

Lab 4

1. 192.168.29.215
2. ICMP (1)
3. There are 20 bytes in the IP header. The payload is 528 bytes, which you can see by expanding out the Internet Control Message Protocol and eventually expanding that same field again below that to see it highlights 520 bytes for the actual payload.¹
4. No it has not, the fragmentation offset is set to 0.
5. Identification, Header Checksum, Time to Live, Source, & Destination Port.
6. The Source and Destination fields stay constant. These fields must stay constant in order to properly trace the route from the source to the destination, while the Identification, Header Checksum and Time to Live fields change in order to measure the times and routes that are taken.
7. It is decrementing by 1 as you go down the list.
8. 0x0000e958 (59736) is the identification, and the TTL field is 64.
9. The TTL stays at 64 since it is the first hop and would always have the same TTL on a TTL-exceeded reply.
10. Yes, this IP datagram has been fragmented into 2 pieces. This is indicated by their showing 2 IPv4 Fragments (1980) bytes.
11. First, the fragmentation offset is higher than 0, which indicates that it is fragmented. Also, the flags are set 0x00, which means that this piece arrived last and not first since the other higher numbered but smaller fragment had different flags. This is not the first fragment, since the offset is not 0.¹
12. This packet appears to be the first datagram fragment, since its offset is 0. After this fragment, there was one more since this one was 1500 and the next was 520. Also, the flags indicate there is more by being set as 0x01.¹
13. The header checksum changed and the length.
14. There were 3 fragments created from the original.¹
15. Total Length, Flags, and Header Checksum.

¹See additional attached for printed packet from WireShark

12229 2016-05-24 20:49:26.798801 192.168.29.1 192.168.29.215 ICMP 590 Time-to-live exceeded (Time to live exceeded in transit)

Frame 12229: 590 bytes on wire (4720 bits), 590 bytes captured (4720 bits) on interface 0

Ethernet II, Src: AsustekC_9a:a6:20 (38:2c:4a:9a:a6:20), Dst: Tp-LinkT_a4:c8:70 (e8:de:27:a4:c8:70)

Internet Protocol Version 4, Src: 192.168.29.1, Dst: 192.168.29.215

0100 = Version: 4

.... 0101 = Header Length: 20 bytes

Differentiated Services Field: 0xc0 (DSCP: CS6, ECN: Not-ECT)

Total Length: 576

Identification: 0xe958 (59736)

Flags: 0x00

Fragment offset: 0

Time to live: 64

Protocol: ICMP (1)

Header checksum: 0xd27b [validation disabled]

Source: 192.168.29.1

Destination: 192.168.29.215

[Source GeoIP: Unknown]

[Destination GeoIP: Unknown]

Internet Control Message Protocol

2359 2016-05-24 20:49:09.692018 192.168.29.215 128.119.245.12 ICMP 534 Echo (ping) request id=0x0001, seq=3053/60683, ttl=255 (reply in 2376)
Frame 2359: 534 bytes on wire (4272 bits), 534 bytes captured (4272 bits) on interface 0
Ethernet II, Src: Tp-LinkT_a4:c8:70 (e8:de:27:a4:c8:70), Dst: AsustekC_9a:a6:20 (38:2c:4a:9a:a6:20)
Internet Protocol Version 4, Src: 192.168.29.215, Dst: 128.119.245.12
0100 = Version: 4
.... 0101 = Header Length: 20 bytes
Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
Total Length: 520
Identification: 0x49e8 (18920)
Flags: 0x00
Fragment offset: 1480
Time to live: 255
Protocol: ICMP (1)
Header checksum: 0x1b50 [validation disabled]
Source: 192.168.29.215
Destination: 128.119.245.12
[Source GeoIP: Unknown]
[Destination GeoIP: Unknown]
[2 IPv4 Fragments (1980 bytes): #2358(1480), #2359(500)]
[Frame: 2358, payload: 0-1479 (1480 bytes)]
[Frame: 2359, payload: 1480-1979 (500 bytes)]
[Fragment count: 2]
[Reassembled IPv4 length: 1980]
[Reassembled IPv4 data: 0800305600010bed2020202020202020202020202020...]
Internet Control Message Protocol

2359 2016-05-24 20:49:09.692018 192.168.29.215 128.119.245.12 ICMP 534 Echo (ping) request id=0x0001, seq=3053/60683, ttl=255 (reply in 2376)
Frame 2359: 534 bytes on wire (4272 bits), 534 bytes captured (4272 bits) on interface 0
Ethernet II, Src: Tp-LinkT_a4:c8:70 (e8:de:27:a4:c8:70), Dst: AsustekC_9a:a6:20 (38:2c:4a:9a:a6:20)
Internet Protocol Version 4, Src: 192.168.29.215, Dst: 128.119.245.12
0100 = Version: 4
.... 0101 = Header Length: 20 bytes
Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
Total Length: 520
Identification: 0x49e8 (18920)
Flags: 0x00
0... = Reserved bit: Not set
.0.. = Don't fragment: Not set
..0. = More fragments: Not set
Fragment offset: 1480
Time to live: 255
Protocol: ICMP (1)
Header checksum: 0x1b50 [validation disabled]
Source: 192.168.29.215
Destination: 128.119.245.12
[Source GeoIP: Unknown]
[Destination GeoIP: Unknown]
[2 IPv4 Fragments (1980 bytes): #2358(1480), #2359(500)]
[Frame: 2358, payload: 0-1479 (1480 bytes)]
[Frame: 2359, payload: 1480-1979 (500 bytes)]
[Fragment count: 2]
[Reassembled IPv4 length: 1980]
[Reassembled IPv4 data: 0800305600010bed2020202020202020202020202020...]
Internet Control Message Protocol

7391 2016-05-24 20:49:19.202943 192.168.29.215 128.119.245.12 IPv4 1514 Fragmented IP protocol (proto=ICMP 1, off=0, ID=4a28) [Reassembled in #7393]
Frame 7391: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0
Interface id: 0 (\Device\NPF_{4B5984CE-D56B-450D-A9F6-EA2E28136BCC})
Encapsulation type: Ethernet (1)
Arrival Time: May 24, 2016 20:49:19.202943000 Pacific Daylight Time
[Time shift for this packet: 0.000000000 seconds]
Epoch Time: 1464148159.202943000 seconds
[Time delta from previous captured frame: 0.156698000 seconds]
[Time delta from previous displayed frame: 0.375216000 seconds]
[Time since reference or first frame: 16.874863000 seconds]
Frame Number: 7391
Frame Length: 1514 bytes (12112 bits)
Capture Length: 1514 bytes (12112 bits)
[Frame is marked: False]
[Frame is ignored: False]
[Protocols in frame: eth:ethertype:ip:data]
Ethernet II, Src: Tp-LinkT_a4:c8:70 (e8:de:27:a4:c8:70), Dst: AsustekC_9a:a6:20 (38:2c:4a:9a:a6:20)
Destination: AsustekC_9a:a6:20 (38:2c:4a:9a:a6:20)
Address: AsustekC_9a:a6:20 (38:2c:4a:9a:a6:20)
.... ..0. = LG bit: Globally unique address (factory default)
.... ..0. = IG bit: Individual address (unicast)
Source: Tp-LinkT_a4:c8:70 (e8:de:27:a4:c8:70)
Address: Tp-LinkT_a4:c8:70 (e8:de:27:a4:c8:70)
.... ..0. = LG bit: Globally unique address (factory default)
.... ..0. = IG bit: Individual address (unicast)
Type: IPv4 (0x0800)
Internet Protocol Version 4, Src: 192.168.29.215, Dst: 128.119.245.12
0100 = Version: 4
.... 0101 = Header Length: 20 bytes
Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
0000 00.. = Differentiated Services Codepoint: Default (0)
.... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
Total Length: 1500
Identification: 0x4a28 (18984)
Flags: 0x01 (More Fragments)
0... = Reserved bit: Not set
.0.. = Don't fragment: Not set
..1. = More fragments: Set
Fragment offset: 0
Time to live: 255
Protocol: ICMP (1)
Header checksum: 0xf7f4 [validation disabled]
[Good: False]
[Bad: False]
Source: 192.168.29.215
Destination: 128.119.245.12
[Source GeoIP: Unknown]
[Destination GeoIP: Unknown]
Reassembled IPv4 in frame: 7393
Data (1480 bytes)
0000 08 00 12 00 00 01 0c 25 20 20 20 20 20 20 20%
0010 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0020 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0030 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0040 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0050 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0060 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0070 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0080 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0090 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
00a0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
00b0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
00c0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
00d0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
00e0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
00f0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0100 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0110 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0120 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0130 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0140 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0150 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0160 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0170 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0180 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0190 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
01a0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
01b0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
01c0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
01d0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
01e0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
01f0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0200 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20

0210 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0220 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0230 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0240 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0250 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0260 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0270 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0280 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0290 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
02a0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
02b0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
02c0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
02d0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
02e0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
02f0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0300 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0310 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0320 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0330 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0340 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0350 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0360 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0370 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0380 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0390 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
03a0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
03b0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
03c0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
03d0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
03e0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
03f0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0400 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0410 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0420 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0430 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0440 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0450 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0460 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0470 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0480 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0490 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
04a0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
04b0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
04c0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
04d0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
04e0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
04f0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0500 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0510 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0520 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0530 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0540 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0550 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0560 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0570 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0580 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0590 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
05a0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
05b0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
05c0 20 20 20 20 20 20 20 20

Data: 0800120000010c2520202020202020202020202020202020...
[Length: 1480]

7392 2016-05-24 20:49:19.202957 192.168.29.215 128.119.245.12 IPv4 1514 Fragmented IP protocol (proto=ICMP 1, off=1480, ID=4a28) [Reassembled in #7393]
Frame 7392: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0
Interface id: 0 (\Device\NPF_{4B5984CE-D56B-450D-A9F6-EA2E28136BCC})
Encapsulation type: Ethernet (1)
Arrival Time: May 24, 2016 20:49:19.202957000 Pacific Daylight Time
[Time shift for this packet: 0.000000000 seconds]
Epoch Time: 1464148159.202957000 seconds
[Time delta from previous captured frame: 0.000014000 seconds]
[Time delta from previous displayed frame: 0.375230000 seconds]
[Time since reference or first frame: 16.874877000 seconds]
Frame Number: 7392
Frame Length: 1514 bytes (12112 bits)
Capture Length: 1514 bytes (12112 bits)
[Frame is marked: False]
[Frame is ignored: False]
[Protocols in frame: eth:ethertype:ip:data]
Ethernet II, Src: Tp-LinkT_a4:c8:70 (e8:de:27:a4:c8:70), Dst: AsustekC_9a:a6:20 (38:2c:4a:9a:a6:20)
Destination: AsustekC_9a:a6:20 (38:2c:4a:9a:a6:20)
Address: AsustekC_9a:a6:20 (38:2c:4a:9a:a6:20)
.... ..0. = LG bit: Globally unique address (factory default)
.... ..0. = IG bit: Individual address (unicast)
Source: Tp-LinkT_a4:c8:70 (e8:de:27:a4:c8:70)
Address: Tp-LinkT_a4:c8:70 (e8:de:27:a4:c8:70)
.... ..0. = LG bit: Globally unique address (factory default)
.... ..0. = IG bit: Individual address (unicast)
Type: IPv4 (0x0800)
Internet Protocol Version 4, Src: 192.168.29.215, Dst: 128.119.245.12
0100 = Version: 4
.... 0101 = Header Length: 20 bytes
Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
0000 00.. = Differentiated Services Codepoint: Default (0)
.... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
Total Length: 1500
Identification: 0x4a28 (18984)
Flags: 0x01 (More Fragments)
0... = Reserved bit: Not set
.0.. = Don't fragment: Not set
..1. = More fragments: Set
Fragment offset: 1480
Time to live: 255
Protocol: ICMP (1)
Header checksum: 0xf73b [validation disabled]
[Good: False]
[Bad: False]
Source: 192.168.29.215
Destination: 128.119.245.12
[Source GeoIP: Unknown]
[Destination GeoIP: Unknown]
Reassembled IPv4 in frame: 7393
Data (1480 bytes)
0000 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0010 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0020 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0030 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0040 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0050 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0060 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0070 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0080 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0090 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
00a0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
00b0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
00c0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
00d0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
00e0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
00f0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0100 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0110 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0120 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0130 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0140 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0150 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0160 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0170 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0180 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0190 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
01a0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
01b0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
01c0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
01d0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
01e0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
01f0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0200 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20

[Length: 1480]

[illegible]