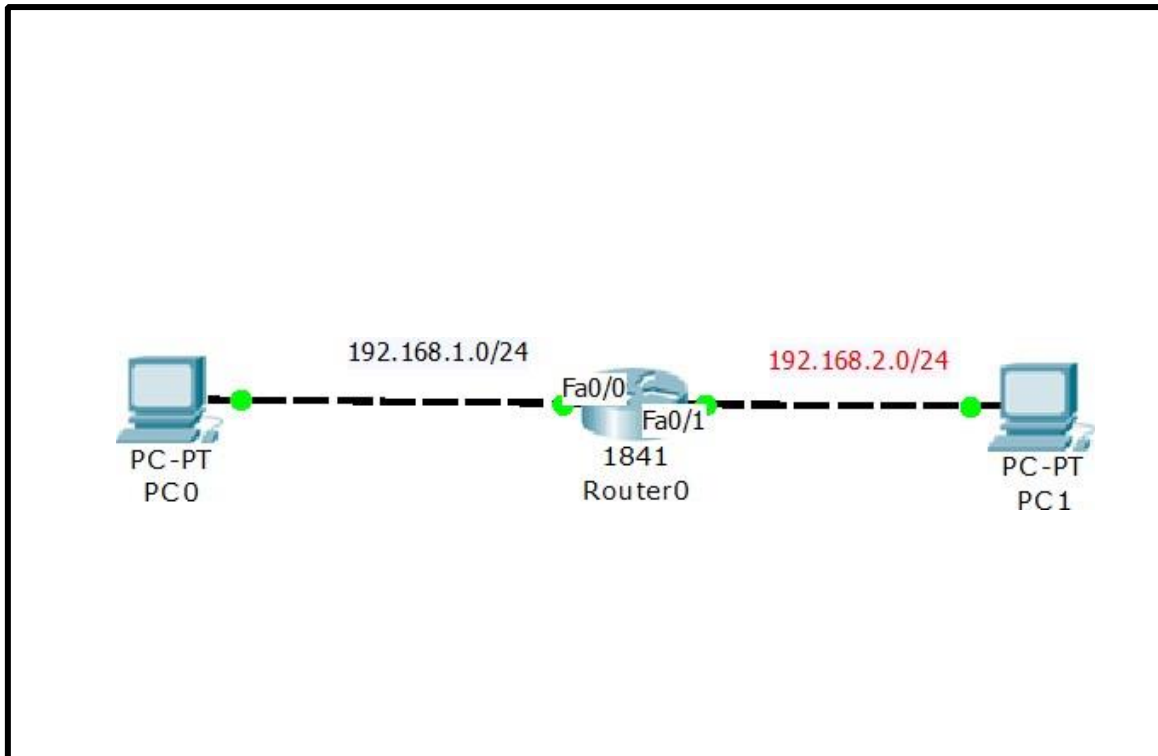
- Two PCs
- one Router
- Two cross-over cables

**DISCUSSION**

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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#**conf t**

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#**hostname Router0**

Router0(config)#**^Z**

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%SYS-5-CONFIG\_I: Configured from console by console

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Router0(config)#**int fa0/0**

Router0(config-if)#**ip address 192.168.1.254 255.255.255.0**

Router0(config-if)#**no shut**

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%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	<b>192.168.1.254</b>	<b>YES</b>	<b>unset</b>	<b>up</b>	<b>up</b>
Fa0/1	<b>192.168.2.254</b>	<b>YES</b>	<b>unset</b>	<b>up</b>	<b>up</b>

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**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

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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

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

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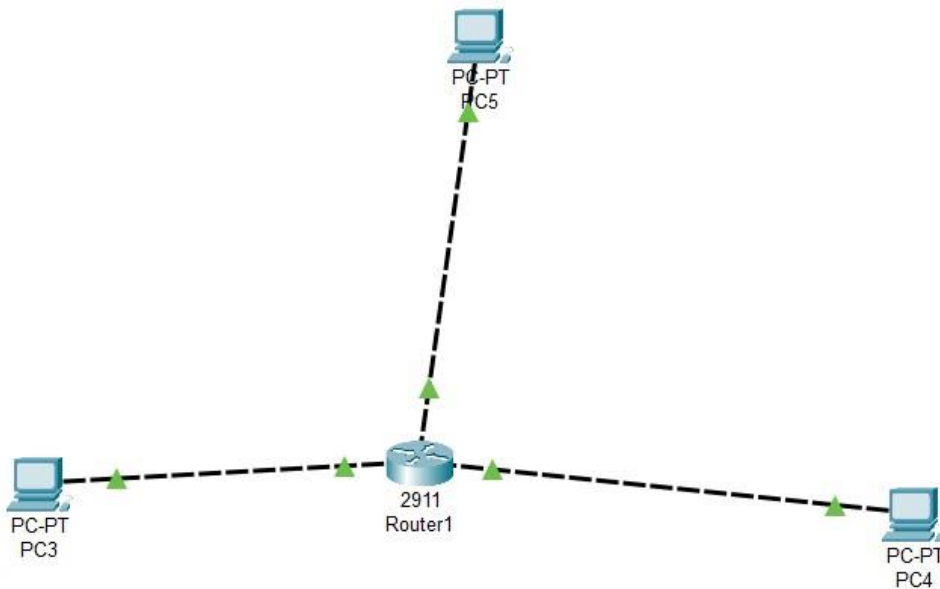
Ping statistics for 192.168.1.1:      Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:

Minimum = 50ms, Maximum = 60ms, Average = 55ms

**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.



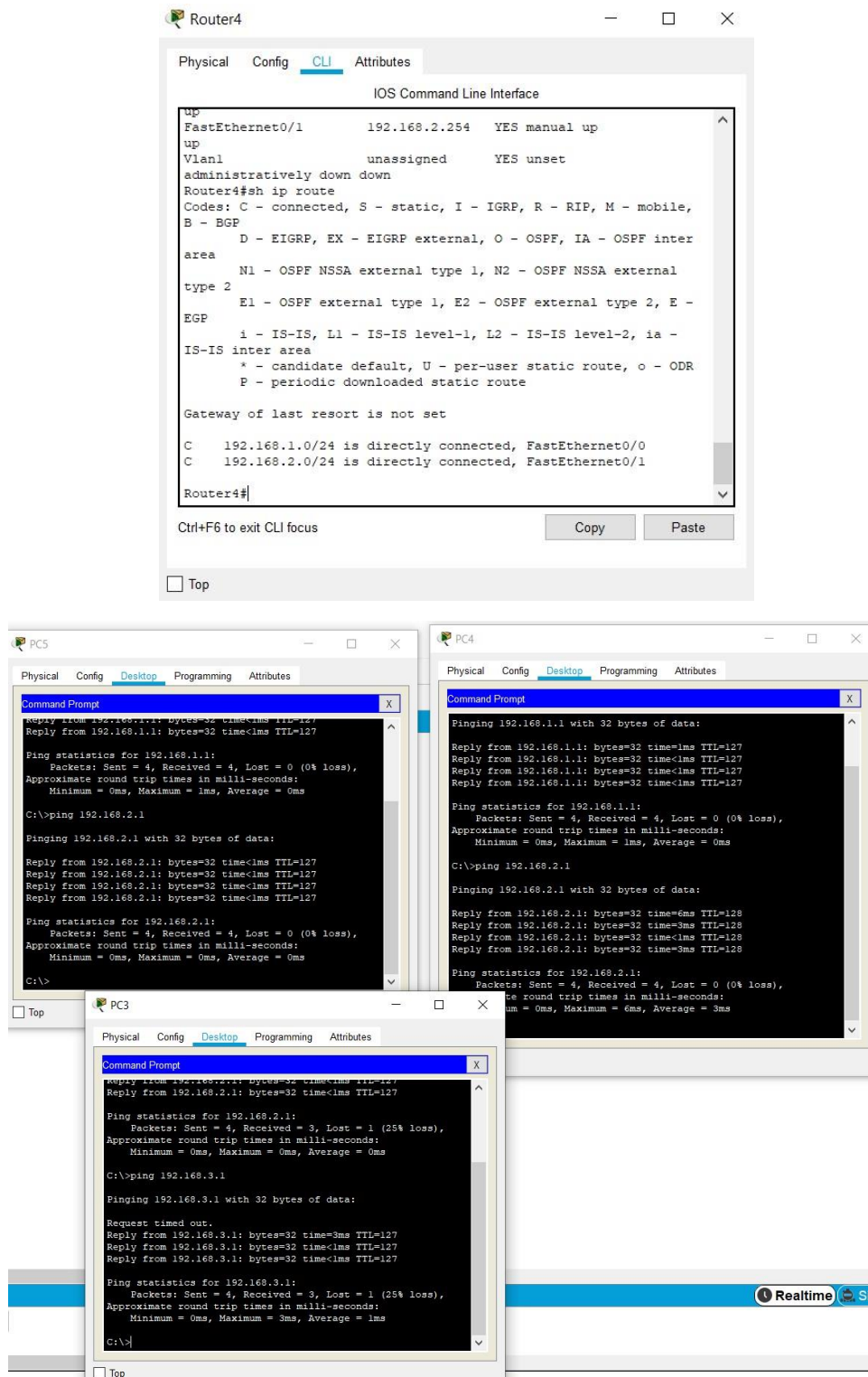
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**FINAL CHECK LIST**

1. Return all equipment and materials to their proper storage area.

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2. Submit your answers to question, before the next laboratory.