

Catalina Cisneros

## Lab: Wireshark IP v9.0

No.	Time	Source	Destination	Protocol	Length	Info
3	0.204852	192.168.86.60	224.0.0.251	MDNS	139	Standard query 0x0000 PTR _companion-link._tcp.local, "QM" ques
4	0.205172	fe80::874:a473:...	ff02::fb	MDNS	159	Standard query 0x0000 PTR _companion-link._tcp.local, "QM" ques
43	1.024256	0.0.0.0	255.255.255.255	DHCP	286	DHCP Discover - Transaction ID 0x60609ac4
44	1.865637	192.168.86.61	128.119.245.12	UDP	70	64928 → 33435 Len=28
45	1.868608	192.168.86.1	192.168.86.61	ICMP	98	Time-to-live exceeded (Time to live exceeded in transit)
46	1.869171	192.168.86.61	192.168.86.1	DNS	85	Standard query 0xd75d PTR 1.86.168.192.in-addr.arpa
47	1.873594	192.168.86.1	192.168.86.61	DNS	85	Standard query response 0xd75d No such name PTR 1.86.168.192.in
48	1.874016	192.168.86.61	128.119.245.12	UDP	70	64928 → 33436 Len=28
49	1.875315	192.168.86.1	192.168.86.61	ICMP	98	Time-to-live exceeded (Time to live exceeded in transit)
50	1.875401	192.168.86.61	128.119.245.12	UDP	70	64928 → 33437 Len=28
51	1.876637	192.168.86.1	192.168.86.61	ICMP	98	Time-to-live exceeded (Time to live exceeded in transit)
52	1.876720	192.168.86.61	128.119.245.12	UDP	70	64928 → 33438 Len=28
53	1.880429	10.0.0.1	192.168.86.61	ICMP	98	Time-to-live exceeded (Time to live exceeded in transit)
54	1.881613	192.168.86.61	192.168.86.1	DNS	81	Standard query 0x9629 PTR 1.0.0.10.in-addr.arpa
55	1.885256	192.168.86.1	192.168.86.61	DNS	81	Standard query response 0x9629 No such name PTR 1.0.0.10.in-add

> Frame 44: Packet, 70 bytes on wire (560 bits), 70 bytes captured (560 bits) on interface 0  
Ethernet II, Src: Apple\_98:d9:27 (78:4f:43:98:d9:27), Dst: Google\_89:0e:c8 (3c:28:6d:89:0e:c8)  
> Destination: Google\_89:0e:c8 (3c:28:6d:89:0e:c8)  
> Source: Apple\_98:d9:27 (78:4f:43:98:d9:27)  
Type: IPv4 (0x0800)  
[Stream index: 4]  
> Internet Protocol Version 4, Src: 192.168.86.61, Dst: 128.119.245.12  
> User Datagram Protocol, Src Port: 64928, Dst Port: 33435  
> Data (28 bytes)

1. Select the first UDP segment sent by your computer via the traceroute command to gaia.cs.umass.edu. What is the IP address of your computer?

→ The IP address of my computer is 192.168.86.61

No.	Time	Source
3	0.204852	192.168.86.60
4	0.205172	fe80::874:a473:...
43	1.024256	0.0.0.0
44	1.865637	192.168.86.61
45	1.868608	192.168.86.1
46	1.869171	192.168.86.61
47	1.873594	192.168.86.1
48	1.874016	192.168.86.61
49	1.875315	192.168.86.1
50	1.875401	192.168.86.61
51	1.876637	192.168.86.1
52	1.876720	192.168.86.61
53	1.880429	10.0.0.1
54	1.881613	192.168.86.61
55	1.885256	192.168.86.1

2. What is the value in the time to live (TTL) field in this IPv4 datagram's header?

→ The TTL value in the IPv4 header is 1.

43	1.024256	0.0.0.0	255.255.255.255	DHCP	286	DHCP Discover - 1
44	1.865637	192.168.86.61	128.119.245.12	UDP	70	64928 → 33435 Len=28
45	1.868608	192.168.86.1	192.168.86.61	ICMP	98	Time-to-live exce
46	1.869171	192.168.86.61	192.168.86.1	DNS	85	Standard query 0
47	1.873594	192.168.86.1	192.168.86.61	DNS	85	Standard query r
48	1.874016	192.168.86.61	128.119.245.12	UDP	70	64928 → 33436 Len=28
49	1.875315	192.168.86.1	192.168.86.61	ICMP	98	Time-to-live exce
50	1.875401	192.168.86.61	128.119.245.12	UDP	70	64928 → 33437 Len=28
51	1.876637	192.168.86.1	192.168.86.61	ICMP	98	Time-to-live exce
52	1.876720	192.168.86.61	128.119.245.12	UDP	70	64928 → 33438 Len=28
53	1.880429	10.0.0.1	192.168.86.61	ICMP	98	Time-to-live exce
54	1.881613	192.168.86.61	192.168.86.1	DNS	81	Standard query 0
55	1.885256	192.168.86.1	192.168.86.61	DNS	81	Standard query r

Frame 44: Packet, 70 bytes on wire (560 bits), 70 bytes captured (560 bits) on interface 0  
Ethernet II, Src: Apple\_98:d9:27 (78:4f:43:98:d9:27), Dst: Google\_89:0e:c8 (3c:28:6d:89:0e:c8)  
Internet Protocol Version 4, Src: 192.168.86.61, Dst: 128.119.245.12  
0100 .... = Version: 4  
.... 0101 = Header Length: 20 bytes (5)  
> Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)  
Total Length: 56  
Identification: 0xfda1 (64929)  
> 0000 .... = Flags: 0x0  
...0 0000 0000 0000 = Fragment Offset: 0  
Time to Live: 1  
[Expert Info (Note/Sequence): "Time to Live" only 1]  
[Time to Live] only 1  
[Severity level: Note]  
[Group: Sequence]  
Protocol: UDP (17)  
Header Checksum: 0x2faa [validation disabled]  
[Header checksum status: Unverified]  
Source Address: 192.168.86.61  
Destination Address: 128.119.245.12  
[Stream index: 4]  
User Datagram Protocol, Src Port: 64928, Dst Port: 33435  
Data (28 bytes)

3. What is the value in the upper layer protocol field in this IPv4 datagram's header?

→ UDP (protocol 17)

```
...0 0000 0000 0000 = Fragme
> Time to Live: 1
Protocol: UDP (17)
Header Checksum: 0x2faa [val
[Header checksum status: Unv
```

#### 4. How many bytes are in the IP header?

→ 20 bytes

```
> Ethernet II, Src: Apple_98:d9:27 (78:4f:43:98:d9:27), Dst: Google_89:0e:c8 (
✓ Internet Protocol Version 4, Src: 192.168.86.61, Dst: 128.119.245.12
0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
> Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
```

#### 5. How many bytes are in the payload of the IP datagram? Explain how you determined the number of payload bytes.

→ 36 bytes

→ Total Length: 56 (IP header + payload) Header Length: 20 bytes → Payload = 56 – 20 = 36 bytes, which matches the UDP Length: 36 field.

```
> Internet Protocol Version 4, Src: 192.168.86.61, Dst: 128.119.245.12
✓ User Datagram Protocol, Src Port: 64928, Dst Port: 33435
Source Port: 64928
> Destination Port: 33435
Length: 36
Checksum: 0xf2ff [unverified]
[Checksum Status: Unverified]
```

#### 6. Has this IP datagram been fragmented? Explain how you determined whether or not the datagram has been fragmented.

→ No, not fragmented.

→ Flags: 0x0 means the More Fragments bit is not set. Fragment Offset: 0 → Both together indicate this datagram is a single, unfragmented IP packet.

```
✓ Internet Protocol Version 4, Src: 192.168.86.61, Dst: 128.119.245.12
0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
> Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
Total Length: 56
Identification: 0xfda1 (64929)
✓ 000. .... = Flags: 0x0
0... .... = Reserved bit: Not set
.0.. .... = Don't fragment: Not set
..0. .... = More fragments: Not set
...0 0000 0000 0000 = Fragment Offset: 0
> Time to Live: 1
Protocol: UDP (17)
```

----

→ packet 44

```

> Frame 44: Packet, 70 bytes on wire (560 bits), 70 bytes captured (560 bits) on interface
> Ethernet II, Src: Apple_98:d9:27 (78:4f:43:98:d9:27), Dst: Google_89:0e:c8 (3c:28:6d:89:0
> Internet Protocol Version 4, Src: 192.168.86.61, Dst: 128.119.245.12
  0100 .... = Version: 4
  .... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 56
    Identification: 0xfda1 (64929)
  > 000. .... = Flags: 0x0
    ...0 0000 0000 0000 = Fragment Offset: 0
  > Time to Live: 1
    > [Expert Info (Note/Sequence): "Time To Live" only 1]
      ["Time To Live" only 1]
      [Severity level: Note]
      [Group: Sequence]
    Protocol: UDP (17)
    Header Checksum: 0x2faa [validation disabled]
    [Header checksum status: Unverified]
    Source Address: 192.168.86.61
    Destination Address: 128.119.245.12
    [Stream index: 4]
  > User Datagram Protocol, Src Port: 64928, Dst Port: 33435
  > Data (28 bytes)

```

→ packet 52

```

> Frame 52: Packet, 70 bytes on wire (560 bits), 70 bytes captured (560 bits) on interface
> Ethernet II, Src: Apple_98:d9:27 (78:4f:43:98:d9:27), Dst: Google_89:0e:c8 (3c:28:6d:89:0
> Internet Protocol Version 4, Src: 192.168.86.61, Dst: 128.119.245.12
  0100 .... = Version: 4
  .... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 56
    Identification: 0xfda4 (64932)
  > 000. .... = Flags: 0x0
    ...0 0000 0000 0000 = Fragment Offset: 0
  > Time to Live: 2
    > [Expert Info (Note/Sequence): "Time To Live" only 2]
      ["Time To Live" only 2]
      [Severity level: Note]
      [Group: Sequence]
    Protocol: UDP (17)
    Header Checksum: 0x2ea7 [validation disabled]
    [Header checksum status: Unverified]
    Source Address: 192.168.86.61
    Destination Address: 128.119.245.12
    [Stream index: 4]
  > User Datagram Protocol, Src Port: 64928, Dst Port: 33438
  > Data (28 bytes)

```

→ packet 58

```

> Frame 58: Packet, 70 bytes on wire (560 bits), 70 bytes captured (560 bits) on interface
> Ethernet II, Src: Apple_98:d9:27 (78:4f:43:98:d9:27), Dst: Google_89:0e:c8 (3c:28:6d:89:0
> Internet Protocol Version 4, Src: 192.168.86.61, Dst: 128.119.245.12
  0100 .... = Version: 4
  .... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 56
    Identification: 0xfda6 (64934)
  > 000. .... = Flags: 0x0
    ...0 0000 0000 0000 = Fragment Offset: 0
  > Time to Live: 2
    > [Expert Info (Note/Sequence): "Time To Live" only 2]
      ["Time To Live" only 2]
      [Severity level: Note]
      [Group: Sequence]
    Protocol: UDP (17)
    Header Checksum: 0x2ea5 [validation disabled]
    [Header checksum status: Unverified]
    Source Address: 192.168.86.61
    Destination Address: 128.119.245.12
    [Stream index: 4]
  > User Datagram Protocol, Src Port: 64928, Dst Port: 33440
  > Data (28 bytes)

```

**7. Which fields in the IP datagram always change from one datagram to the next within this series of UDP segments? Why?**

→ The fields that change from one datagram to the next are the TTL, the Identification field, the header checksum, and the UDP destination port. These change because traceroute sends each probe with a new TTL to discover the next hop, assigns a new Identification value for every datagram, recalculates the checksum based on the modified header, and varies the UDP destination port so it can match the returning ICMP messages to specific traceroute probes.

**8. Which fields in this sequence of IP datagrams stay constant? Why?**

→ The fields that stay constant across the sequence are the source IP address, destination IP address, IPv4 version, header length, differentiated services field, flags, fragment offset, the protocol (UDP), and the payload size. These remain unchanged because all packets are being sent from the same machine to the same destination using the same protocol settings, and none of these packets require fragmentation

**9. Describe the pattern you see in the values in the Identification field of the IP datagrams being sent by your computer.**

→ Packet 44: 0xfda1

→ Packet 52: 0xfda4

→ Packet 58: 0xfda9

→ These values consistently increase as new packets are sent.

**10. What is the upper layer protocol specified in the IP datagrams returned from the routers?**

→ ICMP (1)

No.	Time	Source	Destination	Protocol	Length
53	1.880429	10.0.0.1	192.168.86.61	ICMP	84
57	1.880000	10.0.0.1	192.168.86.61	ICMP	84

**11. Are the values in the Identification fields similar in behavior to your answer to question 9?**

→ packet 53

```

> Frame 53: Packet, 98 bytes on wire (784 bits), 98 bytes captured (784 bits) on interface
> Ethernet II, Src: Google_89:0e:c8 (3c:28:6d:89:0e:c8), Dst: Apple_98:d9:27 (78:4f:43:98:d9:27)
< Internet Protocol Version 4, Src: 10.0.0.1, Dst: 192.168.86.61
  0100 .... = Version: 4
  .... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0xc0 (DSCP: CS6, ECN: Not-ECT)
    Total Length: 84
    Identification: 0xd5c3 (54723)
  > 0000 .... = Flags: 0x0
  ...0 0000 0000 0000 = Fragment Offset: 0
  Time to Live: 63
  Protocol: ICMP (1)
  Header Checksum: 0x843f [validation disabled]
  [Header checksum status: Unverified]
  Source Address: 10.0.0.1
  Destination Address: 192.168.86.61
  [Stream index: 6]
> Internet Control Message Protocol

```

→ packet 198

```

> Frame 198: Packet, 590 bytes on wire (4720 bits), 590 bytes captured (4720 bits) on inter
> Ethernet II, Src: Google_89:0e:c8 (3c:28:6d:89:0e:c8), Dst: Apple_98:d9:27 (78:4f:43:98:d
✓ Internet Protocol Version 4, Src: 10.0.0.1, Dst: 192.168.86.61
  0100 .... = Version: 4
  .... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0xc0 (DSCP: CS6, ECN: Not-ECT)
  Total Length: 576
  Identification: 0xef48 (61256)
  > 000. .... = Flags: 0x0
  ...0 0000 0000 0000 = Fragment Offset: 0
  Time to Live: 63
  Protocol: ICMP (1)
  Header Checksum: 0x68ce [validation disabled]
  [Header checksum status: Unverified]
  Source Address: 10.0.0.1
  Destination Address: 192.168.86.61
  [Stream index: 6]
  > Internet Control Message Protocol

```

→ packet 290

```

> Frame 290: Packet, 70 bytes on wire (560 bits), 70 bytes captured (560 bits) on interface
> Ethernet II, Src: Google_89:0e:c8 (3c:28:6d:89:0e:c8), Dst: Apple_98:d9:27 (78:4f:43:98:d
✓ Internet Protocol Version 4, Src: 128.119.0.10, Dst: 192.168.86.61
  0100 .... = Version: 4
  .... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
  Total Length: 56
  Identification: 0x0000 (0)
  > 000. .... = Flags: 0x0
  ...0 0000 0000 0000 = Fragment Offset: 0
  Time to Live: 245
  Protocol: ICMP (1)
  Header Checksum: 0x2e5e [validation disabled]
  [Header checksum status: Unverified]
  Source Address: 128.119.0.10
  Destination Address: 192.168.86.61
  [Stream index: 14]
  > Internet Control Message Protocol

```

→ No, the Identification values in the ICMP packets are not similar to the pattern seen in Question 9. In my outbound UDP packets (Q9), the Identification numbers increased sequentially. However, in the ICMP packets returned by different routers, the Identification numbers vary widely and do not follow a sequence

## 12. Are the values of the TTL fields similar across all of the ICMP packets from all routers?

→ No. The TTL values are not similar across the ICMP packets. Each ICMP packet comes from a different router, and every router sets its own initial TTL value when generating the ICMP "Time Exceeded" message. This means the TTL values differ from packet to packet

→ Packet 53: TTL = 63

→ Packet 198: TTL = 63

→ Packet 290: TTL = 245

## 13. Find the first IP datagram containing the first part of the 3000 byte segment. Has that segment been fragmented across more than one IP datagram?

→ Yes. It's split into multiple pieces. Packet 179 shows the same ID as the others and the "more fragments" flag is on.

179	12.788154	192.168.86.61	128.119.245.12	IPv4	1514	Fragmented IP
180	12.788155	192.168.86.61	128.119.245.12	IPv4	1514	Fragmented IP
181	12.788155	192.168.86.61	128.119.245.12	UDP	54	64929 → 33430
182	12.792190	192.168.86.1	192.168.86.61	ICMP	590	Time-to-live
183	12.792881	192.168.86.61	128.119.245.12	IPv4	1514	Fragmented IP

  

```

> Frame 179: Packet, 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0
> Ethernet II, Src: Apple_98:d9:27 (78:4f:43:98:d9:27), Dst: Google_89:0e:c8 (3c:28:6d:89:0e:c8)
  > Internet Protocol Version 4, Src: 192.168.86.61, Dst: 128.119.245.12
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
    > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 1500
    Identification: 0xfda2 (64930)
    > 001. .... = Flags: 0x1, More fragments
    ...0 0000 0000 0000 = Fragment Offset: 0
    > Time to Live: 1
      > [Expert Info (Note/Sequence): "Time To Live" only 1]
        ["Time To Live" only 1]
        [Severity level: Note]
        [Group: Sequence]
      Protocol: UDP (17)
      Header Checksum: 0x0a05 [validation disabled]
      [Header checksum status: Unverified]
      Source Address: 192.168.86.61
      Destination Address: 128.119.245.12
      [Reassembled IPv4 in frame: 181]
      [Stream index: 4]
  > Data (1480 bytes)
  
```

**14. What information in the IP header indicates that this datagram has been fragmented?**

→ The IP header has More Fragments = 1 and you can see the fragment offset field being used

**15. What information in the IP header indicates whether this is the first fragment versus a later fragment?**

→ The fragment offset is 0, and more fragments is 1, so this is the first piece

```

001. .... = Flags: 0x1, More fragments
  0... .... = Reserved bit: Not set
  .0.. .... = Don't fragment: Not set
  ..1. .... = More fragments: Set
  ...0 0000 0000 0000 = Fragment Offset: 0
  
```

**16. How many bytes are in this IP datagram (header plus payload)?**

→ The Total Length is 1500 bytes, so this fragment is 1500 bytes total

```

.... 0101 = Header Length: 20 bytes
> Differentiated Services Field: 0x00
Total Length: 1500
Identification: 0xfda2 (64930)
001. .... = Flags: 0x1, More fragments
  
```

**17. Inspect the second fragment. What information indicates that this is not the first fragment?**

→ The source IPv6 address is 2601:193:8302:4620:215c:f5ae:8b40:a27a

19	3.814489	2601:193:8302:4620:215c:f5ae:8b40:a27a	2001:558:feed::1	DNS	91	Standard qu
20	3.814489	2601:193:8302:4620:215c:f5ae:8b40:a27a	2001:558:feed::1	DNS	91	Standard qu
21	3.819370	2601:193:8302:4620:215c:f5ae:8b40:a27a	2001:558:feed::1	DNS	95	Standard qu
22	3.819905	2601:193:8302:4620:215c:f5ae:8b40:a27a	2001:558:feed::1	DNS	95	Standard qu
23	3.946846	2601:558:feed::1	2601:193:8302:4620:215c:f5ae:8b40:a27a	DNS	107	Standard qu
24	3.963863	2601:558:feed::1	2601:193:8302:4620:215c:f5ae:8b40:a27a	DNS	107	Standard qu

  

```

> Frame 20: Packet, 91 bytes on wire (728 bits), 91 bytes captured (728 bits) on interface en0, id 0
> Ethernet II, Src: Apple_98:d9:d27 (78:4f:43:98:d9:d27), Dst: VantivaUSA_81:74:5a (44:1c:12:81:74:5a)
> Internet Protocol Version 6, Src: 2601:193:8302:4620:215c:f5ae:8b40:a27a, Dst: 2001:558:feed::1
  0110 .... = Version: 6
  .... 0000 0000 .... = Traffic Class: 0x00 (DSCP: CS0, ECN: Not-ECT)
  .... 0000 00.... = Differentiated Services Codepoint: Default (0)
  .... ....00 .... = Explicit Congestion Notification: Not ECN-Capable Transport (0)
  .... 0110 0011 1110 1101 0000 = Flow Label: 0x63ed0
    Payload Length: 37
    Next Header: UDP (17)
    Hop Limit: 255
  > Source Address: 2601:193:8302:4620:215c:f5ae:8b40:a27a
  > Destination Address: 2001:558:feed::1
    [Stream Index: 1]
  > User Datagram Protocol, Src Port: 64430, Dst Port: 53
  > Domain Name System (query)

```

**21. What is the IPv6 destination address of this datagram?**

→ The destination IPv6 address is 2001:558:feed::1

**22. What is the value of the flow label for this datagram?**

→ The flow label is 0x63ed0

```

.... .... = Explicit
= Flow Label: 0x63ed0

```

**23. How much payload data is carried in this datagram?**

→ The payload length is 37 bytes

```

.....
Payload Length: 37

```

**24. What is the upper layer protocol for this datagram's payload?**

→ The upper layer protocol is UDP (17)

```

Payload Length: 37
Next Header: UDP (17)
Hop Limit: 255

```



```

22 3.8199905 2601:193:8302:4620:215c:f5ae:8b40:a27a 2601:558::feed::1 DNS 95 Star
23 3.946846 2601:558::feed::1 2601:193:8302:4620:215c:f5ae:8b40:a27a DNS 107 Star
24 3.953852 2601:558::feed::1 2601:193:8302:4620:215c:f5ae:8b40:a27a DNS 241 Star
25 3.954763 2601:193:8302:4620:215c:f5ae:8b40:a27a 2601:558::feed::1 DNS 103 Star
26 3.955402 2601:558::feed::1 2601:193:8302:4620:215c:f5ae:8b40:a27a DNS 337 Star
27 3.955405 2601:558::feed::1 2601:193:8302:4620:215c:f5ae:8b40:a27a DNS 119 Star
28 3.956819 2601:193:8302:4620:215c:f5ae:8b40:a27a 2607:f8b0:4006:81a::200e TCP 98 5062
29 4.099918 2607:f8b0:4006:81a::200e 2601:193:8302:4620:215c:f5ae:8b40:a27a TCP 94 443

> Frame 23: Packet, 107 bytes on wire (856 bits), 107 bytes captured (856 bits) on interface en0, id 0
> Ethernet II, Src: VantivaUSA_81:74:5a (44:1c:12:81:74:5a), Dst: Apple_98:d9:27 (78:4f:43:98:d9:27)
> Internet Protocol Version 6, Src: 2601:558::feed::1, Dst: 2601:193:8302:4620:215c:f5ae:8b40:a27a
> User Datagram Protocol, Src Port: 53, Dst Port: 62315
> Domain Name System (response)
  Transaction ID: 0x4667
  Flags: 0x8180 Standard query response, No error
    1... .. = Response: Message is a response
    0000... .. = Opcode: Standard query (0)
    ....0... .. = Authoritative: Server is not an authority for domain
    ....0... .. = Truncated: Message is not truncated
    ....1... .. = Recursion desired: Do query recursively
    ....1... .. = Recursion available: Server can do recursive queries
    ....0... .. = Z: reserved (0)
    ....0... .. = Answer authenticated: Answer/authority portion was not authenticated by the server
    ....0... .. = Non-authenticated data: Unacceptable
    ....0000... .. = Reply code: No error (0)
  Questions: 1
  Answer RRs: 1
  Authority RRs: 0
  Additional RRs: 0
  Queries
    > youtube.com: type A, class IN
  Answers
    > youtube.com: type A, class IN, addr 172.217.10.142
    [Request In: 19]
    [Time: 132.482000 milliseconds]

```

25. How many IPv6 addresses are returned in the response to this AAAA request?

→ It returned 4 IPv6 addresses.

```

22 3.946846 2601:558::feed::1 2601:193:8302:4620:215c:f5ae:8b40:a27a DNS 107 Star
23 3.953852 2601:558::feed::1 2601:193:8302:4620:215c:f5ae:8b40:a27a DNS 241 Star
24 3.954763 2601:193:8302:4620:215c:f5ae:8b40:a27a 2601:558::feed::1 DNS 103 Star
25 3.955402 2601:558::feed::1 2601:193:8302:4620:215c:f5ae:8b40:a27a DNS 337 Star
26 3.955405 2601:558::feed::1 2601:193:8302:4620:215c:f5ae:8b40:a27a DNS 119 Star
27 3.956819 2601:193:8302:4620:215c:f5ae:8b40:a27a 2607:f8b0:4006:81a::200e TCP 98 5062
28 4.099918 2607:f8b0:4006:81a::200e 2601:193:8302:4620:215c:f5ae:8b40:a27a TCP 94 443

www.youtube.com: type AAAA, class IN
Name: www.youtube.com
Type: CNAME (5) (Canonical NAME for an alias)
Class: IN (0x0001)
Time to live: 57522 (15 hours, 58 minutes, 42 seconds)
Data length: 22
CNAME: youtube-ui.l.google.com
youtube-ui.l.google.com: type AAAA, class IN, addr 2607:f8b0:4006:806::200e
Name: youtube-ui.l.google.com
Type: AAAA (28) (IPv6 Address)
Class: IN (0x0001)
Time to live: 193 (3 minutes, 13 seconds)
Data length: 16
AAAA Address: 2607:f8b0:4006:806::200e
youtube-ui.l.google.com: type AAAA, class IN, addr 2607:f8b0:4006:81a::200e
Name: youtube-ui.l.google.com
Type: AAAA (28) (IPv6 Address)
Class: IN (0x0001)
Time to live: 193 (3 minutes, 13 seconds)
Data length: 16
AAAA Address: 2607:f8b0:4006:81a::200e
youtube-ui.l.google.com: type AAAA, class IN, addr 2607:f8b0:4006:81b::200e
Name: youtube-ui.l.google.com
Type: AAAA (28) (IPv6 Address)
Class: IN (0x0001)
Time to live: 193 (3 minutes, 13 seconds)
Data length: 16
AAAA Address: 2607:f8b0:4006:81b::200e
youtube-ui.l.google.com: type AAAA, class IN, addr 2607:f8b0:4006:807::200e
Name: youtube-ui.l.google.com
Type: AAAA (28) (IPv6 Address)
Class: IN (0x0001)
Time to live: 193 (3 minutes, 13 seconds)
Data length: 16
AAAA Address: 2607:f8b0:4006:807::200e
[Request In: 22]
[Time: 133.947000 milliseconds]

```

26. What is the first IPv6 address returned for youtube.com?

→ The first AAAA address is: 2607:f8b0:4006:806::200e

Time to live: 57522 (15 hours, 58 minutes, 42 seconds)

Data length: 22

CNAME: youtube-ui.l.google.com

▼ youtube-ui.l.google.com: type AAAA, class IN, addr 2607:f8b0:4006:806::200e

Name: youtube-ui.l.google.com

Type: AAAA (28) (IPv6 Address)

Class: IN (0x0001)

Time to live: 193 (3 minutes, 13 seconds)

Data length: 16