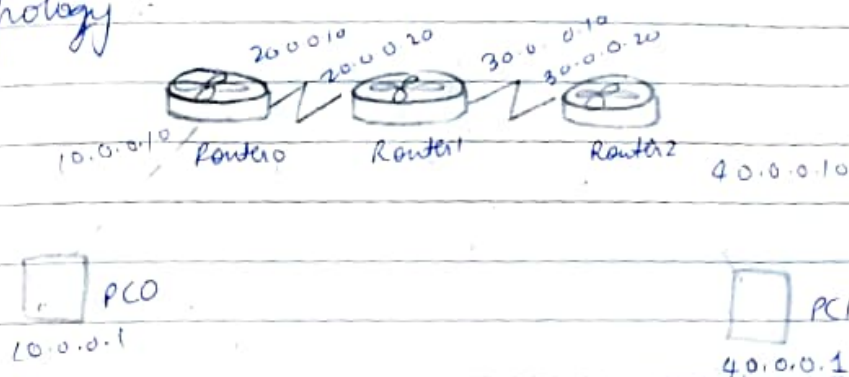


10/8/23

## Experiment - 12

Demonstrate the TTL / Life of a Packet.

### Topology :-



### Procedure:

- Create a 2 pc's and 3 routers configuration. Use serial DTE b/w routers & copper cross over b/w router & PC.
- Configure the IP address & gateway of PC & configure the routers.  
Router > enable (Router 0)

Router# config t

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-if)# exit (static routing)

Router(config)# ip route 30.0.0.0 255.0.0.0 20.0.0.20

Router1(config)# ip route 40.0.0.0 255.0.0.0 20.0.0.20

Router1(config)# exit

Router > enable (Router 1)

Router# config t

Router(config)# interface Serial 2/0

Router(config-if)# ip address 20.0.0.20 255.0.0.0

Router(config-if)# no shut

Router(config-if)# exit

Router1(config)# interface serial 3/0

Router1(config-if)# ip address 30.0.0.10 255.0.0.0

Router1(config-if)# no shut

Router1(config-if)# exit

```

Router(config)# ip route 10.0.0.0 255.0.0.0 20.0.0.10
Router(config)# ip route 40.0.0.0 255.0.0.0 30.0.0.20
Router(config)# exit
Router>enable (Router 2)
Router#config t
Router(config)# interface serial 2/0
Router(config-if)# ip address 30.0.0.20 255.0.0.0
Router(config-if)# no shut
Router(config-if)# exit
Router(config)# interface fastethernet 0/0
Router(config-if)# ip address 40.0.0.10 255.0.0.0
Router(config-if)# no shut
Router(config-if)# exit
Router(config)# ip route 10.0.0.0 255.0.0.0 30.0.0.10
Router(config)# ip route 20.0.0.0 255.0.0.0 30.0.0.10

```

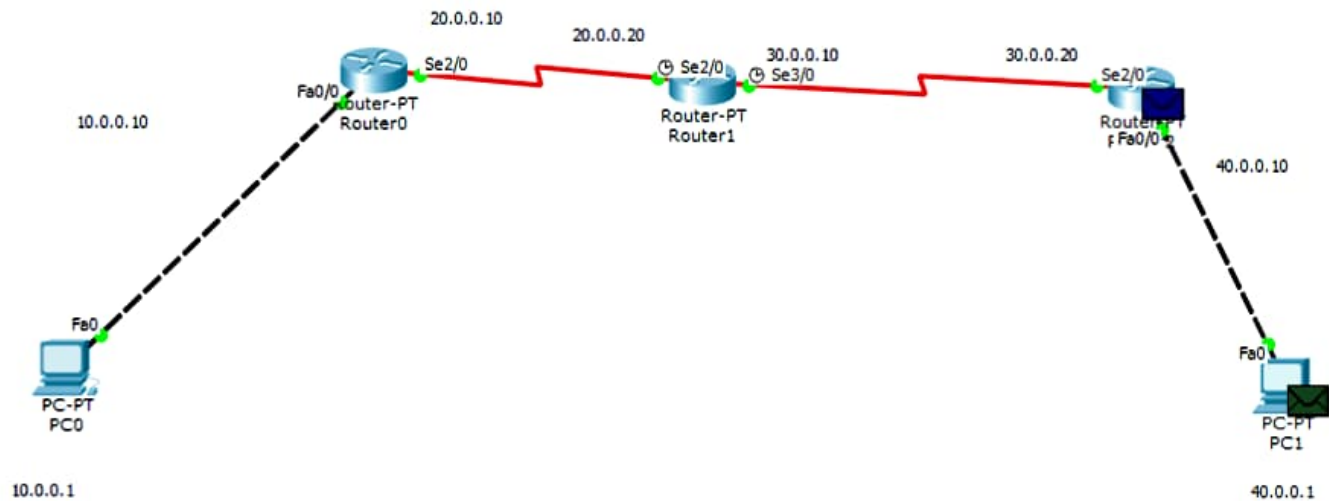
- iii) select simulation mode, select simple PDU and select source & destination PCs.
- iv) use capture button to sent PDU, <sup>acknowledgment</sup> from PC to Router to other routers to PC.
- v) Click on PDU ~~having~~ every transfer to see the inbound and Outbound PDU details. observe the different in the T T L S

### Result:-

PDU information at Device: PC0  
outbound PDU details  
T T L : 255

PDU information at Device: Router0  
Inbound PDU details  
T T L : 255  
Outbound PDU details  
T T L : 250







```
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Wed 27-Apr-04 19:01 by miwang
```

```
PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
```

```
Processor board ID PT0123 (0123)
```

```
PT2005 processor: part number 0, mask 01
```

```
Bridging software.
```

```
X.25 software, Version 3.0.0.
```

```
4 FastEthernet/IEEE 802.3 interface(s)
```

```
2 Low-speed serial(sync/async) network interface(s)
```

```
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 t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#interface fastethernet 10.0.0.10 255.0.0.0
```

```
% Invalid input detected at '^' marker.
```

```
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-if)#exit
```

```
Router(config)#interface serial 2/0
```

```
Router(config-if)#ip address 20.0.0.10 255.0.0.0
```

```
Router(config-if)#no shut
```

```
%LINK-5-CHANGED: Interface Serial2/0, changed state to down
```

```
Router(config-if)#exit
```

```
Router(config)#exit
```

```
Router#config t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#ip route 30.0.0.0 255.0.0.0 20.0.0.20
```

```
Router(config)#ip route 40.0.0.0 255.0.0.0 20.0.0.20
```

```
Router(config)#exit
```

```
Router#
```

```
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
```

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

```
%SYS-5-CONFIG_I: Configured from console by console
```

```
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
```

```
%SYS-5-CONFIG_I: Configured from console by console
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```

```
Cisco Internetwork Operating System Software
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 27-Apr-04 19:01 by miwang
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PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
```

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Processor board ID PT0123 (0123)
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```
PT2005 processor: part number 0, mask 01
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```
Bridging software.
```

```
X.25 software, Version 3.0.0.
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```
4 FastEthernet/IEEE 802.3 interface(s)
```

```
2 Low-speed serial(sync/async) network interface(s)
```

```
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 t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#interface serial 2/0
```

```
Router(config-if)#ip address 20.0.0.20 255.0.0.0
```

```
Router(config-if)#no shut
```

```
Router(config-if)#exit
```

```
Router(config)#interface serial 3/0
```

```
Router(config-if)#ip address 30.0.0.10 255.0.0.0
```

```
Router(config-if)#no shut
```

```
%LINK-5-CHANGED: Interface Serial3/0, changed state to down
```

```
Router(config-if)#exit
```

```
Router(config)#exit
```

```
Router#config t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#ip route 10.0.0.0 255.0.0.0 20.0.0.10
```

```
Router(config)#ip route 40.0.0.0 255.0.0.0 30.0.0.20
```

```
Router(config)#exit
```

```
Router#
```

```
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
```

```
%SYS-5-CONFIG_I: Configured from console by console
```

```
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
```

```
%SYS-5-CONFIG_I: Configured from console by console
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```

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cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, California 95134-1706

Cisco Internetwork Operating System Software  
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)  
Technical Support: <http://www.cisco.com/techsupport>  
Copyright (c) 1986-2005 by cisco Systems, Inc.  
Compiled Wed 27-Apr-04 19:01 by miwang

PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory

Processor board ID PT0123 (0123)  
PT2005 processor: part number 0, mask 01  
Bridging software.  
X.25 software, Version 3.0.0.  
4 FastEthernet/IEEE 802.3 interface(s)  
2 Low-speed serial(sync/async) network interface(s)  
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 t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface serial 2/0
Router(config-if)#ip address 30.0.0.20 255.0.0.0
Router(config-if)#no shut

Router(config-if)#exit
Router(config)#interface fastethernet 0/0
Router(config-if)#ip address 40.0.0.10 255.0.0.0
Router(config-if)#no shut

Router(config-if)#exit
Router(config)#ip route 10.0.0.0 255.0.0.0 30.0.0.10
Router(config)#ip route 20.0.0.0 255.0.0.0 30.0.0.10
Router(config)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```



OSI Model      Outbound PDU Details

PDU Formats

PREAMBLE: 101010...1011		DEST MAC: 00E0.F939.53CB	SRC MAC: 0009.7C05.ED79
TYPE: 0x800	DATA (VARIABLE LENGTH)		FCS: 0x0

IP

0	4	8	16	19	31	Bits
4	IHL	DSCP: 0x0	TL: 28			
ID: 0x2			0x0	0x0		
TTL: 255		PRO: 0x1	CHKSUM			
SRC IP: 10.0.0.1						
DST IP: 40.0.0.1						
OPT: 0x0				0x0		
DATA (VARIABLE LENGTH)						

ICMP

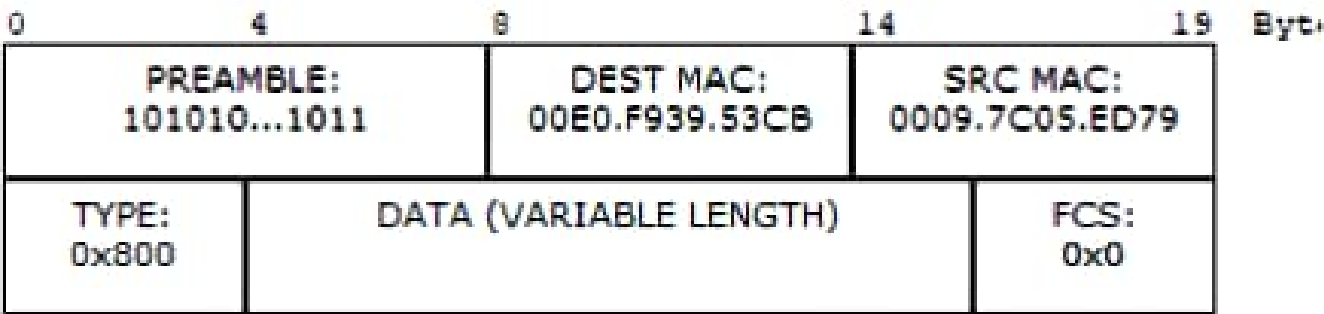
0	8	16	31	Bits
TYPE: 0x8		CODE: 0x0	CHECKSUM	
ID: 0x3			SEQ NUMBER: 2	



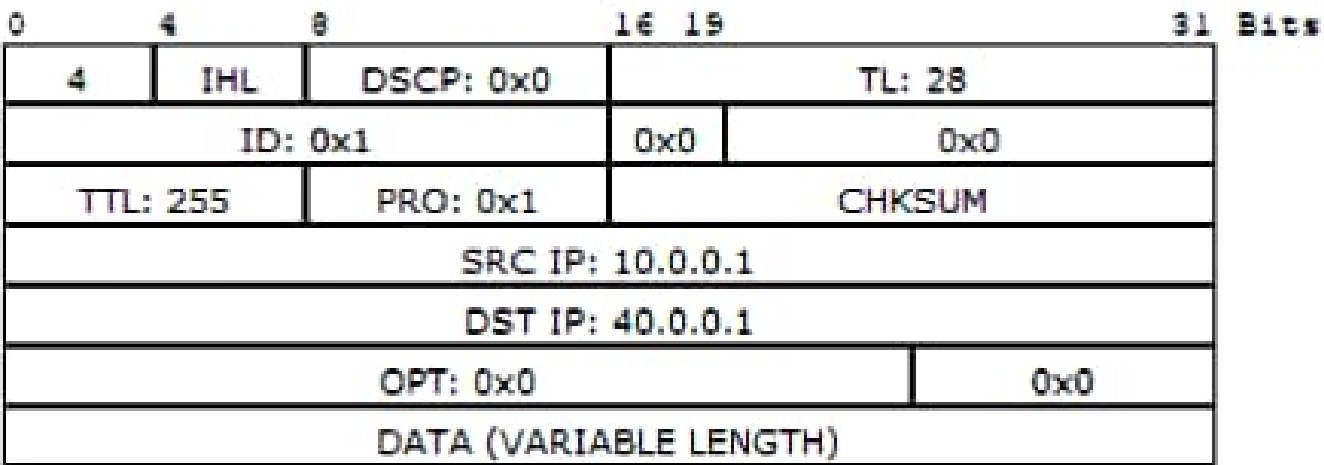


PDU Formats

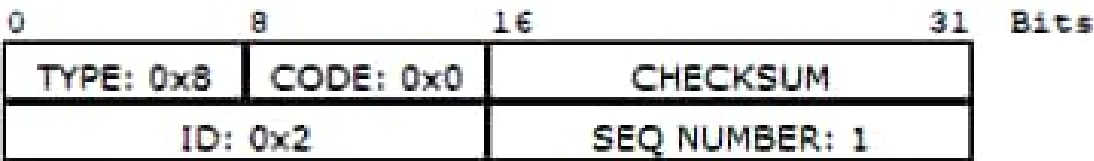
Ethernet II



IP



ICMP





1    PDU Formats

HDLC

0	8	16	32	32+x	48+x	56+x
FLG: 0111 1110	ADR: 0x8f	CONTROL: 0x0	DATA: (VARIABLE LENGTH)	FCS: 0x0	FLG: 0111 1110	

IP

0	4	8	16	19	31	Bits
4	IHL	DSCP: 0x0	TL: 28			
ID: 0x1			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

0	8	16	31 Bits
TYPE: 0x8	CODE: 0x0	CHECKSUM	
ID: 0x2		SEQ NUMBER: 1	



PDU Formats

HDLC

0	8	16	32	32+x	48+x	56+
FLG: 0111 1110	ADR: 0x8f	CONTROL: 0x0	DATA: (VARIABLE LENGTH)	FCS: 0x0	FLG: 0111 1110	

IP

0	4	8	16	19	31 Bits
4	IHL	DSCP: 0x0	TL: 28		
ID: 0xa			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

0	8	16	31 Bits
TYPE: 0x8	CODE: 0x0	CHECKSUM	
ID: 0x4		SEQ NUMBER: 6	

PDU Formats

HDLC

0	8	16	32	32+x	48+x	56+x
FLG: 0111 1110	ADR: 0x8f	CONTROL: 0x0	DATA: (VARIABLE LENGTH)	FCS: 0x0	FLG: 0111 1110	

IP

0	4	8	16	19	31 Bits
4	IHL	DSCP: 0x0	TL: 28		
ID: 0xa			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

0	8	16	31 Bits
TYPE: 0x8	CODE: 0x0	CHECKSUM	
ID: 0x4		SEQ NUMBER: 6	





PDU Formats

HDLC

0	8	16	32	32+x	48+x	56+
FLG: 0111 1110	ADR: 0x8f	CONTROL: 0x0	DATA: (VARIABLE LENGTH)		FCS: 0x0	FLG: 0111 1110

IP

0	4	8	16	19	31 Bits
4	IHL	DSCP: 0x0	TL: 28		
ID: 0xa			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

0	8	16	31 Bits
TYPE: 0x8	CODE: 0x0	CHECKSUM	
ID: 0x4		SEQ NUMBER: 6	



PDU Formats

Ethernet II

0	4	8	14	19	Byt.
PREAMBLE: 101010...1011		DEST MAC: 0010.111B.DD8E		SRC MAC: 00D0.FF93.1A78	
TYPE: 0x800		DATA (VARIABLE LENGTH)		FCS: 0x0	

IP

0	4	8	16	19	31	Bits
4	IHL	DSCP: 0x0	TL: 28			
ID: 0xa			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

0	8	16	31	Bits
TYPE: 0x8		CODE: 0x0		CHECKSUM
ID: 0x4		SEQ NUMBER: 6		



PDU Formats

Ethernet II

0	4	8	14	19	Bytes
PREAMBLE: 101010...1011		DEST MAC: 0010.111B.DD8E		SRC MAC: 00D0.FF93.1A78	
TYPE: 0x800		DATA (VARIABLE LENGTH)		FCS: 0x0	

IP

0	4	8	16	19	31	Bits
4	IHL	DSCP: 0x0	TL: 28			
ID: 0xa			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

0	8	16	31	Bits
TYPE: 0x8		CODE: 0x0		CHECKSUM
ID: 0x4		SEQ NUMBER: 6		