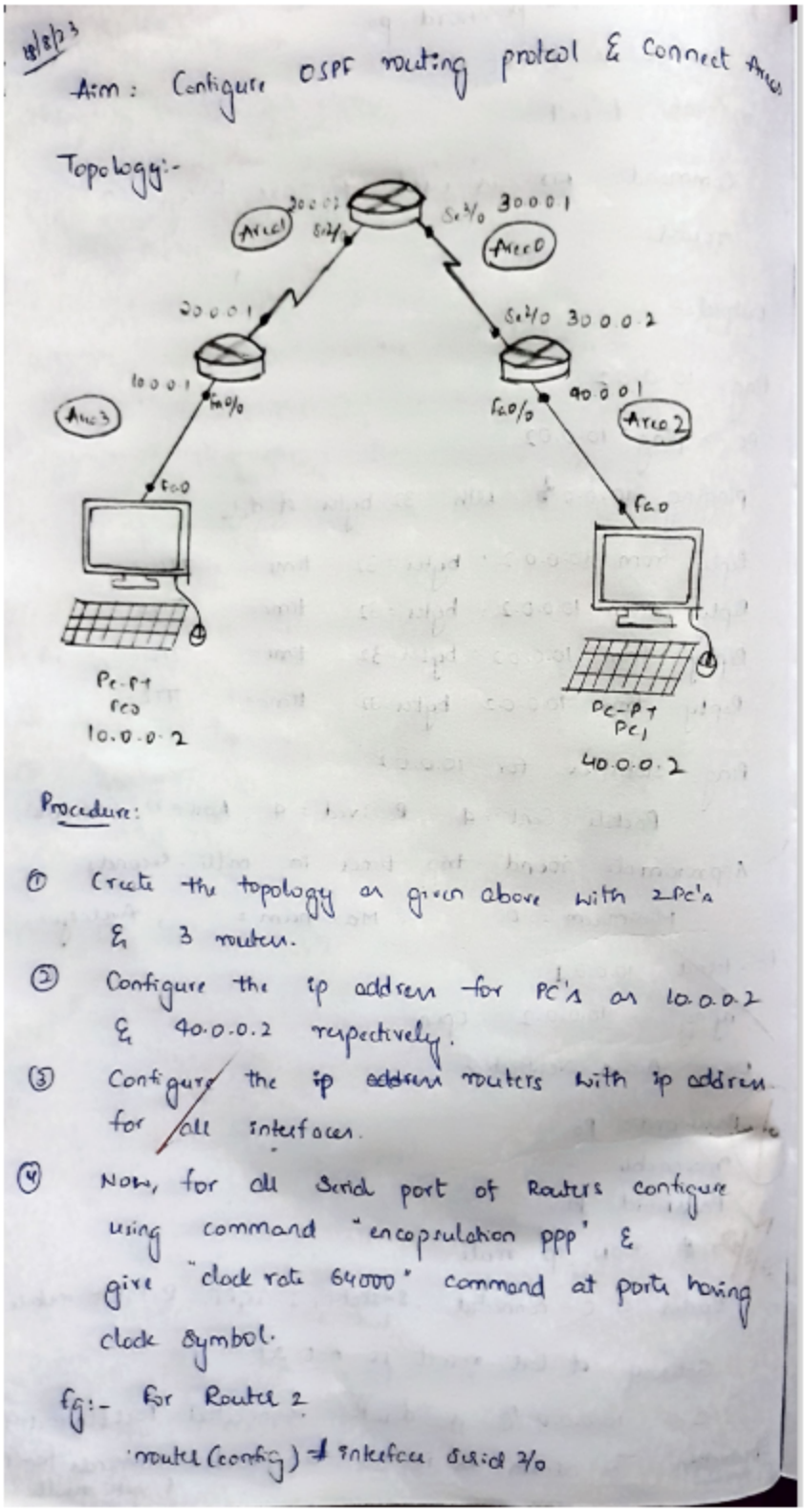
PROGRAM -6

Configure OSPF routing protocol



router (config-if) # ip ~~address~~ encapsulation ppp
router (config-if) # no shut
router (config-if) # exit

router (config) # interface Se3/0
router (config-if) # encapsulation ppp
router (config-if) # clock rate 64000
router (config-if) # no shut

⑤ Now, enable ip routing by configuring ospf routing protcol in all routers,

On Router R_1,

Router (config) # router ospf 1
Router (config-router) # router-id 1.1.1.1
Router (config-router) # network 10.0.0.0 0.255.255.255 area 3
Router (config-router) # network 20.0.0.0 0.255.255.255 area 1
Router (config-router) # exit

Similarly configure for Router 2 and Router 3

⑥ Check the routing table of R1

Router # show ip route

Codes : C- connected, S-Static, R-RIP, M-mobile, B-BGP
O- OSPF, IA-OSPF inter area N1- OSPF NSSA
extend type 1

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, fastEthernet 2/0
C 20.0.0.0/8 is directly connected, Serial 2/0
O IA 40.0.0.0/8 [110/129] via 20.0.0.2, 00:04:23, Serial 2/0

(7) There must be one interface up to keep ospf process up. So its better to configure loopback address to routers. It is virtual interface never goes down once we configured.

For Router 1 :-

```
Router (config-if) # interface loopback 0
Router (config-if) # ip add 172.16.1.252 255.255.0.0
Router (config-if) # no shut
```

Do similarly for Router 2 & Router 3. Using these commands we add loopback address to the routers.

(8) Now, if we check the routing table for R_3.

R_3 # show ip route

Codes : C - connected, S-static, O-OSPF, IA-OSPF

Gateway of last resort is not set

O IA 20.0.0.0/8 [110/128] via 30.0.0.1, 00:18:58, Serial 2/0

C 40.0.0.0/8 is directly connected, FastEthernet 0/0

C 30.0.0.0/8 is directly connected, Serial 2/0

R_3 (Router 3) doesnot know about area 3, so we will create virtual link between Router 1 & Router 3

(9) Now, we have to create virtual link between Router 2, by this we create a virtual link to connect area 3 to area 0

In Router R_2 :-

Router(config-router)

Router (config) # router ospf 1

Router (config-router) # area 1 virtual link 1.1.1.1

Router (config-router) # exit

(10) R_2 and R_3 get updates about area 3,

check routing table for R_3

Router # show ip route

Codes : C - connected OA - OSPF, IA - OSPF

Gateway of last resort is not set

O IA 20.0.0.0/8 [110/128] via 30.0.0.1, 00:01:56, Serial 2/0

C 40.0.0.0/8 is directly connected, fast ethernet 0/0

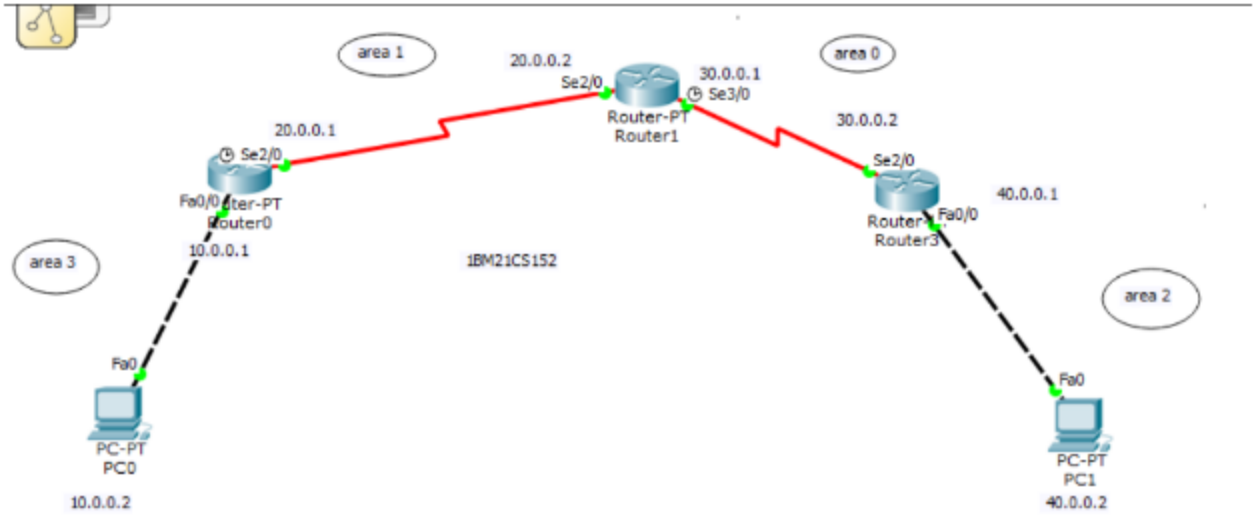
O IA 10.0.0.0/8 [110/129] via 30.0.0.1 00:01:56, Serial 2/0

C 30.0.0.0/8 is directly connected, Serial 2/0

(11) Now, ping 10.0.0.2 to 40.0.0.2

10/10

22/8/23


area 1
20.0.0.2
Se2/0
30.0.0.1
Se3/0
area 0
Router-PT
Router1
20.0.0.1
Se2/0
30.0.0.2
Se2/0
40.0.0.1
Fa0/0
Router-PT
Router0
Router-PT
Router3
area 3
10.0.0.1
1BM21CS152
area 2
Fa0
Fa0
PC-PT
PC0
PC-PT
PC1
10.0.0.2
40.0.0.2

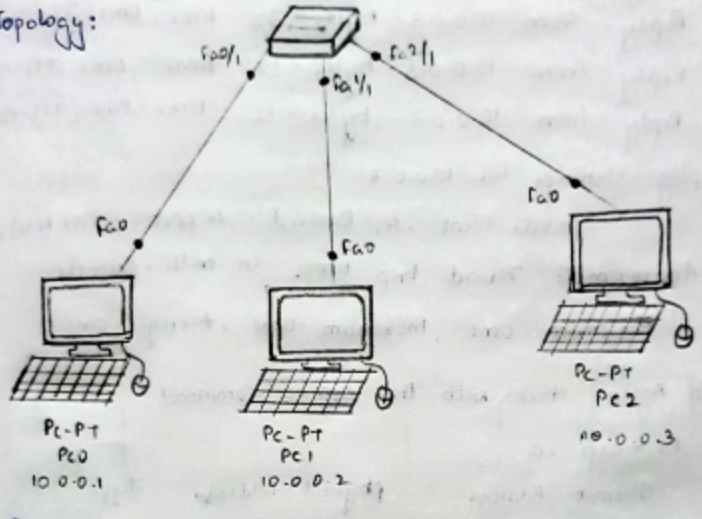
PROGRAM -9

To construct simple LAN and understand the concept and operation of Address Resolution Protocol (ARP)

4/8/23

Aim : To construct simple LAN and understand the concept and operation of Address Resolution protocol (ARP)

Topology:



Procedure:

1. Drag and drop 3 PC's and 1 Switch from the devices.
2. Connect the devices in the topology as shown above
3. Config the IP address for the PC's PC_0, PC_1, PC_2 as 10.0.0.1, 10.0.0.2, 10.0.0.3 respectively.
4. Now, in CLI use the command "arp -a" to see ARP Table, Initially the ARP Table will be empty.
5. Also in CLI of Switch, the command - show mac address-table can be given on every transaction to see how the Switch learns from transactions and build the address table.

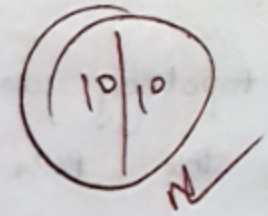
⑥ Now ping from one PC to another PC

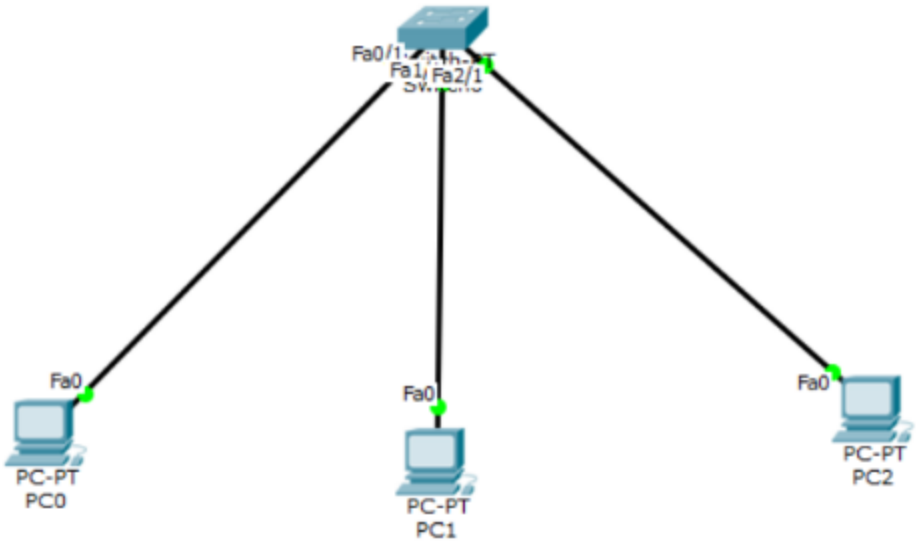
```
PC> ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:
Reply from 10.0.0.3 bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128

Ping statistics for 10.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

⑦ Again check with the arp -a command:

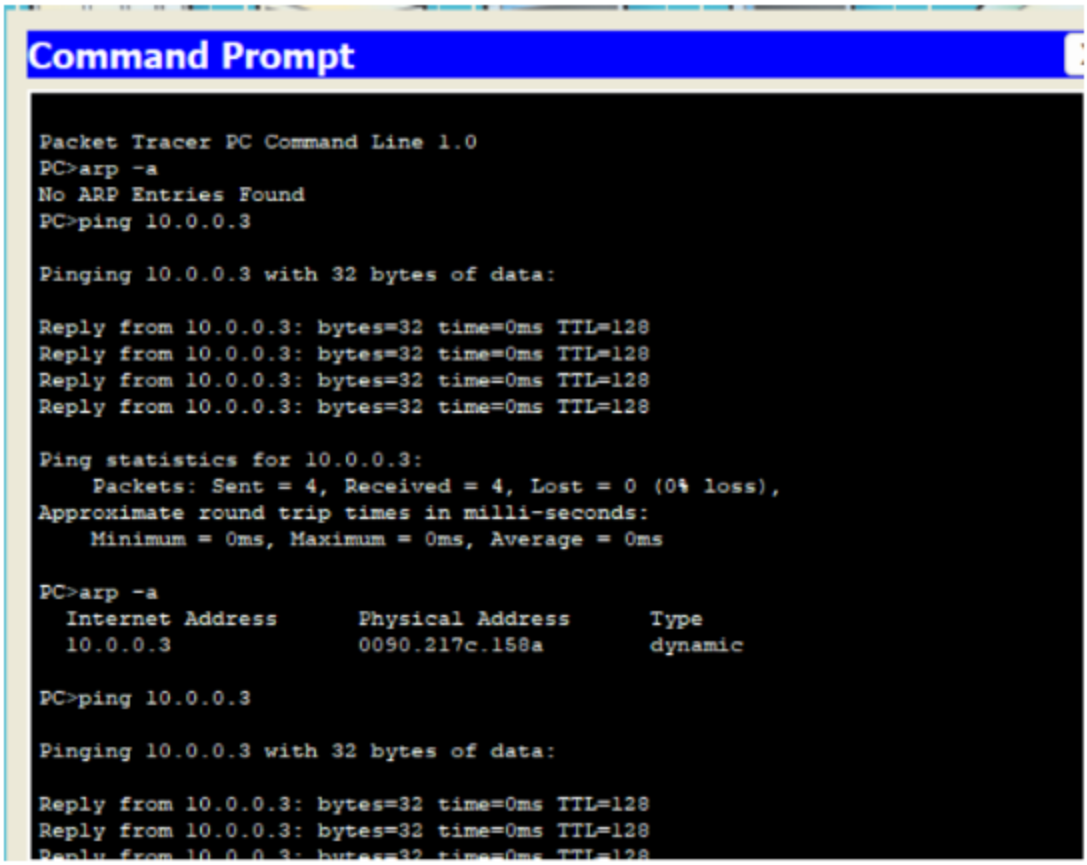
```
PC> arp -a
  Internet Address      Physical Address      Type
  10.0.0.3              0090.217C.158A        dynamic
```

⑧ arp -d command is used to clear the table.





OUTPUT



Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>arp -a
No ARP Entries Found
PC>ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:

Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128

Ping statistics for 10.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>arp -a
  Internet Address      Physical Address      Type
  10.0.0.3              0090.217c.158a        dynamic

PC>ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:

Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
```