

# **Data Communication and Computer Networks**

**EEE314**

## Lab Manual



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# Lab # 01: Introduction to Networks and Networking

## Commands in Windows and Introduction to Packet Tracer

### In-Lab Task

```
Command Prompt
Connection-specific DNS Suffix . : 
Link-local IPv6 Address . . . . . : fe80::2194:52ca:9825:f6c2%8
IPv4 Address. . . . . : 192.168.56.1
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 

Wireless LAN adapter Local Area Connection* 11:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . : 

Wireless LAN adapter Local Area Connection* 12:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . : 

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix . : 
    Link-local IPv6 Address . . . . . : fe80::1d2c:54e:61b:dc90%7
    IPv4 Address. . . . . : 192.168.0.108
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.0.1

Wireless LAN adapter Wi-Fi:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . : 

Ethernet adapter Bluetooth Network Connection:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . : 

C:\Users\HP>

Command Prompt
Physical Address. . . . . : C8-D9-D2-90-B8-2F
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::1d2c:54e:61b:dc90%7(Preferred)
IPv4 Address. . . . . : 192.168.0.108(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Monday, February 22, 2021 3:55:47 PM
Lease Expires . . . . . : Monday, February 22, 2021 5:55:48 PM
Default Gateway . . . . . : 192.168.0.1
DHCP Server . . . . . : 192.168.0.1
DHCPv6 IAID . . . . . : 113826258
DHCPv6 Client DUID. . . . . : 00-01-00-01-27-2E-EA-8E-C8-D9-D2-90-B8-2F
DNS Servers . . . . . : 115.186.188.3
                       : 203.82.48.4
NetBIOS over Tcpip. . . . . : Enabled

Wireless LAN adapter Wi-Fi:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . : 
    Description . . . . . : Realtek RTL8821CE 802.11ac PCIe Adapter
    Physical Address. . . . . : DC-A2-66-72-78-01
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes

Ethernet adapter Bluetooth Network Connection:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . : 
    Description . . . . . : Bluetooth Device (Personal Area Network)
    Physical Address. . . . . : DC-A2-66-72-78-02
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes

C:\Users\HP>
```

## LAB Manual – FA18-BCE-090

```
Command Prompt

C:\Users\HP>arp -a

Interface: 192.168.0.108 --- 0x7
  Internet Address      Physical Address      Type
  192.168.0.1           70-4f-57-8c-fb-8c    dynamic
  192.168.0.255         ff-ff-ff-ff-ff-ff    static
  224.0.0.2             01-00-5e-00-00-02    static
  224.0.0.22            01-00-5e-00-00-16    static
  224.0.0.251           01-00-5e-00-00-fb    static
  224.0.0.252           01-00-5e-00-00-fc    static
  239.255.255.250       01-00-5e-7f-ff-fa    static
  255.255.255.255       ff-ff-ff-ff-ff-ff    static

Interface: 192.168.56.1 --- 0x8
  Internet Address      Physical Address      Type
  192.168.56.255        ff-ff-ff-ff-ff-ff    static
  224.0.0.2             01-00-5e-00-00-02    static
  224.0.0.22            01-00-5e-00-00-16    static
  224.0.0.251           01-00-5e-00-00-fb    static
  224.0.0.252           01-00-5e-00-00-fc    static
  239.255.255.250       01-00-5e-7f-ff-fa    static

Interface: 172.17.136.65 --- 0xb
  Internet Address      Physical Address      Type
  172.17.136.79         ff-ff-ff-ff-ff-ff    static
  224.0.0.2             01-00-5e-00-00-02    static
  224.0.0.22            01-00-5e-00-00-16    static
  224.0.0.251           01-00-5e-00-00-fb    static
  224.0.0.252           01-00-5e-00-00-fc    static
  224.0.1.60            01-00-5e-00-01-3c    static
  239.255.255.250       01-00-5e-7f-ff-fa    static

Interface: 172.17.51.81 --- 0x13
  Internet Address      Physical Address      Type
```

```
Command Prompt

C:\Users\HP>net view
System error 6118 has occurred.

The list of servers for this workgroup is not currently available

C:\Users\HP>
```

```
Command Prompt

C:\Users\HP>ping 192.168.0.108

Pinging 192.168.0.108 with 32 bytes of data:
Reply from 192.168.0.108: bytes=32 time<1ms TTL=128
Reply from 192.168.0.108: bytes=32 time<1ms TTL=128
Reply from 192.168.0.108: bytes=32 time<1ms TTL=128
Reply from 192.168.0.108: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.108:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\HP>
```

## LAB Manual – FA18-BCE-090

```
Command Prompt - nslookup

C:\Users\HP>nslookup
Default Server:  dns-dr.dsl.net.pk
Address:  115.186.188.3

>

C:\Users\HP>netstat -a

Active Connections

Proto Local Address           Foreign Address         State
TCP   0.0.0.0:135              Haris-HP:0              LISTENING
TCP   0.0.0.0:445              Haris-HP:0              LISTENING
TCP   0.0.0.0:5040             Haris-HP:0              LISTENING
TCP   0.0.0.0:6800             Haris-HP:0              LISTENING
TCP   0.0.0.0:7680             Haris-HP:0              LISTENING
TCP   0.0.0.0:49664            Haris-HP:0              LISTENING
TCP   0.0.0.0:49665            Haris-HP:0              LISTENING
TCP   0.0.0.0:49666            Haris-HP:0              LISTENING
TCP   0.0.0.0:49667            Haris-HP:0              LISTENING
TCP   0.0.0.0:49668            Haris-HP:0              LISTENING
TCP   0.0.0.0:49670            Haris-HP:0              LISTENING
TCP   0.0.0.0:49722            Haris-HP:0              LISTENING
TCP   0.0.0.0:49730            Haris-HP:0              LISTENING
TCP   127.0.0.1:1521            Haris-HP:0              LISTENING
TCP   127.0.0.1:1521            kubernetes:49731        ESTABLISHED
TCP   127.0.0.1:5939            Haris-HP:0              LISTENING
TCP   127.0.0.1:27020           kubernetes:27021        ESTABLISHED
TCP   127.0.0.1:27021           kubernetes:27020        ESTABLISHED
TCP   127.0.0.1:49152           Haris-HP:0              LISTENING
TCP   127.0.0.1:49687           kubernetes:49688        ESTABLISHED
TCP   127.0.0.1:49688           kubernetes:49687        ESTABLISHED
TCP   127.0.0.1:49690           Haris-HP:0              LISTENING
TCP   127.0.0.1:49704           Haris-HP:0              LISTENING
TCP   127.0.0.1:49731           kubernetes:1521         ESTABLISHED
TCP   127.0.0.1:50118           kubernetes:50119        ESTABLISHED
TCP   127.0.0.1:50119           kubernetes:50118        ESTABLISHED
TCP   127.0.0.1:50781           kubernetes:50782        ESTABLISHED
TCP   127.0.0.1:50782           kubernetes:50781        ESTABLISHED
TCP   127.0.0.1:55976           kubernetes:55977        ESTABLISHED
```

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```
Command Prompt

C:\Users\HP>nbstat -n

VirtualBox Host-Only Network:
Node IpAddress: [192.168.56.1] Scope Id: []

    NetBIOS Local Name Table

    Name                Type             Status
    -----
    HARIS-HP             <00> UNIQUE        Registered
    HARIS-HP             <20> UNIQUE        Registered
    WORKGROUP            <00> GROUP         Registered

Ethernet:
Node IpAddress: [192.168.0.108] Scope Id: []

    NetBIOS Local Name Table

    Name                Type             Status
    -----
    HARIS-HP             <00> UNIQUE        Registered
    HARIS-HP             <20> UNIQUE        Registered
    WORKGROUP            <00> GROUP         Registered

vEthernet (WSL):
Node IpAddress: [172.17.136.65] Scope Id: []

    NetBIOS Local Name Table

    Name                Type             Status
    -----
    HARIS-HP             <00> UNIQUE        Registered
    HARIS-HP             <20> UNIQUE        Registered
    WORKGROUP            <00> GROUP         Registered
```

```
Command Prompt

C:\Users\HP>tracert www.google.com

Tracing route to www.google.com [216.58.208.228]
over a maximum of 30 hops:

  1  <1 ms  <1 ms  <1 ms  192.168.0.1
  2  1 ms    1 ms    1 ms    58-65-175-241.nayatel.pk [58.65.175.241]
  3  3 ms    3 ms    2 ms    172.16.32.49
  4  3 ms    2 ms    1 ms    58-65-165-58.nayatel.pk [58.65.165.58]
  5  2 ms    2 ms    1 ms    58-65-168-241.nayatel.pk [58.65.168.241]
  6  2 ms    2 ms    2 ms    58-65-165-42.nayatel.pk [58.65.165.42]
  7  2 ms    2 ms    2 ms    203.135.5.69
  8  *        *        *        Request timed out.
  9  40 ms   40 ms   40 ms   74.125.118.170
 10  40 ms   41 ms   40 ms   172.253.51.205
 11  42 ms   42 ms   42 ms   74.125.253.227
 12  39 ms   39 ms   38 ms   fjr01s01-in-f4.1e100.net [216.58.208.228]

Trace complete.

C:\Users\HP>
```

```

C:\Users\HP>netstat -r
=====
Interface List
19...00 15 5d cf d4 b4 .....Hyper-V Virtual Ethernet Adapter
11...00 15 5d 44 7c df .....Hyper-V Virtual Ethernet Adapter #2
8...0a 00 27 00 00 08 .....VirtualBox Host-Only Ethernet Adapter
12...de a2 66 72 78 01 .....Microsoft Wi-Fi Direct Virtual Adapter #3
10...fe a2 66 72 78 01 .....Microsoft Wi-Fi Direct Virtual Adapter #4
7...c8 d9 d2 90 b8 2f .....Realtek PCIe GbE Family Controller
14...dc a2 66 72 78 01 .....Realtek RTL8821CE 802.11ac PCIe Adapter
23...dc a2 66 72 78 02 .....Bluetooth Device (Personal Area Network)
1.....Software Loopback Interface 1
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway          Interface        Metric
0.0.0.0                    0.0.0.0          192.168.0.1      192.168.0.108    35
127.0.0.0                  255.0.0.0        On-link          127.0.0.1        331
127.0.0.1                  255.255.255.255  On-link          127.0.0.1        331
127.255.255.255            255.255.255.255  On-link          127.0.0.1        331
172.17.51.80               255.255.255.240  On-link          172.17.51.81     271
172.17.51.81               255.255.255.255  On-link          172.17.51.81     271
172.17.51.95               255.255.255.255  On-link          172.17.51.81     271
172.17.136.64              255.255.255.240  On-link          172.17.136.65    271
172.17.136.65              255.255.255.255  On-link          172.17.136.65    271
172.17.136.79              255.255.255.255  On-link          172.17.136.65    271
192.168.0.0                 255.255.255.0    On-link          192.168.0.108    291
192.168.0.108              255.255.255.255  On-link          192.168.0.108    291
192.168.0.255              255.255.255.255  On-link          192.168.0.108    291
192.168.56.0               255.255.255.0    On-link          192.168.56.1     281
192.168.56.1               255.255.255.255  On-link          192.168.56.1     281
192.168.56.255             255.255.255.255  On-link          192.168.56.1     281

```

PC0

Physical
Config
Desktop
Programming
Attributes

Command Prompt

Packet Tracer PC Command Line 1.0  
C:\>arp -a  

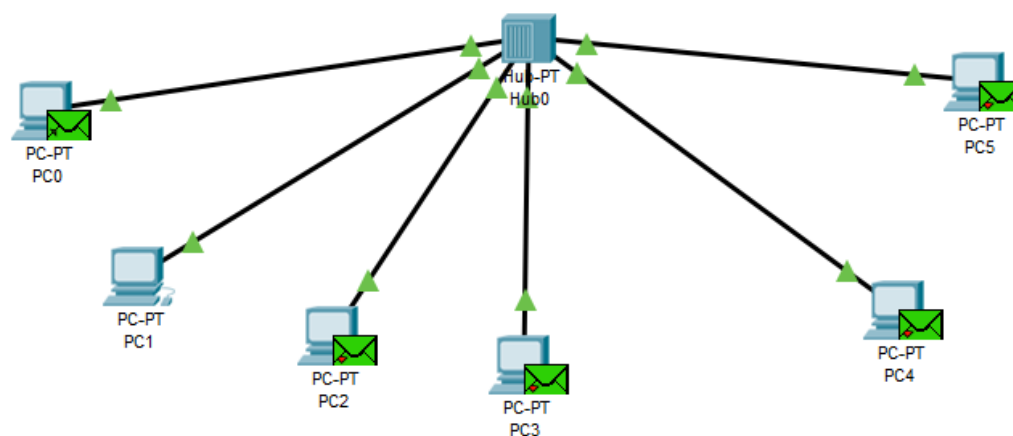
Internet Address	Physical Address	Type
192.168.1.2	000b.be4d.cca8	dynamic
192.168.1.3	00d0.d327.a029	dynamic
192.168.1.4	00e0.b024.0dab	dynamic

C:\>|

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## Lab #02: IP Addressing Scheme & VLSM

### INLAB TASK

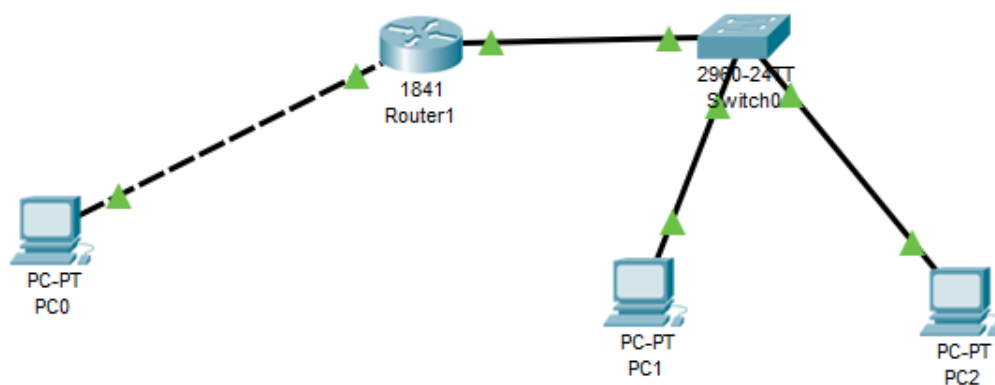


Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Ed
	Successful	PC0	PC1	ICMP		0.000	N	0	(e
	Failed	PC0	PC2	ICMP		0.000	N	1	(e
	Failed	PC0	PC2	ICMP		0.000	N	2	(e

## Lab 3: Network Cabling, Basic CISCO Devices

### Configuration & Introduction to Wireshark

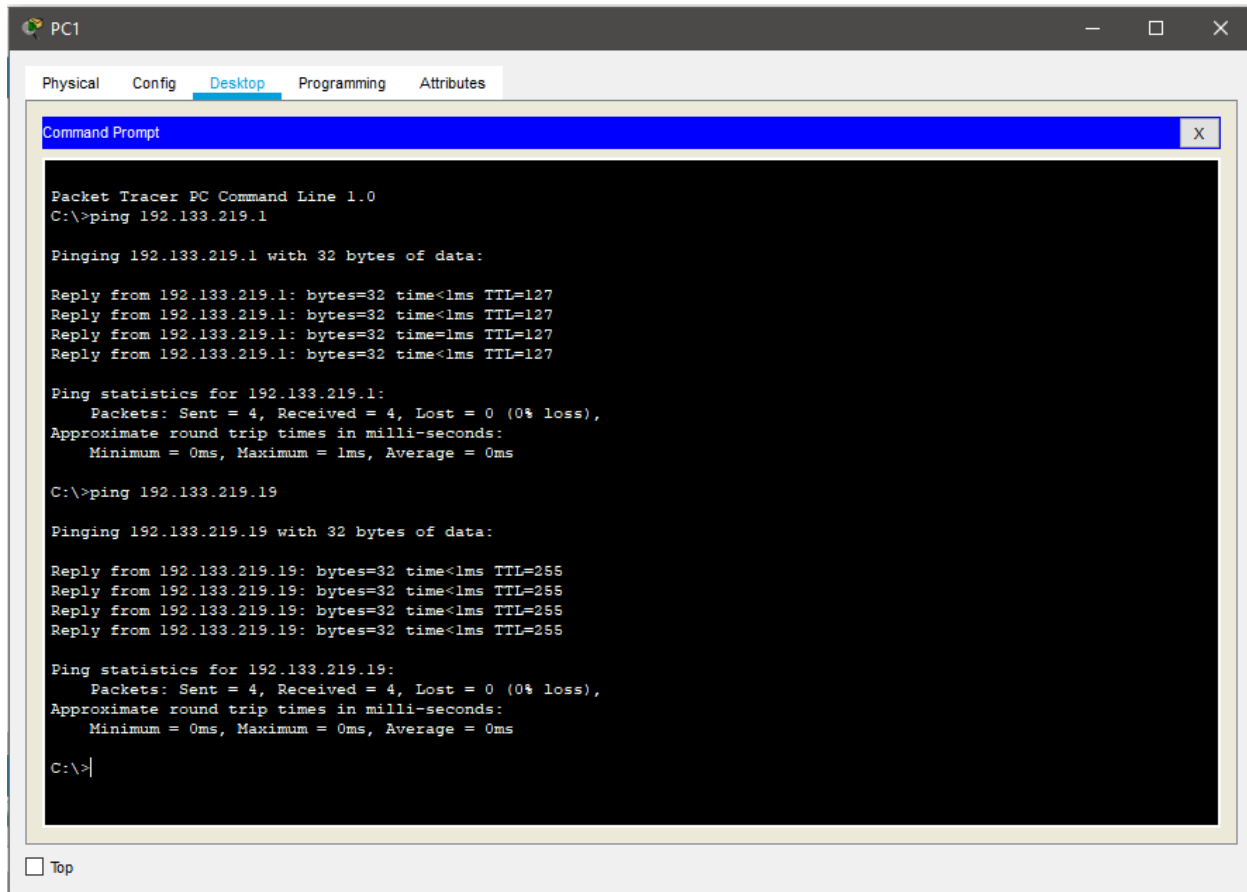
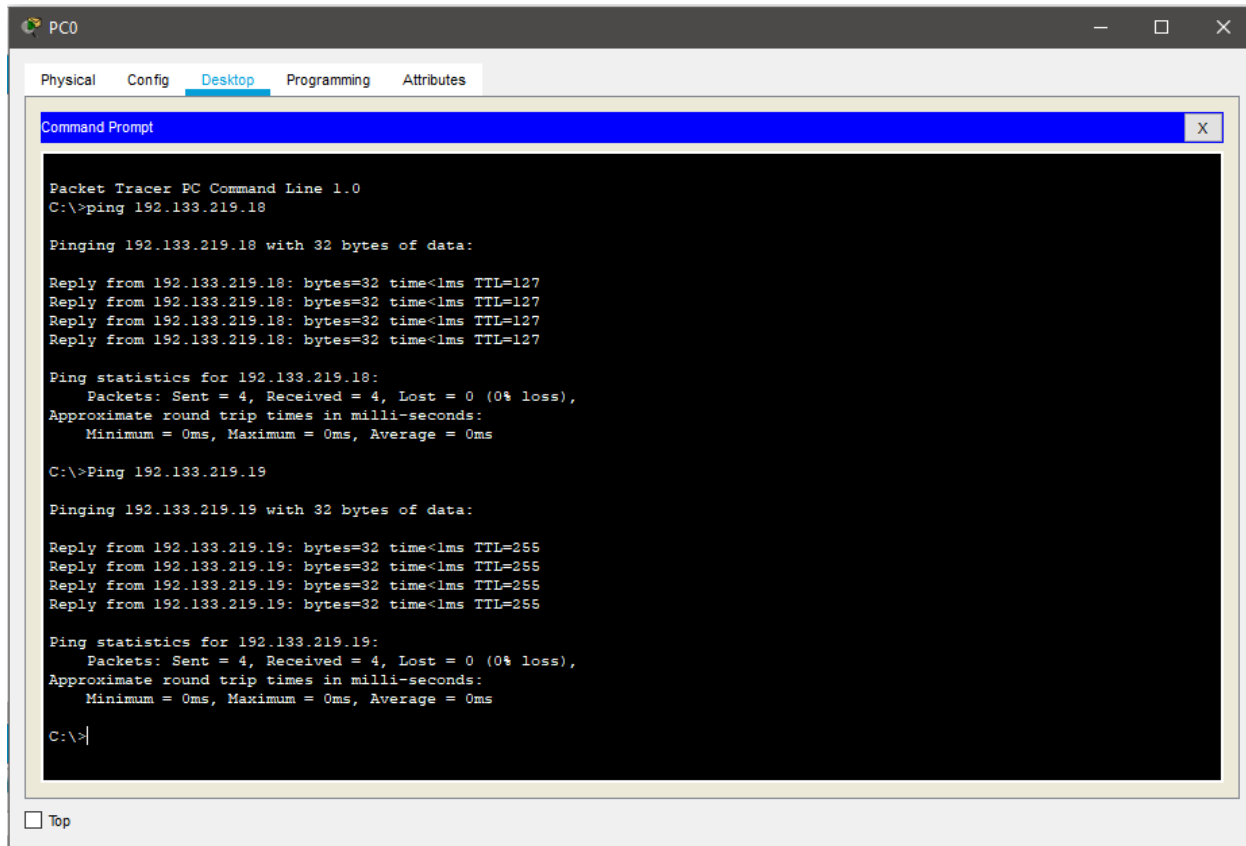
#### INLAB

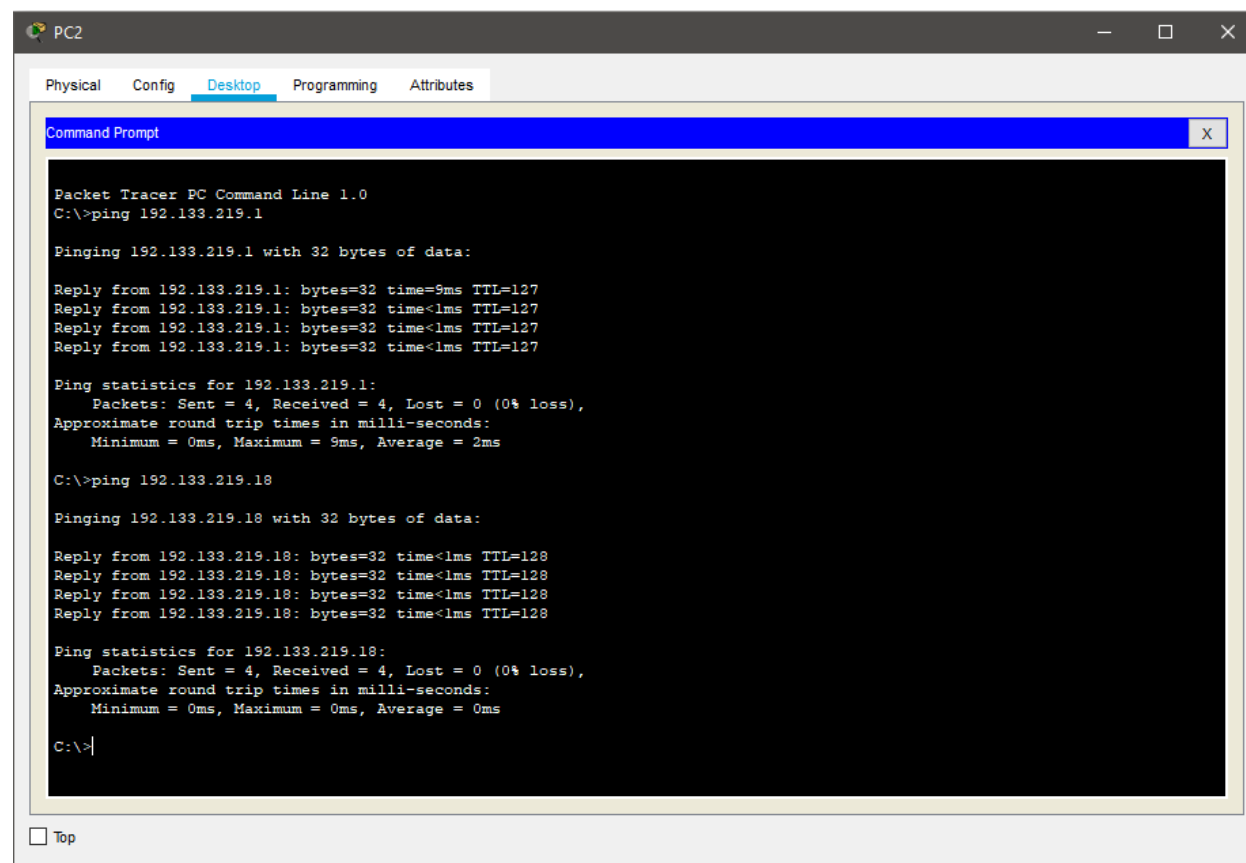


Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	E
	Successful	PC0	PC1	ICMP		0.000	N	0	(
	Successful	PC0	PC2	ICMP		0.000	N	1	(

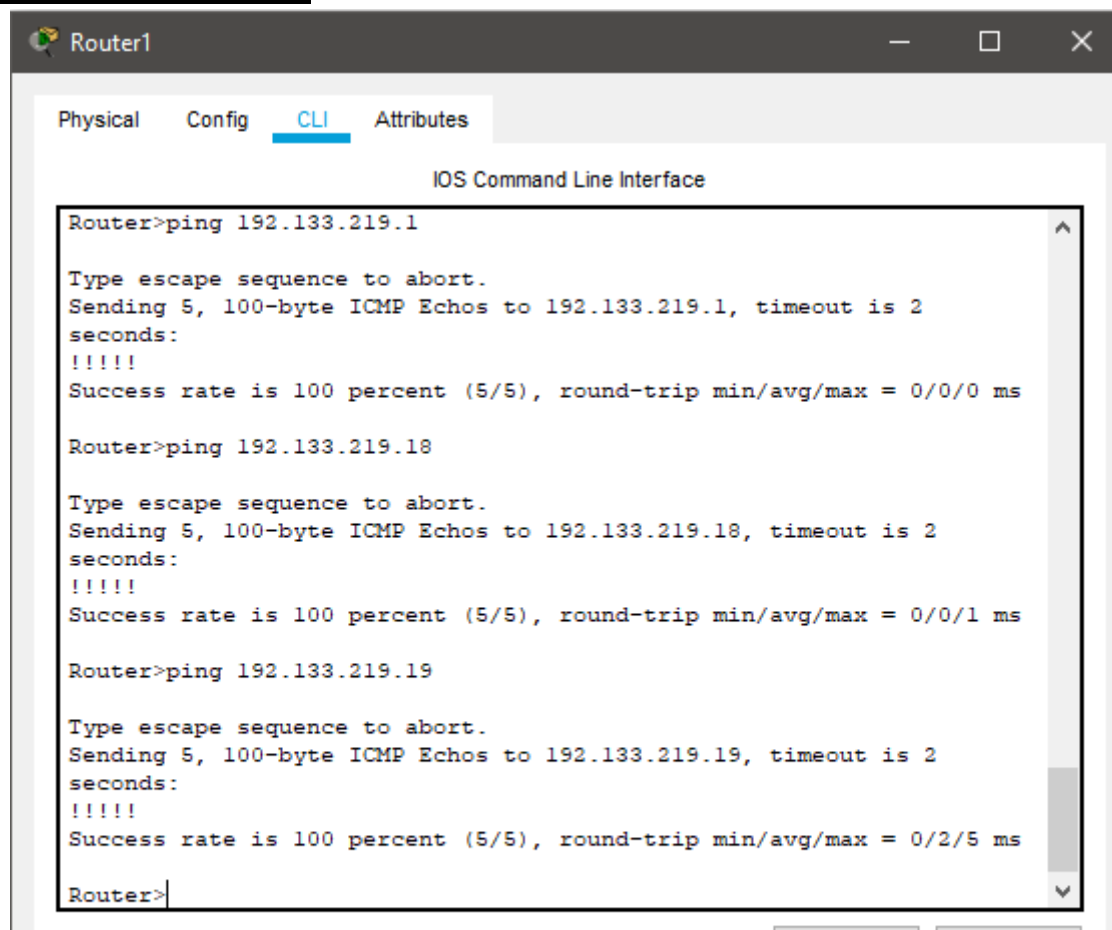


## Ping through PCs





## Ping through Router



## **SHOW RUN**

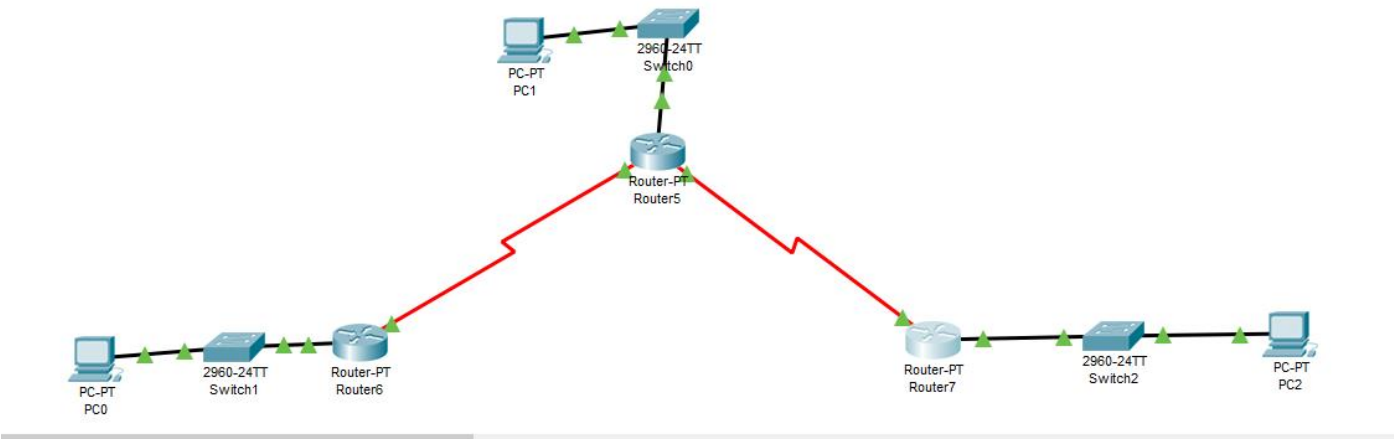
```
Router>en
Router#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
Router#show run
Building configuration...

Current configuration : 588 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
!
!
!
!
!
!
!
!
ip cef
no ipv6 cef
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface FastEthernet0/0
ip address 192.133.219.2 255.255.255.240
duplex auto
```

```
speed auto
!
interface FastEthernet0/1
ip address 192.133.219.19 255.255.255.240
duplex auto
speed auto
!
interface Vlan1
no ip address
shutdown
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

# Lab 4:Static Route Configuration

## In-Lab Task

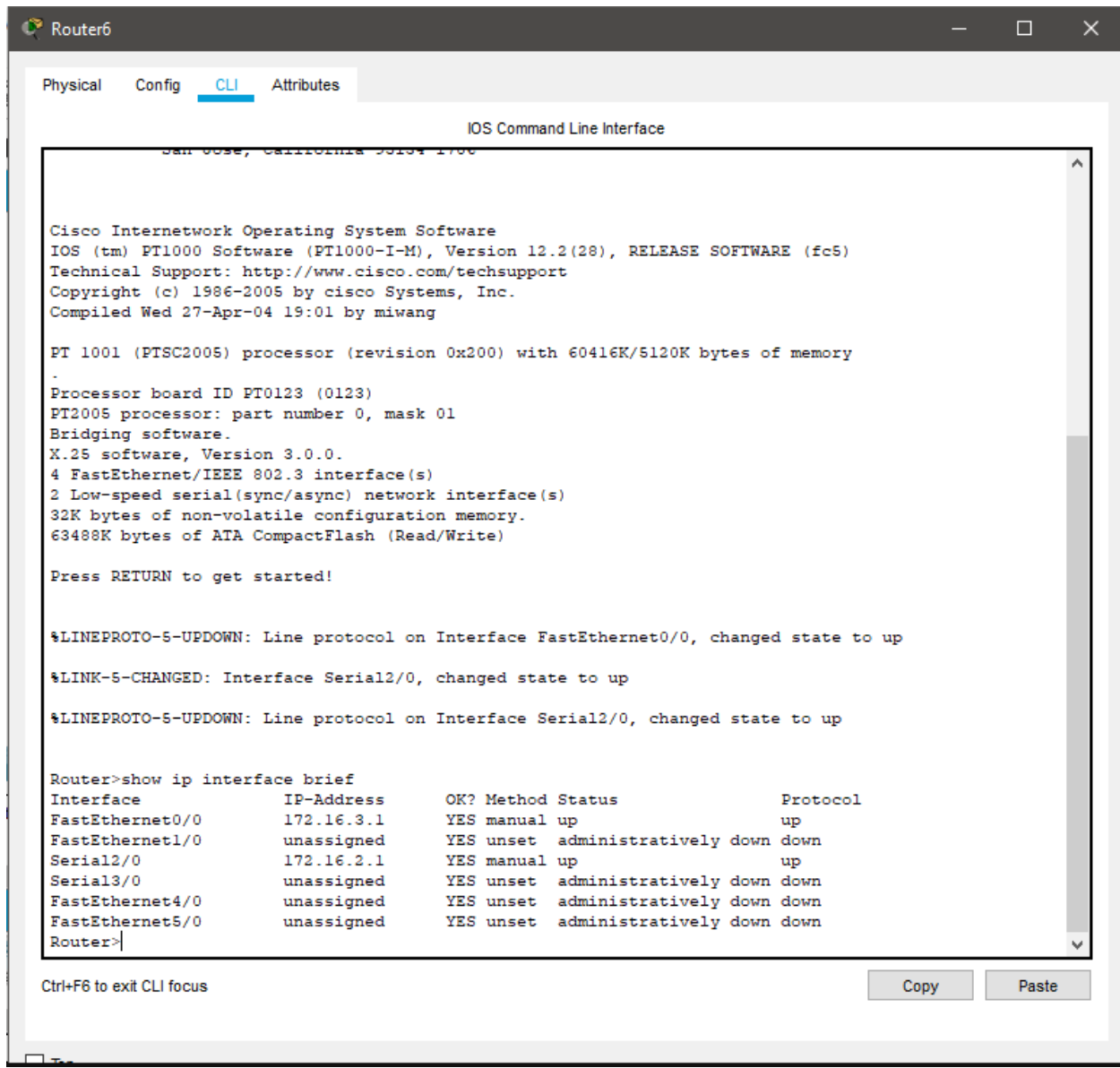


Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Ec
	Successful	PC2	PC1	ICMP	Blue	0.000	N	0	(e
	Successful	PC0	PC2	ICMP	Orange	0.000	N	1	(e
	Successful	PC1	PC2	ICMP	Green	0.000	N	2	(e

## Home Task

### Router 1:

### Show interface brief:



The screenshot shows a Cisco Router CLI window titled "Router6". The window has tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, and the "IOS Command Line Interface" is displayed. The output of the "show ip interface brief" command is shown below.

```
San Jose, California 95134-1700

Cisco Internetwork Operating System Software
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Wed 27-Apr-04 19:01 by miwang

PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
.
Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)

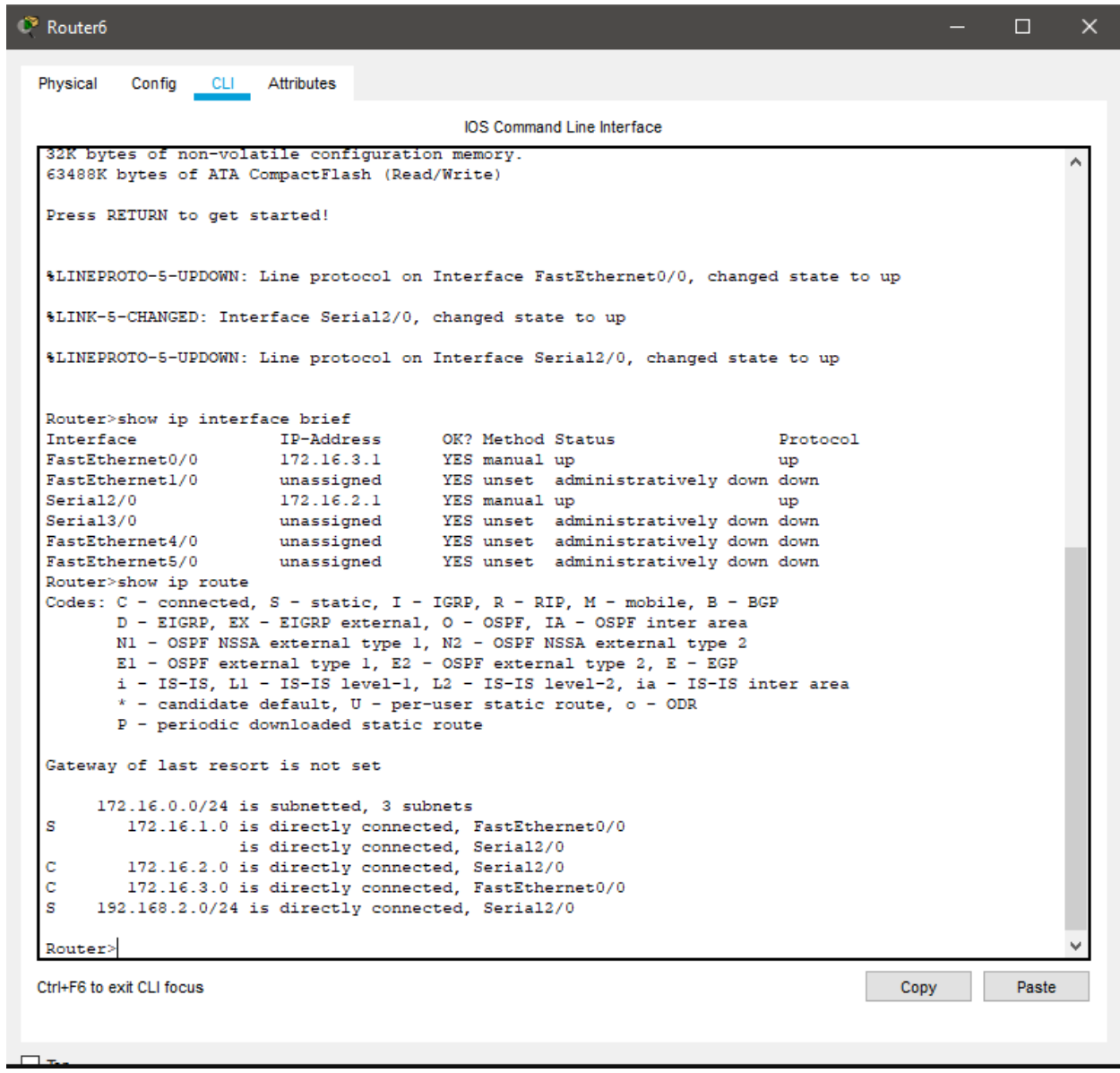
Press RETURN to get started!

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router>show ip interface brief
Interface                IP-Address      OK? Method Status                Protocol
FastEthernet0/0          172.16.3.1      YES manual up                    up
FastEthernet1/0          unassigned      YES unset  administratively down down
Serial2/0                172.16.2.1      YES manual up                    up
Serial3/0                unassigned      YES unset  administratively down down
FastEthernet4/0          unassigned      YES unset  administratively down down
FastEthernet5/0          unassigned      YES unset  administratively down down
Router>
```

At the bottom of the window, there is a status bar that says "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste".

## Show ip route:



The screenshot shows a Cisco Router6 CLI window with the following content:

Router6

Physical Config **CLI** Attributes

IOS Command Line Interface

32K bytes of non-volatile configuration memory.  
63488K bytes of ATA CompactFlash (Read/Write)

Press RETURN to get started!

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up  
%LINK-5-CHANGED: Interface Serial2/0, changed state to up  
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router>show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	172.16.3.1	YES	manual	up	up
FastEthernet1/0	unassigned	YES	unset	administratively down	down
Serial2/0	172.16.2.1	YES	manual	up	up
Serial3/0	unassigned	YES	unset	administratively down	down
FastEthernet4/0	unassigned	YES	unset	administratively down	down
FastEthernet5/0	unassigned	YES	unset	administratively down	down

Router>show 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  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
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, ia - IS-IS inter area  
\* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route

Gateway of last resort is not set

172.16.0.0/24 is subnetted, 3 subnets  
S 172.16.1.0 is directly connected, FastEthernet0/0  
is directly connected, Serial2/0  
C 172.16.2.0 is directly connected, Serial2/0  
C 172.16.3.0 is directly connected, FastEthernet0/0  
S 192.168.2.0/24 is directly connected, Serial2/0

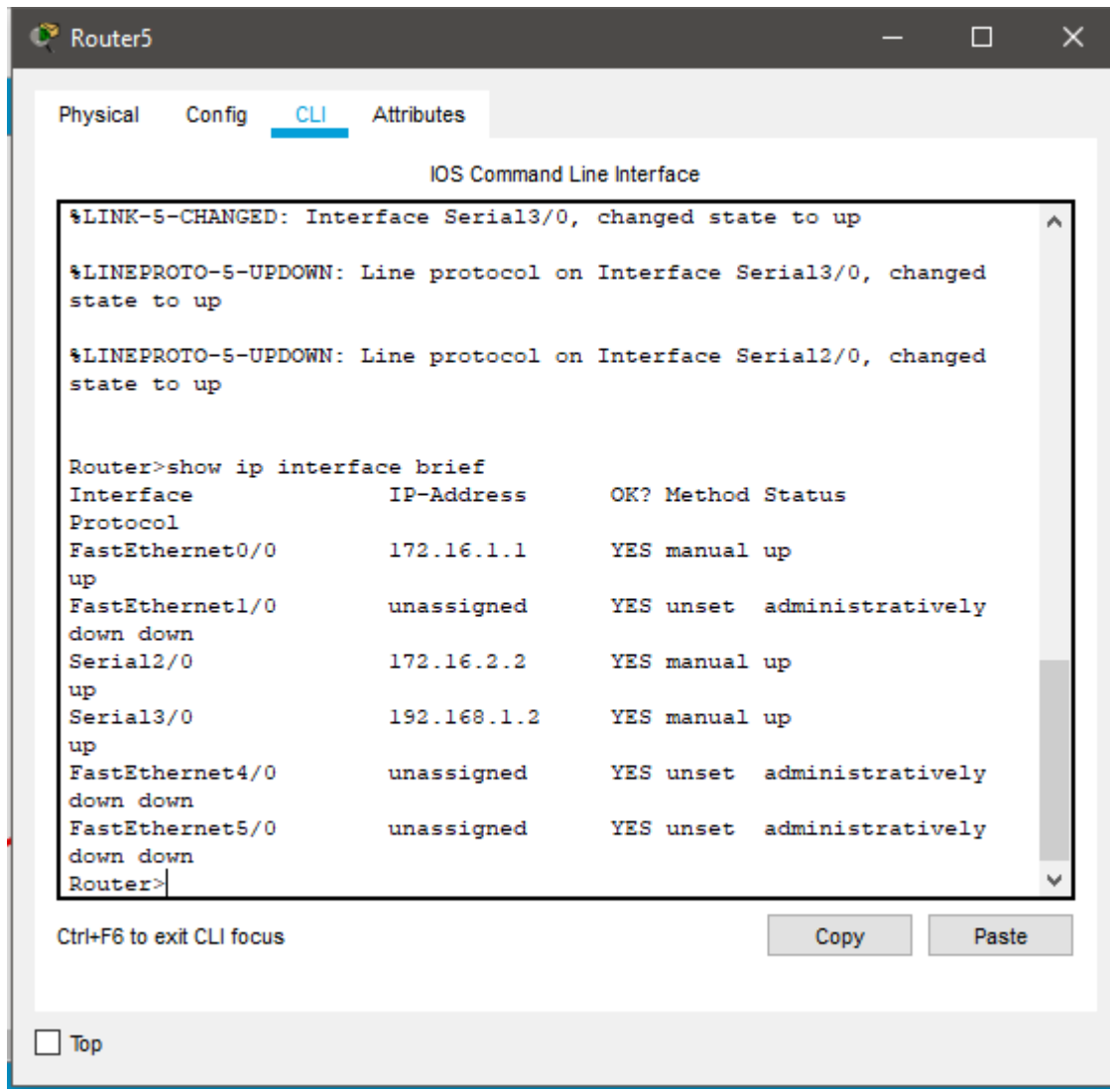
Router>

Ctrl+F6 to exit CLI focus

Copy Paste

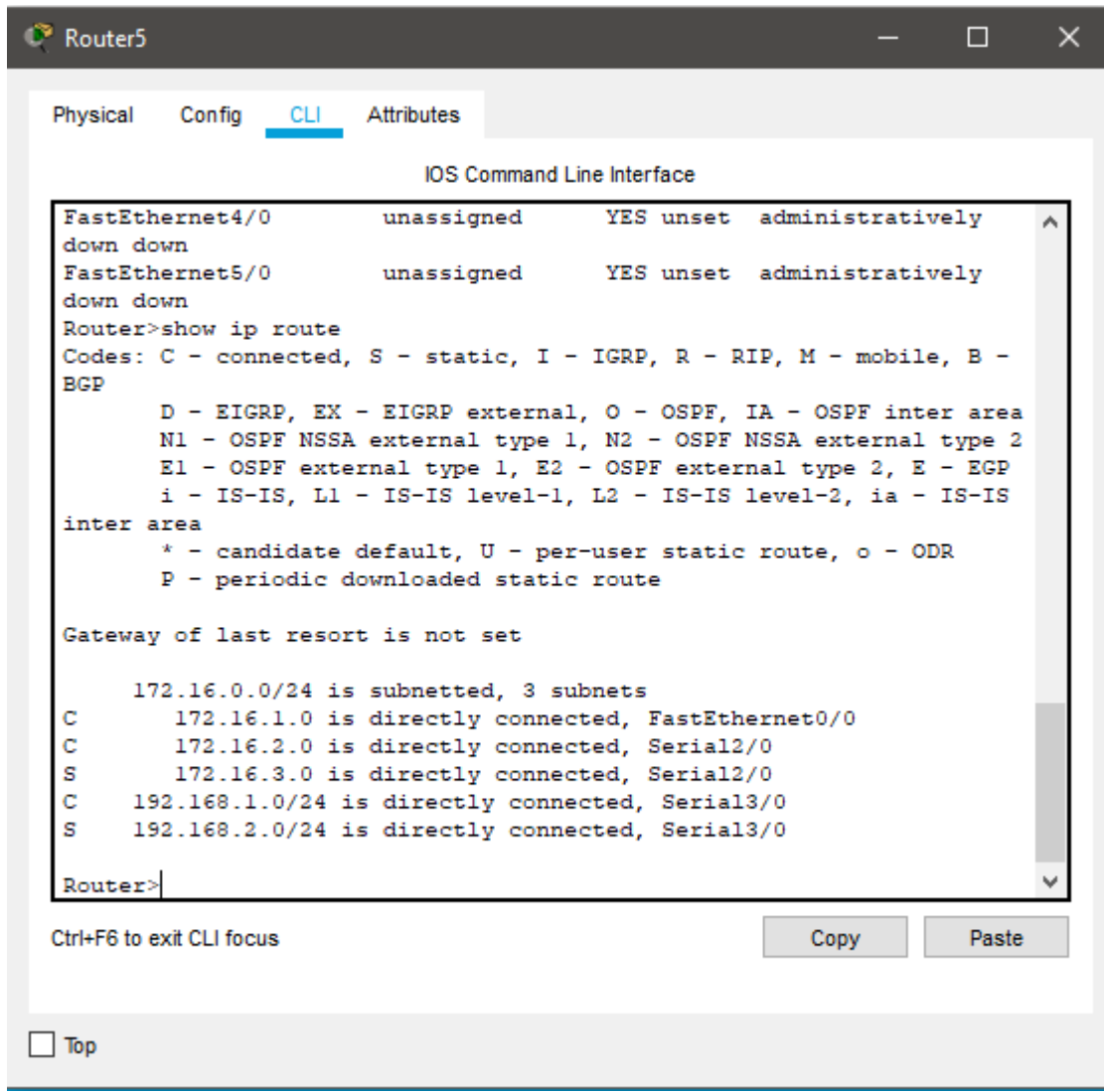
## Router 2:

### Show IP interface brief





## Show ip route:



The screenshot shows the Router5 CLI interface with the 'CLI' tab selected. The 'IOS Command Line Interface' window displays the output of the 'show ip route' command. The output shows the status of FastEthernet4/0 and FastEthernet5/0, followed by the command 'show ip route'. The output lists the codes for various routing protocols and the gateway of last resort. It also shows the subnetting of 172.16.0.0/24 and the directly connected routes for 172.16.1.0, 172.16.2.0, 172.16.3.0, 192.168.1.0, and 192.168.2.0.

```
FastEthernet4/0      unassigned      YES unset  administratively
down down
FastEthernet5/0      unassigned      YES unset  administratively
down down
Router>show 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
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       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, ia - IS-IS
inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

      172.16.0.0/24 is subnetted, 3 subnets
C       172.16.1.0 is directly connected, FastEthernet0/0
C       172.16.2.0 is directly connected, Serial2/0
S       172.16.3.0 is directly connected, Serial2/0
C       192.168.1.0/24 is directly connected, Serial3/0
S       192.168.2.0/24 is directly connected, Serial3/0

Router>
```

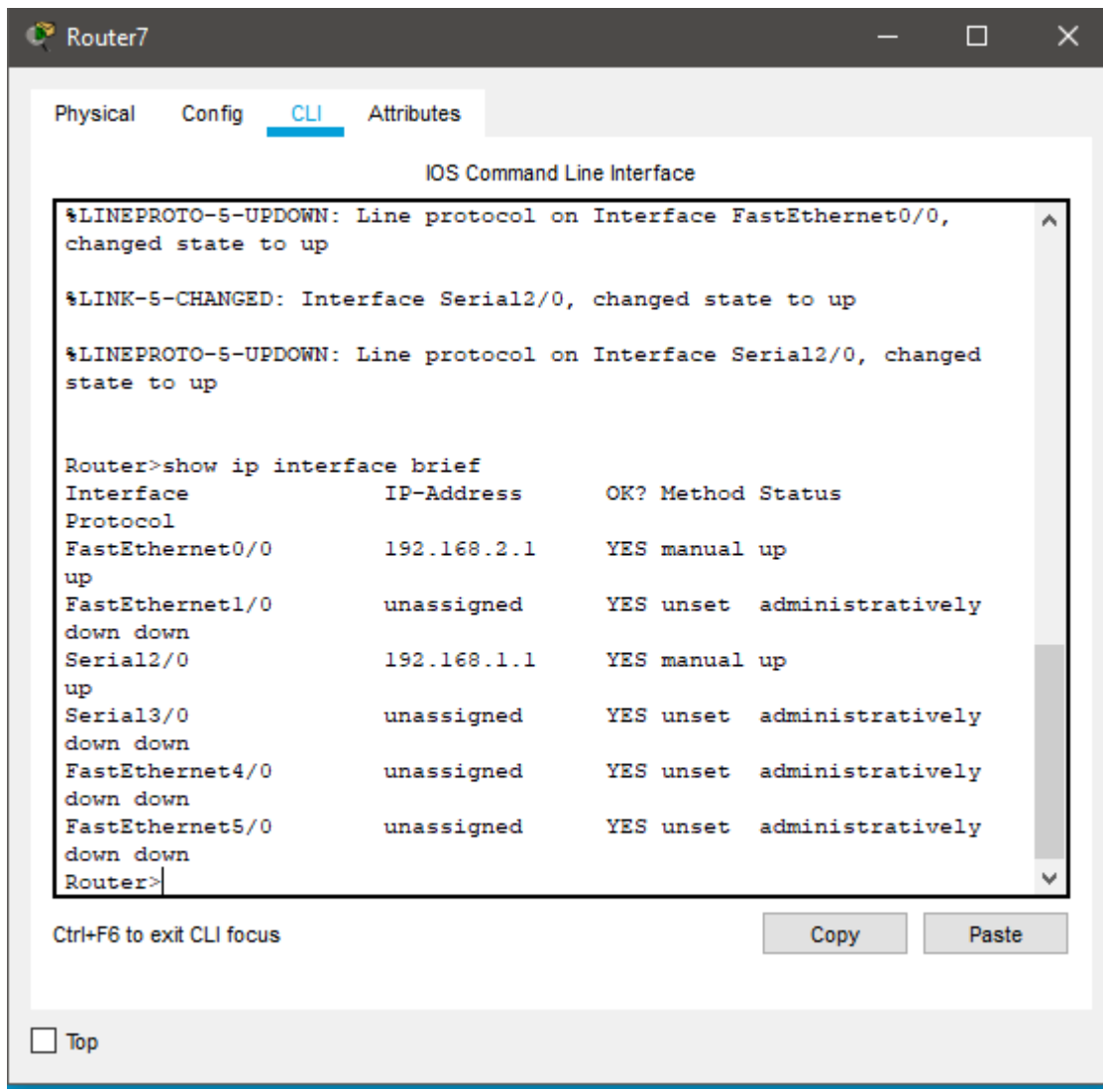
Ctrl+F6 to exit CLI focus

Copy Paste

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## Router 3:

### Show ip interface brief



The screenshot shows a window titled "Router7" with tabs for Physical, Config, CLI, and Attributes. The CLI tab is active, displaying the "IOS Command Line Interface". The output of the command "show ip interface brief" is shown in a scrollable text area. The output includes status messages for interface state changes and a table of interface details.

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0,
changed state to up

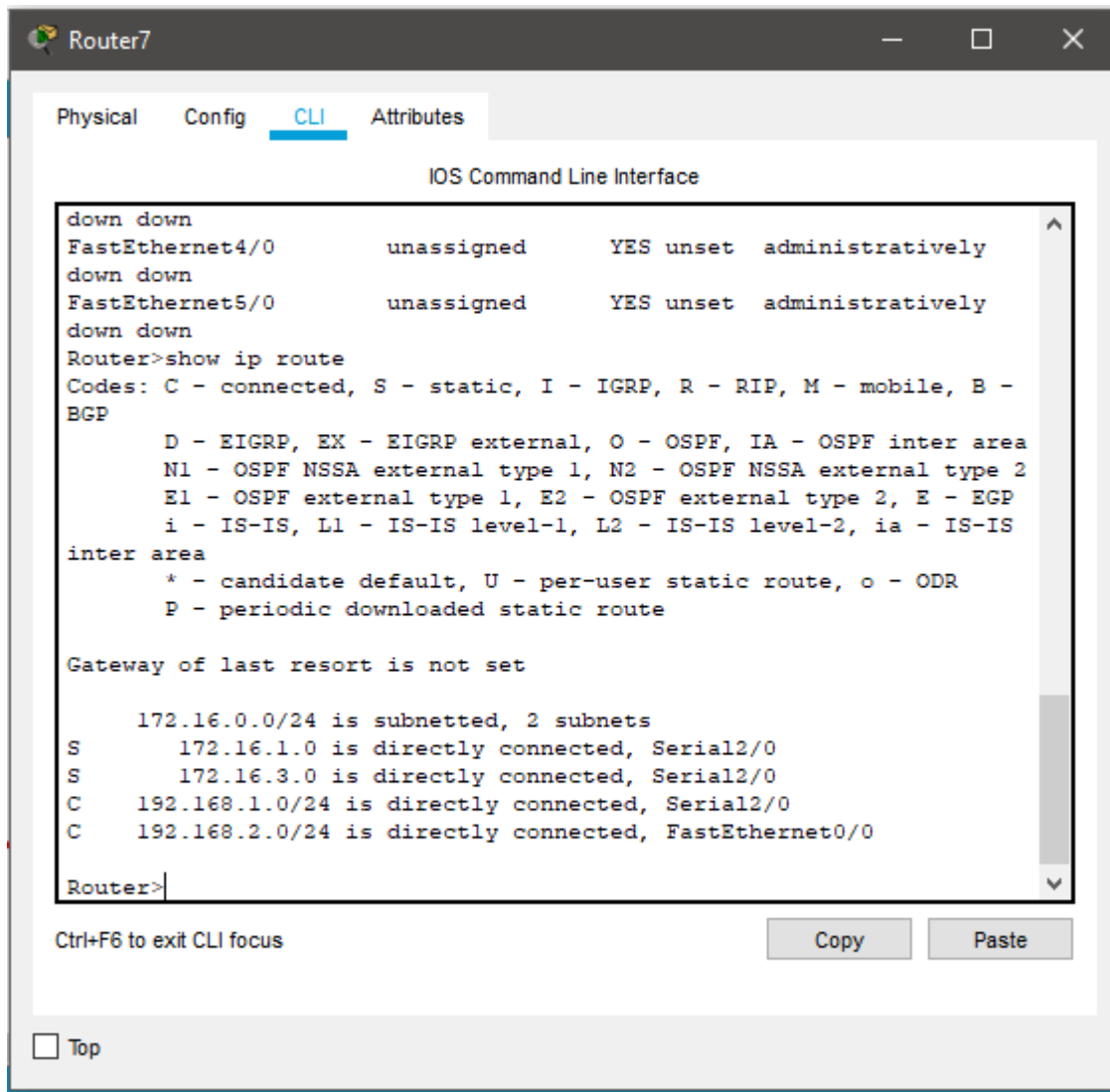
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed
state to up

Router>show ip interface brief
Interface                IP-Address      OK? Method Status
Protocol
FastEthernet0/0          192.168.2.1     YES manual up
up
FastEthernet1/0          unassigned      YES unset  administratively
down down
Serial2/0                 192.168.1.1     YES manual up
up
Serial3/0                 unassigned      YES unset  administratively
down down
FastEthernet4/0          unassigned      YES unset  administratively
down down
FastEthernet5/0          unassigned      YES unset  administratively
down down
Router>
```

Below the text area, there is a prompt "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste". At the bottom left, there is a checkbox labeled "Top".

## Show ip route:



## Critical Analysis / Conclusion

In this lab we learnt how to configure routers using CLI, moreover we connected different routers together by adding IPs to their routing tables statically.

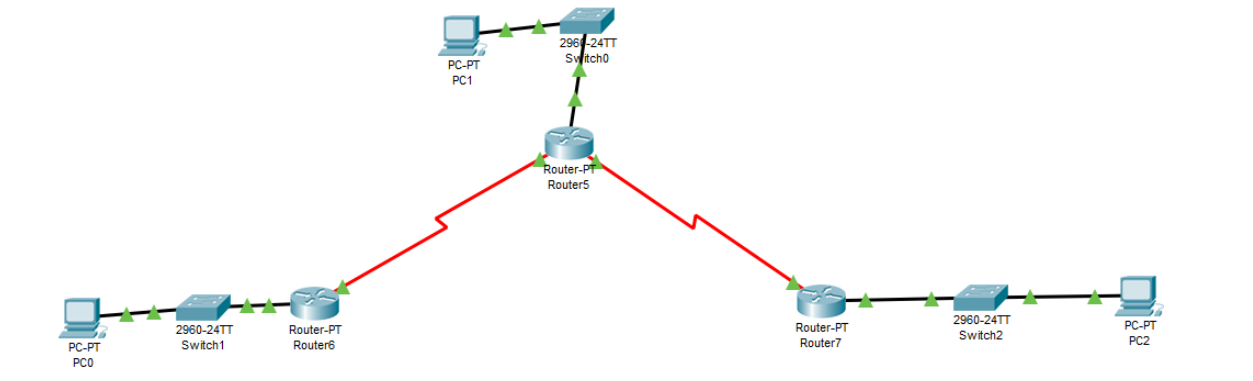
We tested our implementation by sending a packet between pcs connected on a separate routers connected through serial interface.

Lab Assessment		
Pre Lab	/5	/25
Performance	/5	
Results	/5	
Viva	/5	
Critical Analysis	/5	
Instructor Signature and Comments		

## LAB #05 RIP Configuration

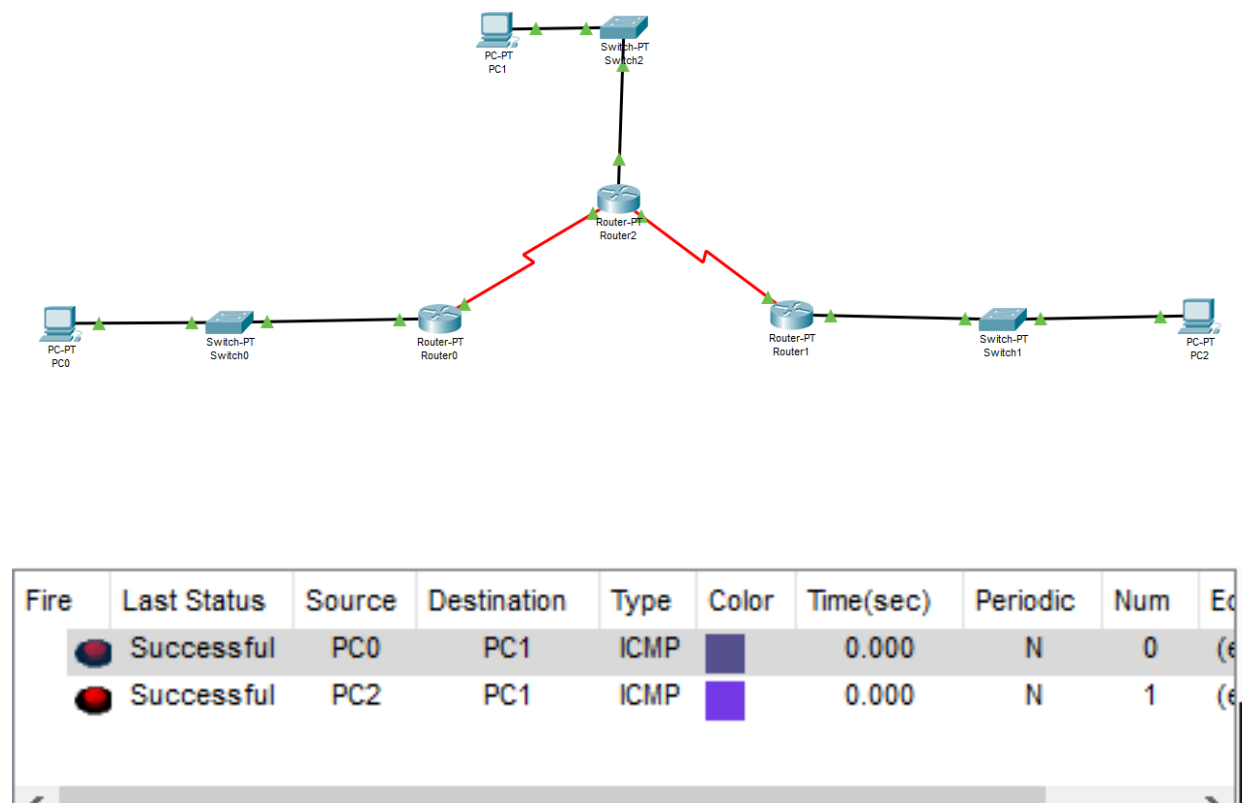
### In-Lab Task

#### Task 1

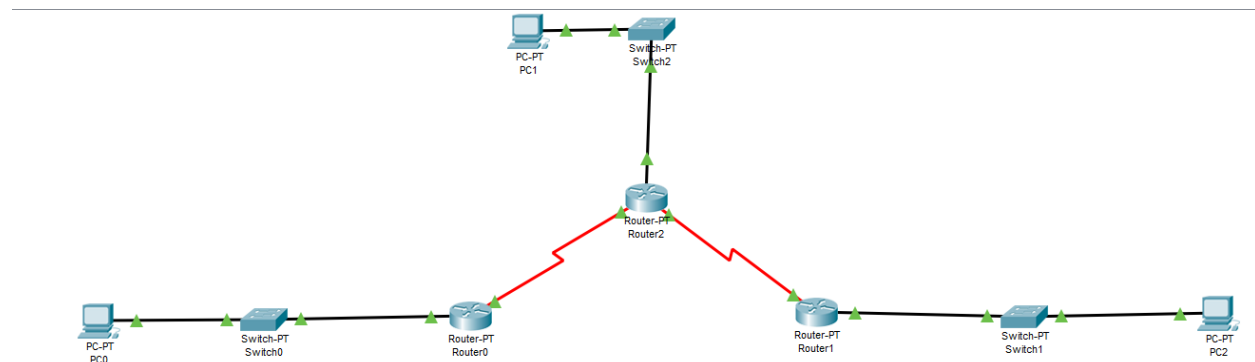




Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	^
	Successful	PC0	PC1	ICMP	Blue	0.000	N	0	
	Successful	PC1	PC0	ICMP	Blue	0.000	N	1	
	Successful	PC1	PC2	ICMP	Green	0.000	N	2	
	Successful	PC2	PC1	ICMP	Green	0.000	N	3	

## Task 2



## Task 3



Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Ec
	Successful	PC1	PC2	ICMP		0.000	N	0	(e

## Home Task

### TASK 1:

#### Router 1:

#### Show ip interface brief:

```
Router>show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 192.168.1.1 YES NVRAM up up
FastEthernet1/0 unassigned YES NVRAM administratively down down
Serial2/0 192.168.2.1 YES NVRAM up up
Serial3/0 unassigned YES NVRAM administratively down down
FastEthernet4/0 unassigned YES NVRAM administratively down down
FastEthernet5/0 unassigned YES NVRAM administratively down down
```

#### Show ip protocols:

```
Router>show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 9 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 1, receive any version
Interface Send Recv Triggered RIP Key-chain
FastEthernet0/0 1 2 1
Serial2/0 1 2 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
192.168.1.0
192.168.2.0
```

Passive Interface(s):

Routing Information Sources:

Gateway Distance Last Update

192.168.2.2 120 00:00:21

Distance: (default is 120)

## **Show ip route:**

Router>show 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

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

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, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

172.16.0.0/24 is subnetted, 1 subnets

S 172.16.1.0 is directly connected, FastEthernet0/0

is directly connected, Serial2/0

C 192.168.1.0/24 is directly connected, FastEthernet0/0

C 192.168.2.0/24 is directly connected, Serial2/0

R 192.168.3.0/24 [120/1] via 192.168.2.2, 00:00:08, Serial2/0

R 192.168.4.0/24 [120/1] via 192.168.2.2, 00:00:08, Serial2/0

R 192.168.5.0/24 [120/2] via 192.168.2.2, 00:00:08, Serial2/0

## **Router 2:**

## **Show ip interface brief:**

Router>show ip interface brief

Interface IP-Address OK? Method Status Protocol

FastEthernet0/0 192.168.3.1 YES NVRAM up up

FastEthernet1/0 unassigned YES NVRAM administratively down down

Serial2/0 192.168.2.2 YES NVRAM up up

Serial3/0 192.168.4.2 YES NVRAM up up

FastEthernet4/0 unassigned YES NVRAM administratively down down

FastEthernet5/0 unassigned YES NVRAM administratively down down



## **Show ip protocols:**

```
Router>show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 24 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 1, receive any version
Interface Send Recv Triggered RIP Key-chain
FastEthernet0/0 1 2 1
Serial3/0 1 2 1
Serial2/0 1 2 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
192.168.2.0
192.168.3.0
192.168.4.0
Passive Interface(s):
Routing Information Sources:
Gateway Distance Last Update
192.168.2.1 120 00:00:01
192.168.4.1 120 00:00:22
Distance: (default is 120)
```

## **Show ip route:**

```
Router>show 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
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
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, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
```

Gateway of last resort is not set

```
172.16.0.0/24 is subnetted, 1 subnets
S 172.16.3.0 is directly connected, Serial2/0
R 192.168.1.0/24 [120/1] via 192.168.2.1, 00:00:05, Serial2/0
```

C 192.168.2.0/24 is directly connected, Serial2/0  
C 192.168.3.0/24 is directly connected, FastEthernet0/0  
C 192.168.4.0/24 is directly connected, Serial3/0  
S 192.168.5.0/24 is directly connected, Serial3/0

## **Router 3:**

### **Show ip interface brief:**

```
Router>show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 192.168.5.1 YES NVRAM up up
FastEthernet1/0 unassigned YES NVRAM administratively down down
Serial2/0 192.168.4.1 YES NVRAM up up
Serial3/0 unassigned YES NVRAM administratively down down
FastEthernet4/0 unassigned YES NVRAM administratively down down
FastEthernet5/0 unassigned YES NVRAM administratively down down
```

### **Show ip protocols:**

```
Router>show ip protocol
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 11 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 1, receive any version
Interface Send Recv Triggered RIP Key-chain
FastEthernet0/0 1 2 1
Serial2/0 1 2 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
192.168.1.0
192.168.2.0
192.168.3.0
192.168.4.0
192.168.5.0
Passive Interface(s):
Routing Information Sources:
Gateway Distance Last Update
```

192.168.4.2 120 00:00:22

Distance: (default is 120)

## **Show ip route:**

Router>show 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

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

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, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

172.16.0.0/24 is subnetted, 2 subnets

S 172.16.1.0 is directly connected, Serial2/0

S 172.16.3.0 is directly connected, Serial2/0

R 192.168.1.0/24 [120/2] via 192.168.4.2, 00:00:26, Serial2/0

R 192.168.2.0/24 [120/1] via 192.168.4.2, 00:00:26, Serial2/0

S 192.168.3.0/24 is directly connected, Serial2/0

C 192.168.4.0/24 is directly connected, Serial2/0

C 192.168.5.0/24 is directly connected, FastEthernet0/0

## **TASK 2:**

### **Router 1:**

## **Show ip interface brief:**

Router>show ip interface brief

Interface IP-Address OK? Method Status Protocol

FastEthernet0/0 172.30.1.1 YES manual up up

FastEthernet1/0 unassigned YES unset administratively down down

Serial2/0 172.30.2.1 YES manual up up

Serial3/0 unassigned YES unset administratively down down

FastEthernet4/0 unassigned YES unset administratively down down

FastEthernet5/0 unassigned YES unset administratively down down

## **Show ip protocols:**

```
Router>show ip protocol
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 13 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 1, receive any version
Interface Send Recv Triggered RIP Key-chain
FastEthernet0/0 1 2 1
Serial2/0 1 2 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
172.30.0.0
Passive Interface(s):
Routing Information Sources:
Gateway Distance Last Update
172.30.2.2 120 00:00:13
Distance: (default is 120)
```

## **Show ip route:**

```
Router>show 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
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
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, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
```

Gateway of last resort is not set

```
172.30.0.0/24 is subnetted, 3 subnets
C 172.30.1.0 is directly connected, FastEthernet0/0
C 172.30.2.0 is directly connected, Serial2/0
R 172.30.3.0 [120/1] via 172.30.2.2, 00:00:04, Serial2/0
R 192.168.4.0/24 [120/1] via 172.30.2.2, 00:00:04, Serial2/0
R 192.168.5.0/24 [120/2] via 172.30.2.2, 00:00:04, Serial2/0
```

## **Router 2:**

### **Show ip interface brief:**

```
Router>show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 172.30.3.1 YES manual up up
FastEthernet1/0 unassigned YES unset administratively down down
Serial2/0 172.30.2.2 YES manual up up
Serial3/0 192.168.4.9 YES manual up up
FastEthernet4/0 unassigned YES unset administratively down down
FastEthernet5/0 unassigned YES unset administratively down down
```

### **Show ip protocols:**

```
Router>show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 10 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 1, receive any version
Interface Send Recv Triggered RIP Key-chain
Serial3/0 1 2 1
Serial2/0 1 2 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
172.30.0.0
192.168.4.0
Passive Interface(s):
FastEthernet0/0
Routing Information Sources:
Gateway Distance Last Update
172.30.2.1 120 00:00:23
192.168.4.10 120 00:00:20
Distance: (default is 120)
```

## **Show ip route:**

Router>show 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

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

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, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

172.30.0.0/24 is subnetted, 3 subnets

R 172.30.1.0 [120/1] via 172.30.2.1, 00:00:14, Serial2/0

C 172.30.2.0 is directly connected, Serial2/0

C 172.30.3.0 is directly connected, FastEthernet0/0

192.168.4.0/30 is subnetted, 1 subnets

C 192.168.4.8 is directly connected, Serial3/0

R 192.168.5.0/24 [120/1] via 192.168.4.10, 00:00:10, Serial3/0

## **Router 3:**

### **Show ip interface brief:**

Router>show ip interface brief

Interface IP-Address OK? Method Status Protocol

FastEthernet0/0 192.168.5.1 YES manual up up

FastEthernet1/0 unassigned YES unset administratively down down

Serial2/0 192.168.4.10 YES manual up up

Serial3/0 unassigned YES unset administratively down down

FastEthernet4/0 unassigned YES unset administratively down down

FastEthernet5/0 unassigned YES unset administratively down down

## **Show ip protocols:**

```
Router>show ip protocol
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 20 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 1, receive any version
Interface Send Recv Triggered RIP Key-chain
Serial2/0 1 2 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
192.168.4.0
192.168.5.0
Passive Interface(s):
FastEthernet0/0
Routing Information Sources:
Gateway Distance Last Update
192.168.4.9 120 00:00:28
Distance: (default is 120)
```

## **Show ip route:**

```
Router>show ip protocol
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 20 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 1, receive any version
Interface Send Recv Triggered RIP Key-chain
Serial2/0 1 2 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
192.168.4.0
192.168.5.0
Passive Interface(s):
FastEthernet0/0
```

Routing Information Sources:  
Gateway Distance Last Update  
192.168.4.9 120 00:00:28  
Distance: (default is 120)

## **TASK 3:**

### **Router 1:**

### **Show ip interface brief:**

```
Router>show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 172.30.1.1 YES manual up up
FastEthernet1/0 unassigned YES unset administratively down down
Serial2/0 172.30.2.1 YES manual up up
Serial3/0 unassigned YES unset administratively down down
FastEthernet4/0 unassigned YES unset administratively down down
FastEthernet5/0 unassigned YES unset administratively down down
```

### **Show ip protocols:**

```
Router>show ip protocol
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 28 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 1, receive any version
Interface Send Recv Triggered RIP Key-chain
FastEthernet0/0 1 2 1
Serial2/0 1 2 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
172.30.0.0
Passive Interface(s):
```



Routing Information Sources:  
Gateway Distance Last Update  
Distance: (default is 120)

## **Show ip route:**

Router>show 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  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
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, ia - IS-IS inter area  
\* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route

Gateway of last resort is not set

172.30.0.0/24 is subnetted, 2 subnets  
C 172.30.1.0 is directly connected, FastEthernet0/0  
C 172.30.2.0 is directly connected, Serial2/0

## **Router 2:**

## **Show ip interface brief:**

Router>show ip interface brief  
Interface IP-Address OK? Method Status Protocol  
FastEthernet0/0 172.30.3.1 YES manual up up  
FastEthernet1/0 unassigned YES unset administratively down down  
Serial2/0 172.30.2.2 YES manual up up  
Serial3/0 192.168.4.9 YES manual up up  
FastEthernet4/0 unassigned YES unset administratively down down  
FastEthernet5/0 unassigned YES unset administratively down down

## **Show ip protocols:**

Router>show ip protocol

## **Show ip route:**

Router>show 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  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
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, ia - IS-IS inter area  
\* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route

Gateway of last resort is 0.0.0.0 to network 0.0.0.0

172.30.0.0/24 is subnetted, 2 subnets  
C 172.30.2.0 is directly connected, Serial2/0  
C 172.30.3.0 is directly connected, FastEthernet0/0  
192.168.4.0/30 is subnetted, 1 subnets  
C 192.168.4.8 is directly connected, Serial3/0  
S\* 0.0.0.0/0 is directly connected, Serial3/0

## **Router 3:**

### **Show ip interface brief:**

```
Router>show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 192.168.5.1 YES manual up up
FastEthernet1/0 unassigned YES unset administratively down down
Serial2/0 192.168.4.10 YES manual up up
Serial3/0 unassigned YES unset administratively down down
FastEthernet4/0 unassigned YES unset administratively down down
FastEthernet5/0 unassigned YES unset administratively down down
```

### **Show ip protocols:**

```
Router>show ip protocol
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 21 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 1, receive any version
```

Interface Send Recv Triggered RIP Key-chain

Serial2/0 1 2 1

Automatic network summarization is in effect

Maximum path: 4

Routing for Networks:

192.168.4.0

192.168.5.0

Passive Interface(s):

FastEthernet0/0

Routing Information Sources:

Gateway Distance Last Update

Distance: (default is 120)

## **Show ip route:**

Router>show 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

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

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, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

172.30.0.0/22 is subnetted, 1 subnets

S 172.30.0.0 is directly connected, Serial2/0

192.168.4.0/30 is subnetted, 1 subnets

C 192.168.4.8 is directly connected, Serial2/0

C 192.168.5.0/24 is directly connected, FastEthernet0/0

---

## Critical Analysis / Conclusion

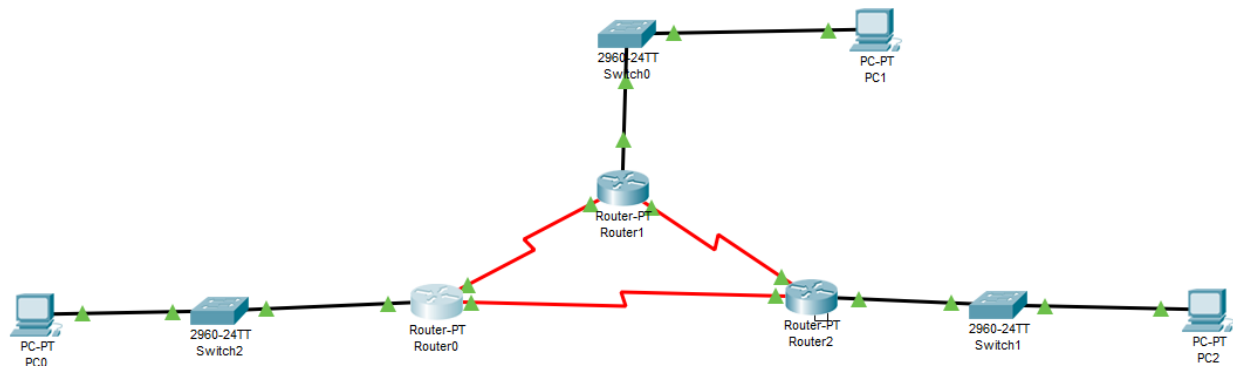
In this lab we learn about the Routing Information Protocol and its different versions like the one designed for classful networks. It is dynamic routing protocol and easier to route as compared to static routing. In this scenario we only use Network address to route.

Lab Assessment		
Pre Lab	/5	/25
Performance	/5	
Results	/5	
Viva	/5	
Critical Analysis	/5	
Instructor Signature and Comments		

## LAB #06 EIGRP configuration

### In-Lab Task

#### Task 1



PDU List Window										
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	PC2	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC0	PC1	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC1	PC0	ICMP		0.000	N	2	(edit)	(delete)
	Successful	PC1	PC2	ICMP		0.000	N	3	(edit)	(delete)
	Successful	PC2	PC1	ICMP		0.000	N	4	(edit)	(delete)
	Successful	PC2	PC0	ICMP		0.000	N	5	(edit)	(delete)

### Home Task

## **TASK 1:**

### **Router 0:**

### **show running-config:**

```
Router#show running-config
Building configuration...
```

```
Current configuration : 957 bytes
```

```
!
```

```
version 12.2
```

```
no service timestamps log datetime msec
```

```
no service timestamps debug datetime msec
```

```
no service password-encryption
```

```
!
```

```
hostname Router
```

```
!
```

```
!
```

```
!
```

```
!
```

```
!
```

```
!
```

```
!
```

```
!
```

```
!
```

```
no ip cef
```

```
no ipv6 cef
```

```
!
```

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!
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```
!  
!  
!  
interface FastEthernet0/0  
ip address 172.16.1.1 255.255.255.0  
duplex auto  
speed auto  
!  
interface FastEthernet1/0  
no ip address  
duplex auto  
speed auto  
shutdown  
!  
interface Serial2/0  
bandwidth 64  
ip address 172.16.3.1 255.255.255.252  
clock rate 64000  
!  
interface Serial3/0  
ip address 192.168.10.5 255.255.255.252  
!  
interface FastEthernet4/0  
no ip address  
shutdown  
!  
interface FastEthernet5/0  
no ip address  
shutdown  
!  
interface Serial6/0  
no ip address  
clock rate 2000000  
shutdown  
!  
router eigrp 1  
network 172.16.0.0  
network 192.168.10.4 0.0.0.3  
network 192.168.10.8 0.0.0.3  
no auto-summary  
!  
router rip  
!  
ip classless  
!  
ip flow-export version 9
```

```
!  
!  
!  
!  
!  
!  
!  
!  
!  
line con 0  
!  
line aux 0  
!  
line vty 0 4  
login  
!  
!  
!  
end
```

## **show ip route:**

Router#show 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  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
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, ia - IS-IS inter area  
\* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route

Gateway of last resort is not set

```
172.16.0.0/16 is variably subnetted, 3 subnets, 2 masks  
C 172.16.1.0/24 is directly connected, FastEthernet0/0  
D 172.16.2.0/24 [90/40514560] via 172.16.3.2, 00:14:49, Serial2/0  
C 172.16.3.0/30 is directly connected, Serial2/0  
D 192.168.1.0/24 [90/41026560] via 172.16.3.2, 00:14:47, Serial2/0  
192.168.10.0/30 is subnetted, 2 subnets  
C 192.168.10.4 is directly connected, Serial3/0  
D 192.168.10.8 [90/41024000] via 172.16.3.2, 00:14:49, Serial2/0
```

## **show ip interface brief:**



```
Router#show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 172.16.1.1 YES manual up up
FastEthernet1/0 unassigned YES unset administratively down down
Serial2/0 172.16.3.1 YES manual up up
Serial3/0 192.168.10.5 YES manual up up
FastEthernet4/0 unassigned YES unset administratively down down
FastEthernet5/0 unassigned YES unset administratively down down
Serial6/0 unassigned YES unset administratively down down
```

## **show ip protocol:**

```
Router#show ip protocol

Routing Protocol is "eigrp 1 "
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Default networks flagged in outgoing updates
  Default networks accepted from incoming updates
  EIGRP metric weight K1=1, K2=0, K3=1, K4=0, K5=0
  EIGRP maximum hopcount 100
  EIGRP maximum metric variance 1
  Redistributing: eigrp 1
  Automatic network summarization is not in effect
  Maximum path: 4
  Routing for Networks:
    172.16.0.0
    192.168.10.4/30
    192.168.10.8/30
  Routing Information Sources:
    Gateway Distance Last Update
    172.16.3.2 90 5409
  Distance: internal 90 external 170
```

## **Router 1:**

## **show running-config:**

Router#show running-config

Building configuration...

Current configuration : 873 bytes

!

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname Router

!

!

!

!

!

!

!

!

!

ip cef

no ipv6 cef

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

interface FastEthernet0/0

ip address 172.16.2.1 255.255.255.0

```
duplex auto
speed auto
!
interface FastEthernet1/0
no ip address
duplex auto
speed auto
shutdown
!
interface Serial2/0
bandwidth 64
ip address 172.16.3.2 255.255.255.252
!
interface Serial3/0
bandwidth 1024
ip address 192.168.10.9 255.255.255.252
clock rate 64000
!
interface FastEthernet4/0
no ip address
shutdown
!
interface FastEthernet5/0
no ip address
shutdown
!
router eigrp 1
network 172.16.0.0
network 192.168.10.8 0.0.0.3
no auto-summary
!
router rip
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
```

```
line aux 0
!  
line vty 0 4  
login  
!  
!  
!  
end
```

## **show ip route:**

```
Router#show 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  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
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, ia - IS-IS inter area  
* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route
```

Gateway of last resort is not set

```
172.16.0.0/16 is variably subnetted, 3 subnets, 2 masks  
D 172.16.1.0/24 [90/40514560] via 172.16.3.1, 00:18:27, Serial2/0  
C 172.16.2.0/24 is directly connected, FastEthernet0/0  
C 172.16.3.0/30 is directly connected, Serial2/0  
D 192.168.1.0/24 [90/3014400] via 192.168.10.10, 00:18:25, Serial3/0  
192.168.10.0/30 is subnetted, 2 subnets  
D 192.168.10.4 [90/41024000] via 172.16.3.1, 00:18:27, Serial2/0  
C 192.168.10.8 is directly connected, Serial3/0
```

## **Show ip interface brief:**

```
Router#show ip interface brief  
Interface IP-Address OK? Method Status Protocol  
FastEthernet0/0 172.16.2.1 YES manual up up  
FastEthernet1/0 unassigned YES unset administratively down down  
Serial2/0 172.16.3.2 YES manual up up  
Serial3/0 192.168.10.9 YES manual up up  
FastEthernet4/0 unassigned YES unset administratively down down  
FastEthernet5/0 unassigned YES unset administratively down down
```

## **show ip protocol:**

Router#show ip protocol

Routing Protocol is "eigrp 1 "  
Outgoing update filter list for all interfaces is not set  
Incoming update filter list for all interfaces is not set  
Default networks flagged in outgoing updates  
Default networks accepted from incoming updates  
EIGRP metric weight K1=1, K2=0, K3=1, K4=0, K5=0  
EIGRP maximum hopcount 100  
EIGRP maximum metric variance 1  
Redistributing: eigrp 1  
Automatic network summarization is not in effect  
Maximum path: 4  
Routing for Networks:  
172.16.0.0  
192.168.10.8/30  
Routing Information Sources:  
Gateway Distance Last Update  
172.16.3.1 90 5409  
192.168.10.10 90 7387  
Distance: internal 90 external 170

## **Router 2:**

## **Show running-config:**

Router#show running-config  
Building configuration...

Current configuration : 880 bytes  
!  
version 12.2  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption  
!

[illegible]

! ! ! ! ! ! ! ! ! ! ! ! ! ! !

```
!
interface FastEthernet1/0
no ip address
duplex auto
speed auto
shutdown
!
```

```
!
interface Serial3/0
bandwidth 1024
```

```
ip address 192.168.10.10 255.255.255.252
!
interface FastEthernet4/0
no ip address
shutdown
!
interface FastEthernet5/0
no ip address
shutdown
!
router eigrp 1
network 192.168.1.0
network 192.168.4.0 0.0.0.3
network 192.168.10.8 0.0.0.3
no auto-summary
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
End
```

## **show ip route:**

Router#show 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  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
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, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route

Gateway of last resort is not set

172.16.0.0/16 is variably subnetted, 3 subnets, 2 masks  
D 172.16.1.0/24 [90/41026560] via 192.168.10.9, 00:21:04, Serial3/0  
D 172.16.2.0/24 [90/3014400] via 192.168.10.9, 00:21:04, Serial3/0  
D 172.16.3.0/30 [90/41024000] via 192.168.10.9, 00:21:04, Serial3/0  
C 192.168.1.0/24 is directly connected, FastEthernet0/0  
192.168.10.0/30 is subnetted, 2 subnets  
C 192.168.10.4 is directly connected, Serial2/0  
C 192.168.10.8 is directly connected, Serial3/0

## **Show ip interface brief:**

```
Router#show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 192.168.1.1 YES manual up up
FastEthernet1/0 unassigned YES unset administratively down down
Serial2/0 192.168.10.6 YES manual up up
Serial3/0 192.168.10.10 YES manual up up
FastEthernet4/0 unassigned YES unset administratively down down
FastEthernet5/0 unassigned YES unset administratively down down
```

## **show ip protocol:**

```
Router# show ip protocol

Routing Protocol is "eigrp 1 "
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Default networks flagged in outgoing updates
  Default networks accepted from incoming updates
  EIGRP metric weight K1=1, K2=0, K3=1, K4=0, K5=0
  EIGRP maximum hopcount 100
  EIGRP maximum metric variance 1
  Redistributing: eigrp 1
  Automatic network summarization is not in effect
  Maximum path: 4
  Routing for Networks:
    192.168.1.0
    192.168.4.0/30
    192.168.10.8/30
```



Routing Information Sources:  
Gateway Distance Last Update  
192.168.10.9 90 7387  
Distance: internal 90 external 170

## Critical Analysis / Conclusion

In this lab we learnt about Enhanced Interior Gateway Routing Protocol (EIGRP). This protocol automatically takes routing decisions and makes configuration. Unlike RIP it only sends incremental updates.

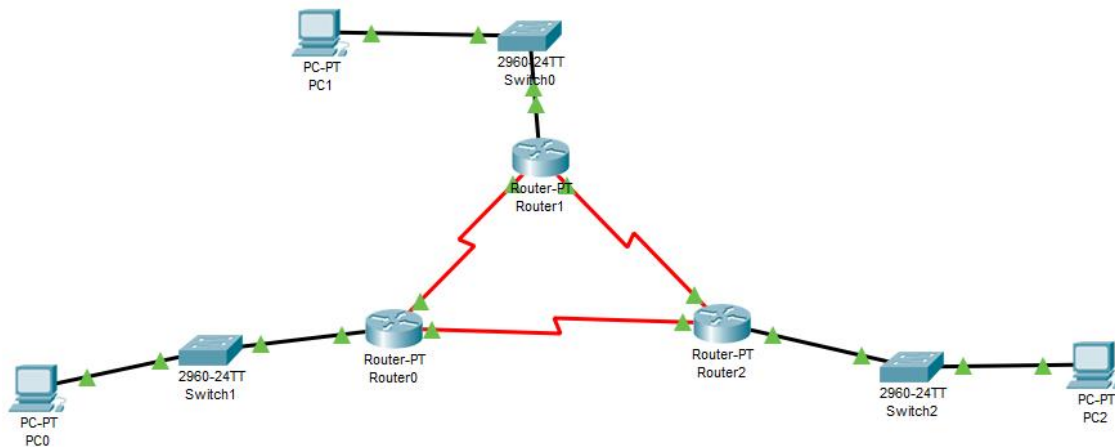
Moreover, we implemented this on a topology given to us and successfully sent packets between PC's connected to different routers.

Lab Assessment		
Pre Lab	/5	/25
Performance	/5	
Results	/5	
Viva	/5	
Critical Analysis	/5	
Instructor Signature and Comments		

## Lab #07 OSPF Configuration

### In-Lab Task

#### Task 1



PDU List Window										
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	PC1	ICMP		0.000	N	0	(edit)	
	Successful	PC0	PC2	ICMP		0.000	N	1	(edit)	
	Successful	PC1	PC0	ICMP		0.000	N	2	(edit)	
	Successful	PC1	PC2	ICMP		0.000	N	3	(edit)	
	Successful	PC2	PC1	ICMP		0.000	N	4	(edit)	
	Successful	PC2	PC0	ICMP		0.000	N	5	(edit)	

## **Home Task**

### **TASK 1:**

#### **➤ Router 0:**

#### **show running-config:**

```
Router#show running-config
Building configuration...
```

```
Current configuration : 923 bytes
```

```
!
```

```
version 12.2
```

```
no service timestamps log datetime msec
```

```
no service timestamps debug datetime msec
```

```
no service password-encryption
```

```
!
```

```
hostname Router
```

```
!
```

```
!
```

```
!
```

```
!
```

```
!
```

```
!
```

```
!
```

```
!
```

```
ip cef
```

```
no ipv6 cef
```

```
!
```

```
!
```

```
!
```

```
!
```

```
!
```

```
!
```

```
!  
!  
!  
!  
!  
!  
!  
!  
interface Loopback0  
ip address 10.1.1.1 255.255.255.255  
!  
interface FastEthernet0/0  
ip address 172.16.1.17 255.255.255.240  
duplex auto  
speed auto  
!  
interface FastEthernet1/0  
no ip address  
duplex auto  
speed auto  
shutdown  
!  
interface Serial2/0  
ip address 192.168.10.1 255.255.255.252  
clock rate 64000  
!  
interface Serial3/0  
ip address 192.168.10.5 255.255.255.252  
!  
interface FastEthernet4/0  
no ip address  
shutdown  
!  
interface FastEthernet5/0  
no ip address  
shutdown  
!  
router ospf 1  
log-adjacency-changes  
network 172.16.1.16 0.0.0.15 area 0  
network 192.168.10.0 0.0.0.3 area 0  
!  
ip classless  
!  
ip flow-export version 9  
!
```

```
!  
!  
!  
!  
!  
!  
!  
!  
line con 0  
!  
line aux 0  
!  
line vty 0 4  
login  
!  
!  
!  
end
```

## **show ip route:**

Router#show 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  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
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, ia - IS-IS inter area  
\* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route

Gateway of last resort is not set

```
10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks  
C 10.1.1.1/32 is directly connected, Loopback0  
O 10.10.10.0/24 [110/65] via 192.168.10.2, 00:05:14, Serial2/0  
172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks  
C 172.16.1.16/28 is directly connected, FastEthernet0/0  
O 172.16.1.32/29 [110/129] via 192.168.10.2, 00:05:04, Serial2/0  
192.168.10.0/30 is subnetted, 3 subnets  
C 192.168.10.0 is directly connected, Serial2/0  
C 192.168.10.4 is directly connected, Serial3/0  
O 192.168.10.8 [110/128] via 192.168.10.2, 00:05:14, Serial2/0
```

## **show ip interface brief:**

```
Router#show ip interface brieg
^
% Invalid input detected at '^' marker.
Router#show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 172.16.1.17 YES manual up up
FastEthernet1/0 unassigned YES unset administratively down down
Serial2/0 192.168.10.1 YES manual up up
Serial3/0 192.168.10.5 YES manual up up
FastEthernet4/0 unassigned YES unset administratively down down
FastEthernet5/0 unassigned YES unset administratively down down
Loopback0 10.1.1.1 YES manual up up
```

## **show ip protocol:**

```
Router#show ip protocol

Routing Protocol is "ospf 1"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 10.1.1.1
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Maximum path: 4
Routing for Networks:
 172.16.1.16 0.0.0.15 area 0
 192.168.10.0 0.0.0.3 area 0
Routing Information Sources:
Gateway Distance Last Update
10.1.1.1 110 00:06:16
10.2.2.2 110 00:06:16
10.3.3.3 110 00:06:17
Distance: (default is 110)
```

## ➤ Router 1:

### show running-config:

Router#show running-config  
Building configuration...

Current configuration : 957 bytes

```
!  
version 12.2  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption  
!  
hostname Router  
!  
!  
!  
!  
!  
!  
ip cef  
no ipv6 cef  
!  
!  
!  
!  
!  
!  
!  
!  
!  
!  
!  
interface Loopback0  
ip address 10.2.2.2 255.255.255.255  
!  
interface FastEthernet0/0  
ip address 10.10.10.1 255.255.255.0  
duplex auto  
speed auto  
!
```

```
interface FastEthernet1/0
no ip address
duplex auto
speed auto
shutdown
!
interface Serial2/0
ip address 192.168.10.2 255.255.255.252
!
interface Serial3/0
ip address 192.168.10.9 255.255.255.252
clock rate 64000
!
interface FastEthernet4/0
no ip address
shutdown
!
interface FastEthernet5/0
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
network 10.10.10.0 0.0.0.255 area 0
network 192.168.10.0 0.0.0.3 area 0
network 192.168.10.8 0.0.0.3 area 0
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
```



!  
end

## **show ip route:**

Router#show 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  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
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, ia - IS-IS inter area  
\* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks  
C 10.2.2.2/32 is directly connected, Loopback0  
C 10.10.10.0/24 is directly connected, FastEthernet0/0  
172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks  
O 172.16.1.16/28 [110/65] via 192.168.10.1, 00:07:12, Serial2/0  
O 172.16.1.32/29 [110/65] via 192.168.10.10, 00:07:12, Serial3/0  
192.168.10.0/30 is subnetted, 3 subnets  
C 192.168.10.0 is directly connected, Serial2/0  
O 192.168.10.4 [110/128] via 192.168.10.10, 00:07:12, Serial3/0  
C 192.168.10.8 is directly connected, Serial3/0

## **Show ip interface brief:**

Router#show ip interface brief  
Interface IP-Address OK? Method Status Protocol  
FastEthernet0/0 10.10.10.1 YES manual up up  
FastEthernet1/0 unassigned YES unset administratively down down  
Serial2/0 192.168.10.2 YES manual up up  
Serial3/0 192.168.10.9 YES manual up up  
FastEthernet4/0 unassigned YES unset administratively down down  
FastEthernet5/0 unassigned YES unset administratively down down  
Loopback0 10.2.2.2 YES manual up up

## **show ip protocol:**

Router#show ip protocol

Routing Protocol is "ospf 1"  
Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set  
Router ID 10.2.2.2  
Number of areas in this router is 1. 1 normal 0 stub 0 nssa  
Maximum path: 4  
Routing for Networks:  
10.10.10.0 0.0.0.255 area 0  
192.168.10.0 0.0.0.3 area 0  
192.168.10.8 0.0.0.3 area 0  
Routing Information Sources:  
Gateway Distance Last Update  
10.1.1.1 110 00:08:06  
10.2.2.2 110 00:08:06  
10.3.3.3 110 00:08:07  
Distance: (default is 110)

## ➤ **Router 2:**

### **Show running-config:**

```
Router#show running-config
Building configuration...
```

```
Current configuration : 960 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
!
!
!
!
!
!
```

```
ip cef
no ipv6 cef
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
interface Loopback0
ip address 10.3.3.3 255.255.255.255
!
interface FastEthernet0/0
ip address 172.16.1.33 255.255.255.248
duplex auto
speed auto
!
interface FastEthernet1/0
no ip address
duplex auto
speed auto
shutdown
!
interface Serial2/0
ip address 192.168.10.6 255.255.255.252
clock rate 64000
!
interface Serial3/0
ip address 192.168.10.10 255.255.255.252
!
interface FastEthernet4/0
no ip address
shutdown
!
interface FastEthernet5/0
no ip address
shutdown
!
router ospf 1
```

```
log-adjacency-changes
network 172.16.1.32 0.0.0.7 area 0
network 192.168.10.4 0.0.0.3 area 0
network 192.168.10.8 0.0.0.3 area 0
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

## **show ip route:**

Router#show 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  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
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, ia - IS-IS inter area  
\* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route

Gateway of last resort is not set

```
10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 10.3.3.3/32 is directly connected, Loopback0
O 10.10.10.0/24 [110/65] via 192.168.10.9, 00:08:46, Serial3/0
172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
O 172.16.1.16/28 [110/129] via 192.168.10.9, 00:08:36, Serial3/0
C 172.16.1.32/29 is directly connected, FastEthernet0/0
```

192.168.10.0/30 is subnetted, 3 subnets  
O 192.168.10.0 [110/128] via 192.168.10.9, 00:08:46, Serial3/0  
C 192.168.10.4 is directly connected, Serial2/0  
C 192.168.10.8 is directly connected, Serial3/0

## **Show ip interface brief:**

```
Router#show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 172.16.1.33 YES manual up up
FastEthernet1/0 unassigned YES unset administratively down down
Serial2/0 192.168.10.6 YES manual up up
Serial3/0 192.168.10.10 YES manual up up
FastEthernet4/0 unassigned YES unset administratively down down
FastEthernet5/0 unassigned YES unset administratively down down
Loopback0 10.3.3.3 YES manual up up
```

## **show ip protocol:**

```
Router#show ip protocol

Routing Protocol is "ospf 1"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 10.3.3.3
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Maximum path: 4
Routing for Networks:
 172.16.1.32 0.0.0.7 area 0
 192.168.10.4 0.0.0.3 area 0
 192.168.10.8 0.0.0.3 area 0
Routing Information Sources:
Gateway Distance Last Update
10.1.1.1 110 00:09:24
10.2.2.2 110 00:09:24
10.3.3.3 110 00:09:25
Distance: (default is 110)
```

## Critical Analysis / Conclusion

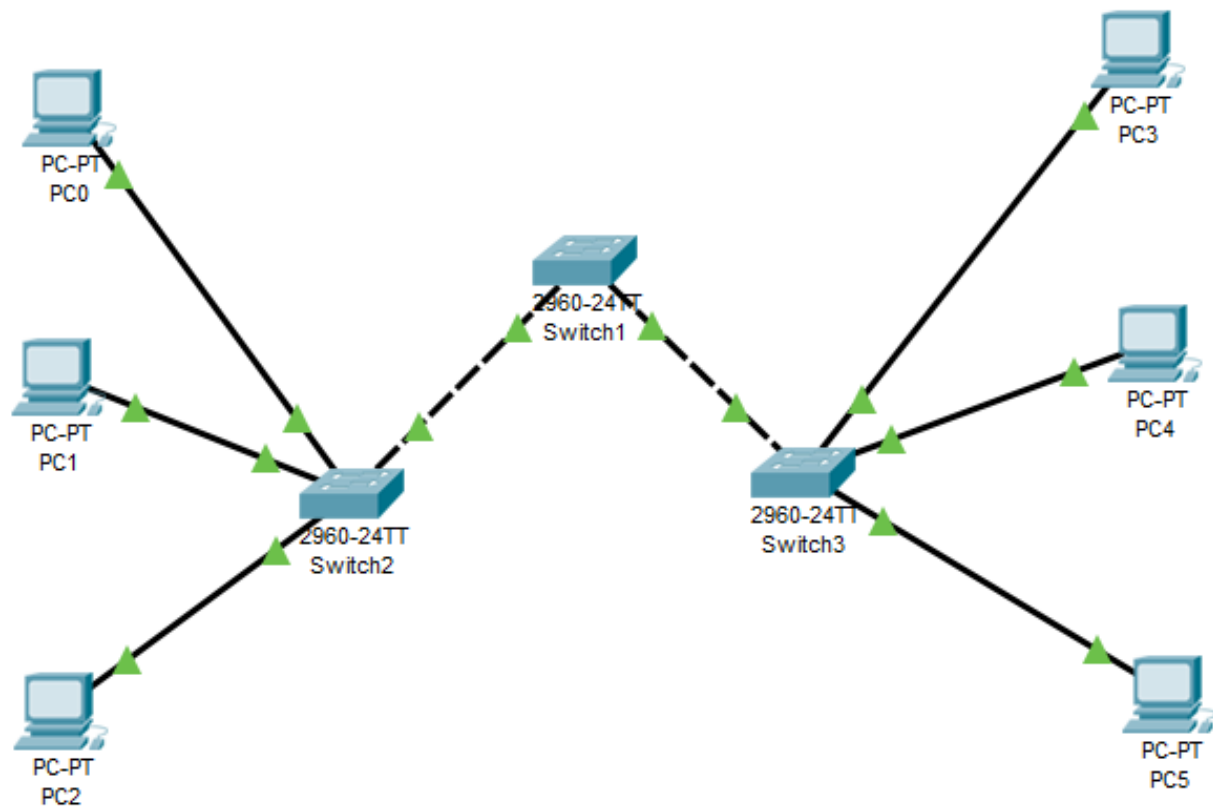
In this lab we learnt about Open shortest path first (OSPF) configuration. It is a classless routing protocol that can be used to provide subnet mask information in the routing updates, this feature of OSPF helps the VLSM subnet information to be available throughout the network.

Moreover, we implemented this on a topology given to us and successfully sent packets between PC's connected to different routers.



Lab Assessment		
Pre Lab	/5	/25
Performance	/5	
Results	/5	
Viva	/5	
Critical Analysis	/5	
Instructor Signature and Comments		

## Lab #08 VLAN Configuration



### In-Lab Task





### Packet from VLAN10 to VLAN10

PDU List Window						
Fire	Last Status	Source	Destination	Type	Color	Time(sec)
	Successful	PC0	PC3	ICMP		0.000



### **Packet from VLAN10 to VLAN20**

PDU List Window							
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic
	Failed	PC0	PC4	ICMP		0.000	N

### **Packet from VLAN10 to VLAN30**



PDU List Window							
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic
	Failed	PC0	PC5	ICMP		0.000	N

### **Packet from VLAN20 to VLAN10**



PDU List Window							
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic
	Failed	PC1	PC3	ICMP		0.000	N





### **Packet from VLAN20 to VLAN20**

PDU List Window							
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic
	Successful	PC1	PC4	ICMP		0.000	N



### **Packet from VLAN20 to VLAN30**

PDU List Window							
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic
	Failed	PC1	PC5	ICMP		0.000	N



### **Packet from VLAN30 to VLAN10**

PDU List Window							
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic
	Failed	PC2	PC3	ICMP		0.000	N

### **Packet from VLAN30 to VLAN20**

PDU List Window							
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic
	Failed	PC2	PC4	ICMP		0.000	N

### **Packet from VLAN30 to VLAN30**

PDU List Window							
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic
	Successful	PC2	PC5	ICMP		0.000	N

## Home Task

### ➤ Switch 1:

#### show running-config:

```
Switch#show running-config
Building configuration...
```

```
Current configuration : 1444 bytes
```

```
!
```

```
version 12.2
```

```
no service timestamps log datetime msec
```

```
no service timestamps debug datetime msec
```

```
no service password-encryption
```

```
!
```

```
hostname Switch
```

```
!
```

```
!
```

```
!
```

```
!
```

```
!
```

```
spanning-tree mode pvst
```

```
spanning-tree extend system-id
```

```
!
```

```
interface FastEthernet0/1
```

```
switchport trunk native vlan 99
```

```
switchport mode trunk
```

```
!
```

```
interface FastEthernet0/2
```

```
switchport trunk native vlan 99
```

```
switchport mode trunk
```

```
!
```

```
interface FastEthernet0/3
```

```
switchport trunk native vlan 99
```

```
switchport mode trunk
```

```
!
```

```
interface FastEthernet0/4
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/5
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
```

```
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
no ip address
shutdown
!
interface Vlan99
mac-address 000c.8559.4201
ip address 172.17.99.11 255.255.255.0
!
!
!
!
line con 0
!
line vty 0 4
login
line vty 5 15
login
!
!
!
!
End
```

## ➤ Switch 2:

### show running-config:

Switch#show running-config  
Building configuration...

Current configuration : 1957 bytes

!

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname Switch

!

!

!

!

!

spanning-tree mode pvst

spanning-tree extend system-id

!

interface FastEthernet0/1

switchport trunk native vlan 99

switchport mode trunk

!

interface FastEthernet0/2

switchport trunk native vlan 99

switchport mode trunk

!

interface FastEthernet0/3

switchport trunk native vlan 99

switchport mode trunk

!

interface FastEthernet0/4

switchport trunk native vlan 99

switchport mode trunk

!

interface FastEthernet0/5

switchport trunk native vlan 99

switchport mode trunk

!

```
interface FastEthernet0/6
switchport access vlan 30
!
interface FastEthernet0/7
switchport access vlan 30
!
interface FastEthernet0/8
switchport access vlan 30
!
interface FastEthernet0/9
switchport access vlan 30
!
interface FastEthernet0/10
switchport access vlan 30
!
interface FastEthernet0/11
switchport access vlan 10
!
interface FastEthernet0/12
switchport access vlan 10
!
interface FastEthernet0/13
switchport access vlan 10
!
interface FastEthernet0/14
switchport access vlan 10
!
interface FastEthernet0/15
switchport access vlan 10
!
interface FastEthernet0/16
switchport access vlan 10
!
interface FastEthernet0/17
switchport access vlan 10
!
interface FastEthernet0/18
switchport access vlan 20
!
interface FastEthernet0/19
switchport access vlan 20
!
interface FastEthernet0/20
switchport access vlan 20
!
interface FastEthernet0/21
```

```
switchport access vlan 20
!
interface FastEthernet0/22
switchport access vlan 20
!
interface FastEthernet0/23
switchport access vlan 20
!
interface FastEthernet0/24
switchport access vlan 20
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
no ip address
shutdown
!
interface Vlan99
mac-address 0007.ece1.0b01
ip address 172.17.99.12 255.255.255.0
!
!
!
!
line con 0
!
line vty 0 4
login
line vty 5 15
login
!
!
!
!
End
```



## ➤ Switch 3:

### Show running-config:

```
Switch#show running-config
Building configuration...
```

```
Current configuration : 1957 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Switch
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/2
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/3
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/4
switchport trunk native vlan 99
switchport mode trunk
```

```
!  
interface FastEthernet0/5  
switchport trunk native vlan 99  
switchport mode trunk  
!  
interface FastEthernet0/6  
switchport access vlan 30  
!  
interface FastEthernet0/7  
switchport access vlan 30  
!  
interface FastEthernet0/8  
switchport access vlan 30  
!  
interface FastEthernet0/9  
switchport access vlan 30  
!  
interface FastEthernet0/10  
switchport access vlan 30  
!  
interface FastEthernet0/11  
switchport access vlan 10  
!  
interface FastEthernet0/12  
switchport access vlan 10  
!  
interface FastEthernet0/13  
switchport access vlan 10  
!  
interface FastEthernet0/14  
switchport access vlan 10  
!  
interface FastEthernet0/15  
switchport access vlan 10  
!  
interface FastEthernet0/16  
switchport access vlan 10  
!  
interface FastEthernet0/17  
switchport access vlan 10  
!  
interface FastEthernet0/18  
switchport access vlan 20  
!  
interface FastEthernet0/19  
switchport access vlan 20
```

```
!  
interface FastEthernet0/20  
switchport access vlan 20  
!  
interface FastEthernet0/21  
switchport access vlan 20  
!  
interface FastEthernet0/22  
switchport access vlan 20  
!  
interface FastEthernet0/23  
switchport access vlan 20  
!  
interface FastEthernet0/24  
switchport access vlan 20  
!  
interface GigabitEthernet0/1  
!  
interface GigabitEthernet0/2  
!  
interface Vlan1  
no ip address  
shutdown  
!  
interface Vlan99  
mac-address 000b.bea6.d701  
ip address 172.17.99.13 255.255.255.0  
!  
!  
!  
!  
line con 0  
!  
line vty 0 4  
login  
line vty 5 15  
login  
!  
!  
!  
!  
end
```

---

## Critical Analysis / Conclusion

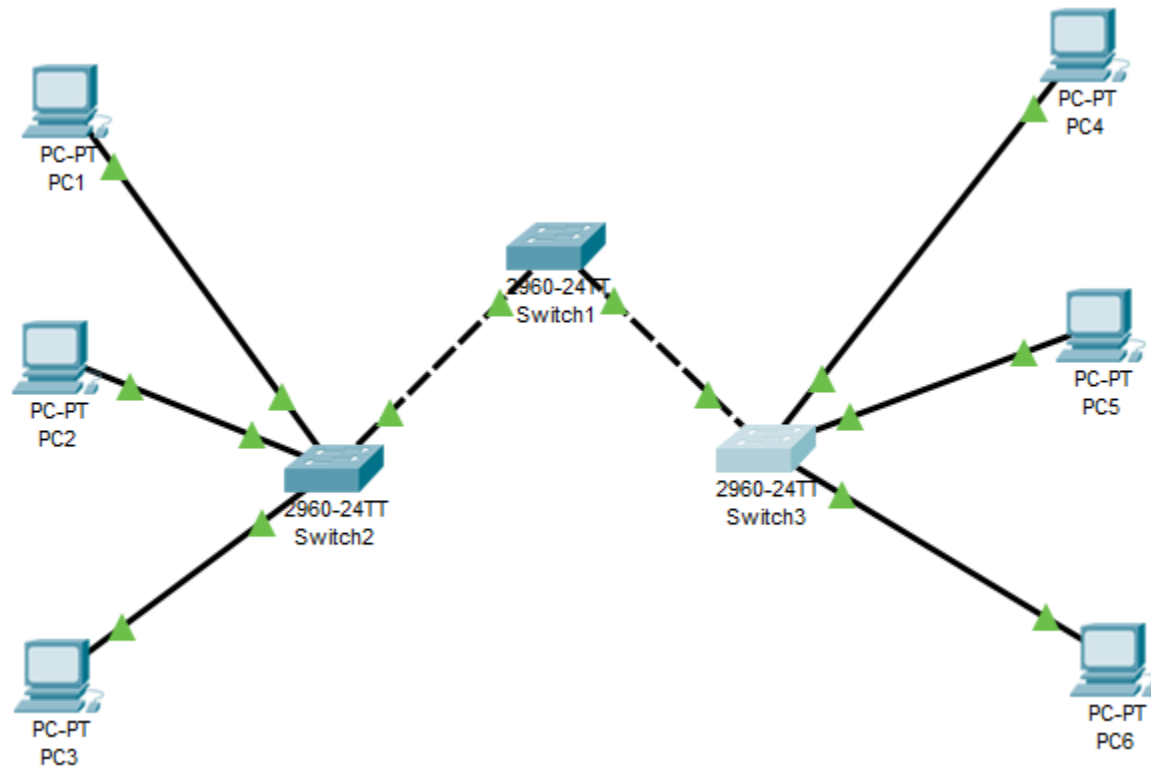
In this lab we learnt about Virtual Local Area Network (VLAN) configuration. It is a group of logically connected devices that function exactly like a Local Area Network (LAN), each VLAN acts as a subgroup of switchports.

Moreover, we implemented this on a topology given to us and successfully sent Packet between PC's connected to same VLAN's and we were unable to send packets between PC's connected to different VLAN's

Lab Assessment		
Pre Lab	/5	/25
Performance	/5	
Results	/5	
Viva	/5	
Critical Analysis	/5	
Instructor Signature and Comments		

## Lab #09 VTP Configuration







### In-Lab Task









### Packet Switches

PDU List Window										
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	Switch2	Switch1	ICMP		0.000	N	0	(edit)	
	Successful	Switch1	Switch2	ICMP		0.000	N	1	(edit)	
	Successful	Switch3	Switch1	ICMP		0.000	N	2	(edit)	
	Successful	Switch1	Switch3	ICMP		0.000	N	3	(edit)	
	Successful	Switch2	Switch3	ICMP		0.000	N	4	(edit)	
	Successful	Switch3	Switch2	ICMP		0.000	N	5	(edit)	







### Packet from VLAN10 to others

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC1	PC4	ICMP		0.000	N	0	(edit)	
	Failed	PC1	PC5	ICMP		0.000	N	1	(edit)	
	Failed	PC1	PC6	ICMP		0.000	N	2	(edit)	

### Packet from VLAN20 to others

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Failed	PC2	PC4	ICMP		0.000	N	0	(edit)	
	Successful	PC2	PC5	ICMP		0.000	N	1	(edit)	
	Failed	PC2	PC6	ICMP		0.000	N	2	(edit)	

### Packet from VLAN20 to VLAN10

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Failed	PC3	PC4	ICMP		0.000	N	0	(edit)	
	Failed	PC3	PC5	ICMP		0.000	N	1	(edit)	
	Successful	PC3	PC6	ICMP		0.000	N	2	(edit)	

## Home Task

### ➤ Switch 1:

#### show running-config:

```
S1# show running-config
Building configuration...

Current configuration : 1738 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname S1
!
enable secret 5 $1$mERr$lnG42Uzc.xuw88Y9qr3Qv0
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/2
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/3
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/4
```

```
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/5
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/6
shutdown
!
interface FastEthernet0/7
shutdown
!
interface FastEthernet0/8
shutdown
!
interface FastEthernet0/9
shutdown
!
interface FastEthernet0/10
shutdown
!
interface FastEthernet0/11
shutdown
!
interface FastEthernet0/12
shutdown
!
interface FastEthernet0/13
shutdown
!
interface FastEthernet0/14
shutdown
!
interface FastEthernet0/15
shutdown
!
interface FastEthernet0/16
shutdown
!
interface FastEthernet0/17
shutdown
!
interface FastEthernet0/18
shutdown
!
```



```
interface FastEthernet0/19
shutdown
!
interface FastEthernet0/20
shutdown
!
interface FastEthernet0/21
shutdown
!
interface FastEthernet0/22
shutdown
!
interface FastEthernet0/23
shutdown
!
interface FastEthernet0/24
shutdown
!
interface GigabitEthernet0/1
shutdown
!
interface GigabitEthernet0/2
shutdown
!
interface Vlan1
no ip address
shutdown
!
interface Vlan99
mac-address 000c.8559.4201
ip address 172.17.99.11 255.255.255.0
!
!
!
!
line con 0
login
!
line vty 0 4
password cisco
login
line vty 5 15
password cisco
login
!
!
```

!  
!  
End

## **Show vtp status:**

```
S3#show vtp status
VTP Version : 2
Configuration Revision : 0
Maximum VLANs supported locally : 255
Number of existing VLANs : 9
VTP Operating Mode : Transparent
VTP Domain Name : Lab4
VTP Pruning Mode : Disabled
VTP V2 Mode : Disabled
VTP Traps Generation : Disabled
MD5 digest : 0x57 0xF8 0xD2 0x5C 0x01 0x86 0xE7 0x6A
Configuration last modified by 0.0.0.0 at 3-1-93 00:13:12
```

## ➤ Switch 2:

### show running-config:

S2#show running-config

Building configuration...

Current configuration : 2705 bytes

!

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname S2

!

enable secret 5 \$1\$mERr\$y7z3zUygcvSzhHhTqWR3K1

!

!

!

!

!

spanning-tree mode pvst

spanning-tree extend system-id

!

interface FastEthernet0/1

switchport trunk native vlan 99

switchport mode trunk

!

interface FastEthernet0/2

switchport trunk native vlan 99

switchport mode trunk

!

interface FastEthernet0/3

switchport trunk native vlan 99

switchport mode trunk

!

interface FastEthernet0/4

switchport trunk native vlan 99

switchport mode trunk

!

interface FastEthernet0/5

switchport trunk native vlan 99

```
switchport mode trunk
!
interface FastEthernet0/6
switchport access vlan 30
switchport mode access
switchport port-security
switchport port-security mac-address sticky
switchport port-security mac-address sticky 0060.47C1.AD9E
!
interface FastEthernet0/7
switchport access vlan 30
shutdown
!
interface FastEthernet0/8
switchport access vlan 30
shutdown
!
interface FastEthernet0/9
switchport access vlan 30
shutdown
!
interface FastEthernet0/10
switchport access vlan 30
shutdown
!
interface FastEthernet0/11
switchport access vlan 10
switchport mode access
switchport port-security
switchport port-security mac-address sticky
switchport port-security mac-address sticky 0009.7C30.BEC8
!
interface FastEthernet0/12
switchport access vlan 10
shutdown
!
interface FastEthernet0/13
switchport access vlan 10
shutdown
!
interface FastEthernet0/14
switchport access vlan 10
shutdown
!
interface FastEthernet0/15
switchport access vlan 10
```

```
shutdown
!
interface FastEthernet0/16
switchport access vlan 10
shutdown
!
interface FastEthernet0/17
switchport access vlan 10
shutdown
!
interface FastEthernet0/18
switchport access vlan 20
switchport mode access
switchport port-security
switchport port-security mac-address sticky
switchport port-security mac-address sticky 0090.0C6C.14D3
!
interface FastEthernet0/19
switchport access vlan 20
shutdown
!
interface FastEthernet0/20
switchport access vlan 20
shutdown
!
interface FastEthernet0/21
switchport access vlan 20
shutdown
!
interface FastEthernet0/22
switchport access vlan 20
shutdown
!
interface FastEthernet0/23
switchport access vlan 20
shutdown
!
interface FastEthernet0/24
switchport access vlan 20
shutdown
!
interface GigabitEthernet0/1
shutdown
!
interface GigabitEthernet0/2
shutdown
```

```
!  
interface Vlan1  
no ip address  
shutdown  
!  
interface Vlan99  
mac-address 0007.ece1.0b01  
ip address 172.17.99.12 255.255.255.0  
!  
!  
!  
!  
line con 0  
password cisco  
login  
!  
line vty 0 4  
password cisco  
login  
line vty 5 15  
password cisco  
login  
!  
!  
!  
!  
end
```

## **Show vtp status:**

```
S3#show vtp status  
VTP Version : 2  
Configuration Revision : 0  
Maximum VLANs supported locally : 255  
Number of existing VLANs : 9  
VTP Operating Mode : Transparent  
VTP Domain Name : Lab4  
VTP Pruning Mode : Disabled  
VTP V2 Mode : Disabled  
VTP Traps Generation : Disabled  
MD5 digest : 0x57 0xF8 0xD2 0x5C 0x01 0x86 0xE7 0x6A  
Configuration last modified by 0.0.0.0 at 3-1-93 00:13:12
```

## ➤ Switch 3:

### Show running-config:

S3#show running-config  
Building configuration...

Current configuration : 2842 bytes

!

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname S3

!

enable secret 5 cisco

!

!

!

!

vtp domain Lab4

vtp mode transparent

vtp password cisco

!

!

spanning-tree mode pvst

spanning-tree extend system-id

!

vlan 10

name faculty/staff

!

vlan 20

name students

!

vlan 30

name guest

!

vlan 99

name management

!

interface FastEthernet0/1

switchport trunk native vlan 99

```
switchport mode trunk
!
interface FastEthernet0/2
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/3
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/4
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/5
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/6
switchport access vlan 30
switchport mode access
switchport port-security
switchport port-security mac-address sticky
switchport port-security mac-address sticky 00E0.F94E.DD5D
!
interface FastEthernet0/7
switchport access vlan 30
shutdown
!
interface FastEthernet0/8
switchport access vlan 30
shutdown
!
interface FastEthernet0/9
switchport access vlan 30
shutdown
!
interface FastEthernet0/10
switchport access vlan 30
shutdown
!
interface FastEthernet0/11
switchport access vlan 10
switchport mode access
switchport port-security
switchport port-security mac-address sticky
```



```
switchport port-security mac-address sticky 0002.4A56.5D93
```

```
!
```

```
interface FastEthernet0/12
```

```
switchport access vlan 10
```

```
shutdown
```

```
!
```

```
interface FastEthernet0/13
```

```
switchport access vlan 10
```

```
shutdown
```

```
!
```

```
interface FastEthernet0/14
```

```
switchport access vlan 10
```

```
shutdown
```

```
!
```

```
interface FastEthernet0/15
```

```
switchport access vlan 10
```

```
shutdown
```

```
!
```

```
interface FastEthernet0/16
```

```
switchport access vlan 10
```

```
shutdown
```

```
!
```

```
interface FastEthernet0/17
```

```
switchport access vlan 10
```

```
shutdown
```

```
!
```

```
interface FastEthernet0/18
```

```
switchport access vlan 20
```

```
switchport mode access
```

```
switchport port-security
```

```
switchport port-security mac-address sticky
```

```
switchport port-security mac-address sticky 00D0.BA65.64D5
```

```
!
```

```
interface FastEthernet0/19
```

```
switchport access vlan 20
```

```
shutdown
```

```
!
```

```
interface FastEthernet0/20
```

```
switchport access vlan 20
```

```
shutdown
```

```
!
```

```
interface FastEthernet0/21
```

```
switchport access vlan 20
```

```
shutdown
```

```
!
```

```
interface FastEthernet0/22
```

```
switchport access vlan 20
shutdown
!
interface FastEthernet0/23
switchport access vlan 20
shutdown
!
interface FastEthernet0/24
switchport access vlan 20
shutdown
!
interface GigabitEthernet0/1
shutdown
!
interface GigabitEthernet0/2
shutdown
!
interface Vlan1
no ip address
shutdown
!
interface Vlan99
mac-address 000b.bea6.d701
ip address 172.17.99.13 255.255.255.0
!
!
!
!
line con 0
password cisco
login
!
line vty 0 4
password cisco
login
line vty 5 15
password cisco
login
!
!
!
!
end
```

## **Show vtp status:**

```
S3#show vtp status
VTP Version : 2
Configuration Revision : 0
Maximum VLANs supported locally : 255
Number of existing VLANs : 9
VTP Operating Mode : Transparent
VTP Domain Name : Lab4
VTP Pruning Mode : Disabled
VTP V2 Mode : Disabled
VTP Traps Generation : Disabled
MD5 digest : 0x57 0xF8 0xD2 0x5C 0x01 0x86 0xE7 0x6A
Configuration last modified by 0.0.0.0 at 3-1-93 00:13:12
```

---

## Critical Analysis / Conclusion

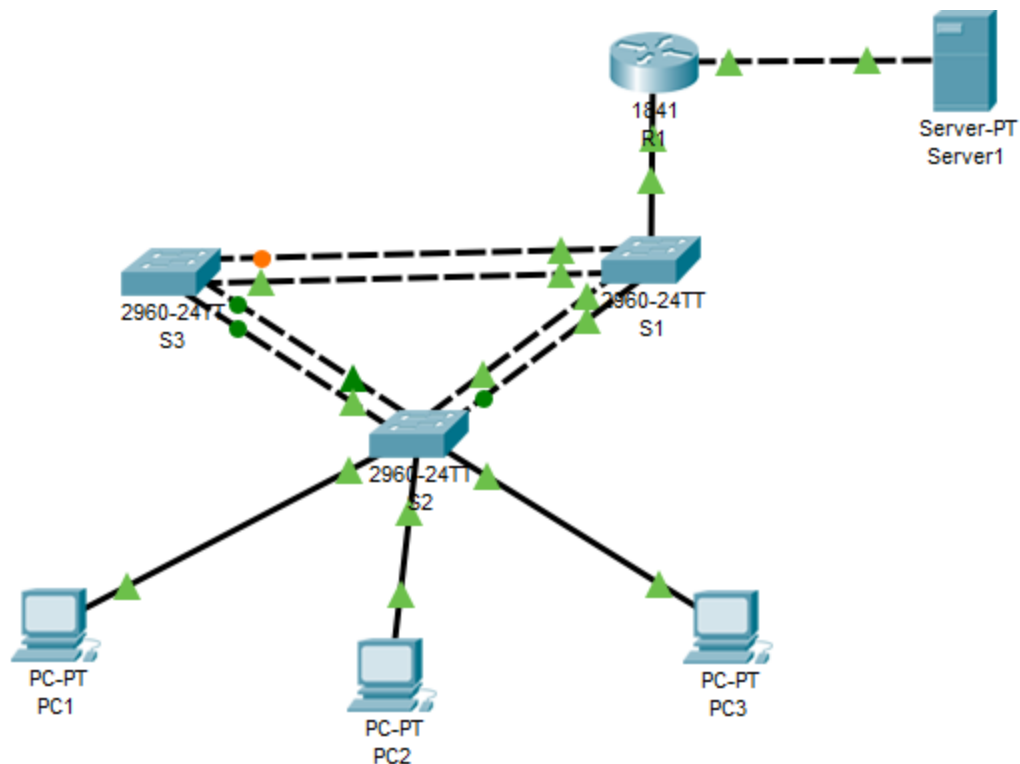
In this lab we learnt about VLAN Trunking Protocol (VTP) configuration. It is a protocol used to share VLAN configuration across the network, the main goal of this configuration is to manage all configured VLANs across the network.

Moreover, we implemented this on a topology given to us and successfully sent Packet between PC's connected to same VLAN's and we were unable to send packets between PC's connected to different VLAN's

Lab Assessment		
Pre Lab	/5	/25
Performance	/5	
Results	/5	
Viva	/5	
Critical Analysis	/5	
Instructor Signature and Comments		

## Lab #10 Inter VLAN Routing

### In-Lab Task



### Packet Switches

PDU List Window									
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	PC1	Server1	ICMP		0.000	N	0	(edit)

PDU List Window									
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	PC1	PC2	ICMP		0.000	N	0	(edit)

PDU List Window									
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	PC1	PC3	ICMP		0.000	N	0	(edit)

## Home Task

### ➤ Switch 1:

#### show running-config:

```
Switch#show running-config
Building configuration...
```

```
Current configuration : 1497 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Switch
!
!
!
no ip domain-lookup
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/2
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/3
switchport trunk native vlan 99
switchport mode trunk
!
```

```
interface FastEthernet0/4
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/5
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
```

```
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
no ip address
shutdown
!
interface Vlan99
mac-address 0004.9aec.4d01
ip address 172.17.99.11 255.255.255.0
!
ip default-gateway 172.17.99.1
!
!
!
!
line con 0
!
line vty 0 4
login
line vty 5 15
login
!
!
!
!
End
```

## ➤ Switch 2:

### show running-config:

```
Switch#show running-config
Building configuration...
```

```
Current configuration : 2029 bytes
!
version 12.2
no service timestamps log datetime msec
```



```
no service timestamps debug datetime msec
no service password-encryption
!
hostname Switch
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/2
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/3
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/4
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/5
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/6
switchport access vlan 30
switchport mode access
!
interface FastEthernet0/7
switchport access vlan 30
!
interface FastEthernet0/8
switchport access vlan 30
!
interface FastEthernet0/9
switchport access vlan 30
!
interface FastEthernet0/10
```

```
switchport access vlan 30
!
interface FastEthernet0/11
switchport access vlan 10
switchport mode access
!
interface FastEthernet0/12
switchport access vlan 10
!
interface FastEthernet0/13
switchport access vlan 10
!
interface FastEthernet0/14
switchport access vlan 10
!
interface FastEthernet0/15
switchport access vlan 10
!
interface FastEthernet0/16
switchport access vlan 10
!
interface FastEthernet0/17
switchport access vlan 10
!
interface FastEthernet0/18
switchport access vlan 20
switchport mode access
!
interface FastEthernet0/19
switchport access vlan 20
!
interface FastEthernet0/20
switchport access vlan 20
!
interface FastEthernet0/21
switchport access vlan 20
!
interface FastEthernet0/22
switchport access vlan 20
!
interface FastEthernet0/23
switchport access vlan 20
!
interface FastEthernet0/24
switchport access vlan 20
!
```

```
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
no ip address
shutdown
!
interface Vlan99
mac-address 0005.5e62.6701
ip address 172.17.99.12 255.255.255.0
!
!
!
!
line con 0
!
line vty 0 4
login
line vty 5 15
login
!
!
!
!
```

### ➤ **Switch 3:**

### **Show running-config:**

```
Switch#show running-config
Building configuration...
```

```
Current configuration : 1444 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
```

```
no service password-encryption
!
hostname Switch
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/2
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/3
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/4
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/5
switchport trunk native vlan 99
switchport mode trunk
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
```

```
!  
interface FastEthernet0/14  
!  
interface FastEthernet0/15  
!  
interface FastEthernet0/16  
!  
interface FastEthernet0/17  
!  
interface FastEthernet0/18  
!  
interface FastEthernet0/19  
!  
interface FastEthernet0/20  
!  
interface FastEthernet0/21  
!  
interface FastEthernet0/22  
!  
interface FastEthernet0/23  
!  
interface FastEthernet0/24  
!  
interface GigabitEthernet0/1  
!  
interface GigabitEthernet0/2  
!  
interface Vlan1  
no ip address  
shutdown  
!  
interface Vlan99  
mac-address 000d.bd9a.6301  
ip address 172.17.99.13 255.255.255.0  
!  
!  
!  
!  
line con 0  
!  
line vty 0 4  
login  
line vty 5 15  
login  
!  
!
```

```
!  
!  
end
```

## ➤ Router 1:

### Show ip route:

Router#show 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  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
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, ia - IS-IS inter area  
\* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route

Gateway of last resort is not set

172.17.0.0/24 is subnetted, 6 subnets  
C 172.17.1.0 is directly connected, FastEthernet0/1.1  
C 172.17.10.0 is directly connected, FastEthernet0/1.10  
C 172.17.20.0 is directly connected, FastEthernet0/1.20  
C 172.17.30.0 is directly connected, FastEthernet0/1.30  
C 172.17.50.0 is directly connected, FastEthernet0/0  
C 172.17.99.0 is directly connected, FastEthernet0/1.99

### Show running-config:

Router#show running-config  
Building configuration...

Current configuration : 1055 bytes

```
!  
version 12.4  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption
```

```
!  
hostname Router  
!  
!  
!  
!  
!  
!  
!  
!  
ip cef  
no ipv6 cef  
!  
!  
!  
!  
!  
!  
!  
!  
!  
!  
spanning-tree mode pvst  
!  
!  
!  
!  
!  
interface FastEthernet0/0  
description server interface  
ip address 172.17.50.1 255.255.255.0  
duplex auto  
speed auto  
!  
interface FastEthernet0/1  
no ip address  
duplex auto  
speed auto  
!  
interface FastEthernet0/1.1  
encapsulation dot1Q 1  
ip address 172.17.1.1 255.255.255.0  
!
```

```
interface FastEthernet0/1.10
encapsulation dot1Q 10
ip address 172.17.10.1 255.255.255.0
!
interface FastEthernet0/1.20
encapsulation dot1Q 20
ip address 172.17.20.1 255.255.255.0
!
interface FastEthernet0/1.30
encapsulation dot1Q 30
ip address 172.17.30.1 255.255.255.0
!
interface FastEthernet0/1.99
encapsulation dot1Q 99 native
ip address 172.17.99.1 255.255.255.0
!
interface Vlan1
no ip address
shutdown
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

---



## Critical Analysis / Conclusion

In this lab we learnt about Inter-VLAN Routing. It is a way to forward traffic between different VLAN by implementing a router in the network.

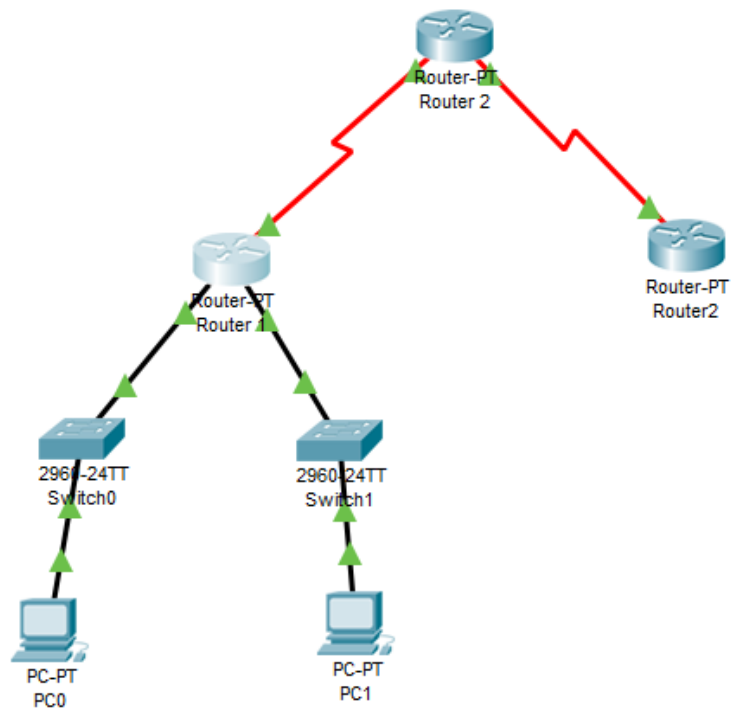
Moreover, we implemented this on a topology given to us and successfully sent Packet between and we were unable to send packets between PC's connect and the server as well.

Lab Assessment		
Pre Lab	/5	/25
Performance	/5	
Results	/5	
Viva	/5	
Critical Analysis	/5	
Instructor Signature and Comments		

## Lab #11 DHCP Configuration

### In-Lab Task

#### Topology:



## **HOME TASK**

### **Show ip dhcp pool:**

R2#show ip dhcp pool

Pool R1Fa0 :

Utilization mark (high/low) : 100 / 0

Subnet size (first/next) : 0 / 0

Total addresses : 254

Leased addresses : 1

Excluded addresses : 2

Pending event : none

1 subnet is currently in the pool

Current index IP address range Leased/Excluded/Total  
192.168.10.1 192.168.10.1 - 192.168.10.254 1 / 2 / 254

Pool R1Fa1 :

Utilization mark (high/low) : 100 / 0

Subnet size (first/next) : 0 / 0

Total addresses : 254

Leased addresses : 1

Excluded addresses : 2

Pending event : none

1 subnet is currently in the pool

Current index IP address range Leased/Excluded/Total  
192.168.11.1 192.168.11.1 - 192.168.11.254 1 / 2 / 254

### **Show IP route:**

R1#show 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

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

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, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is 209.165.200.226

10.0.0.0/30 is subnetted, 1 subnets

C 10.1.1.0 is directly connected, Serial0/0/0  
O 192.168.10.0/24 [110/65] via 10.1.1.1, 00:16:26, Serial0/0/0  
O 192.168.11.0/24 [110/65] via 10.1.1.1, 00:16:26, Serial0/0/0  
C 192.168.20.0/24 is directly connected, FastEthernet0/0  
209.165.200.0/30 is subnetted, 1 subnets  
C 209.165.200.224 is directly connected, Serial0/0/1  
S\* 0.0.0.0/0 [1/0] via 209.165.200.226

### **ISP Router:**

#### **Show ip route**

Router#show 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  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
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, ia - IS-IS inter area  
\* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route

Gateway of last resort is not set

209.165.200.0/30 is subnetted, 1 subnets  
C 209.165.200.224 is directly connected, Serial0/0/1

## Critical Analysis / Conclusion

In this lab we learnt about DHCP (Dynamic Host Configuration Protocol) it is a network management protocol used to dynamically assign an IP address to any device so they can communicate.

Moreover, we implemented this on a topology given to us and successfully assigned IP's using release and renew subcommands of ipconfig.

Lab Assessment		
Pre Lab	/5	/25
Performance	/5	
Results	/5	
Viva	/5	
Critical Analysis	/5	
Instructor Signature and Comments		