Sir Syed University Of Engineering & Technology – Department of Computer Science

LAB 09

Objective: To study about:

To Configuring EIGRP (Enhanced Interior Gateway Routing Protocol)

Theory:

Enhanced Interior Gateway Routing Protocol:

Enhanced Interior Gateway Routing Protocol (EIGRP) or Enhanced IGRP is a Cisco proprietary routing protocol utilizing the Diffusing Update Algorithm (DUAL). The DUAL algorithm was invented by Dr. J.J. Garcia-Luna Aceves of SRI International as an improvement to the IGRP routing protocol. EIGRP was designed to be interoperable with standard IGRP. EIGRP is a hybrid protocol as it incorporates features of a Distance Vector routing protocol and features of a Link State routing protocol. EIGRP is often used in Cisco-based networks running multiple network-layer protocols.

EIGRP can redistribute its routes (and metrics) into other routing protocols and accepts redistribution from other routing protocols as well.

Diffusing Update Algorithm (DUAL)

All route computations in EIGRP are handled by DUAL. One of DUAL's tasks is maintaining a table of loop-free paths to every destination. This table is referred to as the *topology table*. Unlike traditional DV protocols that save only the best (least-cost) path for every destination, DUAL saves all paths in the topology table. The least-cost path(s) is copied from the topology table to the routing table. In the event of a failure, the topology table allows for very quick convergence if another loop-free path is available. If a loop-free path is not found in the topology table, a route re-computation must occur, during which DUAL queries its neighbors, who, in turn, may query their neighbors, and so on... hence the name "Diffusing" Update Algorithm.

EIGRP Features

- Hybrid Distance Vector/Link State algorithm
- Supports VLSM (subnets/supernets)
- Integrates seamlessly with IGRP
- Automatic Redistribution of Routes (IGRP <-> EIGRP)
- EIGRP metrics are 256 times the IGRP metric and therefore 'directly translatable'
- Fast convergence
- Performs Partial Updates as needed
- Consumes less bandwidth (no broadcasts, no periodic updates, updates contain only changes)

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⯀ Supports multiple **network layer** protocols
- Apple talk
- Internet Protocol (IP)
- Novell Netware (IPX/SPX)
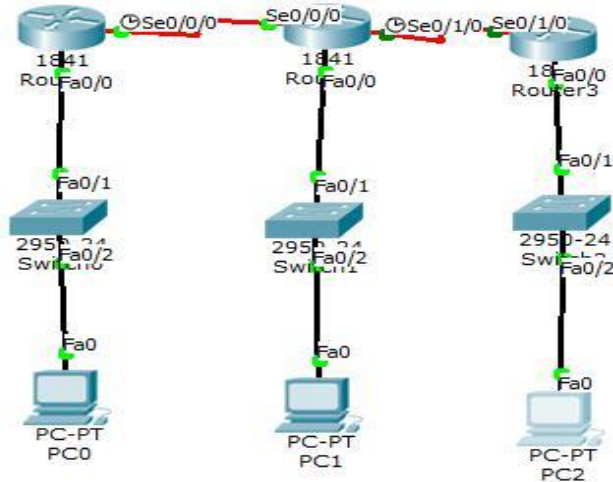
Procedure:

Step1:

The topology consists of 3 Cisco routers which are connected with each other and also with 3switches and switches are connected with 3PCs

Step 2:

A WIC-1T card is placed in the slots in each router. Switch off the router
and place the card in the slots and turn it on again. One end of the cable is
DTE and the other is automatically DCE.

Step 3:

We have total 5 networks , now assign ip to each network, assign first three ip in pc using default gateways: 192.168.1.1, 192.168.2.1, 192.168.3.1and remaining two on the serial interface of router.

Step 4:

Now configure fast Ethernet and serial interface of router by using CLI. Configuration of R0 are as follow:

```
Router#conf t
Router#conf terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int fa 0/0
Router(config-if)#ip add
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shut
Router(config-if)#no shutdown
Router(config-if)#exit
```

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```
Router(config)#int s 0/0/0
Router(config-if)#ip add
Router(config-if)#ip address 10.0.0.1 255.0.0.0
Router(config-if)#clock r
Router(config-if)#clock rate 64000
Router(config-if)#no shut down
Router(config-if)#exit
Router(config)#
```

Step 5:
Enabling EIGRP :
By using following Syntax:
- Router Eigrp Process id
- Network ip address

Enable a EIGRP routing process, which places you in router configuration mode. And associate the networks with a EIGRP routing process. Then enter the command **show ip route** on Ro, R1 and R2 to verify that the new route is now in the routing table.

Exercises:
Q1. What is EIGRP what is the use of EIGRP?

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Q2. How do we configure EIGRP?

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Q3 On which basis EIGRP decides the best path (routing metric)?

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Q.4 What is the maximum hop count in EIGRP?

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Q.5 Which algorithm EIGRP use for finding best path?

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Q.6 In which routing protocol did **EIGRP** lie ?

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Q.7 What do you understand by the term Autonomous system?

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Q.8 If a router receives two updates listing the same remote network, the first thing the router checks is the AD? State true or false with reason.

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Q.9 What is Diffusing Update Algorithm (DUAL)?

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