

HACETTEPE UNIVERSITY DEPARTMENT OF
COMPUTER ENGINEERING
BBM 453 LAB EXPERIMENT



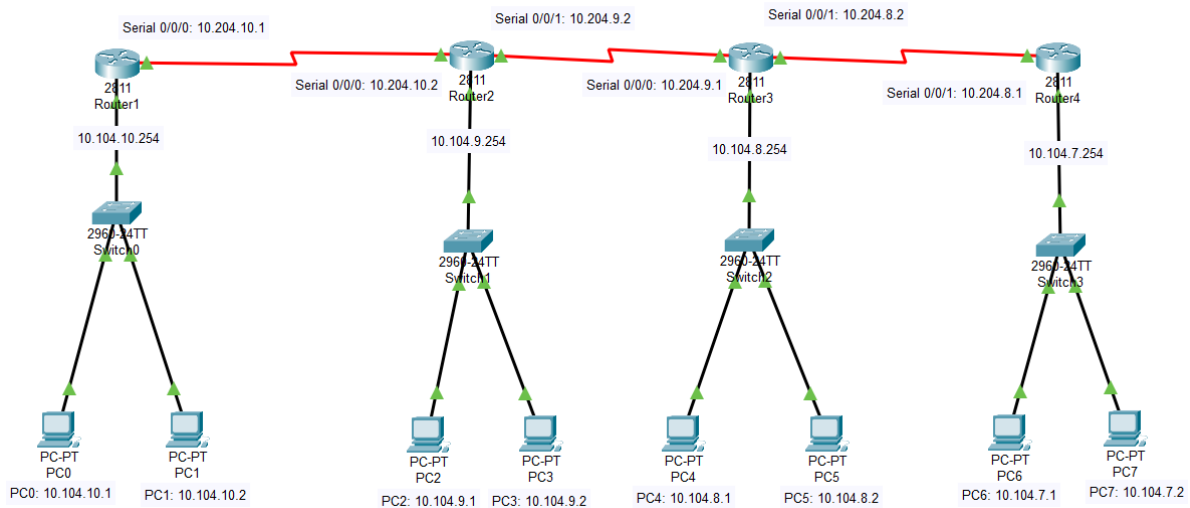
Mehmet Taha USTA – 21527472

Group No: 4

1. First, you should create lab topology described in the Lab09-Routing Experiment Figure2.

Group id is 4, we set the IP's again.

Example : From 10.100.1.254 to 10.104.1.254



2. Assign all interfaces (FastEthernet, Serial) described in the Lab Topology.

All interfaces are shown on the picture in question 1.

PC0: 10.104.10.1

PC1: 10.104.10.2

PC2: 10.104.9.1

PC3: 10.104.9.2

PC4: 10.104.8.1

PC5: 10.104.8.2

PC6: 10.104.7.1

PC7: 10.104.7.2

Router1: 10.104.10.254

Router1 Serial 0/0/0: 10.204.10.1

Router2: 10.104.9.254

Router2 Serial 0/0/0: 10.204.10.2

Router2 Serial 0/0/1: 10.204.9.1

Router3: 10.104.8.254

Router3 Serial 0/0/0: 10.204.9.1

Router3 Serial 0/0/1: 10.204.8.2

Router4: 10.104.7.254

Router4 Serial 0/0/1: 10.204.9.1

3. All groups should use the same dynamic routing protocols simultaneously. You have to research about routing protocol commands for Cisco Router.

3.1) Routing Information Protocol (RIP)

RIP is a standardized vector distance routing protocol and uses a form of distance as hop count metric. It is a distance vector. Through limiting the number of hop counts allowed in paths between sources and destinations, RIP prevents routing loops.

Typically, the maximum number of hops allowed for RIP is 15. However, by achieving this routing loop prevention, the size of supporting networks is sacrificed. Since the maximum number of hop counts allowed for RIP is 15, as long as the number goes beyond 15, the route will be considered as unreachable.

3.2) Open Shortest Path First (OSPF)

OSPF is defined in RFC 2328 which is an interior Gateway Protocol used to distribute routing information within an AS (Autonomous System). Among all the three chosen samples, OSPF is the most widely used routing protocol in large enterprise networks. OSPF is based on link-state technology by using SPF algorithm which calculates the shortest path.

3.3) Enhanced Interior Gateway Routing Protocol (EIGRP)

The Enhanced Interior Gateway Routing Protocol (EIGRP) is a hybrid routing protocol which provides significant improvements on IGRP. EIGRP replaced IGRP in 1993 since Internet Protocol is designed to support IPv4 addresses that IGRP could not support. Hybrid routing protocol incorporates advantages of both Link-state and Distance-Vector routing protocols, it was based on Distance-Vector protocol but contains more features of Link-State protocol. EIGRP saves all routes rather than the best route to ensure the faster convergence. EIGRP keeps neighboring routing tables and it only exchange information that it neighbor would not contain. EIGRP is commonly used in large networks, and it updates only when a topology changes but not periodically unlike old Distance-Vector protocols such as RIP.

The following example shows how to enable BFD for all Enhanced Interior Gateway Routing Protocol (EIGRP) neighbors:

```
Router> enable
Router# configure terminal
Router(config)# router eigrp 123
Router(config-router)# bfd all-interfaces
Router(config-router)# end
```

The following example shows how to enable BFD for all Intermediate System-to-Intermediate System (IS-IS) neighbors:

```
Router> enable
Router# configure terminal
Router(config)# router isis tag1
Router(config-router)# bfd all-interfaces
Router(config-router)# end
```

The following example shows how to enable BFD for all Open Shortest Path First (OSPF) neighbors:

```
Router> enable
Router# configure terminal
Router(config)# router ospf 123
Router(config-router)# bfd all-interfaces
Router(config-router)# end
```

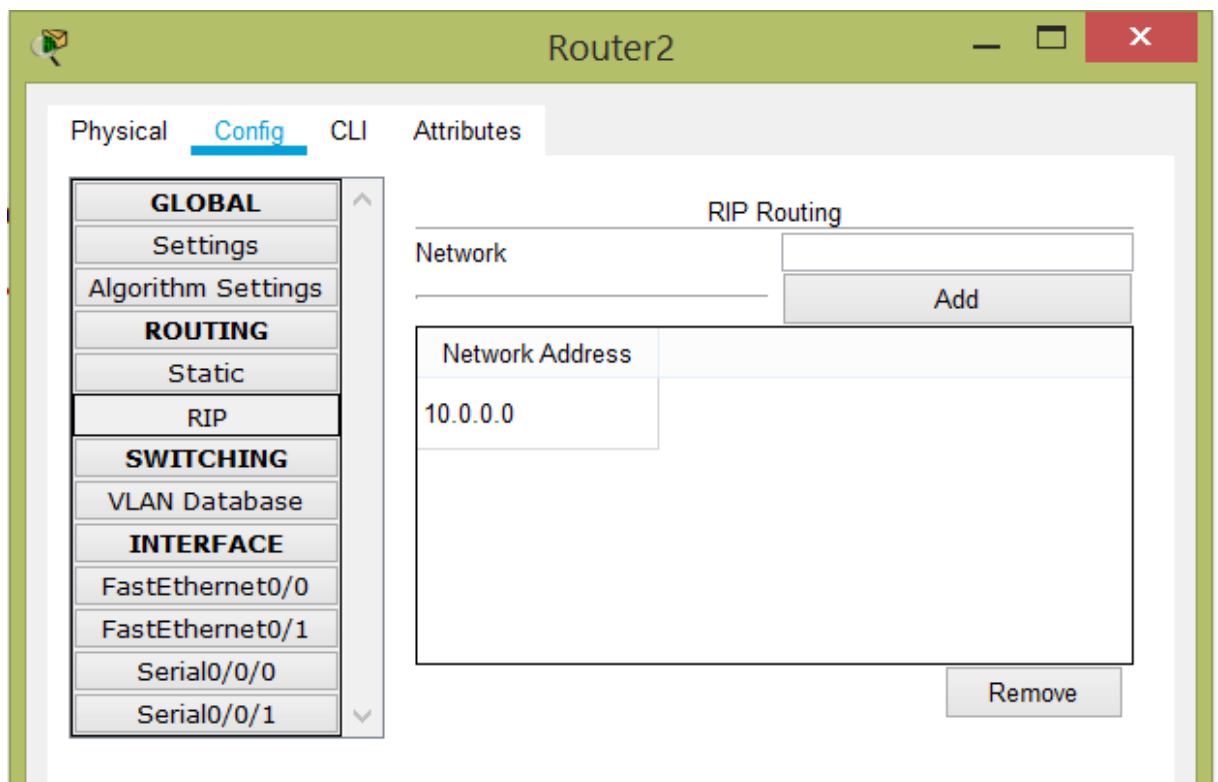
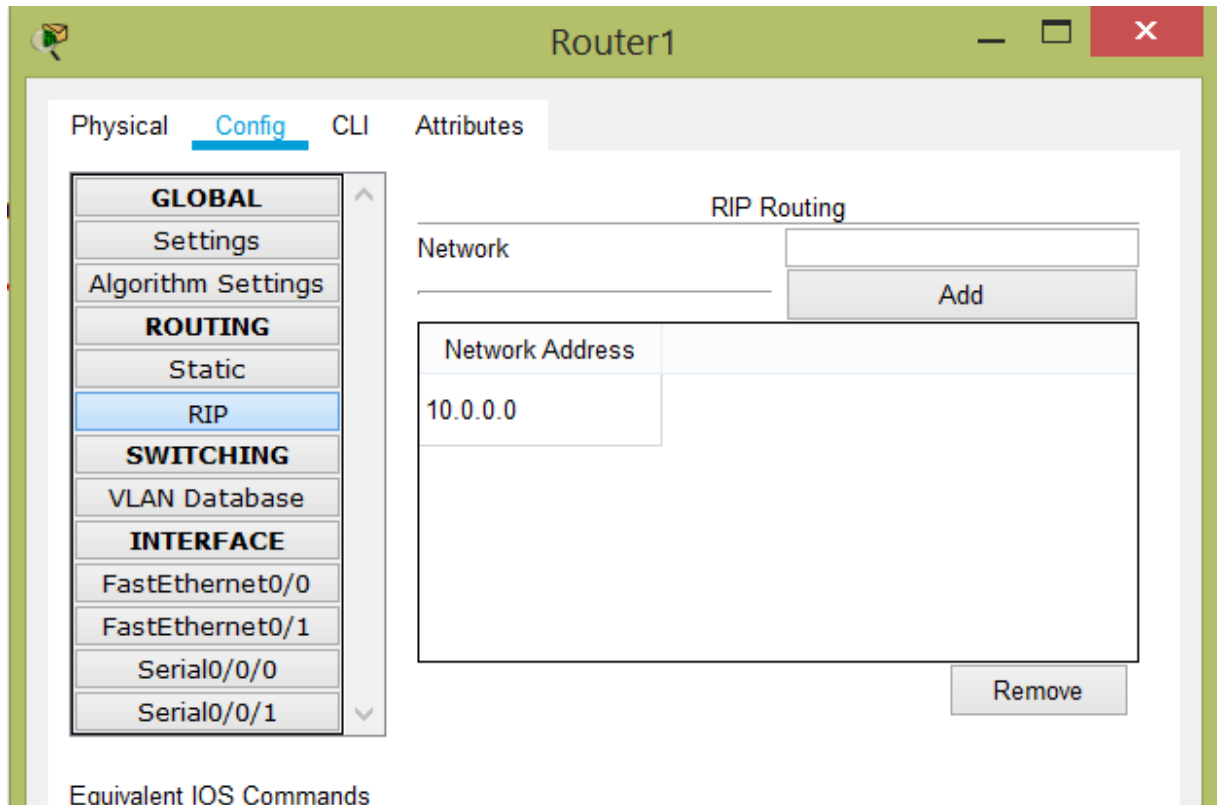
The following example shows how to enable BFD for all EIGRP neighbors, using the bfd command in address-family interface configuration mode:

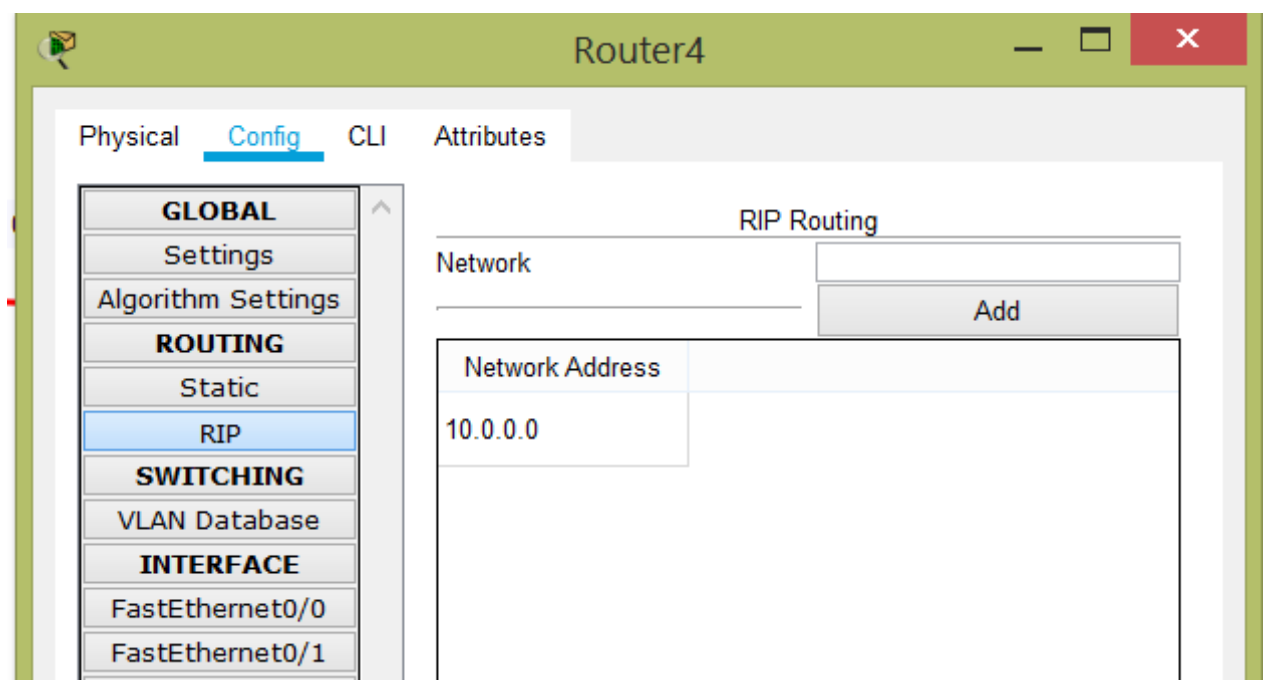
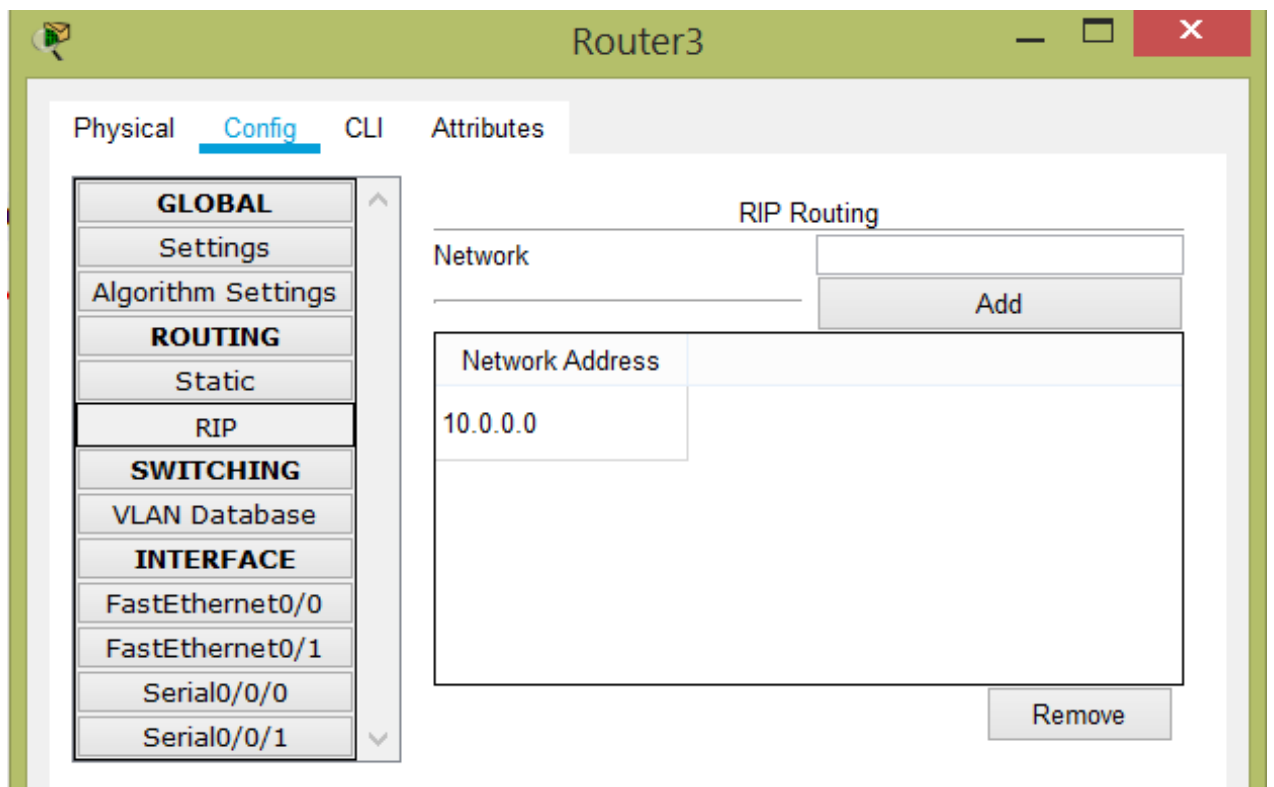
```
Router> enable
Router# configure terminal
Router(config)# router eigrp my_eigrp
Router(config-router)# address-family ipv4 autonomous-system 100
Router(config-router-af)# af-interface FastEthernet 0/0
Router(config-router-af-interface)# bfd
```









The following example shows how to enable BFD for all Routing Information Protocol (RIP) neighbors:

```
Router> enable
Router# configure terminal
Router(config)# router rip
Router(config-router)# bfd all-interfaces
Router(config-router)# end
```

4. Configure RIP protocol. Display routing tables and ping from your computer to all other remote computers.





PDU List Window										
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC7	PC1	ICMP		0.000	N	0	(edit)	
	Successful	PC0	PC3	ICMP		0.000	N	1	(edit)	
	Successful	PC2	PC6	ICMP		0.000	N	2	(edit)	
	Successful	PC4	PC1	ICMP		0.000	N	3	(edit)	

PC0

Physical
Config
Desktop
Programming
Attributes

Command Prompt

X

Packet Tracer PC Command Line 1.0
C:\>ping 10.104.7.1

Pinging 10.104.7.1 with 32 bytes of data:

Reply from 10.104.7.1: bytes=32 time=3ms TTL=124
Reply from 10.104.7.1: bytes=32 time=18ms TTL=124
Reply from 10.104.7.1: bytes=32 time=7ms TTL=124
Reply from 10.104.7.1: bytes=32 time=11ms TTL=124

Ping statistics for 10.104.7.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 3ms, Maximum = 18ms, Average = 9ms

C:\>

PC7

Physical
Config
Desktop
Programming
Attributes

Command Prompt

X

Packet Tracer PC Command Line 1.0
C:\>ping 10.104.9.1

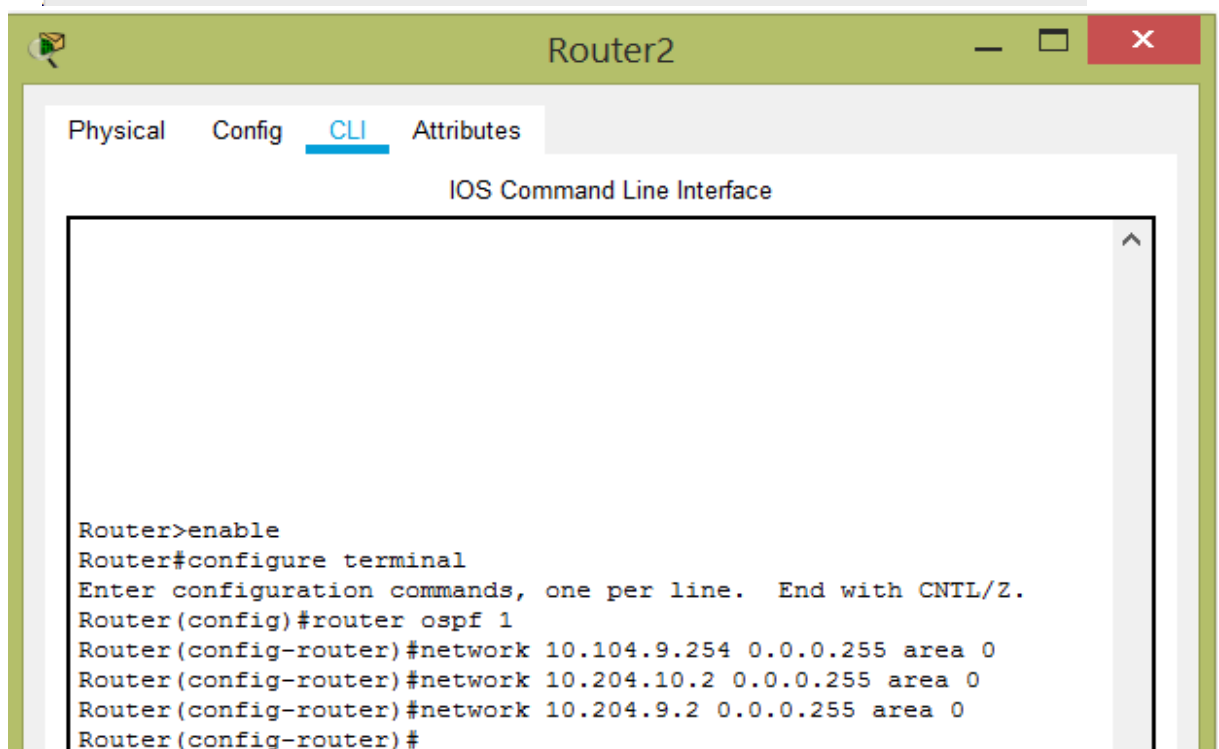
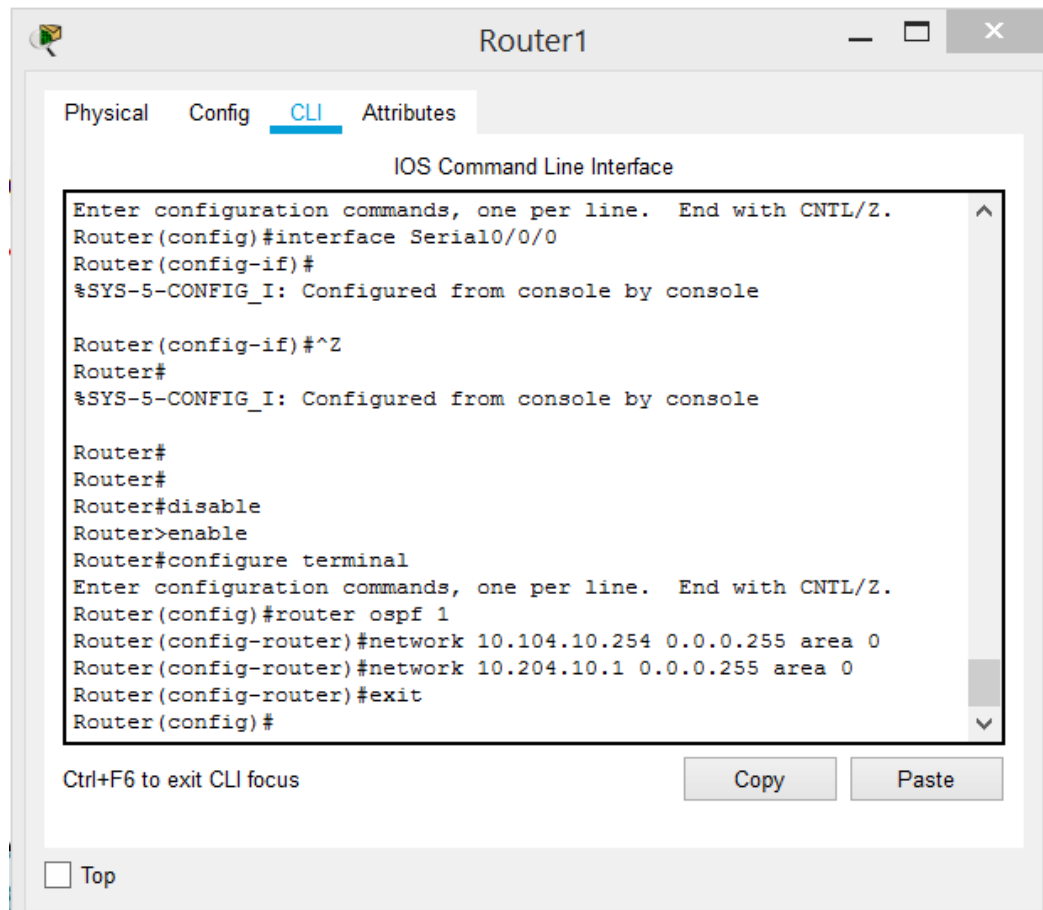
Pinging 10.104.9.1 with 32 bytes of data:

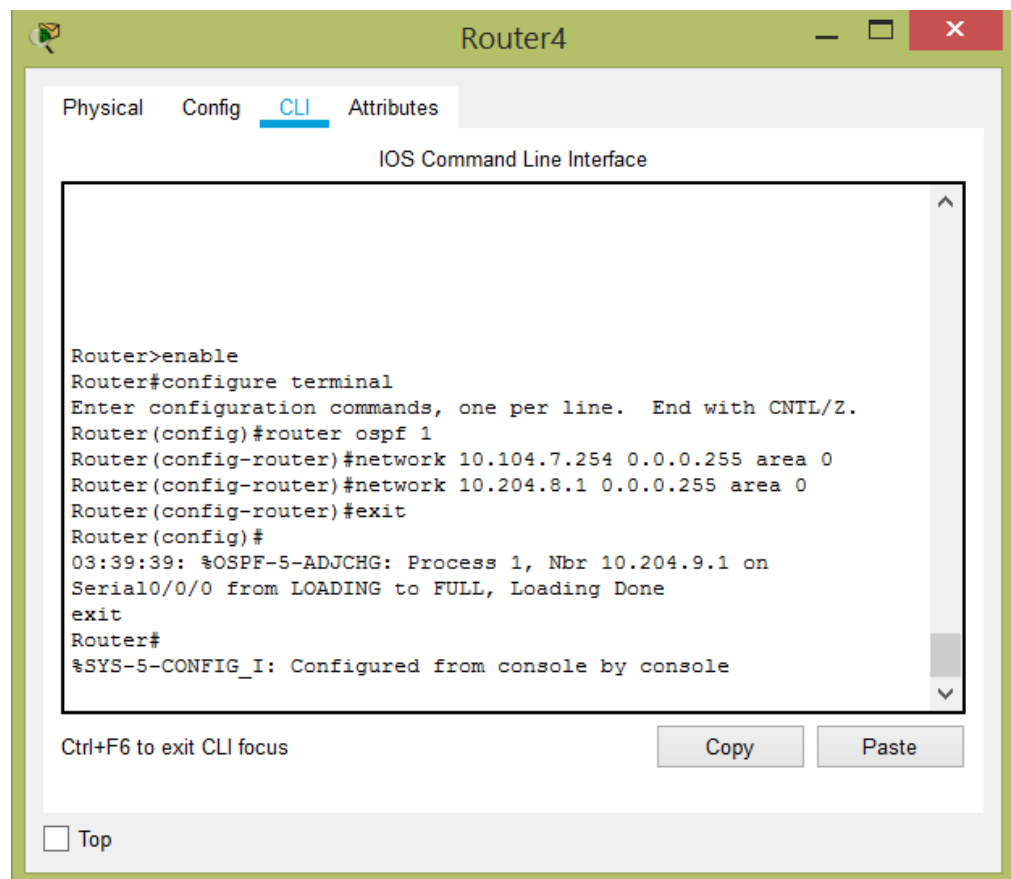
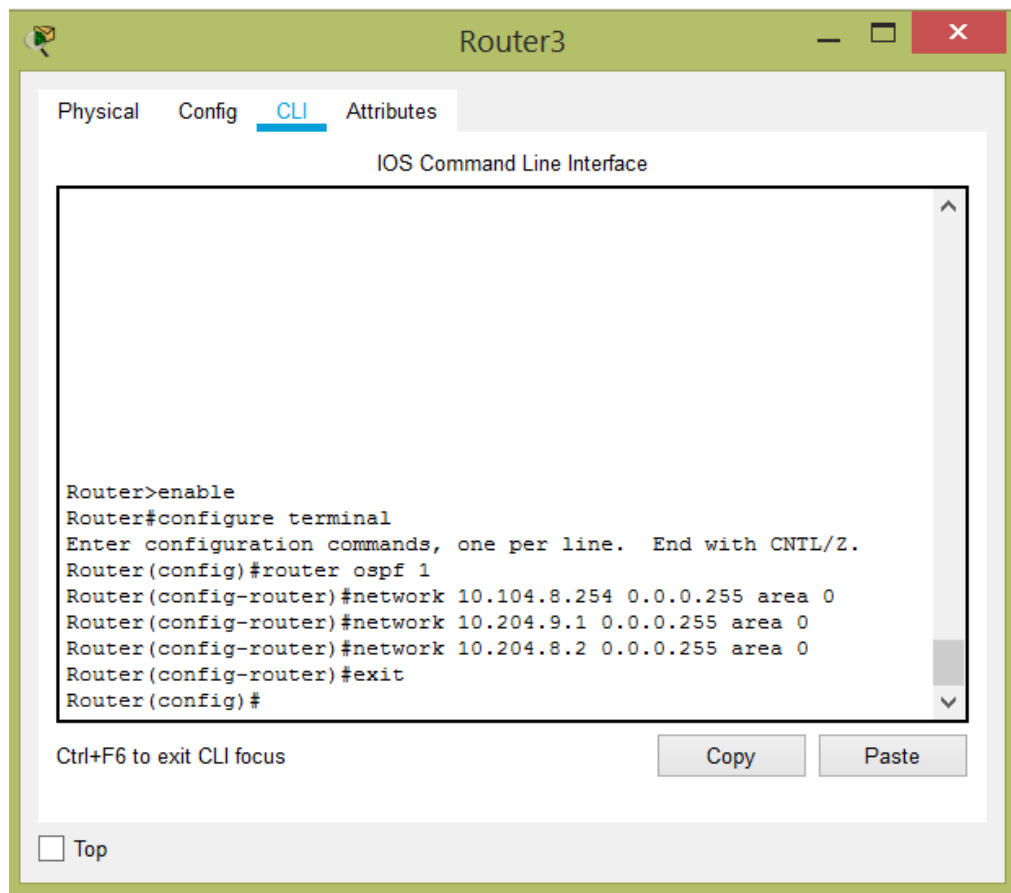
Reply from 10.104.9.1: bytes=32 time=3ms TTL=125
Reply from 10.104.9.1: bytes=32 time=21ms TTL=125
Reply from 10.104.9.1: bytes=32 time=12ms TTL=125
Reply from 10.104.9.1: bytes=32 time=2ms TTL=125

Ping statistics for 10.104.9.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 21ms, Average = 9ms

C:\>|

5. Remove RIP configuration and configure OSPF protocol. Display routing tables and ping from your computer to all other remote computers.





PDU List Window										
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	PC7	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC6	PC5	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC1	PC2	ICMP		0.000	N	2	(edit)	(delete)
	Successful	PC6	PC0	ICMP		0.000	N	3	(edit)	(delete)

```

Packet Tracer PC Command Line 1.0
C:\>ping 10.104.7.2

Pinging 10.104.7.2 with 32 bytes of data:

Reply from 10.104.7.2: bytes=32 time=3ms TTL=124
Reply from 10.104.7.2: bytes=32 time=3ms TTL=124
Reply from 10.104.7.2: bytes=32 time=11ms TTL=124
Reply from 10.104.7.2: bytes=32 time=12ms TTL=124

Ping statistics for 10.104.7.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 12ms, Average = 7ms

C:\>

```

6. Remove OSPF configuration and configure EIGRP protocol. Display routing tables and ping from your computer to all other remote computers.

I removed all OSPF configuration.

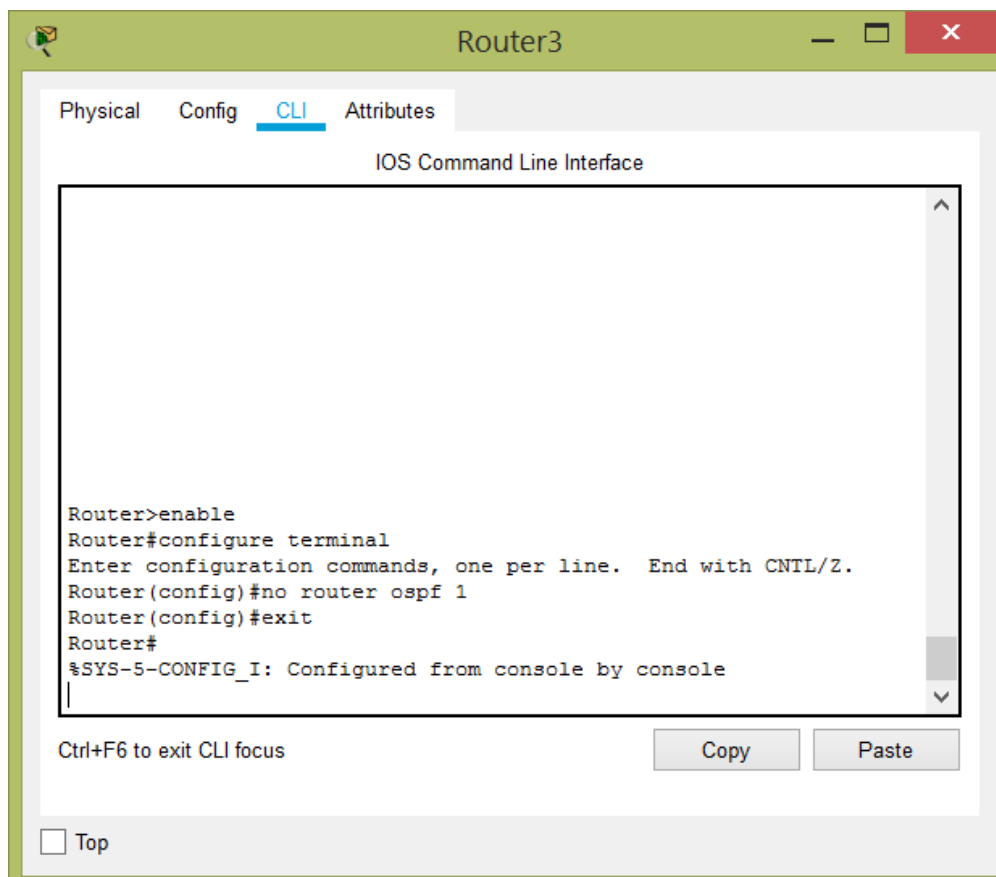
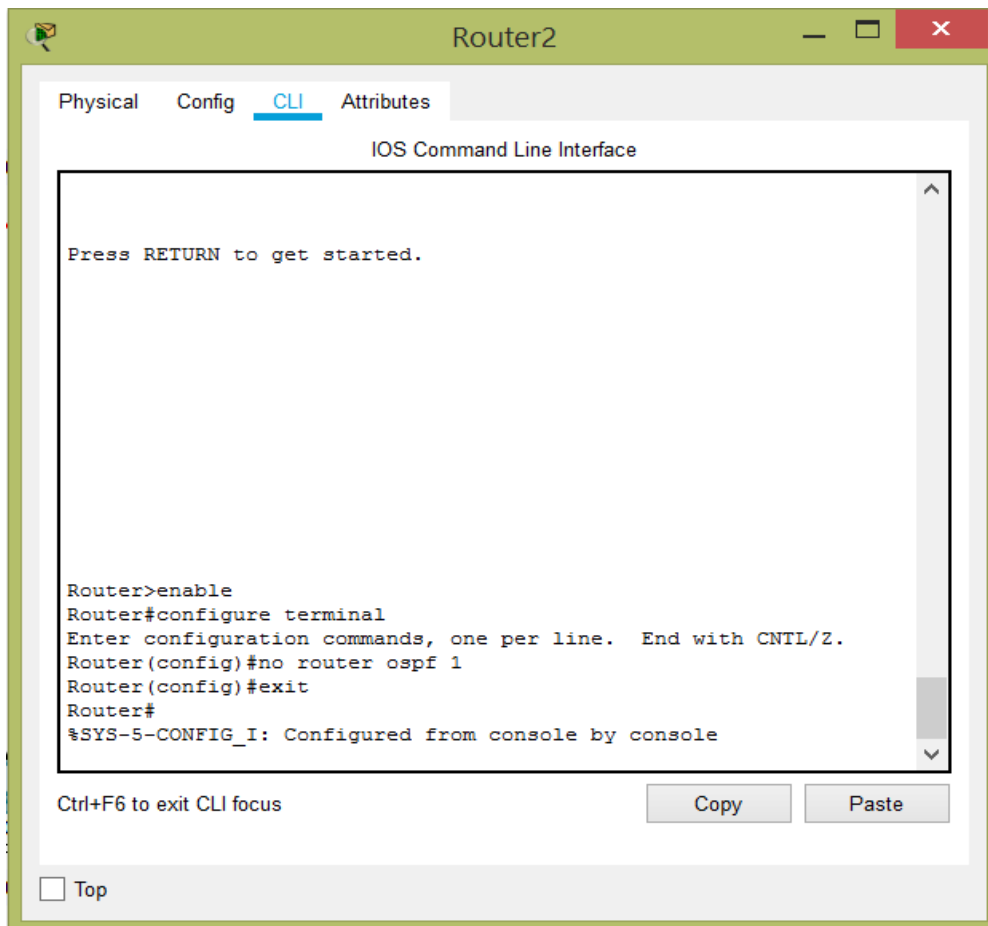
```

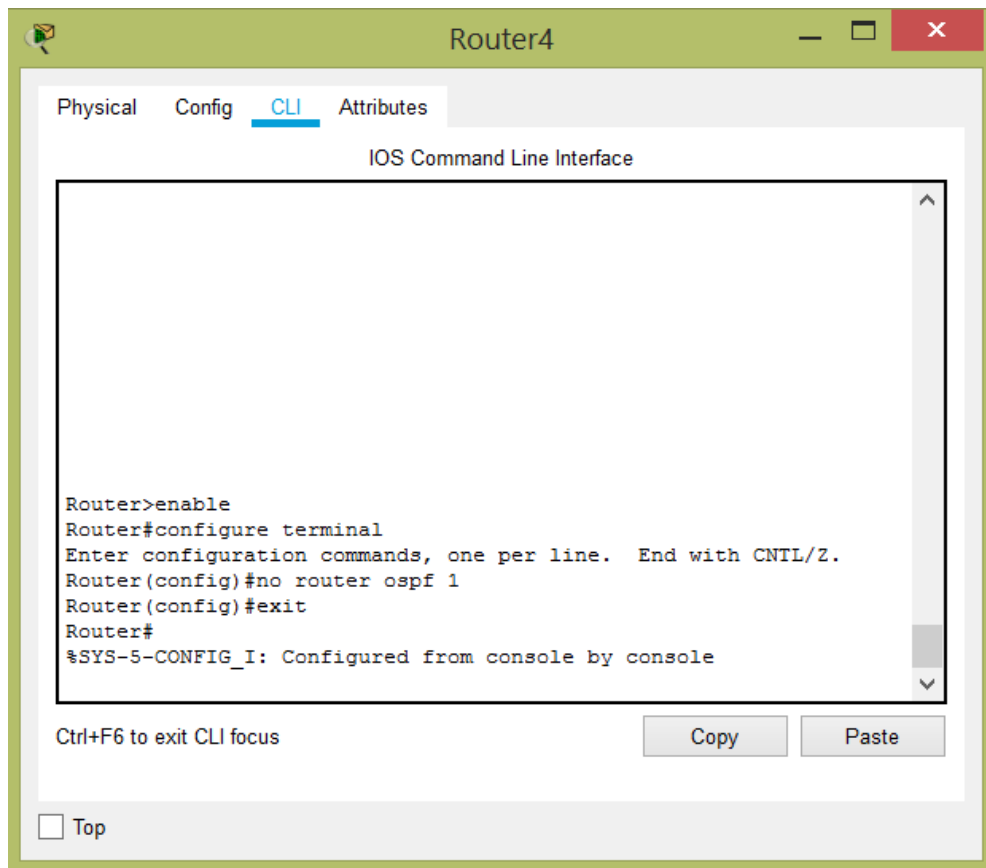
Router1
Physical Config CLI Attributes
IOS Command Line Interface

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no router ospf 1
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

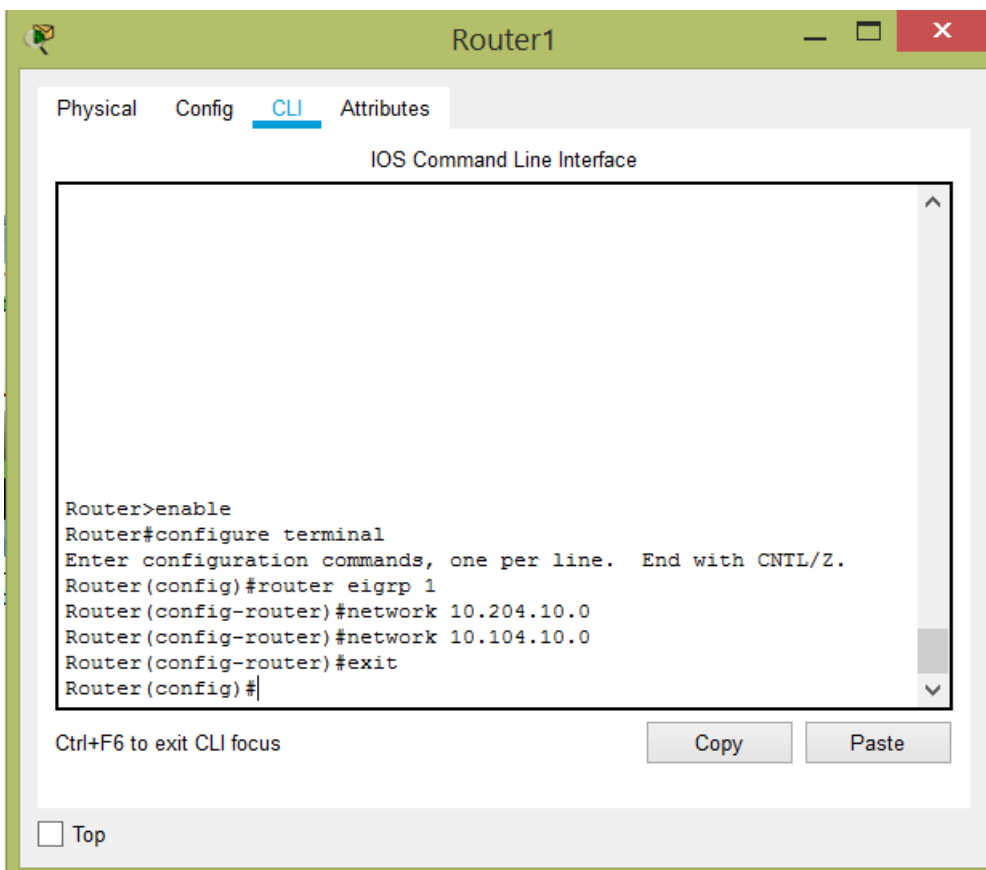
Ctrl+F6 to exit CLI focus
Copy Paste

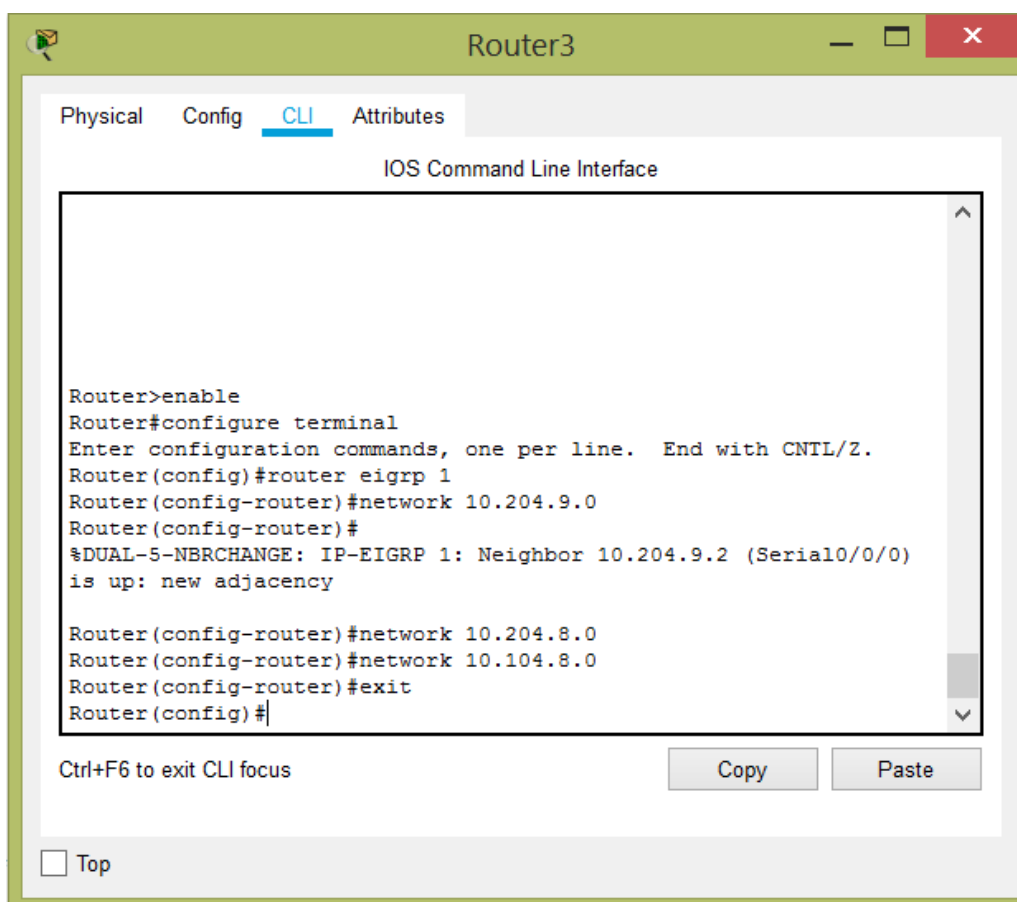
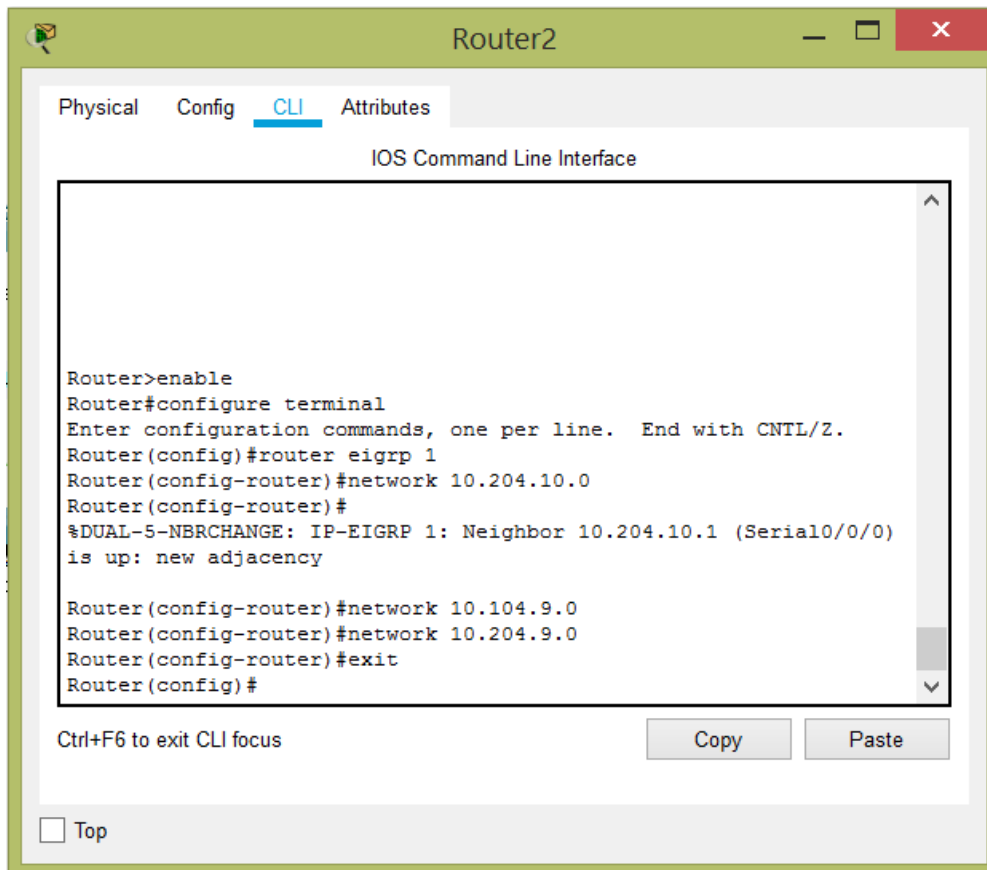
```





Configure Router





Router4

Physical

Config

CLI

Attributes

IOS Command Line Interface

```

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router eigrp 1
Router(config-router)#network 10.204.8.0
Router(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 1: Neighbor 10.204.8.2 (Serial0/0/0)
is up: new adjacency

Router(config-router)#network 10.104.7.0
Router(config-router)#exit
Router(config)#









```

Ctrl+F6 to exit CLI focus

Copy

Paste

☐ Top

PDU List Window										
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	PC4	ICMP		0.000	N	0	(edit)	
	Successful	PC1	PC7	ICMP		0.000	N	1	(edit)	
	Successful	PC6	PC0	ICMP		0.000	N	2	(edit)	
	Successful	PC7	PC1	ICMP		0.000	N	3	(edit)	

