HACETTEPE UNIVERSITY COMPUTER ENGINEERING DEPARTMENT COMPUTER NETWORKS LABORATORY



EXPERIMENT 4 UDP

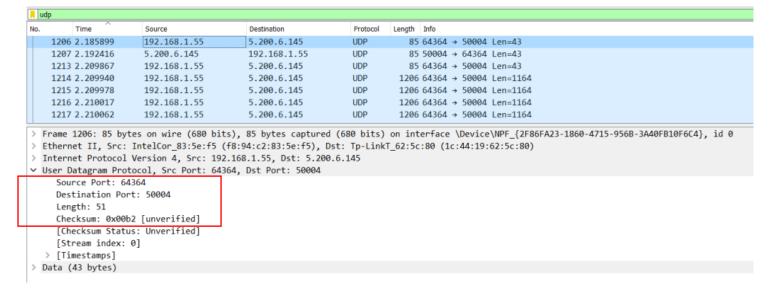
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GROUP NUMBER: 12

IP address of our computer: 192.168.1.55

1. There are four headers which are source port (64364), destination port (50004), length (51) and checksum (0x00b2). We used mit.edu website when capturing packets.



2. Each UDP header field is 2 byte

```
Frame 1206: 85 bytes on wire (680 bits), 85 bytes captured (680 bits) on interface \Device\NPF_{2F86FA23-1860-4715-956B-3A44
  Ethernet II, Src: IntelCor_83:5e:f5 (f8:94:c2:83:5e:f5), Dst: Tp-LinkT_62:5c:80 (1c:44:19:62:5c:80)
> Internet Protocol Version 4, Src: 192.168.1.55, Dst: 5.200.6.145

∨ User Datagram Protocol, Src Port: 64364, Dst Port: 50004

     Source Port: 64364
     Destination Port: 50004
     Length: 51
     Checksum: 0x00b2 [unverified]
     [Checksum Status: Unverified]
     [Stream index: 0]
   > [Timestamps]
> Data (43 bytes)
      1c 44 19 62 5c 80 f8 94 c2 83 5e f5 08 00 45 00
                                                          ·G······7··
··[•]·T·3···xB·0·
     00 47 a3 a4 00 00 80 11 c8 c9 c0 a8 01 37 05 c8
0020 06 91 fb 6c c3 54 00 33 00 b2 90 78 42 98 30 0c
0030 30 eb 00 0d 99 ff a2 5e 03 57 4f 6d 51 77 db 4e
                                                          0 - - - - ^ - WOmQw - N
0040 3b 1b 29 e0 d8 5b b0 d1 f4 04 8c bd a1 9d a1 53
                                                          ;·)··[······s
0050 f4 00 5c 00 80
Source Port (udp.srcport), 2 bytes
```

3. Length 51: 8 bytes UDP header data + 43 byte encapsulated data

```
Frame 1206: 85 bytes on wire (680 bits), 85 bytes captured (680 bits) on interface \Device\NPF_{2F86FA23-1860-4715-9568-3A40FB10F6C4}, id 0
  Ethernet II, Src: IntelCor_83:5e:f5 (f8:94:c2:83:5e:f5), Dst: Tp-LinkT_62:5c:80 (1c:44:19:62:5c:80)
Internet Protocol Version 4, Src: 192.168.1.55, Dst: 5.200.6.145
v User Datagram Protocol, Src Port: 64364, Dst Port: 50004
        Source Port: 64364
       Destination Port: 50004
        Length: 51
        Checksum: 0x00b2 [unverified]
        [Checksum Status: Unverified]
        [Stream index: 0]
       [Timestamps]
Data (43 bytes)
0000 1c 44 19 62 5c 80 f8 94 c2 83 5e f5 08 00 45 00 0010 00 47 a3 a4 00 00 80 11 c8 c9 c0 a8 01 37 05 c8 0020 06 91 fb 6c c3 54 00 33 00 b2 90 78 42 98 30 0c 0030 30 eb 00 00 99 ff a2 5e 03 57 4f 6d 51 77 db 4e 0040 3b 1b 29 e0 d8 5b b0 d1 f4 04 8c bd a1 9d a1 53
                                                                                        D-b\----E
                                                                                        -G-----7--
--<mark>-1-T-3 --</mark>-xB-0
                                                                                                      - WOmQw - N
                                                                                       ;·)··[·· ····
        User Datagram Protocol (udp), 8 bytes
```

- 4. Maximum number of bytes: $(2^{16} 1)$ minus the number of header bytes which is 8 bytes. From this we can conclude that 65535 8 = 65527.
- 5. Largest possible source port number is $2^{16} 1 = 65535$. As we specified this in 4^{th} question.
- 6. Protocol number is 17 (in decimal form) and protocol number in hexadecimal is 0x11.

```
Frame 1206: 85 bytes on wire (680 bits), 85 bytes captured (680 bits) on interface \Device\NPF_{2F86FA23-1860-4715-956B-3A40FB10F6C4}, id 0
  Ethernet II, Src: IntelCor_83:5e:f5 (f8:94:c2:83:5e:f5), Dst: Tp-LinkT_62:5c:80 (1c:44:19:62:5c:80)

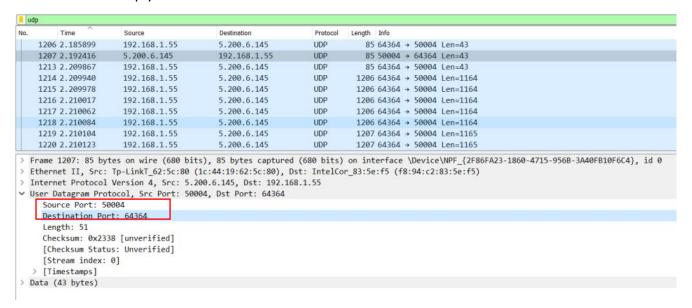
✓ Internet Protocol Version 4, Src: 192.168.1.55, Dst: 5.200.6.145

      0100 .... = Version: 4
       ... 0101 = Header Length: 20 bytes (5)
   > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
      Total Length: 71
      Identification: 0xa3a4 (41892)
   > Flags: 0x0000
      Fragment offset: 0
      Time to live: 128
   Protocol: UDP (17)
      Header checksum: 0xc8c9 [validation disabled]
      [Header checksum status: Unverified]
      Source: 192.168.1.55
      Destination: 5.200.6.145
> User Datagram Protocol, Src Port: 64364, Dst Port: 50004
> Data (43 bytes)
0000 1c 44 19 62 5c 80 f8 94 c2 83 5e f5 08 00 45 00 0010 00 47 a3 a4 00 00 80 11 c8 c9 c0 a8 01 37 05 c8 0020 06 91 fb 6c c3 54 00 33 00 b2 90 78 42 98 30 0c
                                                                    ·D·b\······E·
·G······
                                                                    ---1-T-3 ---xB-0-
0-----^ -WOmQw-N
0030 30 eb 00 0d 99 ff a2 5e 03 57 4f 6d 51 77 db 4e 0040 3b 1b 29 e0 d8 5b b0 d1 f4 04 8c bd a1 9d a1 53
                                                                    ;·)··[·· ····
0050 f4 00 5c 00 80
Protocol (in proto), 1 byte
```

7. UDP sent by host:

```
udp
                                                                       Length Info
                                                                Protocol
                                           Destination
    1206 2.185899 192.168.1.55
                                           5.200.6.145
                                                               UDP 85 64364 → 50004 Len=43
                                                                          85 50004 → 64364 Len=43
    1207 2.192416
                      5.200.6.145
                                           192.168.1.55
                                                               UDP
                                                                          85 64364 → 50004 Len=43
    1213 2.209867
                      192.168.1.55
                                                               UDP
                                           5.200.6.145
    1214 2.209940
                      192.168.1.55
                                                               UDP
                                                                        1206 64364 → 50004 Len=1164
                                           5.200.6.145
   1215 2.209978
                     192.168.1.55
                                          5.200.6.145
                                                               UDP
                                                                        1206 64364 → 50004 Len=1164
    1216 2.210017
                      192.168.1.55
                                          5.200.6.145
                                                               UDP
                                                                        1206 64364 → 50004 Len=1164
    1217 2.210062
                     192.168.1.55
                                                               UDP
                                                                        1206 64364 → 50004 Len=1164
                                          5.200.6.145
    1218 2.210084
                      192.168.1.55
                                           5.200.6.145
                                                               UDP
                                                                        1206 64364 → 50004 Len=1164
    1219 2.210104
                     192.168.1.55
                                          5.200.6.145
                                                               UDP
                                                                        1207 64364 → 50004 Len=1165
    1220 2.210123
                      192.168.1.55
                                          5.200.6.145
                                                               UDP
                                                                        1207 64364 → 50004 Len=1165
> Frame 1206: 85 bytes on wire (680 bits), 85 bytes captured (680 bits) on interface \Device\NPF_{2F86FA23-1860-4715-956B-3A40FB10F6C4}, id 0
> Ethernet II, Src: IntelCor_83:5e:f5 (f8:94:c2:83:5e:f5), Dst: Tp-LinkT_62:5c:80 (1c:44:19:62:5c:80)
> Internet Protocol Version 4, Src: 192.168.1.55, Dst: 5.200.6.145
  User Datagram Protocol, Src Port: 64364, Dst Port: 50004
     Source Port: 64364
    Destination Port: 50004
     Length: 51
     Checksum: 0x00b2 [unverified]
     [Checksum Status: Unverified]
     [Stream index: 0]
   > [Timestamps]
Data (43 bytes)
```

UDP reply to host:



As we show in the pictures above, source port of UDP packet sent (64364) is the same as the destination port of UDP reply. Likewise, destination port of UDP packet sent (50004) is the same as the source port of UDP reply.