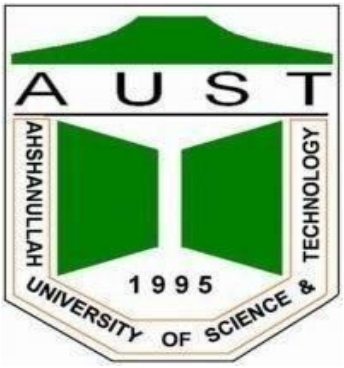


AHSANULLAH UNIVERSITY OF SCIENCE AND ENGINEERING

Department of Computer Science & Engineering

Assignment Submission On EIGRP

Course Name : Computer Network Lab

Course No : CSE 4102

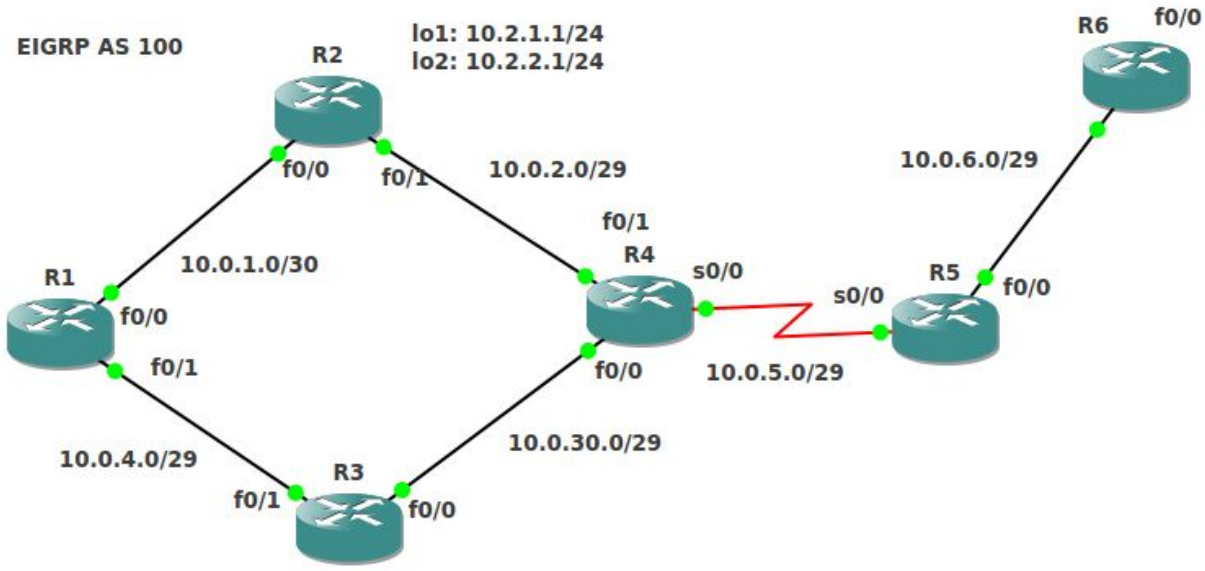
Submitted By

Name : Sadia Afrin Purba

Section : A2

ID : 15-01-04-045

Given Topology



What is EIGRP

EIGRP (Enhanced Interior Gateway Routing Protocol) is a network protocol that lets routers exchange information more efficiently than with earlier network protocols. EIGRP evolved from IGRP (Interior Gateway Routing Protocol).

Using EIGRP, a router keeps a copy of its neighbor's routing tables. If it can't find a route to a destination in one of these tables, it queries its neighbors for a route and they in turn query their neighbors until a route is found. When a routing table entry changes in one of the routers, it notifies its neighbors of the change only (some earlier protocols require sending the entire table).

EIGRP uses the Diffusing-Update Algorithm (DUAL) to determine the most efficient (*least cost*) route to a destination.

EIGRP is applied on the above topology. The configuration commands are given below:

Commands

ROUTER 1:
Router>enable //Enable to administrative mode Router#configure terminal **Router(config)#interface serial 2/0** //for configuring the serial interface. Router to router is connected through serial interface Router(config-if)#ip address 10.0.1.1 255.255.255.252 //255.255.255.252 is the sub-mask and 10.0.1.1/30 is the ip address Router(config-if)#clock rate 64000 This command applies only to DCE interfaces Router(config-if)#no shutdown
Router(config)#interface serial 3/0 //255.255.255.248 is the sub-mask and 10.0.1.4/29 is the ip address Router(config-if)#ip address 10.0.4.1 255.255.255.248 Router(config-if)#clock rate 64000 Router(config-if)#no shutdown %LINK-5-CHANGED: Interface Serial3/0, changed state to down
For saving all the changes to the memory **Router#copy running-config startup-config** Destination filename [startup-config]? Building configuration...[OK]

Router-2
Router>enable Router#configure terminal **Router(config)#interface serial 3/0** Router(config-if)#ip address 10.0.1.2 255.255.255.252 Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial3/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up

Router(config)#interface serial 2/0
Router(config-if)#ip address 10.0.2.1 255.255.255.248
Router(config-if)#clock rate 64000
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial2/0, changed state to down

Loopback Configuration

//A loopback address is a type of IP address that is used to test the communication or transportation medium on a local network card and/or for testing network applications.
Router(config)#int lo0
Router(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
Router(config-if)#ip address 10.2.1.1 255.255.255.0
Router(config-if)#exit

Router(config)#int lo1
Router(config-if)#
%LINK-5-CHANGED: Interface Loopback1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback1, changed state to up
Router(config-if)#ip address 10.2.2.1 255.255.255.0
Router(config-if)#exit

Check Loopback

Router#show interface loopback0	**Router#show interface loopback1**
Loopback0 is up, line protocol is up (connected) Hardware is Loopback Internet address is 10.2.1.1/24 MTU 1514 bytes, BW 8000000 Kbit, DLY 5000 usec, reliability 255/255, txload 1/255, rxload 1/255 Encapsulation LOOPBACK, loopback not set Last input never, output never, output hang never	Loopback1 is up, line protocol is up (connected) Hardware is Loopback Internet address is 10.2.2.1/24 MTU 1514 bytes, BW 8000000 Kbit, DLY 5000 usec, reliability 255/255, txload 1/255, rxload 1/255 Encapsulation LOOPBACK, loopback not set Last input never, output never, output hang never

Last clearing of "show interface" counters never Queueing strategy: fifo Output queue 0/0, 0 drops; input queue 0/75, 0 drops 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0 packets/sec …...	Last clearing of "show interface" counters never Queueing strategy: fifo Output queue 0/0, 0 drops; input queue 0/75, 0 drops 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0 packets/sec 0 packets input, 0 bytes, 0 no buffer Received 0 broadcasts, 0 runts, 0 giants, 0 throttles …..

Router-3
Router>enable Router#configure terminal **Router(config)#interface serial 3/0** Router(config-if)#ip address 10.0.30.2 255.255.255.248 Router(config-if)#no shutdown Router(config-if)# %LINK-5-CHANGED: Interface Serial3/0, changed state to up %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
Router(config)#interface serial 2/0 Router(config-if)#ip address 10.0.4.2 255.255.255.248 Router(config-if)#no shutdown Router(config-if)# %LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router 4
Router>enable Router#configure terminal **Router(config)#interface serial 2/0** Router(config-if)#ip address 10.0.2.2 255.255.255.248 Router(config-if)#no shutdown Router(config-if)# %LINK-5-CHANGED: Interface Serial2/0, changed state to up %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up it
Router(config)#interface serial 3/0 Router(config-if)#ip address 10.0.30.1 255.255.255.248 Router(config-if)#clock rate 64000 Router(config-if)#no shutdown %LINK-5-CHANGED: Interface Serial3/0, changed state to down Router(config-if)#exit
Router(config)#interface serial 6/0 Router(config-if)#ip address 10.0.5.1 255.255.255.248 Router(config-if)#clock rate 64000 Router(config-if)#no shutdown

Router 5
Router>enable Router#configure terminal **Router(config)#interface serial 2/0** Router(config-if)#ip address 10.0.5.2 255.255.255.248 Router(config-if)#no shutdown %LINK-5-CHANGED: Interface Serial2/0, changed state to up Router(config-if)#exit
Router(config)#interface serial 3/0 Router(config-if)#ip address 10.0.6.1 255.255.255.248 Router(config-if)#clock rate 64000

This command applies only to DCE interfaces
Router(config-if)#no shutdown

Router 6
Router>enable Router#configure terminal **Router(config)#interface serial 2/0** Router(config-if)#ip address 10.0.6.2 255.255.255.248 Router(config-if)#clock rate 64000 This command applies only to DCE interfaces Router(config-if)#no shutdown %LINK-5-CHANGED: Interface Serial2/0, changed state to up

EIGRP

Configuring EIGRP For ROUTER 1

Router(config)#router eigrp 100
Router(config-router)#network 10.0.1.0 0.0.0.3 //ip address 10.0.1.0/30 and wildcard mask 0.0.0.3
Router(config-router)#network 10.0.4.0 0.0.0.7 //ip address 10.0.4.0/29 and wildcard mask 0.0.0.7

For Verifying EIGRP
Router#show 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 in effect

Automatic address summarization:
Maximum path: 4
Routing for Networks:
10.0.1.0/30
10.0.4.0/29
Routing Information Sources:
Gateway Distance Last Update
Distance: internal 90 external 170

For Showing The Routing Table

Router#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
10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 10.0.1.0/30 is directly connected, Serial2/0
C 10.0.4.0/29 is directly connected, Serial3/0

Configuring EIGRP For ROUTER 2

Router>enable
Router#configure terminal
Router(config)#router eigrp 100
Router(config-router)#network 10.0.1.0 0.0.0.3
%DUAL-5-NBRCHANGE: IP-EIGRP 100: Neighbor 10.0.1.1 (Serial3/0) is up: new adjacency
Router(config-router)#network 10.0.2.0 0.0.0.7

To See The Neighbors of Router 2

Router#show ip eigrp neighbors

IP-EIGRP neighbors for process 100
H Address Interface Hold Uptime SRTT RTO Q Seq
(sec) (ms) Cnt Num
0 10.0.1.1 Se3/0 13 00:01:12 40 1000 0 3

For Verifying EIGRP in Router 2

Router#show ip protocols

Routing Protocol is "eigrp 100 "
….
….
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 in effect
Automatic address summarization:
Maximum path: 4
Routing for Networks:
10.0.1.0/30
10.0.2.0/29
Routing Information Sources:
Gateway Distance Last Update
10.0.1.1 90 2461650
Distance: internal 90 external 170

Showing The Routing Table of Router 2

Router#show ip route
10.0.0.0/8 is variably subnetted, 5 subnets, 3 masks
C 10.0.1.0/30 is directly connected, Serial3/0
C 10.0.2.0/29 is directly connected, Serial2/0
D 10.0.4.0/29 [90/21024000] via 10.0.1.1, 00:01:40, Serial3/0
C 10.2.1.0/24 is directly connected, Loopback0
C 10.2.2.0/24 is directly connected, Loopback1

Configuring EIGRP For ROUTER 3

Router(config)#router eigrp 100
Router(config-router)#network 10.0.4.0 0.0.0.7
%DUAL-5-NBRCHANGE: IP-EIGRP 100: Neighbor 10.0.4.1 (Serial2/0) is up: new adjacency

Router(config-router)#network 10.0.30.0 0.0.0.7

For Verifying EIGRP in Router 3

Router#show 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 in effect
Automatic address summarization:
Maximum path: 4
Routing for Networks:
10.0.4.0/29
10.0.30.0/29
Routing Information Sources:
Gateway Distance Last Update
10.0.4.1 90 3957454
Distance: internal 90 external 170

Showing The Routing Table of Router 3

Router#show ip route
10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
D 10.0.1.0/30 [90/21024000] via 10.0.4.1, 00:00:51, Serial2/0
D 10.0.2.0/29 [90/21536000] via 10.0.4.1, 00:00:51, Serial2/0
C 10.0.4.0/29 is directly connected, Serial2/0
C 10.0.30.0/29 is directly connected, Serial3/0

To See The Neighbors of Router 3

Router#show ip eigrp neighbors
IP-EIGRP neighbors for process 100
H Address Interface Hold Uptime SRTT RTO Q Seq
(sec) (ms) Cnt Num
0 10.0.4.1 Se2/0 12 00:00:40 40 1000 0 6

Configuring EIGRP For ROUTER 4

Router(config)#router eigrp 100
Router(config-router)#network 10.0.2.0 0.0.0.7
%DUAL-5-NBRCHANGE: IP-EIGRP 100: Neighbor 10.0.2.1 (Serial2/0) is up: new adjacency
Router(config-router)#network 10.0.30.0 0.0.0.7
%DUAL-5-NBRCHANGE: IP-EIGRP 100: Neighbor 10.0.30.2 (Serial3/0) is up: new adjacency
Router(config-router)#network 10.0.5.0 0.0.0.7

For Verifying EIGRP in Router 4

Router#show 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 in effect
Automatic address summarization:
Maximum path: 4
Routing for Networks:
10.0.2.0/29
10.0.30.0/29
10.0.5.0/29
Routing Information Sources:
Gateway Distance Last Update
10.0.2.1 90 3931838
10.0.30.2 90 3948280
Distance: internal 90 external 170

Showing The Routing Table of Router 4

Router#show ip route
10.0.0.0/8 is variably subnetted, 5 subnets, 2 masks

D 10.0.1.0/30 [90/21024000] via 10.0.2.1, 00:01:23, Serial2/0
C 10.0.2.0/29 is directly connected, Serial2/0
D 10.0.4.0/29 [90/21024000] via 10.0.30.2, 00:01:06, Serial3/0
C 10.0.5.0/29 is directly connected, Serial6/0
C 10.0.30.0/29 is directly connected, Serial3/0
C 10.0.30.0/29 is directly connected, Serial3/0

To See The Neighbors of Router 4

Router#show ip eigrp neighbors
IP-EIGRP neighbors for process 100
H Address Interface Hold Uptime SRTT RTO Q Seq
(sec) (ms) Cnt Num
0 10.0.2.1 Se2/0 13 00:01:15 40 1000 0 12
1 10.0.30.2 Se3/0 12 00:00:58 40 1000 0 12

Configuring EIGRP For ROUTER 5

Router(config)#router eigrp 100
Router(config-router)#network 10.0.5.0 0.0.0.7
%DUAL-5-NBRCHANGE: IP-EIGRP 100: Neighbor 10.0.5.1 (Serial2/0) is up: new adjacency
Router(config-router)#network 10.0.6.0 0.0.0.7

For Verifying EIGRP in Router 5

Router#show 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 in effect
Automatic address summarization:
Maximum path: 4
Routing for Networks:

10.0.5.0/29
10.0.6.0/29
Routing Information Sources:
Gateway Distance Last Update
10.0.5.1 90 4371370
Distance: internal 90 external 170

Showing The Routing Table of Router 5

Router#show ip route
10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
D 10.0.1.0/30 [90/21536000] via 10.0.5.1, 00:02:03, Serial2/0
D 10.0.2.0/29 [90/21024000] via 10.0.5.1, 00:02:03, Serial2/0
D 10.0.4.0/29 [90/21536000] via 10.0.5.1, 00:02:03, Serial2/0
C 10.0.5.0/29 is directly connected, Serial2/0
C 10.0.6.0/29 is directly connected, Serial3/0
D 10.0.30.0/29 [90/21024000] via 10.0.5.1, 00:02:03, Serial2/0

To See The Neighbors of Router 5

Router#show ip eigrp neighbors
IP-EIGRP neighbors for process 100
H Address Interface Hold Uptime SRTT RTO Q Seq
(sec) (ms) Cnt Num
0 10.0.5.1 Se2/0 14 00:01:55 40 1000 0 17

Configuring EIGRP For ROUTER 6

Router(config)#router eigrp 100
Router(config-router)#network 10.0.6.0 0.0.0.7
%DUAL-5-NBRCHANGE: IP-EIGRP 100: Neighbor 10.0.6.1 (Serial2/0) is up: new adjacency

For Verifying EIGRP in Router 6

Router#show 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 in effect
Automatic address summarization:
Maximum path: 4
Routing for Networks:
10.0.6.0/29
Routing Information Sources:
Gateway Distance Last Update
10.0.6.1 90 4605082
Distance: internal 90 external 170

Showing The Routing Table of Router 6

Router#show ip route
10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
D 10.0.1.0/30 [90/22048000] via 10.0.6.1, 00:00:41, Serial2/0
D 10.0.2.0/29 [90/21536000] via 10.0.6.1, 00:00:41, Serial2/0
D 10.0.4.0/29 [90/22048000] via 10.0.6.1, 00:00:41, Serial2/0
D 10.0.5.0/29 [90/21024000] via 10.0.6.1, 00:00:41, Serial2/0
C 10.0.6.0/29 is directly connected, Serial2/0
D 10.0.30.0/29 [90/21536000] via 10.0.6.1, 00:00:41, Serial2/0

To See The Neighbors of Router 5

Router#show ip eigrp neighbors
IP-EIGRP neighbors for process 100
H Address Interface Hold Uptime SRTT RTO Q Seq
(sec) (ms) Cnt Num
0 10.0.6.1 Se2/0 10 00:00:23 40 1000 0 12