WireShark Lab: UDP

Computer Networks

By:
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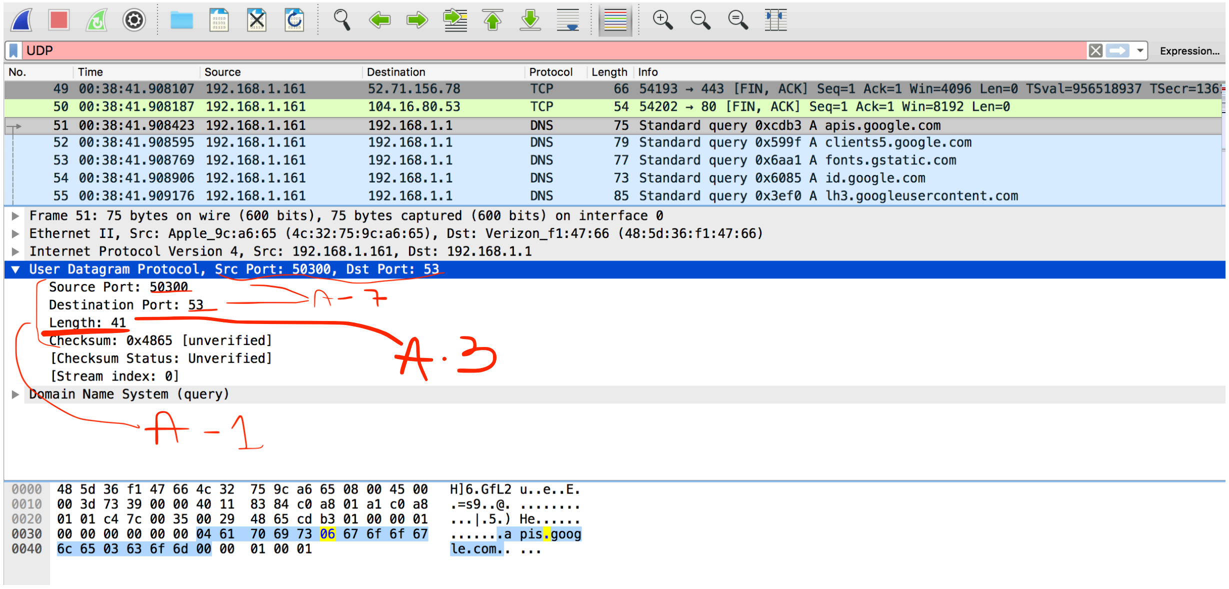
1) Select one UDP packet from your trace. From this packet, determine how many fields there are in the UDP header. (You shouldn't look in the textbook! Answer these questions directly from what you observe in the packet trace.) Name these fields.

Ans)

- Source Port
- Destination Port
- Length
- Checksum



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UDP                                                                    Expression...
No.   Time             Source          Destination     Protocol Length Info
   49 00:38:41.908107  192.168.1.161   52.71.156.78    TCP        66  54193 → 443 [FIN, ACK] Seq=1 Ack=1 Win=4096 Len=0 TSval=956518937 TSecr=136
   50 00:38:41.908187  192.168.1.161   104.16.80.53    TCP        54  54202 → 80 [FIN, ACK] Seq=1 Ack=1 Win=8192 Len=0
   51 00:38:41.908423  192.168.1.161   192.168.1.1     DNS        75  Standard query 0xcdb3 A apis.google.com
   52 00:38:41.908595  192.168.1.161   192.168.1.1     DNS        79  Standard query 0x599f A clients5.google.com
   53 00:38:41.908769  192.168.1.161   192.168.1.1     DNS        77  Standard query 0x6aa1 A fonts.gstatic.com
   54 00:38:41.908906  192.168.1.161   192.168.1.1     DNS        73  Standard query 0x6085 A id.google.com
   55 00:38:41.909176  192.168.1.161   192.168.1.1     DNS        85  Standard query 0x3ef0 A lh3.googleusercontent.com

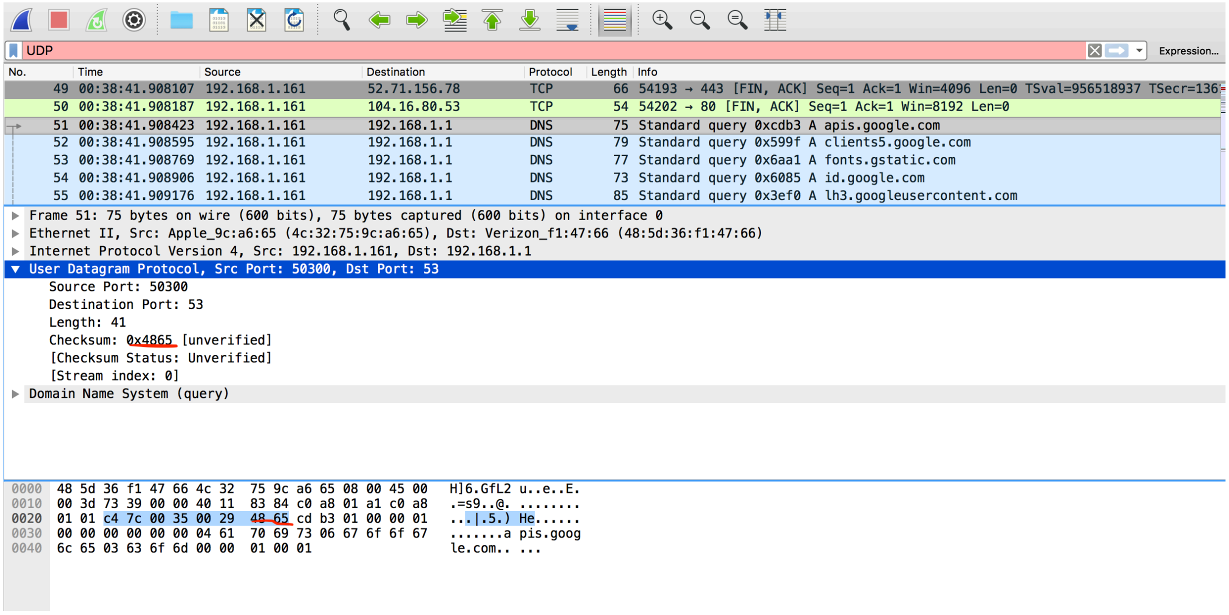
▶ Frame 51: 75 bytes on wire (600 bits), 75 bytes captured (600 bits) on interface 0
▶ Ethernet II, Src: Apple_9c:a6:65 (4c:32:75:9c:a6:65), Dst: Verizon_f1:47:66 (48:5d:36:f1:47:66)
▶ Internet Protocol Version 4, Src: 192.168.1.161, Dst: 192.168.1.1
▼ User Datagram Protocol, Src Port: 50300, Dst Port: 53
    Source Port: 50300
    Destination Port: 53
    Length: 41
    Checksum: 0x4865 [unverified]
    [Checksum Status: Unverified]
    [Stream index: 0]
▶ Domain Name System (query)

0000  48 5d 36 f1 47 66 4c 32  75 9c a6 65 08 00 45 00   H]6.GfL2 u..e..E.
0010  00 3d 73 39 00 00 40 11  83 84 c0 a8 01 a1 c0 a8   .=s9..@. ........
0020  01 01 c4 7c 00 35 00 29  48 65 cd b3 01 00 00 01   ...|.5.) He......
0030  00 00 00 00 00 00 04 61  70 69 73 06 67 6f 6f 67   .......a pis.goog
0040  6c 65 03 63 6f 6d 00 00  01 00 01                  le.com.. ...
```

2) By consulting the displayed information in Wireshark's packet content field for

this packet, determine the length (in bytes) of each of the UDP header fields.

Ans) Length of each UDP header fields = 2 bytes



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  50 00:38:41.908187  192.168.1.161  104.16.80.53   TCP        54 54202 → 80 [FIN, ACK] Seq=1 Ack=1 Win=8192 Len=0
  51 00:38:41.908423  192.168.1.161  192.168.1.1    DNS        75 Standard query 0xcdb3 A apis.google.com
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  53 00:38:41.908769  192.168.1.161  192.168.1.1    DNS        77 Standard query 0x6aa1 A fonts.gstatic.com
  54 00:38:41.908906  192.168.1.161  192.168.1.1    DNS        73 Standard query 0x6085 A id.google.com
  55 00:38:41.909176  192.168.1.161  192.168.1.1    DNS        85 Standard query 0x3ef0 A lh3.googleusercontent.com
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▼ User Datagram Protocol, Src Port: 50300, Dst Port: 53
    Source Port: 50300
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    Length: 41
    Checksum: 0x4865 [unverified]
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▶ Domain Name System (query)
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```
0000  48 5d 36 f1 47 66 4c 32  75 9c a6 65 08 00 45 00   H]6.GfL2 u..e..E.
0010  00 3d 73 39 00 00 40 11  83 84 c0 a8 01 a1 c0 a8   .=s9..@. ........
0020  01 01 c4 7c 00 35 00 29  48 65 cd b3 01 00 00 01   ...|.5.) He......
0030  00 00 00 00 00 00 04 61  70 69 73 06 67 6f 6f 67   .......a pis.goog
0040  6c 65 03 63 6f 6d 00 00  01 00 01                  le.com.. ...
```

3) The value in the Length field is the length of what? (You can consult the text for this answer). Verify your claim with your captured UDP packet.

Ans) The value in the length field = 8 bytes(sum of header field lengths) + 33 bytes(data encapsulated in packets.) = 41 bytes

4) What is the maximum number of bytes that can be included in a UDP payload? (Hint: the answer to this question can be determined by your answer to 2. above)

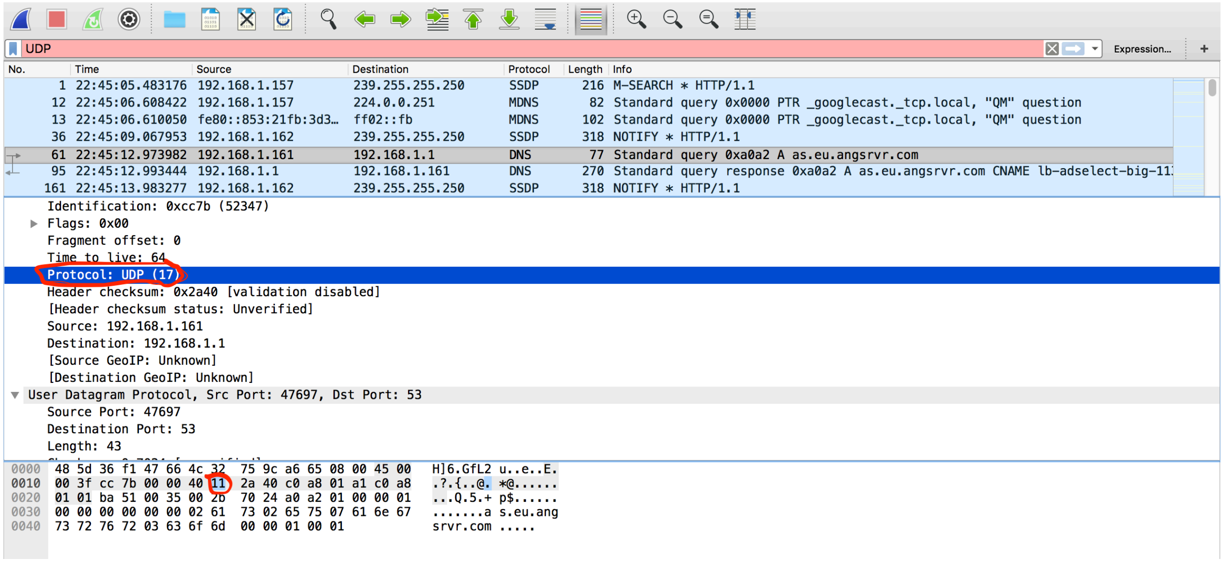
Ans) 2^{16}- 1 - 8(sum of header field lengths) = 65536 -1 -8 = 65527 is the maximum number of bytes that can be included in a UDP payload.

5) What is the largest possible source port number? (Hint: see the hint in 4.)

Ans) 2^{16}- 1 = 65536 -1 = 65535 is the largest possible source port number.

6) What is the protocol number for UDP? Give your answer in both hexadecimal and decimal notation. To answer this question, you'll need to look into the Protocol field of the IP datagram containing this UDP segment (see Figure 4.13 in the text, and the discussion of IP header fields).

Ans) 11 Hex and 17 decimal is the protocol number for UDP.



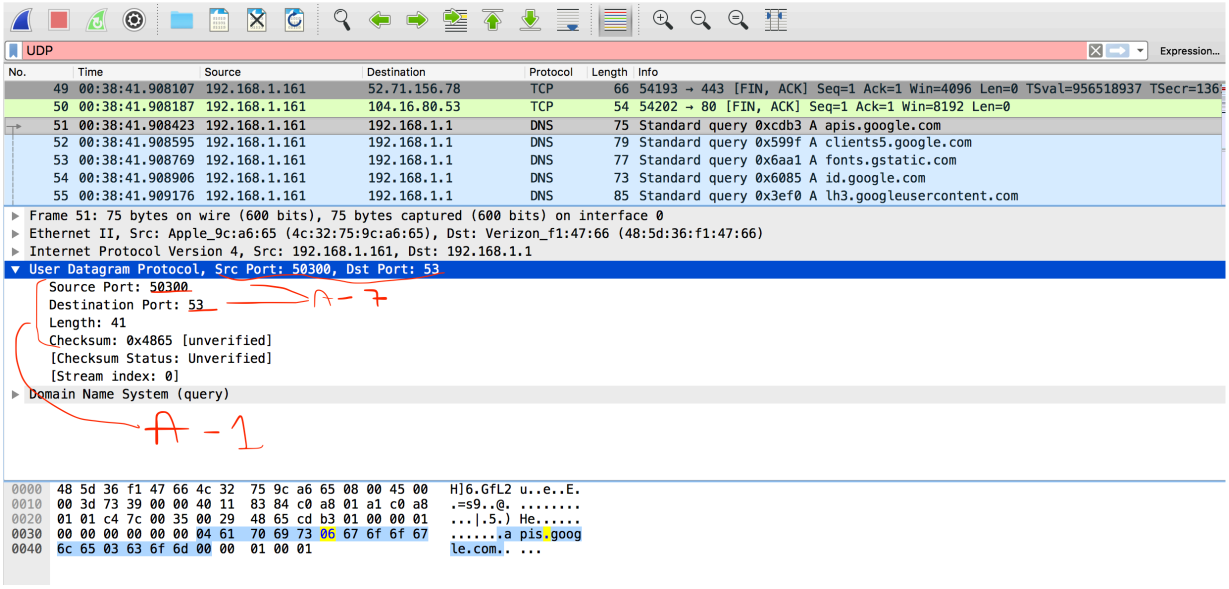
```
No.   Time             Source                   Destination       Protocol Length Info
    1 22:45:05.483176  192.168.1.157            239.255.255.250   SSDP      216   M-SEARCH * HTTP/1.1
   12 22:45:06.608422  192.168.1.157            224.0.0.251       MDNS       82   Standard query 0x0000 PTR _googlecast._tcp.local, "QM" question
   13 22:45:06.610050  fe80::853:21fb:3d3…      ff02::fb          MDNS      102   Standard query 0x0000 PTR _googlecast._tcp.local, "QM" question
   36 22:45:09.067953  192.168.1.162            239.255.255.250   SSDP      318   NOTIFY * HTTP/1.1
   61 22:45:12.973982  192.168.1.161            192.168.1.1       DNS        77   Standard query 0xa0a2 A as.eu.angsrvr.com
   95 22:45:12.993444  192.168.1.1              192.168.1.161     DNS       270   Standard query response 0xa0a2 A as.eu.angsrvr.com CNAME lb-adselect-big-11
  161 22:45:13.983277  192.168.1.162            239.255.255.250   SSDP      318   NOTIFY * HTTP/1.1
```

```
    Identification: 0xcc7b (52347)
  ▶ Flags: 0x00
    Fragment offset: 0
    Time to live: 64
    Protocol: UDP (17)
    Header checksum: 0x2a40 [validation disabled]
    [Header checksum status: Unverified]
    Source: 192.168.1.161
    Destination: 192.168.1.1
    [Source GeoIP: Unknown]
    [Destination GeoIP: Unknown]
▼ User Datagram Protocol, Src Port: 47697, Dst Port: 53
    Source Port: 47697
    Destination Port: 53
    Length: 43
```

```
0000  48 5d 36 f1 47 66 4c 32  75 9c a6 65 08 00 45 00   H]6.GfL2 u..e..E.
0010  00 3f cc 7b 00 00 40 11  2a 40 c0 a8 01 a1 c0 a8   .?.{..@. *@......
0020  01 01 ba 51 00 35 00 2b  70 24 a0 a2 01 00 00 01   ...Q.5.+ p$......
0030  00 00 00 00 00 00 02 61  73 02 65 75 07 61 6e 67   .......a s.eu.ang
0040  73 72 76 72 03 63 6f 6d  00 00 01 00 01            srvr.com .....
```

7) Examine a pair of UDP packets in which your host sends the first UDP packet and the second UDP packet is a reply to this first UDP packet. (Hint: for a second packet to be sent in response to a first packet, the sender of the first packet should be the destination of the second packet). Describe the relationship between the port numbers in the two packets.

Ans) Host UDP packet source port = Reply packet UDP packet destination port and vice-versa Host UDP packet destination port = Reply packet UDP packet source port



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   52 00:38:41.908595  192.168.1.161   192.168.1.1     DNS       79 Standard query 0x599f A clients5.google.com
   53 00:38:41.908769  192.168.1.161   192.168.1.1     DNS       77 Standard query 0x6aa1 A fonts.gstatic.com
   54 00:38:41.908906  192.168.1.161   192.168.1.1     DNS       73 Standard query 0x6085 A id.google.com
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```

A - 7

A - 1

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0010  00 3d 73 39 00 00 40 11  83 84 c0 a8 01 a1 c0 a8   .=s9..@. ........
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```