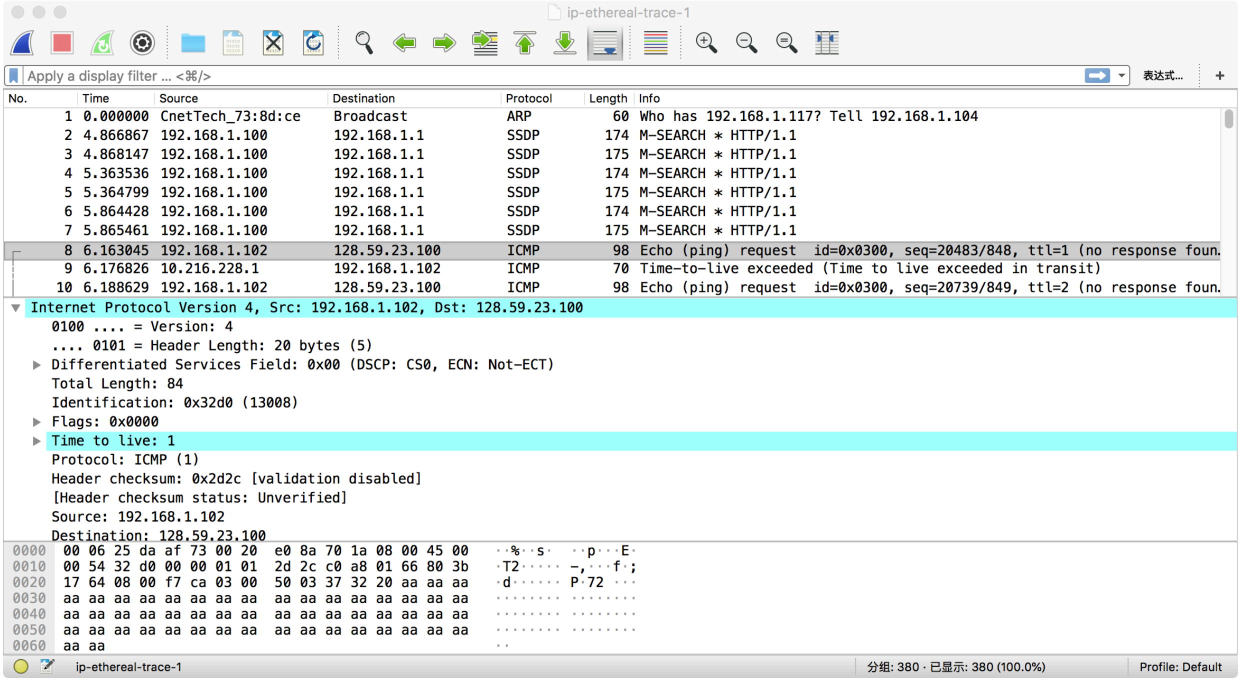
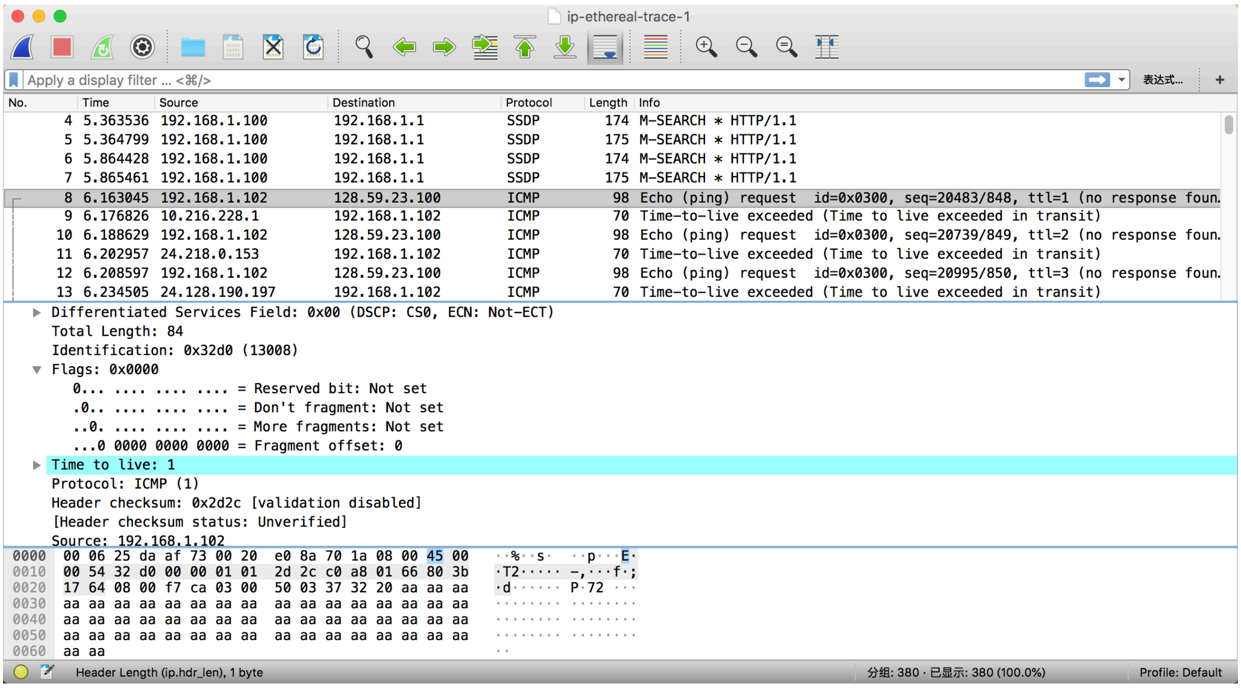
1.



```
No.  Time      Source             Destination       Protocol  Length Info
   1 0.000000  CnetTech_73:8d:ce  Broadcast         ARP           60 Who has 192.168.1.117? Tell 192.168.1.104
   2 4.866867  192.168.1.100      192.168.1.1       SSDP         174 M-SEARCH * HTTP/1.1
   3 4.868147  192.168.1.100      192.168.1.1       SSDP         175 M-SEARCH * HTTP/1.1
   4 5.363536  192.168.1.100      192.168.1.1       SSDP         174 M-SEARCH * HTTP/1.1
   5 5.364799  192.168.1.100      192.168.1.1       SSDP         175 M-SEARCH * HTTP/1.1
   6 5.864428  192.168.1.100      192.168.1.1       SSDP         174 M-SEARCH * HTTP/1.1
   7 5.865461  192.168.1.100      192.168.1.1       SSDP         175 M-SEARCH * HTTP/1.1
   8 6.163045  192.168.1.102      128.59.23.100     ICMP          98 Echo (ping) request  id=0x0300, seq=20483/848, ttl=1 (no response foun…
   9 6.176826  10.216.228.1       192.168.1.102     ICMP          70 Time-to-live exceeded (Time to live exceeded in transit)
  10 6.188629  192.168.1.102      128.59.23.100     ICMP          98 Echo (ping) request  id=0x0300, seq=20739/849, ttl=2 (no response foun…
▼ Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.59.23.100
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
  ▶ Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 84
    Identification: 0x32d0 (13008)
  ▶ Flags: 0x0000
  ▶ Time to live: 1
    Protocol: ICMP (1)
    Header checksum: 0x2d2c [validation disabled]
    [Header checksum status: Unverified]
    Source: 192.168.1.102
    Destination: 128.59.23.100
0000  00 06 25 da af 73 00 20  e0 8a 70 1a 08 00 45 00   ··%··s·  ··p···E·
0010  00 54 32 d0 00 00 01 01  2d 2c c0 a8 01 66 80 3b   ·T2·····  -,···f·;
0020  17 64 08 00 f7 ca 03 00  50 03 37 32 20 aa aa aa   ·d······  P·72 ···
0030  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········  ········
0040  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········  ········
0050  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········  ········
0060  aa aa                                              ··
ip-ethereal-trace-1                     分组: 380 · 已显示: 380 (100.0%)     Profile: Default
```

192.168.1.102

2. Protocol: ICMP(1)
3. 20 bytes in the IP header. 64 bytes in the payload of the IP datagram because total bytes are 84.
4.



```
No.  Time      Source             Destination       Protocol  Length Info
   4 5.363536  192.168.1.100      192.168.1.1       SSDP         174 M-SEARCH * HTTP/1.1
   5 5.364799  192.168.1.100      192.168.1.1       SSDP         175 M-SEARCH * HTTP/1.1
   6 5.864428  192.168.1.100      192.168.1.1       SSDP         174 M-SEARCH * HTTP/1.1
   7 5.865461  192.168.1.100      192.168.1.1       SSDP         175 M-SEARCH * HTTP/1.1
   8 6.163045  192.168.1.102      128.59.23.100     ICMP          98 Echo (ping) request  id=0x0300, seq=20483/848, ttl=1 (no response foun…
   9 6.176826  10.216.228.1       192.168.1.102     ICMP          70 Time-to-live exceeded (Time to live exceeded in transit)
  10 6.188629  192.168.1.102      128.59.23.100     ICMP          98 Echo (ping) request  id=0x0300, seq=20739/849, ttl=2 (no response foun…
  11 6.202957  24.218.0.153       192.168.1.102     ICMP          70 Time-to-live exceeded (Time to live exceeded in transit)
  12 6.208597  192.168.1.102      128.59.23.100     ICMP          98 Echo (ping) request  id=0x0300, seq=20995/850, ttl=3 (no response foun…
  13 6.234505  24.128.190.197     192.168.1.102     ICMP          70 Time-to-live exceeded (Time to live exceeded in transit)
  ▶ Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 84
    Identification: 0x32d0 (13008)
  ▼ Flags: 0x0000
      0... .... .... .... = Reserved bit: Not set
      .0.. .... .... .... = Don't fragment: Not set
      ..0. .... .... .... = More fragments: Not set
      ...0 0000 0000 0000 = Fragment offset: 0
  ▶ Time to live: 1
    Protocol: ICMP (1)
    Header checksum: 0x2d2c [validation disabled]
    [Header checksum status: Unverified]
    Source: 192.168.1.102
0000  00 06 25 da af 73 00 20  e0 8a 70 1a 08 00 45 00   ··%··s·  ··p···E·
0010  00 54 32 d0 00 00 01 01  2d 2c c0 a8 01 66 80 3b   ·T2·····  -,···f·;
0020  17 64 08 00 f7 ca 03 00  50 03 37 32 20 aa aa aa   ·d······  P·72 ···
0030  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········  ········
0040  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········  ········
0050  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········  ········
0060  aa aa                                              ··
Header Length (ip.hdr_len), 1 byte      分组: 380 · 已显示: 380 (100.0%)     Profile: Default
```

fragment offset = 0 , so data is not fragmented.

5. Identification, Time to live and Header checksum

6. stay constant:

   Version(all packets are IPv4),

   header length(ICMP packets)

   source IP(the same source)

   destination IP(the same destination)

   Differentiated Services(ICMP use the same Type of Service class)

   Upper Layer Protocal(ICMP packets)

   must stay constant:

   Version(all packets are IPv4)

   header length(ICMP packets)

   source IP(the same source)

   destination IP(the same destination)

   Differentiated Services(ICMP use the same Type of Service class)

   Upper Layer Protocol (ICMP packets)

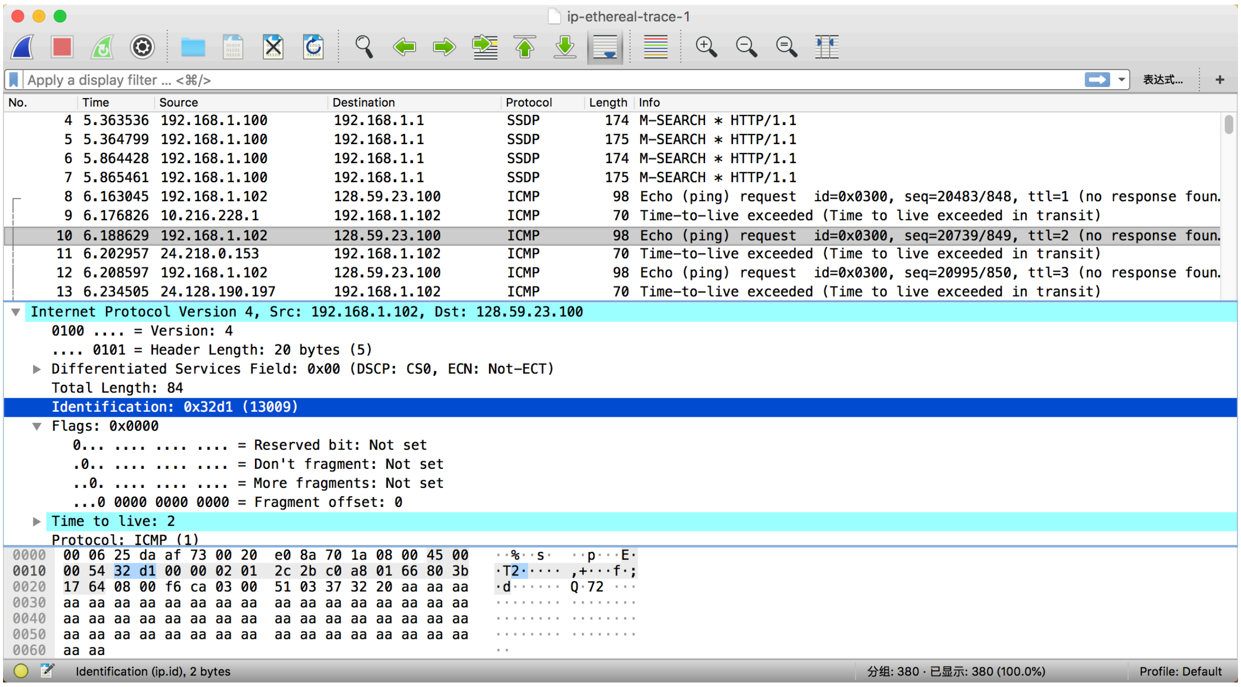
   must change:

   Identification(IP packets must have different ids)

   Time to live(traceroute increase)

   Header checksum(header changes)

7.



```
No.  Time      Source          Destination    Protocol Length Info
   4 5.363536  192.168.1.100   192.168.1.1    SSDP      174 M-SEARCH * HTTP/1.1
   5 5.364799  192.168.1.100   192.168.1.1    SSDP      175 M-SEARCH * HTTP/1.1
   6 5.864428  192.168.1.100   192.168.1.1    SSDP      174 M-SEARCH * HTTP/1.1
   7 5.865461  192.168.1.100   192.168.1.1    SSDP      175 M-SEARCH * HTTP/1.1
   8 6.163045  192.168.1.102   128.59.23.100  ICMP       98 Echo (ping) request  id=0x0300, seq=20483/848, ttl=1 (no response foun.
   9 6.176826  10.216.228.1    192.168.1.102  ICMP       70 Time-to-live exceeded (Time to live exceeded in transit)
  10 6.188629  192.168.1.102   128.59.23.100  ICMP       98 Echo (ping) request  id=0x0300, seq=20739/849, ttl=2 (no response foun.
  11 6.202957  24.218.0.153    192.168.1.102  ICMP       70 Time-to-live exceeded (Time to live exceeded in transit)
  12 6.208597  192.168.1.102   128.59.23.100  ICMP       98 Echo (ping) request  id=0x0300, seq=20995/850, ttl=3 (no response foun.
  13 6.234505  24.128.190.197  192.168.1.102  ICMP       70 Time-to-live exceeded (Time to live exceeded in transit)
```

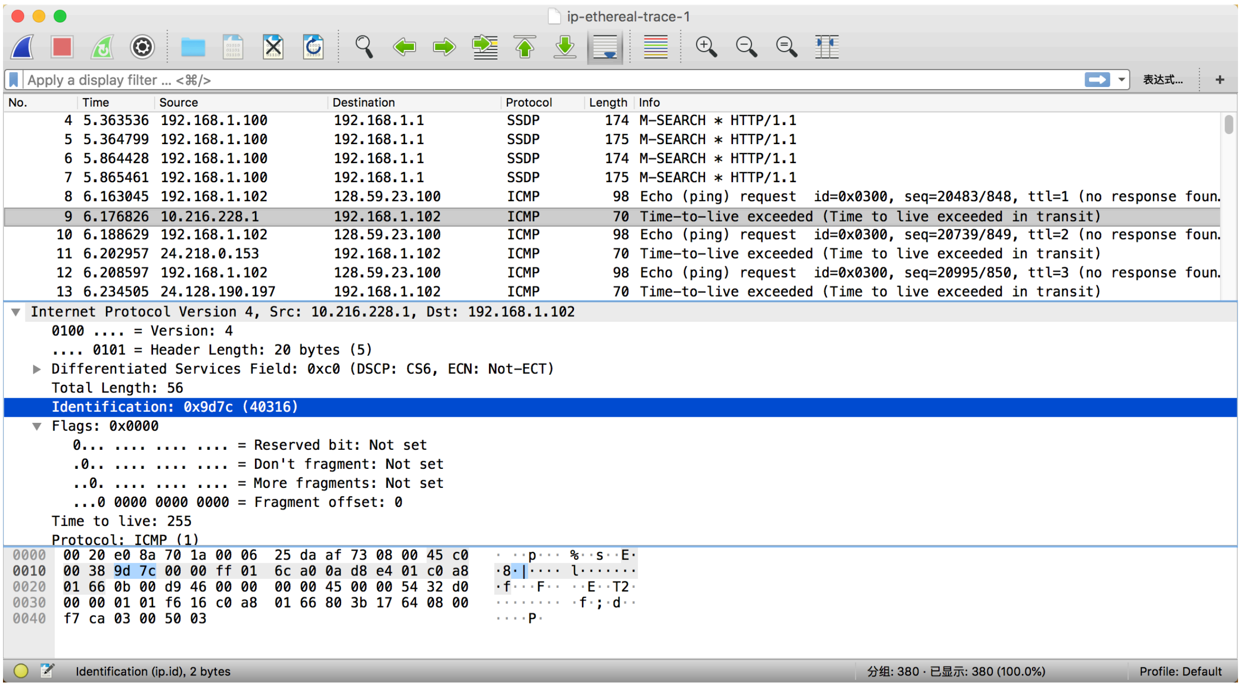
```
▼ Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.59.23.100
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
  ▶ Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 84
    Identification: 0x32d1 (13009)
  ▼ Flags: 0x0000
      0... .... .... .... = Reserved bit: Not set
      .0.. .... .... .... = Don't fragment: Not set
      ..0. .... .... .... = More fragments: Not set
      ...0 0000 0000 0000 = Fragment offset: 0
  ▶ Time to live: 2
    Protocol: ICMP (1)
```

```
0000  00 06 25 da af 73 00 20  e0 8a 70 1a 08 00 45 00   ··%··s·   ··p···E·
0010  00 54 32 d1 00 00 02 01  2c 2b c0 a8 01 66 80 3b   ·T2·····  ,+···f·;
0020  17 64 08 00 f6 ca 03 00  51 03 37 32 20 aa aa aa   ·d······  Q·72 ···
0030  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········  ········
0040  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········  ········
0050  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········  ········
0060  aa aa                                              ··
```

Identification (ip.id), 2 bytes   分组: 380 · 已显示: 380 (100.0%)   Profile: Default

Identification fields increase with each ICMP ping request.

8.



```
No.     Time      Source          Destination     Protocol  Length  Info
      4 5.363536  192.168.1.100   192.168.1.1     SSDP       174  M-SEARCH * HTTP/1.1
      5 5.364799  192.168.1.100   192.168.1.1     SSDP       175  M-SEARCH * HTTP/1.1
      6 5.864428  192.168.1.100   192.168.1.1     SSDP       174  M-SEARCH * HTTP/1.1
      7 5.865461  192.168.1.100   192.168.1.1     SSDP       175  M-SEARCH * HTTP/1.1
      8 6.163045  192.168.1.102   128.59.23.100   ICMP        98  Echo (ping) request  id=0x0300, seq=20483/848, ttl=1 (no response foun.
      9 6.176826  10.216.228.1    192.168.1.102   ICMP        70  Time-to-live exceeded (Time to live exceeded in transit)
     10 6.188629  192.168.1.102   128.59.23.100   ICMP        98  Echo (ping) request  id=0x0300, seq=20739/849, ttl=2 (no response foun.
     11 6.202957  24.218.0.153    192.168.1.102   ICMP        70  Time-to-live exceeded (Time to live exceeded in transit)
     12 6.208597  192.168.1.102   128.59.23.100   ICMP        98  Echo (ping) request  id=0x0300, seq=20995/850, ttl=3 (no response foun.
     13 6.234505  24.128.190.197  192.168.1.102   ICMP        70  Time-to-live exceeded (Time to live exceeded in transit)
▼ Internet Protocol Version 4, Src: 10.216.228.1, Dst: 192.168.1.102
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
  ▶ Differentiated Services Field: 0xc0 (DSCP: CS6, ECN: Not-ECT)
    Total Length: 56
    Identification: 0x9d7c (40316)
  ▼ Flags: 0x0000
      0... .... .... .... = Reserved bit: Not set
      .0.. .... .... .... = Don't fragment: Not set
      ..0. .... .... .... = More fragments: Not set
      ...0 0000 0000 0000 = Fragment offset: 0
    Time to live: 255
    Protocol: ICMP (1)
0000  00 20 e0 8a 70 1a 00 06  25 da af 73 08 00 45 c0   · ··p··· %··s··E·
0010  00 38 9d 7c 00 00 ff 01  6c a0 0a d8 e4 01 c0 a8   ·8·|···· l·······
0020  01 66 0b 00 d9 46 00 00  00 00 45 00 00 54 32 d0   ·f···F·· ··E··T2·
0030  00 00 01 01 f6 16 c0 a8  01 66 80 3b 17 64 08 00   ········ ·f·;·d··
0040  f7 ca 03 00 50 03                                  ····P·
```

Identification (ip.id), 2 bytes
分组: 380 · 已显示: 380 (100.0%)
Profile: Default

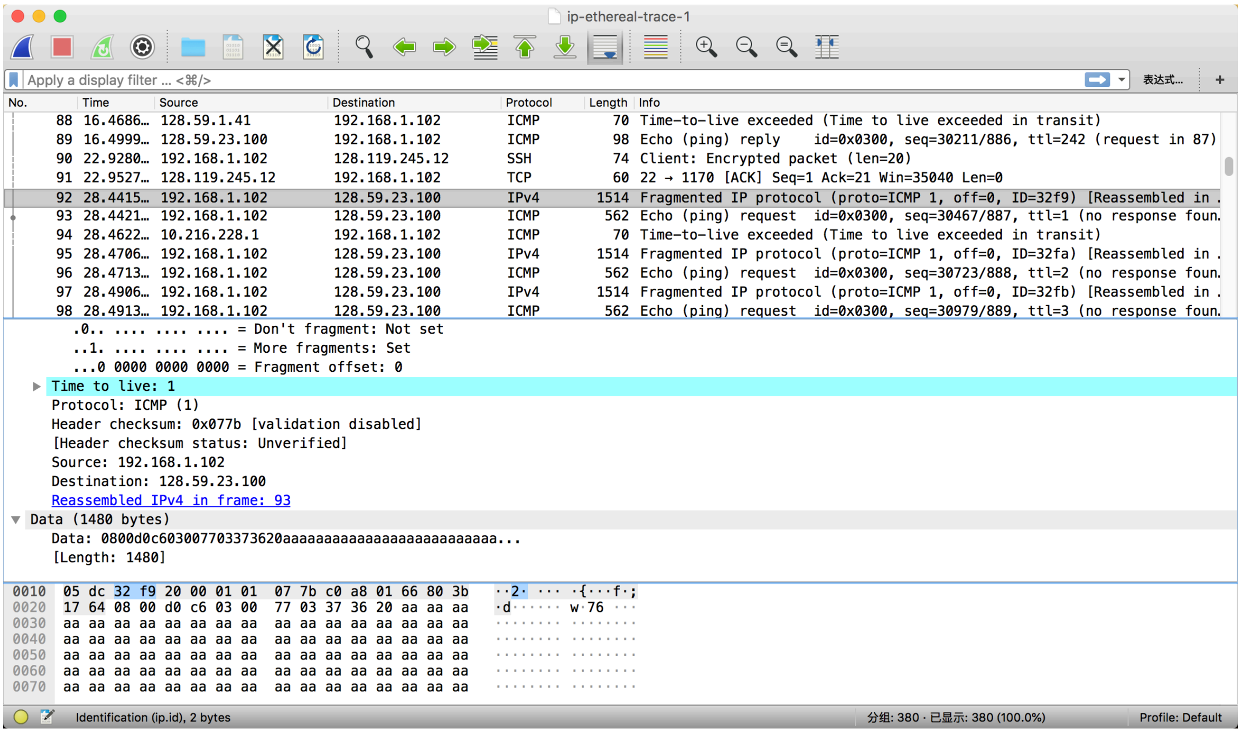
Identification is 40316

TTL is 255

9.Identification changes always because it's a unique value.The same identification means fragments of one. TTL doesn't change because the first hop router is always the same.

10.Yes

11.



```
No.     Time       Source          Destination     Protocol  Length  Info
     88 16.4686…   128.59.1.41     192.168.1.102   ICMP        70  Time-to-live exceeded (Time to live exceeded in transit)
     89 16.4999…   128.59.23.100   192.168.1.102   ICMP        98  Echo (ping) reply    id=0x0300, seq=30211/886, ttl=242 (request in 87)
     90 22.9280…   192.168.1.102   128.119.245.12  SSH         74  Client: Encrypted packet (len=20)
     91 22.9527…   128.119.245.12  192.168.1.102   TCP         60  22 → 1170 [ACK] Seq=1 Ack=21 Win=35040 Len=0
     92 28.4415…   192.168.1.102   128.59.23.100   IPv4      1514  Fragmented IP protocol (proto=ICMP 1, off=0, ID=32f9) [Reassembled in .
     93 28.4421…   192.168.1.102   128.59.23.100   ICMP       562  Echo (ping) request  id=0x0300, seq=30467/887, ttl=1 (no response foun.
     94 28.4622…   10.216.228.1    192.168.1.102   ICMP        70  Time-to-live exceeded (Time to live exceeded in transit)
     95 28.4706…   192.168.1.102   128.59.23.100   IPv4      1514  Fragmented IP protocol (proto=ICMP 1, off=0, ID=32fa) [Reassembled in .
     96 28.4713…   192.168.1.102   128.59.23.100   ICMP       562  Echo (ping) request  id=0x0300, seq=30723/888, ttl=2 (no response foun.
     97 28.4906…   192.168.1.102   128.59.23.100   IPv4      1514  Fragmented IP protocol (proto=ICMP 1, off=0, ID=32fb) [Reassembled in .
     98 28.4913…   192.168.1.102   128.59.23.100   ICMP       562  Echo (ping) request  id=0x0300, seq=30979/889, ttl=3 (no response foun.
      .0.. .... .... .... = Don't fragment: Not set
      ..1. .... .... .... = More fragments: Set
      ...0 0000 0000 0000 = Fragment offset: 0
  ▶ Time to live: 1
    Protocol: ICMP (1)
    Header checksum: 0x077b [validation disabled]
    [Header checksum status: Unverified]
    Source: 192.168.1.102
    Destination: 128.59.23.100
    Reassembled IPv4 in frame: 93
▼ Data (1480 bytes)
    Data: 0800d0c603007703373620aaaaaaaaaaaaaaaaaaaaaaaa...
    [Length: 1480]
0010  05 dc 32 f9 20 00 01 01  07 7b c0 a8 01 66 80 3b   ··2· ··· ·{···f·;
0020  17 64 08 00 d0 c6 03 00  77 03 37 36 20 aa aa aa   ·d······ w·76 ···
0030  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········ ········
0040  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········ ········
0050  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········ ········
0060  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········ ········
0070  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········ ········
```

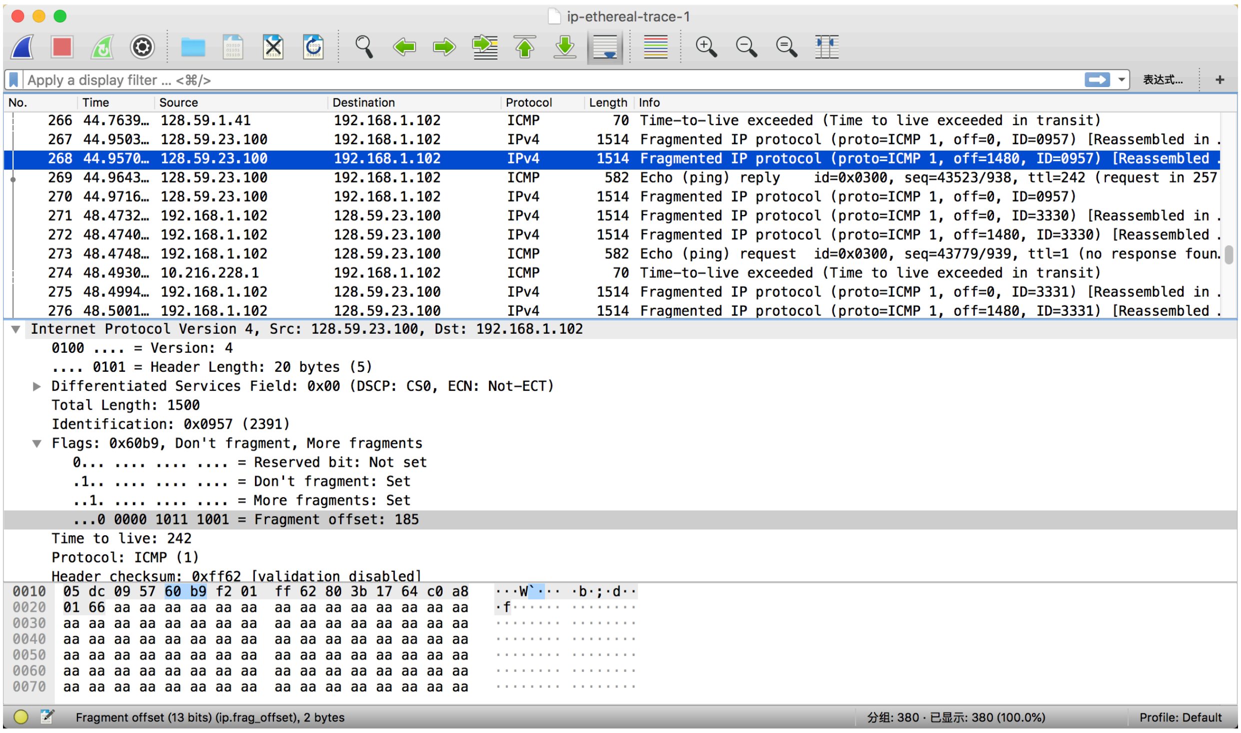
Identification (ip.id), 2 bytes
分组: 380 · 已显示: 380 (100.0%)
Profile: Default

information1 : More fragments

information2 : offset is 0

total length : 1480

12.



```
No.  Time       Source         Destination    Protocol  Length  Info
 266 44.7639…  128.59.1.41    192.168.1.102  ICMP        70  Time-to-live exceeded (Time to live exceeded in transit)
 267 44.9503…  128.59.23.100  192.168.1.102  IPv4      1514  Fragmented IP protocol (proto=ICMP 1, off=0, ID=0957) [Reassembled in .
 268 44.9570…  128.59.23.100  192.168.1.102  IPv4      1514  Fragmented IP protocol (proto=ICMP 1, off=1480, ID=0957) [Reassembled .
 269 44.9643…  128.59.23.100  192.168.1.102  ICMP       582  Echo (ping) reply    id=0x0300, seq=43523/938, ttl=242 (request in 257
 270 44.9716…  128.59.23.100  192.168.1.102  IPv4      1514  Fragmented IP protocol (proto=ICMP 1, off=0, ID=0957)
 271 48.4732…  192.168.1.102  128.59.23.100  IPv4      1514  Fragmented IP protocol (proto=ICMP 1, off=0, ID=3330) [Reassembled in .
 272 48.4740…  192.168.1.102  128.59.23.100  IPv4      1514  Fragmented IP protocol (proto=ICMP 1, off=1480, ID=3330) [Reassembled .
 273 48.4748…  192.168.1.102  128.59.23.100  ICMP       582  Echo (ping) request  id=0x0300, seq=43779/939, ttl=1 (no response foun.
 274 48.4930…  10.216.228.1   192.168.1.102  ICMP        70  Time-to-live exceeded (Time to live exceeded in transit)
 275 48.4994…  192.168.1.102  128.59.23.100  IPv4      1514  Fragmented IP protocol (proto=ICMP 1, off=0, ID=3331) [Reassembled in .
 276 48.5001…  192.168.1.102  128.59.23.100  IPv4      1514  Fragmented IP protocol (proto=ICMP 1, off=1480, ID=3331) [Reassembled .
```

```
▼ Internet Protocol Version 4, Src: 128.59.23.100, Dst: 192.168.1.102
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
  ▶ Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 1500
    Identification: 0x0957 (2391)
  ▼ Flags: 0x60b9, Don't fragment, More fragments
      0... .... .... .... = Reserved bit: Not set
      .1.. .... .... .... = Don't fragment: Set
      ..1. .... .... .... = More fragments: Set
      ...0 0000 1011 1001 = Fragment offset: 185
    Time to live: 242
    Protocol: ICMP (1)
    Header checksum: 0xff62 [validation disabled]
```

```
0010  05 dc 09 57 60 b9 f2 01  ff 62 80 3b 17 64 c0 a8   ···W`···  ·b·;·d··
0020  01 66 aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ·f······  ········
0030  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········  ········
0040  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········  ········
0050  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········  ········
0060  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········  ········
0070  aa aa aa aa aa aa aa aa  aa aa aa aa aa aa aa aa   ········  ········
```

```
Fragment offset (13 bits) (ip.frag_offset), 2 bytes      分组: 380 · 已显示: 380 (100.0%)      Profile: Default
```

fragments offset is 185. There are more fragments because more fragments is set.

13.The IP header fields that changed between the fragments are: total length,flags, fragment offset, and checksum.

14. 3 packets are created
15. fragment offset, checksum, total length, flags