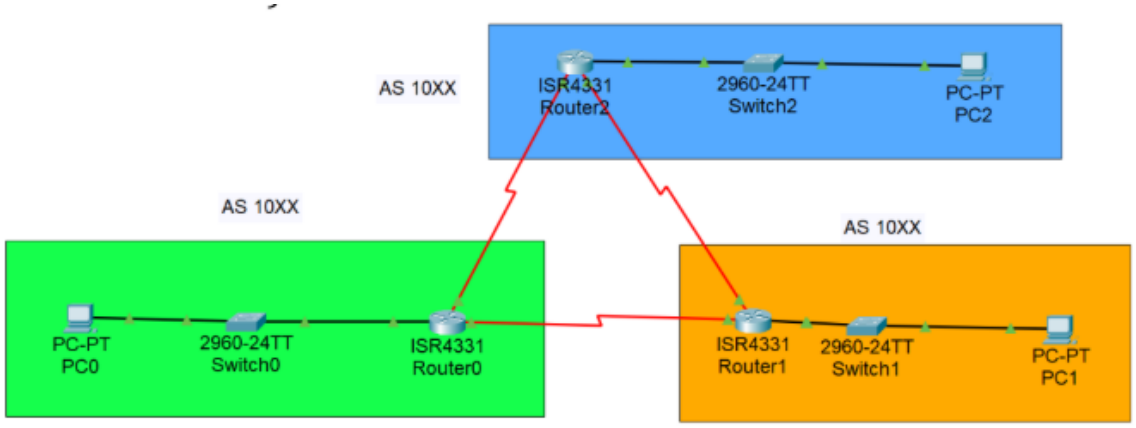
Name : Kansara Anjali | Class : A | Branch : Cyber Security
Semester: 5 | Enrollment No: 23162171032|Batch:52
Institute of Computer Technology
B. Tech Computer Science and Engineering

Sub:CN
Practical 10

Aim: To design a network using Enhanced Interior Gateway Routing Protocol (EIGRP).

Scenario:

Consider that organization has three departments and as routing protocol Enhanced Interior Gateway Routing Protocol (EIGRP) is to be implemented. Configure network as shown in figure below and implement Enhanced Interior Gateway Routing Protocol (EIGRP).

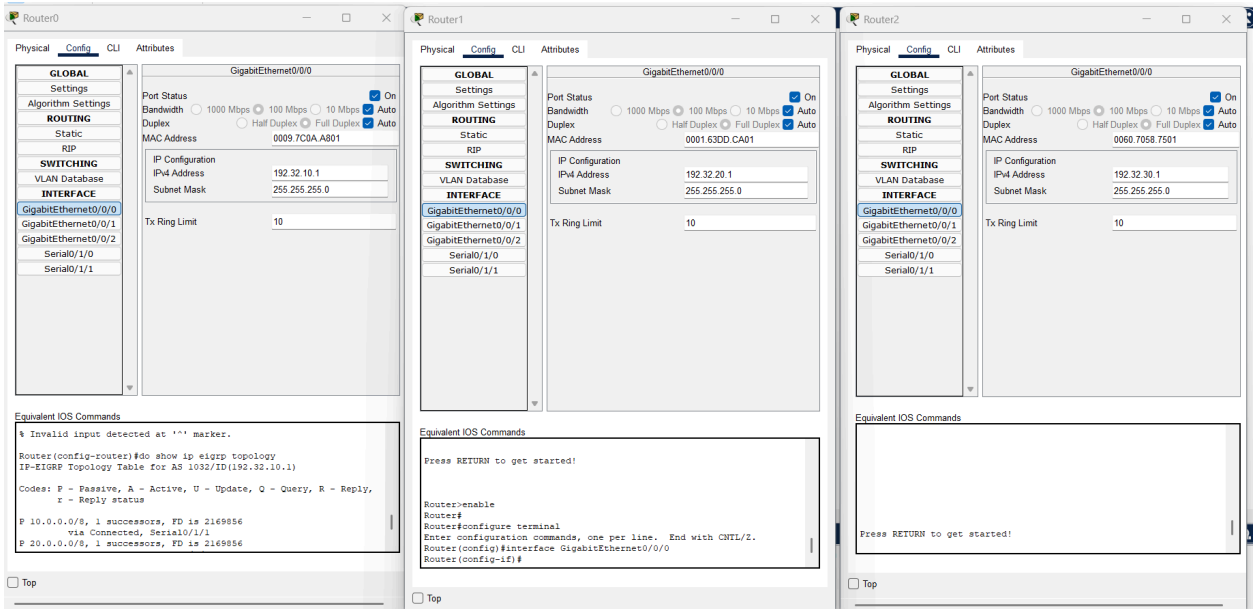


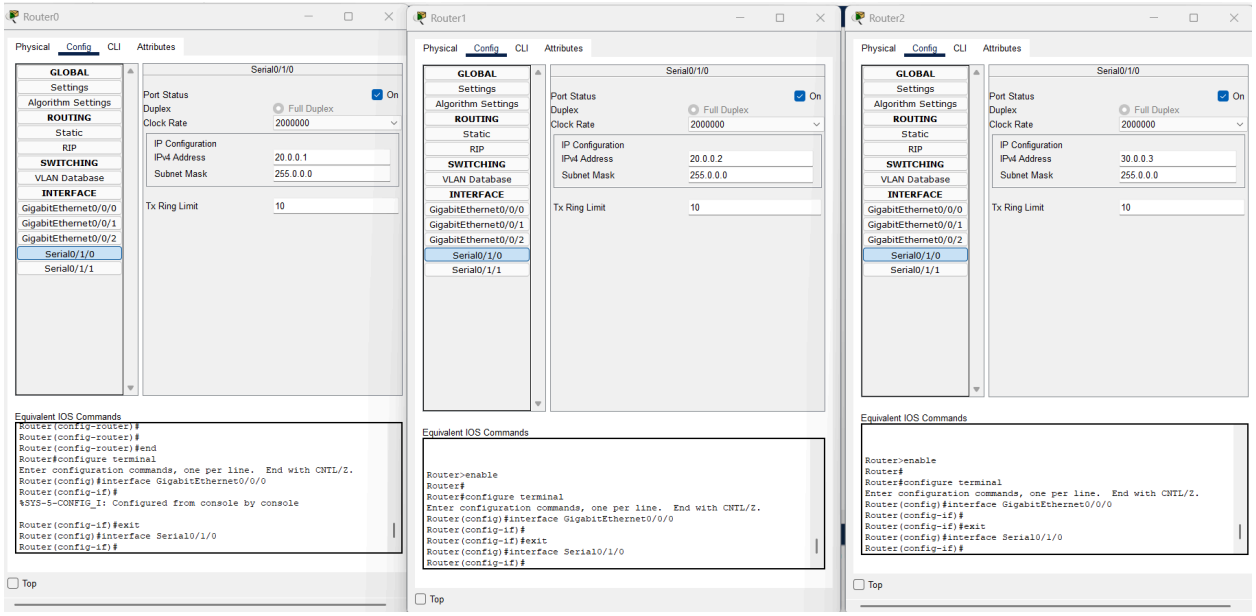
Procedure:

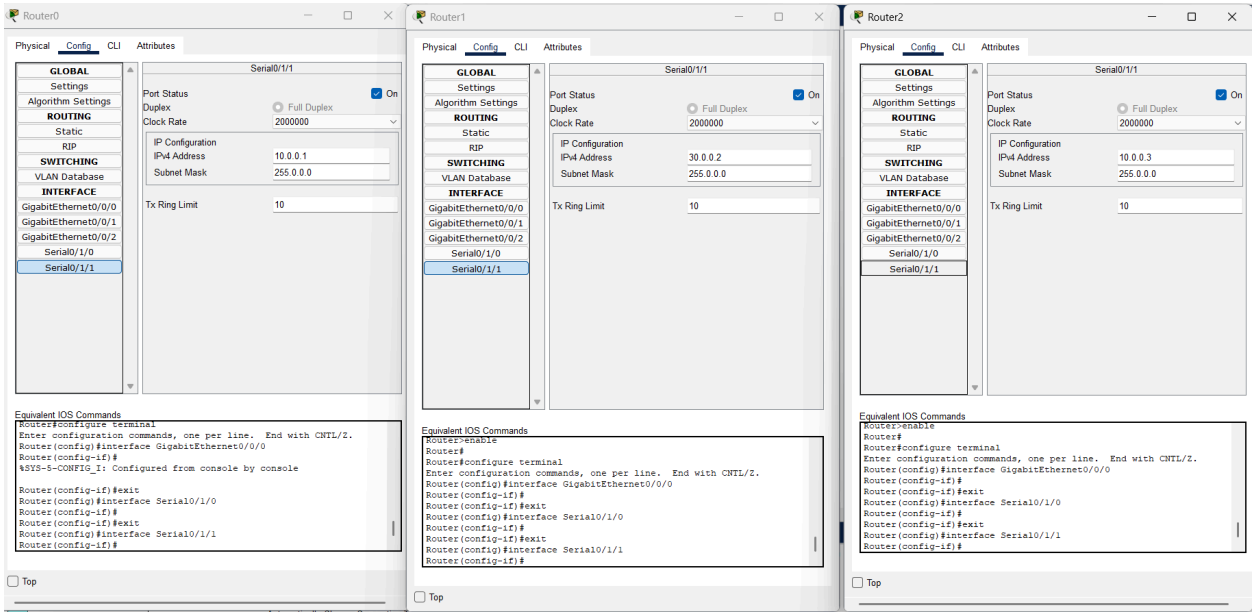
1) Create a network as given below. (XX indicates the last two digits of your enrollment no.)

2) Configure IP address (All Devices, Routers)

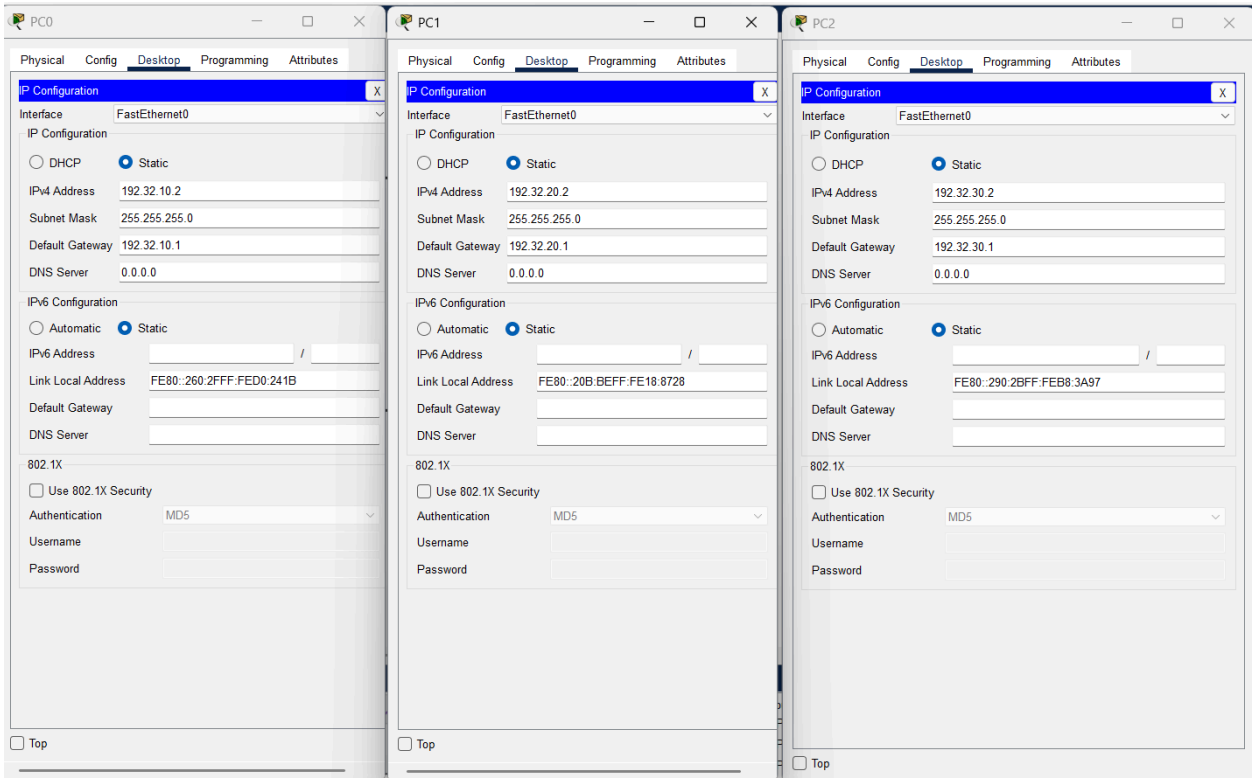
Routers:




Router0
Physical Config CLI Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0/0
GigabitEthernet0/0/1
GigabitEthernet0/0/2
Serial0/1/0
Serial0/1/1
Serial0/1/0
Port Status On
Duplex Full Duplex
Clock Rate 2000000
IP Configuration
IPv4 Address 20.0.0.1
Subnet Mask 255.0.0.0
Tx Ring Limit 10
Equivalent IOS Commands
Router(config-router)#
Router(config-router)#
Router(config-router)#end
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
%SYS-5-CONFIG_I: Configured from console by console
Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#
Top
Router1
Physical Config CLI Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0/0
GigabitEthernet0/0/1
GigabitEthernet0/0/2
Serial0/1/0
Serial0/1/1
Serial0/1/0
Port Status On
Duplex Full Duplex
Clock Rate 2000000
IP Configuration
IPv4 Address 20.0.0.2
Subnet Mask 255.0.0.0
Tx Ring Limit 10
Equivalent IOS Commands
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#
Top
Router2
Physical Config CLI Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0/0
GigabitEthernet0/0/1
GigabitEthernet0/0/2
Serial0/1/0
Serial0/1/1
Serial0/1/0
Port Status On
Duplex Full Duplex
Clock Rate 2000000
IP Configuration
IPv4 Address 30.0.0.3
Subnet Mask 255.0.0.0
Tx Ring Limit 10
Equivalent IOS Commands
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#
Top

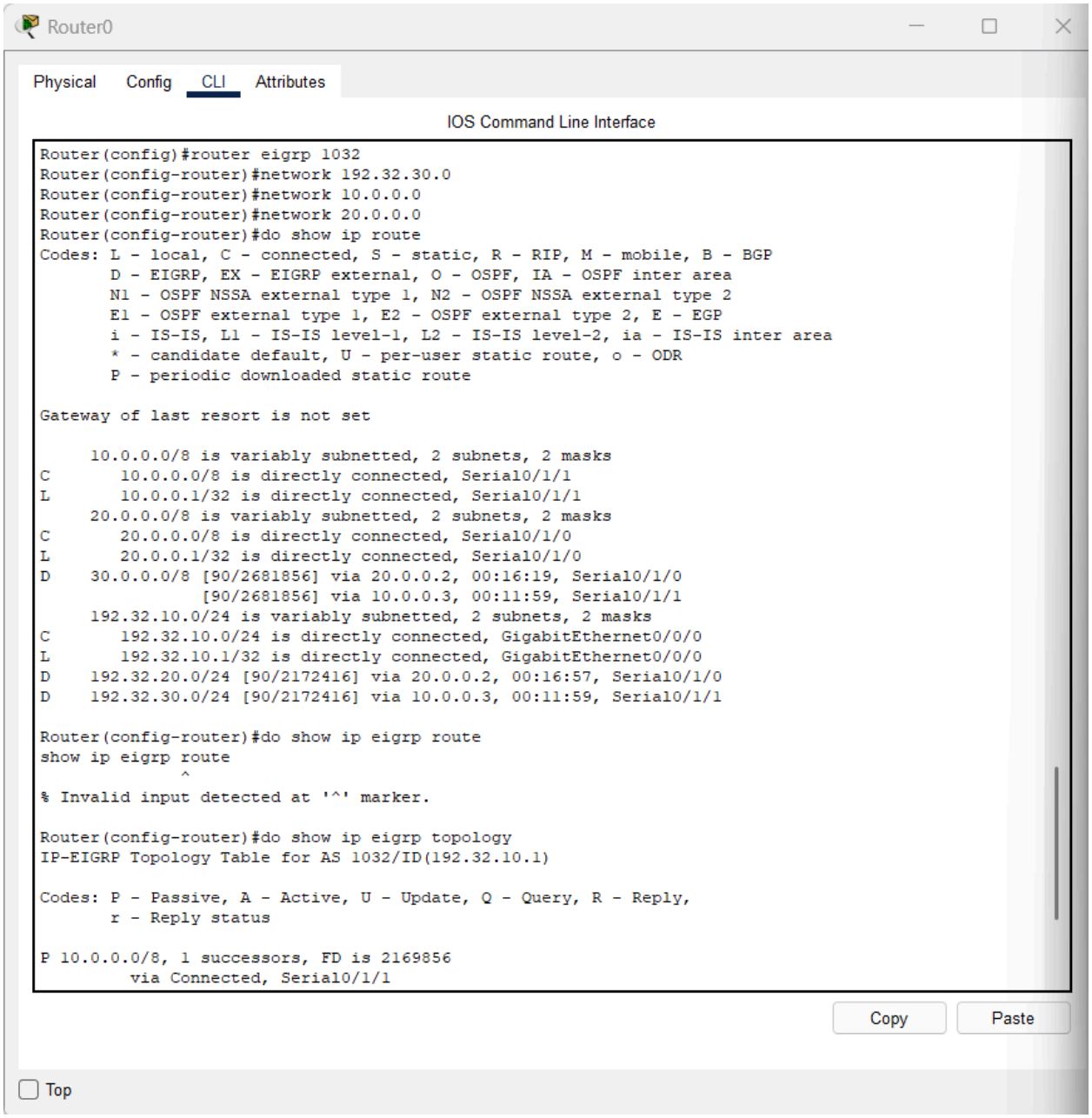

Router0
Physical Config CLI Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0/0
GigabitEthernet0/0/1
GigabitEthernet0/0/2
Serial0/1/0
Serial0/1/1
Serial0/1/1
Port Status On
Duplex Full Duplex
Clock Rate 2000000
IP Configuration
IPv4 Address 10.0.0.1
Subnet Mask 255.0.0.0
Tx Ring Limit 10
Equivalent IOS Commands
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
%SYS-5-CONFIG_I: Configured from console by console
Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/1
Router(config-if)#
Top
Router1
Physical Config CLI Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0/0
GigabitEthernet0/0/1
GigabitEthernet0/0/2
Serial0/1/0
Serial0/1/1
Serial0/1/1
Port Status On
Duplex Full Duplex
Clock Rate 2000000
IP Configuration
IPv4 Address 30.0.0.2
Subnet Mask 255.0.0.0
Tx Ring Limit 10
Equivalent IOS Commands
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/1
Router(config-if)#
Top
Router2
Physical Config CLI Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0/0
GigabitEthernet0/0/1
GigabitEthernet0/0/2
Serial0/1/0
Serial0/1/1
Serial0/1/1
Port Status On
Duplex Full Duplex
Clock Rate 2000000
IP Configuration
IPv4 Address 10.0.0.3
Subnet Mask 255.0.0.0
Tx Ring Limit 10
Equivalent IOS Commands
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/1
Router(config-if)#
Top

PCs:



3) Configure Border Gateway Protocol (EIGRP)

Configuration:


Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config)#router eigrp 1032
Router(config-router)#network 192.32.30.0
Router(config-router)#network 10.0.0.0
Router(config-router)#network 20.0.0.0
Router(config-router)#do show ip route
Codes: L - local, C - connected, S - static, 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 10.0.0.0/8 is directly connected, Serial0/1/1
L 10.0.0.1/32 is directly connected, Serial0/1/1
20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 20.0.0.0/8 is directly connected, Serial0/1/0
L 20.0.0.1/32 is directly connected, Serial0/1/0
D 30.0.0.0/8 [90/2681856] via 20.0.0.2, 00:16:19, Serial0/1/0
[90/2681856] via 10.0.0.3, 00:11:59, Serial0/1/1
192.32.10.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.32.10.0/24 is directly connected, GigabitEthernet0/0/0
L 192.32.10.1/32 is directly connected, GigabitEthernet0/0/0
D 192.32.20.0/24 [90/2172416] via 20.0.0.2, 00:16:57, Serial0/1/0
D 192.32.30.0/24 [90/2172416] via 10.0.0.3, 00:11:59, Serial0/1/1
Router(config-router)#do show ip eigrp route
show ip eigrp route
^
% Invalid input detected at '^' marker.
Router(config-router)#do show ip eigrp topology
IP-EIGRP Topology Table for AS 1032/ID(192.32.10.1)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
r - Reply status
P 10.0.0.0/8, 1 successors, FD is 2169856
via Connected, Serial0/1/1
Copy
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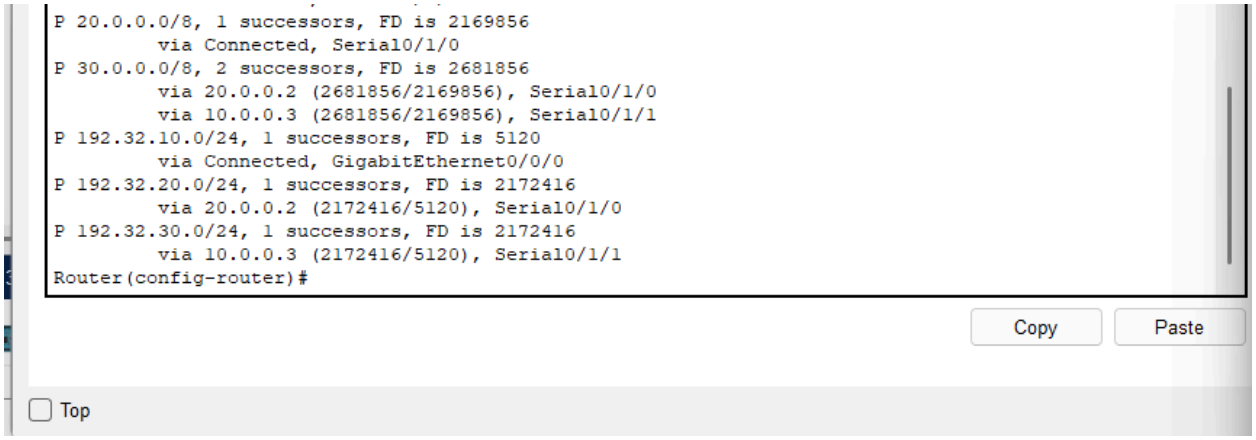
Top


P 20.0.0.0/8, 1 successors, FD is 2169856
via Connected, Serial0/1/0
P 30.0.0.0/8, 2 successors, FD is 2681856
via 20.0.0.2 (2681856/2169856), Serial0/1/0
via 10.0.0.3 (2681856/2169856), Serial0/1/1
P 192.32.10.0/24, 1 successors, FD is 5120
via Connected, GigabitEthernet0/0/0
P 192.32.20.0/24, 1 successors, FD is 2172416
via 20.0.0.2 (2172416/5120), Serial0/1/0
P 192.32.30.0/24, 1 successors, FD is 2172416
via 10.0.0.3 (2172416/5120), Serial0/1/1
Router(config-router)#
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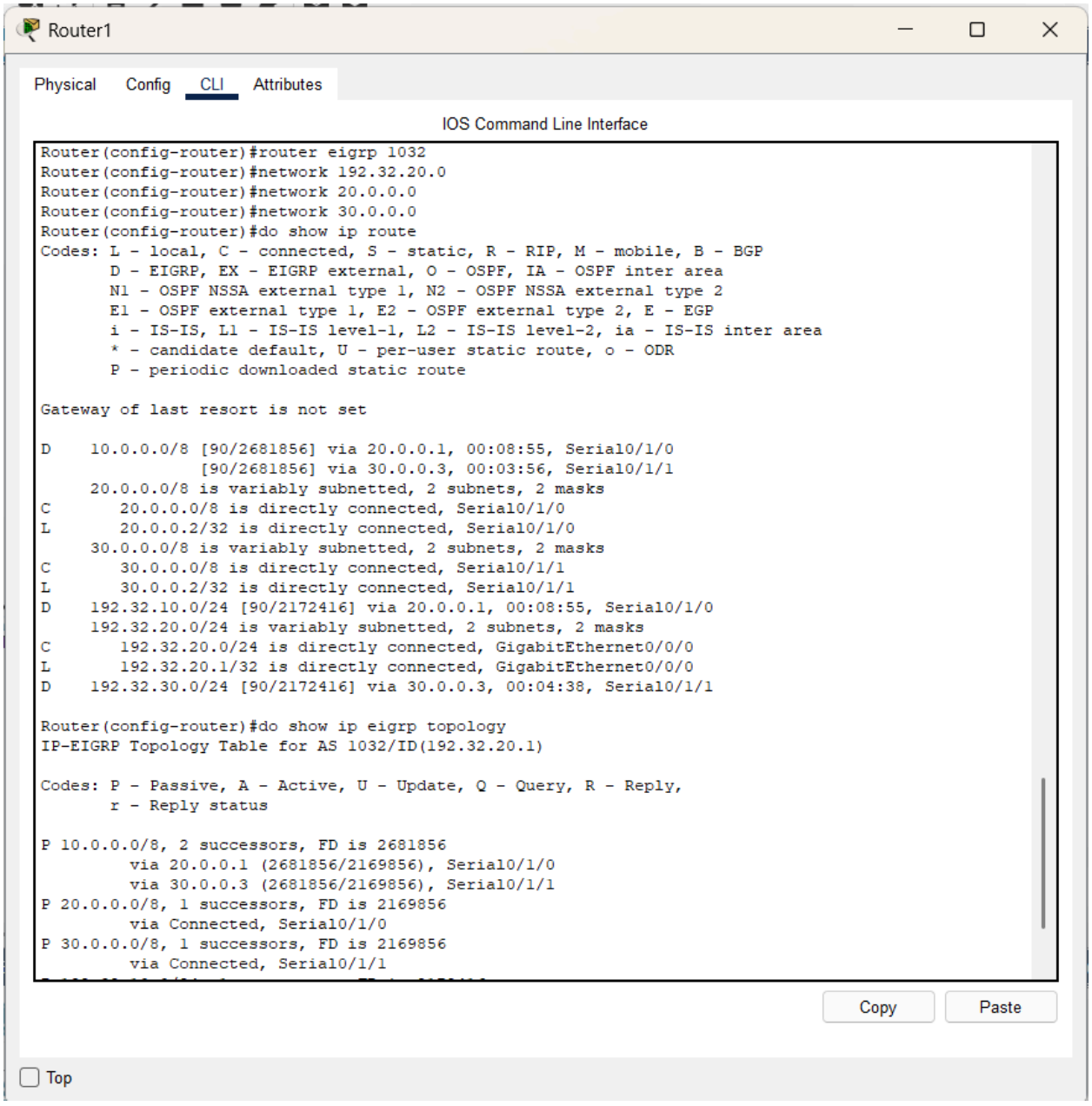
Top


Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config-router)#router eigrp 1032
Router(config-router)#network 192.32.20.0
Router(config-router)#network 20.0.0.0
Router(config-router)#network 30.0.0.0
Router(config-router)#do show ip route
Codes: L - local, C - connected, S - static, 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
D 10.0.0.0/8 [90/2681856] via 20.0.0.1, 00:08:55, Serial0/1/0
[90/2681856] via 30.0.0.3, 00:03:56, Serial0/1/1
20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 20.0.0.0/8 is directly connected, Serial0/1/0
L 20.0.0.2/32 is directly connected, Serial0/1/0
30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 30.0.0.0/8 is directly connected, Serial0/1/1
L 30.0.0.2/32 is directly connected, Serial0/1/1
D 192.32.10.0/24 [90/2172416] via 20.0.0.1, 00:08:55, Serial0/1/0
192.32.20.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.32.20.0/24 is directly connected, GigabitEthernet0/0/0
L 192.32.20.1/32 is directly connected, GigabitEthernet0/0/0
D 192.32.30.0/24 [90/2172416] via 30.0.0.3, 00:04:38, Serial0/1/1
Router(config-router)#do show ip eigrp topology
IP-EIGRP Topology Table for AS 1032/ID(192.32.20.1)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
r - Reply status
P 10.0.0.0/8, 2 successors, FD is 2681856
via 20.0.0.1 (2681856/2169856), Serial0/1/0
via 30.0.0.3 (2681856/2169856), Serial0/1/1
P 20.0.0.0/8, 1 successors, FD is 2169856
via Connected, Serial0/1/0
P 30.0.0.0/8, 1 successors, FD is 2169856
via Connected, Serial0/1/1
Copy
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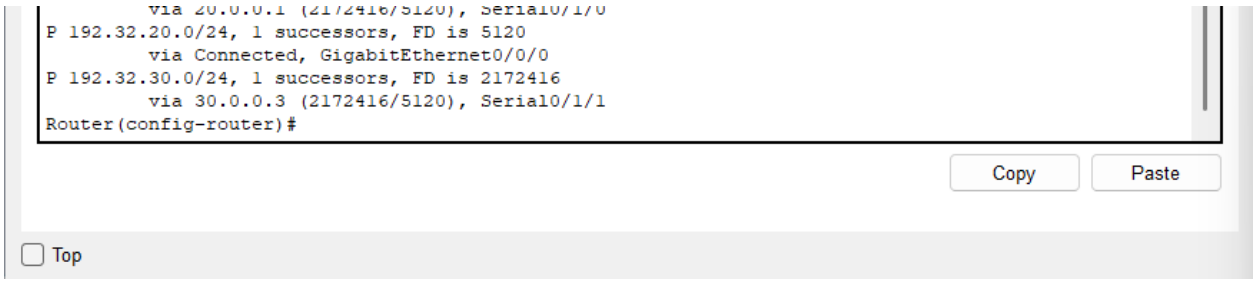
Top


via 20.0.0.1 (2172416/5120), Serial0/1/0
P 192.32.20.0/24, 1 successors, FD is 5120
via Connected, GigabitEthernet0/0/0
P 192.32.30.0/24, 1 successors, FD is 2172416
via 30.0.0.3 (2172416/5120), Serial0/1/1
Router(config-router)#
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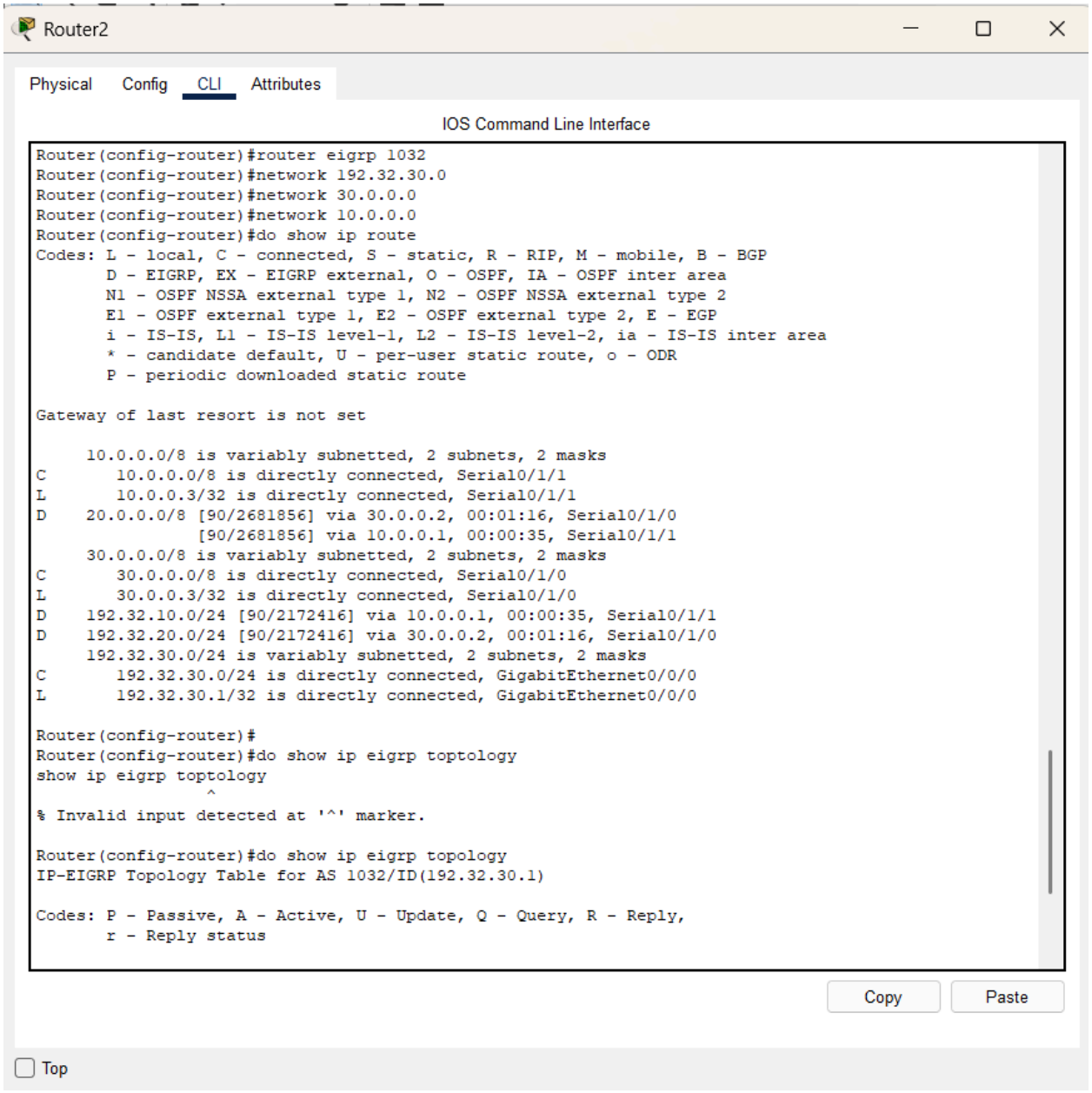
Top


Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config-router)#router eigrp 1032
Router(config-router)#network 192.32.30.0
Router(config-router)#network 30.0.0.0
Router(config-router)#network 10.0.0.0
Router(config-router)#do show ip route
Codes: L - local, C - connected, S - static, 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 10.0.0.0/8 is directly connected, Serial0/1/1
L 10.0.0.3/32 is directly connected, Serial0/1/1
D 20.0.0.0/8 [90/2681856] via 30.0.0.2, 00:01:16, Serial0/1/0
[90/2681856] via 10.0.0.1, 00:00:35, Serial0/1/1
30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 30.0.0.0/8 is directly connected, Serial0/1/0
L 30.0.0.3/32 is directly connected, Serial0/1/0
D 192.32.10.0/24 [90/2172416] via 10.0.0.1, 00:00:35, Serial0/1/1
D 192.32.20.0/24 [90/2172416] via 30.0.0.2, 00:01:16, Serial0/1/0
192.32.30.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.32.30.0/24 is directly connected, GigabitEthernet0/0/0
L 192.32.30.1/32 is directly connected, GigabitEthernet0/0/0
Router(config-router)#
Router(config-router)#do show ip eigrp toptology
show ip eigrp toptology
^
% Invalid input detected at '^' marker.
Router(config-router)#do show ip eigrp topology
IP-EIGRP Topology Table for AS 1032/ID(192.32.30.1)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
r - Reply status
Copy
Paste
Top

```
P 10.0.0.0/8, 1 successors, FD is 2169856
         via Connected, Serial0/1/1
P 20.0.0.0/8, 2 successors, FD is 2681856
         via 30.0.0.2 (2681856/2169856), Serial0/1/0
         via 10.0.0.1 (2681856/2169856), Serial0/1/1
P 30.0.0.0/8, 1 successors, FD is 2169856
         via Connected, Serial0/1/0
P 192.32.10.0/24, 1 successors, FD is 2172416
         via 10.0.0.1 (2172416/5120), Serial0/1/1
P 192.32.20.0/24, 1 successors, FD is 2172416
         via 30.0.0.2 (2172416/5120), Serial0/1/0
P 192.32.30.0/24, 1 successors, FD is 5120
         via Connected, GigabitEthernet0/0/0
Router(config-router)#
```

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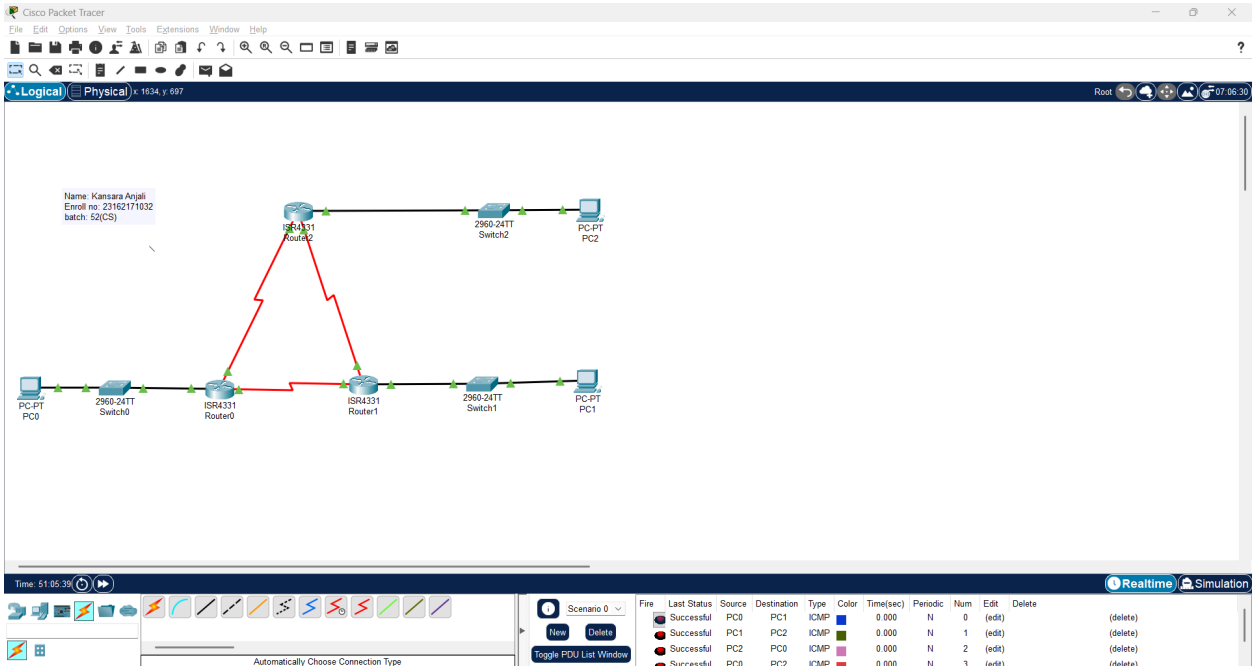
Top

Output:



Conclusion:

The network was successfully configured using EIGRP. All routers formed neighbor relationships, exchanged routes, and provided full connectivity between all departments. The routing tables and ping results verified that EIGRP worked correctly, achieving fast convergence and efficient dynamic routing across the network.