Bafna Gold
Date: Page:

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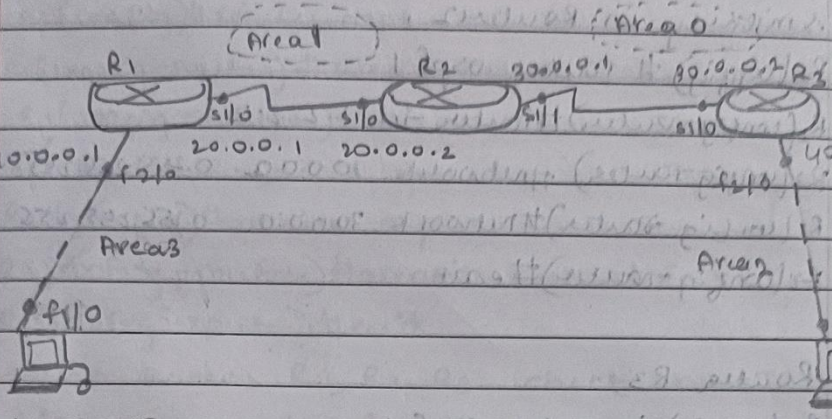
Experiment - 7

Q-?

Aim: To configure OSPF routing protocol.

Topology:



Procedure:

1) Take three routers and two PCs drop them in the workspace.
2) Configure the PC's with IP address and gateway according to the above topology.
3) Configure each of the routers according to IP address given.
4) Encapsulation ppp and clock rate need to be set as done in RIP protocol experiment.
5) Same wires connection cables are used as in RIP protocol experiment.

*) select Routers -> CLI. (when it is in config mode)
R1(config)# router ospf 1
R1(config-router)# router-id 1.1.1.1
R1(config-router)# network 10.0.0.0 0.255.255.255 area 0
R1(config-router)# network 20.0.0.0 0.255.255.255 area 0
R1(config-router)# exit

similarly in Router2,
R2(config)# router ospf 1
R2(config-router)# router-id 2.2.2.2
R2(config-router)# network 20.0.0.0 0.255.255.255 area 0
R2(config-router)# network 30.0.0.0 0.255.255.255 area 0
R2(config-router)# exit

Router R3,
R3(config)# router ospf 1
R3(config-router)# router-id 3.3.3.3
R3(config-router)# network 30.0.0.0 0.255.255.255 area 0
R3(config-router)# network 40.0.0.0 0.255.255.255 area 0
R3(config-router)# exit.
virtual interface never goes down once we configure routers. (to be in config-if)
*) Router 1 (config)# interface serial 2/0, then.
R1(config-if)# interface loopback 0
R1(config-if)# ip address 172.16.1.252 255.255.0.0
R1(config-if)# no shutdown.

R2(config-if)# interface loopback 0
R2(config-if)# ip address 172.16.1.253 255.255.0.0
R2(config-if)# no shut.

R3(config-if)# interface loopback 0
R3(config-if)# IP address 192.16.1.254. 255.255.0.0
R3(config-if)# no shut.

*) create virtual link between R1, R2 by this we create virtual link to connect to area 0.
In Router R1,
R1(config)# router ospf 1
R1(config-router)# area 1 virtual-link 2.2.2.2.
R1(config-router)#
In Router R2,
R2(config)# router ospf 1
R2(config-router)# area 1 virtual-link 1.1.1.1
R2(config-router)# exit.
select Routers R1, R2, R3. check show IP route for all routers. for Router 2.

*) Router# show ip route.

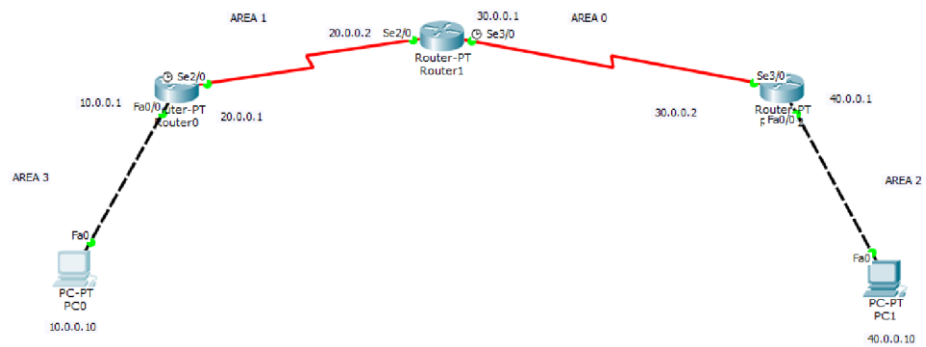
O IA 10.0.0.0/8 via 20.0.0.1 00:00:01, serial 2/0
20.0.0.0/8 is variably subnetted 2 subnets 2 masks
C 20.0.0.0/8 is directly connected serial 2/0
C 20.0.0.0/8 is directly connected serial 2/0.
30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 30.0.0.0/8 is directly connected, serial 3/0
L 30.0.0.8/32 is directly connected, serial 3/0
O IA 40.0.0.0/8 via 300.0.2, 00:06:40, serial 3/0
C 172.16.0.0/16 is directly connected, loopback 0

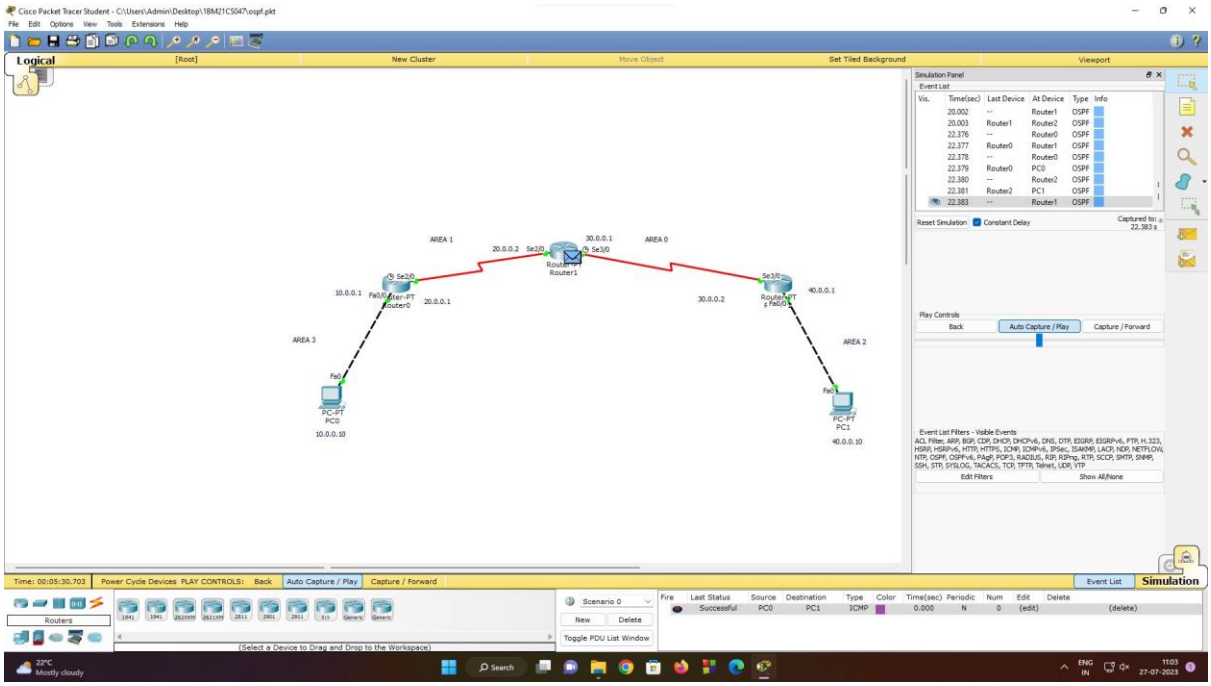
*) Observation:- OSPF → open shortest path first is a routing protocol for Internet protocol networks. It uses link state routing algorithm and falls into group of interior gateway protocol.

Result:

PC > ping 40.0.0.10

Ranging 40.0.0.10 with 32 bytes of data:
Reply from 40.0.0.10: bytes = 32 time=9ms TTL=125
Reply from 40.0.0.10: bytes = 32 time=9ms TTL=125
Reply from 40.0.0.10: bytes = 32 time=29ms TTL=125
Reply from 40.0.0.10 bytes = 32 time=9ms TTL=125
ping statistics for 40.0.0.10:
Packets: sent = 24, Received = 24, Lost = 0
Approximate round trip times in milliseconds:
Minimum = 2ms, Maximum = 12ms, Average = 8ms





PC0

Physical Config Desktop Custom Interface

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 40.0.0.10

Pinging 40.0.0.10 with 32 bytes of data:

Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.

Ping statistics for 40.0.0.10:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>ping 40.0.0.10

Pinging 40.0.0.10 with 32 bytes of data:

Request timed out.
Reply from 40.0.0.10: bytes=32 time=4ms TTL=125
Reply from 40.0.0.10: bytes=32 time=6ms TTL=125
Reply from 40.0.0.10: bytes=32 time=12ms TTL=125

Ping statistics for 40.0.0.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 4ms, Maximum = 12ms, Average = 7ms

PC>
```