Experiment No.: 03

Experiment Name: Configuring a Network Topology Using EIGRP Protocol.

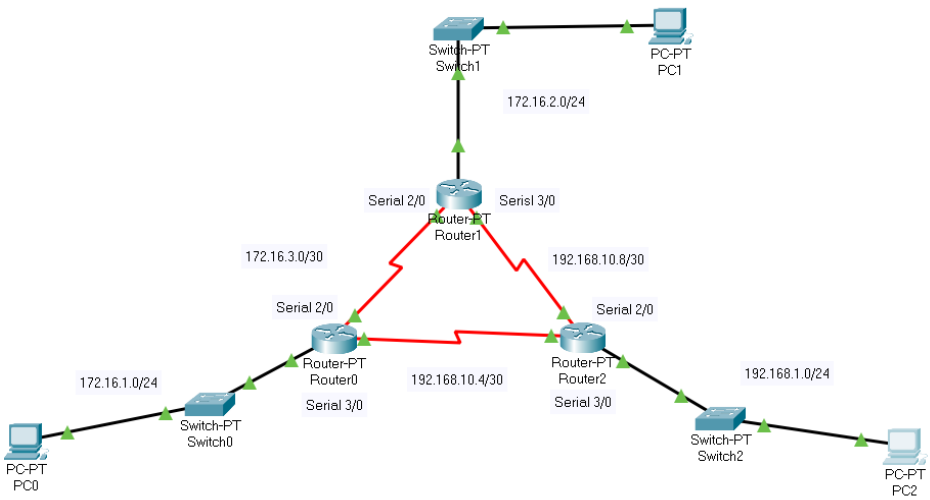
Objective:

- To learn computer networking protocols
- To learn basics of EIGRP protocol
- To configure a network using EIGRP protocol

Introduction:

EIGRP is a Cisco-developed advanced distance-vector routing protocol. Routers using this protocol automatically distribute route information to all neighbors. The Diffusing Update Algorithm (DUA) is used for routing optimization, fast convergence, as well as to avoid routing loops. Full routing information is only exchanged once upon neighbor establishment, after which only partial updates are sent. When a router is unable to find a path through the network, it sends out a query to its neighbors, which propagates until a suitable route is found. This need-based update is an advantage over other protocols as it reduces traffic between routers and therefore saves bandwidth. The metric that is used to find an optimal path is calculated with variables bandwidth, load, delay and reliability. By incorporating many such variables, the protocol ensures that the best path is found. Also, compared to other distance-vector algorithms, EIGRP has a larger maximum hop limitation, which makes it compatible with large networks. The disadvantage of EIGRP is that it is a Cisco proprietary protocol, meaning it is only compatible with Cisco technology.

Topology:



Command:

1. **PC Configuration:**

PC-PT PC0:

IP Address: 172. 16. 1. 2

Subnet Mask: 255. 255. 255. 0

Default Gateway: 172. 16. 1. 1

PC-PT PC1:

IP Address: 172. 16. 2. 2

Subnet Mask: 255. 255. 255. 0

Default Gateway: 172. 16. 2. 1

PC-PT PC2:

IP Address: 192. 168. 1. 2

Subnet Mask: 255. 255. 255. 0

Default Gateway: 192. 168. 1. 1

2. **Interface Configuring:**

Router-PT Router0:

Router > no

Router# conf terminal

Router(config)# interface fastEthernet 0/0

Router(config-if)# ip address 172. 16. 1. 1 255. 255. 255. 0

Router(config-if)# no shutdown

Router(config-if)# exit

Router(config)# interface serial 2/0

Router(config-if)# ip address 172. 16. 3. 1 255. 255. 255. 252

Router(config-if)# clock rate 64000

Router(config-if)# no shutdown

Router(config-if)# exit

Router(config)# interface serial 3/0

Router(config-if)# ip address 192. 168. 10. 5 255. 255. 255. 252

Router(config-if)# clock rate 64000

Router(config-if)# no shutdown

Router(config-if)# exit

Router-PT Router1:

Router > no

Router# conf terminal

Router(config)# interface fastEthernet 0/0

Router(config-if)# ip address 172. 16. 2. 1 255. 255. 255. 0

Router(config-if)# no shutdown

Router(config-if)# exit

Router(config)# interface serial 2/0

Router(config-if)# ip address 172. 16. 3. 2 255. 255. 255. 252

Router(config-if)# no shutdown

Router(config-if)# exit

Router(config)# interface serial 3/0

Router(config-if)# ip address 192. 168. 10. 9 255. 255. 255. 252

Router(config-if)# no shutdown

Router(config-if)# exit

Router-PT Router2:

Router > no

Router# conf terminal

Router(config)# interface fastEthernet 0/0

Router(config-if)# ip address 192. 168. 1. 1 255. 255. 255. 0

Router(config-if)# no shutdown

Router(config-if)# exit

Router(config)# interface serial 2/0

Router(config-if)# ip address 192.168.10.10 255. 255. 255. 252

Router(config-if)# no shutdown

Router(config-if)# exit

Router(config)# interface serial 3/0

Router(config-if)# ip address 192. 168. 10. 6 255. 255. 255. 252

Router(config-if)# no shutdown

Router(config-if)# exit

3. EIGRP Configuring:

Router-PT Router0:

Router > no

Router# conf terminal

Router(config)# router eigrp 1

Router(config-router)# network 172. 16. 1. 0 0. 0. 0. 255

Router(config-router)# network 172. 16. 3. 0 0. 0. 0. 3

Router(config-router)# network 192. 168. 10. 4 0. 0. 0. 3

Router-PT Router1:

Router > no

Router# conf terminal

Router(config)# router eigrp 1

Router(config-router)# network 172. 16. 2. 0 0. 0. 0. 255

Router(config-router)# network 172. 16. 3. 0 0. 0. 0. 3

Router(config-router)# network 192. 168. 10. 8 0. 0. 0. 3

Router-PT Router2:

Router > no

Router# conf terminal

Router(config)# router eigrp 1

Router(config-router)# network 192. 168. 10. 8 0. 0. 0. 3

Router(config-router)# network 192. 168. 1. 0 0. 0. 0. 255

Router(config-router)# network 192. 168. 10. 4 0. 0. 0. 3

Result & Analysis:

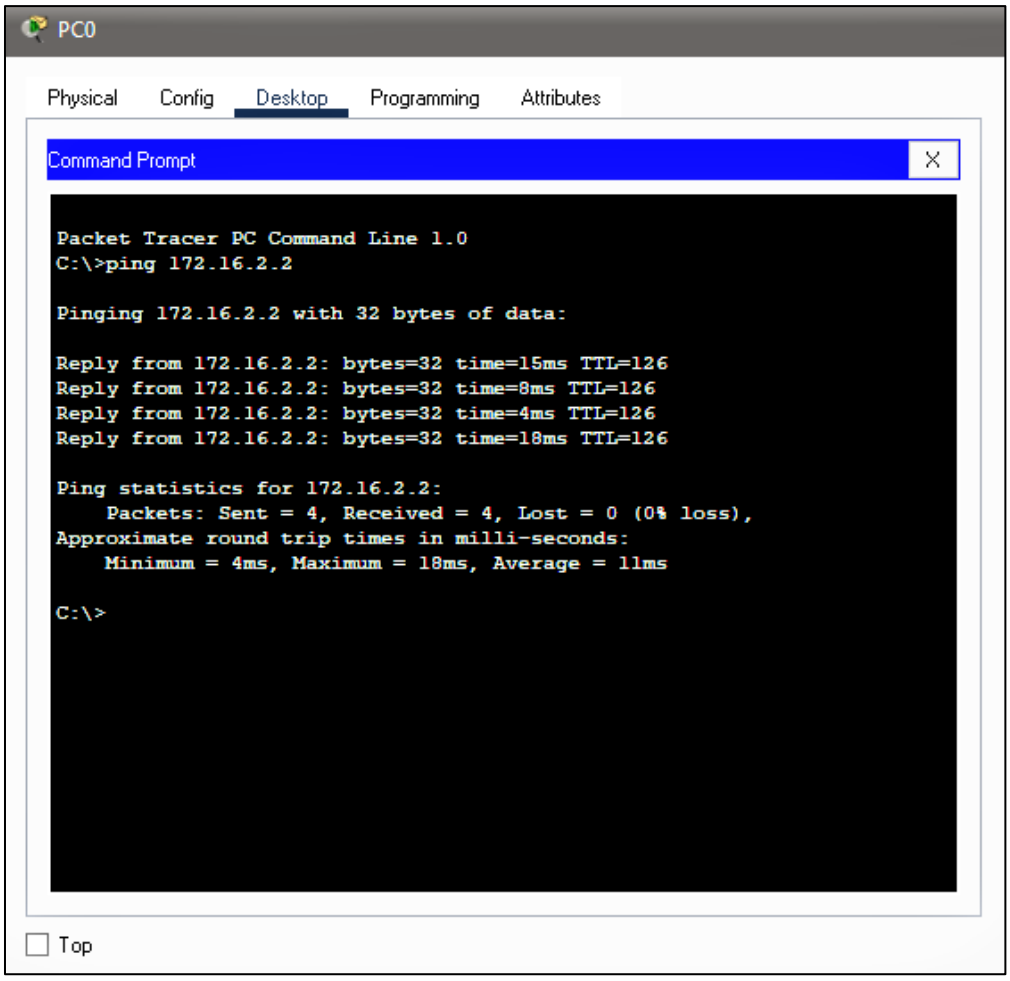


Figure 01: Ping from **PC-PT PC0** to **PC-PT PC1**

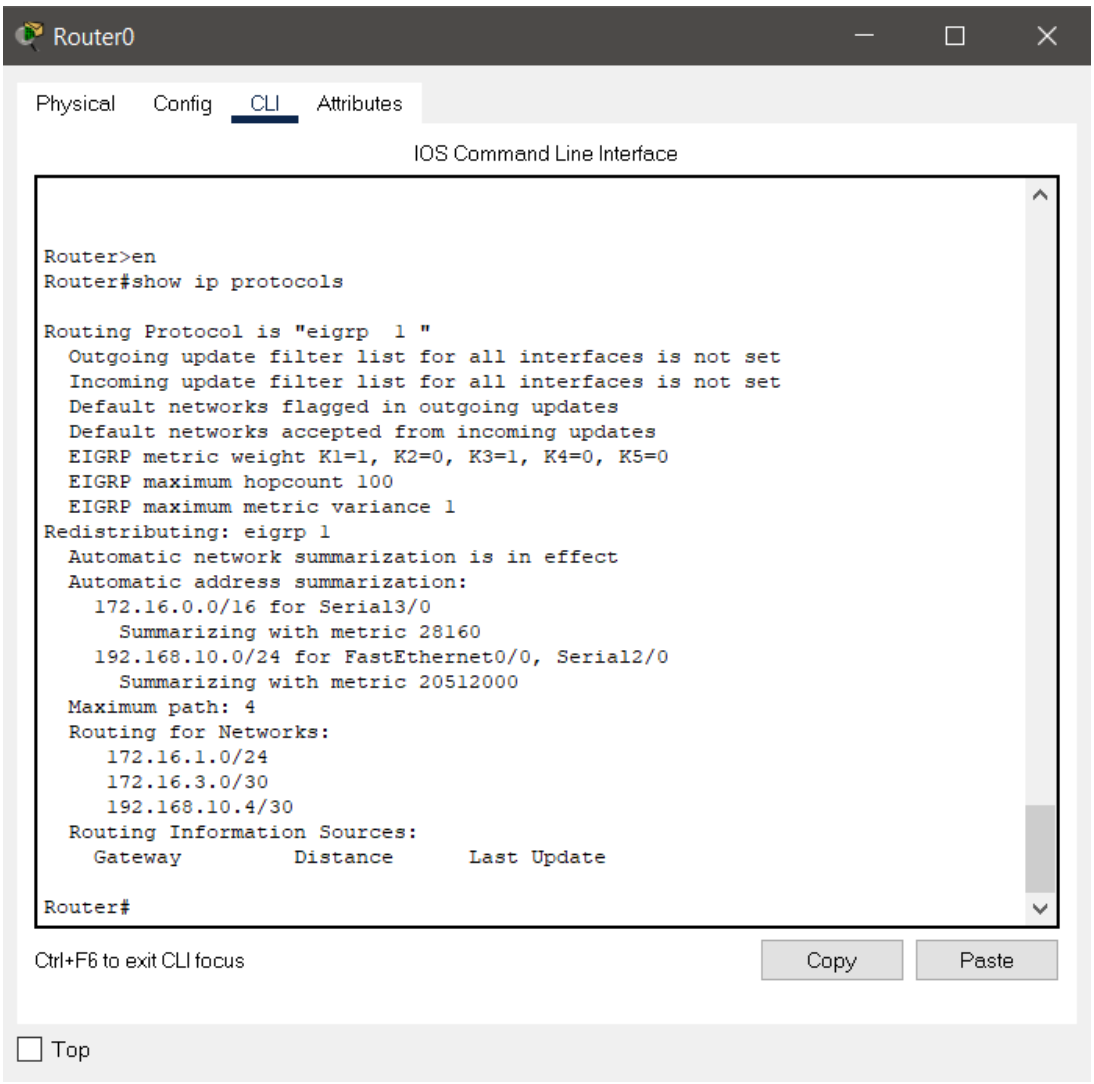


Figure 02: IP Protocols **Router-PT Router0**

Conclusion:

In this experiment, a network topology was configured using EIGRP protocol. The network was built properly and worked without any data loss. It can be concluded that EIGRP is the best choice for both large and small networks since it has the fastest convergence and EIGRP uses the bandwidth efficiently. But research shows that EIGRP had just been implemented to companies other than CISCO (2013), and the structure is complicated.