

INSTITUTE OF COMPUTER TECHNOLOGY
B-TECH COMPUTER SCIENCE ENGINEERING 2025-26
SUBJECT: COMPUTER NETWORKS

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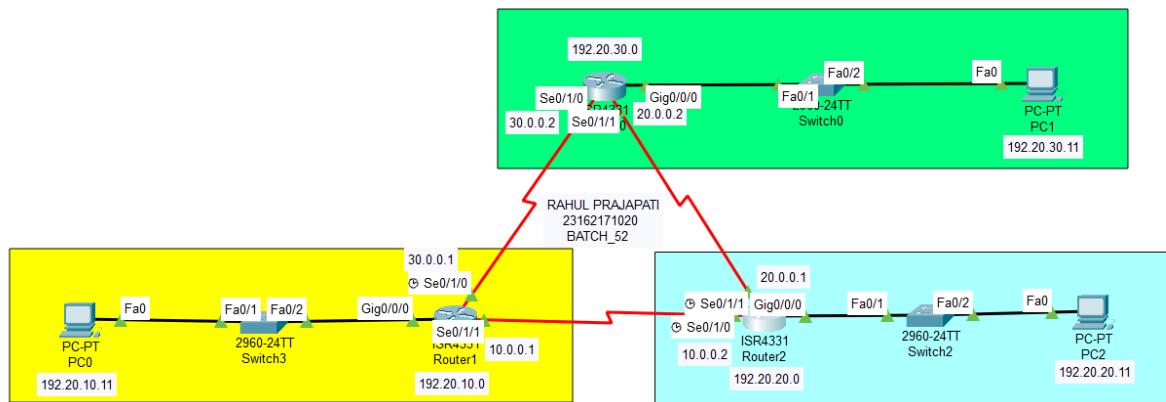
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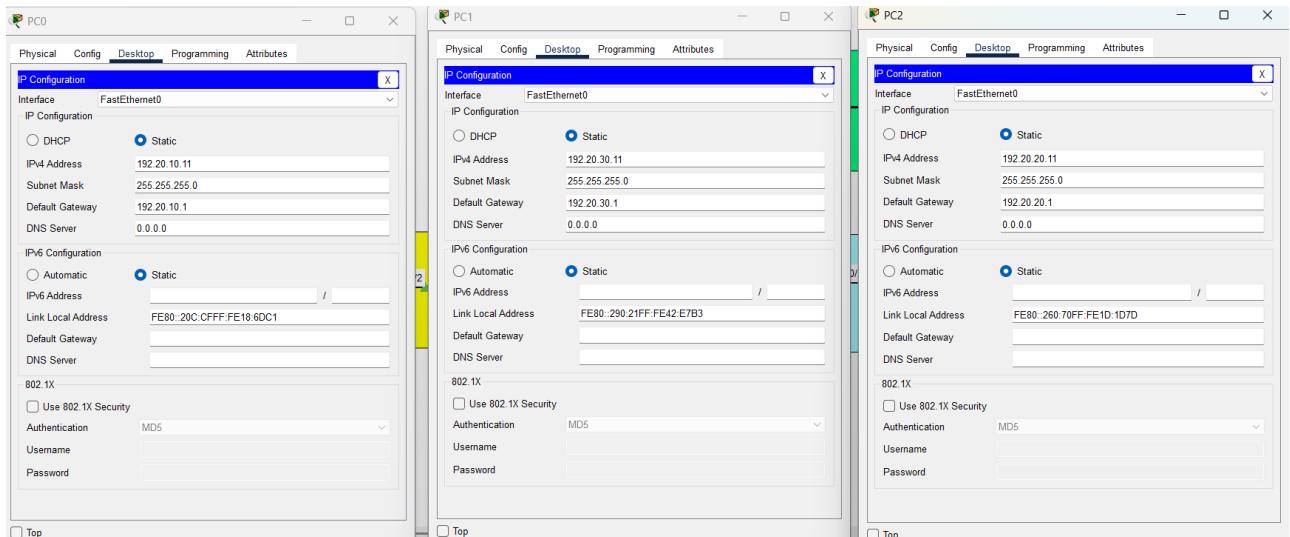
PRACTICAL_10

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

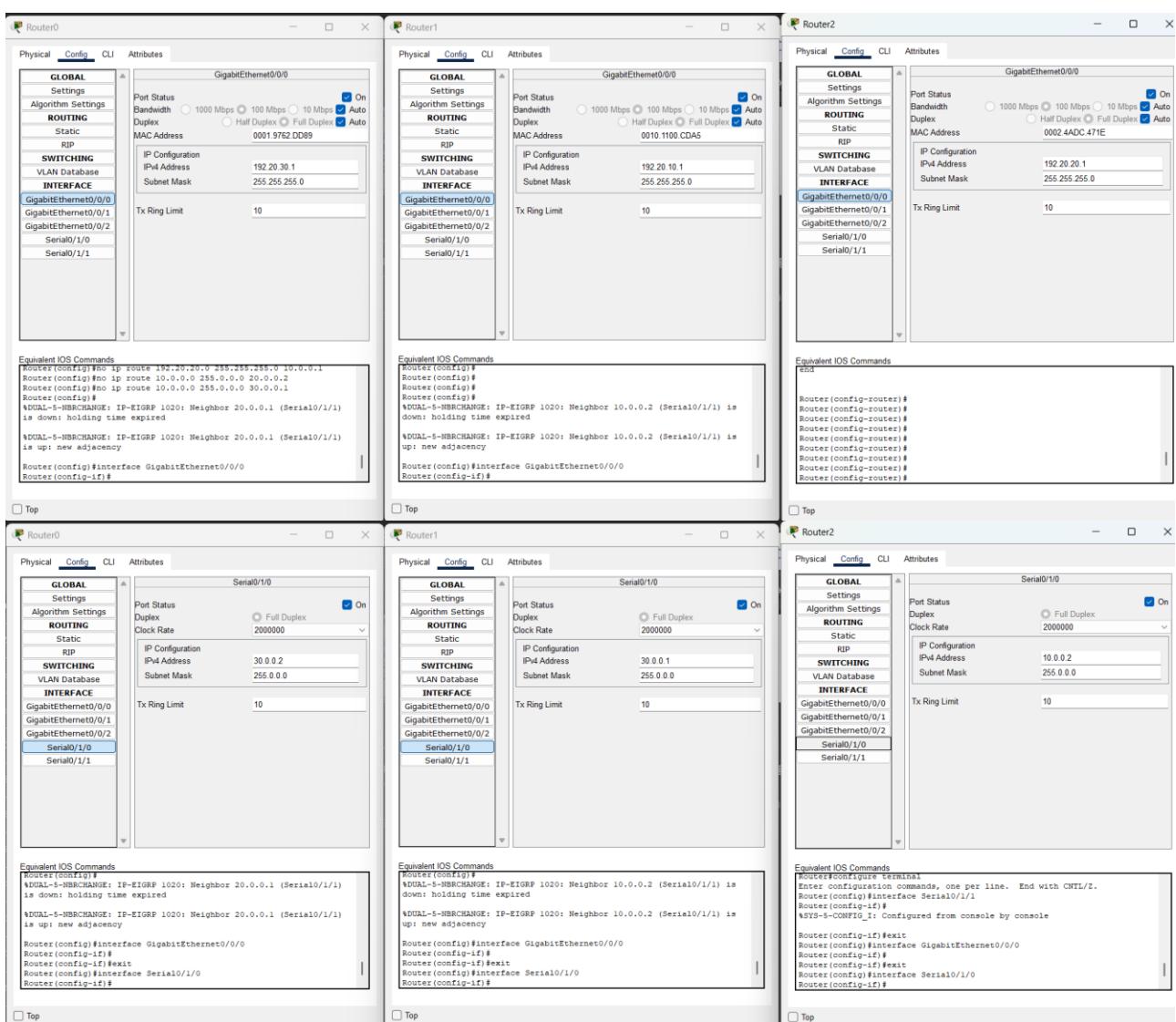
1. NETWORK DESIGN:



2. PCs_IP:



3. ROUTERS_IP_CONFIGURATION:



The figure displays three separate windows of the Cisco Router Configuration interface, each representing a different router (Router0, Router1, and Router2). Each window shows the configuration for a Serial0/1/1 interface.

Router0 Configuration:

- Global:** Settings, Algorithm Settings, Routing (Static), RIP, Switching, VLAN Database.
- ROUTING:** IP Configuration (IPv4 Address: 20.0.0.2, Subnet Mask: 255.0.0.0).
- INTERFACE:** GigabitEthernet0/0/0, GigabitEthernet0/0/1, GigabitEthernet0/0/2, Serial0/1/0, **Serial0/1/1**.

Equivalent IOS Commands:

```
%DUAL-5-NBRCHANGE: IP-EIGRP 1020: Neighbor 20.0.0.1 (Serial0/1/1) is up: new adjacency
```

```
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#exit
Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#exit
Router(config-if)#exit
Router(config)#interface Serial0/1/1
Router(config-if)#
```

Router1 Configuration:

- Global:** Settings, Algorithm Settings, Routing (Static), RIP, Switching, VLAN Database.
- ROUTING:** IP Configuration (IPv4 Address: 10.0.0.1, Subnet Mask: 255.0.0.0).
- INTERFACE:** GigabitEthernet0/0/0, GigabitEthernet0/0/1, GigabitEthernet0/0/2, Serial0/1/0, **Serial0/1/1**.

Equivalent IOS Commands:

```
%DUAL-5-NBRCHANGE: IP-EIGRP 1020: Neighbor 10.0.0.2 (Serial0/1/1) is up: new adjacency
```

```
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#exit
Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#exit
Router(config-if)#exit
Router(config)#interface Serial0/1/1
Router(config-if)#
```

Router2 Configuration:

- Global:** Settings, Algorithm Settings, Routing (Static), RIP, Switching, VLAN Database.
- ROUTING:** IP Configuration (IPv4 Address: 20.0.0.1, Subnet Mask: 255.0.0.0).
- INTERFACE:** GigabitEthernet0/0/0, GigabitEthernet0/0/1, GigabitEthernet0/0/2, Serial0/1/0, **Serial0/1/1**.

Equivalent IOS Commands:

```
%DUAL-5-NBRCHANGE: IP-EIGRP 1020: Neighbor 20.0.0.1 (Serial0/1/1) is up: new adjacency
```

```
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#exit
Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#exit
Router(config-if)#exit
Router(config)#interface Serial0/1/1
Router(config-if)#
```

4. IP_ROUTE & CONFIGURATION :

A. ROUTEs_1

Router1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
Router>enable
Router#conf ter
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router eigrp 1020
Router(config-router)#do sh ip int brief
Interface          IP-Address      OK? Method Status      Protocol
GigabitEthernet0/0/0 192.20.10.1    YES manual up        up
GigabitEthernet0/0/1 unassigned      YES unset administratively down down
GigabitEthernet0/0/2 unassigned      YES unset administratively down down
Serial0/1/0         30.0.0.1       YES manual up        up
Serial0/1/1         10.0.0.1       YES manual up        up
Vlan1              unassigned      YES unset administratively down down
Router(config-router)#network 192.20.10.0
Router(config-router)#network 30.0.0.0
Router(config-router)#network 10.0.0.0
Router(config-router)#do show ip route
```



Router1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
!
router eigrp 1020
network 192.20.10.0
network 30.0.0.0
network 10.0.0.0
!
```

Router1

Physical Config **CLI** Attributes

IOS Command Line Interface

```

ROUTER(config)#
ROUTER(config)#
ROUTER(config)#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
D        20.0.0.0/8 [90/2681856] via 30.0.0.2, 00:19:10, Serial0/1/0
                  [90/2681856] via 10.0.0.2, 00:17:43, 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        30.0.0.1/32 is directly connected, Serial0/1/0
            192.20.10.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.20.10.0/24 is directly connected, GigabitEthernet0/0/0
L        192.20.10.1/32 is directly connected, GigabitEthernet0/0/0
D        192.20.20.0/24 [90/2172416] via 10.0.0.2, 00:17:49, Serial0/1/1

ROUTER(config)#

```

A. ROUTER_0:

Router0

Physical Config **CLI** Attributes

IOS Command Line Interface

```

Router>
Router>
Router>enable
Router#conf ter
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router eigrp 1020
Router(config-router)#do show ip interface brief
Interface          IP-Address      OK? Method Status      Protocol
GigabitEthernet0/0/0 192.20.30.1    YES manual up       up
GigabitEthernet0/0/1 unassigned      YES unset administratively down down
GigabitEthernet0/0/2 unassigned      YES unset administratively down down
Serial0/1/0         30.0.0.2       YES manual up       up
Serial0/1/1         20.0.0.2       YES manual up       up
Vlan1              unassigned      YES unset administratively down down
Router(config-router)#network 120.20.30.0
Router(config-router)#network 30.0.0.0
Router(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 1020: Neighbor 30.0.0.1 (Serial0/1/0) is up: new adjacency
Router(config-router)#network 20.0.0.0

```

Router0

Physical Config **CLI** Attributes

IOS Command Line Interface

```

router eigrp 1020
network 120.0.0.0
network 30.0.0.0
network 20.0.0.0
!

```

Router0

Physical Config **CLI** Attributes

IOS Command Line Interface

```

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

S    10.0.0.0/8 [1/0] via 20.0.0.1
      [1/0] via 30.0.0.1
      20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C      20.0.0.0/8 is directly connected, Serial0/1/1
L      20.0.0.2/32 is directly connected, 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      30.0.0.2/32 is directly connected, Serial0/1/0
D    192.20.10.0/24 [90/2172416] via 30.0.0.1, 00:07:22, Serial0/1/0
S    192.20.20.0/24 [1/0] via 10.0.0.1
      192.20.30.0/24 is variably subnetted, 2 subnets, 2 masks
C      192.20.30.0/24 is directly connected, GigabitEthernet0/0/0
L      192.20.30.1/32 is directly connected, GigabitEthernet0/0/0

Router(config-router)#

```

A. ROUTER_2:

Router2

Physical Config **CLI** Attributes

IOS Command Line Interface

```

Router>enable
Router#conf ter
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router eigrp 1020
Router(config-router)#do show ip interface brief
Interface          IP-Address      OK? Method Status      Protocol
GigabitEthernet0/0/0 192.20.20.1    YES manual up       up
GigabitEthernet0/0/1 unassigned      YES unset administratively down down
GigabitEthernet0/0/2 unassigned      YES unset administratively down down
Serial0/1/0         10.0.0.2      YES manual up       up
Serial0/1/1         20.0.0.1      YES manual up       up
Vlan1              unassigned      YES unset administratively down down
Router(config-router)#network 192.20.20.0
Router(config-router)#network 20.0.0.0
Router(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 1020: Neighbor 20.0.0.2 (Serial0/1/1) is up: new adjacency

Router(config-router)#network 10.0.0.0
Router(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 1020: Neighbor 10.0.0.1 (Serial0/1/0) is up: new adjacency

Router(config-router)#do show ip route

```

Router2

Physical Config **CLI** Attributes

IOS Command Line Interface

```
!
interface Vlan1
no ip address
shutdown
!
router eigrp 1020
network 192.20.20.0
network 20.0.0.0
network 10.0.0.0
!
```

Router2

Physical Config **CLI** Attributes

IOS Command Line Interface

```
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, Serial0/1/0
L        10.0.0.2/32 is directly connected, Serial0/1/0
      20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C        20.0.0.0/8 is directly connected, Serial0/1/1
L        20.0.0.1/32 is directly connected, Serial0/1/1
D        30.0.0.0/8 [90/2681856] via 20.0.0.2, 00:00:16, Serial0/1/1
                  [90/2681856] via 10.0.0.1, 00:00:08, Serial0/1/0
D        192.20.10.0/24 [90/2172416] via 10.0.0.1, 00:00:08, Serial0/1/0
      192.20.20.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.20.20.0/24 is directly connected, GigabitEthernet0/0/0
L        192.20.20.1/32 is directly connected, GigabitEthernet0/0/0

Router(config-router)#

```

Conclusion:

EIGRP was successfully configured. After assigning IP addresses and enabling EIGRP on all routers, they exchanged routing information within the same autonomous system. This verified that EIGRP provides fast convergence, efficient route calculation, and stable communication across the internal network.