ECE361 – Computer Networks

Wireshark Lab 2: UDP

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Mark:

	Question	Answer
1	Select one packet. From this packet, determine how many fields there are in the UDP header. Name these fields.	4 fields. Source port, destination port, length, checksum.
2	From the packet content field, determine the length (in bytes) of each of the UDP header fields.	Each of the UDP header fields is 2 bytes.

User Datagram Protocol, Src Port: 443, Dst Port: 56668
    Source Port: 443
    Destination Port: 56668
    Length: 34
    Checksum: 0x74ad [unverified]
    [Checksum Status: Unverified]
    [Stream index: 2]
  > [Timestamps]
    UDP payload (26 bytes)
> Data (26 bytes)

```
0000   e0 9d 31 f2 35 fa f0 f2   49 5a 35 e2 86 dd 60 00    ··1·5··· IZ5···`·
0010   00 00 00 22 11 3a 26 07   f8 b0 40 0d 0c 0d 00 00    ···":&·  ··@·····
0020   00 00 00 00 00 bd 26 07   fe a8 05 60 00 3b f0 de    ······&· ···`·;··
0030   1b f6 d4 cb 46 bd 01 bb   dd 5c 00 22 74 ad 47 94    ····F··· ·\·"t·G·
0040   91 d6 02 1a 03 79 0b 00   fa 31 ce 9e 72 48 82 09    ·····y·· ·1··rH··
0050   e9 7b b2 34 9a 60 10 7b                              ·{·4·`·{
```

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0030   1b f6 d4 cb 46 bd 01 bb   dd 5c 00 22 74 ad 47 94    ····F··· ·\·"t·G·
0040   91 d6 02 1a 03 79 0b 00   fa 31 ce 9e 72 48 82 09    ·····y·· ·1··rH··
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0040   91 d6 02 1a 03 79 0b 00   fa 31 ce 9e 72 48 82 09    ·····y·· ·1··rH··
0050   e9 7b b2 34 9a 60 10 7b                              ·{·4·`·{
```

3	The value in the length field is the length of what? Verify your claim with your captured UDP packet.	Length field is the total number of bytes in UDP datagram including the header. 2*4 (header length) + 26 (data length) = 34 bytes
	User Datagram Protocol, Src Port: 443, Dst Port: 56668 　　Source Port: 443 　　Destination Port: 56668 　　Length: 34 　　Checksum: 0x74ad [unverified] 　　[Checksum Status: Unverified] 　　[Stream index: 2] 　　> [Timestamps] 　　UDP payload (26 bytes)	
4	What is the maximum number of bytes that can be included in a UDP payload?	The maximum number of bytes that can be included in a UDP payload is: 2^16 - 1 (the maximum number of bytes that can be included in the entire datagram) - 8 (headers) = **65527 bytes**
5	What is the largest possible source port number?	2^16 - 1 = **65535** since the source port header contains 2 bytes.
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 IP header.)	The protocol number is 17, which is 0x11 in hexadecimal.
	Internet Protocol Version 6, Src: 2607:f8b0:400d:c0d::bd, Dst: 2607:fea8:560:3b 　　0110 .... = Version: 6 　　> .... 0000 0000 .... = Traffic Class: 0x00 (DSCP: CS0, ECI 　　.... .... 0000 0000 0000 0000 0000 = Flow Label: 0x00000 　　Payload Length: 34 　　Next Header: UDP (17) 　　Hop Limit: 58 　　Source Address: 2607:f8b0:400d:c0d::bd 　　Destination Address: 2607:fea8:560:3b:f0de:1bf6:d4cb:46bd 0000　e0 9d 31 f2 35 fa f0 f2　49 5a 35 e2 86 dd 60 00　··1·5··· IZ5···`· 0010　00 00 00 22 11 3a 26 07　f8 b0 40 0d 0c 0d 00 00　···"·:&·　··@····· 0020　00 00 00 00 00 bd 26 07　fe a8 05 60 00 3b f0 de　······&·　····`·;·· 0030　1b f6 d4 cb 46 bd 01 bb　dd 5c 00 22 74 ad 47 94　····F···　·\·"t·G· 0040　91 d6 02 1a 03 79 0b 00　fa 31 ce 9e 72 48 82 09　·····y··　·1··rH·· 0050　e9 7b b2 34 9a 60 10 7b　　　　　　　·{·4·`·{	

7	Search "UDP" in Google and determine the fields over which the UDP checksum is calculated.	The UDP checksum is performed over the entire UDP datagram (header and payload), and the pseudo header. (The IPv4 pseudo header contains the source IP, the destination IP, the UDP protocol number, and UDP length.)

Reference:
https://en.wikipedia.org/wiki/User_Datagram_Protocol#:~:text=When%20UDP%20runs%20over%20IPv4,IPv4%20pseudo%20header%20format

8	Examine a pair of UDP packets in which the first packet is sent by your host and the second packet is a reply to the first packet. Describe the relationship between the port numbers in the two packets.	The first packet's source port is the second packet's destination port. The first packet's destination port is the second packet's source port. This is because the communication uses the same pair of ports.

```
26 0.433617        2607:f8b0:400d:c0d::bd                2607:fea8:560:3b:f0de:1bf6:d4cb:46bd
27 0.442954        2607:fea8:560:3b:f0de:1bf6:d4cb:46bd  2607:f8b0:400d:c0d::bd
28 0.444366        2607:fea8:560:3b:f0de:1bf6:d4cb:46bd  2607:f8b0:400d:c0d::bd
29 0.493022        2607:f8b0:400d:c0d::bd                2607:fea8:560:3b:f0de:1bf6:d4cb:46bd
30 0.499306        2607:f8b0:400d:c0d::bd                2607:fea8:560:3b:f0de:1bf6:d4cb:46bd
31 0.499306        2607:f8b0:400d:c0d::bd                2607:fea8:560:3b:f0de:1bf6:d4cb:46bd
```

```
> Frame 26: 88 bytes on wire (704 bits), 88 bytes captured (704 bits) on interface \Device\NPF_{AC130580-765E-424(
> Ethernet II, Src: HitronTe_5a:35:e2 (f0:f2:49:5a:35:e2), Dst: IntelCor_f2:35:fa (e0:9d:31:f2:35:fa)
> Internet Protocol Version 6, Src: 2607:f8b0:400d:c0d::bd, Dst: 2607:fea8:560:3b:f0de:1bf6:d4cb:46bd
v User Datagram Protocol, Src Port: 443, Dst Port: 56668
    Source Port: 443
    Destination Port: 56668
```

```
27 0.442954        2607:fea8:560:3b:f0de:1bf6:d4cb:46bd  2607:f8b0:400d:c0d::bd
28 0.444366        2607:fea8:560:3b:f0de:1bf6:d4cb:46bd  2607:f8b0:400d:c0d::bd
29 0.493022        2607:f8b0:400d:c0d::bd                2607:fea8:560:3b:f0de:1bf6:d4cb:46bd
30 0.499306        2607:f8b0:400d:c0d::bd                2607:fea8:560:3b:f0de:1bf6:d4cb:46bd
31 0.499306        2607:f8b0:400d:c0d::bd                2607:fea8:560:3b:f0de:1bf6:d4cb:46bd
```

```
> Frame 27: 95 bytes on wire (760 bits), 95 bytes captured (760 bits) on interface \Device\NPF_{AC130580-765E-4246-8
> Ethernet II, Src: IntelCor_f2:35:fa (e0:9d:31:f2:35:fa), Dst: HitronTe_5a:35:e2 (f0:f2:49:5a:35:e2)
> Internet Protocol Version 6, Src: 2607:fea8:560:3b:f0de:1bf6:d4cb:46bd, Dst: 2607:f8b0:400d:c0d::bd
v User Datagram Protocol, Src Port: 56668, Dst Port: 443
    Source Port: 56668
    Destination Port: 443
```