LAB – 6

AIM: Configure routing information protocol in Router and TTL.

AIM: Configure routing information protocol in Router

Procedure:

1) Select the 3 Routers & drag on the screen. Then Select 5 switches & drag on the screen then Connect the some end devices to that switches using copper straight through cable.

2) Then Connect all the switches to 3 different routers using Copper-straight-through cable. & also Connect the router to router using serial DCE cable.

Router to Router → Serial Connection.
Switch to Router → Fast Etherent Connection.

3) Next set the IP address to all the end devices with gateway.

PC0 → 10.0.0.2		PC1 → 10.0.0.3
PC2 → 20.0.0.2		PC3 → 20.0.0.3
PC4 → 30.0.0.2		PC5 → 30.0.0.3

4) Go to router 0, To establish the connection between switch 0 & router follow these commands.

1) enable
2) Config terminal
3) interface FastEthernet 0/0
4) ip address 10.0.0.1 255.0.0.0
5) no shut
6) exit.

To establish the connection between router 0 to router 1
1) enable   4) no shut
2) Config terminal.   5) no shut
3) interface Serial 2/0   6) exit
4) ip address 40.0.0.1 255.0.0.0

5) Go to router1, For router1 to router 0.
   interface Serial 2/0
   ip address 40.0.0.2 255.0.0.0

   For router1 to router2
   interface Serial 3/0.
   ip address 50.0.0.1 255.0.0.0

   For router1 to Switch1
   interface FastEthernet 0/0
   ip address 20.0.0.0.1   255.0.0.0.

6) Go to router2, For Router 2 to router1
   interface Serial 3/0
   ip address 50.0.0.2 255.0.0.0

   To Send packet Sucessfully over network.
   For router 0

1) Config terminal   router rip   router rip
   router rip   network 40.0.0.0   network
   network 10.0.0.0   network 50.0.0.0   50.0.0.0
   network 40.0.0.0   network 20.0.0.0   network
   Show ip route   Show ip router   30.0.0.0
        LAN1   LAN2   Show ip route
                                                  LAN3

Topology:

Router 0-PT   Router 1-PT   Router 2-PT

Ser2/0   Se3/0   Se2/0   Se3/0

10.0.0.1   20.0.0.1   30.0.0.1

Switch-PT1   Switch-PT2   Switch-PT3

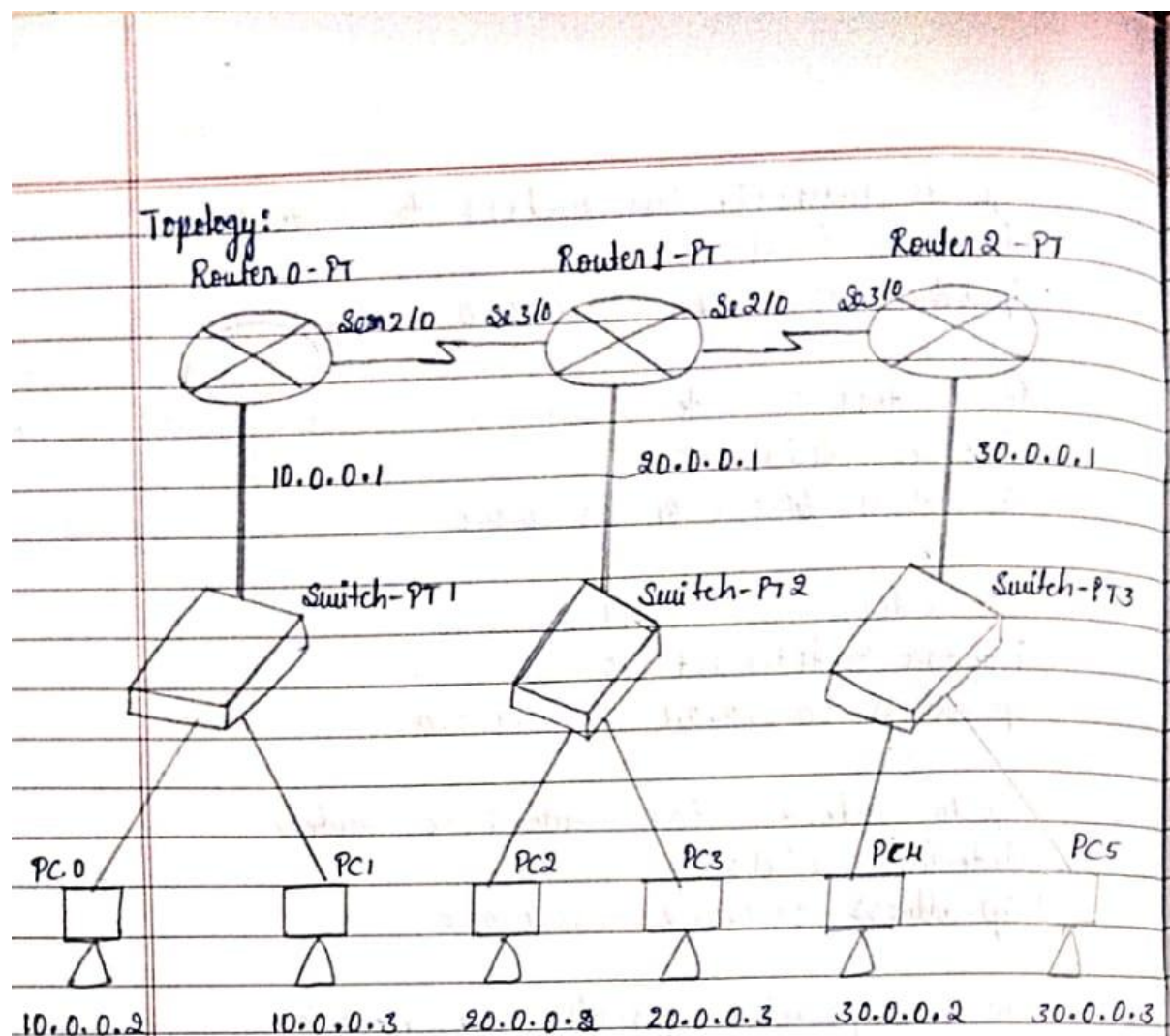PC.0   PC1   PC2   PC3   PC4   PC5

10.0.0.2   10.0.0.3   20.0.0.2   20.0.0.3   30.0.0.2   30.0.0.3

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Observation: Connection established successfully over a network & packets are sent from one to another Pc over a network.

Aim: Demonstrate TTL / life of a packet.

Steps
1) Select a packet
2) Transfer it from one pc to another over a network i.e. PC0 to PC1
3) while transforming packets pause the packets (Click on Auto/capture play)
4) Then click on packet then you can able to view inbound & outbound PDU.
5) It will reduces the TTL when we are pause the Auto/capture play.

Observation: when we are sending the packet over through one LAN to another LAN it will be reduces by 1 in TTL.

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TOPOLOGY:
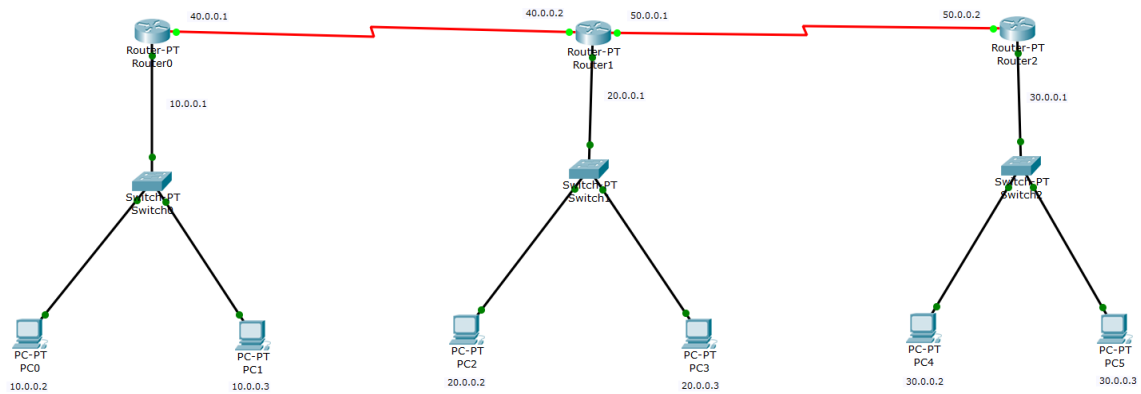
PING Commands:

```
C:\>ping 30.0.0.3

Pinging 30.0.0.3 with 32 bytes of data:

Reply from 30.0.0.3: bytes=32 time=3ms TTL=125
Reply from 30.0.0.3: bytes=32 time=2ms TTL=125
Reply from 30.0.0.3: bytes=32 time=2ms TTL=125
Reply from 30.0.0.3: bytes=32 time=2ms TTL=125

Ping statistics for 30.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 3ms, Average = 2ms
```

```
C:\>ping 20.0.0.2

Pinging 20.0.0.2 with 32 bytes of data:

Reply from 20.0.0.2: bytes=32 time=1ms TTL=128
Reply from 20.0.0.2: bytes=32 time=2ms TTL=128
Reply from 20.0.0.2: bytes=32 time<1ms TTL=128
Reply from 20.0.0.2: bytes=32 time=2ms TTL=128

Ping statistics for 20.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 1ms
```

```
C:\>ping 30.0.0.2

Pinging 30.0.0.2 with 32 bytes of data:

Reply from 30.0.0.2: bytes=32 time=3ms TTL=125
Reply from 30.0.0.2: bytes=32 time=3ms TTL=125
Reply from 30.0.0.2: bytes=32 time=6ms TTL=125
Reply from 30.0.0.2: bytes=32 time=2ms TTL=125

Ping statistics for 30.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 6ms, Average = 3ms
```

TTL (Time To Live):
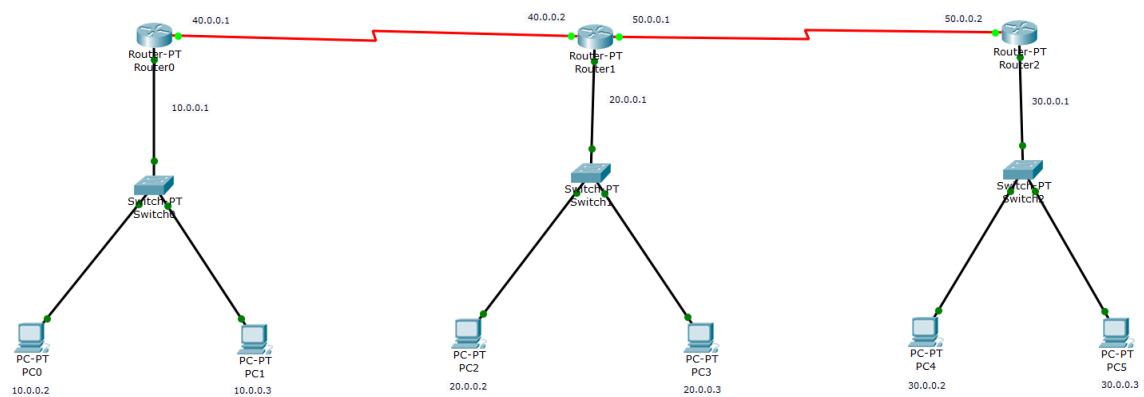
PDU Information at Device: Router2

OSI Model | **Outbound PDU Details**

PDU Formats

HDLC

0	8	16	32	32+x	48+x	56+xBits
FLG: 0111 1110	ADR: 0x8f	CONTROL: 0x0	DATA: (VARIABLE LENGTH)	FCS: 0x0	FLG: 0111 1110	

IP

0	4	8	16	19	31 Bits
4	IHL	DSCP: 0x0		TL: 52	
ID: 0x7			0x0	0x0	
TTL: 255		PRO: 0x11	CHKSUM		
SRC IP: 50.0.0.2					
DST IP: 255.255.255.255					
OPT: 0x0				0x0	
DATA (VARIABLE LENGTH)					

UDP

0	16	31 Bits
SRC PORT: 520	DEST PORT: 520	
LENGTH: 0x20	CHECKSUM: 0x0	
DATA (VARIABLE)		