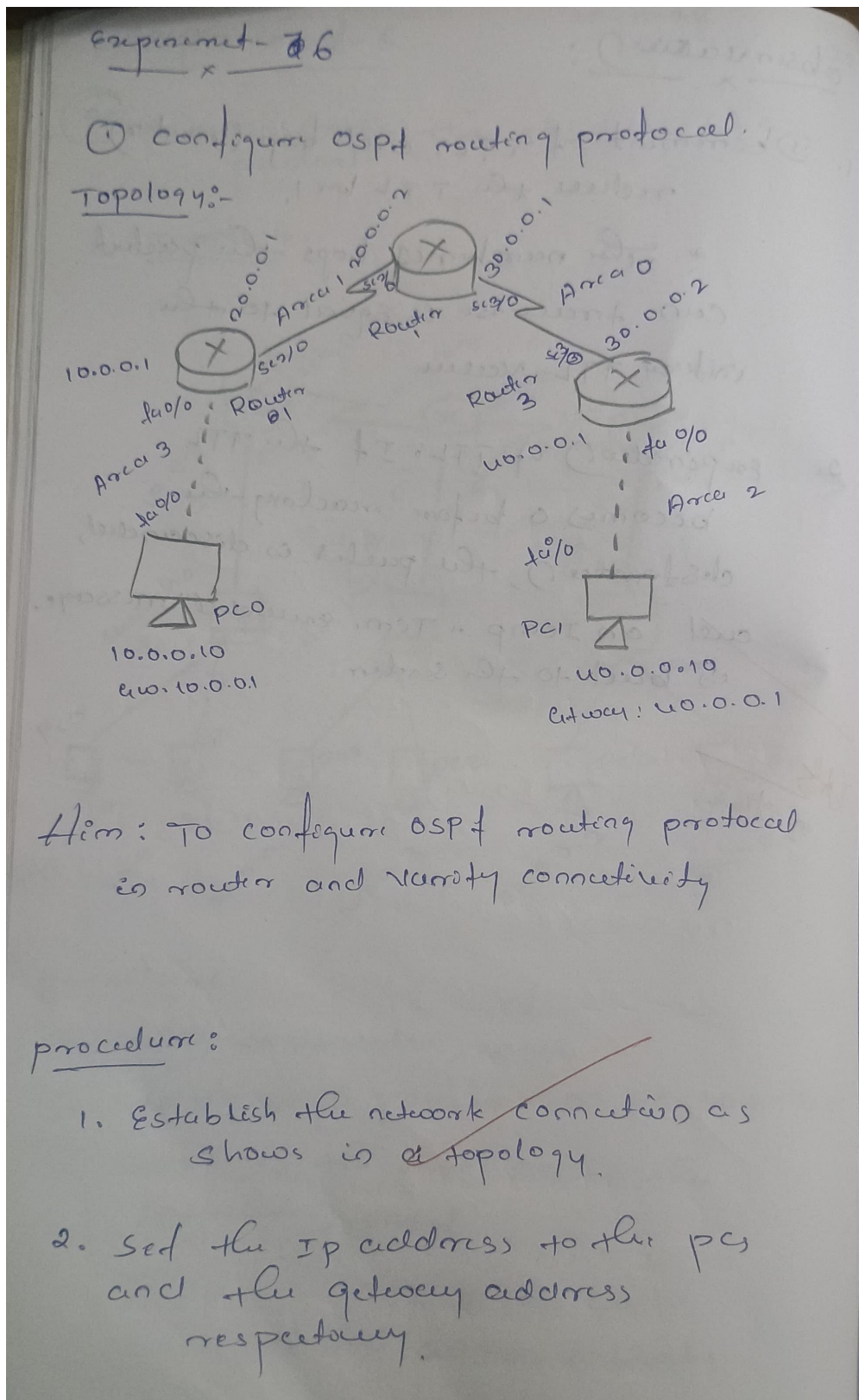


27/11/2024

Experiment 6- Configure OSPF routing protocol

Observation Book:



3. → open CLI in Router 01

```
# config $ interface fastEthernet 0/0  
# (config-if) ip address 10.0.0.1 255.0.0.0  
# (config-if) no shutdown  
# (config-if) exit
```

```
# (config) # interface serial 2/0  
# (config-if) # ip address 20.0.0.1 255.0.0.0  
# (config-if) # encapsulation ppp  
# (config-if) # clock rate 64000
```

→ open CLI in Router 2

```
# (config) # interface serial 2/0  
# (config-if) # ip address 20.0.0.2 255.0.0.0  
# (config-if) # encapsulation ppp
```

→ open CLI in Router 3

```
# (config) # interface serial 2/0  
# (config-if) # ip address 30.0.0.2 255.0.0.0  
# (config-if) # encapsulation ppp  
# (config-if) # clock rate 64000
```

```
# (config) # interface fastEthernet 0/0  
# (config-if) ip address 10.0.0.10 255.0.0.0  
# (config-if) no shutdown  
# (config-if) exit
```

→ open Router 2

```
# (config-if) # interface serial 3/0
# (config-if) # 30.0.0.2 255.0.0.0
# (config-if) # encapsulation PPP
# (config-if) # no shutdown
# (config-if) # exit.
```

4. enable ip routing by configuring ospf routing protocol.

In Router 1

```
$ (config) # router ospf 1
$ (config-router) # router-id 1.1.1.1
$ (config-router) network 10.0.0.0
255.255.255.0 area 3
$ (config-router) network 20.0.0.0
255.255.255.0
$ (config-router) # exit
```

In Router 2.

```
$ (config) # router ospf 1
$ (config) # router-id 2.2.2.2
$ (config-router) # network 30.0.0.0
0.255.255.255 area 0
$ (config-router) # network 40.0.0.0
0.255.255.255 area 2
```


5. check the routing table

Router # show ip route

you can see the code 0 which stands for the ospf connection.

There must be one interface up to keep ospf process up, so, it's better to configure loopback address to routers.

R1 (config) # interface loopback 0
R1 (config-l) # ip add 172.16.1.252
255.255.0.0

R1 (config-l) # no shutdown

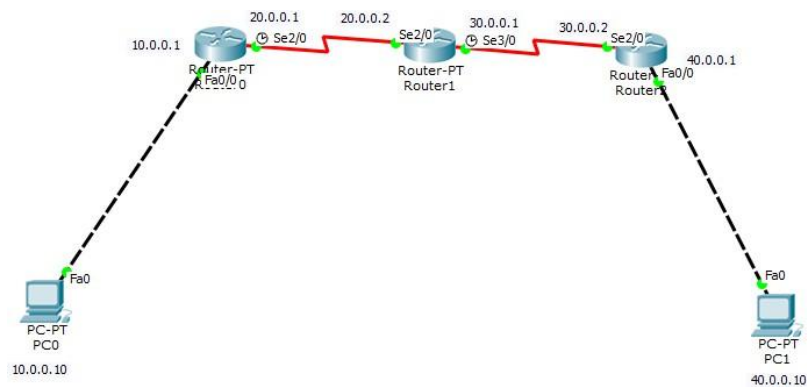
R2 (config) # interface loopback 0
R2 (config) # ip add 172.16.1.254.

R3 (config) # router ospf 1

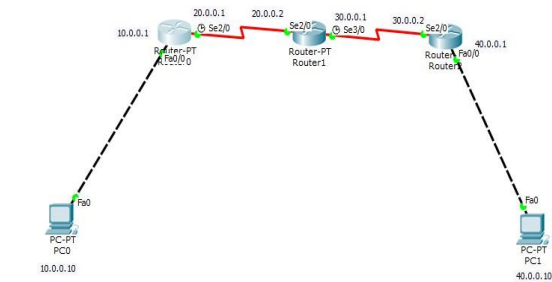
R3 (config-router) # area 0 network 2.2.2.2

output: PC0:
 PC ping 40.0.0.1
 ping 40.0.0.1 with 32 byte of data
 Reply from 40.0.0.1: 32 bytes 3ms
 TTL: 125 (4 hops)
 ping statistics for 40.0.0.1
 packet sent 4, ~~Received = 3~~ lost = 1
 18/12/14

Topology:



Output:

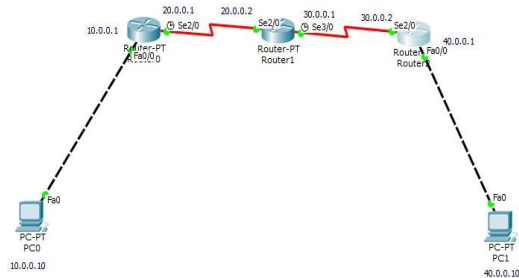


```
Router0
Physical Config CLI
IOS Command Line Interface

Router#enable
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

C 10.0.0.0/8 is directly connected, FastEthernet0/0
C 20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 20.0.0.0/8 is directly connected, Serial2/0
C 20.0.0.2/32 is directly connected, Serial2/0
O IA 30.0.0.0/8 [110/128] via 20.0.0.1, 00:08:09, Serial2/0
O IA 40.0.0.0/8 [110/128] via 20.0.0.1, 00:08:09, Serial2/0
C 172.16.0.0/16 is directly connected, Loopback0
Router#
```



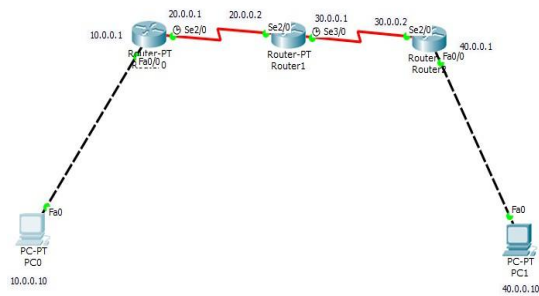
```
Router2
Physical Config CLI
IOS Command Line Interface

C 30.0.0.0/8 is directly connected, Serial2/0
C 30.0.0.1/32 is directly connected, Serial2/0
C 40.0.0.0/8 is directly connected, FastEthernet0/0
C 172.16.0.0/16 is directly connected, Loopback0
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface loopback 0
Router(config-if)#exit
Router(config)#exit
Router#
*SYS-5-CONFIG_I: Configured from console by console

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

O IA 10.0.0.0/8 [110/128] via 30.0.0.1, 00:06:21, Serial2/0
O IA 20.0.0.0/8 [110/128] via 30.0.0.1, 00:27:12, Serial2/0
C 30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 30.0.0.0/8 is directly connected, Serial2/0
C 30.0.0.1/32 is directly connected, Serial2/0
C 40.0.0.0/8 is directly connected, FastEthernet0/0
C 172.16.0.0/16 is directly connected, Loopback0
Router#
```



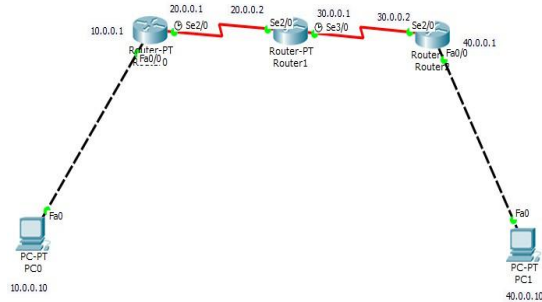
```

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:

Request timed out.
Reply from 40.0.0.10: bytes=32 time=6ms TTL=125
Reply from 40.0.0.10: bytes=32 time=7ms TTL=125
Reply from 40.0.0.10: bytes=32 time=5ms 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 = 5ms, Maximum = 7ms, Average = 7ms
PC>
  
```



```

PC1
Physical Config Desktop Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.10

Pinging 10.0.0.10 with 32 bytes of data:

Reply from 10.0.0.10: bytes=32 time=2ms TTL=125
Reply from 10.0.0.10: bytes=32 time=4ms TTL=125
Reply from 10.0.0.10: bytes=32 time=3ms TTL=125
Reply from 10.0.0.10: bytes=32 time=12ms TTL=125

Ping statistics for 10.0.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 12ms, Average = 6ms
PC>
  
```