Lab4

Exercise 1:

A Traceroute is a network diagnostic protocol. With this tool, you can follow the route of a data packet in real-time. This protocol confirms that the actual route followed by the packet– and not just the IP addresses– is one that is normally just being used to reach the intended site.

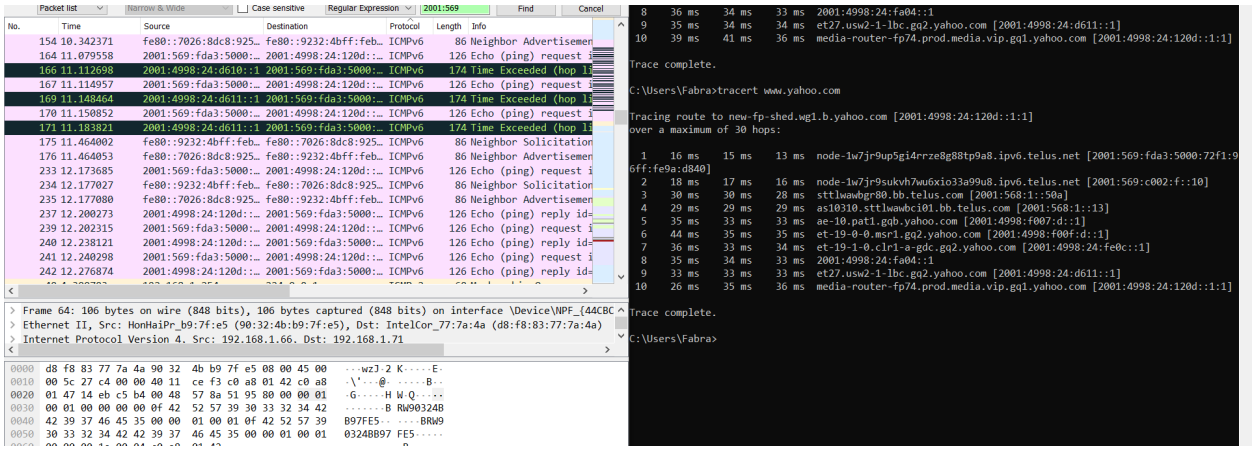
Exercise 3:

1: Trace route uses ICMP packets

2: an ICMP time exceeded message

3: each time a packet passes a router the router sends an ICMP “time exceeded” message back to the computer

2-2



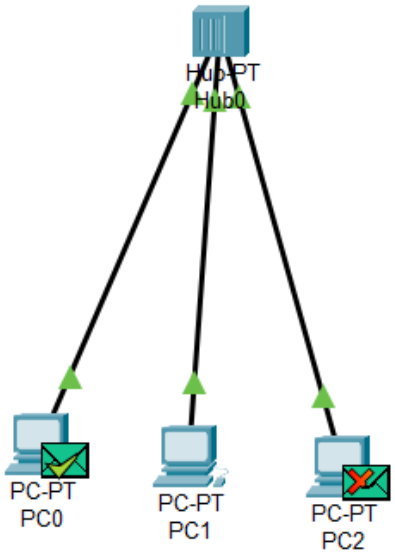
2-6 part 1

```
C:\Users\Fabra>tracert www.yahoo.com

Tracing route to new-fp-shed.wg1.b.yahoo.com [2001:4998:24:120d::1:0]
over a maximum of 30 hops:

  1    16 ms    15 ms    15 ms  node-1w7jr9up5gi4rrze8g88tp9a8.ipv6.telus.net [2001:569:fda3:5000:72f1:9
6ff:fe9a:d840]
  2    19 ms    17 ms    16 ms  node-1w7jr9sukvh7wu6xio33a99u8.ipv6.telus.net [2001:569:c002:f::10]
  3    31 ms    27 ms    27 ms  sttlwawbgr80.bb.telus.com [2001:568:1::50a]
  4    30 ms    29 ms    28 ms  as10310.sttlwawbci01.bb.telus.com [2001:568:1::13]
  5    34 ms    36 ms    32 ms  ae-7.pat2.gqb.yahoo.com [2001:4998:f007:6::1]
  6    32 ms    35 ms    30 ms  et-1-0-0.msr1.gq2.yahoo.com [2001:4998:f00f:20c::1]
  7    34 ms    33 ms    33 ms  et-0-1-0.clr2-a-gdc.gq2.yahoo.com [2001:4998:24:fe02::1]
  8    35 ms    30 ms    31 ms  2001:4998:24:f803::1
  9    32 ms    31 ms    33 ms  et26.usw1-1-lbc.gq2.yahoo.com [2001:4998:24:d810::1]
 10    34 ms    33 ms    33 ms  media-router-fp73.prod.media.vip.gq1.yahoo.com [2001:4998:24:120d::1:0]
```

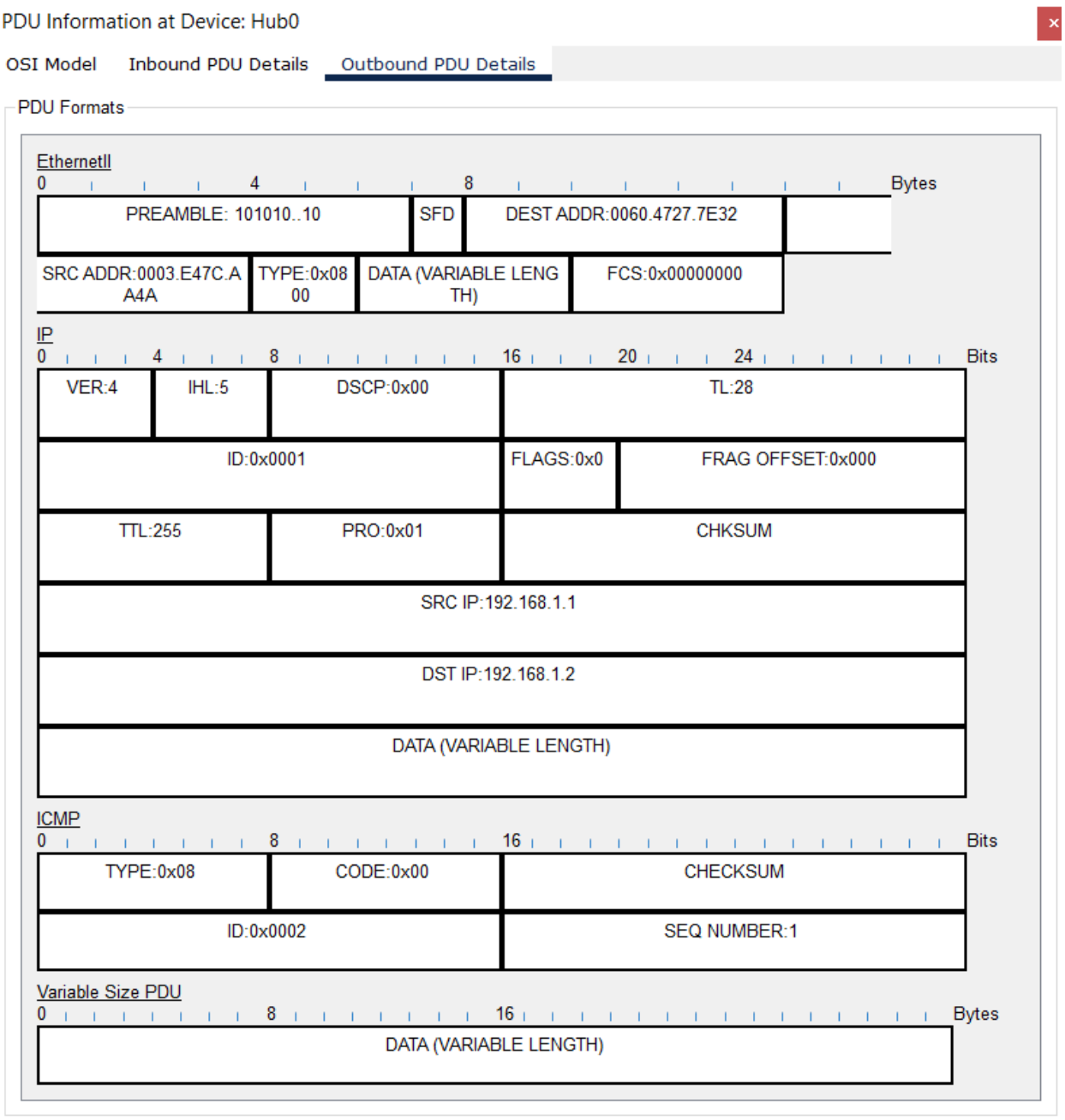
2-6 part 2

```
Trace complete.

C:\Users\Fabra>tracert -d www.yahoo.com

Tracing route to new-fp-shed.wg1.b.yahoo.com [2001:4998:24:120d::1:0]
over a maximum of 30 hops:

  1    16 ms    15 ms    16 ms  2001:569:fda3:5000:72f1:96ff:fe9a:d840
  2    17 ms    18 ms    18 ms  2001:569:c002:f::10
  3    29 ms    27 ms    29 ms  2001:568:1::50a
  4    29 ms    27 ms    28 ms  2001:568:1::13
  5    32 ms    33 ms    32 ms  2001:4998:f007:6::1
  6    32 ms    30 ms    30 ms  2001:4998:f00f:20c::1
  7    35 ms    39 ms    33 ms  2001:4998:24:fe02::1
  8    33 ms    31 ms    31 ms  2001:4998:24:f803::1
  9    34 ms    33 ms    31 ms  2001:4998:24:d811::1
 10    34 ms    33 ms    33 ms  2001:4998:24:120d::1:0

Trace complete.
```

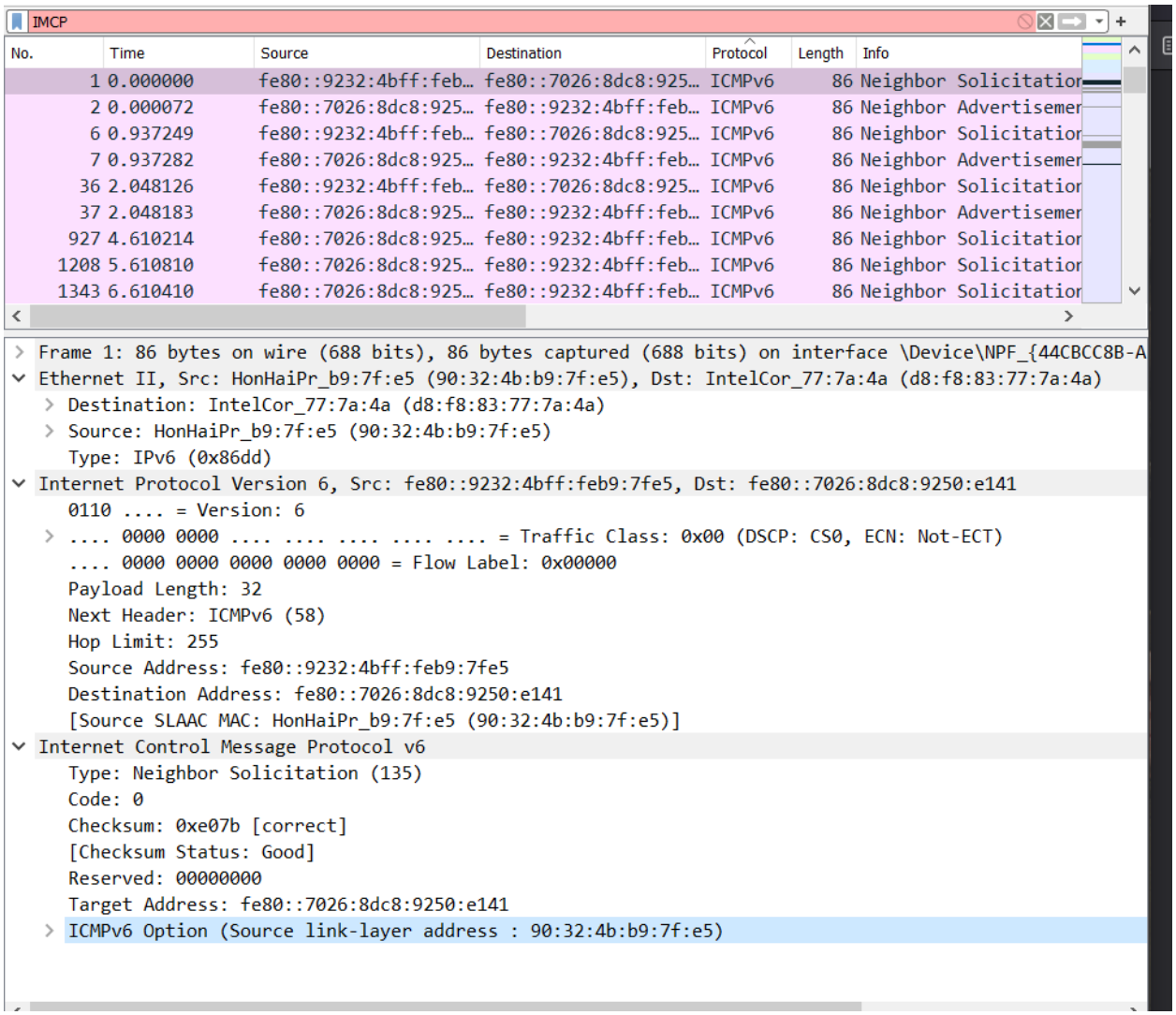
3-1


Hub-PT
Hub0
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2

3-2


PDU Information at Device: Hub0
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
EthernetII
0
4
8
Bytes
PREAMBLE: 101010..10
SFD
DEST ADDR:0060.4727.7E32
SRC ADDR:0003.E47C.AA4A
TYPE:0x0800
DATA (VARIABLE LENGTH)
FCS:0x00000000
IP
0
4
8
16
20
24
Bits
VER:4
IHL:5
DSCP:0x00
TL:28
ID:0x0001
FLAGS:0x0
FRAG OFFSET:0x000
TTL:255
PRO:0x01
CHKSUM
SRC IP:192.168.1.1
DST IP:192.168.1.2
DATA (VARIABLE LENGTH)
ICMP
0
8
16
Bits
TYPE:0x08
CODE:0x00
CHECKSUM
ID:0x0002
SEQ NUMBER:1
Variable Size PDU
0
8
16
Bytes
DATA (VARIABLE LENGTH)

3-3


ICMP
No. Time Source Destination Protocol Length Info
1 0.000000 fe80::9232:4bff:feb… fe80::7026:8dc8:925… ICMPv6 86 Neighbor Solicitation
2 0.000072 fe80::7026:8dc8:925… fe80::9232:4bff:feb… ICMPv6 86 Neighbor Advertisement
6 0.937249 fe80::9232:4bff:feb… fe80::7026:8dc8:925… ICMPv6 86 Neighbor Solicitation
7 0.937282 fe80::7026:8dc8:925… fe80::9232:4bff:feb… ICMPv6 86 Neighbor Advertisement
36 2.048126 fe80::9232:4bff:feb… fe80::7026:8dc8:925… ICMPv6 86 Neighbor Solicitation
37 2.048183 fe80::7026:8dc8:925… fe80::9232:4bff:feb… ICMPv6 86 Neighbor Advertisement
927 4.610214 fe80::7026:8dc8:925… fe80::9232:4bff:feb… ICMPv6 86 Neighbor Solicitation
1208 5.610810 fe80::7026:8dc8:925… fe80::9232:4bff:feb… ICMPv6 86 Neighbor Solicitation
1343 6.610410 fe80::7026:8dc8:925… fe80::9232:4bff:feb… ICMPv6 86 Neighbor Solicitation
Frame 1: 86 bytes on wire (688 bits), 86 bytes captured (688 bits) on interface \Device\NPF_{44CBCC8B-A
Ethernet II, Src: HonHaiPr_b9:7f:e5 (90:32:4b:b9:7f:e5), Dst: IntelCor_77:7a:4a (d8:f8:83:77:7a:4a)
Destination: IntelCor_77:7a:4a (d8:f8:83:77:7a:4a)
Source: HonHaiPr_b9:7f:e5 (90:32:4b:b9:7f:e5)
Type: IPv6 (0x86dd)
Internet Protocol Version 6, Src: fe80::9232:4bff:feb9:7fe5, Dst: fe80::7026:8dc8:9250:e141
0110 .... = Version: 6
.... 0000 0000 .... = Traffic Class: 0x00 (DSCP: CS0, ECN: Not-ECT)
.... 0000 0000 0000 0000 0000 = Flow Label: 0x00000
Payload Length: 32
Next Header: ICMPv6 (58)
Hop Limit: 255
Source Address: fe80::9232:4bff:feb9:7fe5
Destination Address: fe80::7026:8dc8:9250:e141
[Source SLAAC MAC: HonHaiPr_b9:7f:e5 (90:32:4b:b9:7f:e5)]
Internet Control Message Protocol v6
Type: Neighbor Solicitation (135)
Code: 0
Checksum: 0xe07b [correct]
[Checksum Status: Good]
Reserved: 00000000
Target Address: fe80::7026:8dc8:9250:e141
ICMPv6 Option (Source link-layer address : 90:32:4b:b9:7f:e5)