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37839	2019-11-16	19:10:45.323259	192.168.1.249	128.119.245.12	ICMP	70 Echo (ping) request id=0x0001, seq=1063/9988, ttl=6 (no response found)
37840	2019-11-16	19:10:45.339384	64.15.0.76	192.168.1.249	ICMP	110 Time-to-live exceeded (Time to live exceeded in transit)
37841	2019-11-16	19:10:45.374194	192.168.1.249	128.119.245.12	ICMP	70 Echo (ping) request id=0x0001, seq=1064/10244, ttl=7 (no response found)
37842	2019-11-16	19:10:45.393123	96.87.8.97	192.168.1.249	ICMP	110 Time-to-live exceeded (Time to live exceeded in transit)
37843	2019-11-16	19:10:45.424931	192.168.1.249	128.119.245.12	ICMP	70 Echo (ping) request id=0x0001, seq=1065/10500, ttl=8 (no response found)
37844	2019-11-16	19:10:45.438443	68.86.83.89	192.168.1.249	ICMP	110 Time-to-live exceeded (Time to live exceeded in transit)
37845	2019-11-16	19:10:45.475995	192.168.1.249	128.119.245.12	ICMP	70 Echo (ping) request id=0x0001, seq=1066/10756, ttl=9 (no response found)
37846	2019-11-16	19:10:45.494691	68.86.90.218	192.168.1.249	ICMP	110 Time-to-live exceeded (Time to live exceeded in transit)
37847	2019-11-16	19:10:45.526079	192.168.1.249	128.119.245.12	ICMP	70 Echo (ping) request id=0x0001, seq=1067/11012, ttl=10 (no response found)
37848	2019-11-16	19:10:45.549634	162.151.53.214	192.168.1.249	ICMP	98 Time-to-live exceeded (Time to live exceeded in transit)
37849	2019-11-16	19:10:45.577018	192.168.1.249	128.119.245.12	ICMP	70 Echo (ping) request id=0x0001, seq=1068/11268, ttl=11 (no response found)
37850	2019-11-16	19:10:45.598620	96.108.44.226	192.168.1.249	ICMP	110 Time-to-live exceeded (Time to live exceeded in transit)
37851	2019-11-16	19:10:45.627355	192.168.1.249	128.119.245.12	ICMP	70 Echo (ping) request id=0x0001, seq=1069/11524, ttl=12 (no response found)
37852	2019-11-16	19:10:45.648701	50.222.38.42	192.168.1.249	ICMP	70 Time-to-live exceeded (Time to live exceeded in transit)
37853	2019-11-16	19:10:45.677808	192.168.1.249	128.119.245.12	ICMP	70 Echo (ping) request id=0x0001, seq=1070/11780, ttl=13 (no response found)
37854	2019-11-16	19:10:45.698945	192.80.83.113	192.168.1.249	ICMP	70 Time-to-live exceeded (Time to live exceeded in transit)
37855	2019-11-16	19:10:45.727796	192.168.1.249	128.119.245.12	ICMP	70 Echo (ping) request id=0x0001, seq=1071/12036, ttl=14 (no response found)
37856	2019-11-16	19:10:45.747961	128.119.0.10	192.168.1.249	ICMP	70 Time-to-live exceeded (Time to live exceeded in transit)
37857	2019-11-16	19:10:45.777765	192.168.1.249	128.119.245.12	ICMP	70 Echo (ping) request id=0x0001, seq=1072/12292, ttl=15 (no response found)
37858	2019-11-16	19:10:45.797703	128.119.3.32	192.168.1.249	ICMP	70 Time-to-live exceeded (Time to live exceeded in transit)

- 1) The IP of my computer is 192.168.1.102.

No.	Time	Source	Destination	Protocol	Length	Info
37827	2019-11-16	19:10:45.222576	192.168.1.249	ICMP	70	Echo (ping) request id=0x0001, seq=1061/9476, ttl=6 (no response found)
37828	2019-11-16	19:10:45.228198	77.2.18.37	TCP	64	53532 → 6881 [ACK] Seq=325 Ack=141602 Win=262656 Len=0
37829	2019-11-16	19:10:45.228591	77.2.18.37	TCP	64	53532 → 6881 [ACK] Seq=325 Ack=143094 Win=262656 Len=0
37830	2019-11-16	19:10:45.233049	67.83.221.24	ICMP	110	Time-to-live exceeded (Time to live exceeded in transit)
37831	2019-11-16	19:10:45.264429	78.97.203.221	TCP	64	49769 → 6881 [ACK] Seq=192 Ack=185385 Win=1026 Len=0
37832	2019-11-16	19:10:45.264429	78.97.203.221	TCP	64	49769 → 6881 [ACK] Seq=192 Ack=186941 Win=1026 Len=0
37833	2019-11-16	19:10:45.272586	192.168.1.249	ICMP	70	Echo (ping) request id=0x0001, seq=1062/9732, ttl=7 (no response found)
37834	2019-11-16	19:10:45.277372	181.117.48.64	TCP	64	1917 → 6881 [ACK] Seq=192 Ack=183957 Win=259 Len=0
37835	2019-11-16	19:10:45.278363	181.117.48.64	TCP	64	1917 → 6881 [ACK] Seq=192 Ack=185369 Win=259 Len=0
37836	2019-11-16	19:10:45.278557	181.117.48.64	TCP	64	1917 → 6881 [ACK] Seq=192 Ack=186781 Win=259 Len=0
37837	2019-11-16	19:10:45.278557	181.117.48.64	TCP	64	1917 → 6881 [ACK] Seq=192 Ack=186941 Win=258 Len=0
37838	2019-11-16	19:10:45.283022	65.19.99.248	ICMP	110	Time-to-live exceeded (Time to live exceeded in transit)
37839	2019-11-16	19:10:45.323259	192.168.1.249	ICMP	70	Echo (ping) request id=0x0001, seq=1063/9988, ttl=6 (no response found)
37840	2019-11-16	19:10:45.339384	64.15.0.76	ICMP	110	Time-to-live exceeded (Time to live exceeded in transit)
37841	2019-11-16	19:10:45.374194	192.168.1.249	ICMP	70	Echo (ping) request id=0x0001, seq=1064/10244, ttl=7 (no response found)
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37844	2019-11-16	19:10:45.438443	68.86.83.89	ICMP	110	Time-to-live exceeded (Time to live exceeded in transit)
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37849	2019-11-16	19:10:45.577018	192.168.1.249	ICMP	70	Echo (ping) request id=0x0001, seq=1068/11268, ttl=11 (no response found)
37850	2019-11-16	19:10:45.598620	96.108.44.226	ICMP	110	Time-to-live exceeded (Time to live exceeded in transit)
0100 = Version: 4						
.... 0101 = Header Length: 20 bytes (5)						
> Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)						
Total Length: 56						
Identification: 0x7b90 (31632)						
> Time to live: 6						
Protocol: ICMP (1)						
Header checksum: 0x0110 [validation disabled]						
[Header checksum status: Unverified]						
Source: 192.168.1.249						
Destination: 128.119.245.12						
> Internet Control Message Protocol						

- 2) The Value of the upper layer protocol is 1

- 3) The Ip header length is 20 bytes and the data length is 36. The data of 56 bytes minus the ip header length of 20 is 36.

```
Total Length: 56
Identification: 0x7b90 (31632)
▼ 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: 6
```

- 4) The fragment bit is 0.

```
Total Length: 96
Identification: 0x5b97 (23447)
▼ 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: 251
Protocol: ICMP (1)
Header checksum: 0xfc58 [validation disabled]
[Header checksum status: Unverified]
Source: 65.19.99.248
Destination: 192.168.1.249
```

```
Total Length: 96
Identification: 0x6cb2 (27826)
▼ 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: 249
Protocol: ICMP (1)
Header checksum: 0x2991 [validation disabled]
[Header checksum status: Unverified]
Source: 96.87.8.97
Destination: 192.168.1.249
```

- 5) The time to live field changes within each ip packet.
- 6) Source IP, Dest IP, IPv4 Version, header length, the fields that should stay constant. The version, header length, destination ip and what needed to be change are the identification, time to

live, header checksum. The reason why identification TTL and header checksum changes because ip have different id, time to live increments for each packet and the checksum header changes.

```
Internet Protocol Version 4, Src: 192.168.1.249, Dst: 128.119.245.12
  0100 .... = Version: 4
  .... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 56
    Identification: 0x7bb9 (31673)
  ▾ 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

  ▾ Internet Protocol Version 4, Src: 192.168.1.249, Dst: 128.119.245.12
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
    > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
      Total Length: 56
      Identification: 0x7bb8 (31672)
    ▾ 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: 10
```

7) The identification value increment from 31672 to 31673.

```
0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
> Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
  Total Length: 56
  Identification: 0x7bb8 (31672)
▾ 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: 10
Protocol: ICMP (1)
Header checksum: 0xfce7 [validation disabled]
Pseudo header checksum: 0xfce7 [validation disabled]
```

8)

The identification is 31672 and the Time too live is 10.

9) The value changes because the identification is a unique value. If the ip datagram is the same, then the fragments part of a large IP datagram.

10) Looking at each specific packet , it look the the packet has been fragmented.

11) The packet is 520 length

```
0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
> Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
Total Length: 520
Identification: 0xe3f7 (58359)
✓ Flags: 0x00b9
  0... .. = Reserved bit: Not set
  .0.. .. = Don't fragment: Not set
  ..0. .. = More fragments: Not set
  ...0 0000 1011 1001 = Fragment offset: 185
> Time to live: 3
Protocol: ICMP (1)
Header checksum: 0x991f [validation disabled]
```

12) The fragment offset is greater 0, which the data is fragmented.

13) flags, Total length, and checksum, fragment offset.

No.	Time	Source	Destination	Protocol	Length	Info
12946	2019-11-16 20:13:28.826543	128.119.245.12	192.168.1.249	ICMP	534	Echo (ping) reply id=0x0001, seq=27916/3181, ttl=48 (request in 12940)
12940	2019-11-16 20:13:28.803670	192.168.1.249	128.119.245.12	ICMP	534	Echo (ping) request id=0x0001, seq=27916/3181, ttl=17 (reply in 12946)
12937	2019-11-16 20:13:28.793652	192.168.1.249	128.119.245.12	ICMP	534	Echo (ping) request id=0x0001, seq=27915/2925, ttl=16 (no response found!)
12933	2019-11-16 20:13:28.727291	128.119.3.32	192.168.1.249	ICMP	70	Time-to-live exceeded (Time to live exceeded in transit)
12931	2019-11-16 20:13:28.705149	192.168.1.249	128.119.245.12	ICMP	534	Echo (ping) request id=0x0001, seq=27914/2609, ttl=15 (no response found!)
12929	2019-11-16 20:13:28.683018	128.119.0.10	192.168.1.249	ICMP	70	Time-to-live exceeded (Time to live exceeded in transit)
12917	2019-11-16 20:13:28.653207	192.168.1.249	128.119.245.12	ICMP	534	Echo (ping) request id=0x0001, seq=27913/2413, ttl=14 (no response found!)
12915	2019-11-16 20:13:28.626395	192.80.83.113	192.168.1.249	ICMP	70	Time-to-live exceeded (Time to live exceeded in transit)
12914	2019-11-16 20:13:28.603229	192.168.1.249	128.119.245.12	ICMP	534	Echo (ping) request id=0x0001, seq=27912/2157, ttl=13 (no response found!)
12905	2019-11-16 20:13:28.576114	50.222.38.42	192.168.1.249	ICMP	70	Time-to-live exceeded (Time to live exceeded in transit)
12902	2019-11-16 20:13:28.552625	192.168.1.249	128.119.245.12	ICMP	534	Echo (ping) request id=0x0001, seq=27911/1901, ttl=12 (no response found!)
12899	2019-11-16 20:13:28.525571	96.108.44.226	192.168.1.249	ICMP	110	Time-to-live exceeded (Time to live exceeded in transit)
12898	2019-11-16 20:13:28.502151	192.168.1.249	128.119.245.12	ICMP	534	Echo (ping) request id=0x0001, seq=27910/1645, ttl=11 (no response found!)

14) Look like 3 packets were created judging by the offset and data length.

```
✓ Internet Protocol Version 4, Src: 192.168.1.249, Dst: 128.119.245.12
  0100 .... = Version: 4
  .... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0x20 (DSCP: CS1, ECN: Not-ECT)
  Total Length: 1500
  Identification: 0xe46d (58477)
  ✓ Flags: 0x2000, More fragments
    0... .. = Reserved bit: Not set
    .0.. .. = Don't fragment: Not set
    ..1. .... = More fragments: Set
    ...0 0000 0000 0000 = Fragment offset: 0
  > Time to live: 1
```

15) The fragment offset and the checksum has field, and the third packet of the packet total length.