Lab - 0

Class - A IP Address : 10.0.0.x
Subnet mask : 255.0.0.0 (assigned by default when IP address is entered) - 32 bits. (first 8 bits for host 24 bits after that for network)

Types of cables that we are working with:
a) copper straight - strong bleeds, without breaks
b) copper crossover - strong bleeds with breaks

Types of lights:
a) green - physical link is up
b) red - physical link is down

Types of PDU's we use:
a) Simple - System defined specifications.
b) Complex - User can define specifications

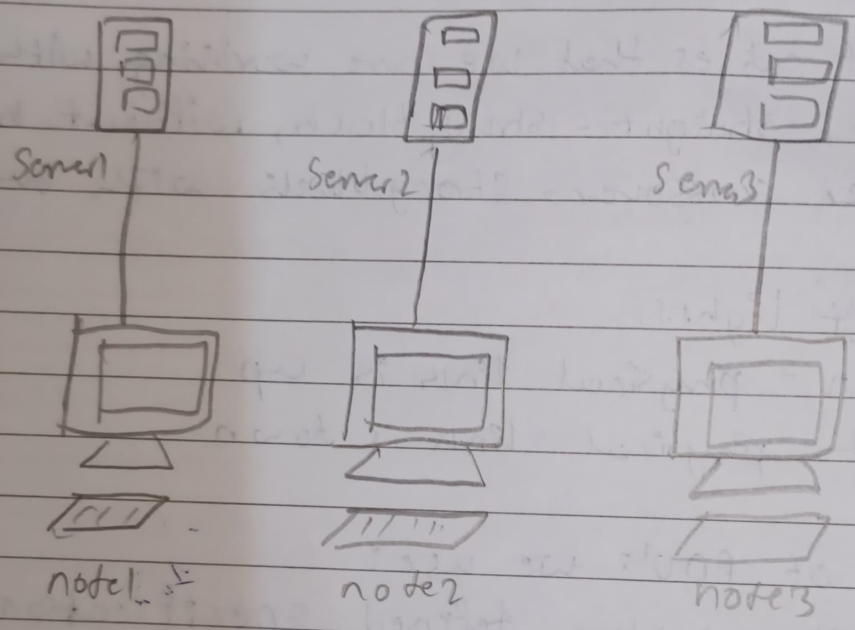
Reference for further info - file:///c:/Program%20files%20(x86)/Cisco%20Packet%20Tracer%206.2sv/help/default/intro.html

Instructions for LAB - 1
1. Add a node (generic).
2. Add a server
[1 & 2 are under lab devices]

3. Click on device, under config lab - set the IP address (10.0.0.1) and the subnet mask (255.0.0.0) is set by default

4 Connect using Copper crossover connection. It shows Show green light at both ends.
5. Add a Simple PDU
6 Auto - capture the transfer
7. Save the file.

Topology:-

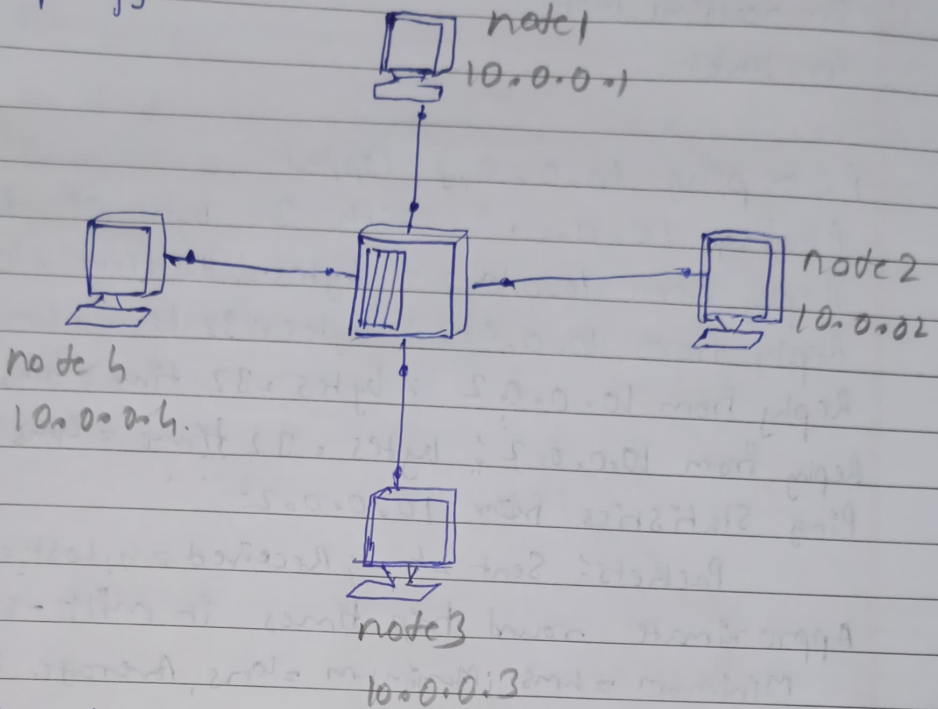


Date
Page

Hubs and Switches

Aim: Create a topology and simulate sending a simple PDU from source to destination using hubs and switches using as connecting devices.

Topology



Procedure:

Create a generic hub and switch.
Add Generic PC's, connect 4 to hub, 4 to switch.
Connect them using copper Straight Cables
Place nodes with the IP addresses assigned.

Observations:

A) learning:

1) Hub sends information to all connected devices, switch sends information to the specific device.
2) In a hub, before adding a new device, first we need to check if ports are available. If no ports are available, then turn off the device first and drag and drop ports
3) In a generaic hub, a maximum number of 10 devices.

4) Switch has one console and 6 fast ethernet connec
No option of adding an extra port.

B) Results:

1) In realtime mode,
for Hub:

PC > ping 10.0.0.2 Cinput
Pinging: 10.0.0.2 with 32 bytes of data:
Reply from 10.0.0.2 : bytes = 32 time = 10ms TTL
Reply from 10.0.0.2 : bytes = 32 time = 4ms TTL =
Reply from 10.0.0.2 : bytes = 32 time = 4ms TTL = 12
Reply from 10.0.0.2 : bytes = 32 time = 4ms TTL = 12
Ping Statistics for 10.0.0.2:
Packets: Sent = 4 ; Received = 4, Lost = 0 (0% loss)
Approximate round trip times in milli-seconds:
Minimum = 4ms ; Maximum = 10ms, Average = 5ms

for switch:

PC > ping 10.0.0.71 with 32 bytes of data:
Reply from 10.0.0.71 : bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.71 : bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.71 : bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.71 : bytes = 32 time = 0ms TTL = 128
Ping Statistics for 10.0.0.71:
Packets: Sent = 4 ; Received = 4, lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms

2) In simulation mode

for Hub;

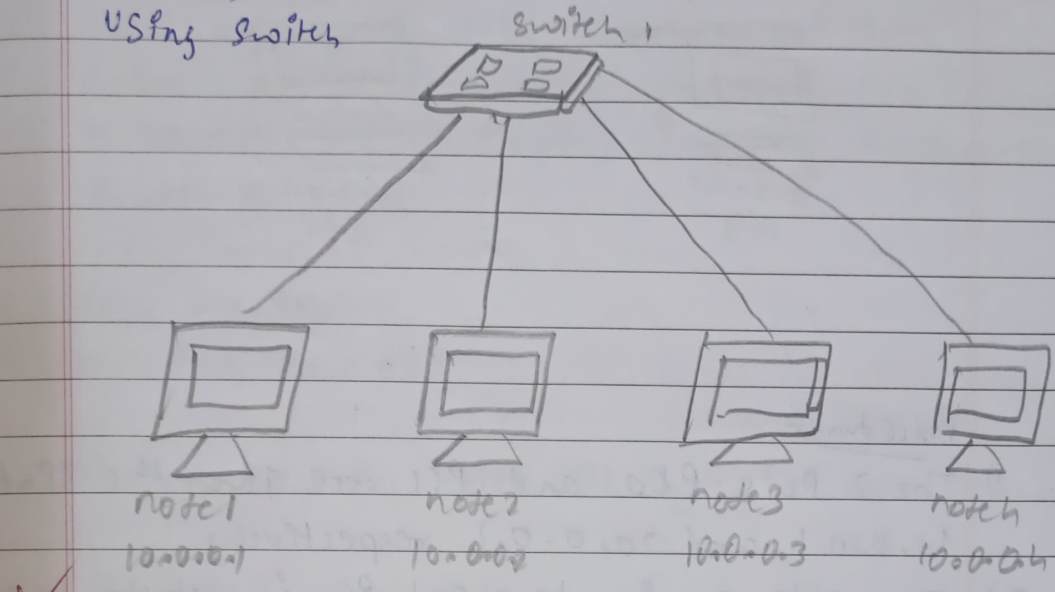
a simple PDU sent from a source is sent to the Hub and from there it is sent to all the nodes.

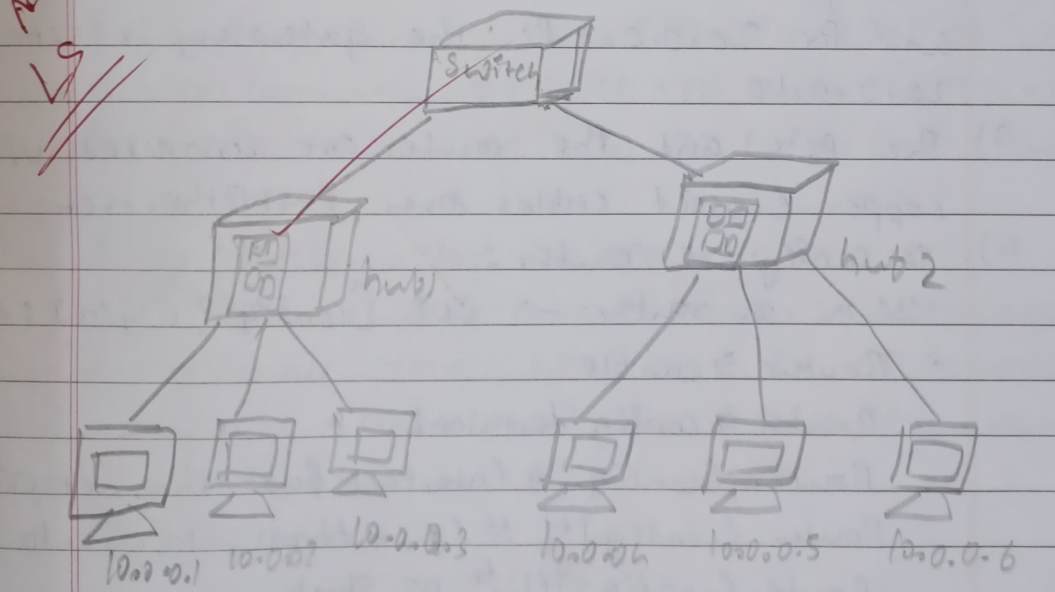
For switch:

a simple PDU is sent from source to switch and from there to the specific device.

Topology

Using Switch



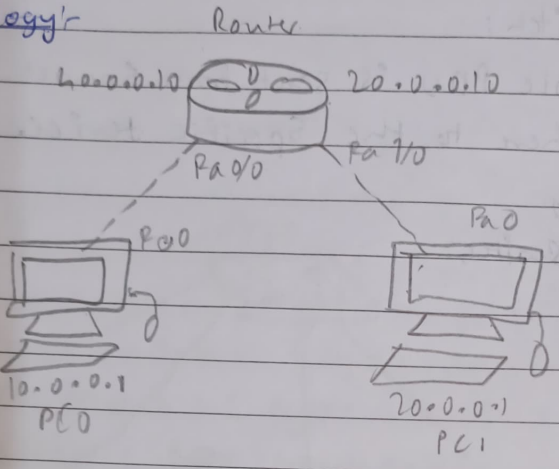


Lab - 2

Aim: To configure IP address to Routers in Packet tracer, Explore the following messages: Ping Responses, Destination unreachable, Request timed out, Reply

Pre-requisite

Topology:



Procedure:

1) The 2 PC's PC0 and PC1 are given the IP address 10.0.0.1 and 20.0.0.1 respectively
2) The gateway for 10.0.0.1 PC is set to 10.0.0.10 and for 20.0.0.1 PC the gateway is set to 20.0.0.10
3) The PC's and the router are connected via copper crosset cables over FastEthernet
4) To configure router:

   click on router → CLI. [config ? (y/n) : n]

   - Router > enable
     Router # config terminal
     Router (config) # interface fastethernet 0/0
     Router (config-if) # ip address 10.0.0.10 255.0.0.0
     Router (config-if) # no shut
     Router (config) # exit

5) The following CLI commands are again repeated for gateway interface 20.0.0.10.

6) Ping from PC0 to PC1

PING 20.0.0.1

7) Record the results obtained

Observation.

a) Result

Router # show ip 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 directly connected, FastEthernet1/2

Router #

Ping results

PC> Ping 20.0.0.1.

Pinging 20.0.0.1 with 32 bytes of data

Request timed out

Reply from 20.0.0.1 bytes=32 time=0ms TTL=127

Reply from 20.0.0.1 bytes=32 time=0ms 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=3, Lost=1(25% loss)

Approximate round trip times in milliseconds:

Minimum = 0ms, maximum = 0ms, Average=0ms

PC> Ping 20.0.0.1.

Pinging 20.0.0.1 with 32 bytes of data:

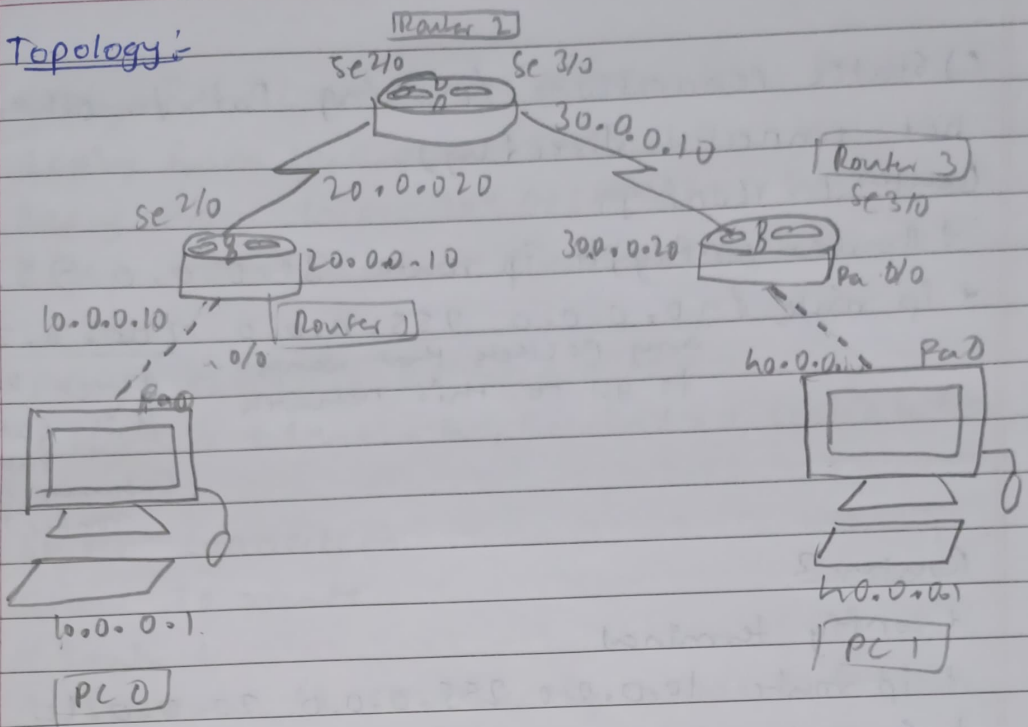
Reply from 20.0.0.1 bytes=32 time=0ms TTL=12
Reply from 20.0.0.1 byte=32 time=0ms TTL=12
Reply from 20.0.0.1 bytes=32 time=0ms TTL=12
Reply from 20.0.0.1 bytes=32 time=0ms TTL=12

Ping Statistics for 20.0.0.1:
Packets: Sent=4 received=4 loss=0 (0% Loss)
Approximate round trip times in milliseconds:
Minimum=0ms, maximum=0ms, Average=0ms

b) Learning:

* Router is a layer 3 device / networks layer device
* Router and PC's are connected via copper crossover cables because in crossover wiring we connect MAC devices to MAC devices and non-MAC device to non-MAC devices. So, we use crossover cable to connect computer and routers because both have MAC address
* When we pinged 2nd PC from 1st PC, the router took some time to understand its networks and thus "Request Timed out" was displayed. Then when pinged again, it instantly derived packets successfully.

Topology:-



Procedure:-

1) PC0 and PC1 computers are assigned IP addresses 10.0.0.1 and 40.0.0.1 along with gateway of 10.0.0.10 and 40.0.0.10 respectively.
2) Router to PC connection - copper crossover and router to router connection - Serial DCE cables
3) Router configuration:-
   a) Router with computer
   Continue with configuration dialog (y/n) [n] no
   Router > enable.
   Router # config terminal
   Router (config) # interface fastethernet 0/0
   Router (config-if) # ip address 10.0.0.10 255.0.0.0
   Router (config-if) # no shut
   exit
   b) Router to Router (adjacent Router)
   Router (config) # interface serial 2/0
   Router (config-if) # ip address 20.0.0.10 255.0.0.0
   Router (config-if) # no shut

c) Static connections (making Path to other routers not connected directly)

Router 1 - #config#

* Router (config)# ip route 30.0.0.0 255.0.0.0
* ip route 40.0.0.0 255.0.0.0 200.0.20

any packets that wants to go to this network → direct through this gateway interface (gateway of adjacent router)

Router 2

* config terminal
* ip route 10.0.0.0 255.0.0.0 20.0.0.10
* ip route 40.0.0.0 255.0.0.0 30.0.0.20
* exit

Router 3:-

* config terminal
* ip route 10.0.0.0 255.0.0.0 30.0.0.10
* ip route 20.0.0.0 255.0.0.0 30.0.0.10
* exit

4) Sent Ping from 10.0.0.1 to 40.0.0.1 and record the results.

Observation:

a) Results

i) Befor static connection

PC > Ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data

Reply from 40.0.0.10: Destination host unreachable
Reply from 10.0.0.10: Destination host unreachable
Reply from 40.0.0.10: Destination host unreachable
Reply from 10.0.0.10: Destination host unreachable

Ping statistics for 40.0.0.1:
Packets: sent = 4, Received = 0, Lost = 4 (100% loss)

ii) Static connection
show ip route
// Router 1
C 10.0.0.0/8 is directly connected, FastEthernet 0/0
C 20.0.0.0/8 is directly connected, Serial 2/0
S 30.0.0.0/8 [1/0] via 20.0.0.20
S 40.0.0.0/8 [1/0] via 20.0.0.20

// Router 2
S 10.0.0.0/8 [1/0] via 20.0.0.10
C 20.0.0.0/8 is directly connected, Serial 2/0
C 30.0.0.0/8 is directly connected Serial 3/0
S 40.0.0.0/8 [1/0] via 30.0.0.20

// Router 3
S 10.0.0.0/8 [1/0] via 30.0.0.10
S 30.0.0.0/8 [1/0] via 30.0.0.10
C 30.0.0.0/8 is directly connected, Serial 2/0
C 40.0.0.0/8 is directly connected, FastEthernet 0/0

iii) Pinging PC1:
Checking each and every connection

PC > Ping 20.0.0.10
Pinging 20.0.0.10 with 32 bytes of data

Reply from 20.0.0.10 : bytes=32 time = 0ms TTL=255
Reply from 20.0.0.10 : bytes=32 time = 1ms TTL=255
Reply from 20.0.0.10 : bytes = 32 time = 0ms TTL=255
Reply from 20.0.0.10 : bytes = 32 time = 0ms TTL = 255

Ping Statistics for 20.0.0.10
Packets : Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms

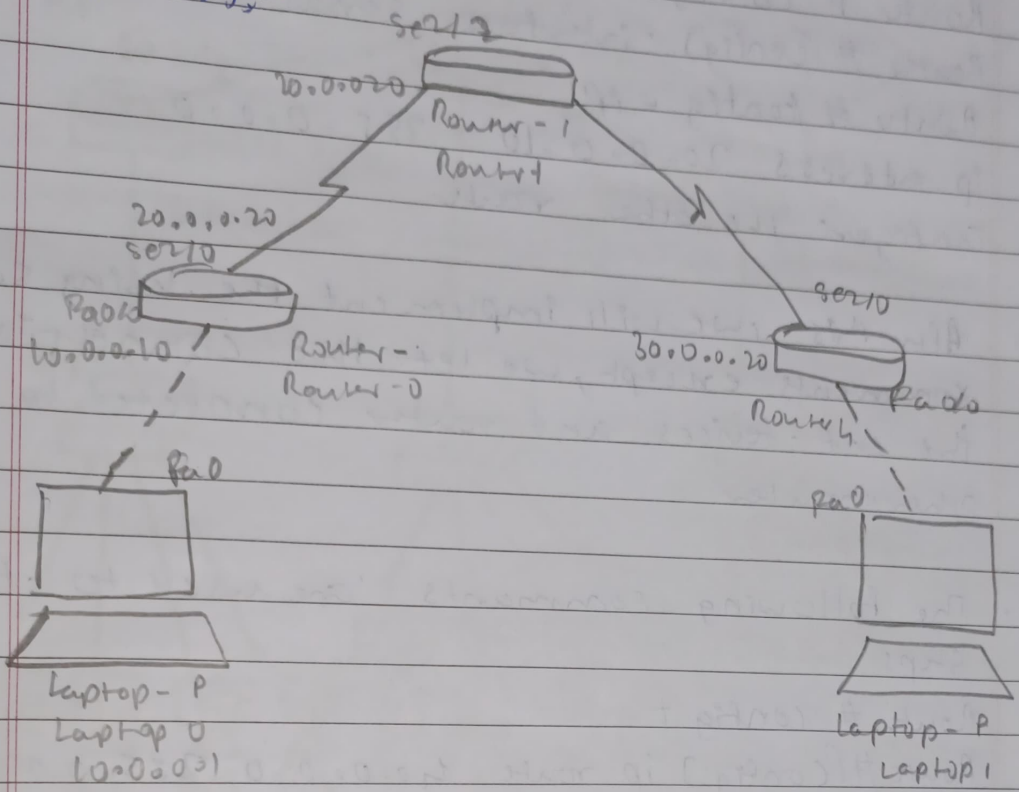
b) Learning:

* Even if normal router configuration is done, whenever we try to send any data to a device that is not directly connected with the router, the data is unreachable.
* So, we need to configure and make the routers understand if any data to a networks that is not directly connected to it must be transferred via the particular gateway that leads to the destination device - static configuration

Lab - 3

Aim: Configuring default route in the Router

Topology:-



Procedure:-

1. Insert 3 routers end to end - devices
2. Let the ip address of the end devices as shown in the topology
3. Connect the end devices to the router using copper cross-over. Connect the router to each other using serial DCB
4. Click on the router and go to the CLR to make the router learn about the other two router
5. Write the following commands on the CLR

To configure route

Config ? [y/n] n

Router > enable

Router # config t

Router (config) interface fastEthernet 0/0

Router # (config-if)

ip address 10.0.0.10 255.0.0.0

Router > enable
Router # config t
Router # (config) · interface · Serial 2/0
Router # (config - if)
ip address 20.0.0.10 255.0.0.0
Configure the other router.

6.

6. After this, we will implement the using same comments except, we let the connections with the end devices and router connected to the other router

7. The following commands are used to do the steps

Route # config t
Route # [config] ip route 40.0.0.0 255.0.0.0 20.0.0.
Route # [config] exit
Show ip route.

Observations

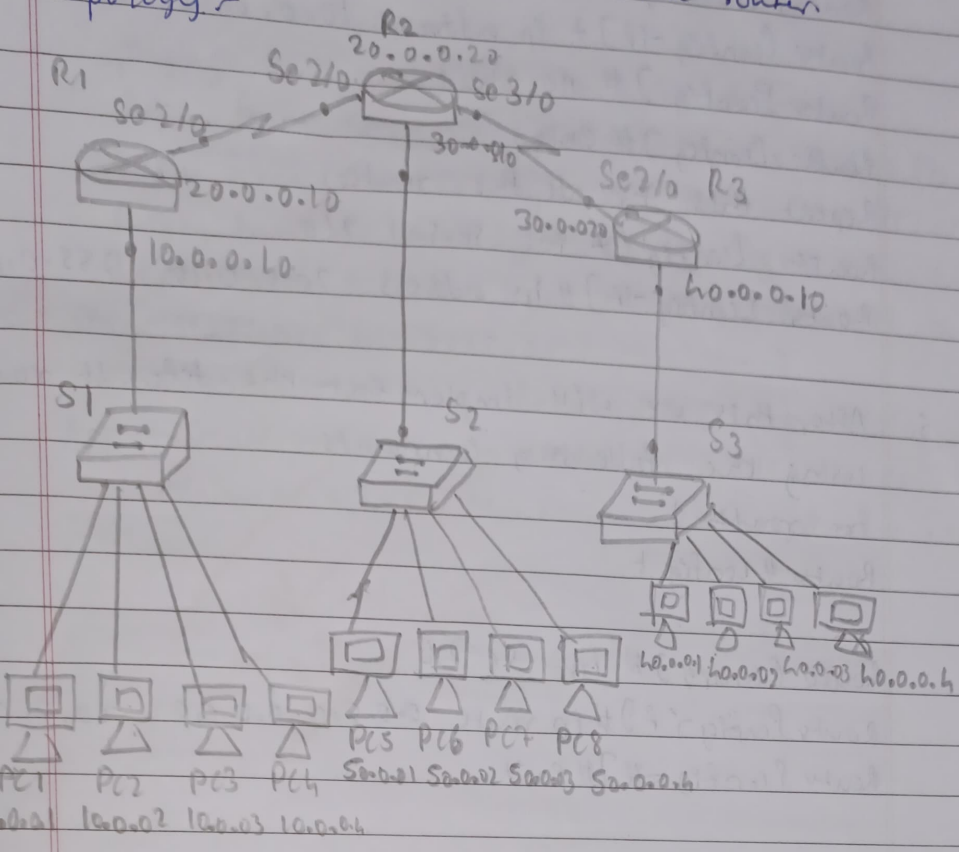
PC > ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data:
Reply from 40.0.0.1 : Bytes = 32 time = 2ms TTL = 125
Reply from 40.0.0.1 : bytes = 32 time = 20 ms TTL = 125
Reply from 40.0.0.1 : bytes = 32 time = 4ms TTL = 125
Ping Statistics for 40.0.0.1
Package Sent = 4, Received 4, Lost = 0 (0% loss).
Approximate round trip time in milliseconds:
Minimum = 2ms, Maximum = 20ms, Average = 7ms

Lab - 4

Aim: Configuring default route to the router.

Topology:-



Procedure:

* Add 3 routers, 3 switch, each router is connected to a switch through a copper - straight, 3 routers are connected with each other through serial DCE
* Add 4 PC's connect to the switch repeat this for other switches too through copper straight
* Assign the IP address as shown in the above Topology
* Click on the router and go to the [CLI] to make the router through default routing
* Write the following comments on the CLI

  Config: y/n : n

  Router > enable

  Route # config t.

Router [config] # int fastethernet 4/0
Router [config-if] # ip address 10.0.0.10 255.0.0.0
Router [config] # no shut
Router [config] # exit
Repeat this for all the routers
Router [config] # int serial 2/0
Router [config-if] # ip address 20.0.0.10 255.0.0.0

5. After this we will implement the default routing using the following commands
For router 1
Router # config t

Router [config] # int se 2/0
Router [config-if] # ip route 0.0.0.0 0.0.0.0 20.0.0.20
Router [config-if] # exit

For router 2
Router # config t
Router [config] # int se 3/0
Router [config-if] # ip route 0.0.0.0 0.0.0.0 20.0.0.20
Router [config] # int se 3/0
Router [config-if] # ip route 0.0.0.0 0.0.0.0 30.0.0.20
Router [config-if] # ip route 0.0.0.0

For router 3
Router [config] # int se 2/0
Router [config-if] # ip route 0.0.0.0 0.0.0.0 30.0.0.10
exit

Observation

PC> ping 50.0.0.1

Pinging 50.0.0.1 with 32 bytes of data

Reply from 50.0.0.1 bytes=32 time=20.5ms TTL=12

Reply from 50.0.0.1 bytes=32 time=3ms TTL=124

Reply from 50.0.0.1 bytes=32 time=15ms TTL=124

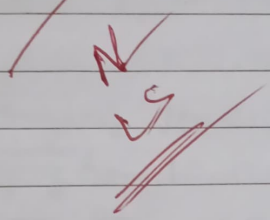
Reply from 50.0.0.1 bytes=32 time=36ms TTL=124

Ping statistics for 50.0.0.1

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

Approximate round trip status in milli-seconds

Minimum=3ms, Maximum=20.5ms, Average=56ms

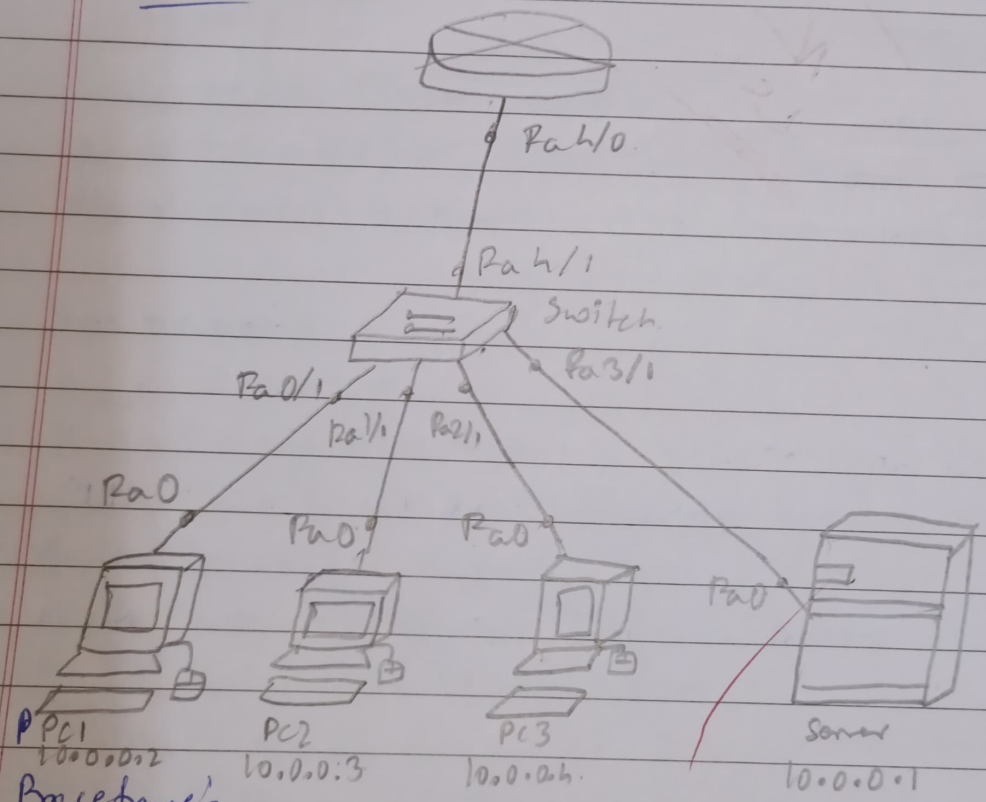


Lab-5.

Aim:- Configuring DHCP within a LAN in a packet tracer.

Dynamic Host configuration Protocol - DHCP
- Dynamically allocates IP address
- applied in mobile networks.
- Follow procedure are follows
  D - Discover -> note -> txn in n/w
  O - offer -> DHCP servers reply back to note
  R - Request -> Node selects one and requests
  A - Acknowledgement -> Confirmation sent to node

Topology:-



Procedure:-

1. Add a router, switch and server.
2. Add 3 PC's and Server connected to switch through Copper straight, switch is connected to router through Copper straight
3. Open the CLI in router -

3. Click on Server → configure the gateway 10.0.0.10 and fastEthernet 0 to IP address 10.0.0.1
Then click on DesktOp → IP configuration make it dynamic. This will make the PC's to request for the dynamic address from server.

4. click on each PC → Desktop → IP configuration → dynamic
Repeat this for all PC's
As we change this from static from dynamic we get a message that "DHCP request successful"

Observation from 10.0.0.2.

PC > 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 = 1ms 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 for 10.0.0.1:

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

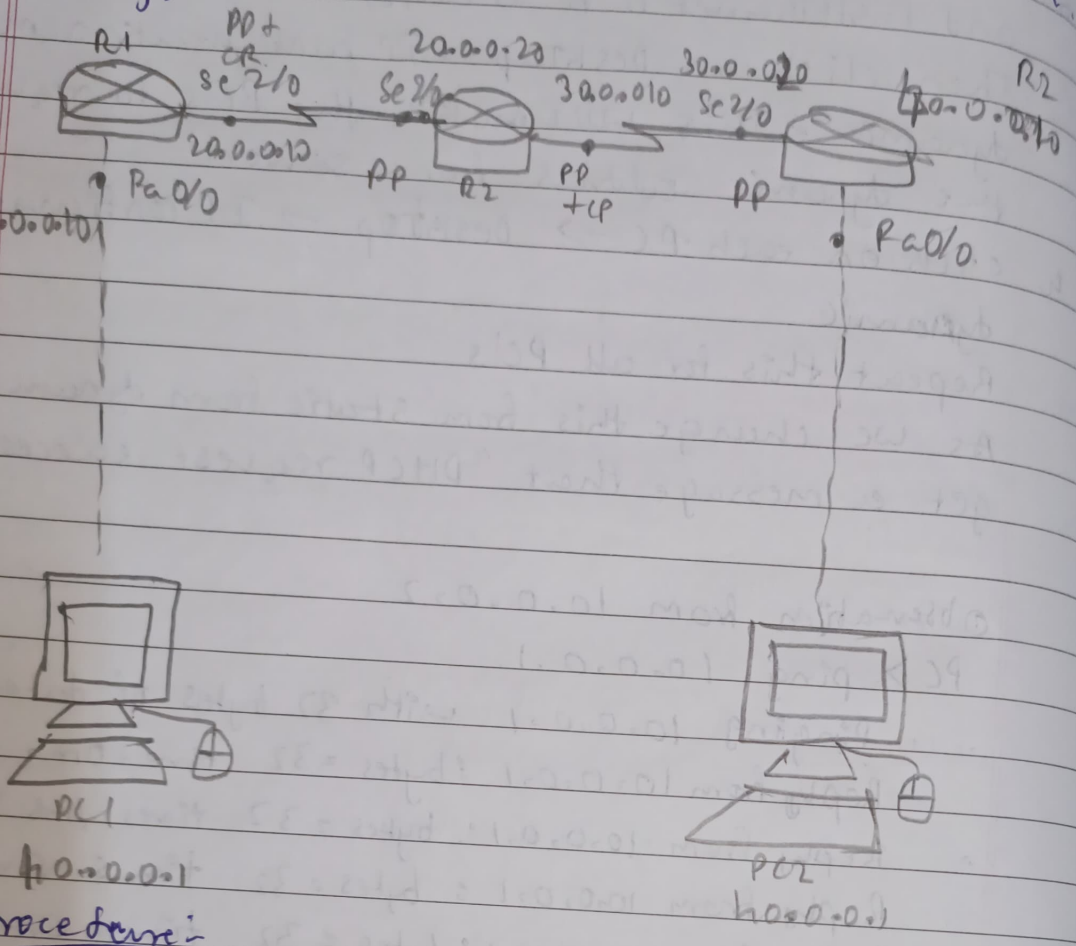
Approximate round trip times in milli-seconds:

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

Lab-6

Aim: Configuring RIP routing protocol in router

Topology:



Procedure:

RIP - Routing Information Protocol

CIDR - Class Less Inter-Domain Routing

PPP - Point to point Protocol.

1. Insert 3- routers and 2 PC's; connect the routers through serial DCE wire and PC's with routers through copper Cross-over.
2. The IP addresses for the PC's were set to 10.0.0.1 and 40.0.0.1 for PC1 and PC2.

PC1 - 10.0.0.1 255.0.0.0 ; Gateway - 10.0.0.10

PC2 - 40.0.0.1 255.0.0.0 ; Gateway - 40.0.0.10

Open CLI of Router.

enable
config t
int fa 0/0
ip address 10.0.0.10 255.0.0.0
no shut
exit
int se 2/0
ip address 20.0.0.10 255.0.0.0
no shut.
exit

Router 2
ip address 20.0.0.20 255.0.0.0
no shut
int se 2/0
ip address 30.0.0.10 255.0.0.0
no shut

Router 3
ip address 30.0.0.20 255.0.0.0
no shut.
interface Fa0/0
ip address 40.0.0.10 255.0.0.0
no shut.

b. After the basic configuration for the routers were done, the RIP had to be setup B
For router 1
config t.
int se 2/0
encapsulation PPP
clock rate 64000

#no shut
#router rip
#networks 10.0.0.0
#networks 20.0.0.0
#exit

5) PC1 was opened and 40.0.0.1 is pinged

Observations

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 = 18ms
TTL = 125

Reply from 40.0.0.1 bytes = 32 time = 12ms
TTL = 125

Reply from 40.0.0.1 bytes = 32 time = 1ms
TTL = 125.

Reply from 40.0.0.1 bytes = 32 time = 1ms
TTL = 125

Ping statistics for 40.0.0.1.

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

Approximate round-trip time in ms;

Minimum = 12ms Maximum = 12ms Average = 1ms

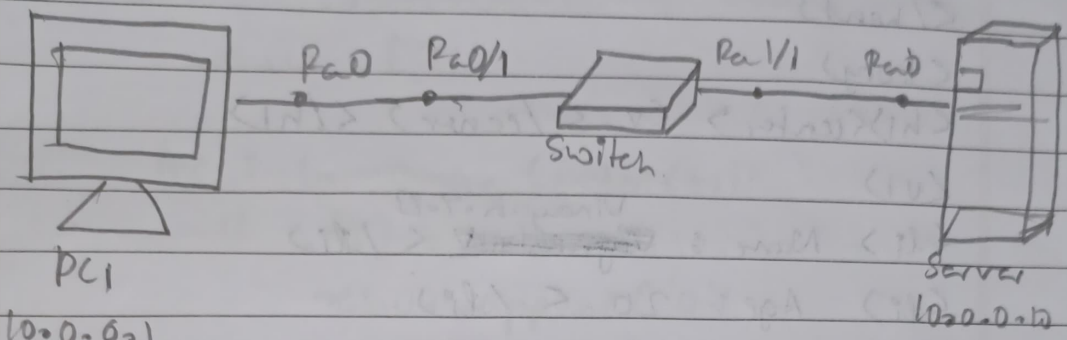
Learnings

RIP. router information protocol is of 2 types RIP-1 and RIP-2, where RIP2 supports classless inter domain routing and RIP-1 doesn't. without knowledge of RIP, terminals can ping each other without teaching the routers about the networks individually

Lab - 7

Aim: Demonstration of WEB server and DNS using Packet Tracer.

Topology:-



Procedure:

1. Add a PC, switch and a server, connect the PC and Switch using copper - Straight and switch and server using copper - straight
2. Click on the PC and set the IP address, subnet mask. Click on server set the IP address and go to services. turn on the DNS and HTTP create a HTML file or any txt file in the HTTP.
3. Then go to desktop → web browser
   URL : http://10.0.0.10/filename.html
   the contents in the file will be displayed.

Result:
URL : http://10.0.0.10/myfile.html
welcome to my first HTML page

File Name: myfile.html

```
<html>
<head>
<title> First HTML </title>
</head>
<body>
<h1><center> CV </center></h1>
<ul>
<li> Name : Vinayak.Y.B </li>
<li> Age : 20 </li>
<li> college : BMSCE </li>
</ul>
</body>
</html>
```