

Lab Exercise – IPV4 Ying Di

No.	Time	Source	Destination	Protocol	Length	Info
10	0.467879	192.168.1.7	104.20.10.164	TCP	54	58884 → 80 [FIN, ACK] Seq=79 Ack=741
9	0.467473	192.168.1.7	104.20.10.164	TCP	54	58884 → 80 [ACK] Seq=79 Ack=741 Win=2
8	0.467472	192.168.1.7	104.20.10.164	TCP	54	58884 → 80 [ACK] Seq=79 Ack=736 Win=2
4	0.028648	192.168.1.7	104.20.10.164	HTTP	132	GET / HTTP/1.1
3	0.014072	192.168.1.7	104.20.10.164	TCP	54	58884 → 80 [ACK] Seq=1 Ack=1 Win=2621
1	0.000000	192.168.1.7	104.20.10.164	TCP	78	58884 → 80 [SYN] Seq=0 Win=65535 Len=
15	0.487945	104.20.10.164	192.168.1.7	TCP	66	[TCP Dup ACK 13#1] 80 → 58884 [ACK] S
13	0.480860	104.20.10.164	192.168.1.7	TCP	54	80 → 58884 [FIN, ACK] Seq=741 Ack=80
11	0.468902	104.20.10.164	192.168.1.7	TCP	59	[TCP Spurious Retransmission] 80 → 58884 [P

▶ Frame 1: 78 bytes on wire (624 bits), 78 bytes captured (624 bits) on interface 0
 ▶ Ethernet II, Src: Apple_6f:e9:2e (88:e9:fe:6f:e9:2e), Dst: Netgear_6d:c6:6b (78:d2:94:6d:c6:6b)
 ▼ Internet Protocol Version 4, Src: 192.168.1.7, Dst: 104.20.10.164
 0100 = Version: 4
 0101 = Header Length: 20 bytes (5)
 ▶ Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
 Total Length: 64
 Identification: 0x0000 (0)
 ▶ Flags: 0x4000, Don't fragment
 Time to live: 64
 Protocol: TCP (6)
 Header checksum: 0x0651 [validation disabled]
 [Header checksum status: Unverified]
 Source: 192.168.1.7
 Destination: 104.20.10.164
 ▶ Transmission Control Protocol, Src Port: 58884, Dst Port: 80, Seq: 0, Len: 0

0000	78 d2 94 6d c6 6b 88 e9 fe 6f e9 2e 08 00 45 00	x . . m . k . . . o . . . E .
0010	00 40 00 00 40 00 40 06 06 51 c0 a8 01 07 68 14	. @ . . @ . @ . . Q . . . h .
0020	0a a4 e6 04 00 50 91 d6 c8 b3 00 00 00 00 b0 02 P
0030	ff ff 8e 27 00 00 02 04 05 b4 01 03 03 06 01 01
0040	08 0a 43 18 f0 75 00 00 00 00 04 02 00 00	. . C . . u

a figure of an IP packet:

0	4	8	16	19	31
Version	Identification	Type of Service	Flags	Total Length	Fragment Offset
Time to Live	Protocol	Header Checksum	Source IP Address	Destination IP Address	Options
Source IP Address					Destination IP Address
Destination IP Address					Options
Options					Padding

1. What are the IP addresses of your computer and the remote server?

A: My computer's IP address: 192.168.1.7; remote server's IP address: 104.20.10.164

2. Does the Total Length field include the IP header plus IP payload, or just the IP payload?

A: The IP header plus IP payload

3. How does the value of the Identification field change or stay the same for different packets? For instance, does it hold the same value for all packets in a TCP connection or does it differ for each packet? Is it the same in both directions? Can you see any pattern if the value does change?

A: When the packets are sent from client to server, then the Identification field stays the same.

When the packets are sent from server to client, then the Identification field changes.

4. What is the initial value of the TTL field for packets sent from your computer? Is it the maximum possible value, or some lower value?

A: The initial value of the TTL field is 64. It is the maximum possible value.

5. How can you tell from looking at a packet that it has not been fragmented? Most often IP packets in normal operation are not fragmented. But the receiver must have a way to be sure. Hint: you may need to read your text to confirm a guess.

A: We can check “more fragments”, if it is 0, then, it is not fragmented, otherwise it is fragmented.

6. What is the length of the IP Header and how is this encoded in the header length field? Hint: notice that only 4 bits are used for this field, as the version takes up the other 4 bits of the byte. You may guess and check your text.

A: The length of the IP Header is 20 bytes.

Step 4: Internet Paths

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Yings-MacBook-Pro-2:assignment3 rachel$ traceroute www.uwa.edu.au
traceroute: Warning: www.uwa.edu.au has multiple addresses; using 104.20.10.164
traceroute to www.uwa.edu.au.cdn.cloudflare.net (104.20.10.164), 64 hops max, 52 byte packets
 1  www.routerlogin.com (192.168.1.1)  6.469 ms  1.695 ms  1.859 ms
 2  96.120.102.73 (96.120.102.73)  13.547 ms  12.150 ms  13.375 ms
 3  po-102-rur202.seattle.wa.seattle.comcast.net (96.108.11.117)  11.797 ms  21.423 ms  12.841 ms
 4  be-220-ar01.seattle.wa.seattle.comcast.net (69.139.160.249)  12.024 ms  12.267 ms  11.722 ms
 5  be-33650-cr01.seattle.wa.ibone.comcast.net (68.86.93.165)  15.238 ms  14.747 ms  15.280 ms
 6  be-10847-pe02.seattle.wa.ibone.comcast.net (68.86.86.226)  13.844 ms  13.533 ms  12.492 ms
 7  66.208.229.58 (66.208.229.58)  13.161 ms  12.017 ms  14.031 ms
 8  104.20.10.164 (104.20.10.164)  12.068 ms  14.289 ms  12.953 ms
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