FACULTY OF ENGINEERING AND TECHNOLOGY

ENCS4130, COMPUTER NETWORK LABORATORY

Experiment 4 problem

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- **Student ID: 1190113**
- **Section: 6**

Part1:

1- Dijkstra's Algorithm:

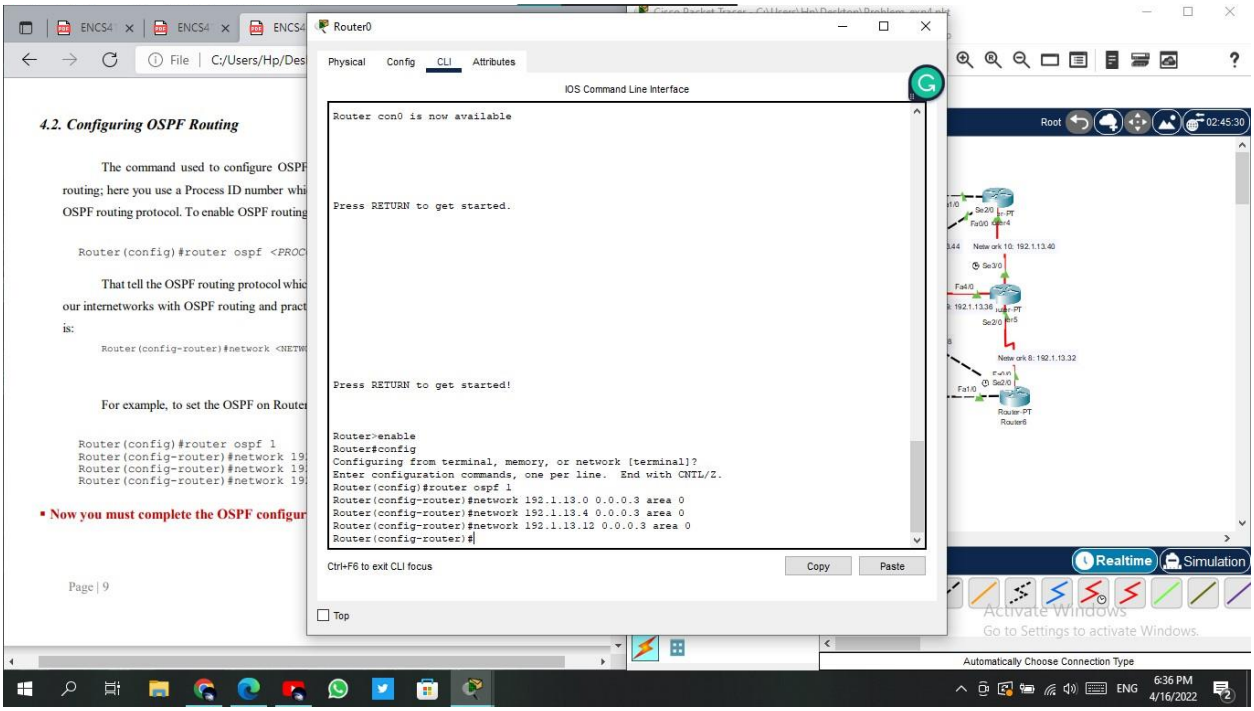
Step	N'	R1(P1)	R2(P2)	R3(P3)	R4(P4)	R5(P5)	R6 (P6)
0	R0	2,R0	∞	8,R0	4,R0	∞	∞
1	R0,R1		4,R1	8,R0	4,R0	∞	∞
2	R0,R1,R2			6,R2	4,R0	∞	104,R2
3	R0,R1,R2,R3				80,R3	24,R3	6,R3

- According to dijkstra's table, the shortest path from R0 to R6 with the least cost will be: R0, R1, R2, R3, R6 with the cost equals 8

2- The cost between R0 and R6 = the cost from R0 to R1 + the cost from R1 to R2 + the cost from R2 to R3 + the cost from R3 to R6 which equals 2+2+2+2 = 8

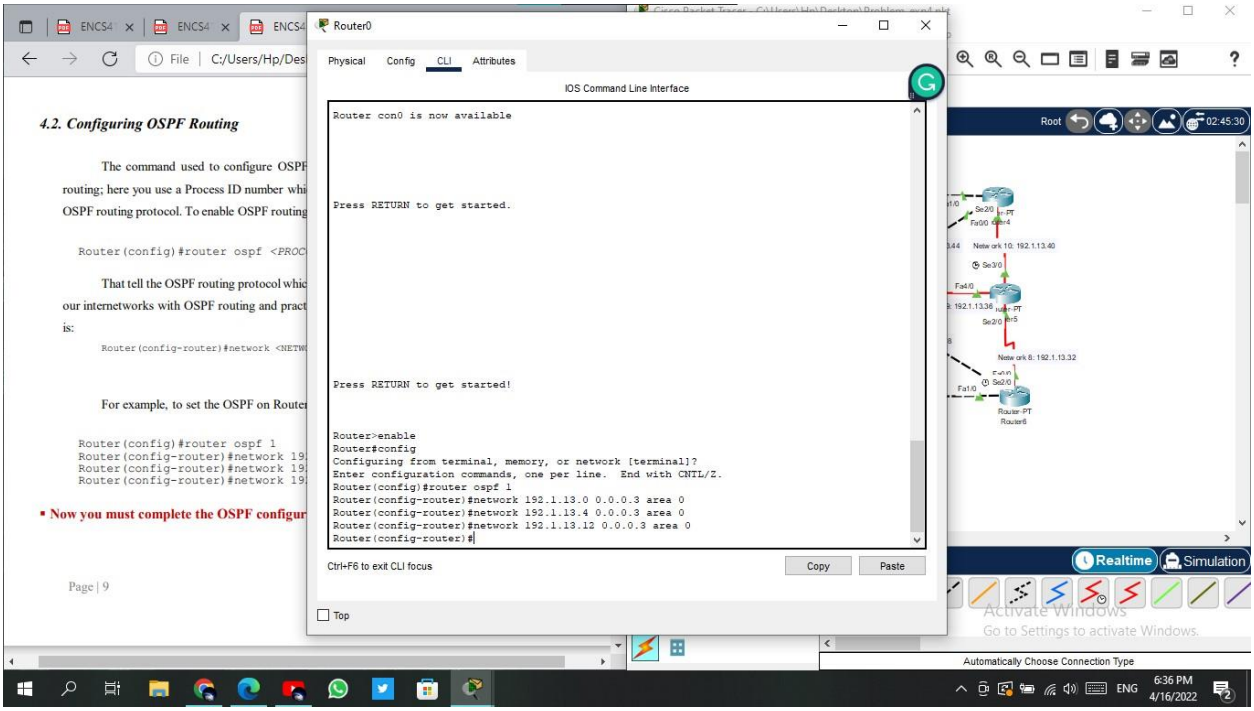
Part 2

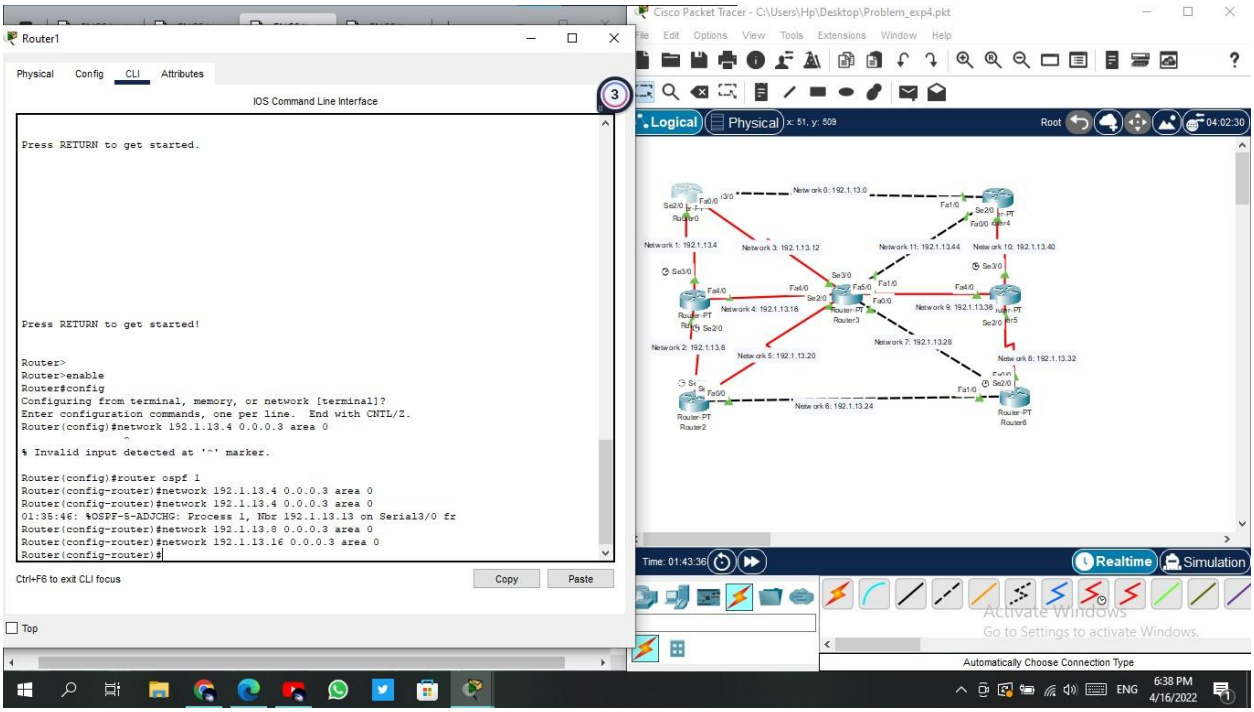
The Topology:

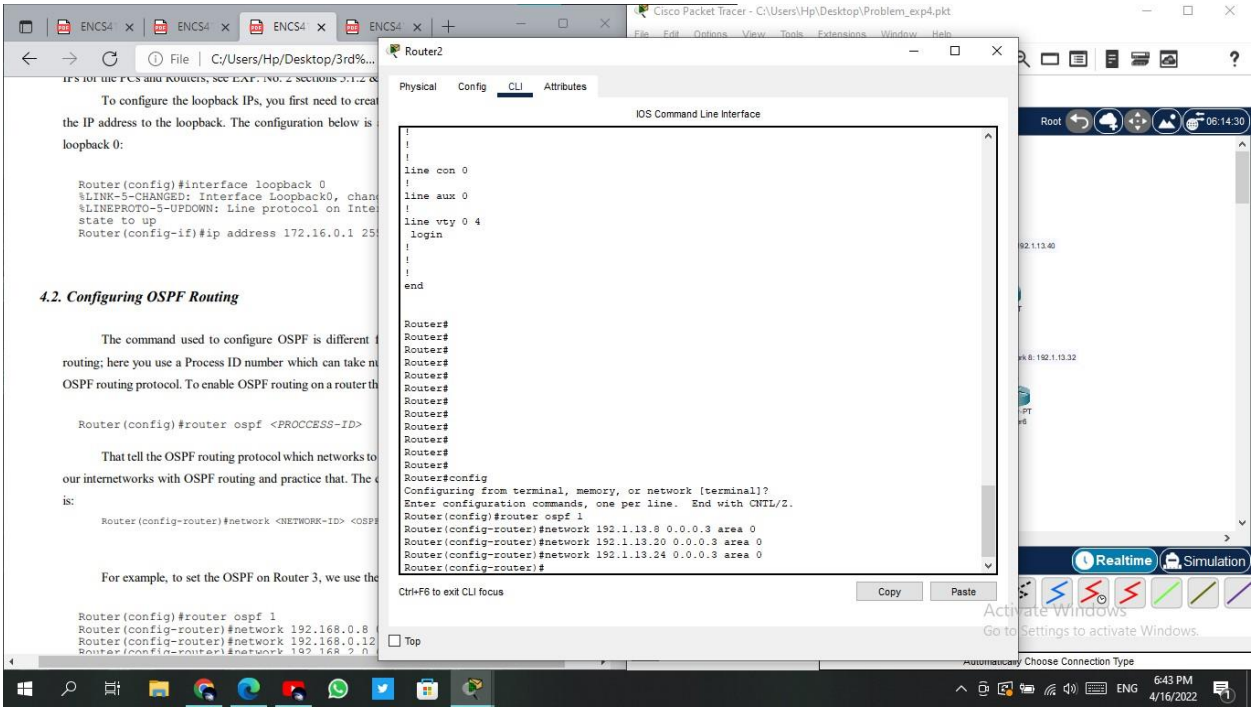


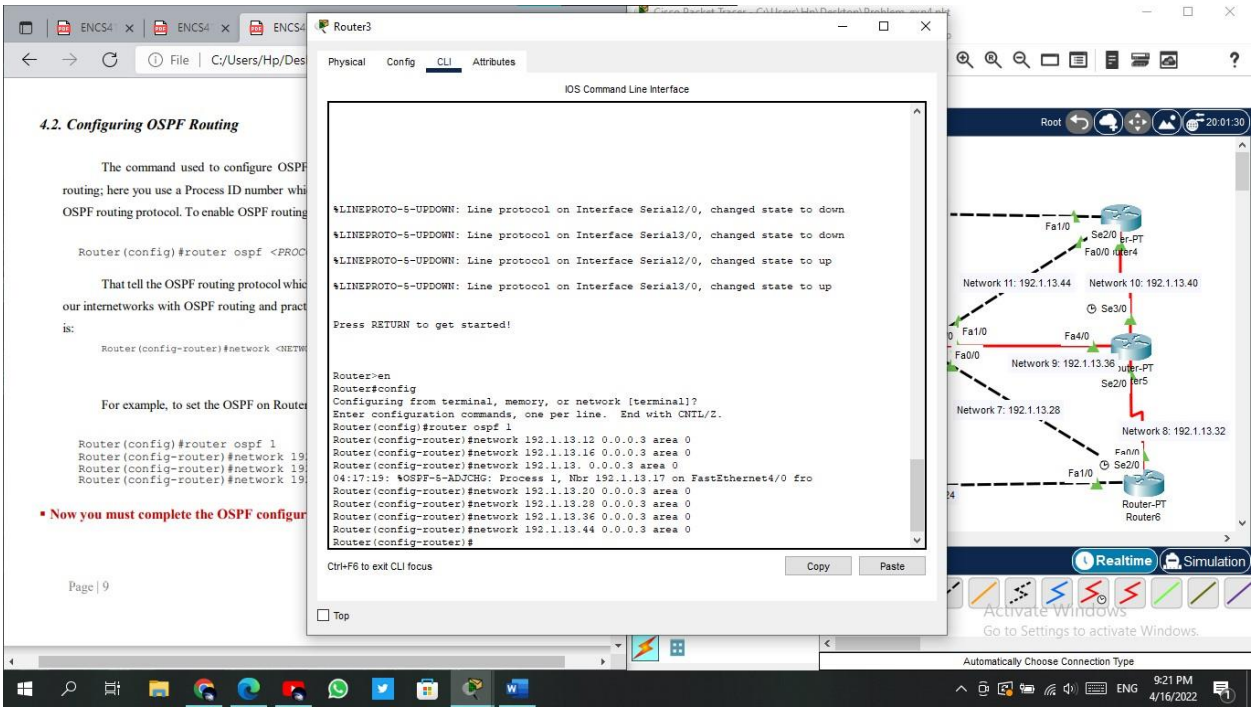
Enabling OSPF for each router with suitable network

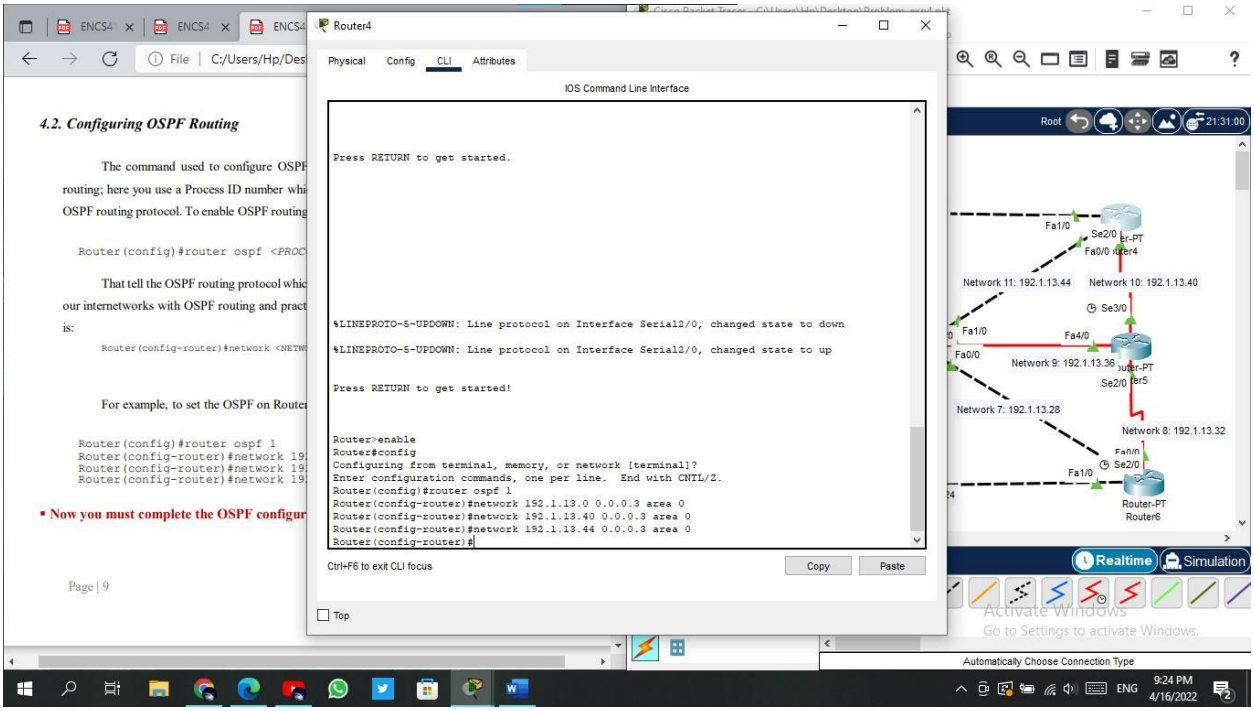
NOTE: I used the Config screen to fill the IPs for the interfaces which is faster to fill, but you can fill them by using CLI commands by entering the interface in the configured router to have the access for adding the required IPs.

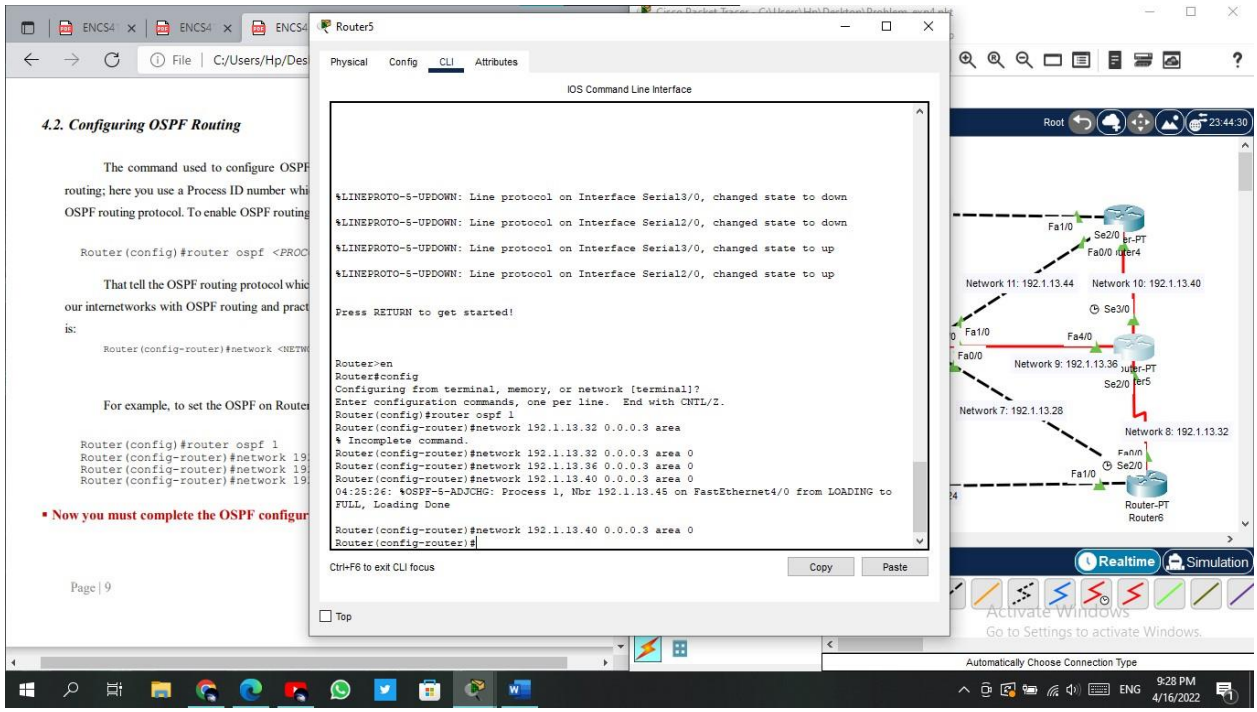

Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router con0 is now available
Press RETURN to get started.
Press RETURN to get started!
Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 192.1.13.0 0.0.0.3 area 0
Router(config-router)#network 192.1.13.4 0.0.0.3 area 0
Router(config-router)#network 192.1.13.12 0.0.0.3 area 0
Router(config-router)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
4.2. Configuring OSPF Routing
The command used to configure OSPF
routing; here you use a Process ID number whi
OSPF routing protocol. To enable OSPF routing
Router(config)#router ospf <PROC
That tell the OSPF routing protocol whic
our internetworks with OSPF routing and pract
is:
Router(config-router)#network <NETW
For example, to set the OSPF on Router
Router(config)#router ospf 1
Router(config-router)#network 19
Router(config-router)#network 19
Router(config-router)#network 19
Now you must complete the OSPF configur
Page | 9
Root
02:45:30
Realtime
Simulation
Activate Windows
Go to Settings to activate Windows.
Automatically Choose Connection Type
ENG
6:36 PM
4/16/2022

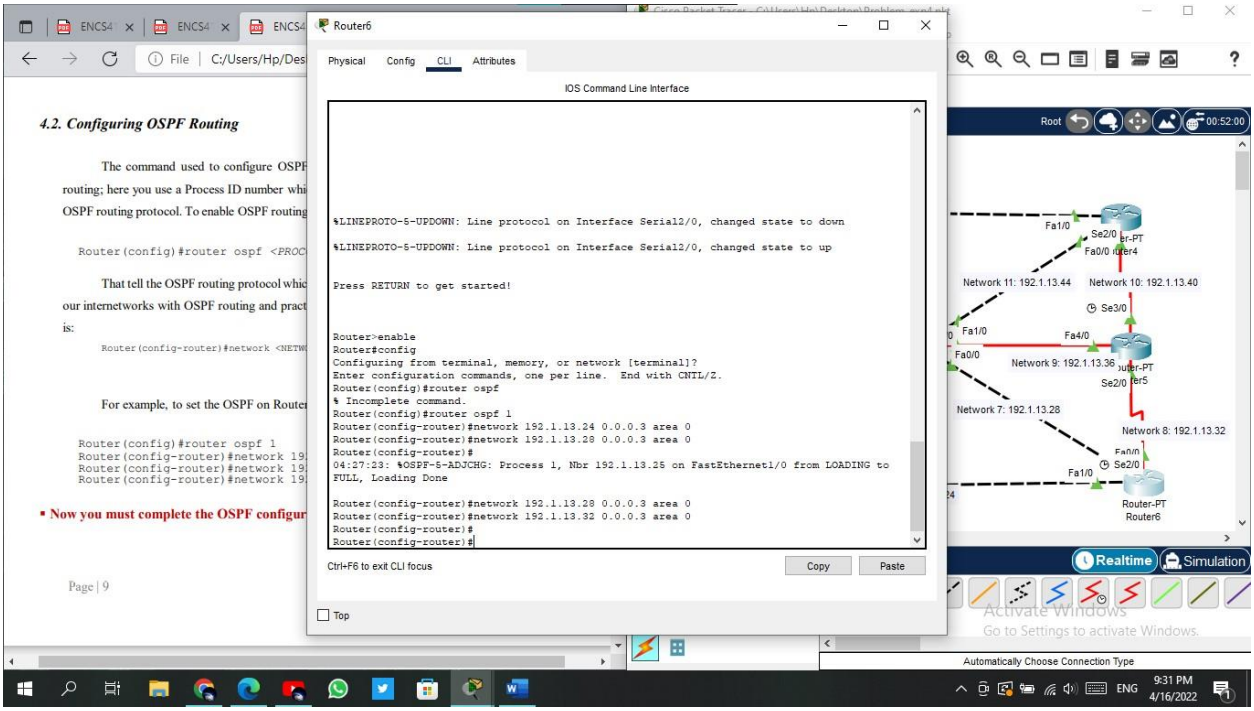

Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
3
Press RETURN to get started.
Press RETURN to get started!
Router>
Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#network 192.1.13.4 0.0.0.3 area 0
% Invalid input detected at '^' marker.
Router(config)#router ospf 1
Router(config-router)#network 192.1.13.4 0.0.0.3 area 0
Router(config-router)#network 192.1.13.4 0.0.0.3 area 0
01:35:46: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.13 on Serial3/0 fr
Router(config-router)#network 192.1.13.8 0.0.0.3 area 0
Router(config-router)#network 192.1.13.16 0.0.0.3 area 0
Router(config-router)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
Cisco Packet Tracer - C:\Users\Hp\Desktop\Problem_exp4.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
Root
04:02:30
Time: 01:43:36
Realtime
Simulation
Activate Windows
Go to Settings to activate Windows.
Automatically Choose Connection Type
ENG
6:38 PM
4/16/2022

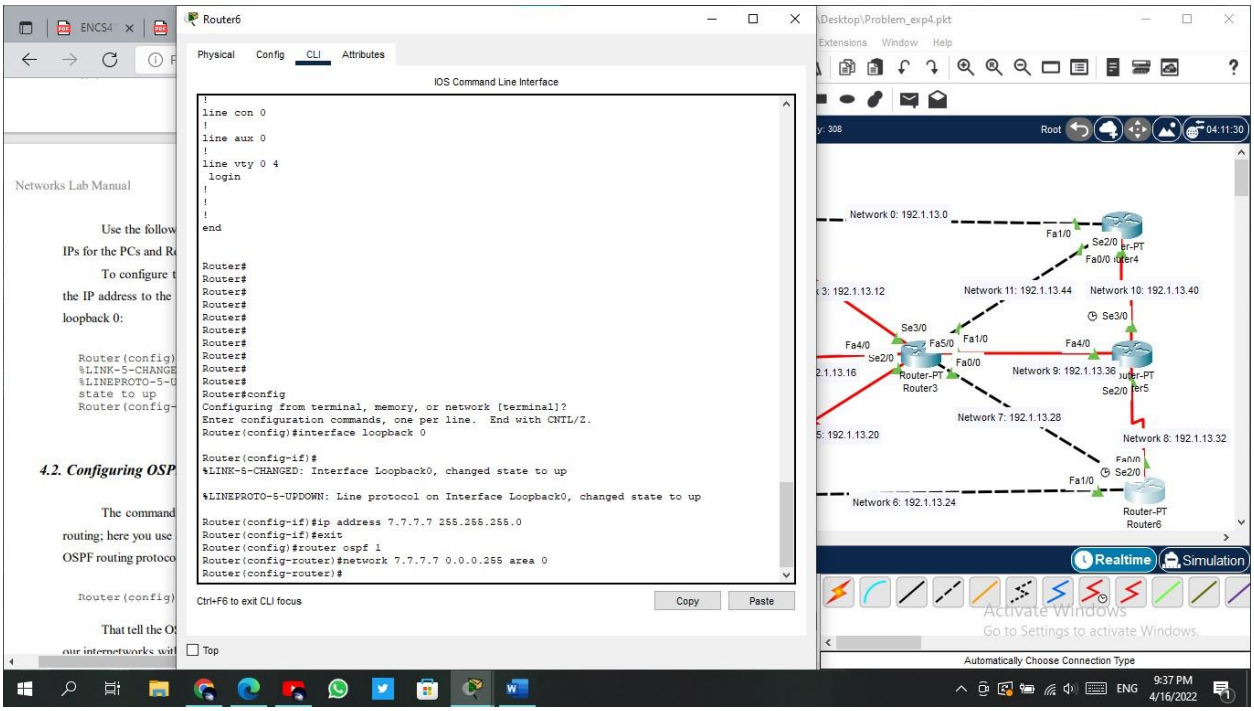

Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 192.1.13.8 0.0.0.3 area 0
Router(config-router)#network 192.1.13.20 0.0.0.3 area 0
Router(config-router)#network 192.1.13.24 0.0.0.3 area 0
Router(config-router)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
4.2. Configuring OSPF Routing
Router(config)#interface loopback 0
Router(config)#router ospf <PROCCESS-ID>
Router(config)#router ospf 1
Router(config-router)#network 192.168.0.8
Router(config-router)#network 192.168.0.12
Realtime
Simulation
Activate Windows
Go to Settings to activate Windows.
Automatically Choose Connection Type
6:43 PM
4/16/2022


Router3
Physical
Config
CLI
Attributes
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
Press RETURN to get started!
Router>en
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 192.1.13.12 0.0.0.3 area 0
Router(config-router)#network 192.1.13.16 0.0.0.3 area 0
Router(config-router)#network 192.1.13. 0.0.0.3 area 0
04:17:19: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.17 on FastEthernet4/0 fro
Router(config-router)#network 192.1.13.20 0.0.0.3 area 0
Router(config-router)#network 192.1.13.28 0.0.0.3 area 0
Router(config-router)#network 192.1.13.36 0.0.0.3 area 0
Router(config-router)#network 192.1.13.44 0.0.0.3 area 0
Router(config-router)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
4.2. Configuring OSPF Routing
Router(config)#router ospf <PROC
Router(config)#router ospf 1
Router(config-router)#network 19
Router(config-router)#network 19
Router(config-router)#network 19
▪ Now you must complete the OSPF configur
Page | 9
Network 11: 192.1.13.44
Network 10: 192.1.13.40
Network 9: 192.1.13.36
Network 7: 192.1.13.28
Network 8: 192.1.13.32
Router-PT
Router6
Realtime
Simulation
Activate Windows
Go to Settings to activate Windows.
Automatically Choose Connection Type
9:21 PM
4/16/2022


Router4
Physical
Config
CLI
Attributes
IOS Command Line Interface
Press RETURN to get started.
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Press RETURN to get started!
Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 192.1.13.0 0.0.0.3 area 0
Router(config-router)#network 192.1.13.40 0.0.0.3 area 0
Router(config-router)#network 192.1.13.44 0.0.0.3 area 0
Router(config-router)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
4.2. Configuring OSPF Routing
Router(config)#router ospf
Router(config-router)#network
Router(config)#router ospf 1
Router(config-router)#network 19
Router(config-router)#network 19
Router(config-router)#network 19
Now you must complete the OSPF configur
Page | 9
Network 11: 192.1.13.44
Network 10: 192.1.13.40
Network 9: 192.1.13.36
Network 7: 192.1.13.28
Network 8: 192.1.13.32
Router-PT
Router6
Realtime
Simulation
Automatically Choose Connection Type
9:24 PM
4/16/2022


Router5
Physical
Config
CLI
Attributes
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Press RETURN to get started!
Router>en
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 192.1.13.32 0.0.0.3 area
% Incomplete command.
Router(config-router)#network 192.1.13.32 0.0.0.3 area 0
Router(config-router)#network 192.1.13.36 0.0.0.3 area 0
Router(config-router)#network 192.1.13.40 0.0.0.3 area 0
04:25:26: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.45 on FastEthernet4/0 from LOADING to FULL, Loading Done
Router(config-router)#network 192.1.13.40 0.0.0.3 area 0
Router(config-router)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
4.2. Configuring OSPF Routing
Router(config)#router ospf
Router(config-router)#network
Router(config)#router ospf 1
Router(config-router)#network 19
Router(config-router)#network 19
Router(config-router)#network 19
Now you must complete the OSPF configur
Page | 9
Network 11: 192.1.13.44
Network 10: 192.1.13.40
Network 9: 192.1.13.36
Network 7: 192.1.13.28
Network 8: 192.1.13.32
Router-PT
Router6
Realtime
Simulation
Automatically Choose Connection Type
9:28 PM
4/16/2022

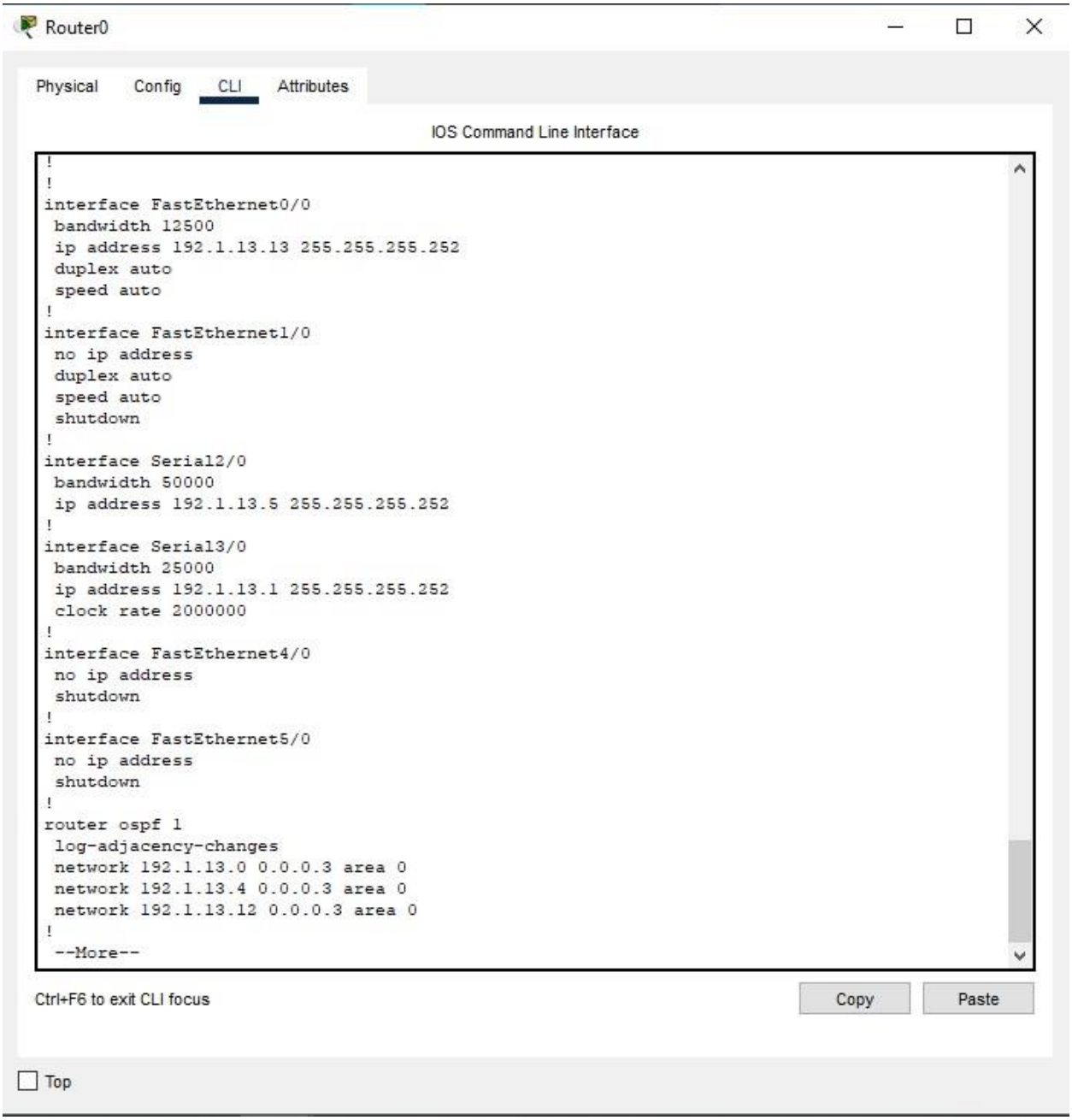


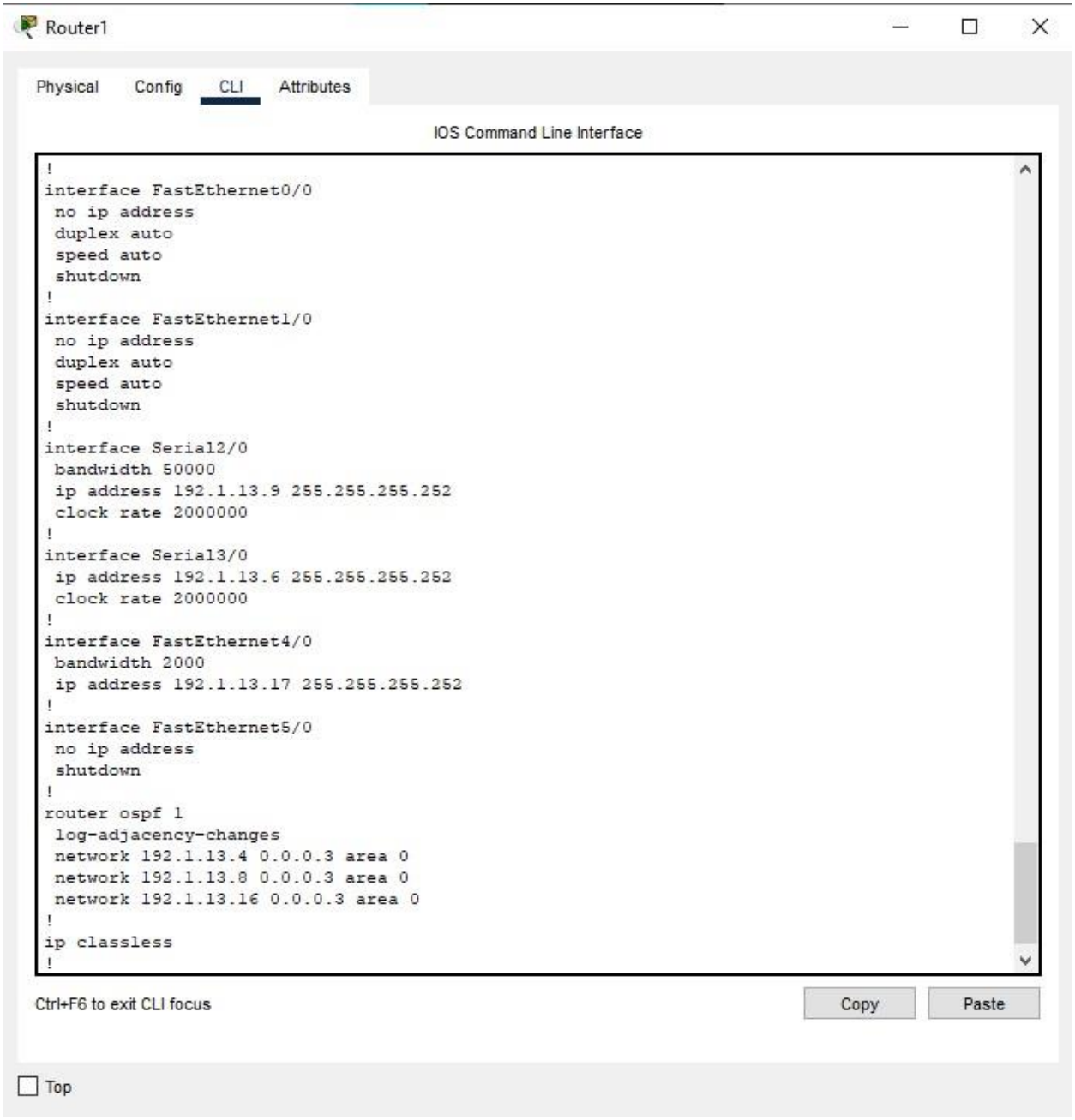


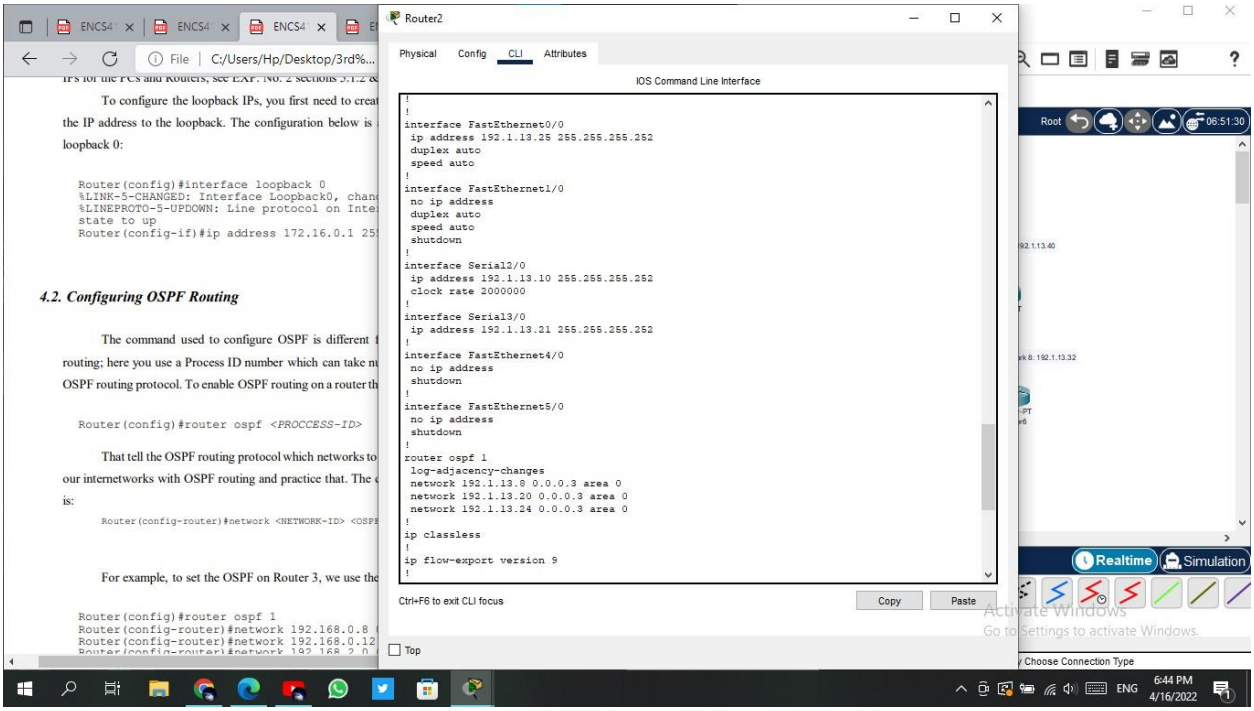
Router6 loopBack

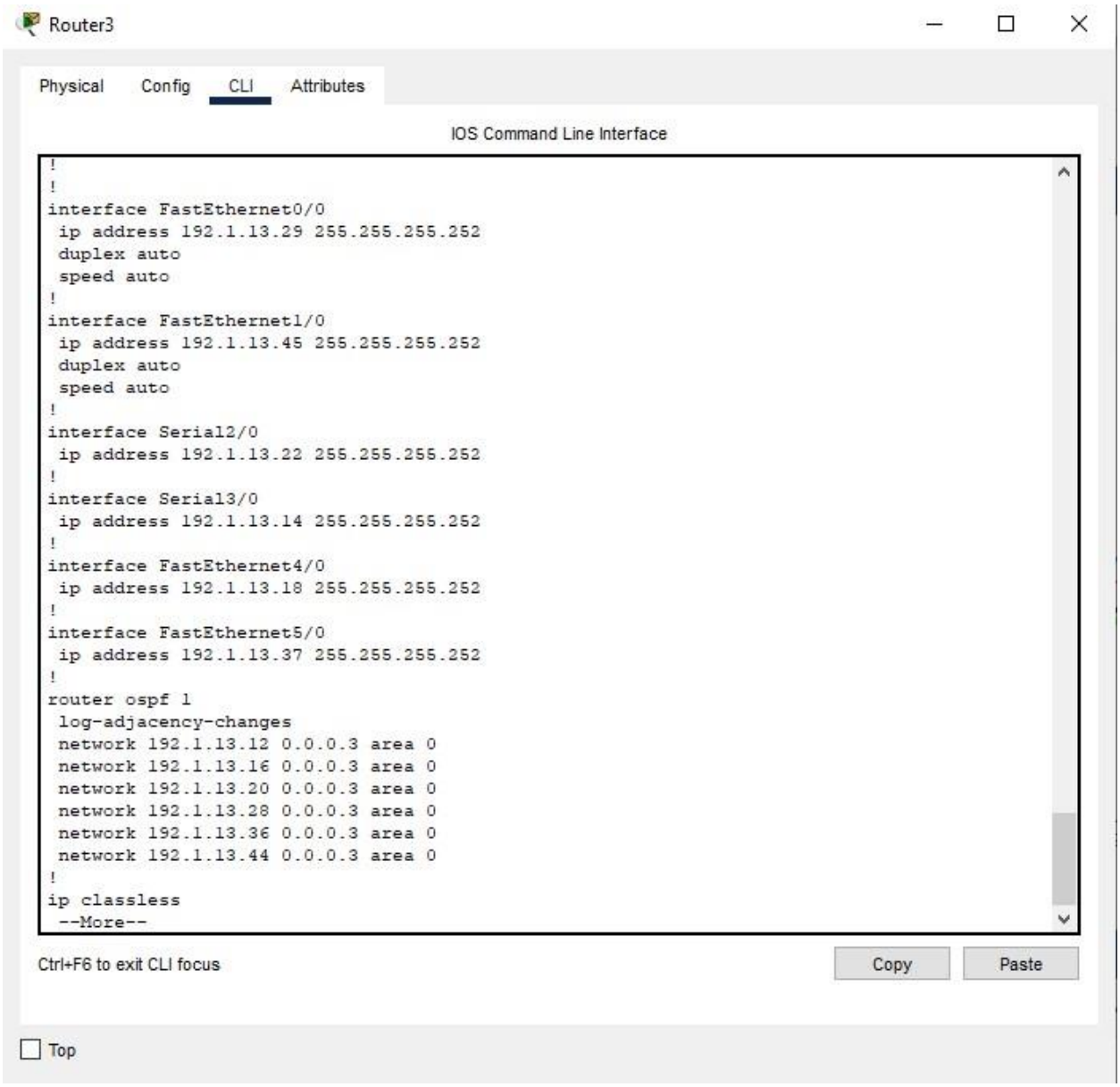
Routers Interfaces:

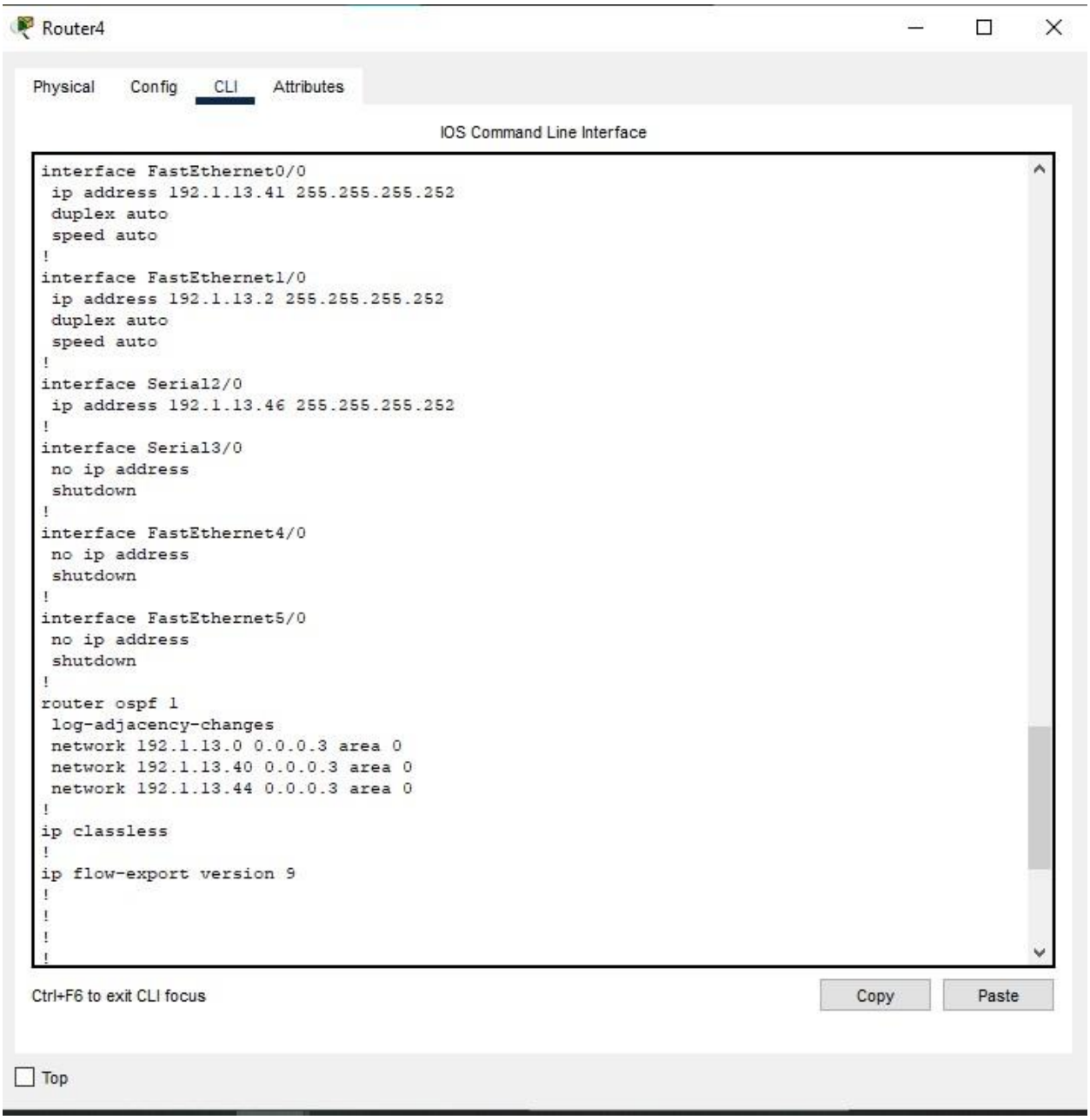
- we got all interfaces IPs data by typing the command #sh run in the CLI which shows all connections for the router.

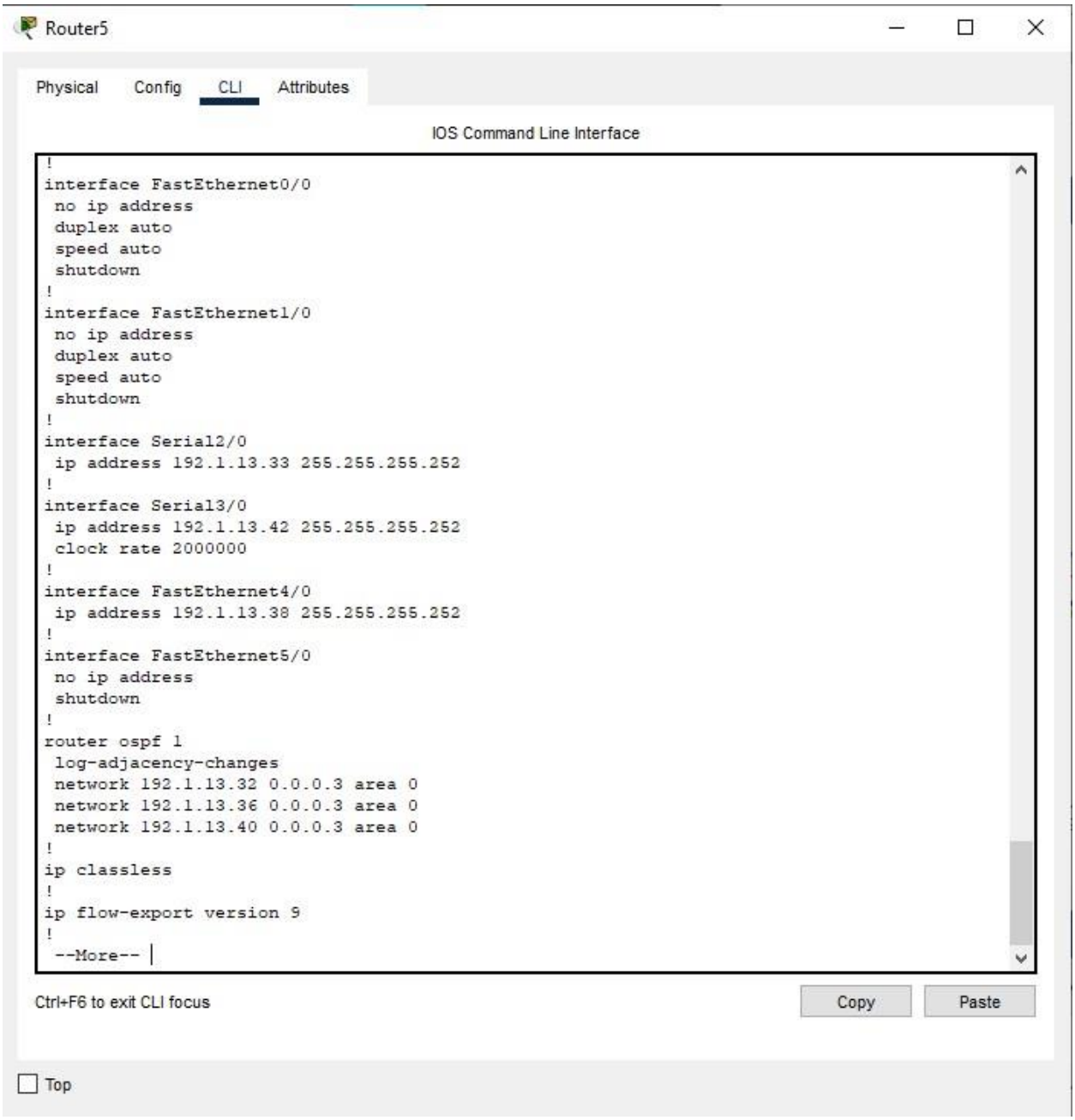


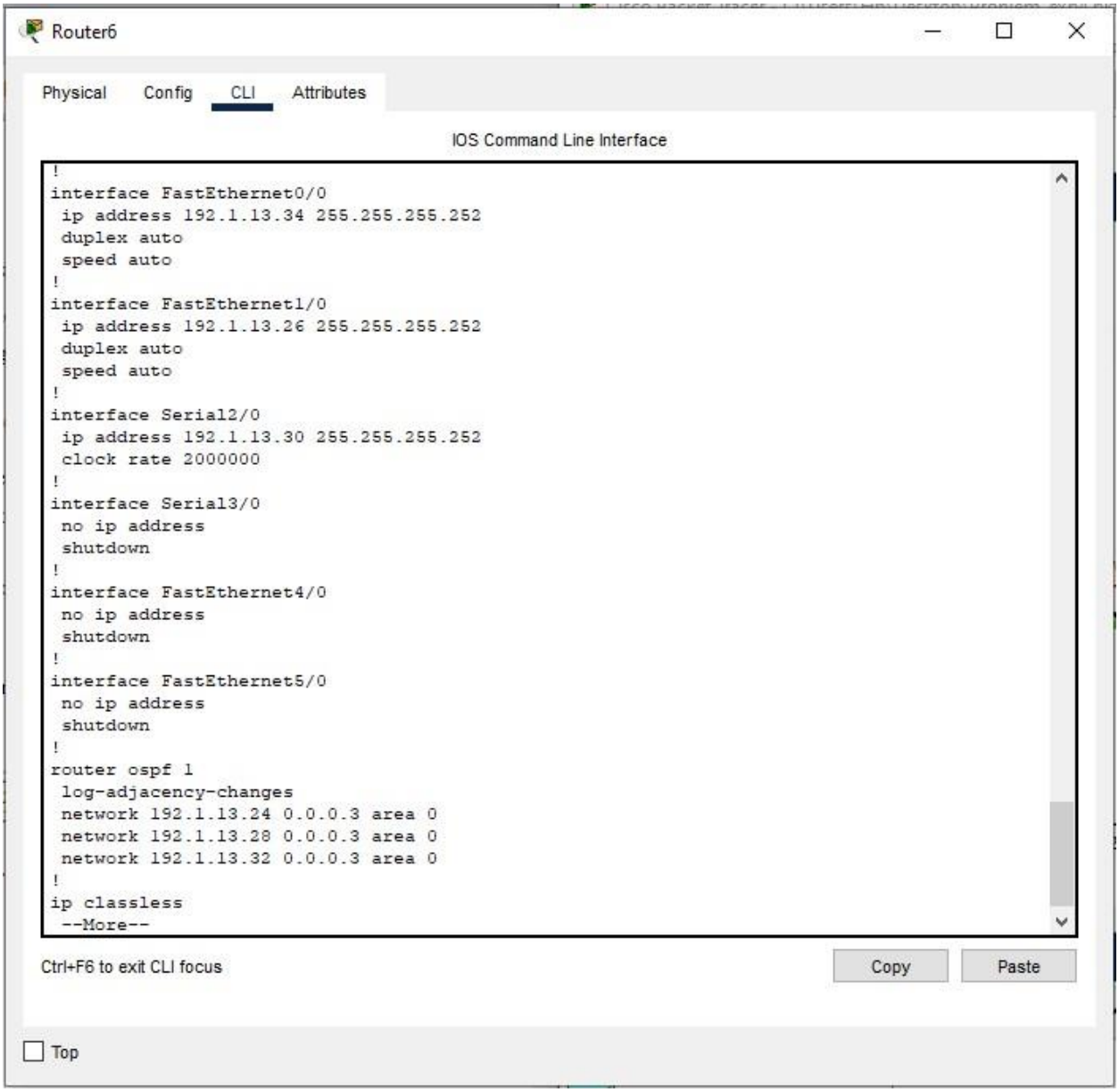

Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
!
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface FastEthernet1/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial2/0
 bandwidth 50000
 ip address 192.1.13.9 255.255.255.252
 clock rate 2000000
!
interface Serial3/0
 ip address 192.1.13.6 255.255.255.252
 clock rate 2000000
!
interface FastEthernet4/0
 bandwidth 2000
 ip address 192.1.13.17 255.255.255.252
!
interface FastEthernet5/0
 no ip address
 shutdown
!
router ospf 1
 log-adjacency-changes
 network 192.1.13.4 0.0.0.3 area 0
 network 192.1.13.8 0.0.0.3 area 0
 network 192.1.13.16 0.0.0.3 area 0
!
ip classless
!
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


ENCS4
ENCS4
ENCS4
File | C:/Users/Hp/Desktop/3rd%...
To configure the loopback IPs, you first need to creat
the IP address to the loopback. The configuration below is
loopback 0:
Router(config)#interface loopback 0
%LINK-5-CHANGED: Interface Loopback0, chan
%LINEPROTO-5-UPDOWN: Line protocol on Inte
state to up
Router(config-if)#ip address 172.16.0.1 25
4.2. Configuring OSPF Routing
The command used to configure OSPF is different
routing; here you use a Process ID number which can take n
OSPF routing protocol. To enable OSPF routing on a router th
Router(config)#router ospf <PROCCESS-ID>
That tell the OSPF routing protocol which networks to
our internetworks with OSPF routing and practice that. The
is:
Router(config-router)#network <NETWORK-ID> <OSPF
For example, to set the OSPF on Router 3, we use the
Router(config)#router ospf 1
Router(config-router)#network 192.168.0.8
Router(config-router)#network 192.168.0.12
Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
!
!
interface FastEthernet0/0
ip address 192.1.13.25 255.255.255.252
duplex auto
speed auto
!
interface FastEthernet1/0
no ip address
duplex auto
speed auto
shutdown
!
interface Serial2/0
ip address 192.1.13.10 255.255.255.252
clock rate 2000000
!
interface Serial3/0
ip address 192.1.13.21 255.255.255.252
!
interface FastEthernet4/0
no ip address
shutdown
!
interface FastEthernet5/0
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
network 192.1.13.8 0.0.0.3 area 0
network 192.1.13.20 0.0.0.3 area 0
network 192.1.13.24 0.0.0.3 area 0
!
ip classless
!
ip flow-export version 9
!
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
Root
06:51:30
Realtime
Simulation
Choose Connection Type
Activate Windows
Go to Settings to activate Windows.
ENG
6:44 PM
4/16/2022


Router3
Physical
Config
CLI
Attributes
IOS Command Line Interface
!
!
interface FastEthernet0/0
 ip address 192.1.13.29 255.255.255.252
 duplex auto
 speed auto
!
interface FastEthernet1/0
 ip address 192.1.13.45 255.255.255.252
 duplex auto
 speed auto
!
interface Serial2/0
 ip address 192.1.13.22 255.255.255.252
!
interface Serial3/0
 ip address 192.1.13.14 255.255.255.252
!
interface FastEthernet4/0
 ip address 192.1.13.18 255.255.255.252
!
interface FastEthernet5/0
 ip address 192.1.13.37 255.255.255.252
!
router ospf 1
 log-adjacency-changes
 network 192.1.13.12 0.0.0.3 area 0
 network 192.1.13.16 0.0.0.3 area 0
 network 192.1.13.20 0.0.0.3 area 0
 network 192.1.13.28 0.0.0.3 area 0
 network 192.1.13.36 0.0.0.3 area 0
 network 192.1.13.44 0.0.0.3 area 0
!
ip classless
 --More--
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


Router4
Physical
Config
CLI
Attributes
IOS Command Line Interface
interface FastEthernet0/0
 ip address 192.1.13.41 255.255.255.252
 duplex auto
 speed auto
!
interface FastEthernet1/0
 ip address 192.1.13.2 255.255.255.252
 duplex auto
 speed auto
!
interface Serial2/0
 ip address 192.1.13.46 255.255.255.252
!
interface Serial3/0
 no ip address
 shutdown
!
interface FastEthernet4/0
 no ip address
 shutdown
!
interface FastEthernet5/0
 no ip address
 shutdown
!
router ospf 1
 log-adjacency-changes
 network 192.1.13.0 0.0.0.3 area 0
 network 192.1.13.40 0.0.0.3 area 0
 network 192.1.13.44 0.0.0.3 area 0
!
ip classless
!
ip flow-export version 9
!
!
!
!
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

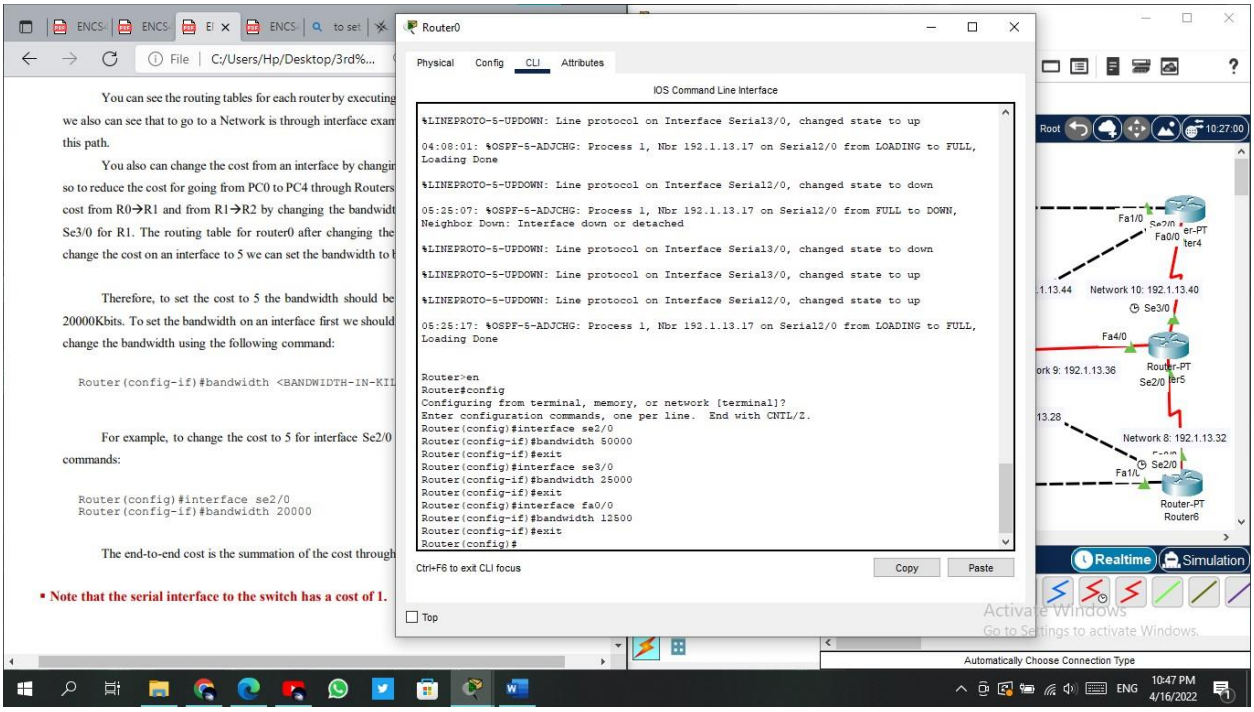

Router5
Physical
Config
CLI
Attributes
IOS Command Line Interface
!
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface FastEthernet1/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial2/0
 ip address 192.1.13.33 255.255.255.252
!
interface Serial3/0
 ip address 192.1.13.42 255.255.255.252
 clock rate 2000000
!
interface FastEthernet4/0
 ip address 192.1.13.38 255.255.255.252
!
interface FastEthernet5/0
 no ip address
 shutdown
!
router ospf 1
 log-adjacency-changes
 network 192.1.13.32 0.0.0.3 area 0
 network 192.1.13.36 0.0.0.3 area 0
 network 192.1.13.40 0.0.0.3 area 0
!
ip classless
!
ip flow-export version 9
!
 --More--
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

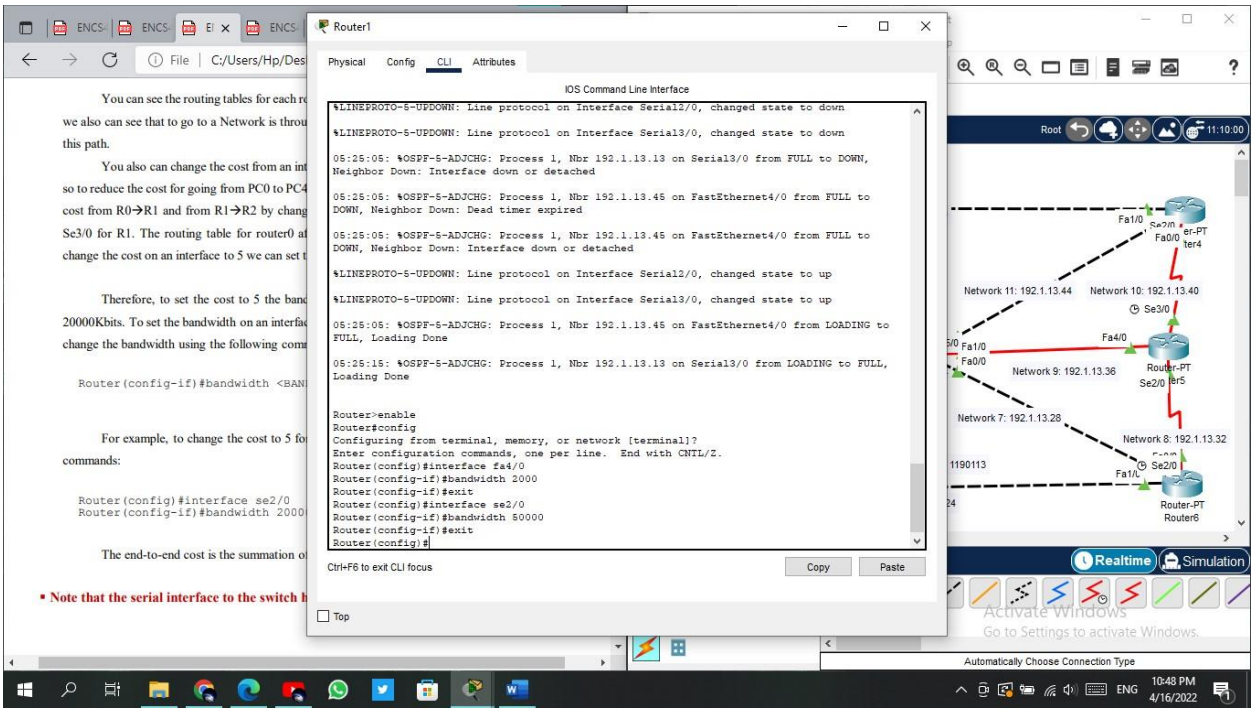

Router6
Physical
Config
CLI
Attributes
IOS Command Line Interface
!
interface FastEthernet0/0
 ip address 192.1.13.34 255.255.255.252
 duplex auto
 speed auto
!
interface FastEthernet1/0
 ip address 192.1.13.26 255.255.255.252
 duplex auto
 speed auto
!
interface Serial2/0
 ip address 192.1.13.30 255.255.255.252
 clock rate 2000000
!
interface Serial3/0
 no ip address
 shutdown
!
interface FastEthernet4/0
 no ip address
 shutdown
!
interface FastEthernet5/0
 no ip address
 shutdown
!
router ospf 1
 log-adjacency-changes
 network 192.1.13.24 0.0.0.3 area 0
 network 192.1.13.28 0.0.0.3 area 0
 network 192.1.13.32 0.0.0.3 area 0
!
ip classless
 --More--
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

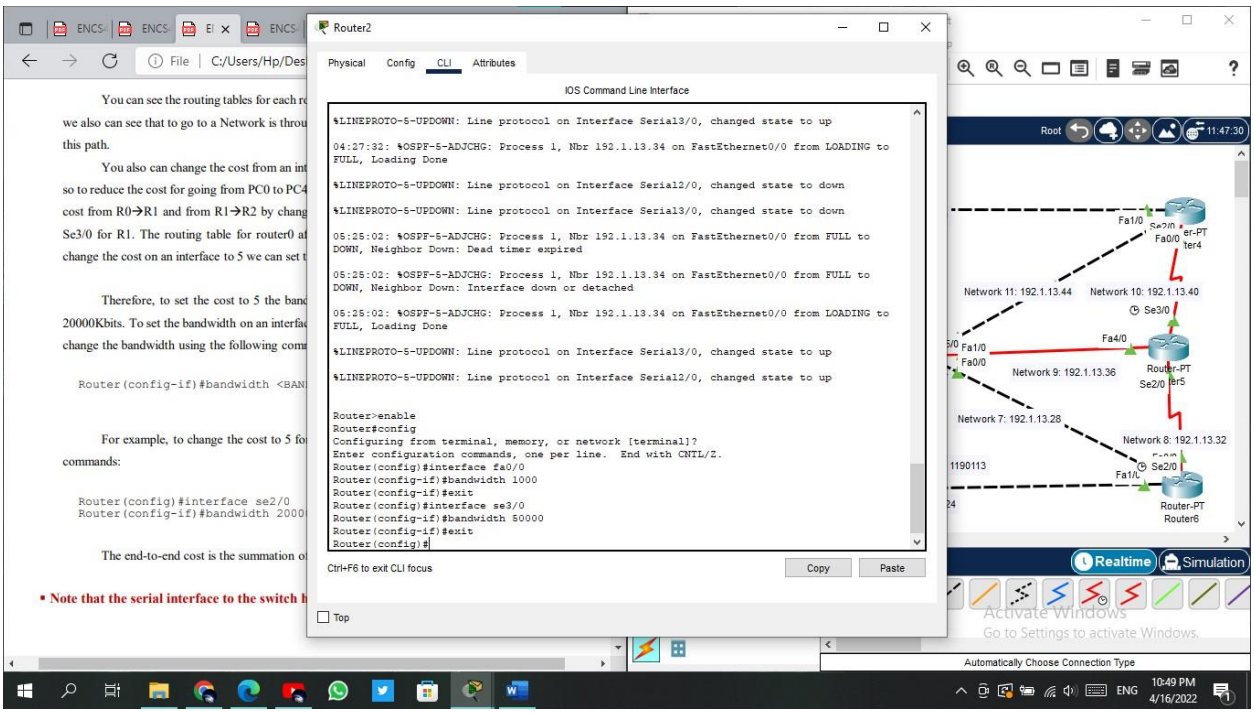
Setting Costs

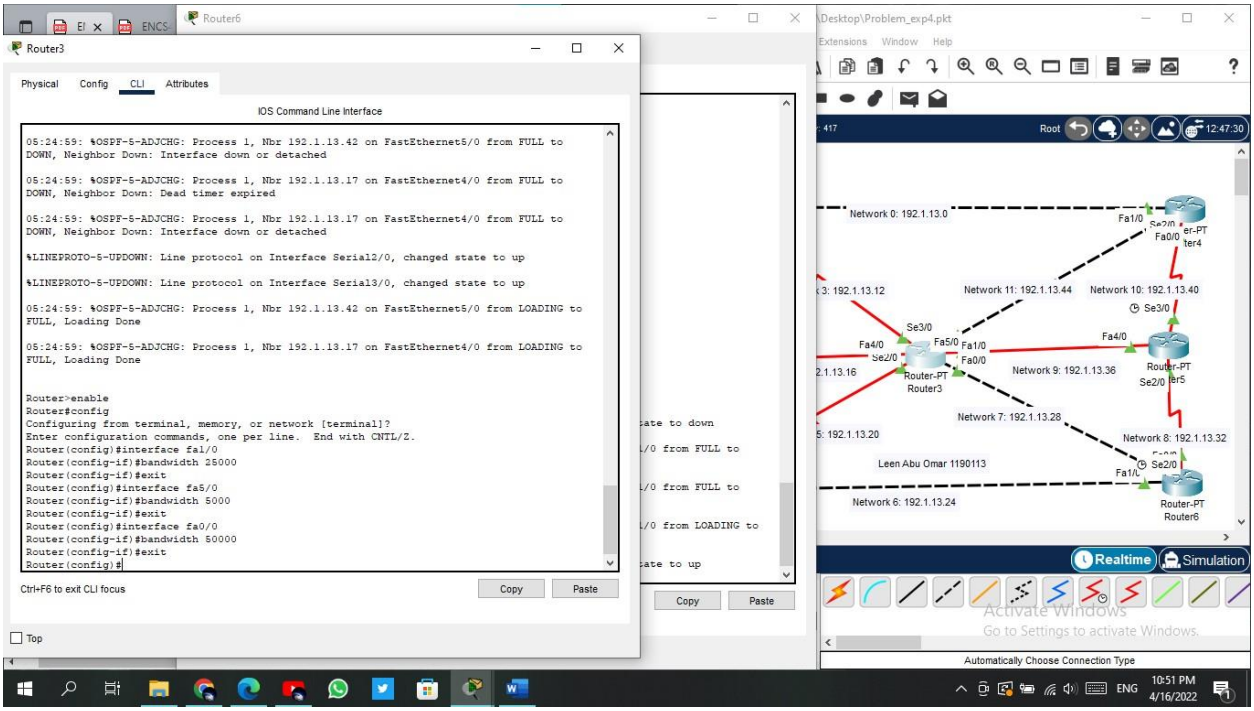
BandWidth = (100 * 10^6)/cost and the result should be written in Kilobits in the CLI screen.

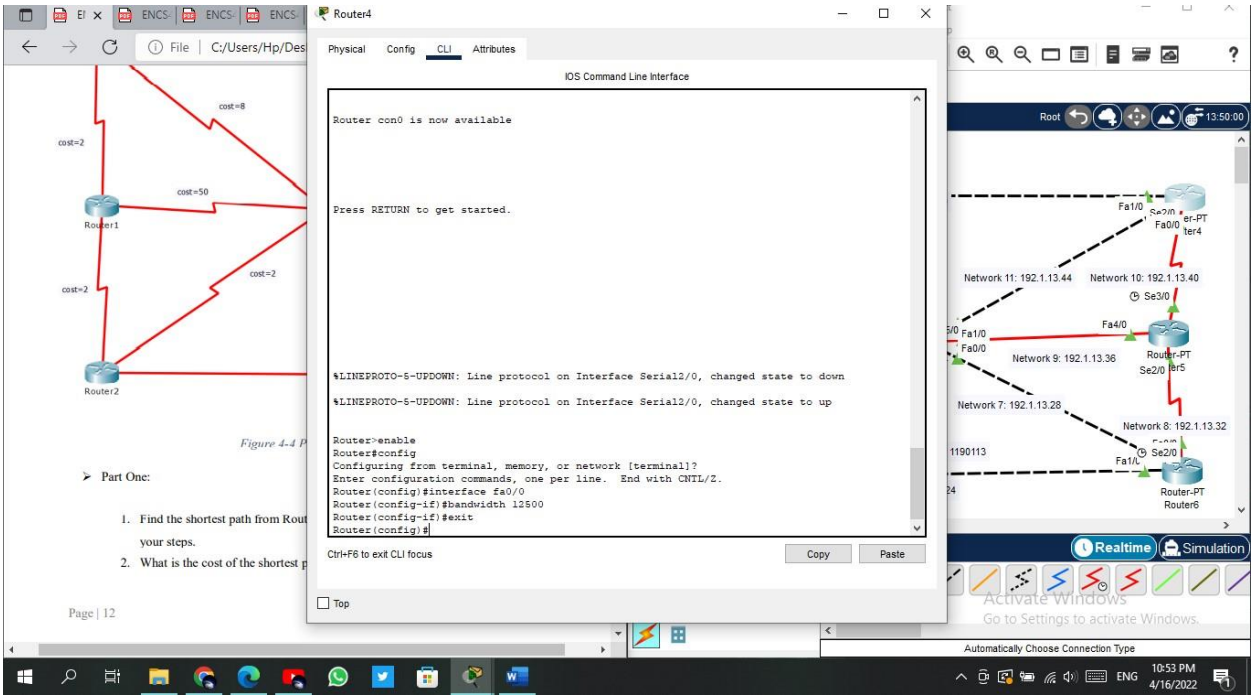
Here are screenshots for each router while setting the cost for each one.

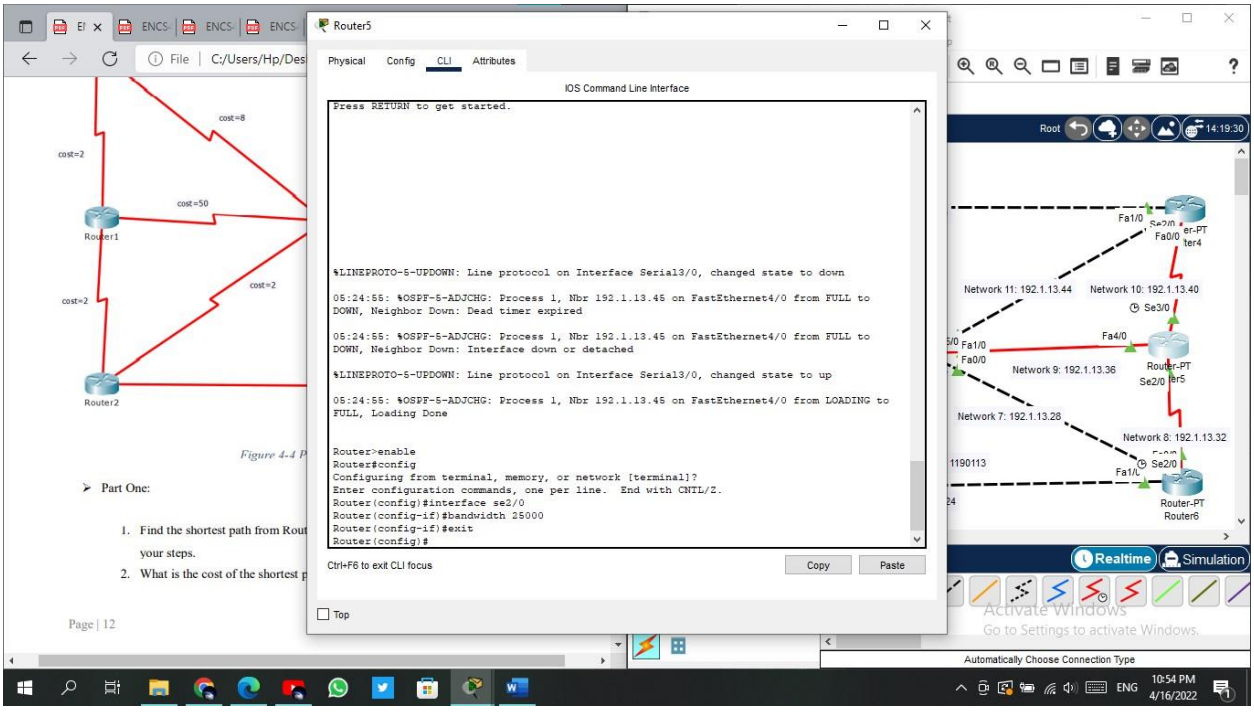


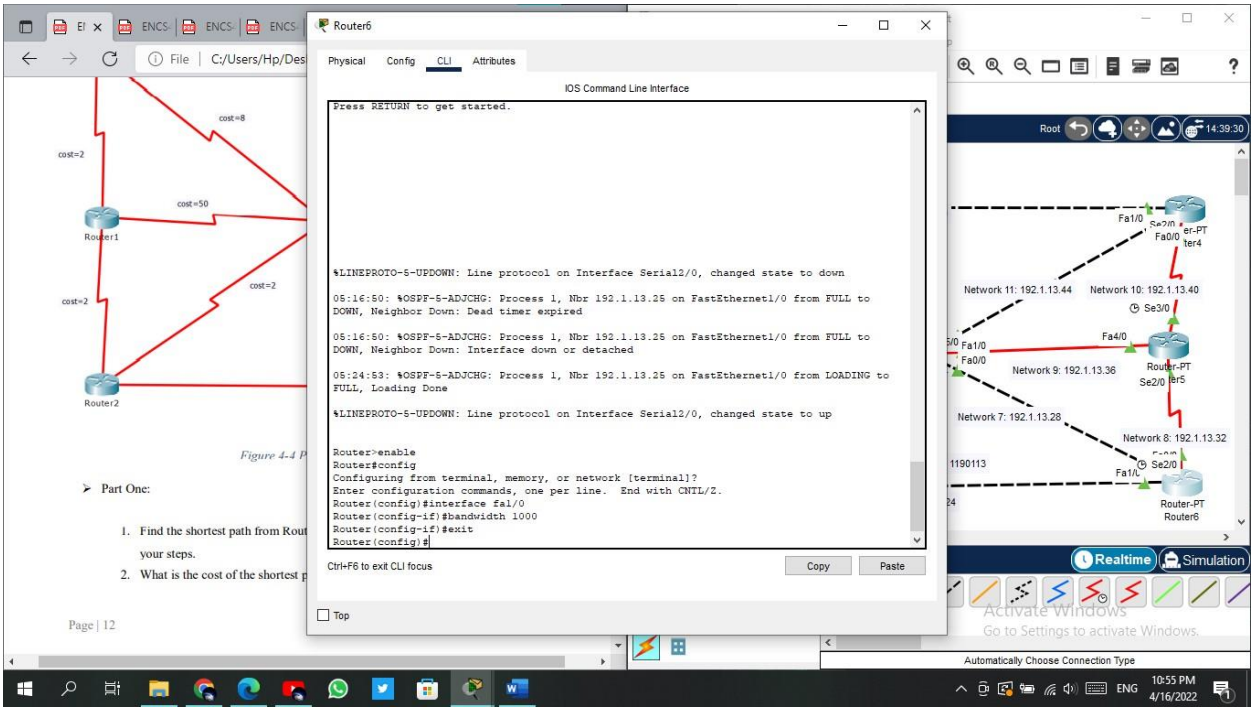

Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to down
05:25:05: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.13 on Serial3/0 from FULL to DOWN, Neighbor Down: Interface down or detached
05:25:05: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.45 on FastEthernet4/0 from FULL to DOWN, Neighbor Down: Dead timer expired
05:25:05: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.45 on FastEthernet4/0 from FULL to DOWN, Neighbor Down: Interface down or detached
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
05:25:05: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.45 on FastEthernet4/0 from LOADING to FULL, Loading Done
05:25:15: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.13 on Serial3/0 from LOADING to FULL, Loading Done
Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fa4/0
Router(config-if)#bandwidth 2000
Router(config-if)#exit
Router(config)#interface se2/0
Router(config-if)#bandwidth 50000
Router(config-if)#exit
Router(config)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
Network 11: 192.1.13.44
Network 10: 192.1.13.40
Network 9: 192.1.13.36
Network 7: 192.1.13.28
Network 8: 192.1.13.32
Router-PT Router6
Realtime
Simulation
Activate Windows
Go to Settings to activate Windows.
Automatically Choose Connection Type
10:48 PM
4/16/2022


Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
04:27:32: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.34 on FastEthernet0/0 from LOADING to FULL, Loading Done
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to down
05:25:02: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.34 on FastEthernet0/0 from FULL to DOWN, Neighbor Down: Dead timer expired
05:25:02: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.34 on FastEthernet0/0 from FULL to DOWN, Neighbor Down: Interface down or detached
05:25:02: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.34 on FastEthernet0/0 from LOADING to FULL, Loading Done
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fa0/0
Router(config-if)#bandwidth 1000
Router(config-if)#exit
Router(config)#interface se3/0
Router(config-if)#bandwidth 50000
Router(config-if)#exit
Router(config)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
Network 11: 192.1.13.44
Network 10: 192.1.13.40
Network 9: 192.1.13.36
Network 7: 192.1.13.28
Network 8: 192.1.13.32
Router-PT Router6
Realtime
Simulation
Activate Windows
Go to Settings to activate Windows.
Automatically Choose Connection Type
10:49 PM
4/16/2022


Router3
Physical
Config
CLI
Attributes
IOS Command Line Interface
05:24:59: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.42 on FastEthernet5/0 from FULL to DOWN, Neighbor Down: Interface down or detached
05:24:59: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.17 on FastEthernet4/0 from FULL to DOWN, Neighbor Down: Dead timer expired
05:24:59: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.17 on FastEthernet4/0 from FULL to DOWN, Neighbor Down: Interface down or detached
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
05:24:59: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.42 on FastEthernet5/0 from LOADING to FULL, Loading Done
05:24:59: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.17 on FastEthernet4/0 from LOADING to FULL, Loading Done
Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fa1/0
Router(config-if)#bandwidth 25000
Router(config-if)#exit
Router(config)#interface fa5/0
Router(config-if)#bandwidth 5000
Router(config-if)#exit
Router(config)#interface fa0/0
Router(config-if)#bandwidth 50000
Router(config-if)#exit
Router(config)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
Router6
Copy
Paste
Desktop\Problem_exp4.pkt
Extensions
Window
Help
Root
12:47:30
Network 0: 192.1.13.0
Network 11: 192.1.13.44
Network 10: 192.1.13.40
Network 9: 192.1.13.36
Network 7: 192.1.13.28
Network 8: 192.1.13.32
Network 6: 192.1.13.24
Leen Abu Omar 1190113
Router-PT Router3
Router-PT Router5
Router-PT Router6
Realtime
Simulation
Activate Windows
Go to Settings to activate Windows.
Automatically Choose Connection Type
ENG
10:51 PM
4/16/2022


Router4
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router con0 is now available
Press RETURN to get started.
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fa0/0
Router(config-if)#bandwidth 12500
Router(config-if)#exit
Router(config)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
cost=8
cost=2
cost=50
cost=2
cost=2
Router1
Router2
Network 11: 192.1.13.44
Network 10: 192.1.13.40
Network 9: 192.1.13.36
Network 7: 192.1.13.28
Network 8: 192.1.13.32
Router-PT
Router6
Realtime
Simulation
Automatically Choose Connection Type
10:53 PM
4/16/2022


Router5
Physical
Config
CLI
Attributes
IOS Command Line Interface
Press RETURN to get started.
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to down
05:24:55: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.45 on FastEthernet4/0 from FULL to DOWN, Neighbor Down: Dead timer expired
05:24:55: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.45 on FastEthernet4/0 from FULL to DOWN, Neighbor Down: Interface down or detached
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
05:24:55: %OSPF-5-ADJCHG: Process 1, Nbr 192.1.13.45 on FastEthernet4/0 from LOADING to FULL, Loading Done
Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface se2/0
Router(config-if)#bandwidth 25000
Router(config-if)#exit
Router(config)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
cost=8
cost=2
cost=50
cost=2
cost=2
Router1
Router2
Network 11: 192.1.13.44
Network 10: 192.1.13.40
Network 9: 192.1.13.36
Network 7: 192.1.13.28
Network 8: 192.1.13.32
Router-PT
Router6
Realtime
Simulation
Automatically Choose Connection Type
10:54 PM
4/16/2022

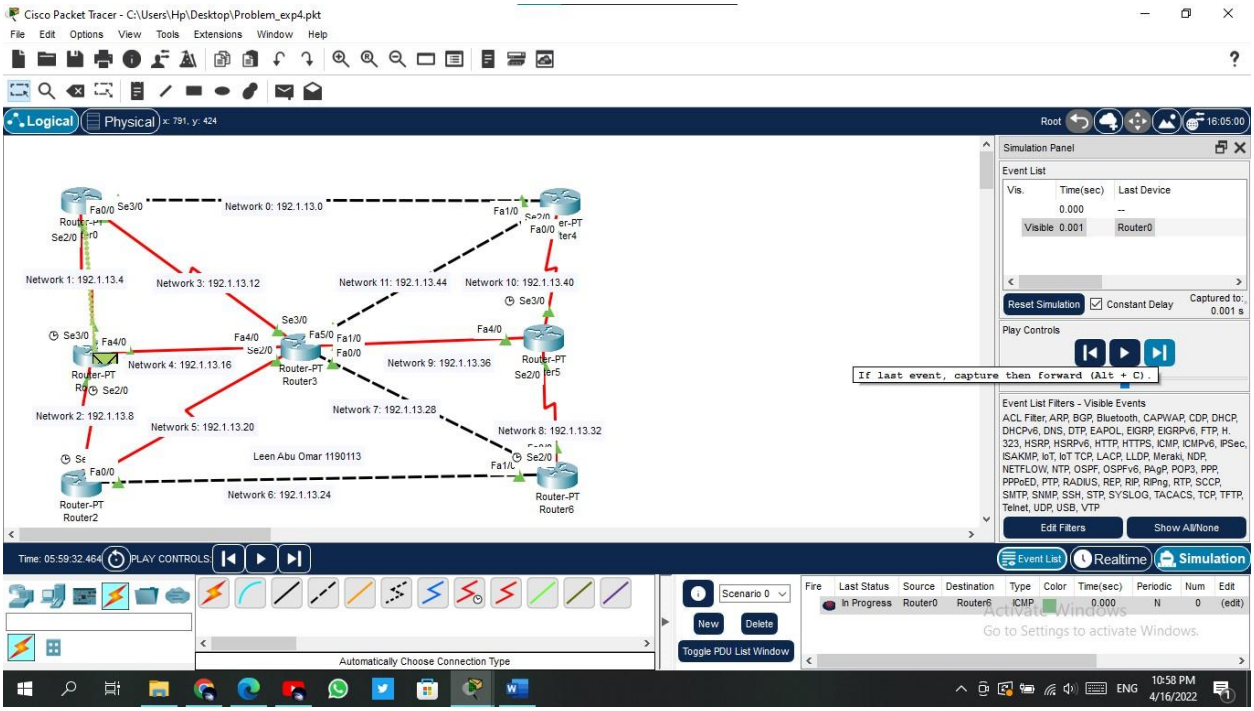


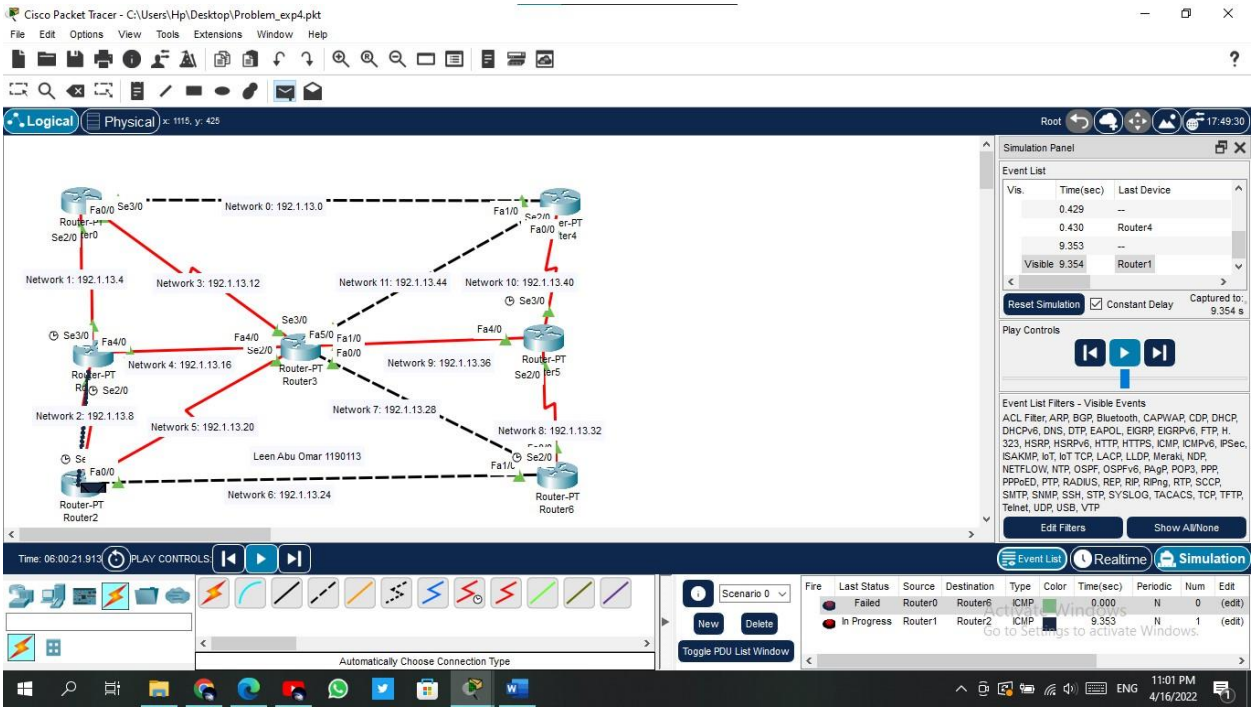
Bandwidth calculated according to the previous equation is:

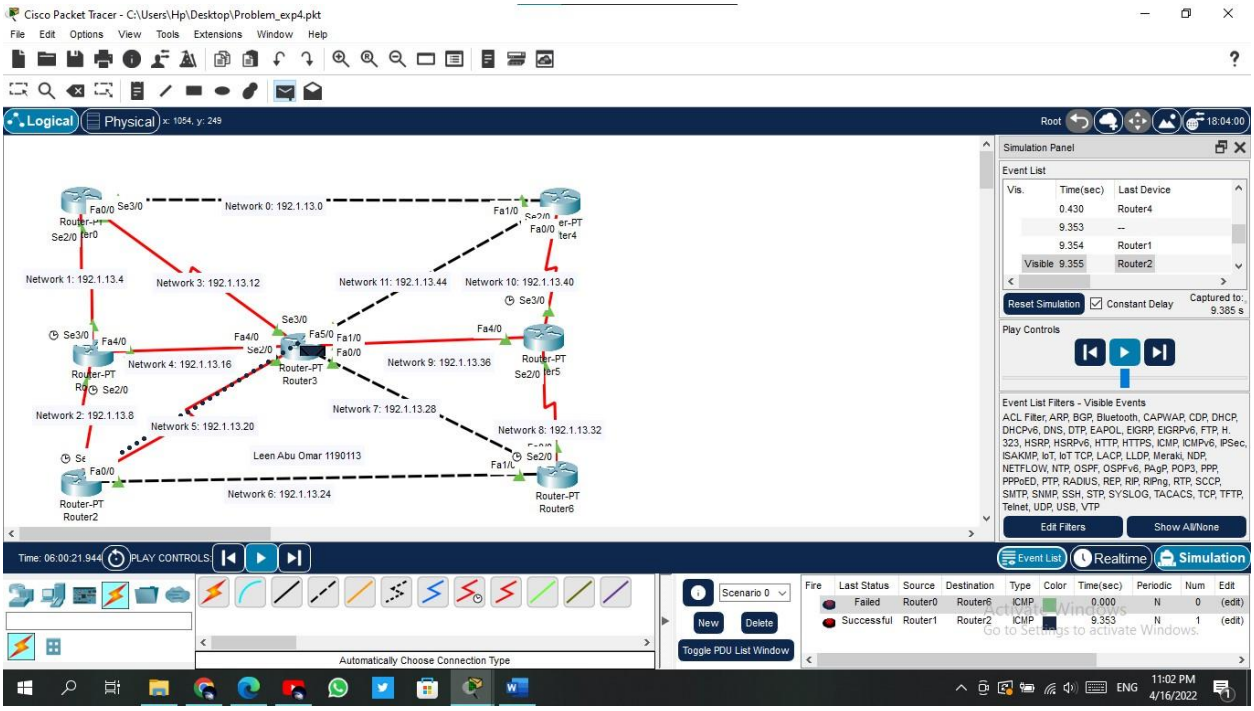
- For Cost = 2, BW = 50000 Kbits
- For Cost = 4, BW = 25000 Kbits
- For Cost = 8, BW = 12500 Kbits
- For Cost = 20, BW = 5000 Kbits
- For Cost = 50, BW = 2000 Kbits
- For Cost = 100, BW = 1000 Kbits

The Final Result:

Here are screenshots implements the way of routing done according to dijkstra's algorithm (by crossing the least cost starting from R0, ending in R6 with Cost = 8)







And finally R3 reached to R6 by the shortest path with the cost of 8.