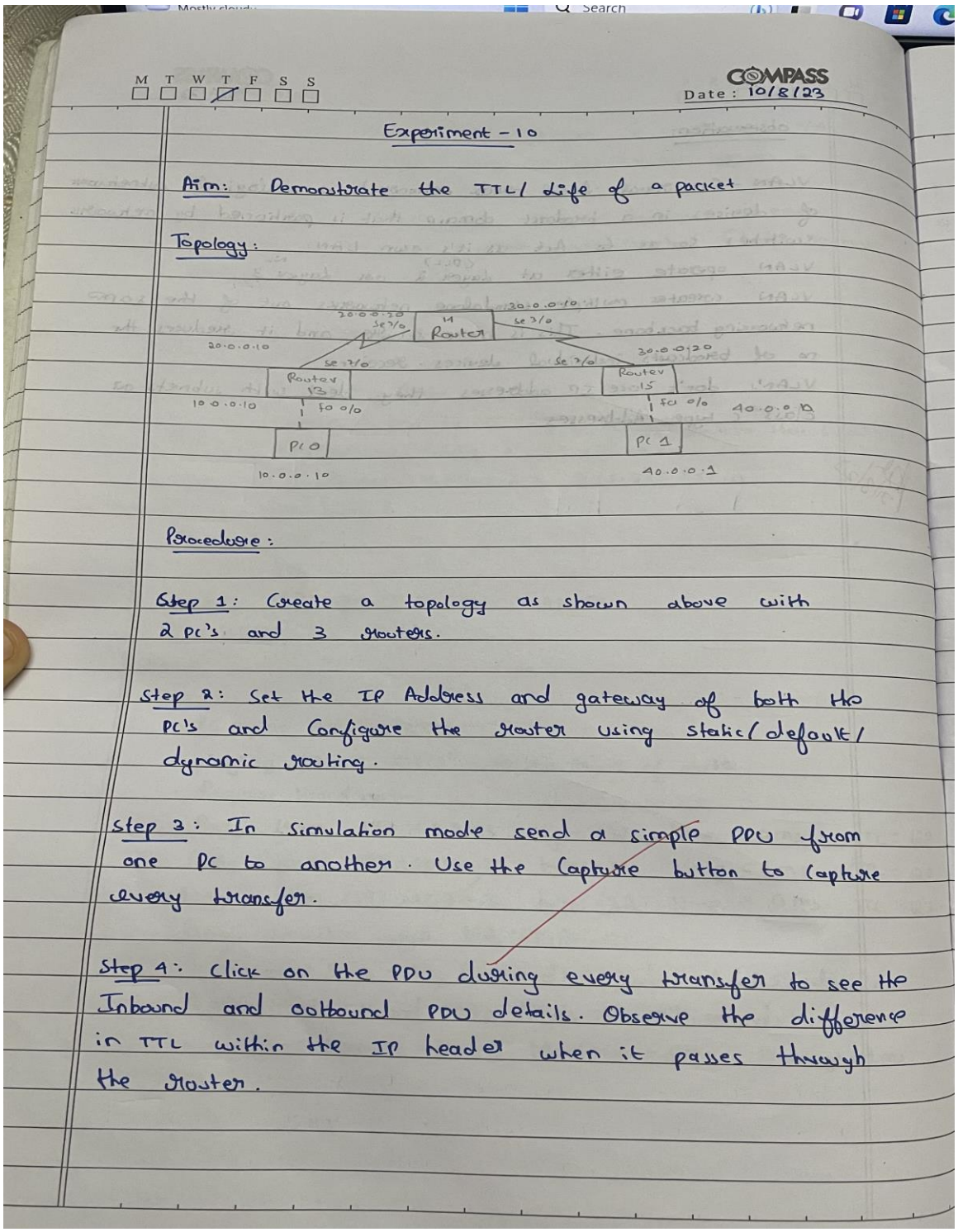
LAB PROGRAM -10

Q) Demonstrate the TTL/ Life of a PacketTopology

Procedure :



M T W T F S S

COMPASS

Date : 10/8/23

Experiment - 10

Aim: Demonstrate the TTL/ Life of a packet

Topology:

Procedure:

Step 1: Create a topology as shown above with 2 PC's and 3 routers.

Step 2: Set the IP Address and gateway of both the PC's and Configure the router using static/default/ dynamic routing.

Step 3: In Simulation mode send a simple PDU from one PC to another. Use the Capture button to capture every transfer.

Step 4: Click on the PDU during every transfer to see the Inbound and outbound PDU details. Observe the difference in TTL within the IP header when it passes through the router.

M T W T F S S

COMPASS

Date: 10/8/23

output:

IP header: (PC 0) (Inbound)

0 4	8	16	19	31 bits
4	IHL	DSCP:	TL: 28	
ID: 0x7		0x	0x0	
TTL: (255)	PRO: 0x1	CHKSUM		
SRC IP: 10.0.0.1				
DST IP: 40.0.0.1				
OPT: 0x0			0x0	
DATA (variable length)				

IP header: (Router 0) (outbound)

↳ Inbound IP header for router 0 will look the same as above

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			0x0	
DATA (variable length)				

→ Similar results are seen for the other 2 routers and PC.

observation:

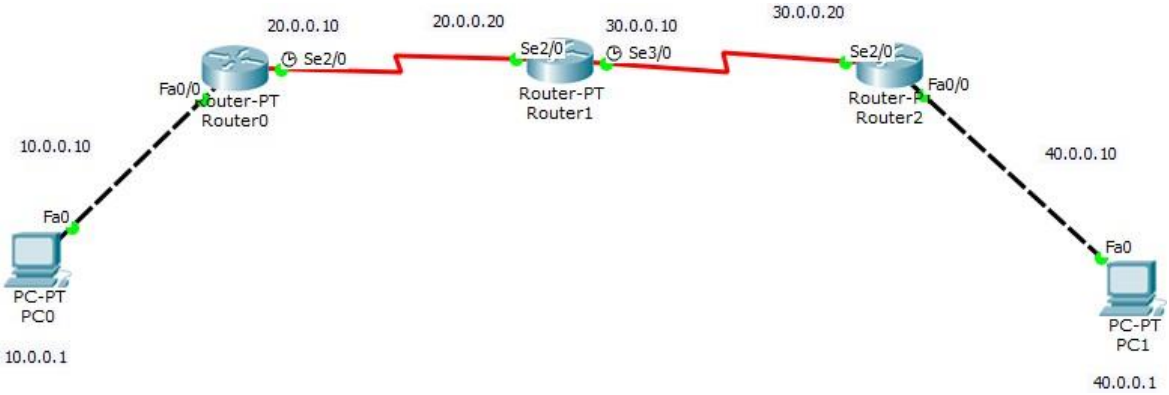
→ TTL: time to live indicates the no of hops the packet can travel before it is discarded by the router to prevent a packet from travelling aimlessly within the network. This field is set by the sender & reduced by 1 by the router it passes through. When the TTL = 0, the router discards the packet and sends ICMP message to source.

Topology :

Configurations:

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

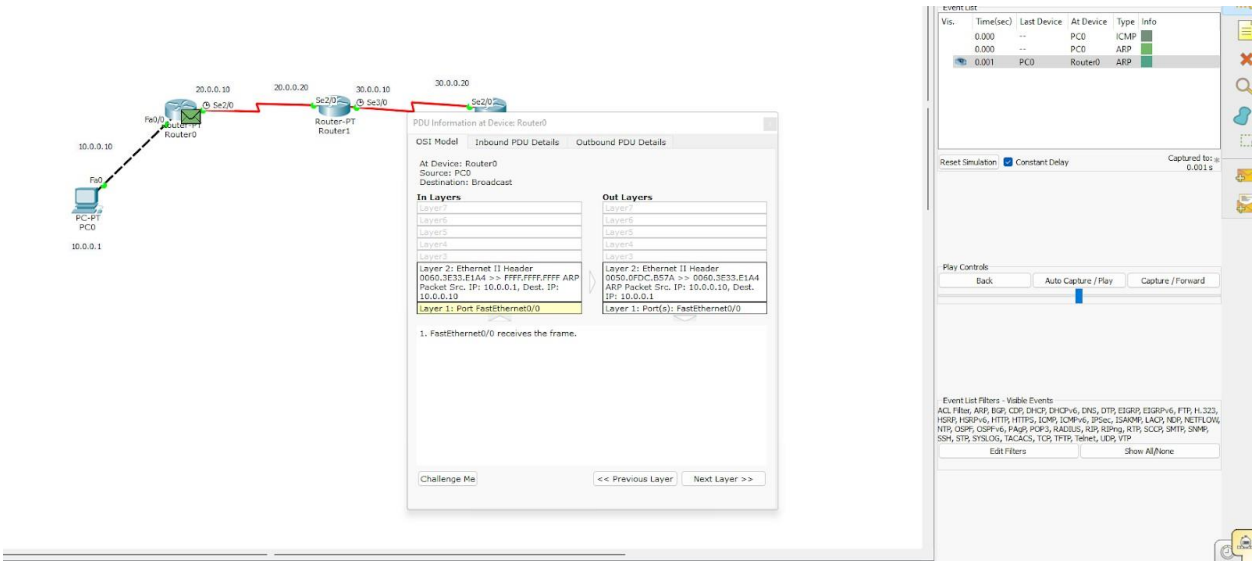
(Below has been done using static routing)

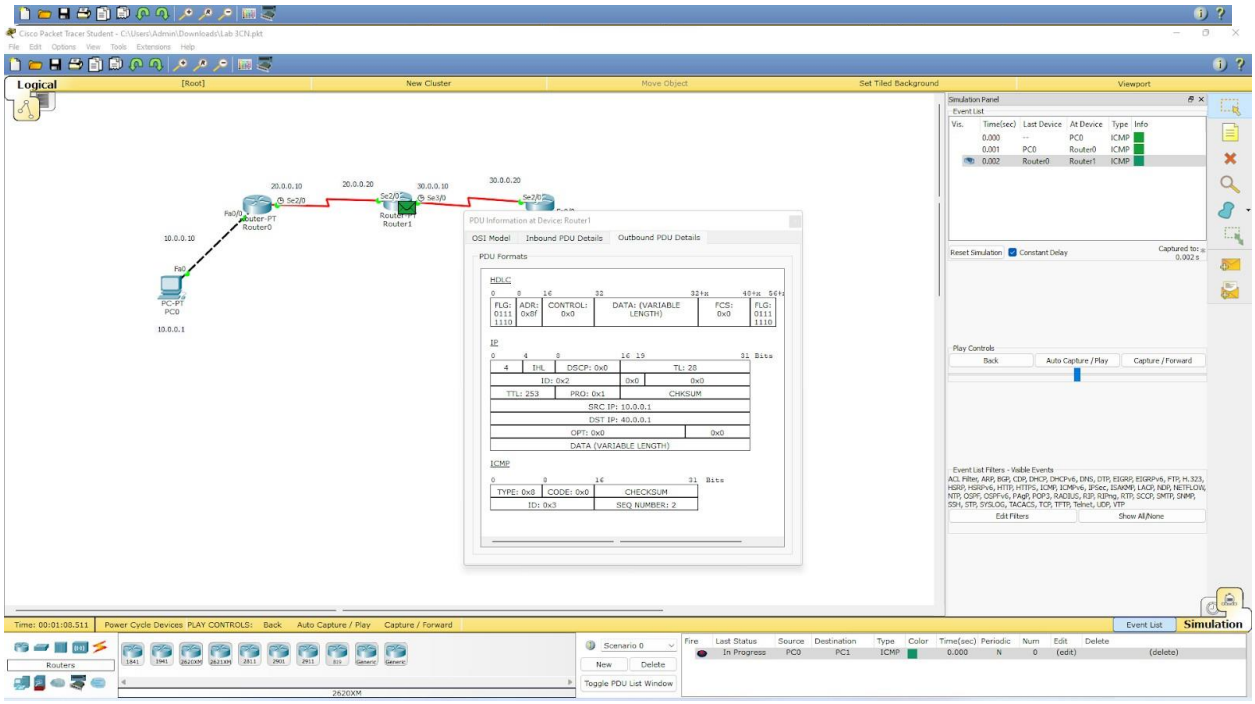


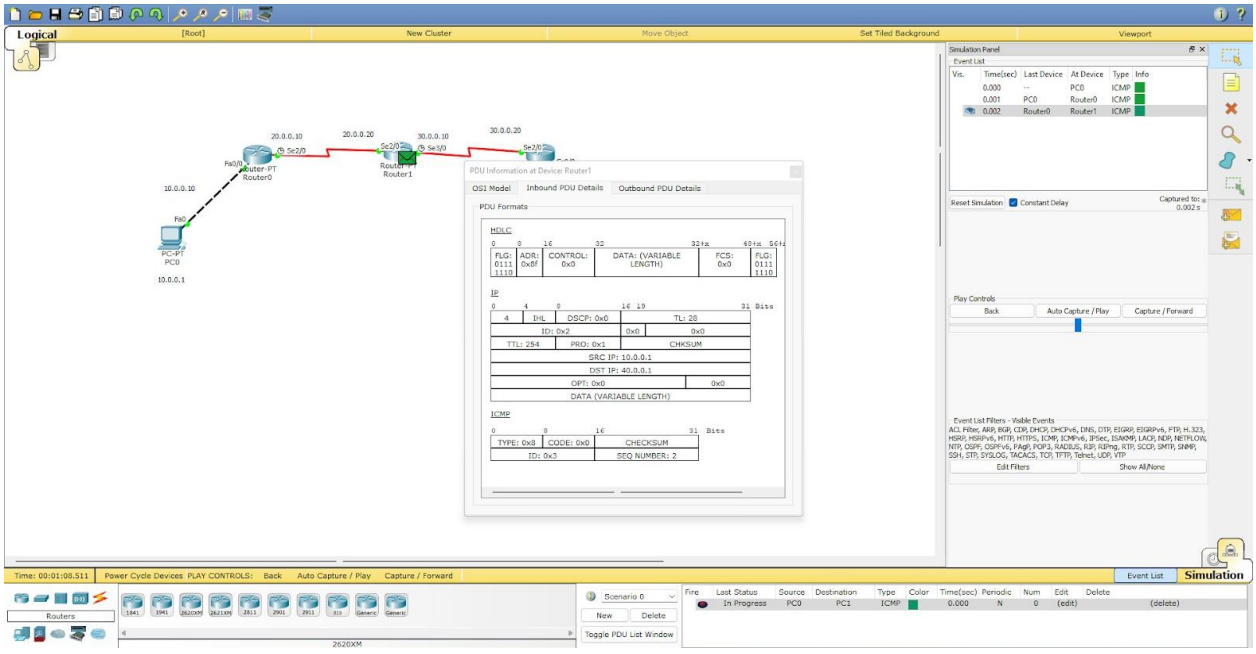
Output :

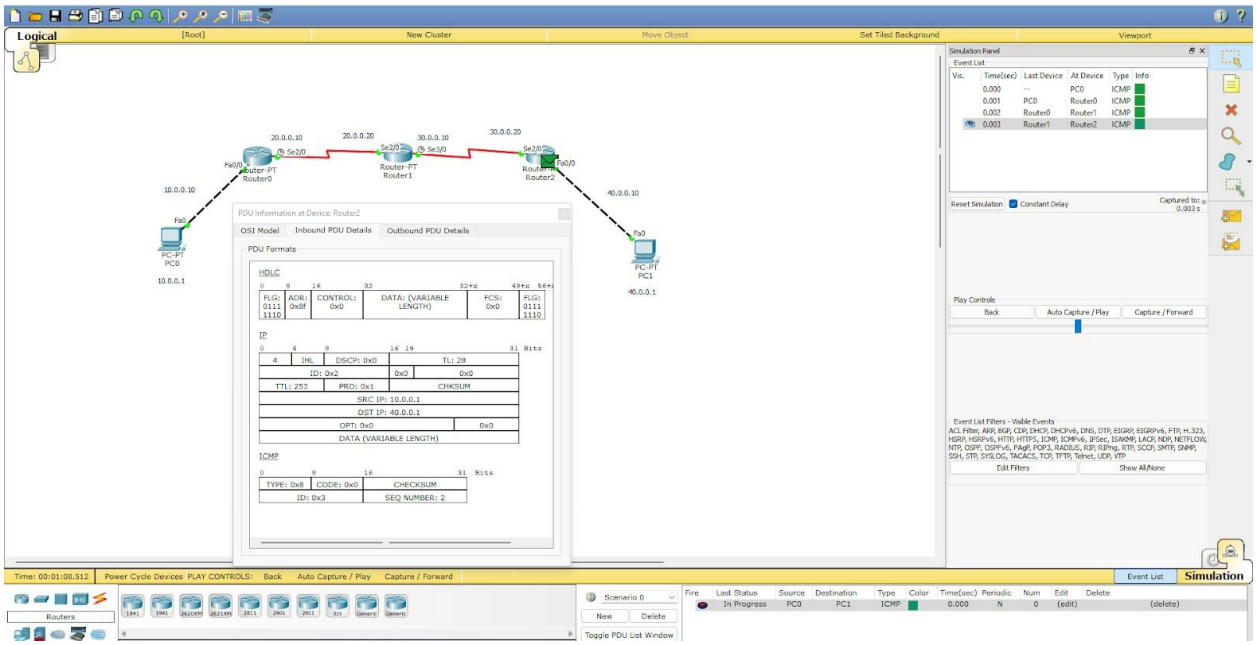
PDU Details :

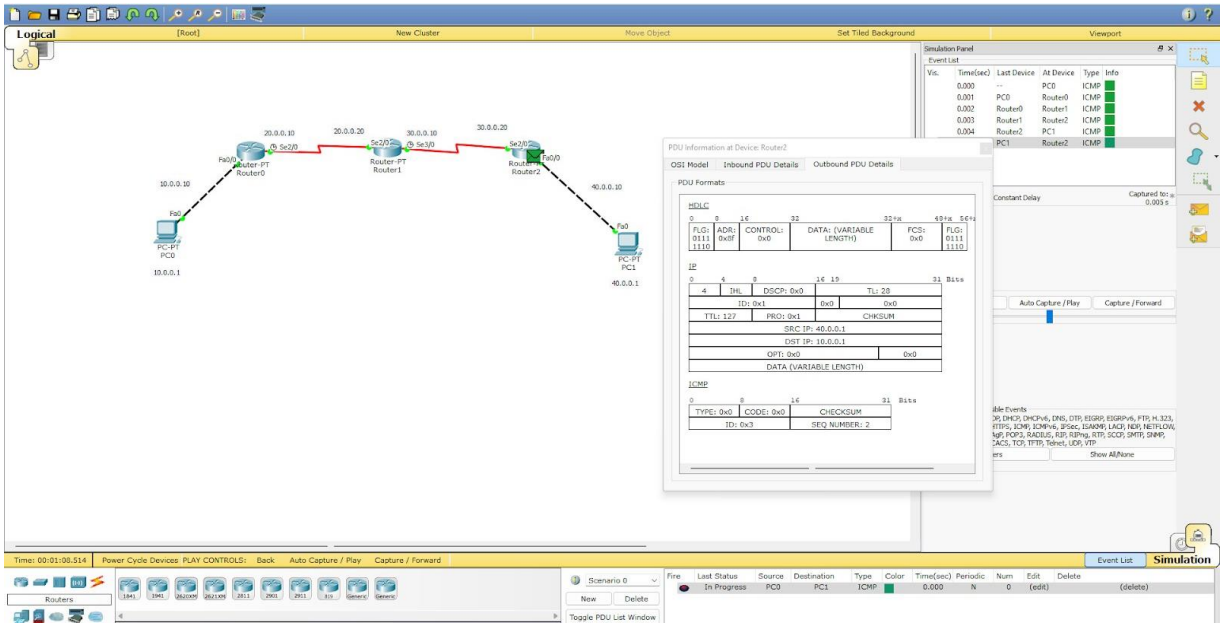
Simple PDU sent from PC0 to PC1 in simulation mode.

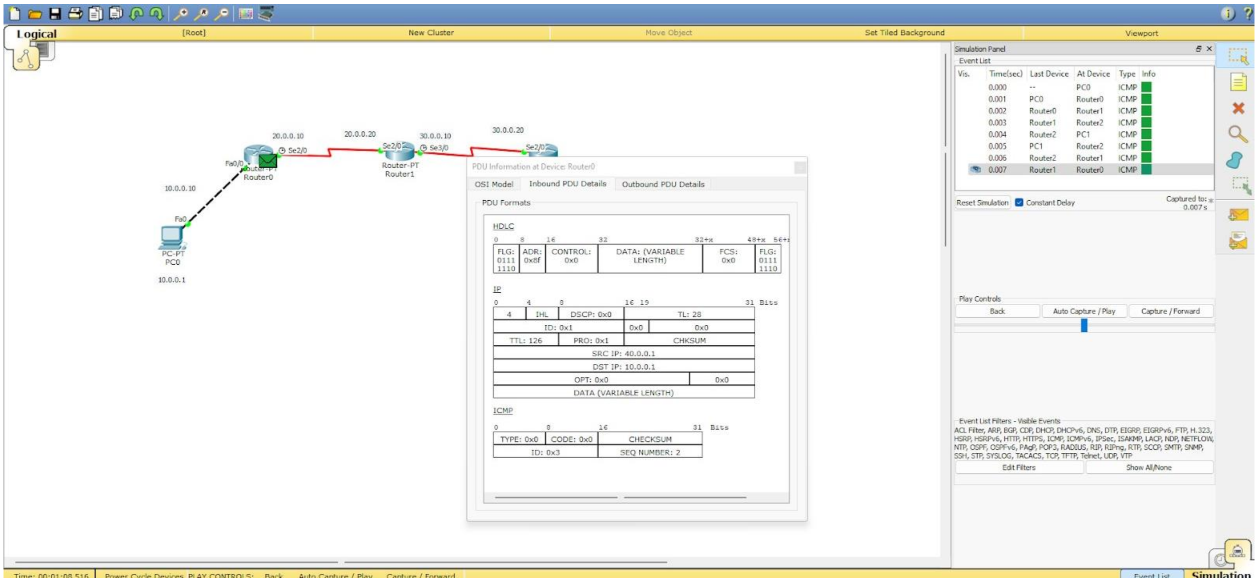


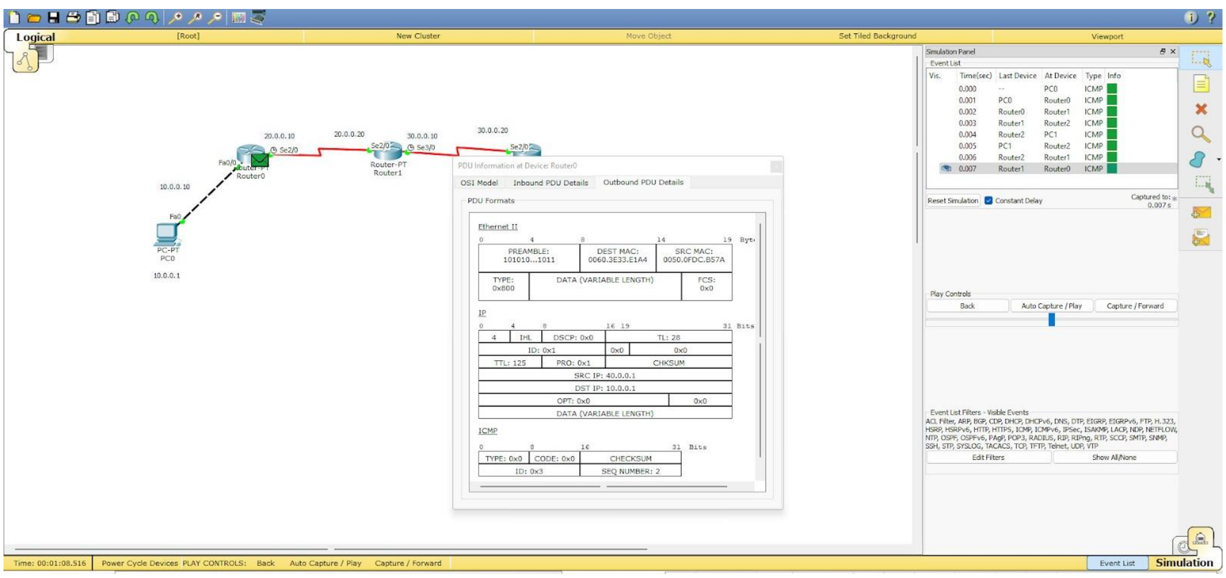

Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
Router-PT
Router0
Router1
PC-PT
PC0
10.0.0.10
10.0.0.1
PDU Information at Device: Router1
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
HDLC
IP
ICMP
Simulation Panel
Event List
Play Controls
Simulation

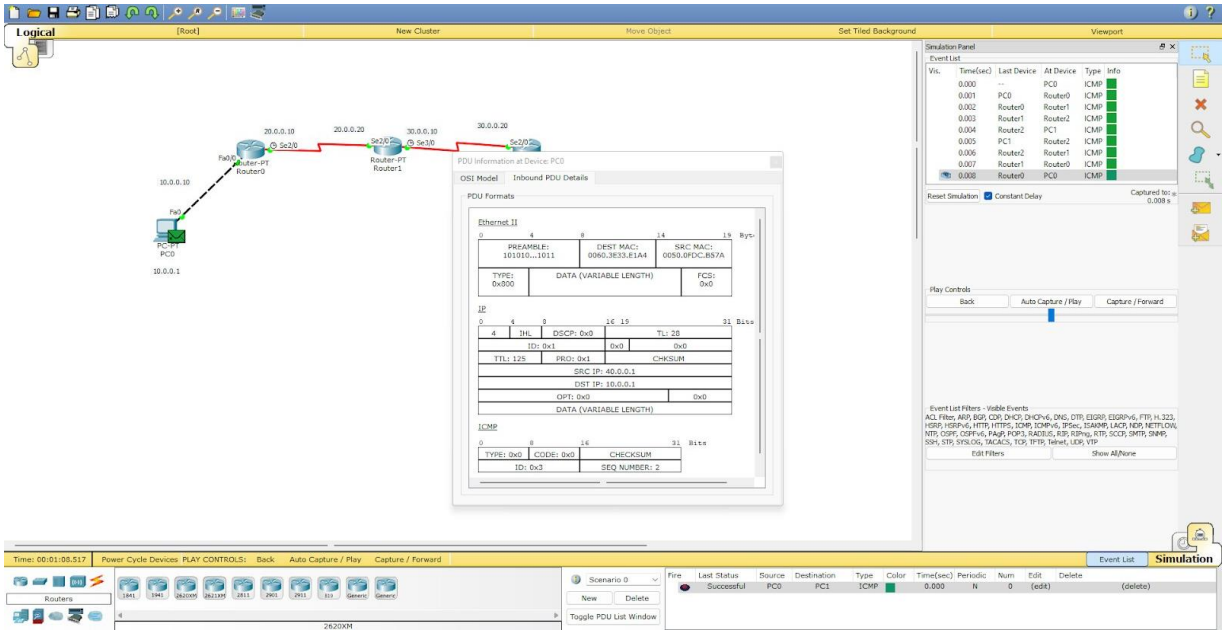

Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
Router-PT
Router0
Router1
PC-PT
PC0
10.0.0.10
10.0.0.1
PDU Information at Device: Router1
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
HDLC
IP
ICMP
Simulation Panel
Event List
Play Controls
Simulation


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Router-PT Router0
Router-PT Router1
Router-PT Router2
PC-PT PC0
PC-PT PC1
10.0.0.10
20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
40.0.0.10
10.0.0.1
40.0.0.1
PDU Information at Device: Router2
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
HDLC
IP
ICMP
Simulation Panel
Event List
Reset Simulation
Constant Delay
Play Controls
Back
Auto Capture / Play
Capture / Forward
Edit Filters
Show All/None
Time: 00:01:08.512
Power Cycle Devices PLAY CONTROLS:
Event List
Simulation
Routers
Scenario 0
New
Delete
Toggle PDU List Window
In Progress
PC0
PC1
ICMP
0.000
(edit)
(delete)


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Router-PT Router0
Router-PT Router1
Router-PT Router2
PC-PT PC0
PC-PT PC1
10.0.0.10
20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
40.0.0.10
10.0.0.1
40.0.0.1
PDU Information at Device: Router2
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
HDLC
IP
ICMP
Simulation Panel
Event List
Auto Capture / Play
Capture / Forward
Show All/None
Time: 00:01:08.514
Power Cycle Devices PLAY CONTROLS:
Event List
Simulation
Routers
Scenario 0
New
Delete
Toggle PDU List Window
In Progress
PC0
PC1
ICMP
0.000
(edit)
(delete)


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
PDU Information at Device: Router0
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
HDLC
FLG: 0111 1110
ADR: 0x8f
CONTROL: 0x0
DATA: (VARIABLE LENGTH)
FCS: 0x0
FLG: 0111 1110
IP
4
IHL
DSCP: 0x0
TL: 28
ID: 0x1
0x0
0x0
TTL: 126
PRO: 0x1
CHKSUM
SRC IP: 40.0.0.1
DST IP: 10.0.0.1
OPT: 0x0
0x0
DATA (VARIABLE LENGTH)
ICMP
TYPE: 0x0
CODE: 0x0
CHECKSUM
ID: 0x3
SEQ NUMBER: 2
Simulation Panel
Event List
Reset Simulation
Constant Delay
Play Controls
Back
Auto Capture / Play
Capture / Forward
Edit Filters
Show All/None
Simulation


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
PDU Information at Device: Router0
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
Ethernet II
PREAMBLE: 101010...1011
DEST MAC: 0060.3E33.E1A4
SRC MAC: 0050.0FDC.B57A
TYPE: 0x800
DATA (VARIABLE LENGTH)
FCS: 0x0
IP
4
IHL
DSCP: 0x0
TL: 28
ID: 0x1
0x0
0x0
TTL: 125
PRO: 0x1
CHKSUM
SRC IP: 40.0.0.1
DST IP: 10.0.0.1
OPT: 0x0
0x0
DATA (VARIABLE LENGTH)
ICMP
TYPE: 0x0
CODE: 0x0
CHECKSUM
ID: 0x3
SEQ NUMBER: 2
Simulation Panel
Event List
Reset Simulation
Constant Delay
Play Controls
Back
Auto Capture / Play
Capture / Forward
Edit Filters
Show All/None
Time: 00:01:08.516
Power Cycle Devices
PLAY CONTROLS:
Event List
Simulation


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Router-PT
Router0
Router-PT
Router1
PC-PT
PC0
PDU Information at Device: PC0
OSI Model
Inbound PDU Details
PDU Formats
Ethernet II
IP
ICMP
Simulation Panel
Event List
Play Controls
Back
Auto Capture / Play
Capture / Forward
Reset Simulation
Constant Delay
Edit Filters
Show All/None
Time: 00:01:05.517
Power Cycle Devices
PLAY CONTROLS:
Routers
2620XM
Scenario 0
New
Delete
Toggle PDU List Window
Event List
Simulation