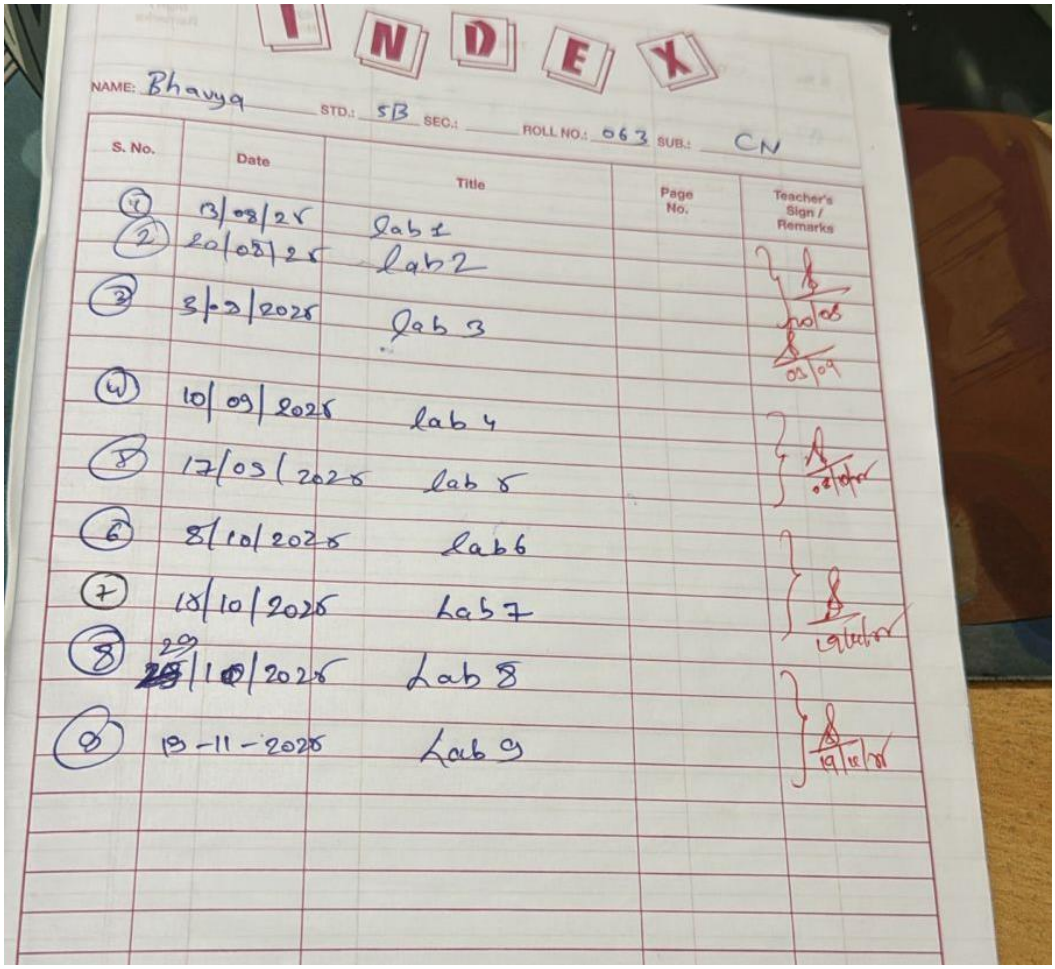

INDEX

NAME: Bhavya STD.: 5B SEC.: ROLL NO.: 063 SUB.: CN

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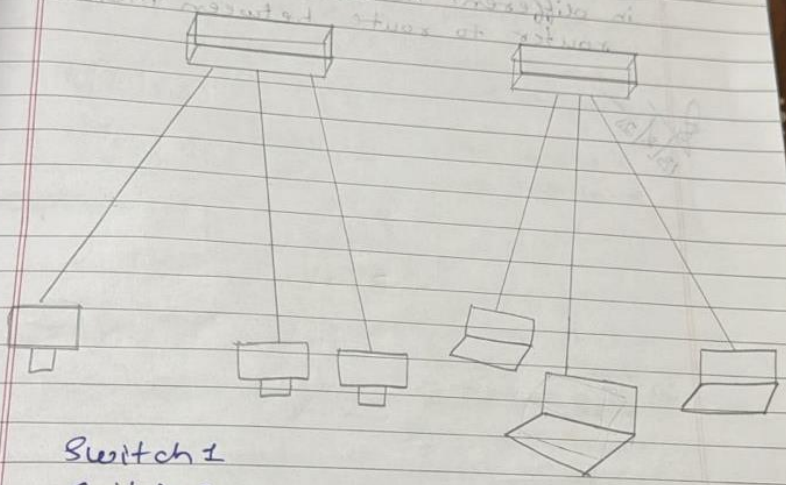
3	3/09/2025	lab 3		
4	10/09/2025	lab 4		
5	17/09/2025	lab 5		
6	8/10/2025	lab 6		
7	15/10/2025	Lab 7		
8	~~29~~ 22/10/2025	Lab 8		
9	19-11-2025	Lab 9		

Aim: Introduction to Cisco Packet Tracker
Simple System Connection



Switch 1
Switch 2

	IP Address
PC 1	192.168.10.1
PC 2	192.168.10.2
PC 3	192.168.10.3
Laptop 1	192.168.20.1
Laptop 2	192.168.20.2
Laptop 3	192.168.20.3

① PC1 to PC2 worked → They are connected to the same switch, so communication happens within the same local network (layer 2) without routing.

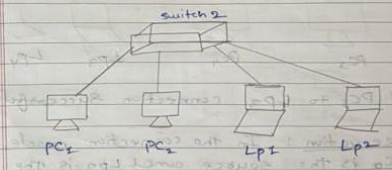
② PC1 to Laptop2 didn't worked → They are in different networks and there is no router to route between them.

20/8/2025

Create a topology and simulate a sending a simple PDU from source to destination using hub and switch as connecting devices and demostrate ping message.

(i) Component Used :

- Switch - PT Switch 2
- PC - PT PC1 — 192.168.10.1
- PC - PT PC2 — 192.168.10.2
- PC - PT
- Laptop - PT. Lp1 — 192.168.10.4
- Laptop - PT. Lp2 — 192.168.10.8

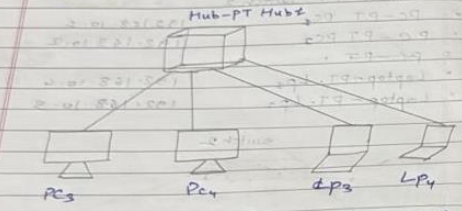


PC1 to Lp1 the file is transfer successfully.

Observation :- In the connection made Pc2 is the source and Lp1 is the destination. The message sent from PC1 goes to switch and is recived only by PC2 Lp1. Lp1 sends back a message in a similar way.

(ii) Component Used :

- Hub - PT Hub1
- PC - PT PC3 — 192.168.20.1
- PC - PT PC4 — 192.168.20.2
- Laptop - PT Lp3 — 192.168.20.3
- Laptop - PT Lp4 — 192.168.20.4

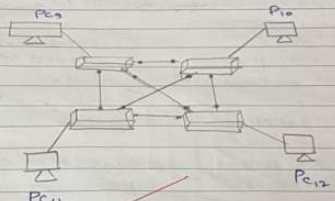


① e. PC3 to Lp3 connection Successful

Observation :- In the connection made, PC3 is the source and Lp2 is the destination. The message sent by PC3 goes to hub, from there is broadcasted to PC4, Lp3, Lp4. Since Lp3 is the destination, only Lp3 accept the message. PC3 sends back message in a simple way.

(iii) Components Used :

- Switch - PT Switch 3
- Switch - PT Switch 4
- Switch - PT Switch 5
- Switch - PT Switch 6
- PC - PT PC9 — 192.168.30.1
- PC - PT PC10 — 192.168.30.2
- PC - PT PC11 — 192.168.30.3
- PC - PT PC12 — 192.168.30.4



Connection :- PC9 to PC12 is successful

03/09/2025

Q Configure DHCP within a lan and outside a lan.

Server

① DHCP
↳ desktop ip config
↳ Static
↳ 192.168.10.2
Gateway 192.168.10.1

② Services
↳ DHCP
↳ PoolName switchone switchtwo

Gateway	192.168.10.1	192.168.20.1
Start IP address	192.168.10.3	192.168.20.2
Submit mask	255.255.255.0	255.255.255.0
Max no. of user	20	20

Add Add

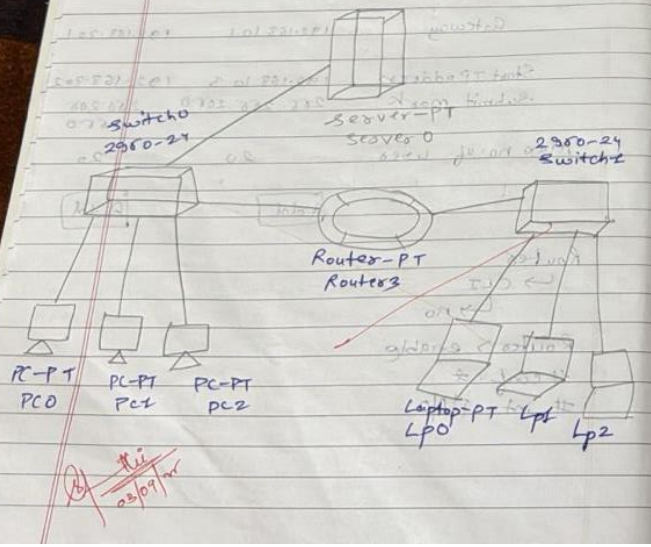
Router
↳ CLI
↳ no

Router> enable
#conf t
#int Fa0/0

ip address 192.168.10.1 255.255.255.0
ip helper-address 192.168.10.2
no shutdown
^z
do write memory
exit

int fa0/1
ip address 192.168.20.1 255.255.255.0
ip helper-address 192.168.10.2

no shutdown
do write memory
exit

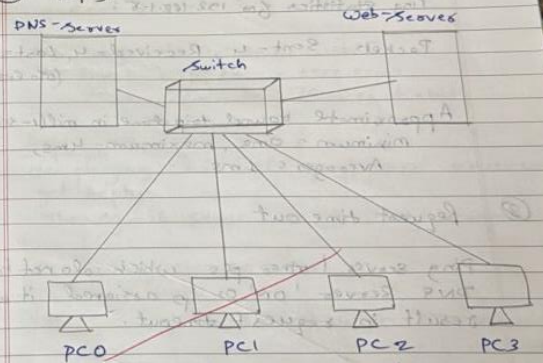


10/9/2025

① Configure webserver, DNS within a LAN

② Configure IP addresses to router in packet tracer.
Explore the following messages

① Ping Response
② Destination Unreachable
③ Request timeout
④ Reply



① Ping Response

On PC0,
Ping 192.168.1.5 (It's DNS Server)

O/P :-
Pinging 192.168.1.5 with 32 bytes of data:

Replay from 192.168.1.8
bytes = 32 time = 0ms TTL = 128

Replay from 192.168.1.8 : bytes = 32 time = 0ms TTL = 128 0ms

Replay from 192.168.1.8 : bytes = 32 time = 0ms TTL = 128

Replay from 192.168.1.8 : bytes = 32 time = 0ms TTL = 128

Ping statistics for 192.168.1.8 :

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

Approximate round trip time in milli-seconds:
Minimum = 0ms, maximum = 4ms,
Average = 1ms

(3) Request time out

Ping server / other pcs which do not have DNS server 'ON' or ip assigned, it will result in request timeout.

Eg: ping 192.168.1.7

Pinging 192.168.1.7 with 32 bytes of data:

Request timed out
Request timed out
Request timed out
Request timed out

Ping stats for 192.168.1.7

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

(2) Destination Unreachable

Try accessing web address which is not configured yet you won't be able to access it.

Eg:- go to web Browser
type: http://www.tere.com
→ Destination Unreachable

(4) Replay

On pinging the well configured server we get reply.
The eg. is same as (1) Ping response

eg: ping 192.168.1.8

O/p: pinging 192.168.1.8 with 32 bytes of data

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

Approximate round trip times in milliseconds

Minimum = 0ms, Max = 5ms
Average = 1ms

this adapter

Lab - 5

(1) Configure IPv4 static and default route.

→ Router - 1841 Routes (all routers)
physical - off power
HWIC - 2T (drop it)
turn on power
wires - serial dce - from router to router
Hw PC & Switch, switch & router } automatic

R1
CLI
↳ no
↳ enable
↳ config t
↳ int se0/1/0
↳ ip address 172.16.1.1 255.255.255.252
↳ no shutdown
↳ exit

→ int fa0/0
→ ip address 192.168.10.1 255.255.255.0
→ no shutdown
→ exit
→ exit (from config)
→ write memory

R2
→ no
→ enable
→ conf t
→ hostname R2
→ int se0/1/0 (towards R1)
→ ip address 172.16.1.2 255.255.255.252

→ no shutdown
→ exit

→ int Fa0/0 (towards switch)
→ ip address 192.168.20.1 255.255.255.0
→ no shutdown
→ exit

→ int Se0/1/1 (towards R3)
→ ip address 172.16.2.1 255.255.255.252
→ no shutdown
→ exit
→ exit
→ write memory

R3

→ no
→ enable
→ config t
→ hostname R3
→ int Se0/1/1 (towards R2)
→ if address 172.16.2.2 255.255.255.252
→ no shutdown
→ exit
→ int fa0/0
→ ip address 192.168.30.1 255.255.255.0
→ no shutdown
→ exit
→ exit
→ exit
→ write memory

R1

enable
config t
ip route 192.168.20.0 255.255.255.0 172.16.1.2
ip route 172.162.0.0 255.255.255.252 172.16.1.2
ip route 192.168.30.0 255.255.255.0 172.16.1.2
exit
write memory

R2

enable
config t

if route 192.168.10.0 255.255.255.0 172.16.1.1
if route 192.168.30.0 255.255.255.0 172.16.2.2
exit
write memory

R3 → making it as default

→ enable
→ config t
→ ip route 0.0.0.0 0.0.0.0 Se0/1/1
→ exit
→ write memory

R1 R2 R3
show ip route

PC0
terminal
ping 192.168.10.1 (local)
ping 192.168.20.1
ping 192.168.30.1

Output

Packet Tracer PC Command Line 1.0
PC > ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time=3ms
TTL=255
" " " time=0ms
" " " time=0ms
" " " time=5ms

Ping statistics for 192.168.10.1:
Packets: Sents=4, Received=4, Lost=0
0% loss

Approximate round trip time in milli-seconds:
Minimum=0ms, Maximum=5ms,
Average=2ms

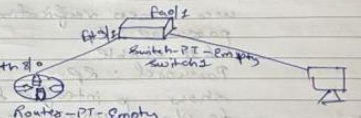
9/10/2023

Lab-6

① Configure telnet to access routers remotely
TELNET

① It is used to access remote server. It is a simple command line tool that runs on your computer and it allows you to send command remotely to a server and administrator.

② Telnet is also used to manage other devices like routers, switch to check if ports are open or closed on the server.



Components	Display	IP address / config
① Switch-PT-Empty	Switch1	—
② PC-PT	PC0	
③ Router	Router0	192.168.1.2/24

Routers Configuration
Router — CLI
Router > enable
Router # conf t
hostname R1
enable secret cp
int fa 0/0
ip address 192.168.1.1
no shutdown

(enter)
(enter)
line vty - virtual deletype
is a virtual path so that PC has access

PC

command prompt
ping 192.168.1.1
reply success

Now access/edit router from PC
telnet 192.168.1.1
user access verification
password: tp
R1# enable
Password: RP
show ip interface brief
fa 0/0 192.168.1.1 yes manual up 1/0 unassi unassigned yes unset

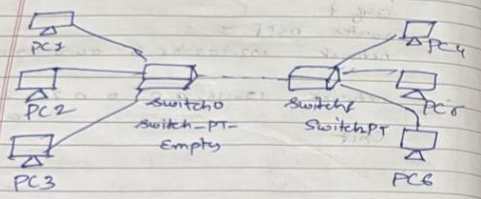
R1# enable
R1# conft
R1(conft)# int fa1/0 (choose any which is not assigned)
→ ip address 192.168.1.2 255.255.255.0
show ip interface brief

② Configure OSPF routing protocol

open shortest path first
PC → CLI
config t
router ospf 1
network 192.168.5.0 00.0.255 area 0
network 196.16.0.0 0.0.255.255 area 0
exit

16/10/2025 Lab-7

① To construct a VLAN and make the PC communicating among a VLAN



	Components	Display Name	IP
1	PC-PT	PC1	192.168.1.2/24
2	PC-PT	PC2	192.168.1.3/24
3	PC-PT	PC3	192.168.1.4/24
4	PC-PT	PC4	192.168.1.5/24
5	PC-PT	PC5	192.168.1.6/24
6	PC-PT	PC6	192.168.1.7/24
7	Switch-PT-Empty	Switch0	
8	Switch-PT	Switch1	

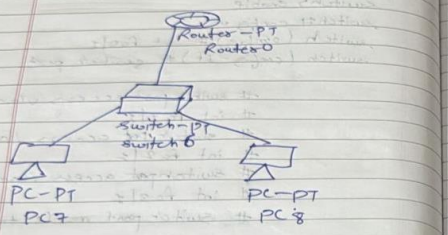
VLAN 10	VLAN 20	VLAN 30
PC1 fa0/1	PC2 fa1/1	PC3 fa2/1
PC4 fa3/1	PC5 fa1/1	PC6 fa1/1

Switch-PT
switch ki configuration

switch> enable
switch# config t
switch(config)# int fa0/1
switch(config-if)# switch port
switch port access vlan10
int fa1/1
switch port access vlan20
int fa2/1
switch port access vlan30
int fa3/1
switch port mode trunk

→ switch 5 configuration
→ CLI
→ switch> enable
switch# config t
#int fa0/1
switch port access vlan10
int fa1/1
switch port access vlan20
int fa2/1
switch port access vlan30
int fa3/1
switch port mode trunk
exit

Q. Demonstrate the TTL/ Life of a packet



Components	Display Name	IP address
① Router-PT	Router 0	192.168.1.1/24
② Switch-PT	Switch 6	
③ PC-PT	PC 7	
④ PC-PT	PC 8	192.168.1.2/24

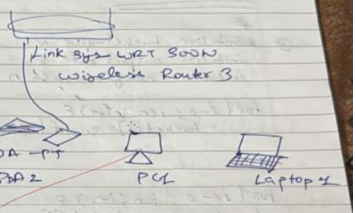
→ TTL = 128 → The packet can travel across 128 device max, before being dropped

→ Seq Number = 9 = 9th ping in a series.

This is a ping (ICMP Echo Request) from PC

The switch is forwarding the packet

Q. To construct a WLAN and make the nodes communicate wirelessly



LAB-8

Leaky Bucket Algorithm

Pseudo Code

```
Initialise bucket size N
initialise output rate R
initialise n no. of intervals n

for(i=0; i<n; i++) {
    bucket[i] = scanf("%d", &bucket[i]);
}

for(i<-0; i<n; i++) {
    stored += bucket[i];
    if(stored >= bucket size) store = N;
    else {
        print(stored + output; stored - output rate);
        stored -= output_rate;
    }
}
```

N = 8
R = 2
n = 2

Enter incoming packets at each time $t_1 = 4$
$t_2 = 8$
$t_3 = 6$

Time	Received	Sent	Left	Dropped
1	4	2	2	0
2	8	2	3	2
3	6	2	3	4

① Leaky bucket is a Queue with incoming data rate and outgoing data rate.

② Always incoming > outgoing

③ It always sends out of the bucket at constant rate.

④ If is the sudden increase in incoming data rate (burst) then it causes congestion (overflow)

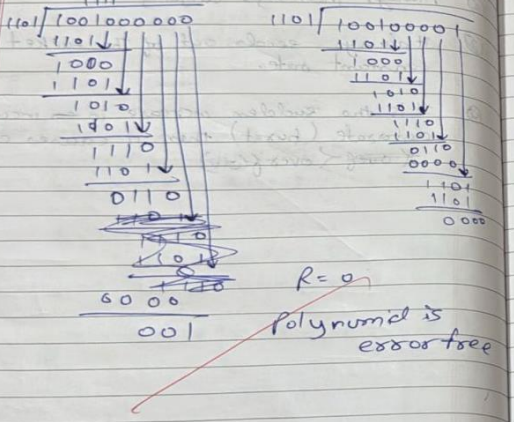
Error Detecting Code Using CRC

(1) $F = 100100$

$Q = x^3 + x^2 + 1$

$= 1101$ (G-1 = 3)

$F = 100100\,000$



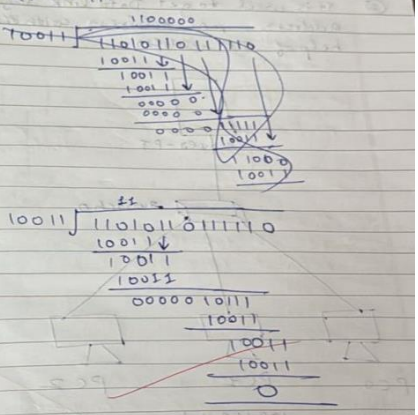
R = 0

Polynomial is error free

(2) $F = 11010110111$

$Q = 10011$

CRC = 111

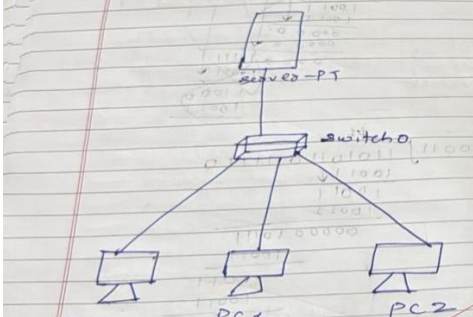


Get zero

ARP → Address Resolution Protocol

① It is used to map an ip address to the MAC address

② It is used to get Data link layer Address, mac address with the help of IP address



P 192.168.11.1
255.255.255.0

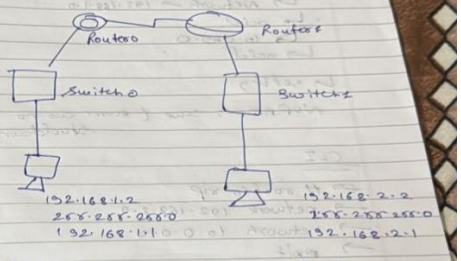
PC0
cmd
PC → ARP -A
Internal address

192.168.11.2

192.168.11.3

RIP

→ Configure RIP routing protocol in routers to transfer packet into pc



192.168.1.2
255.255.255.0
192.168.1.1

192.168.2.2
255.255.255.0
192.168.2.1

Router0
Interface,
Fa0/0 → power ON
IP → 192.168.1.1
Se2/0
↳ ON
↳ clock rate 64K (64000)
(4 Pack Life time → no sum)
IP → 10.100.2

R1
Fa 0/0 → power ON
IP → 192.168.2.1
Se 2/0
↳ ON
↳ clock rate 64000
↳ IP 10.0.0.1

Router 0

↳ config
↳ RIP
↳ Network → 192.168.1.0
↳ add
↳ 10.0.0.0
↳ add
↳ setting
NVRAM → save (same as no shutdown)

CLI

router rip
→ network 192.168.2.0
→ network 10.0.0.0
→ exit
→ exit
→ wr

Packet from PC0 to PC1 now successfully after RIP settings change.