Expt-1.

Aim: To create a topology & simulate sending a simple PDU from source to destination using hub & switch as connecting devices.

Topology: Star topology

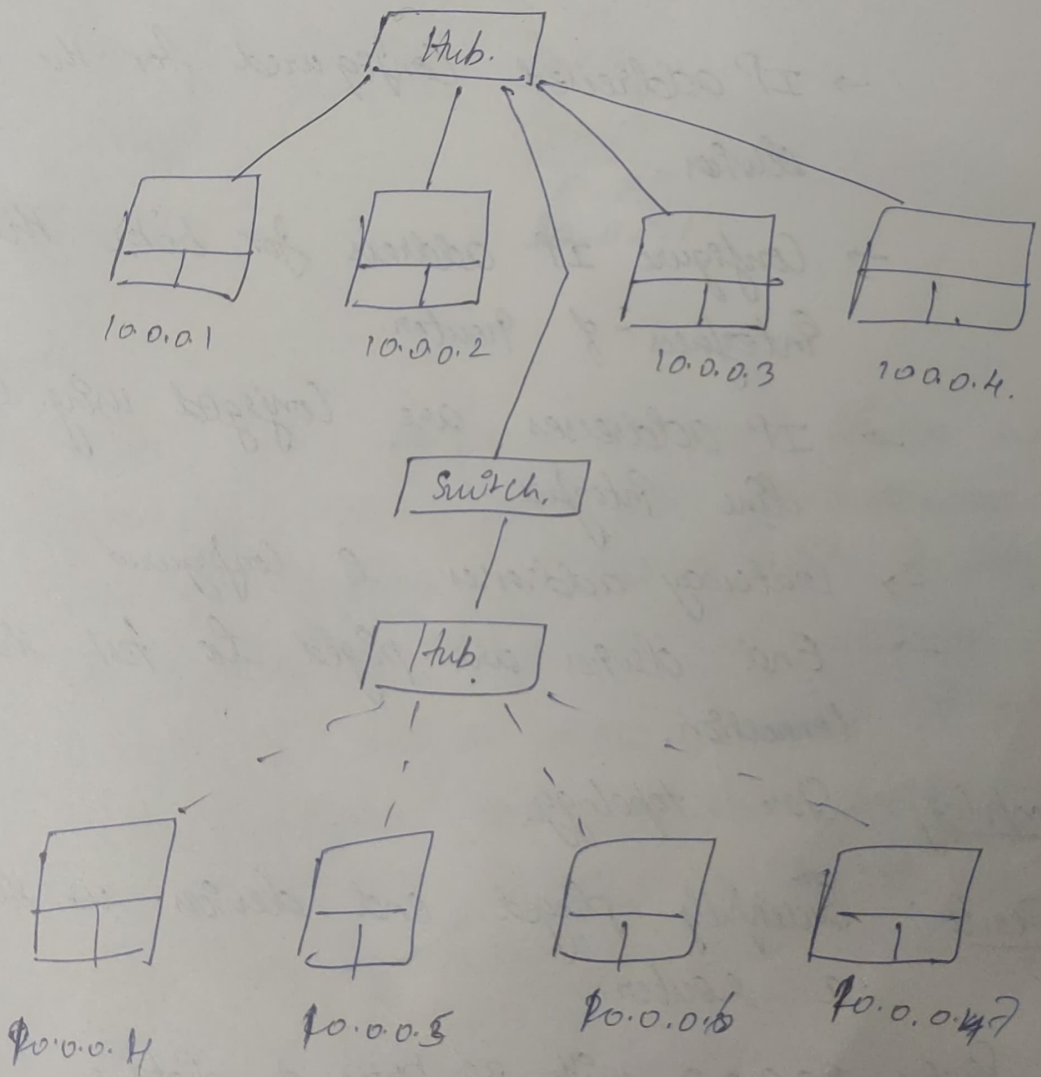
Procedure: → End devices are connected to the hub
→ The hubs are interconnected via a switch.
→ IP addresses of the end devices are set.
→ Connections between all of them are checked if it is working.
→ They are checked by pinging a message between 2 end devices.
→ Once verified, a simple PDU is sent/transmitted b/w a source & a destination.

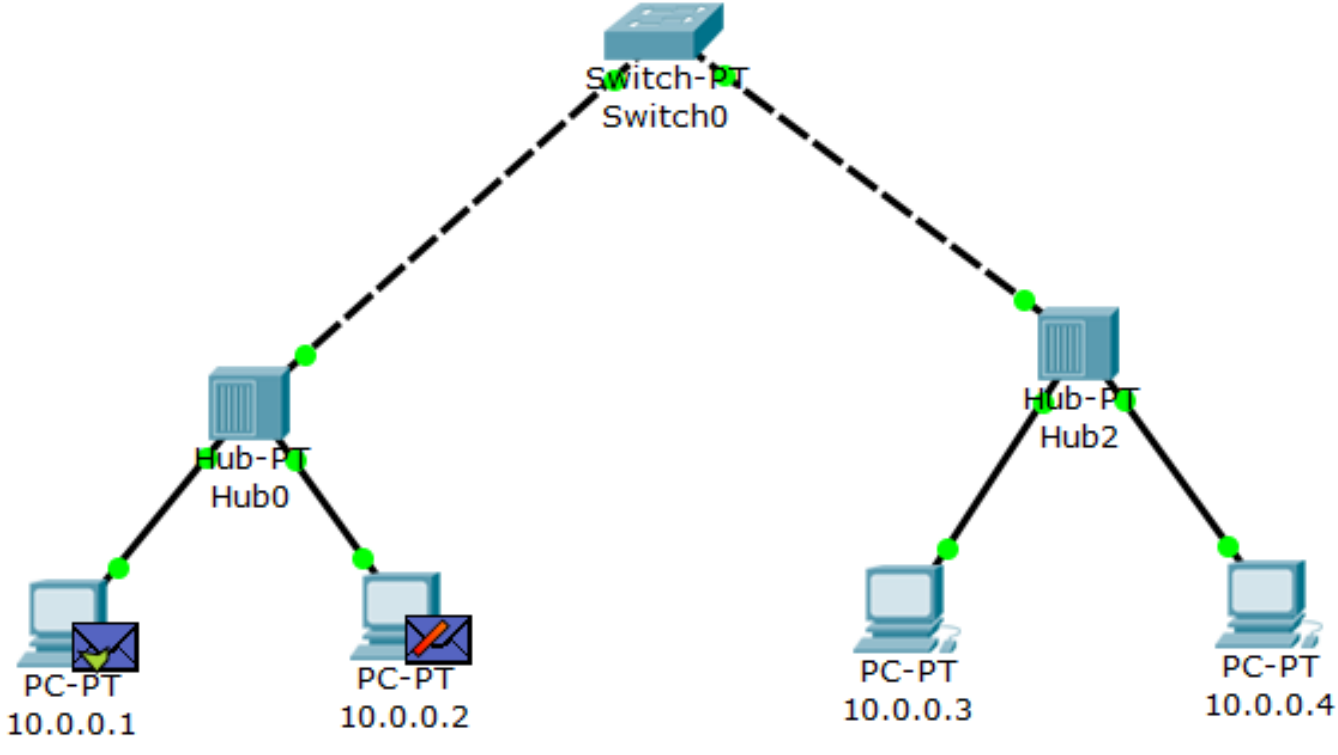
Result: The transmitting of PDU's were successful between the source & destination.

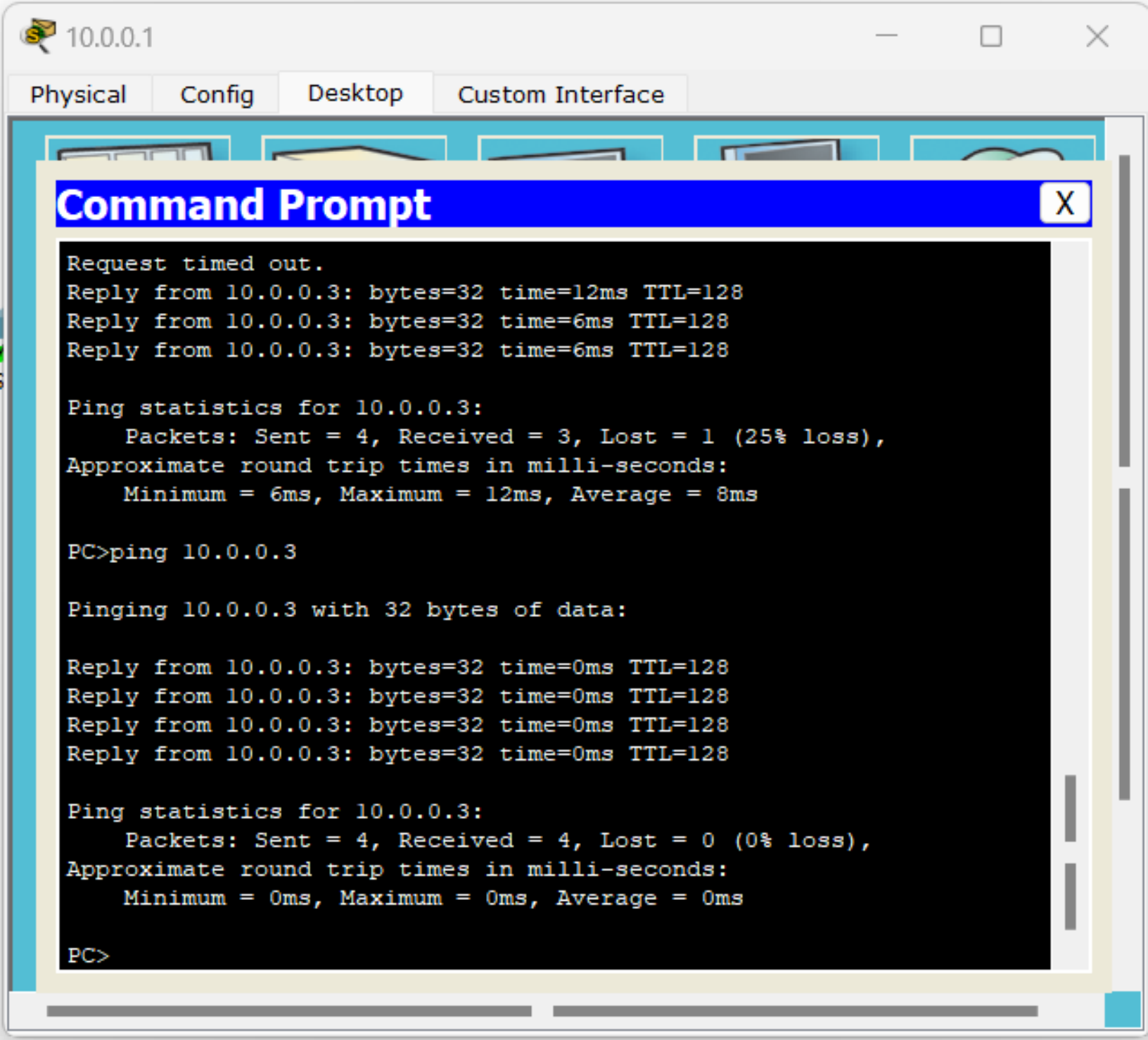
Observations: → Hubs broadcast a PDU to all the connected devices in a network, when a source transmit a PDU to hub.
→ Switches initially broadcast a PDU to the remaining connected devices. The devices, destination, replies back with a message to confirm the destination MAC addresses

Once the connection is established, there is unicasting between the source and destination via the switch.

→ If a receiver host isn't connected to a internetwork a message cannot be pinged & hence response will be timed out




Switch-PT
Switch0
Hub-PT
Hub0
Hub-PT
Hub2
PC-PT
10.0.0.1
PC-PT
10.0.0.2
PC-PT
10.0.0.3
PC-PT
10.0.0.4


10.0.0.1
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Request timed out.
Reply from 10.0.0.3: bytes=32 time=12ms TTL=128
Reply from 10.0.0.3: bytes=32 time=6ms TTL=128
Reply from 10.0.0.3: bytes=32 time=6ms TTL=128
Ping statistics for 10.0.0.3:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 6ms, Maximum = 12ms, Average = 8ms
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>

Exp 2:

Aim:- Configuring IP address to routers in packet tracer. Explore ping responses destination unreachable, reply, request, timed out.

Procedure:→ End devices are PC's which are connected to a Router.

→ IP addressed Configured for the end devices.

→ Configure IP address for both the Interfaces of Router.

→ IP addresses are Configed using Command line Interface.

→ Gateway addresses is Configured.

→ End devices are pinged to test the connection.

Topology: Star topology

Result: Succesfully pinged end devices through a router.

Pinging 20.0.0.2 with 32 bytes of data:

Reply from 20.0.0.2 : bytes = 32 time = 0ms TTL = 255

Reply from 20.0.0.2 : bytes = 32 time = 0ms TTL = 255

Reply from 20.0.0.2 : bytes = 32 time = 0ms TTL = 255

Reply from 20.0.0.2 : bytes = 32 time = 0ms TTL = 255

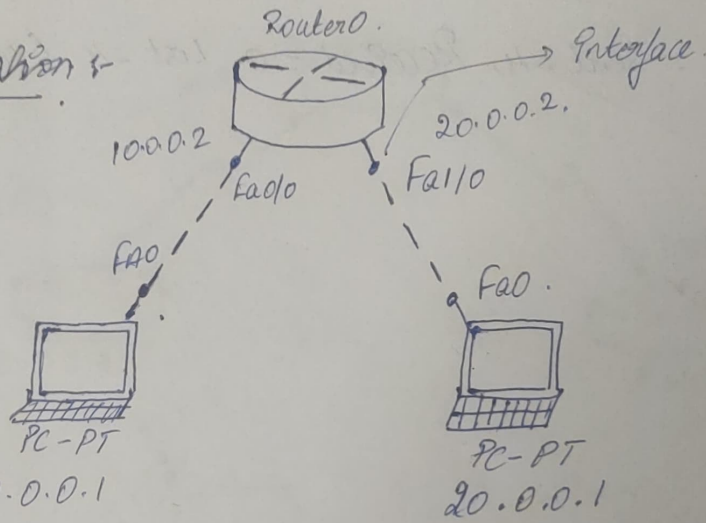
Ping statistics for 20.0.0.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% Loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 0ms, Average = 0ms.

Observation:-



Observation.

Successfull

1) → when we configure both end devices and router with appropriate IP addresses. and by configuring subnet mask of Interfaces of router, as 255.0.0.0 and gateway of PC0 is set as 10.0.0.2. which is of Fa0/0 interface. ~~and~~ & followed by same. for PC1, we could successfully ping the end devices.

Timed out:

→ If IP address of end devices or gateway is not configured properly, then we get request timed out.

Pinging 20.0.0.3 with 32 bytes of data:

Request timed out.

Ping statistics for 20.0.0.3:

Packets: Sent = 4, Received = 0, Lost = 4 (100% Loss)

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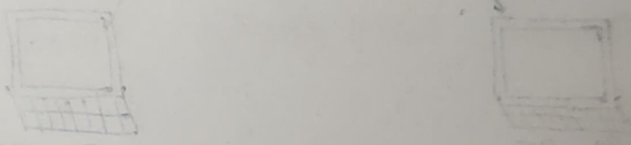
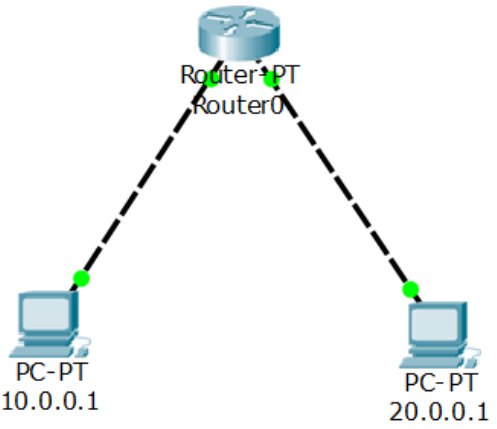
17/11/2022






```
PC>ping 20.0.0.1

Pinging 20.0.0.1 with 32 bytes of data:

Reply from 10.0.0.2: Destination host unreachable.
Reply from 10.0.0.2: Destination host unreachable.
Reply from 10.0.0.2: Destination host unreachable.
Reply from 10.0.0.2: Destination host unreachable.

Ping statistics for 20.0.0.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

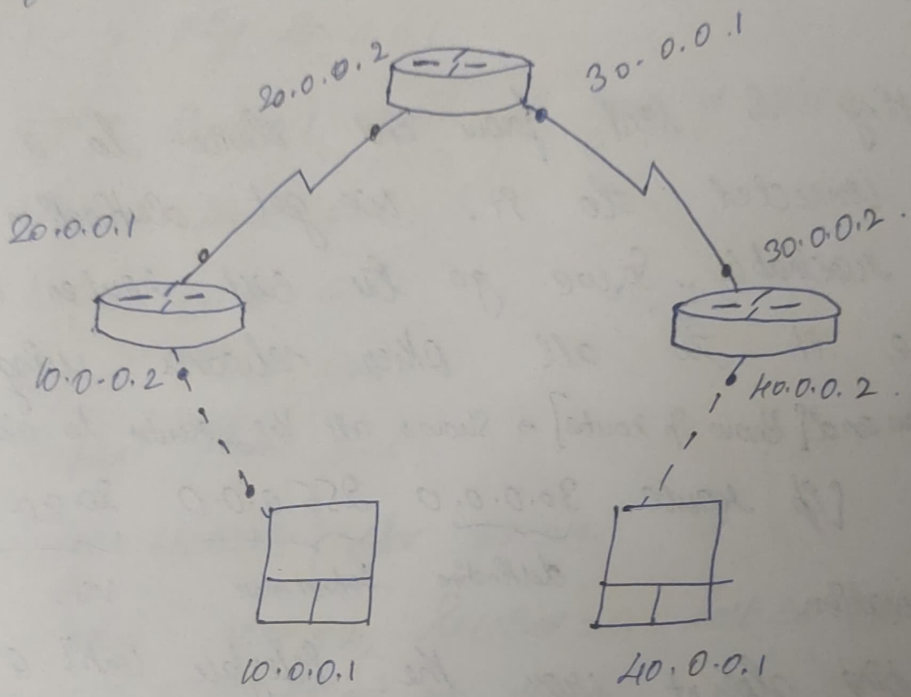
```
PC>ping 20.0.0.1

Pinging 20.0.0.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 20.0.0.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

```
PC>ping 20.0.0.1

Pinging 20.0.0.1 with 32 bytes of data:

Reply from 20.0.0.1: bytes=32 time=6ms TTL=127
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127
Reply from 20.0.0.1: bytes=32 time=1ms TTL=127
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127

Ping statistics for 20.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 6ms, Average = 1ms

PC>
```

Expt-3.

Aim: Configuring ~~Default~~ Static route to router.

Topology: Star topology.



Procedure:

→ 2 Routers are connected to 2 end devices and a router is used to connect other two Routers using serial DCE connection.

→ Configure IP address for end devices (PC-PT) and for Interfaces of routers.

→ Configured Gateway address of the end devices with ~~nearest~~ connected Interface of the router.

→ Configure IP addresses between routers using Serial 2/0, Serial 3/0 Interfaces.

→ ~~When~~ we could configure IP address using these Command

enable
config terminal.
interface Se2/0.
ip address 10.0.0.2 255.0.0.0
no shutdown
exit

→ A ping is sent from end device to a router not connected to it. we get destination host not reachable. So we go to each router and route it to all other networks, using command [show ip route] → shows all the routes to other networks

[ip route 30.0.0.0 255.0.0.0 20.0.0.2.
destination subnet mask via.

Observation

→ A ping doesn't cross the interface until a gateway has been sent to the connected interface / router.

→ Once gateway has been set, the ping will not cross over to another router as the router are not connected to other networks and they don't know which route to take are where the next hop of the signal is to be done.

→ The routes are configured with ip-route where the network ~~are~~ name, subnet mask and the next hop to reach the network is given to all the networks not directly connected to it

Result: A successful ping message has been sent over the end devices that are connected to different routers/networks.

Output: Gateway not Configured.

1) PC > Ping 20.0.0.1

Pinging 20.0.0.1 with 32 bytes of data.

Request timed out

Request timed out

Request timed out

Request timed out

Ping statistics for 20.0.0.1

Packets: Sent = 4, Received = 0, Lost = 4 (100% loss).

ip route is not set properly.

2) PC > ping 30.0.0.1

Pinging 30.0.0.1 with 32 bytes of data.

Destination host not reachable.

Successfull reply.

3) PC > ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data

Reply from 40.0.0.1: bytes = 32, time = 8ms TTL = 125

Reply from 40.0.0.1: bytes = 32, time = 8ms TTL = 125

Reply from 40.0.0.1: bytes = 32, time = 8ms, TTL = 125

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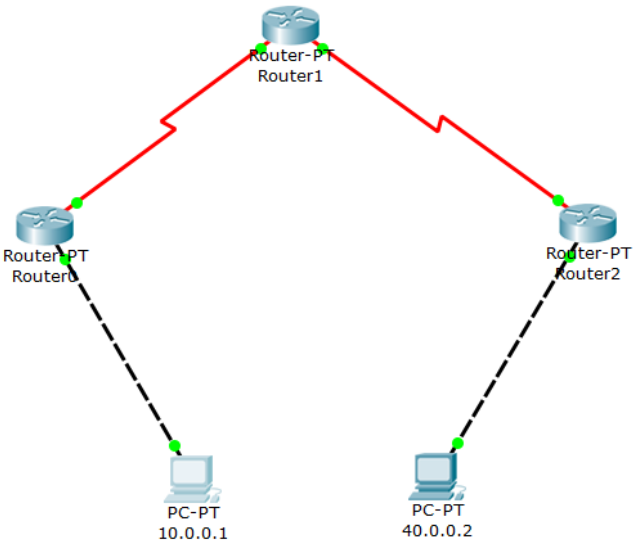
Ping statistics for 40.0.0.1

Packets: Sent = 4, Received = 4, Lost = 0 (0% Loss)




```
PC>ping 40.0.0.2

Pinging 40.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: Destination host unreachable.
Reply from 10.0.0.2: Destination host unreachable.
Reply from 10.0.0.2: Destination host unreachable.
Reply from 10.0.0.2: Destination host unreachable.

Ping statistics for 40.0.0.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

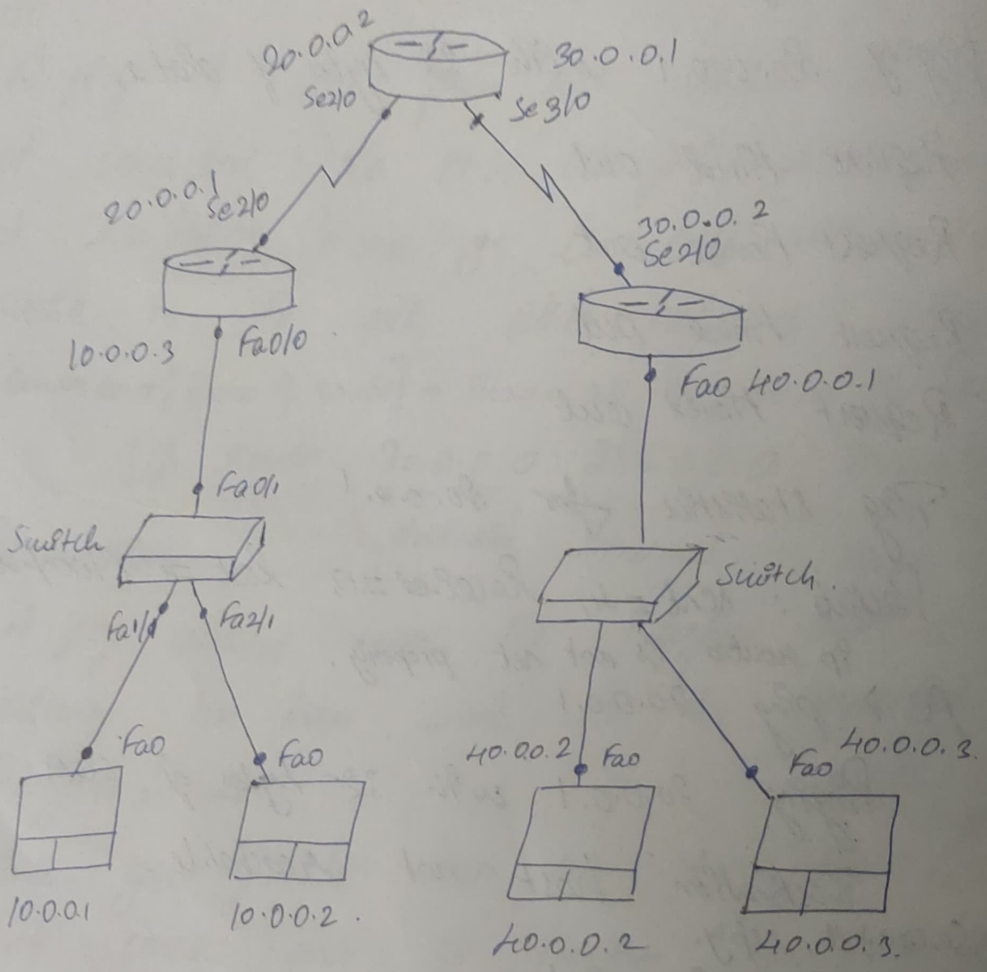
```
PC>ping 30.0.0.1

Pinging 30.0.0.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 30.0.0.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

```
PC>ping 40.0.0.2

Pinging 40.0.0.2 with 32 bytes of data:

Reply from 40.0.0.2: bytes=32 time=2ms TTL=125
Reply from 40.0.0.2: bytes=32 time=2ms TTL=125
Reply from 40.0.0.2: bytes=32 time=2ms TTL=125
Reply from 40.0.0.2: bytes=32 time=4ms TTL=125

Ping statistics for 40.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 4ms, Average = 2ms

PC>
```

Exp 4

Aim: Configuring Default route to router.

Topology: Star topology.



Procedure:

→ End devices are connected to the switch. switches are then connected to routers,

→ Configure end devices ~~of end~~ and interfaces of routers

→ Configure IP address between routers as serial interface.

→ To configure IP address following commands are executed

enable
Config terminal
Interface Se2/0
ip address 10.0.0.2 255.0.0.0
no shutdown
exit.

→ Configure gateway address of the end devices with. Connected Interface of the router.

→ Inorder to establish default route across the routers, ip route is configured using the command

ip route 0.0.0.0 0.0.0.0 20.0.0.2

Observation

→ A ping doesn't cross the Interface until a gateway has been sent to the connected Interface/router.

→ Once gateway has been set, the ping will not ~~not~~ cross over to another router as the router are not connected to other, networks and they won't know which route to take are where the next hop of the signal is to be done

→ Default route is configured between the routers, where ip route and subnet mask. Is not specified only via Interface of connected router.

→ Later pinged connections between all the routers and end devices.

Result:

A succesfull ping message has been sent over the end devices that are connected to different routes/ networks.

Output:

i) Gateway not configured.

PC > ping 20.0.0.1

Pinging 20.0.0.1 with 32 bytes of data

Request timed out

Request timed out.

Request timed out

Ping statistics for 20.0.0.1

Packets: Sent = 4, Received = 0, lost = 4 (100% loss)

ii) IP route not configured

PC > Ping 30.0.0.1

Pinging 20.0.0.1 with 32 bytes of data

Destination host unreachable

iii) Succesfull reply

PC > Ping Lo.0.0.1

Pinging Lo.0.0.1 with 32 bytes of data

Reply from Lo.0.0.1; bytes = 32; time = 8ms, TTL = 125

Reply from Lo.0.0.1, bytes = 32, time = 9ms, TTL = 125

Ping statistics from Lo.0.0.1

Packets, Sent = 4, Received = 4, Lost = 0 (0% Loss)

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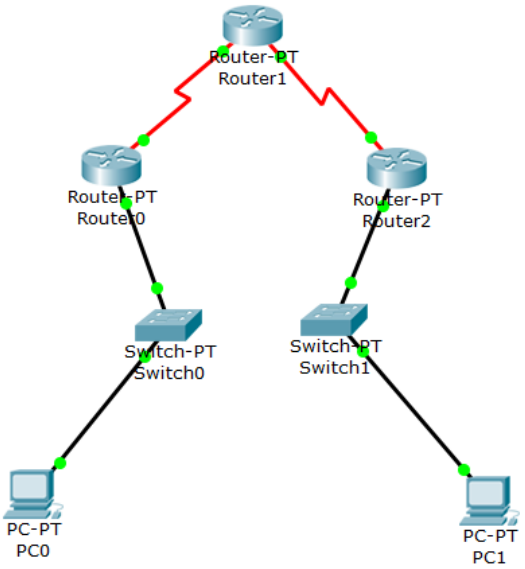



```
PC>ping 30.0.0.1

Pinging 30.0.0.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 30.0.0.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>
```

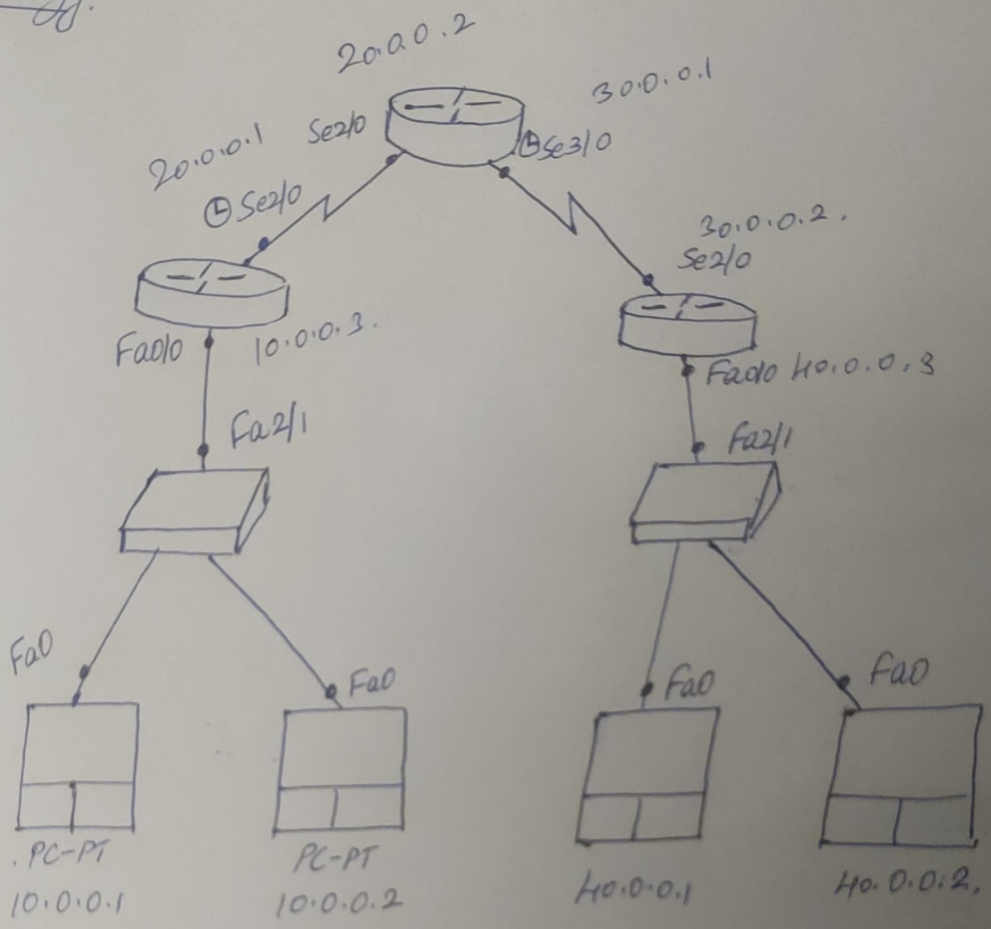
```
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.1

Pinging 10.0.0.1 with 32 bytes of data:

Reply from 40.0.0.1: Destination host unreachable.
Request timed out.
Reply from 40.0.0.1: Destination host unreachable.
Reply from 40.0.0.1: Destination host unreachable.

Ping statistics for 10.0.0.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>
```

```
PC>ping 40.0.0.2

Pinging 40.0.0.2 with 32 bytes of data:

Reply from 40.0.0.2: bytes=32 time=14ms TTL=125
Reply from 40.0.0.2: bytes=32 time=11ms TTL=125
Reply from 40.0.0.2: bytes=32 time=11ms TTL=125
Reply from 40.0.0.2: bytes=32 time=11ms TTL=125

Ping statistics for 40.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 11ms, Maximum = 14ms, Average = 11ms

PC>
```

LAB-5

Aim:- Configuring RIP routing protocol on routers

Topology:



Procedure

→ Three router are connected to 2 switches which are then connected to ~~router~~ end devices.

→ Configure end device and interface of router.

→ Configure IP address following commands are executed.

enable.
Config terminal.
Interface Se2/0
ip address 10.0.0.2 255.0.0.0.
no shutdown.

Ext.

→ Configure gateway address of end devices with connected Interface of routers.

→ Inorder to configure RIP protocol among the router. Serial DCE connection, we run following commands.

#router rip

#network 20.0.0.0

#network 30.0.0.0.

→ For every serial DCE connection, to configure RIP, with defined clock rate.

encapsulation PPP

clock rate 64,000.

→ A ping has been sent from one end device to other network end devices.

Observation:

> ping 40.00.1

Reply from 40.0.0.1 with 32 bytes of data.

Reply from 40.0.0.1 : bytes = 32 time = 2ms TTL = 125

Reply from 40.0.0.1 : bytes = 32 time = 2ms TTL = 125

Reply from 40.00.1 : bytes = 32 time = 2ms TTL = 125

Reply from 40.0.01 : byts = 32 time = 2ms TTL = 125

Ping Statistics for 40.0.0.1:

Packets: Sent = 4, Received = 4; Lost = 0 (0% loss)

Approximate round trip in milliseconds.

Maximum = 2ms, Maximum = 40ms.

Average = 10ms.

Since RIP Protocol has been established, IP route does not have to be set for each router.

Before RIP was set. ~~for each to~~.

Ping 10.0.0.1 → 40.0.0.1 : Destination host unreachable.

Before RIP

Ping 10.x → 20.x Request timed out.

Only on correctly configuring gateways and protocol, its reply received properly.

Result:

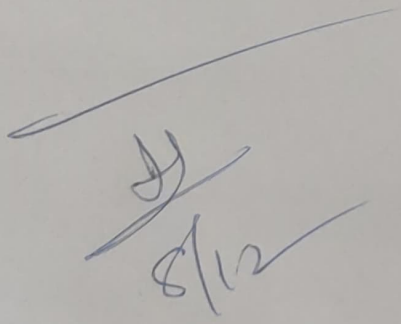
(Routing Information Protocol) RIP is established in network correctly.

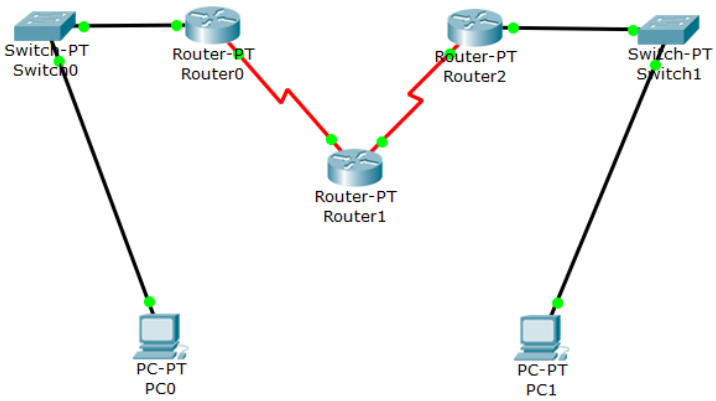
Note:

Even on proper connection and configuration. The first packet of first inter network ping is timed out as switches have not learnt network yet.

RIP- Routing Information Protocol.-

Is dynamic routing protocol that uses hop. count as a meter to find best path. between. source and destination.






```
PC>ping 40.0.0.2

Pinging 40.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: Destination host unreachable.
Reply from 10.0.0.2: Destination host unreachable.
Reply from 10.0.0.2: Destination host unreachable.
Request timed out.

Ping statistics for 40.0.0.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

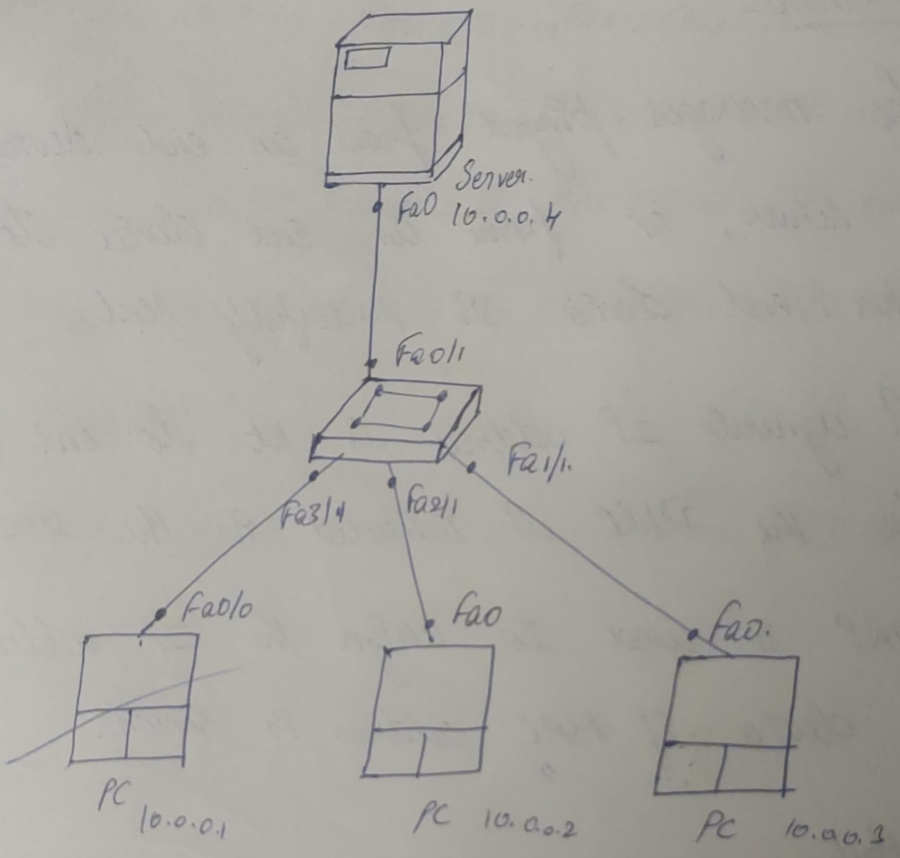
```
PC>ping 20.0.0.2

Pinging 20.0.0.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 20.0.0.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

```
PC>ping 40.0.0.2

Pinging 40.0.0.2 with 32 bytes of data:

Reply from 40.0.0.2: bytes=32 time=2ms TTL=125
Reply from 40.0.0.2: bytes=32 time=12ms TTL=125
Reply from 40.0.0.2: bytes=32 time=2ms TTL=125
Reply from 40.0.0.2: bytes=32 time=12ms TTL=125

Ping statistics for 40.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 12ms, Average = 7ms
```

LAB-6

Aim: Configure DHCP Server.

Topology:



Procedure:

→ Construct the following topology. That is Server is connected to a switch, and further is connected to PC's (end devices)

→ Configuring IP address of the server as 10.0.0.4,

→ Add/save IP address of the end devices &. Start IP address of DHCP., After switching on.

→ ~~Later~~ the DHCP service.

→ After assigning addresses, change the IP address of the end devices from static to DHCP.

→ Ping the IP addresses across all the end devices.

Observation:-

→ The messages pinged from an end device to the server, or from an end device to another end device is successfully sent.

→ A dynamic IP address is set to end devices when the DHCP is initialed on the server.

→ RARP is used to assign the IP address of a device of MAC address is known.

Output:

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=1ms TTL=128

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

Ping statistics for 10.0.0.3

Packet: Sent=4, Received=4, Lost=0 (0% Loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 4ms, Average = 1ms.

2) SERVER > ping 10.0.0.1

Pinging 10.0.0.1 with 32 bytes of data:

Reply from 10.0.0.1 : bytes = 32 time = 0ms TTL = 128

Reply from 10.0.0.1 : bytes = 32 time = 0ms TTL = 128

Reply from 10.0.0.1 : bytes = 32 time = 0ms TTL = 128

Reply from 10.0.0.1 : bytes = 32 time = 0ms TTL = 128.

Ping statistics

Packets : sent = 4, Received = 4, Lost = 0 (0% loss).

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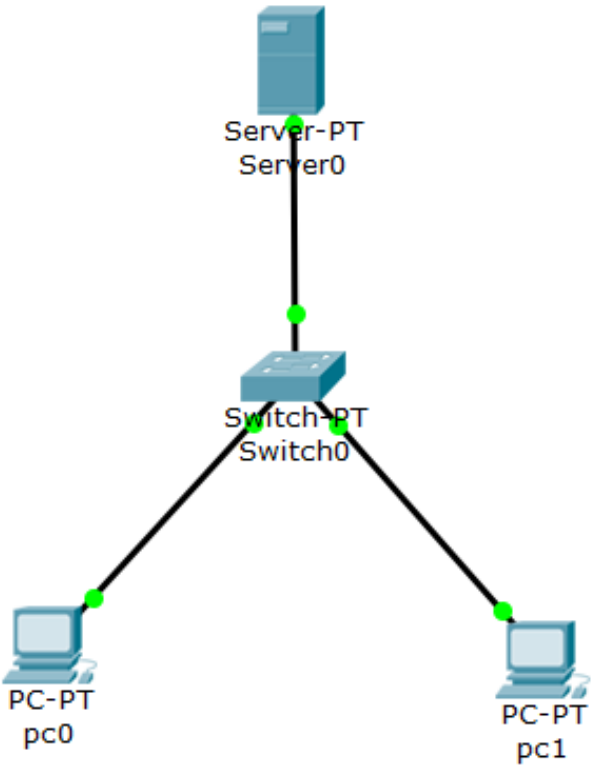
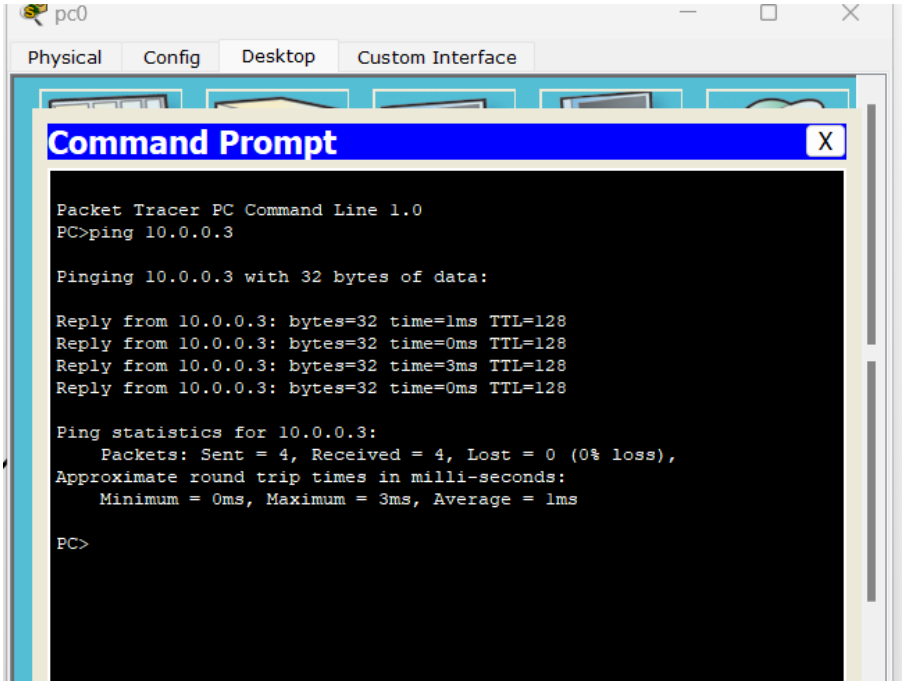
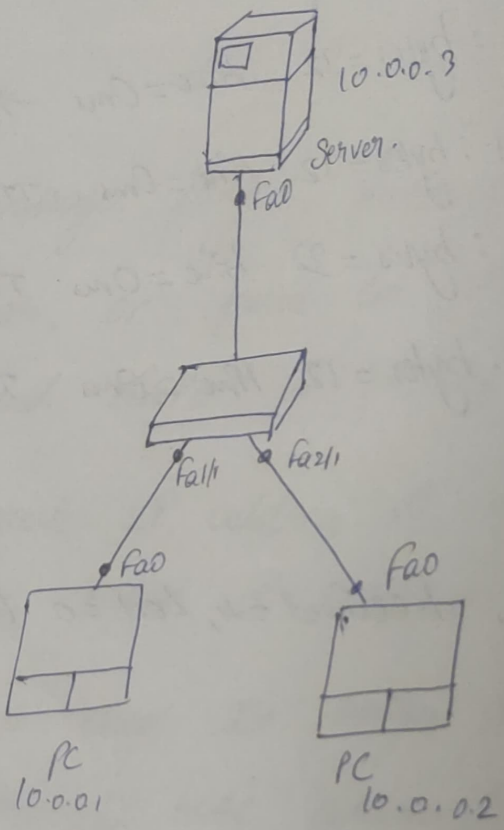

Server-PT
Server0
Switch-PT
Switch0
PC-PT
pc0
PC-PT
pc1


pc0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
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=1ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=3ms 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 = 3ms, Average = 1ms
PC>

LAB-7.

Aim: Configuring webserver and DNS server.

Topology:



Procedure:

→ Construct the following topology, where Server is connected to end devices through switches.

→ Configure IP address of the server and the end devices.

→ Set the HTTP and DNS server to on state.

→ Set the Server Domain Name and address of it as same as server. And save the following.

→ From one of the end devices, check if the Webserver is reachable from the end devices by entering URL.

Observation:

→ Web browser module is opened on the end device and the set domain name (www.pmsce.com) is entered.

→ If the system/server hasn't been configured properly, i.e, set DNS server and default gateway, the 'Host Unresolved' is shown.

→ If configured properly, the page of Cisco Packet Tracer is opened.

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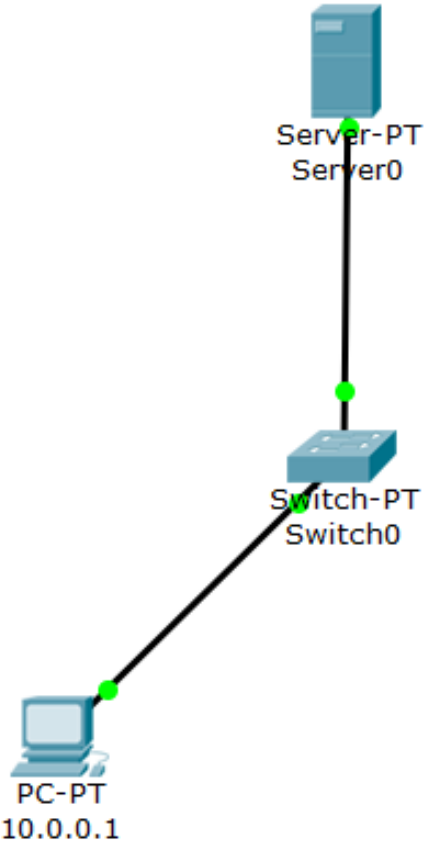
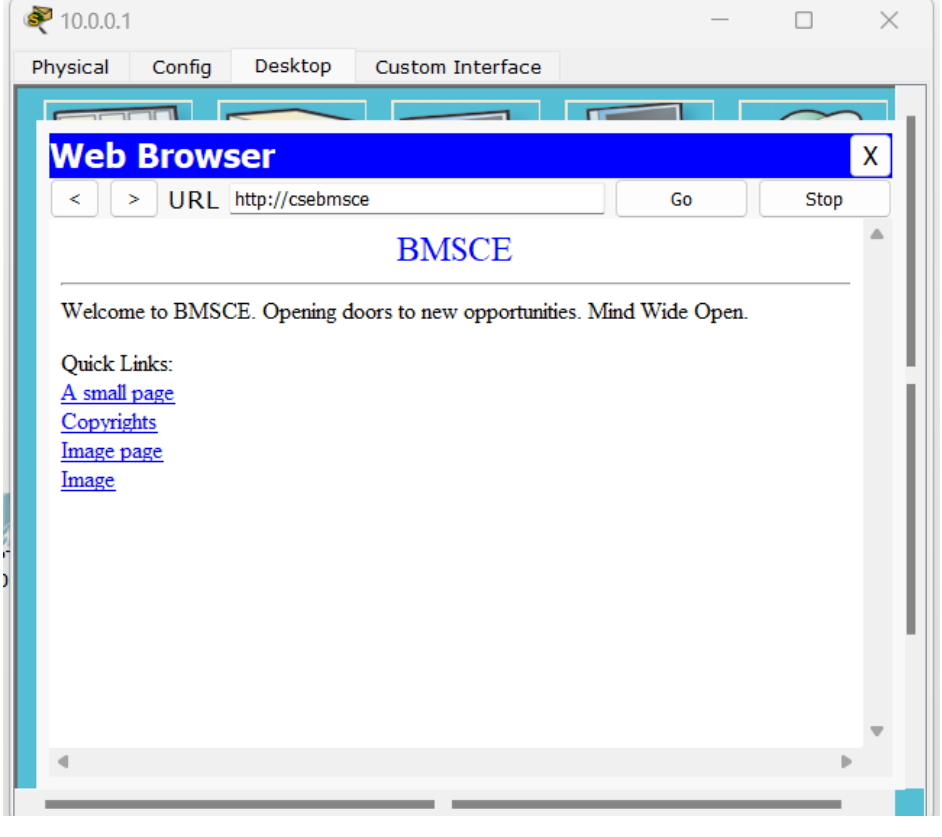

Server-PT
Server0
Switch-PT
Switch0
PC-PT
10.0.0.1


10.0.0.1
Physical
Config
Desktop
Custom Interface
Web Browser
X
<
>
URL
http://csebmsce
Go
Stop
BMSCE
Welcome to BMSCE. Opening doors to new opportunities. Mind Wide Open.
Quick Links:
A small page
Copyrights
Image page
Image

LAB: 6

1) Write a program, for error detection using CRC 16-bit.

Ans

```
import java.util.*;
class CRC-algo{
    public static void main(String args[]){
    Scanner sc = new Scanner(System.in);
    System.out.println("Enter no.");
      int n = sc.nextInt();
    int[] data = new int[n+16];
    int[] rem = new int[n];
  for(int i=0; i<n+16; i++){
    data[i] = (i>n)?0 : sc.nextInt();
      if(i<n)
        rem[i] = data[i]
    }
  for(int i= 0; i<n; i++){
    if(data[i]!=1)
      continue;
    for(int j=0; j<17; j++){
      data[i+j] = data[i+j] ^ divisor[j];
    }
}
```

```
for (int i=0; i< rem.length;
    data[i] = rem[i];
System.out.println();
for (int i=0; i< data.length; i++)
    System.out.println (data[i] + " ");
data[10] =1;
for (int i = 0; i<n ; i++){
    if (data[i]!=1)
        continue;
    for (int j = 0; j<17; j++)
        data[i+j] = data[i+j] ^ divisor[j];
}
System.out.println();
for (int i=0 ; i< data.length ;i++)
    System.out.print (data[i] + " ");
}
}
```

Output.

Enter message to be passed : 3.

1 1

1 1 1 0 1 1 0 0 0 0 0 1 1 0 0 0 1 1

0 0 1 0 0 0 0 0 0 1 0 0 0 0 0 0 0.

```
Enter the length of Data Frame:
3
Enter the Message:
1 0 1
Data to be transmitted:
1 0 1 0 1 0 1 0 0 0 0 1 0 1 0 0 1 0 1
Enter the Reveived Data:
1 0 1 0 1 0 0 1 0 0 1 0 1 0 0 0 0 0 0
error in data
PS C:\Users\mknv7\OneDrive\Desktop\5th Sem\Computer Network>
```

LAB-9

2) Leaky - Bucket

```
import java.util.*;
class leaky_bucket {
    public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        System.out.println ("Enter bucket capacity");
        int capacity = sc.nextInt();
        System.out.println ("Enter output rate");
        int rate = sc.nextInt();
        int curr = 0;
while (true) {
    System.out.println ("Enter the input rate");
    int input = sc.nextInt();
    if (curr + input > capacity)
        System.out.println ("Bucket Overflow");
    else {
        curr += input;
        Curr -= rate;
        curr = Math.max (0, curr);
        System.out.println ("Bucket Capacity : "+curr);
    }
```

```
System.out.println("Do you want to continue, 2 to
exit, 1 to continue");
  int choose = sc.nextInt();
  if (choose == 2)
    break;
  }
}
```

Output

```
Enter bucket capacity.
500
Enter Output rate.
200
Enter Input rate
300
Bucket capacity is : 100.
Do you want to continue, 2 to exit, 1 to continue
2.
```

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```
Enter the bucket capacity :
500
Enter output rate
200
Enter the input rate :
300
Bucket Capacity is 100
Do you want to continue, 2 to exit ,1 to continue
1
Enter the input rate :
300
Bucket Capacity is 200
Do you want to continue, 2 to exit ,1 to continue
1
Enter the input rate :
400
Bucket Overflow
Do you want to continue, 2 to exit ,1 to continue
```

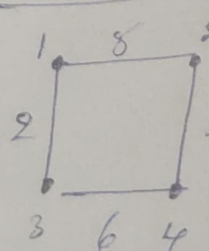
Write a program for distance vector routing algorithm to find suitable path for transmission

```
Class DVR{
    int graph[][];
    public static void main(String args[]){
    System.out.println("Enter number of edges");
      e=sc.nextInt();
    System.out.println("Enter number of vertices");
      v = sc.nextInt();
    for(int i=0; i<v; i++)
        for(int j=0;j<v;j++){
            if(i==j)
              graph[i][j] = 0;
            else
              graph[i][j] = 9999;
    }
static void updateTable(int source){
  for(int i=0;i<v;i++){
      if(graph[source][i] != 9999){
          int dist = graph[source][i];
        for(int j=0;j<v;j++){
            int interdist = rt[i][j];
            if(via[i][j] = source)
                interdist = 9999;
          if(dist + interdist < rt[source][j]){
```

```
        rt[source][j] = dist + inter_dist;
        via[source][j] = i;
      }
    }
  }

  static void update_tables(){
    int k=0;
    for(int i=0; i<4*V; i++){
      update_table(k);
      k++;
      if(k==V)
        k=0
    }
  }
  void print_table(){
    for(int i=0; i<V; i++){
      for(int j=0; j<V; j++){
        System.out.println("Dist" + rt[i][j]+" ");
      }
      System.out.println();
    }
  }
}
```

Output:



Routing tables are

0	5	2	8
5	0	7	5
2	7	0	6
8	5	6	6

```
Please enter the number of Vertices:
5
Please enter the number of Edges:
6
Please enter data for Edge 1:
Source: 1
Destination: 2
Cost: 3
Please enter data for Edge 2:
Source: 2
Destination: 4
Cost: 6
Please enter data for Edge 3:
Source: 3
Destination: 5
Cost: 4
Please enter data for Edge 4:
Source: 1
Destination: 4
Cost: 8
Please enter data for Edge 5:
Source: 2
Destination: 5
Cost: 5
Please enter data for Edge 6:
Source: 4
```

```
Source: 2
Destination: 5
Cost: 5
Please enter data for Edge 6:
Source: 4
Destination: 5
Cost: 2

The initial Routing Tables are:
Dist: 0    Dist: 3    Dist: 12    Dist: 8    Dist: 8
Dist: 3    Dist: 0    Dist: 9    Dist: 6    Dist: 5
Dist: 12    Dist: 9    Dist: 0    Dist: 6    Dist: 4
Dist: 8    Dist: 6    Dist: 6    Dist: 0    Dist: 2
Dist: 8    Dist: 5    Dist: 4    Dist: 2    Dist: 0

Please enter the Source Node for the edge whose cost has changed: 2
Please enter the Destination Node for the edge whose cost has changed: 4
Please enter the new cost: 7

The new Routing Tables are:
Dist: 0    Dist: 3    Dist: 12    Dist: 8    Dist: 8
Dist: 3    Dist: 0    Dist: 9    Dist: 7    Dist: 5
Dist: 12    Dist: 9    Dist: 0    Dist: 6    Dist: 4
Dist: 8    Dist: 7    Dist: 6    Dist: 0    Dist: 2
Dist: 8    Dist: 5    Dist: 4    Dist: 2    Dist: 0
```

Implement dijkstra's algorithm to find the shortest path for a given topology.

```
#include<stdio.h>
void dijkstras();
int c[10][10],n,src;
void main()
{
  int i,j;
  for(i=1;i<=n;i++){
    for(j=1;j<=n;j++){
      scanf("%d",&c[i][j]);
      if(c[i][j]==0)
        c[i][j]=9999;
    }
  }
void dijkstras(){
  for(j=1;j<=n;j++)
    dist[j]=c[src][j];
  for(j=1;j<=n;j++)
    vis[j]=0;
  while(count!=n){
    min=9999;
    for(j=1;j<=n;j++)
      if(dist[j]<min && vis[j]!=1)
        min=dist[j];
        u=j;
```

```
vis[u] = 1;
count++;
for(j=1; j<=n; j++)
  if (min + c[u][j] < dist[j] && vis[j] != 1)
      dist[j] = min + c[u][j];

for(j=1; j<=n; j++)
    printf("%d ---> %d = %d", src, j, dist[j]);
```

Output:

```
Enter number of vertices: 3
Enter cost matrix:
0 4 1
4 0 2
1 2 0

Enter source node: 1
1 ---> 1 = 0
1 ---> 2 = 3
1 ---> 3 = 1.
```

```
Vertex                  Distance from Source
0                       0
1                       4
2                       12
3                       19
4                       21
5                       11
6                       9
7                       8
8                       14
PS C:\Users\mknv7\OneDrive\Desktop\5th Sem\Computer Network>
```

(10) Using TCP/IP Sockets, write a client-server program to make client sending the file name and the server send back the contents of the requested file if present.

Server TCP.py

```
from socket import *
serverName = "127.0.0.1"
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_STREAM)
serverSocket.bind((serverName, serverPort))
serverSocket.listen(1)
while 1:
    print("The server is ready to receive")
    connectionSocket, addr = serverSocket.accept()
    sentence = connectionSocket.recv(1024).decode()
    file = open(sentence, "r")
    l = file.read(1024)
    connectionSocket.send(l.encode())
    print('\n Sent Contents of ' + sentence)
    file.close()
    connectionSocket.close()
```

ClientTCP.py

```
from socket import *
serverName = '127.0.0.1'
serverPort = 12000
```

```
clientSocket = socket(AF_INET, SOCK_STREAM)
clientSocket.connect((serverName, serverPort))
sentence = input("\n Enter file name")
clientSocket.send(sentence.encode())
fileContents = clientSocket.recv(1024).decode()
print("From Server:\n")
print(fileContents)
clientSocket.close()
```

Output:

Serverside

The server is ready to receive
Sent contents of dummy.txt
The server is ready to receive.

Client

Enter file name: dummy.txt
From server:
Received dummy.txt file from server

Server Side

```
The server is ready to receive

Sent contents of serverTCP.py
The server is ready to receive
```

Client Side

```
Enter file name: serverTCP.py

From Server:
 connectionSocket, addr = serverSocket.accept()
 sentence = connectionSocket.recv(1024).decode()

 file=open(sentence,"r")
 l=file.read(1024)

 connectionSocket.send(l.encode())
 print ('\nSent contents of ' + sentence)
 file.close()
 connectionSocket.close()
```

Using UDP sockets, write a client-server program to make client sending the file name and the server to send back the contents of the requested file if present.

Server_UDP.py

```
from socket import *
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_DGRAM)
serverSocket.bind("127.0.0.1", serverPort)
print("Server is ready to receive")
while 1:
    sentence, clientAddress = serverSocket.recvfrom(2048)
    sentence = sentence.decode("utf-8")
    file = open(sentence, "r")
    l = file.read(2048)
    serverSocket.sendto(bytes(l, "utf-8"), clientAddress)
    print('\n Sent Content of ', end=' ')
    print(sentence)
    file.close()
```

Client_UDP.py

```
from socket import *
serverName = "127.0.0.1"
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_DGRAM)
sentence = input("Enter file name: ")
clientSocket.sendto(bytes(sentence, "utf-8"), (serverName, serverPort))
```

```
file_contents, serverAddress = clientSocket.recvfrom(2048)
print('Reply from server')
print(file_contents.decode("utf-8"))
clientSocket.close()
clientSocket.close
```

Output.

Server side

Server is ready to receive

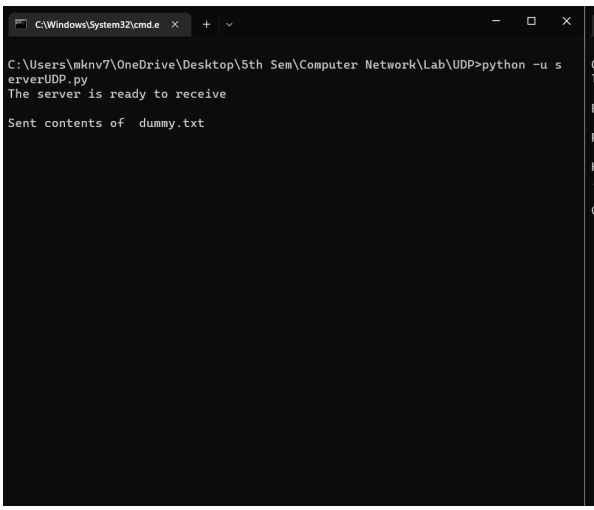
Sent contents of dummy.txt

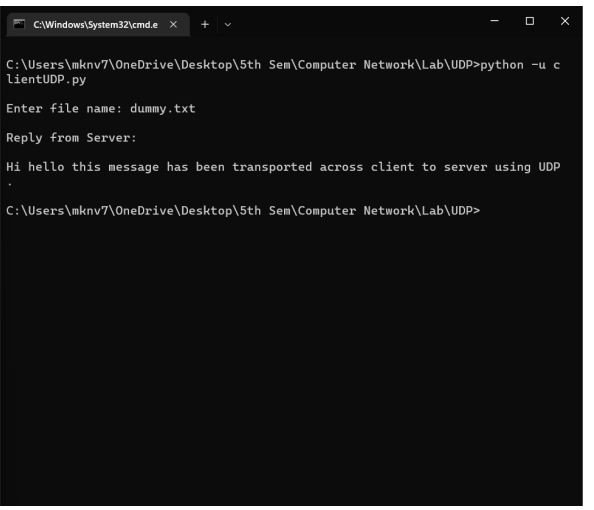
Client side

Enter file name: dummy.txt

Reply from Server:

Hi hello this message is transported via UDP.


C:\Windows\System32\cmd.e
C:\Users\mknv7\OneDrive\Desktop\5th Sem\Computer Network\Lab\UDP>python -u s
erverUDP.py
The server is ready to receive
Sent contents of dummy.txt


C:\Windows\System32\cmd.e
C:\Users\mknv7\OneDrive\Desktop\5th Sem\Computer Network\Lab\UDP>python -u c
lientUDP.py
Enter file name: dummy.txt
Reply from Server:
Hi hello this message has been transported across client to server using UDP
.
C:\Users\mknv7\OneDrive\Desktop\5th Sem\Computer Network\Lab\UDP>