

For CN LAB on 10/8/2023

Demonstrate the TTL/ Life of a Packet

Create a topology as shown below with two PCs and three routers.

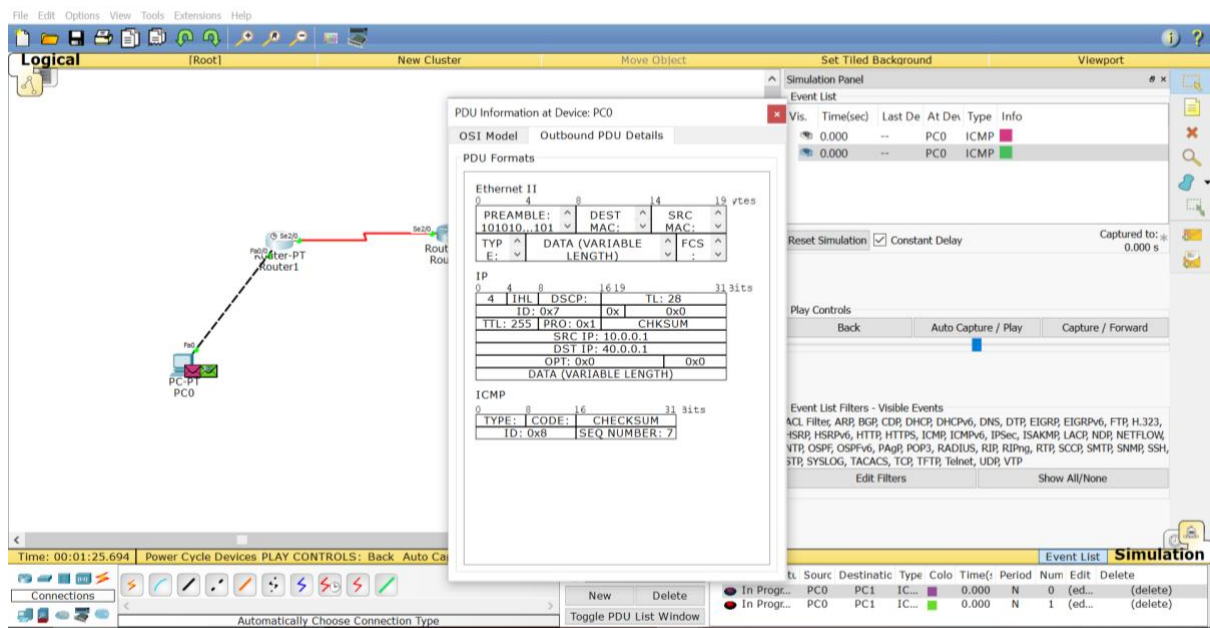
Configure the devices as per static / default / dynamic routing.

In the simulation mode, send a simple PDU from one PC to another.

Use capture button to capture every transfer.

Click on the PDU during every transfer to see the Inbound and outbound PDU details.

Observe that there is a difference of 1 in TTL when it crosses every router.



File Edit Options View Tools Extensions Help

Logical [Root] New Cluster Move Object Set Tiled Background Viewport

PDU Information at Device: Router1

OSI Model Inbound PDU Details Outbound PDU Details

PDU Formats

Ethernet II

0	4	8	14	19	bytes
PREAMBLE:	DEST:	SRC:			
101010...	MAC:	MAC:			
TYP:	DATA (VARIABLE LENGTH)	FCS:			
E:					

IP

0	4	8	16	19	31	bits
4	IHL:	DSCP:	TL:	28		
ID:	0x6	0x	0x0			
TTL:	255	PRO:	0x1	CHKSUM		
SRC IP:	10.0.0.1					
DST IP:	40.0.0.1					
OPT:	0x0					
DATA (VARIABLE LENGTH)						

ICMP

0	8	16	31	bits
TYPE:	CODE:	CHECKSUM		
ID:	0x7	SEQ NUMBER:	6	

Simulation Panel

Event List

Time(sec)	Last De	At Dev	Type	Info
0.000	--	PC0	ICMP	
0.000	--	PC0	ICMP	
0.001	PC0	Rout...	ICMP	
0.001	--	PC0	ICMP	

Simulation

Source Destination Type Color Time(s) Period Num Edit Delete

PC0	PC1	IC...	0.000	N	0	(ed...)	(delete)
PC0	PC1	IC...	0.000	N	1	(ed...)	(delete)

Cisco Packet Tracer Student - C:\Users\nanv\Cisco Packet Tracer 6.2sv\saves\default1.pkt

File Edit Options View Tools Extensions Help

Logical [Root] New Cluster Move Object Set Tiled Background Viewport

PDU Information at Device: Router1

OSI Model Inbound PDU Details Outbound PDU Details

PDU Formats

HDLC

0	8	16	32	2+x	8+x	6+x	bits
FL	AD	CONTR	DATA:	FCS:	FL		
G:	R:	OL:	(VARIABLE)	0x0	G:		

IP

0	4	8	16	19	31	bits
4	IHL:	DSCP:	TL:	28		
ID:	0x6	0x	0x0			
TTL:	254	PRO:	0x1	CHKSUM		
SRC IP:	10.0.0.1					
DST IP:	40.0.0.1					
OPT:	0x0					
DATA (VARIABLE LENGTH)						

ICMP

0	8	16	31	bits
TYPE:	CODE:	CHECKSUM		
ID:	0x7	SEQ NUMBER:	6	

Simulation Panel

Event List

Time(sec)	Last De	At Dev	Type	Info
0.000	--	PC0	ICMP	
0.000	--	PC0	ICMP	
0.001	PC0	Rout...	ICMP	
0.001	--	PC0	ICMP	

Simulation

Source Destination Type Color Time(s) Period Num Edit Delete

PC0	PC1	IC...	0.000	N	0	(ed...)	(delete)
PC0	PC1	IC...	0.000	N	1	(ed...)	(delete)

File Edit Options View Tools Extensions Help

Logical [Root] New Cluster Move Object Set Tiled Background Viewport

PDU Information at Device: Router2

OSI Model Inbound PDU Details Outbound PDU Details

PDU Formats

HDLC

FL	AD	CONTR	DATA	FCS	FL
G:	R:	OL:	(VARIABLE)	(Frame Checksum)	

IP

4	8	16	32	31
THL	DSCP:	TL:	28	
ID:	0x6	0x	0x0	
TTL:	254	PRO:	0x1	CHKSUM
SRC IP:	10.0.0.1			
DST IP:	40.0.0.1			
OPT:	0x0			0x0
DATA (VARIABLE LENGTH)				

ICMP

0	8	16	31
TYPE:	CODE:	CHECKSUM	
ID:	0x7	SEQ NUMBER:	0

Simulation Panel

Event List

Time(sec)	Last De	At Dev	Type	Info
0.000	--	PC0	ICMP	
0.001	PC0	Rout...	ICMP	
0.001	--	PC0	ICMP	
0.002	PC0	Rout...	ICMP	
0.002	Router1	Rout...	ICMP	

Set Simulation ☒ Constant Delay Captured to: 0.002 s

Simulation

Time: 00:01:25.696 Power Cycle Devices PLAY CONTROLS: Back Auto

Connections

Scenario 0

New Delete

Toggle PDU List Window

Fire Last Statu Sourc Destination Type Colo Time(e Period Num Edit Delete

In Progr... PC0 PC1 IC... 0.000 N 0 (ed... (delete)

In Progr... PC0 PC1 IC... 0.000 N 1 (ed... (delete)

File Edit Options View Tools Extensions Help

Logical [Root] New Cluster Move Object Set Tiled Background Viewport

PDU Information at Device: Router2

OSI Model Inbound PDU Details Outbound PDU Details

PDU Formats

HDLC

FL	AD	CONTR	DATA	FCS	FL
G:	R:	OL:	(VARIABLE)	0x0	G:

IP

4	8	16	32	31
THL	DSCP:	TL:	28	
ID:	0x6	0x	0x0	
TTL:	253	PRO:	0x1	CHKSUM
SRC IP:	10.0.0.1			
DST IP:	40.0.0.1			
OPT:	0x0			0x0
DATA (VARIABLE LENGTH)				

ICMP

0	8	16	31
TYPE:	CODE:	CHECKSUM	
ID:	0x7	SEQ NUMBER:	0

Simulation Panel

Event List

Time(sec)	Last De	At Dev	Type	Info
0.000	--	PC0	ICMP	
0.001	PC0	Rout...	ICMP	
0.001	--	PC0	ICMP	
0.002	PC0	Rout...	ICMP	
0.002	Router1	Rout...	ICMP	

Set Simulation ☒ Constant Delay Captured to: 0.002 s

Simulation

Time: 00:01:25.696 Power Cycle Devices PLAY CONTROLS: Back Auto

Connections

Scenario 0

New Delete

Toggle PDU List Window

Fire Last Statu Sourc Destination Type Colo Time(e Period Num Edit Delete

In Progr... PC0 PC1 IC... 0.000 N 0 (ed... (delete)

In Progr... PC0 PC1 IC... 0.000 N 1 (ed... (delete)

Cisco Packet Tracer Student - C:\Users\nanw\Cisco Packet Tracer 6.2sv\saves\default1.pkt

File Edit Options View Tools Extensions Help

Logical [Root] New Cluster Move Object Set Tiled Background Viewport

Simulation Panel

Event List

Time(sec)	Last De	At Dev	Type	Info
0.001	--	PC0	ICMP	
0.002	PC0	Rout...	ICMP	
0.002	Router1	Rout...	ICMP	
0.003	Router1	Rout...	ICMP	
0.003	Router2	Rout...	ICMP	

Set Simulation ☒ Constant Delay Captured to: 0.003 s

Play Controls Back Auto Capture / Play Capture / Forward

Event List Filters - Visible Events

Filter: ARP, BGP, CD, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, IP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, OSPF, OSPFv6, PAgg, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP

Edit Filters Show All/None

Time: 00:01:25.697 Power Cycle Devices PLAY CONTROLS: Back Auto

PDU Information at Device: Router3

OSI Model Inbound PDU Details Outbound PDU Details

PDU Formats

HDLC

0	8	16	32	24	8+6+31	bits
FL	AD	CONTR	DATA:	FCS:	FL	
G:	R:	OL:	(VARIABLE)	0x0	G:	

IP

0	4	8	16	19	31	bits
4	IHL	DSCP:	TL:	28		
ID:	0x6	0x	0x0			
TTL:	253	PRO:	0x1	CHKSUM		
SRC IP:	10.0.0.1					
DST IP:	40.0.0.1					
OPT:	0x0		0x0			
DATA (VARIABLE LENGTH)						

ICMP

0	8	16	31	bits
TYPE:	CODE:	CHECKSUM		
ID:	0x7	SEQ NUMBER:	6	

Cisco Packet Tracer Student - C:\Users\nanw\Cisco Packet Tracer 6.2sv\saves\default1.pkt

File Edit Options View Tools Extensions Help

Logical [Root] New Cluster Move Object Set Tiled Background Viewport

Simulation Panel

Event List

Time(sec)	Last De	At Dev	Type	Info
0.001	--	PC0	ICMP	
0.002	PC0	Rout...	ICMP	
0.002	Router1	Rout...	ICMP	
0.003	Router1	Rout...	ICMP	
0.003	Router2	Rout...	ICMP	

Set Simulation ☒ Constant Delay Captured to: 0.003 s

Play Controls Back Auto Capture / Play Capture / Forward

Event List Filters - Visible Events

Filter: ARP, BGP, CD, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, IP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, OSPF, OSPFv6, PAgg, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP

Edit Filters Show All/None

Time: 00:01:25.697 Power Cycle Devices PLAY CONTROLS: Back Auto

PDU Information at Device: Router3

OSI Model Inbound PDU Details Outbound PDU Details

PDU Formats

Ethernet II

0	4	8	14	19	bytes
PREAMBLE:	DEST	SRC			
101010...	101	MAC:	MAC:		
TYPE	DATA (VARIABLE LENGTH)	FCS			
E:					

IP

0	4	8	16	19	31	bits
4	IHL	DSCP:	TL:	28		
ID:	0x6	0x	0x0			
TTL:	252	PRO:	0x1	CHKSUM		
SRC IP:	10.0.0.1					
DST IP:	40.0.0.1					
OPT:	0x0		0x0			
DATA (VARIABLE LENGTH)						

ICMP

0	8	16	31	bits
TYPE:	CODE:	CHECKSUM		
ID:	0x7	SEQ NUMBER:	6	

Connections

Automatically Choose Connection Type

New Delete

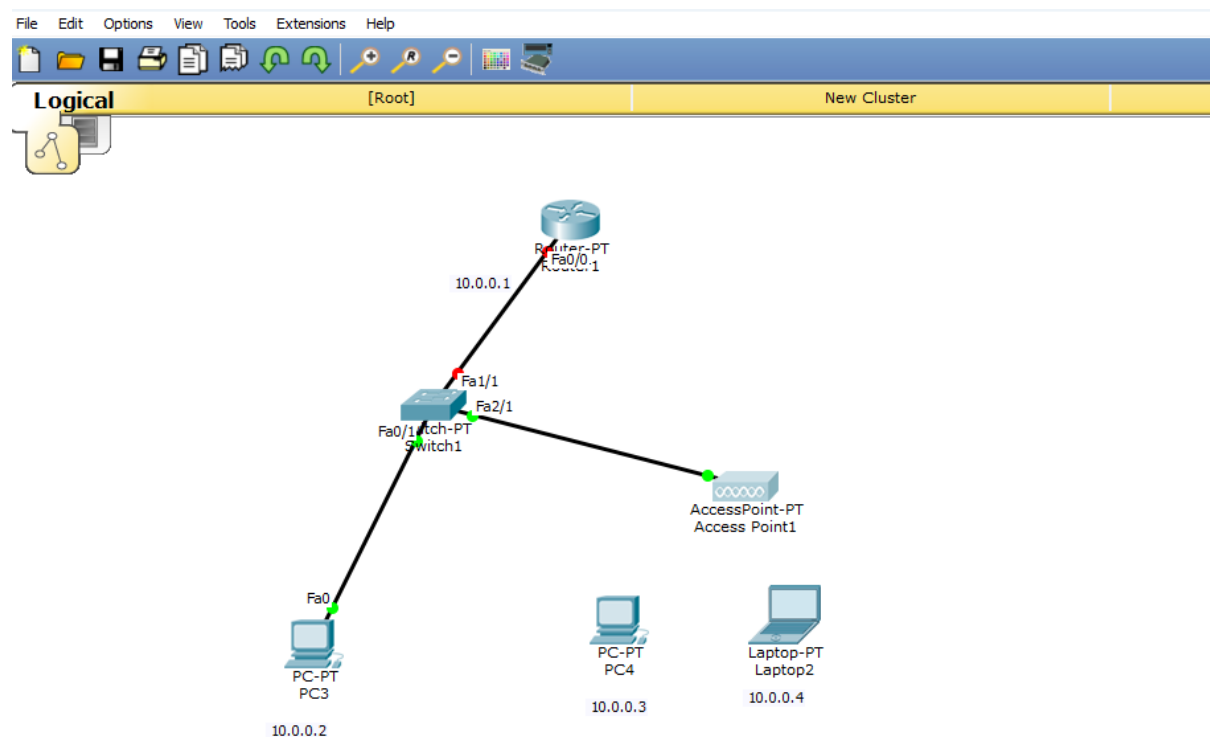
In Prog... In Prog...

Toggle PDU List Window

Source Destination Type Color Time(s) Period Num Edit Delete

PC0	PC1	IC...	0.000	N	0	(ed...	(delete)
PC0	PC1	IC...	0.000	N	1	(ed...	(delete)

To construct a WLAN and make the nodes communicate wirelessly

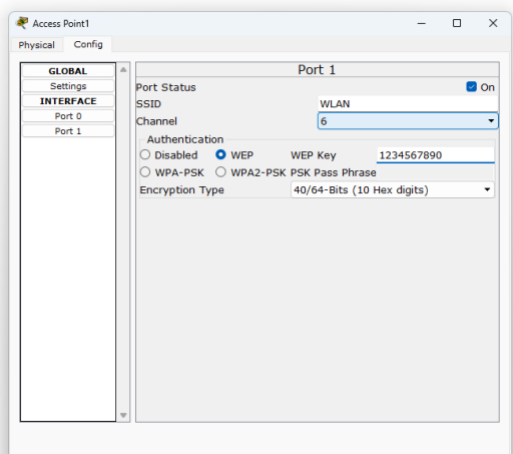


Construct the above topology

Configure PC3 and the Router1 as is normally done

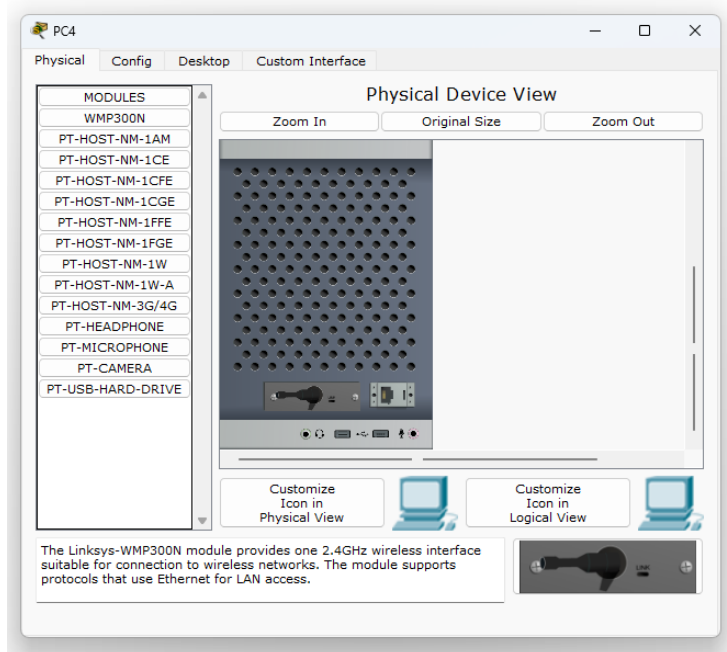
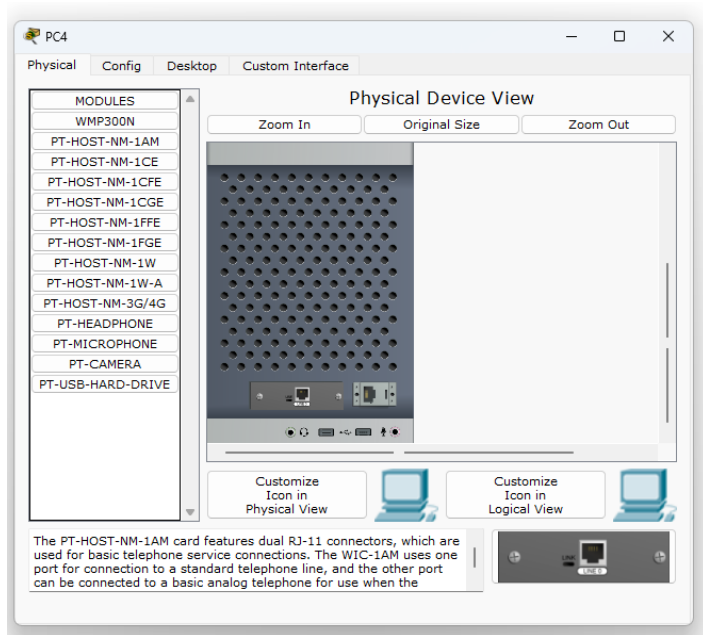
Configure Access Point1- Port1 -> SSID Name- any name(WLAN here)

Select WEP and give any 10 digit hex key – 1234567890 here



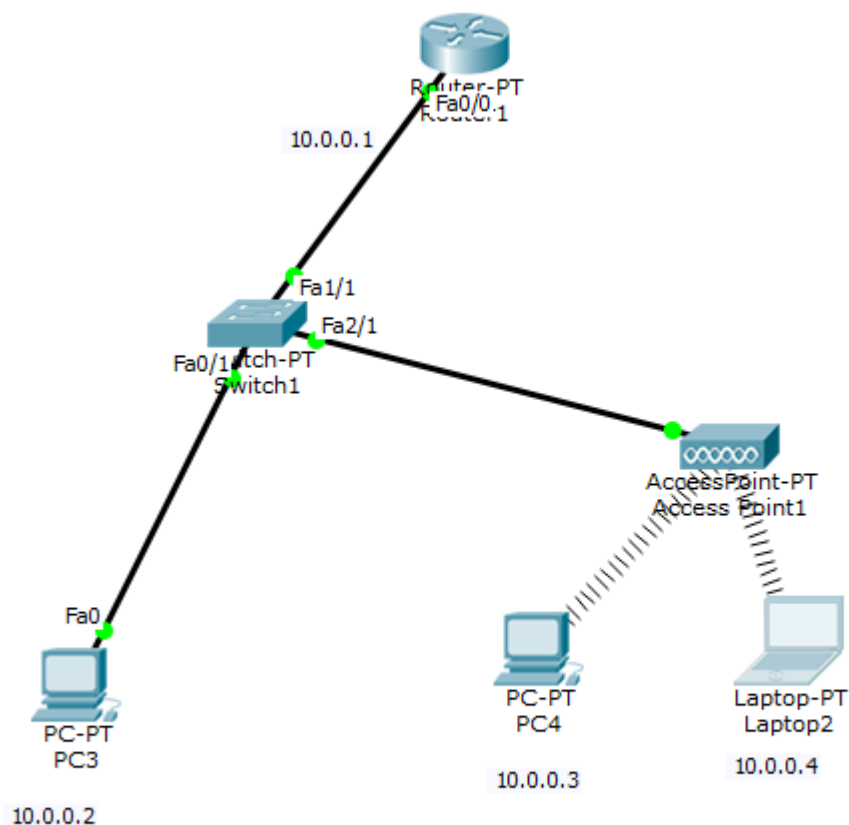
Configuring PC4 and Laptop with Wireless standards

Switch off the device. Drag the existing PT-HOST-NM-1AM to the component listed in the LHS. Drag WMP300N wireless interface to the empty port. Switch On the device.



In the config tab a new wireless interface would have been added. Now configure SSID, WEP, WEP Key, IP address and **Gateway** (as normally done) to the device.

Final topology on screen

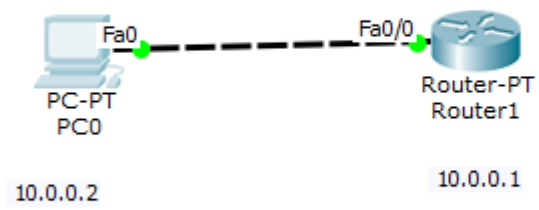


Ping from every device to every other device and see the results

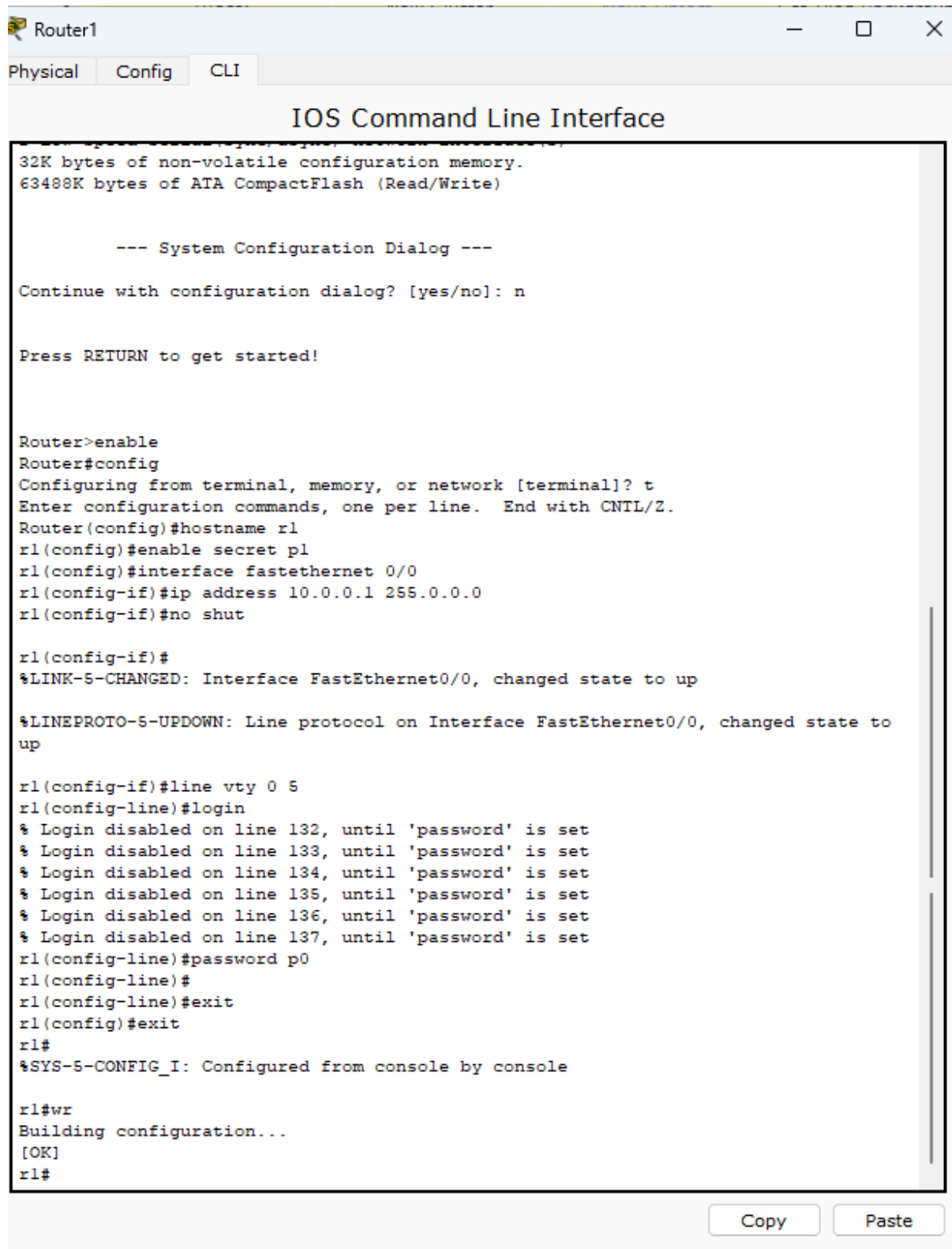
Telnet

To understand the operation of TELNET by accessing the router in server room from a PC in IT office.

Telnet, developed in 1969, is a protocol that provides a command line interface for communication with a remote device or server, sometimes employed for remote management but also for initial device setup like network hardware. Telnet stands for **Teletype Network**, but it can also be used as a verb; 'to telnet' is to establish a connection using the Telnet protocol. Telnet is a simple, text-based network protocol that is used for accessing remote computers over TCP/IP networks like the Internet.



Commands in Router



The screenshot shows a Cisco Router CLI window titled "Router1". It has three tabs: "Physical", "Config", and "CLI", with "CLI" being the active tab. The main title is "IOS Command Line Interface". The terminal output shows the following sequence of commands and responses:

```
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)

--- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!

Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]? t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname r1
r1(config)#enable secret p1
r1(config)#interface fastethernet 0/0
r1(config-if)#ip address 10.0.0.1 255.0.0.0
r1(config-if)#no shut

r1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to
up

r1(config-if)#line vty 0 5
r1(config-line)#login
% Login disabled on line 132, until 'password' is set
% Login disabled on line 133, until 'password' is set
% Login disabled on line 134, until 'password' is set
% Login disabled on line 135, until 'password' is set
% Login disabled on line 136, until 'password' is set
% Login disabled on line 137, until 'password' is set
r1(config-line)#password p0
r1(config-line)#
r1(config-line)#exit
r1(config)#exit
r1#
%SYS-5-CONFIG_I: Configured from console by console

r1#wr
Building configuration...
[OK]
r1#
```

At the bottom right of the window, there are two buttons: "Copy" and "Paste".

enable

config t

hostname R1

enable secret p1

```
interface fastethernet 0/0
```

```
ip address 10.0.0.1 255.0.0.0
```

```
no shut
```

```
line vty 0 5 --to allow virtual terminal access for 6 users
```

```
login
```

```
password p0
```

```
exit
```

```
exit
```

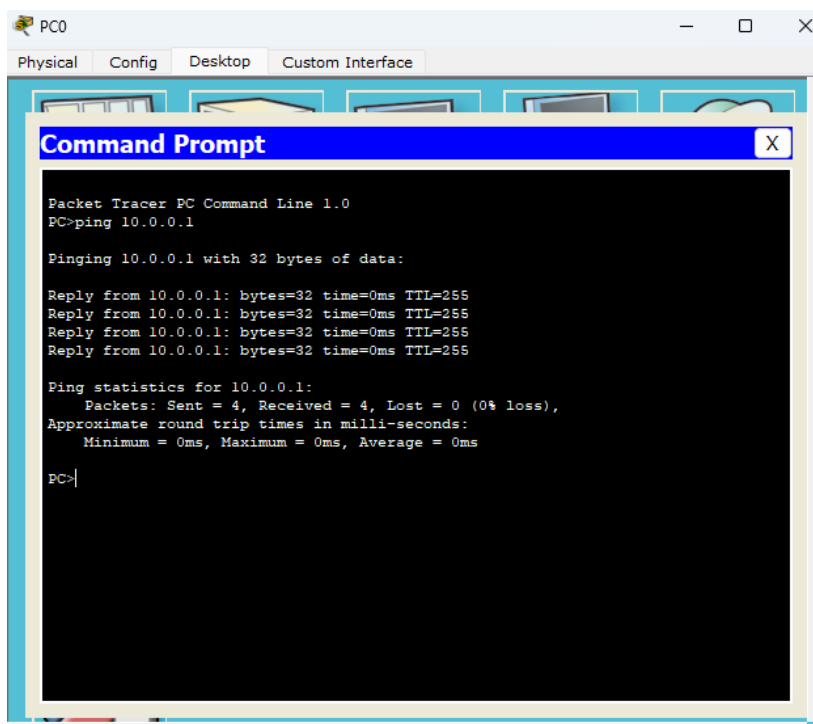
```
wr – to save changes in router
```

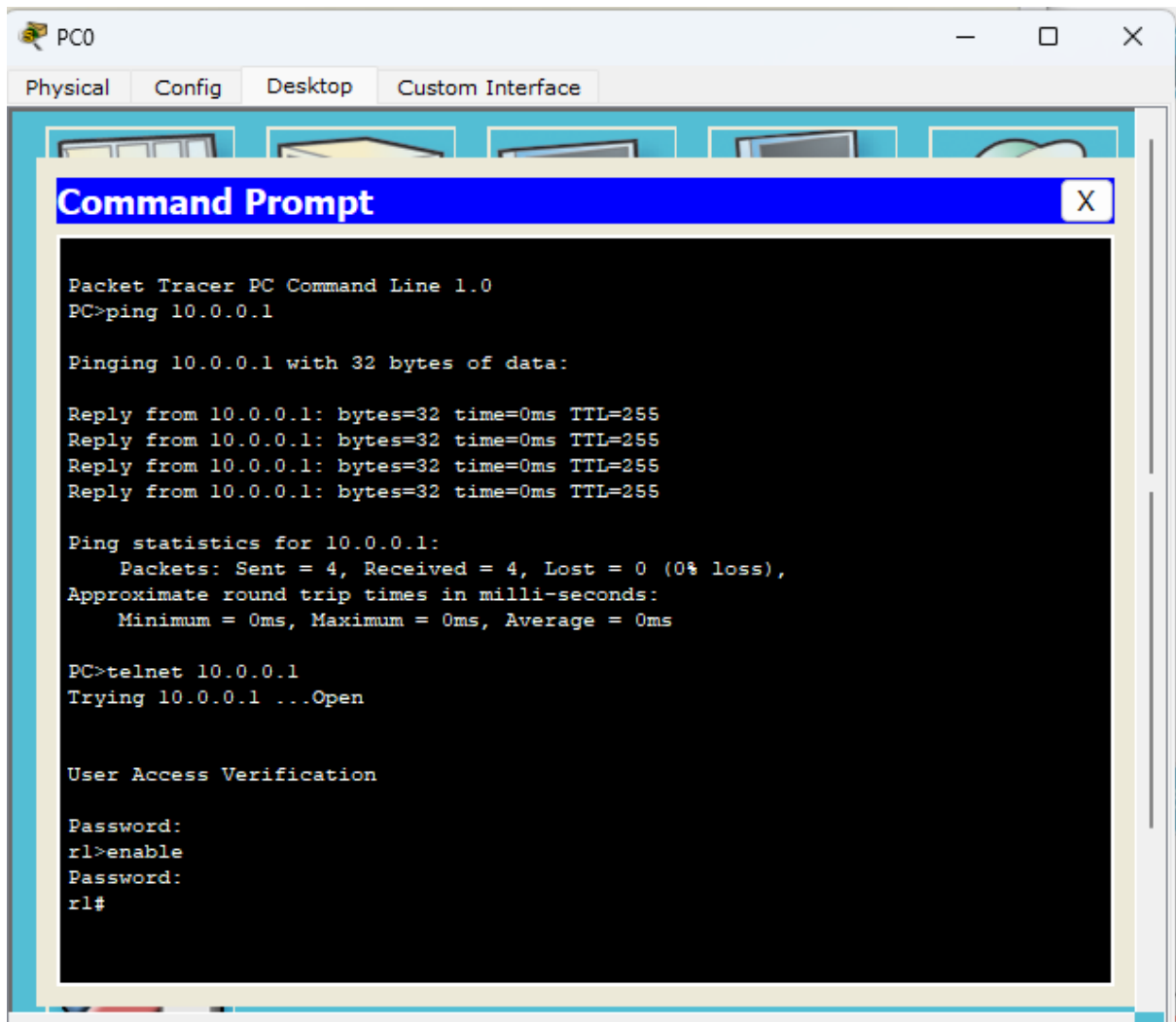
Commands in PC

In command prompt,

Ping 10.0.0.1

Ping results seen

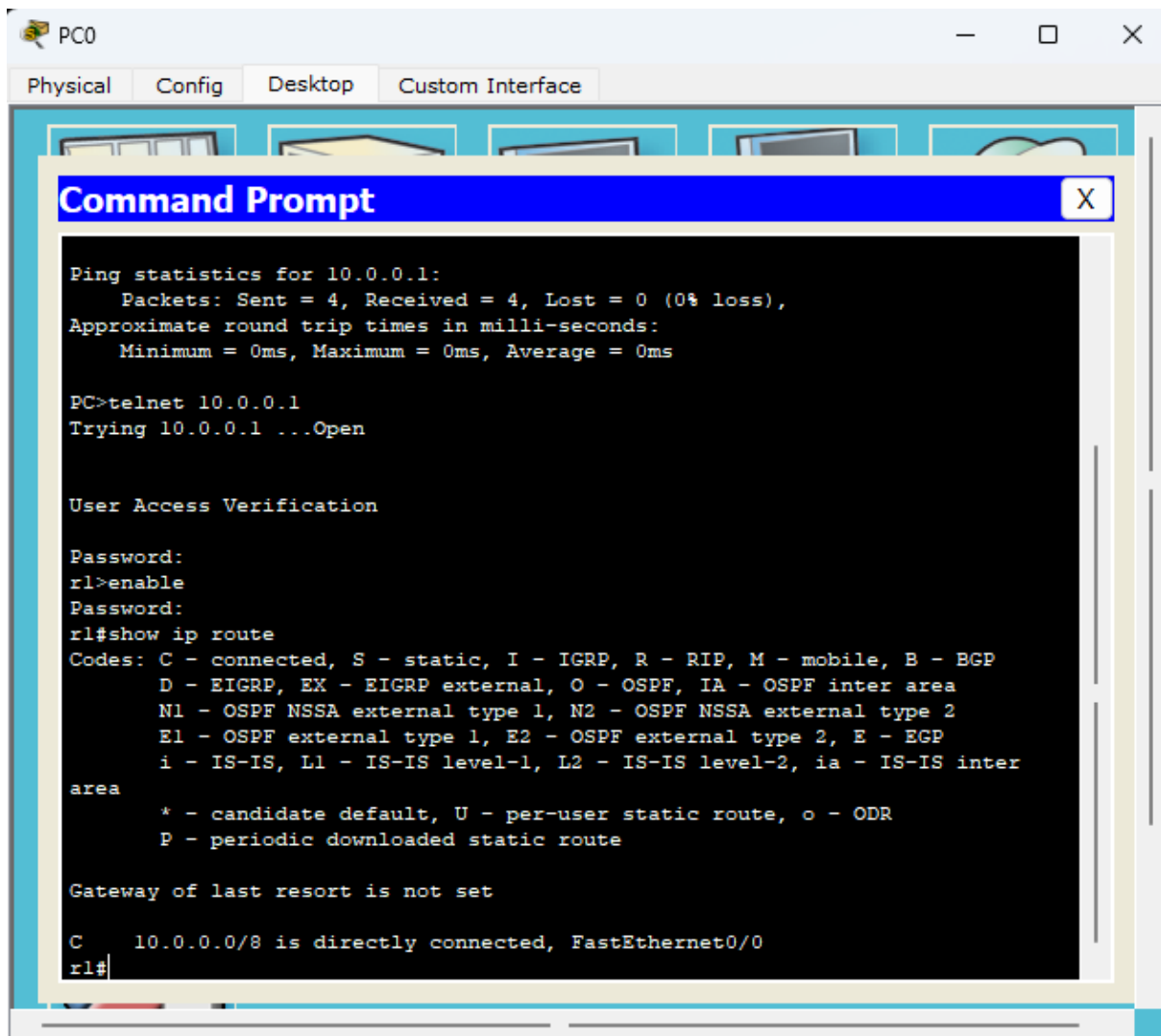




Password for User Access Verification is p0

Password for enable is p1

Accessing router CLI from PC



The admin in PC is able to run commands as run in router CLI and see the result from PC.