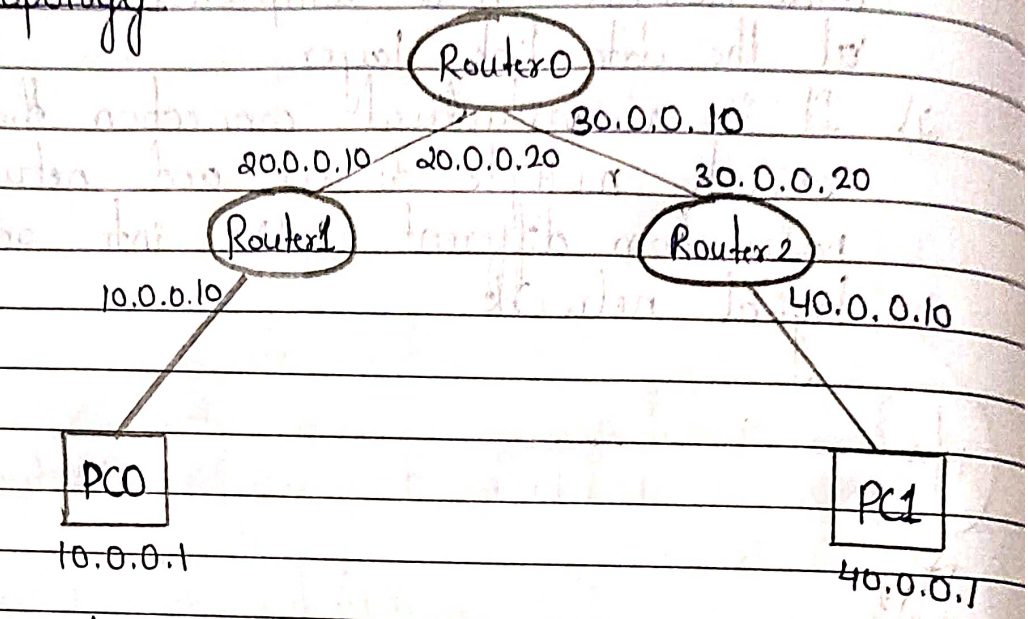
10/8/23

Aim - To demonstrate the TTL / life of a Packet.

Topology -



Procedure -

1) Create a 2 PC and 3 router configuration as shown in the topology.
2) Use serial DTE between routers and copper cross over between router and PC.
3) Configure the IP address and gateway of PC and configure all the routers.

For router 0

```
>enable
#config t
#interface fastethernet 0/0
#ip address 10.0.0.10 255.0.0.0
#no shut
#exit
#ip route 30.0.0.0 255.0.0.0 20.0.0.20
#ip route 40.0.0.0 255.0.0.0 20.0.0.20
#exit
```

For router 1

```
>enable
#config t
#interface serial 2/0
#ip address 20.0.0.20 255.0.0.0
#no shut
#exit
#interface serial 3/0
#ip address 30.0.0.10 255.0.0.0
#no shut
#exit
#ip route 10.0.0.0 255.0.0.0 20.0.0.20
#ip route 40.0.0.0 255.0.0.0 30.0.0.20
#exit
```

For router 2

```
>enable
#config t
#interface serial 2/0
#ip address 30.0.0.20 255.0.0.0
#no shut
#exit
#interface fastethernet 0/0
#ip address 40.0.0.10 255.0.0.0
#no shut
#exit
#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
```

4) Select simulation mode, select simple PDU and select source & dustination PCs

5) Click on capture button to send PDU, and acknowledgement from PC to router and router to PC.

6) Click on PDU during every transfer to see the inbound and outbound PDU details. Observe the difference in the TTL

Result -

PDU information at PC0

Outbound PDU details:

TTL = 255

PDU information at Router 0

Inbound PDU details:

TTL = 255

Outbound PDU details:

TTL = 254

PDU information at Router 1

Inbound PDU details:

TTL = 254

Outbound PDU details:

TTL = 253

PDU information at Router 2

Inbound PDU details:

TTL = 253

Outbound PDU details:

TTL = 252

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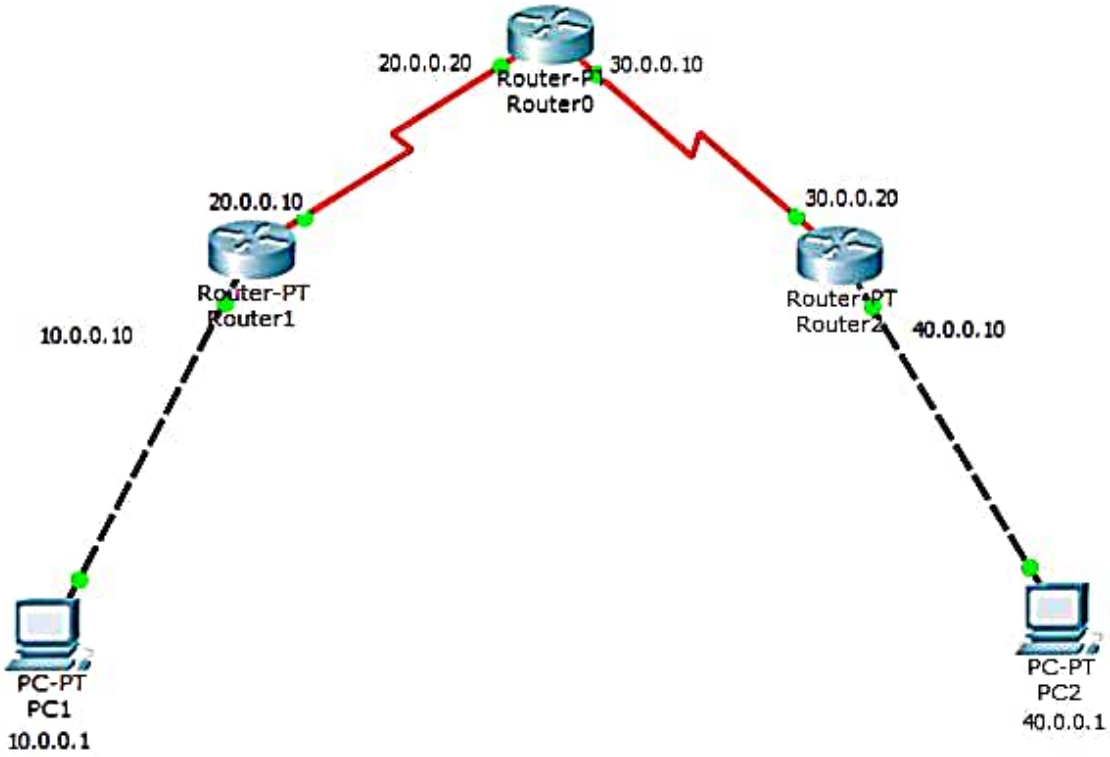
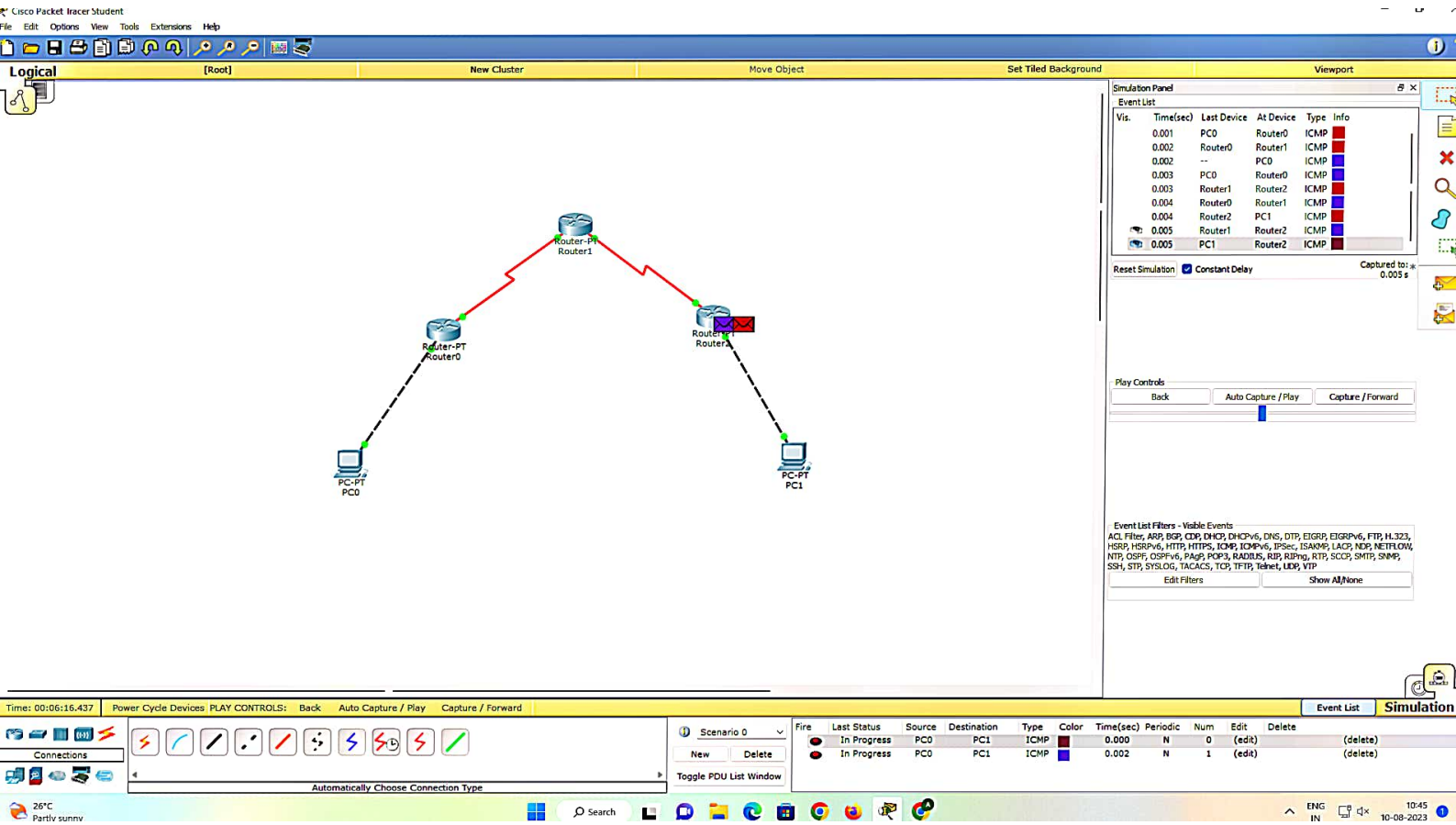
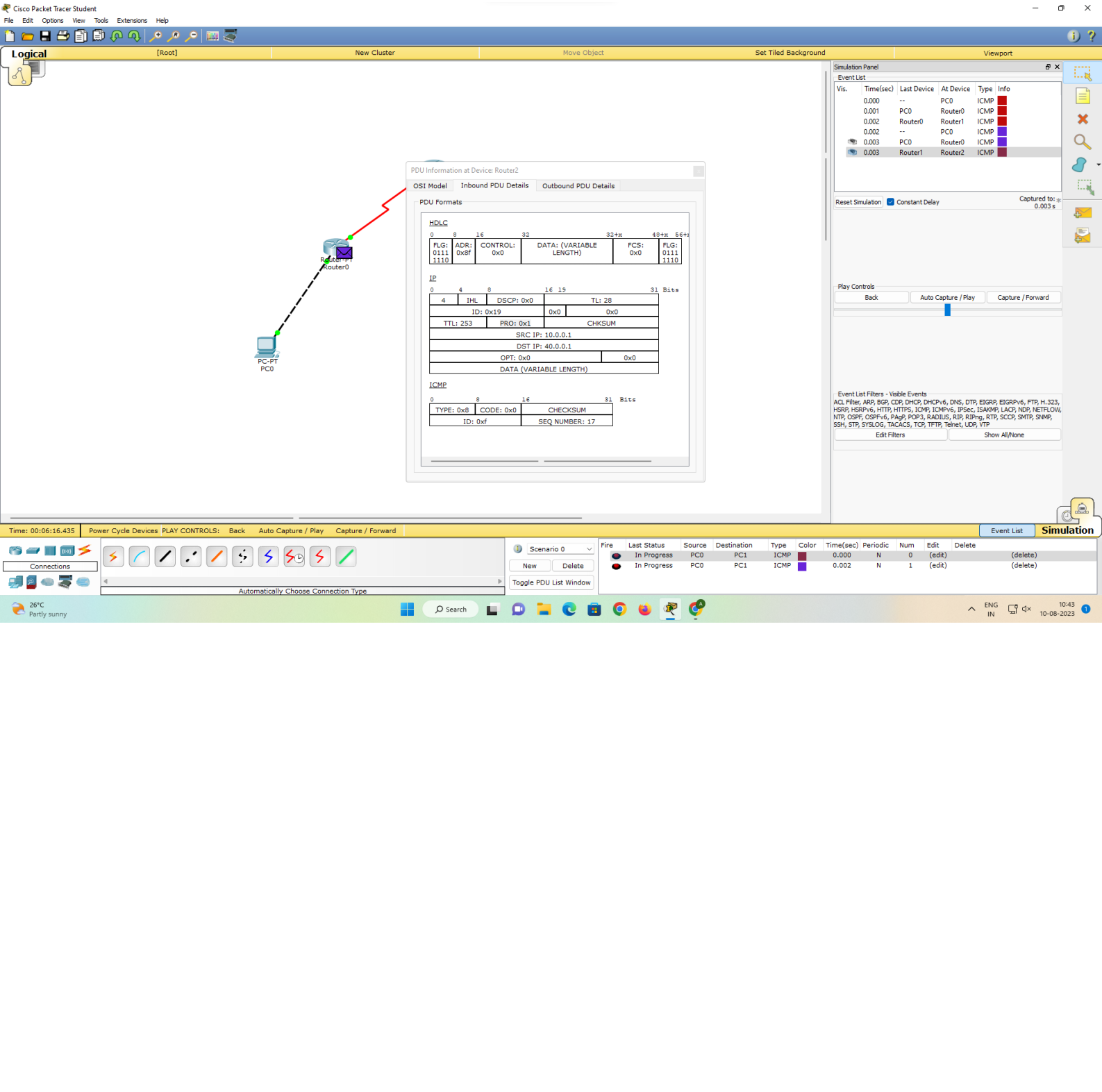
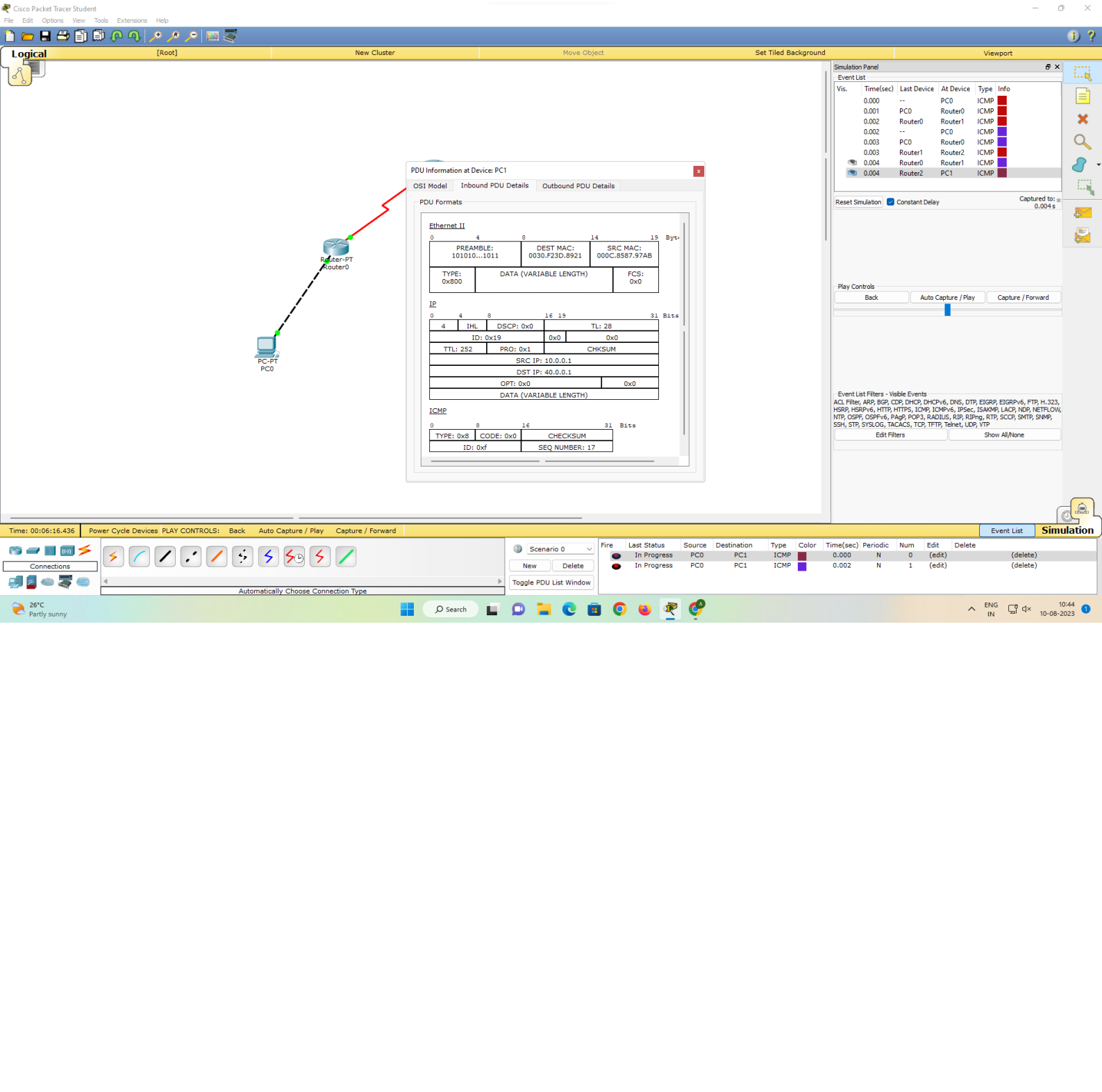
Observation -

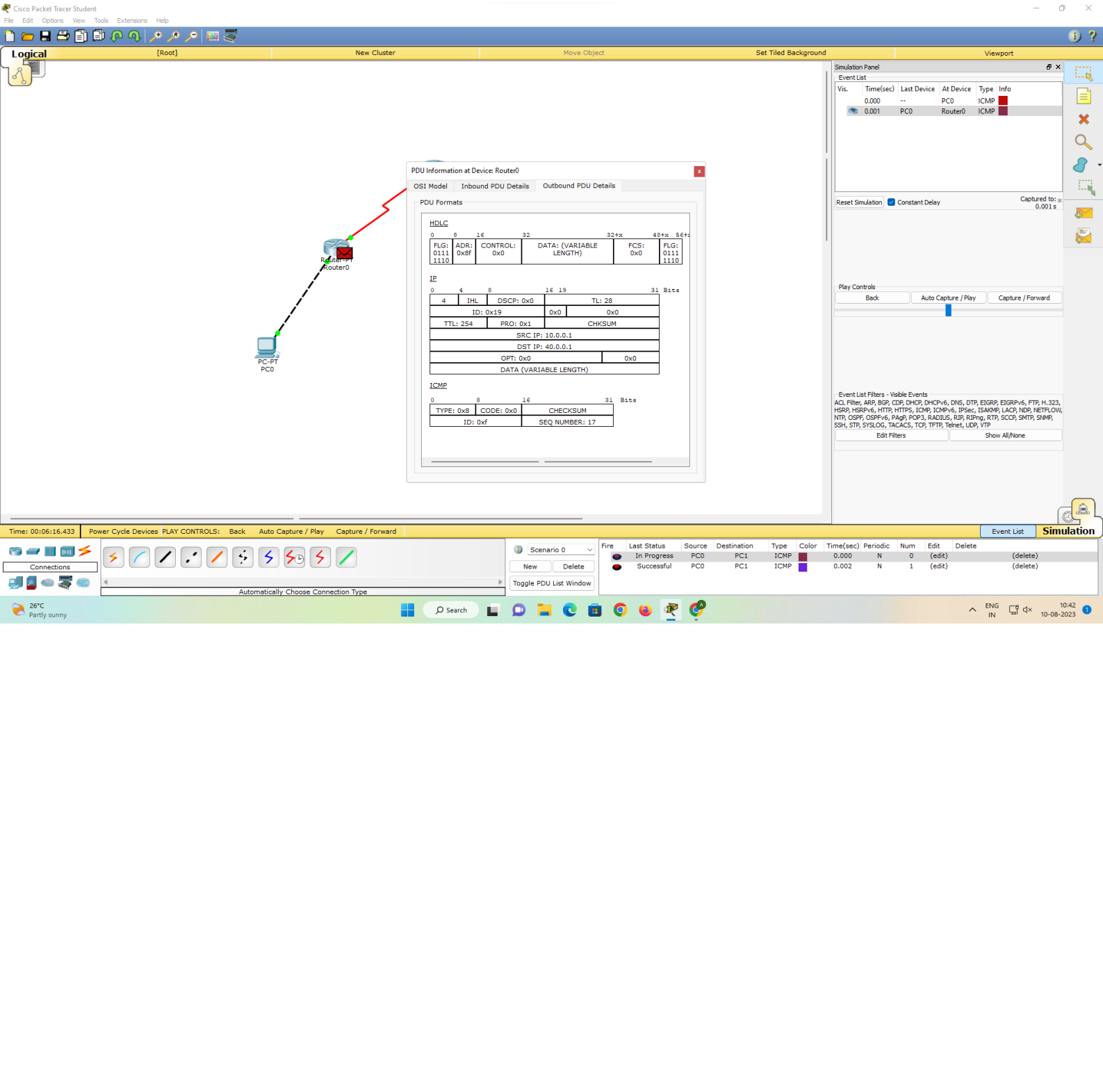
The TTL is reduced by 1 in every router. TTL is a mechanism which limits the number of hops between source and destination.

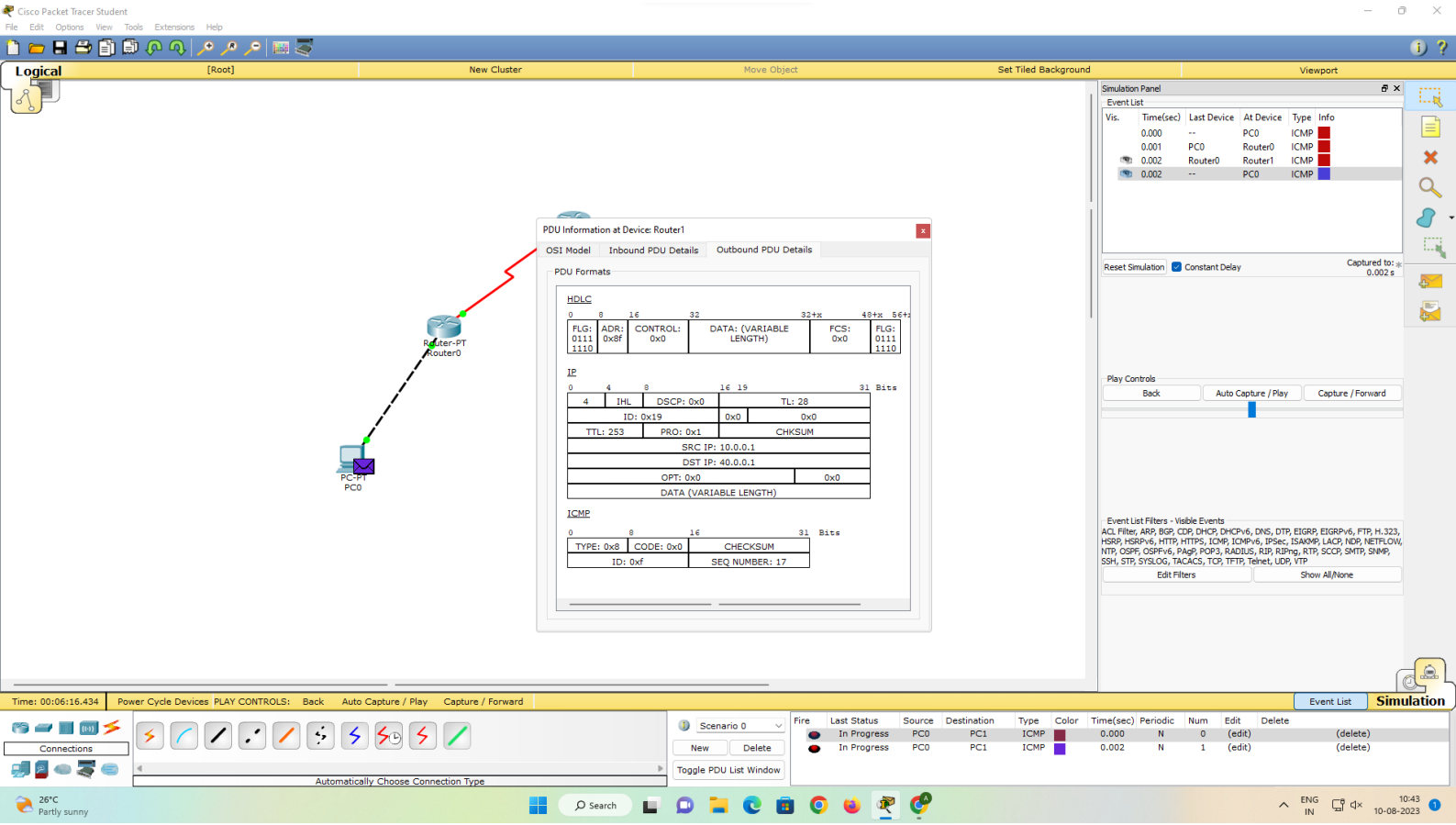

20.0.0.20
Router-PT
Router0
30.0.0.10
20.0.0.10
Router-PT
Router1
30.0.0.20
Router-PT
Router2
10.0.0.10
40.0.0.10
PC-PT
PC1
10.0.0.1
PC-PT
PC2
40.0.0.1

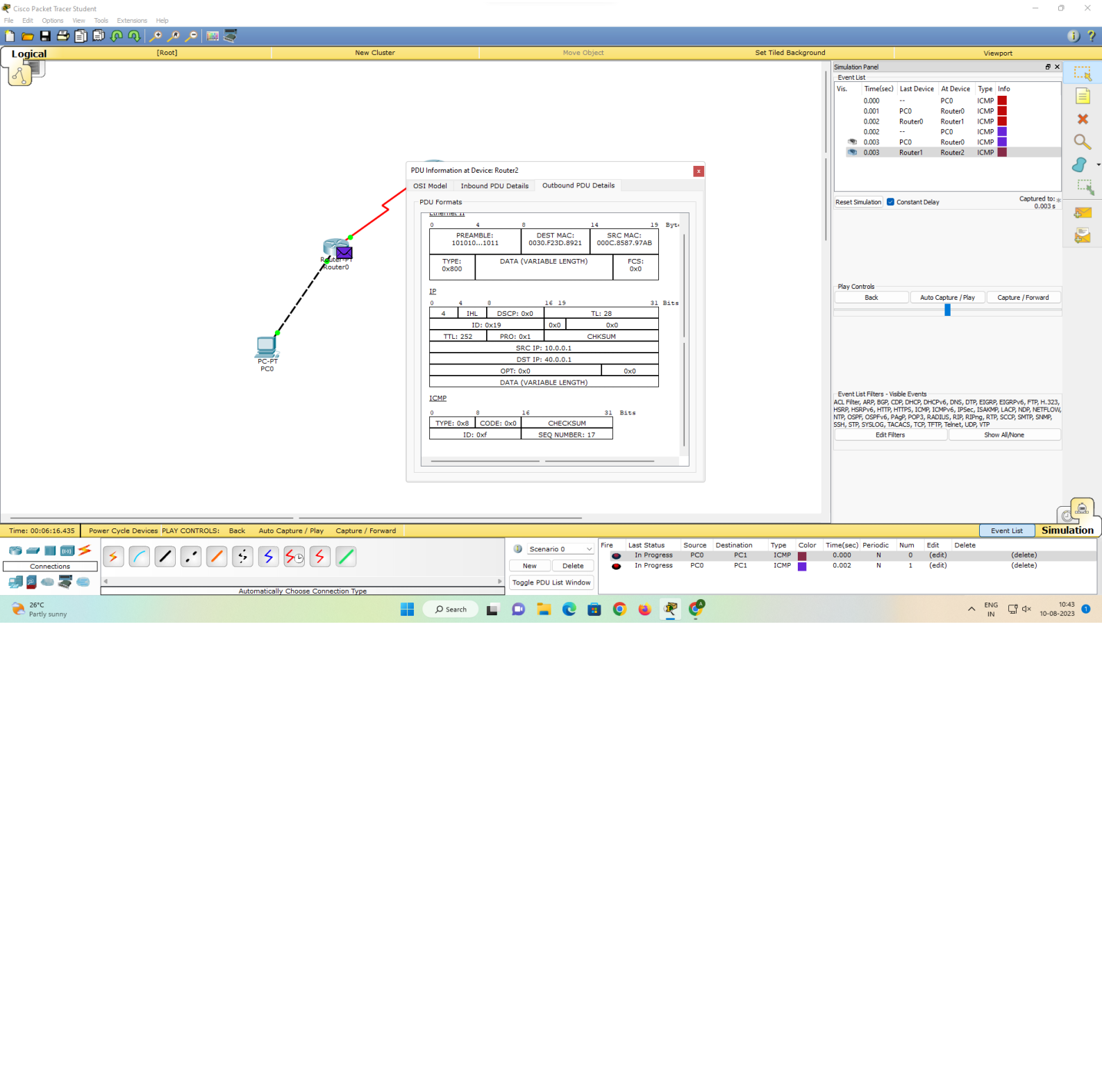

Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Router-PT
Router1
Router-PT
Router0
Router-PT
Router2
PC-PT
PC0
PC-PT
PC1
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.001 PC0 Router0 ICMP
0.002 Router0 Router1 ICMP
0.002 -- PC0 ICMP
0.003 PC0 Router0 ICMP
0.003 Router1 Router2 ICMP
0.004 Router0 Router1 ICMP
0.004 Router2 PC1 ICMP
0.005 Router1 Router2 ICMP
0.005 PC1 Router2 ICMP
Reset Simulation
Constant Delay
Captured to: 0.005 s
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP
Edit Filters
Show All/None
Time: 00:06:16.437
Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward
Event List
Simulation
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
In Progress PC0 PC1 ICMP 0.000 N 0 (edit) (delete)
In Progress PC0 PC1 ICMP 0.002 N 1 (edit) (delete)
26°C
Partly sunny
Search
ENG
IN
10:45
10-08-2023


Cisco Packet Tracer Student
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
FLG: 0111 1110
ADR: 0x8f
CONTROL: 0x0
DATA: (VARIABLE LENGTH)
FCS: 0x0
FLG: 0111 1110
IP
4
IHL
DSCP: 0x0
TL: 28
ID: 0x19
0x0
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
TYPE: 0x8
CODE: 0x0
CHECKSUM
ID: 0xf
SEQ NUMBER: 17
Router0
PC-PT PC0
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC0 ICMP
0.001 PC0 Router0 ICMP
0.002 Router0 Router1 ICMP
0.002 -- PC0 ICMP
0.003 PC0 Router0 ICMP
0.003 Router1 Router2 ICMP
Reset Simulation
Constant Delay
Captured to: 0.003 s
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP
Edit Filters
Show All/None
Time: 00:06:16.435
Power Cycle Devices
PLAY CONTROLS:
Back
Auto Capture / Play
Capture / Forward
Event List
Simulation
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
In Progress PC0 PC1 ICMP 0.000 N 0 (edit) (delete)
In Progress PC0 PC1 ICMP 0.002 N 1 (edit) (delete)
26°C Partly sunny
Search
ENG IN
10:43 10-08-2023


Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
PDU Information at Device: PC1
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
Ethernet II
PREAMBLE: 101010...1011
DEST MAC: 0030.F23D.8921
SRC MAC: 000C.8587.97AB
TYPE: 0x800
DATA (VARIABLE LENGTH)
FCS: 0x0
IP
4 IHL DSCP: 0x0 TL: 28
ID: 0x19 0x0 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
TYPE: 0x8 CODE: 0x0 CHECKSUM
ID: 0xf SEQ NUMBER: 17
Router-PT Router0
PC-PT PC0
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC0 ICMP
0.001 PC0 Router0 ICMP
0.002 Router0 Router1 ICMP
0.002 -- PC0 ICMP
0.003 PC0 Router0 ICMP
0.003 Router1 Router2 ICMP
0.004 Router0 Router1 ICMP
0.004 Router2 PC1 ICMP
Reset Simulation
Constant Delay
Captured to: 0.004 s
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP
Edit Filters
Show All/None
Time: 00:06:16.436
Power Cycle Devices
PLAY CONTROLS:
Back
Auto Capture / Play
Capture / Forward
Event List
Simulation
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
In Progress PC0 PC1 ICMP 0.000 N 0 (edit) (delete)
In Progress PC0 PC1 ICMP 0.002 N 1 (edit) (delete)
26°C Partly sunny
Search
ENG IN
10:44 10-08-2023


Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
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: 0x19
0x0
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
TYPE: 0x8
CODE: 0x0
CHECKSUM
ID: 0xf
SEQ NUMBER: 17
Router-PT Router0
PC-PT PC0
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC0 ICMP
0.001 PC0 Router0 ICMP
Reset Simulation
Constant Delay
Captured to: 0.001 s
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP
Edit Filters
Show All/None
Time: 00:06:16.433
Power Cycle Devices
PLAY CONTROLS:
Back
Auto Capture / Play
Capture / Forward
Event List
Simulation
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
In Progress PC0 PC1 ICMP 0.000 N 0 (edit) (delete)
Successful PC0 PC1 ICMP 0.002 N 1 (edit) (delete)
26°C Partly sunny
Search
ENG IN
10:42 10-08-2023


Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Router-PT
Router0
PC-PT
PC0
PDU Information at Device: Router1
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: 0x19
0x0
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
TYPE: 0x8
CODE: 0x0
CHECKSUM
ID: 0xf
SEQ NUMBER: 17
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC0 ICMP
0.001 PC0 Router0 ICMP
0.002 Router0 Router1 ICMP
0.002 -- PC0 ICMP
Reset Simulation
Constant Delay
Captured to: 0.002 s
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP
Edit Filters
Show All/None
Time: 00:06:16.434
Power Cycle Devices
PLAY CONTROLS:
Back
Auto Capture / Play
Capture / Forward
Event List
Simulation
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
In Progress PC0 PC1 ICMP 0.000 N 0 (edit) (delete)
In Progress PC0 PC1 ICMP 0.002 N 1 (edit) (delete)
26°C
Partly sunny
Search
ENG
IN
10:43
10-08-2023


Cisco Packet Tracer Student
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
PREAMBLE: 101010...1011
DEST MAC: 0030.F23D.8921
SRC MAC: 000C.8587.97AB
TYPE: 0x800
DATA (VARIABLE LENGTH)
FCS: 0x0
IP
4 IHL DSCP: 0x0 TL: 28
ID: 0x19 0x0 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
TYPE: 0x8 CODE: 0x0 CHECKSUM
ID: 0xf SEQ NUMBER: 17
Router0
PC-PT PC0
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC0 ICMP
0.001 PC0 Router0 ICMP
0.002 Router0 Router1 ICMP
0.002 -- PC0 ICMP
0.003 PC0 Router0 ICMP
0.003 Router1 Router2 ICMP
Reset Simulation
Constant Delay
Captured to: 0.003 s
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
Edit Filters
Show All/None
Time: 00:06:16.435
Power Cycle Devices
PLAY CONTROLS: Back Auto Capture / Play Capture / Forward
Event List
Simulation
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
In Progress PC0 PC1 ICMP 0.000 N 0 (edit) (delete)
In Progress PC0 PC1 ICMP 0.002 N 1 (edit) (delete)
26°C Partly sunny
Search
ENG IN
10:43 10-08-2023