CMPT371 Project 2 Lab

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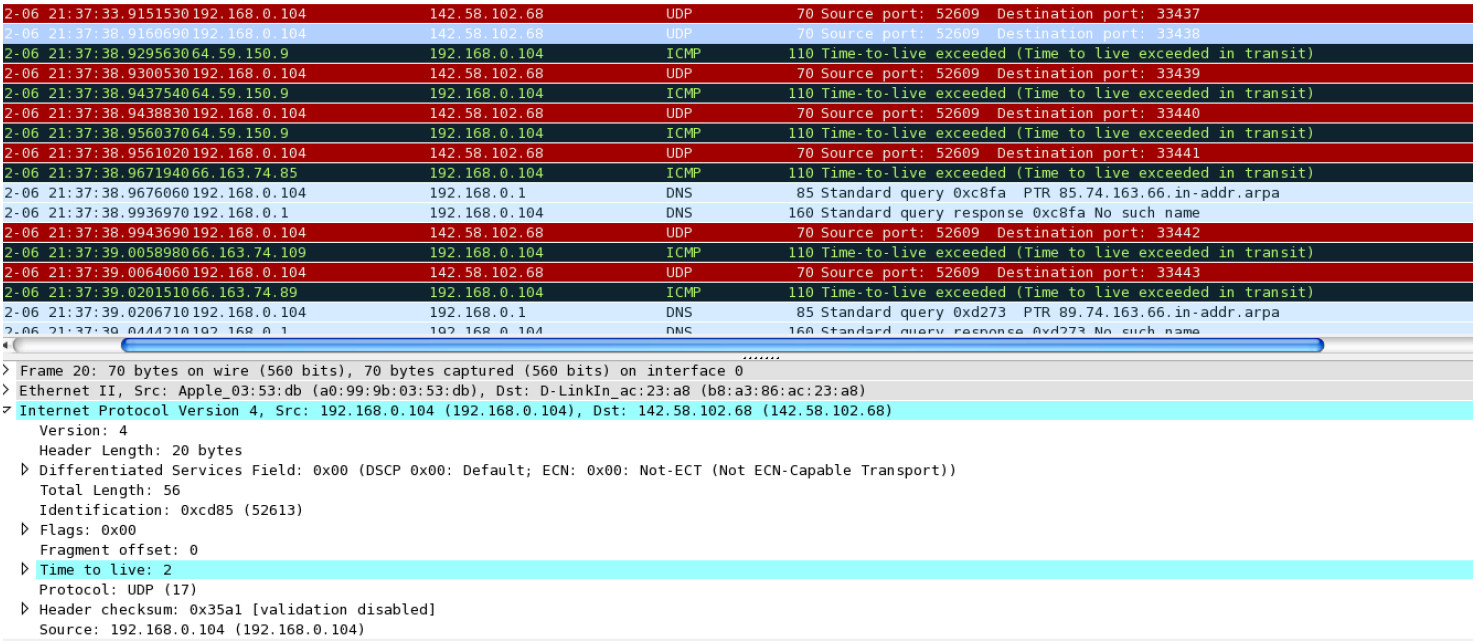
IP

1.



My computer IP address is 192.168.0.104.

2.

See the screen shot in Q1.

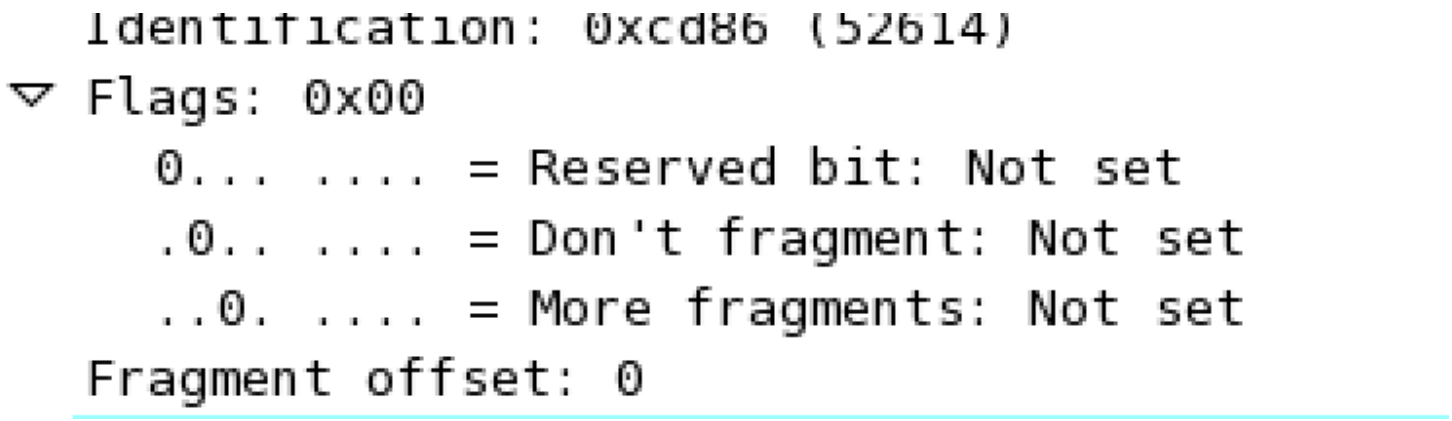
The value is UDP.

3.

See the screen shot in Q1.

Header length is 20 bytes. Payload is total length minus header length is 36 bytes.

4.



Since more fragments is not set, this IP datagram is not fragmented.

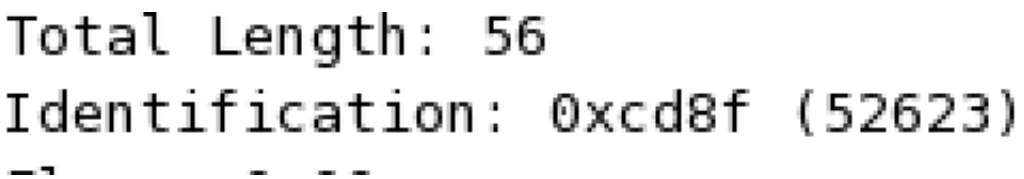
5.

Identification, time to live and checksum.

6.

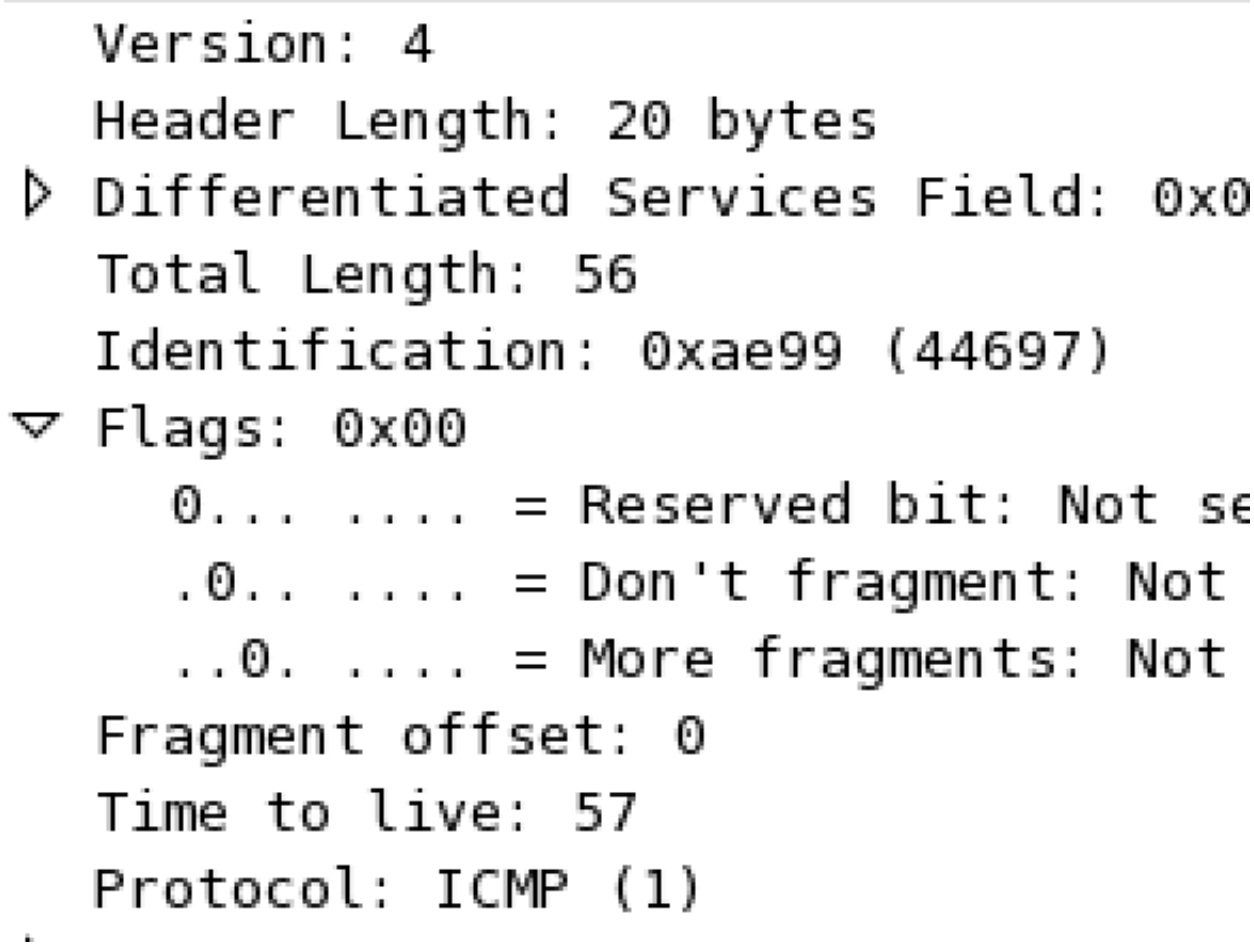
Version, header length, total length, flags, fragment offset, protocol, source and destination stay constant.
Version, header length, total length, flags, fragment offset, UDP protocol, source and destination must must stay constant. Reason are, respectively, we use IPv4, according to the protocol, we set total bytes as 56 bytes, according to protocol, datagram is not fragmented, upper layer protocol is UDP, source IP is the IP of this computer which is fixed, destination IP is also fixed.
Identification, time to live, checksum must change. The first and third change in order to distinguish each packet, the second is because the distance of the packets is going further.

7.



Identification is a 16 bits number. And the value increases by one as is in the next packet.

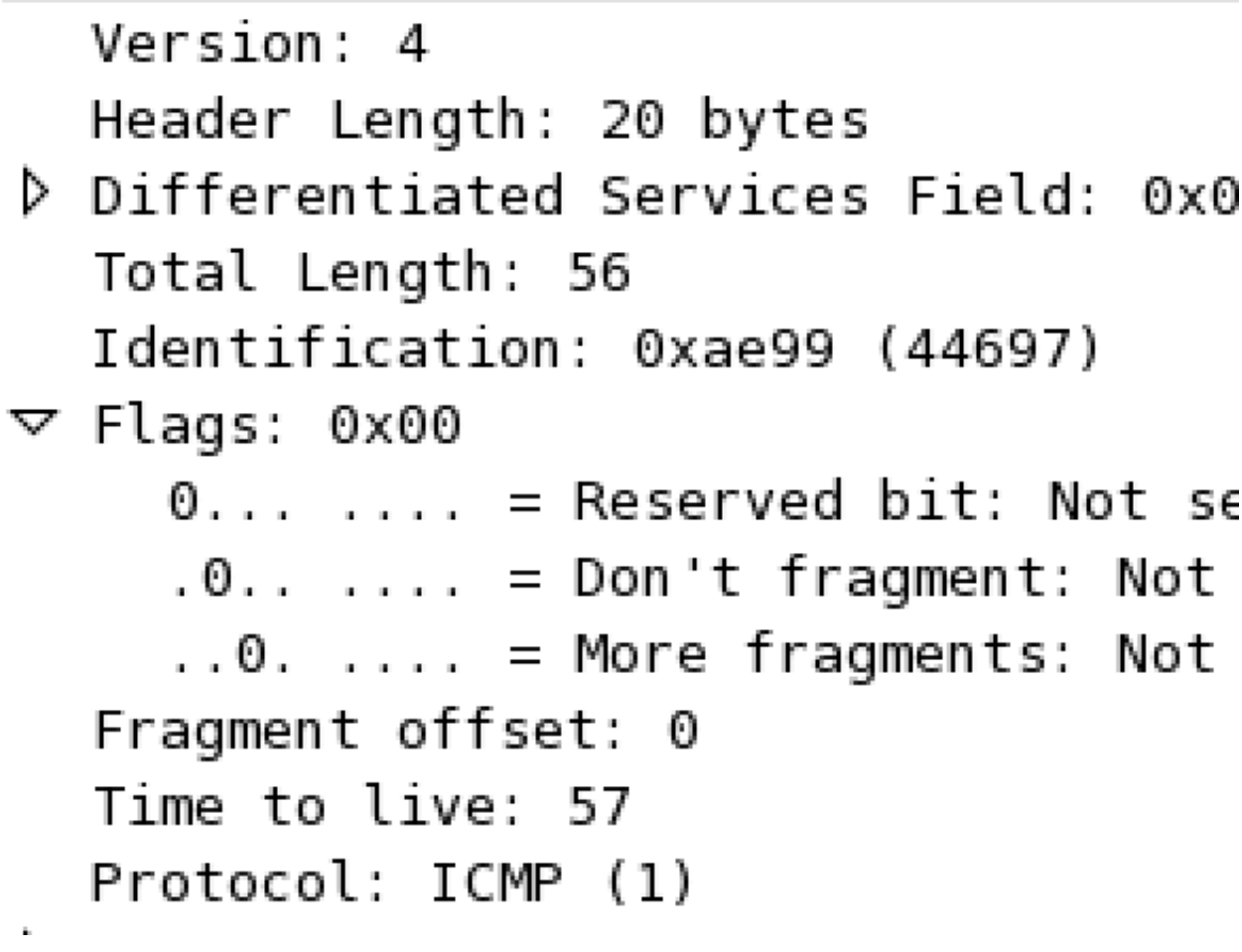
8.



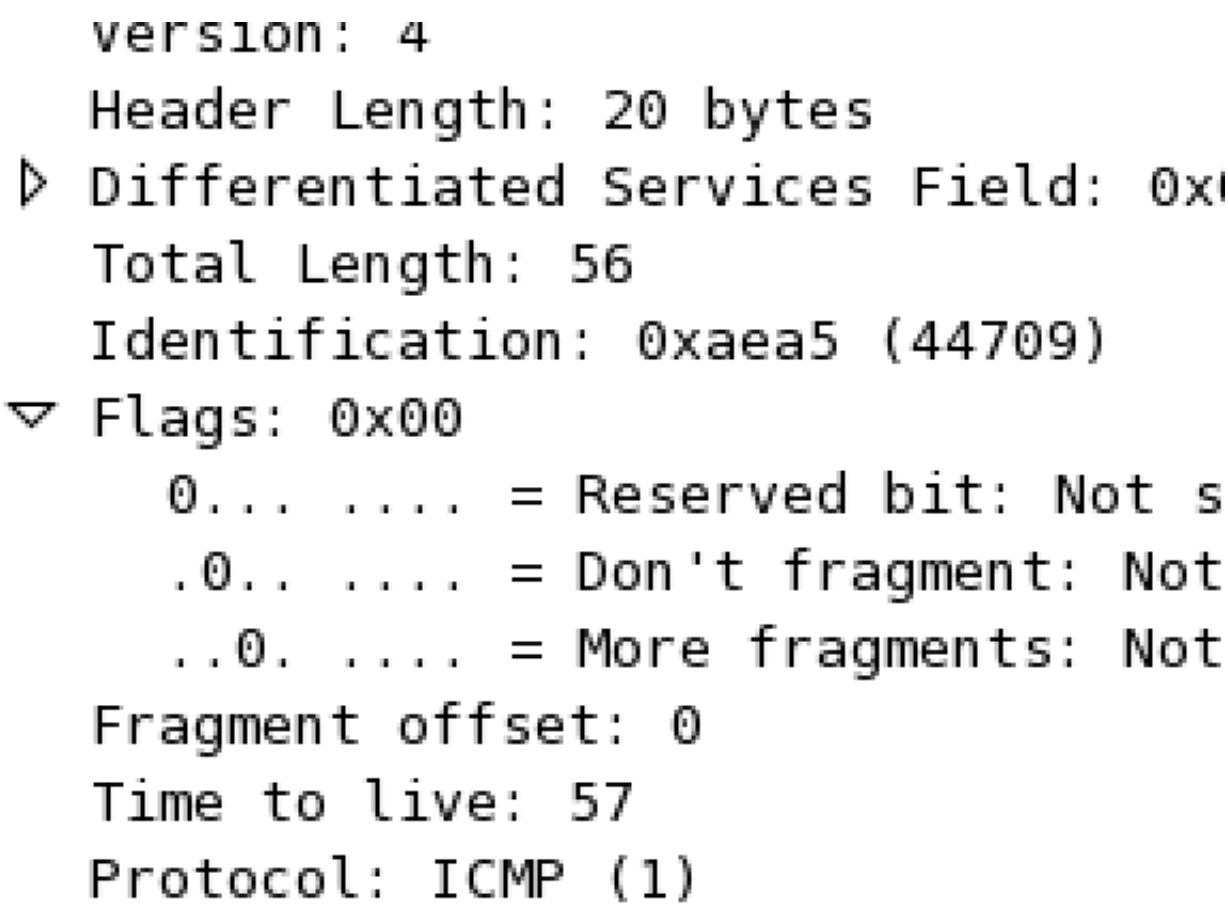
The value of Identification is 44697. The value of TTL is 57.

9.

The first packet:


Version: 4
Header Length: 20 bytes
Differentiated Services Field: 0x0
Total Length: 56
Identification: 0xae99 (44697)
Flags: 0x00
0... .... = Reserved bit: Not se
.0.. .... = Don't fragment: Not
..0. .... = More fragments: Not
Fragment offset: 0
Time to live: 57
Protocol: ICMP (1)

The



second packet:

The third packet:

```
Version: 4
Header Length: 20 bytes
▷ Differentiated Services Field: 0x00
Total Length: 56
Identification: 0xaeb4 (44724)
▽ Flags: 0x00
    0... .... = Reserved bit: Not set
    .0.. .... = Don't fragment: Not s
    ..0. .... = More fragments: Not s
Fragment offset: 0
Time to live: 57
Protocol: ICMP (1)
```

The Identifications change, but not TTL. These packets are different, and identification is used to distinguish them. But the distance remains the same, so TTL doesn't change.

10.

```
    8 2015-12-06 21:38:17.523677 192.168.0.104   142.58.102.68    UDP      534 Source port: 52648  Destination port: 334
    9 2015-12-06 21:38:17.718522 192.168.0.104   24.244.4.88      TCP       54 56336→443 [ACK] Seq=1 Ack=1 Win=4096 Len=
   10 2015-12-06 21:38:17.740925 24.244.4.88     192.168.0.104    TCP       66 [TCP ACKed unseen segment] 443→56336 [ACK
   11 2015-12-06 21:38:19.911303 192.168.0.105   255.255.255.255  DB-LSP-DI 147 Dropbox LAN sync Discovery Protocol
   12 2015-12-06 21:38:19.911306 192.168.0.105   192.168.0.255    DB-LSP-DI 147 Dropbox LAN sync Discovery Protocol
   13 2015-12-06 21:38:21.931322 192.168.0.104   216.58.216.142   TCP       54 56337→443 [ACK] Seq=1 Ack=1 Win=4103 Len=
   14 2015-12-06 21:38:21.948995 216.58.216.142  192.168.0.104    TCP       66 [TCP ACKed unseen segment] 443→56337 [ACK
   15 2015-12-06 21:38:22.523975 192.168.0.104   142.58.102.68    IPv4    1514 Fragmented IP protocol (proto=UDP 17, off
   16 2015-12-06 21:38:22.523976 192.168.0.104   142.58.102.68    UDP      534 Source port: 52648  Destination port: 334
   17 2015-12-06 21:38:27.524150 192.168.0.104   142.58.102.68    IPv4    1514 Fragmented IP protocol (proto=UDP 17, off
Frame 7: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0
Ethernet II, Src: Apple_03:53:db (a0:99:9b:03:53:db), Dst: D-LinkIn_ac:23:a8 (b8:a3:86:ac:23:a8)
Internet Protocol Version 4, Src: 192.168.0.104 (192.168.0.104), Dst: 142.58.102.68 (142.58.102.68)
    Version: 4
    Header Length: 20 bytes
  ▷ Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00: Not-ECT (Not ECN-Capable Transport))
    Total Length: 1500
    Identification: 0xcda9 (52649)
  ▽ Flags: 0x01 (More Fragments)
      0... .... = Reserved bit: Not set
      .0.. .... = Don't fragment: Not set
      ..1. .... = More fragments: Set
    Fragment offset: 0
  ▷ Time to live: 1
    Protocol: UDP (17)
```

Yes.

11.

```
▽ Internet Protocol Version 4, Src: 192.168.0.104 (192.168.0.104), Dst: 142.58.102.68 (142.58.102.68)
    Version: 4
    Header Length: 20 bytes
  ▷ Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00: Not-ECT (Not ECN-Capable Transport))
    Total Length: 1500
    Identification: 0xcdaa (52650)
  ▽ Flags: 0x01 (More Fragments)
      0... .... = Reserved bit: Not set
      .0.. .... = Don't fragment: Not set
      ..1. .... = More fragments: Set
    Fragment offset: 0
  ▷ Time to live: 1
    Protocol: UDP (17)
  ▷ Header checksum: 0x10d8 [validation disabled]
    Source: 192.168.0.104 (192.168.0.104)
    Destination: 142.58.102.68 (142.58.102.68)
    [Source GeoIP: Unknown]
    [Destination GeoIP: Unknown]
```

In the flag field, more segments is set.

The fragment offset being 0 indicates this fragment is the first.

This datagram is in total 1500 bytes.

12.

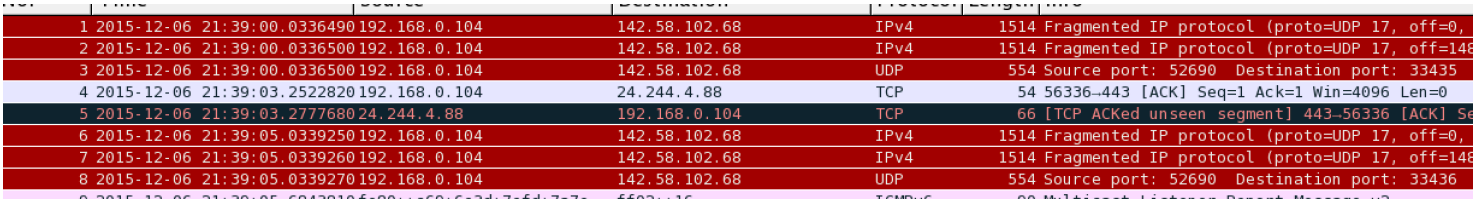
```
▽ Internet Protocol Version 4, Src: 192.168.0.104 (192.168.0.104), Dst: 142.58.102.68 (142.58.102.68)
    Version: 4
    Header Length: 20 bytes
  ▷ Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00: Not-ECT (Not ECN-Capable Transport))
    Total Length: 520
    Identification: 0xcdaa (52650)
  ▽ Flags: 0x00
      0... .... = Reserved bit: Not set
      .0.. .... = Don't fragment: Not set
      ..0. .... = More fragments: Not set
    Fragment offset: 1480
  ▷ Time to live: 1
    Protocol: UDP (17)
  ▷ Header checksum: 0x33f3 [validation disabled]
    Source: 192.168.0.104 (192.168.0.104)
    Destination: 142.58.102.68 (142.58.102.68)
    [Source GeoIP: Unknown]
    [Destination GeoIP: Unknown]
```

The fragment offset being 1480 indicates this is not the first fragment. But there is no more fragments since more fragments in this datagram is not set.

13.

Total length, flag, fragment offset, header checksum.

14.



No.	Time	Source	Destination	Protocol	Length	Info
1	2015-12-06 21:39:00.033649	0 192.168.0.104	142.58.102.68	IPv4	1514	Fragmented IP protocol (proto=UDP 17, off=0,
2	2015-12-06 21:39:00.033650	0 192.168.0.104	142.58.102.68	IPv4	1514	Fragmented IP protocol (proto=UDP 17, off=148
3	2015-12-06 21:39:00.033650	0 192.168.0.104	142.58.102.68	UDP	554	Source port: 52690 Destination port: 33435
4	2015-12-06 21:39:03.252282	0 192.168.0.104	24.244.4.88	TCP	54	56336→443 [ACK] Seq=1 Ack=1 Win=4096 Len=0
5	2015-12-06 21:39:03.277768	0 24.244.4.88	192.168.0.104	TCP	66	[TCP ACKed unseen segment] 443→56336 [ACK] Se
6	2015-12-06 21:39:05.033925	0 192.168.0.104	142.58.102.68	IPv4	1514	Fragmented IP protocol (proto=UDP 17, off=0,
7	2015-12-06 21:39:05.033926	0 192.168.0.104	142.58.102.68	IPv4	1514	Fragmented IP protocol (proto=UDP 17, off=148
8	2015-12-06 21:39:05.033927	0 192.168.0.104	142.58.102.68	UDP	554	Source port: 52690 Destination port: 33436

Totally three fragments.

15.

Flag, total length, fragment offset, header checksum.