



STUDENT LAB GUIDE

CCNA (640-802)



Developed By,

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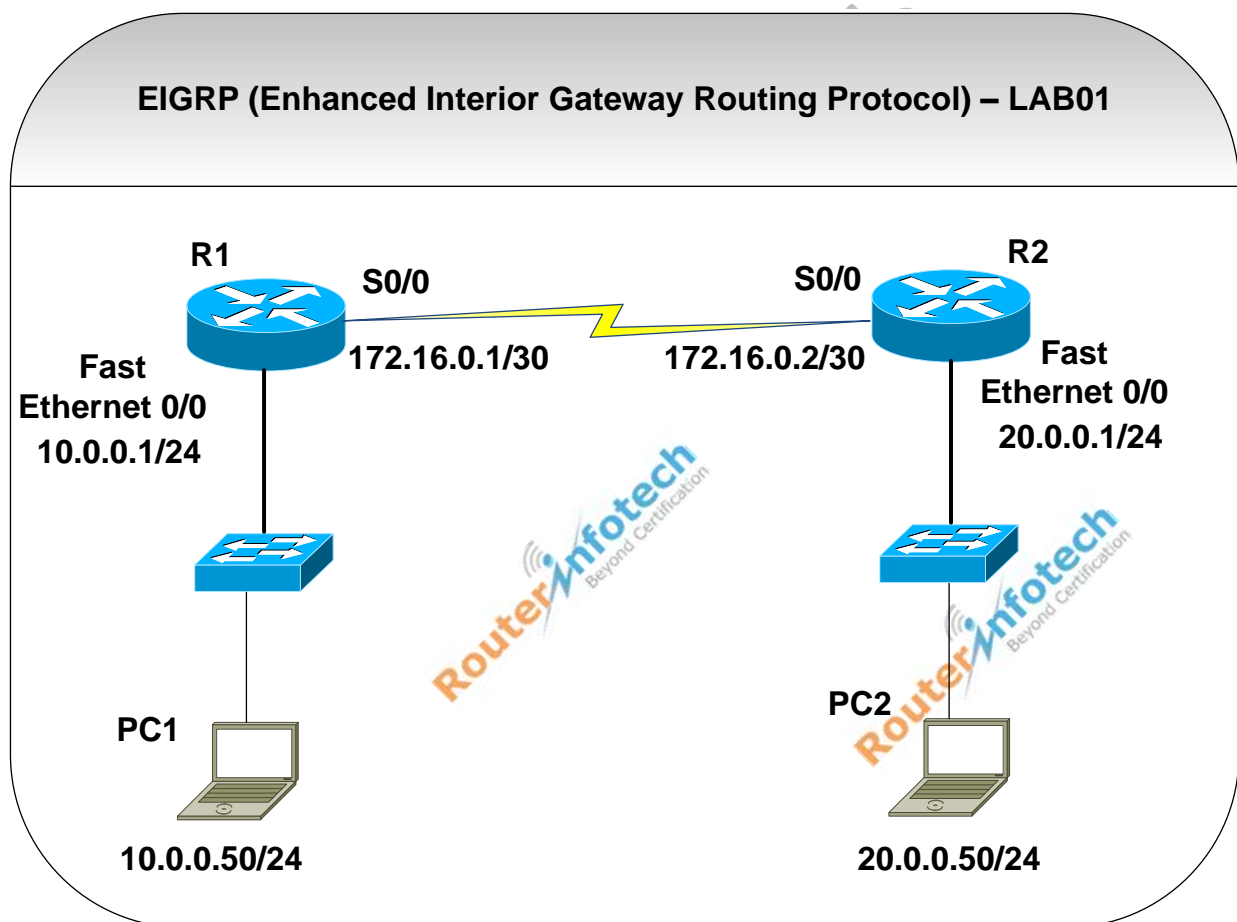
LAB: 06

Routing Protocols: EIGRP Configuration

Objective:

Understanding the Routing Updates process using Enhanced Interior Gateway Routing Protocol (EIGRP).

Topology:



Procedure:

1. Configuring & Assigning the IP addresses on the routers R1 & R2.
2. Check the routing table on both the routers.
3. Enable the EIGRP protocol on both routers so that hosts on the both routers can communicate with each other.
4. Verifying the Routing protocols on the Router.
5. Check the routing table on both the routers after enabling the EIGRP on both sides.
6. Verifying the connection of both hosts.

Configuration:

Step 1:

- 1.1 : Assigning the IP addresses on the FastEthernet & Serial Interfaces of Router R1 as shown in figure.**

```
Router#conf t
Router(config)#hostname R1
R1(config)#int fastEthernet 0/0
R1(config-if)#ip address 10.0.0.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#end

R1(config)#int serial 0/0
R1(config-if)#ip address 172.16.0.1 255.255.255.252
R1(config-if)#no shutdown
R1(config-if)#^Z
R1#
```

Check the DCE Interface and configure clock rate 64000

```
R1#sh controllers serial 0/0
Interface Serial0/0
Hardware is PowerQUICC MPC860
DCE V.35, no clock
idb at 0x81081AC4, driver data structure at 0x81084AC0
SCC Registers:
```

Configure Clock Rate on DCE Interface:

```
R1(config)#int serial 0/0
```

```
R1(config-if)#clock rate 64000
R1(config-if)#^Z
R1#
```

1.2: Assigning the IP addresses on the FastEthernet & Serial Interfaces of Router R2 as shown in figure.

Step 2:

2.1 : Check the Routing table of the Router R1.

```
R1#sh 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

 10.0.0.0/24 is subnetted, 1 subnets
 C       10.0.0.0 is directly connected, FastEthernet0/0
 172.16.0.0/30 is subnetted, 1 subnets
 C       172.16.0.0 is directly connected, Serial0/0
R1#
```

2.2: Check the Routing table of the Router R2.

```
R2#sh 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
```

20.0.0.0/24 is subnetted, 1 subnets

C 20.0.0.0 is directly connected, FastEthernet0/0

172.16.0.0/30 is subnetted, 1 subnets

C 172.16.0.0 is directly connected, Serial0/0

R2#

Step 3: Enable the EIGRP protocol on the Router R1 and R2

3.1 : Enable the EIGRP protocol on the Router R1.

```
R1(config)#router eigrp ?
  <1-65535> Autonomous system number
R1(config)#router eigrp 100
R1(config-router)#network ?
  A.B.C.D Network number
R1(config-router)#network 10.0.0.0 0.0.0.255
  (Network to be advertised which is Directly Connected)
R1(config-router)#network 172.16.0.0 0.0.0.3
  (Network to be advertised which is Directly Connected)
R1(config-router)#no auto-summary
R1(config-router)#^Z
R1#
```

Step 3.2 : Enable the EIGRP protocol on the Router R2.

```
R2(config)#router eigrp 100
R2(config-router)#network 20.0.0.0 0.0.0.255
R2(config-router)#network 172.16.0.0 0.0.0.3
R2(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 100: Neighbor 172.16.0.1 (Serial0/0)
is up: new adjacency
R2(config-router)#no auto-summary
R2(config-router)#end
R2#
```

Step 4:

4.1: Check the Routing Protocol on the Router R1.

```
R1#sh ip protocols
Routing Protocol is "eigrp 100 "
  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 100
  Automatic network summarization is not in effect
  Maximum path: 4
  Routing for Networks:
    10.0.0.0/24
    172.16.0.0/30
  Routing Information Sources:
    Gateway         Distance      Last Update
    172.16.0.2      90           2024507
  Distance: internal 90 external 170
```

4.2: Check the Routing Protocol on the Router R2.

```
R2#sh ip protocols
Routing Protocol is "eigrp 100 "
  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 100
  Automatic network summarization is not in effect
  Maximum path: 4
  Routing for Networks:
    20.0.0.0/24
    172.16.0.0/30
  Routing Information Sources:
    Gateway         Distance      Last Update
    172.16.0.1      90           1640767
```

Distance: internal 90 external 170

Step 5:

5.1: Check the Routing table of the Router R1 after enabling EIGRP.

```
R1#sh 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
```

```

10.0.0.0/24 is subnetted, 1 subnets
C    10.0.0.0 is directly connected, FastEthernet0/0
20.0.0.0/24 is subnetted, 1 subnets
D    20.0.0.0 [90/20514560] via 172.16.0.2, 00:05:05, Serial0/0
    172.16.0.0/30 is subnetted, 1 subnets
C    172.16.0.0 is directly connected, Serial0/0
R1#

```

5.2: Check the Routing table of the Router R2 after enabling EIGRP.

```
R2#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
```

```

10.0.0.0/24 is subnetted, 1 subnets
D    10.0.0.0 [90/20514560] via 172.16.0.1, 00:06:25, Serial0/0
    20.0.0.0/24 is subnetted, 1 subnets
C    20.0.0.0 is directly connected, FastEthernet0/0

```

```
172.16.0.0/30 is subnetted, 1 subnets
C    172.16.0.0 is directly connected, Serial0/0
R2#
```

Step 6: Verifying the connection of PC1 & PC2.

From PC1

```
PC1>ipconfig
```

```
IP Address.....: 10.0.0.50
Subnet Mask.....: 255.255.255.0
Default Gateway.....: 10.0.0.1
```

```
PC1>ping 20.0.0.50
```

Pinging 20.0.0.50 with 32 bytes of data:

```
Reply from 20.0.0.50: bytes=32 time=12ms TTL=126
Reply from 20.0.0.50: bytes=32 time=24ms TTL=126
Reply from 20.0.0.50: bytes=32 time=18ms TTL=126
Reply from 20.0.0.50: bytes=32 time=18ms TTL=126
```

Ping statistics for 20.0.0.50:

```
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 12ms, Maximum = 24ms, Average = 18ms
```

```
PC1>
```

From PC2

```
PC2>ipconfig
```

```
IP Address.....: 20.0.0.50
Subnet Mask.....: 255.255.255.0
Default Gateway.....: 20.0.0.1
```

```
PC2>ping 10.0.0.1
```

Pinging 10.0.0.1 with 32 bytes of data:

```
Reply from 10.0.0.1: bytes=32 time=8ms TTL=254
Reply from 10.0.0.1: bytes=32 time=9ms TTL=254
Reply from 10.0.0.1: bytes=32 time=11ms TTL=254
Reply from 10.0.0.1: bytes=32 time=13ms TTL=254
```


Ping statistics for 10.0.0.1:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 8ms, Maximum = 13ms, Average = 10ms

PC>

COOL COOL



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