

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.

udp						
No.	Time	Source	Destination	Protocol	Length	Info
1206	2.185899	192.168.1.55	5.200.6.145	UDP	85	64364 → 50004 Len=43
1207	2.192416	5.200.6.145	192.168.1.55	UDP	85	50004 → 64364 Len=43
1213	2.209867	192.168.1.55	5.200.6.145	UDP	85	64364 → 50004 Len=43
1214	2.209940	192.168.1.55	5.200.6.145	UDP	1206	64364 → 50004 Len=1164
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	5.200.6.145	UDP	1206	64364 → 50004 Len=1164

> 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)

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-3A40FB10F6C4}

> 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)

0000	1c 44 19 62 5c 80 f8 94	c2 83 5e f5 08 00 45 00	-D-b\... ..^...E-
0010	00 47 a3 a4 00 00 80 11	c8 c9 c0 a8 01 37 05 c8	-G.....7..
0020	06 91 fb 6c c3 54 00 33	00 b2 90 78 42 98 30 0c	..l.T.3...xB-0-
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_{2F86FA23-1860-4715-956B-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)

0000	1c 44 19 62 5c 80 f8 94	c2 83 5e f5 08 00 45 00	-D-b\... ..^...E-
0010	00 47 a3 a4 00 00 80 11	c8 c9 c0 a8 01 37 05 c8	-G.....7..
0020	06 91 fb 6c c3 54 00 33	00 b2 90 78 42 98 30 0c	..l.T.3...xB-0-
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		..\..

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 4th 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)
v 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  -D-b\... ..^...E.
0010 00 47 a3 a4 00 00 80 11 c8 c9 c0 a8 01 37 05 c8  -G.....  ....7..
0020 06 91 fb 6c c3 54 00 33 00 b2 90 78 42 98 30 0c  -..l.T.3 ...xB-0-
0030 30 eb 00 0d 99 ff a2 5e 03 57 4f 6d 51 77 db 4e  0.....^..W0mQw.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                                     ..\..
```

Protocol (ip.proto), 1 byte

7. UDP sent by host:

udp						
No.	Time	Source	Destination	Protocol	Length	Info
1206	2.185899	192.168.1.55	5.200.6.145	UDP	85	64364 → 50004 Len=43
1207	2.192416	5.200.6.145	192.168.1.55	UDP	85	50004 → 64364 Len=43
1213	2.209867	192.168.1.55	5.200.6.145	UDP	85	64364 → 50004 Len=43
1214	2.209940	192.168.1.55	5.200.6.145	UDP	1206	64364 → 50004 Len=1164
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	5.200.6.145	UDP	1206	64364 → 50004 Len=1164
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
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)
```

UDP reply to host :

udp						
No.	Time	Source	Destination	Protocol	Length	Info
1206	2.185899	192.168.1.55	5.200.6.145	UDP	85	64364 → 50004 Len=43
1207	2.192416	5.200.6.145	192.168.1.55	UDP	85	50004 → 64364 Len=43
1213	2.209867	192.168.1.55	5.200.6.145	UDP	85	64364 → 50004 Len=43
1214	2.209940	192.168.1.55	5.200.6.145	UDP	1206	64364 → 50004 Len=1164
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	5.200.6.145	UDP	1206	64364 → 50004 Len=1164
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 1207: 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: Tp-LinkT_62:5c:80 (1c:44:19:62:5c:80), Dst: IntelCor_83:5e:f5 (f8:94:c2:83:5e:f5)

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

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

Source Port: 50004

Destination Port: 64364

Length: 51

Checksum: 0x2338 [unverified]

[Checksum Status: Unverified]

[Stream index: 0]

> [Timestamps]

> Data (43 bytes)

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.