Lab10

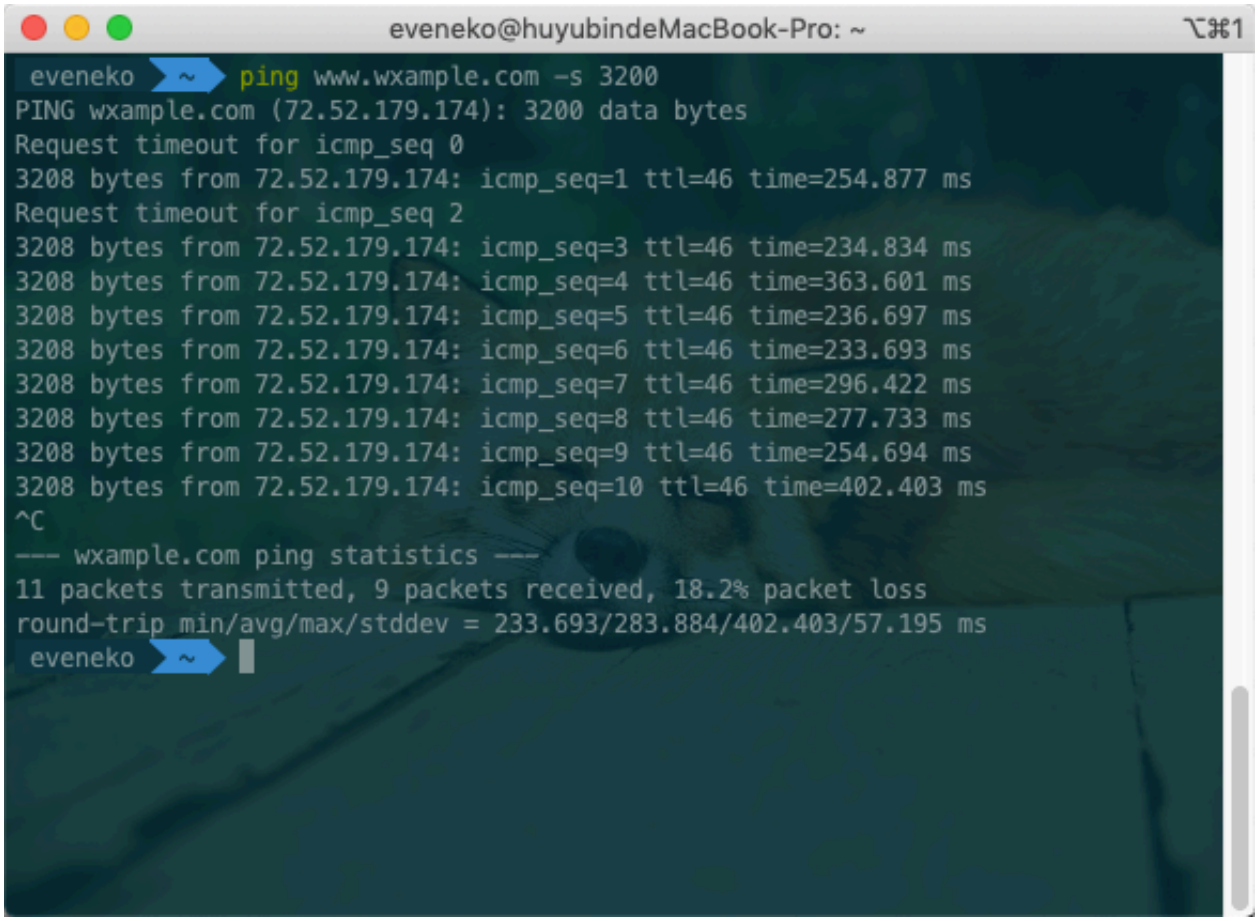
Name: 胡玉斌

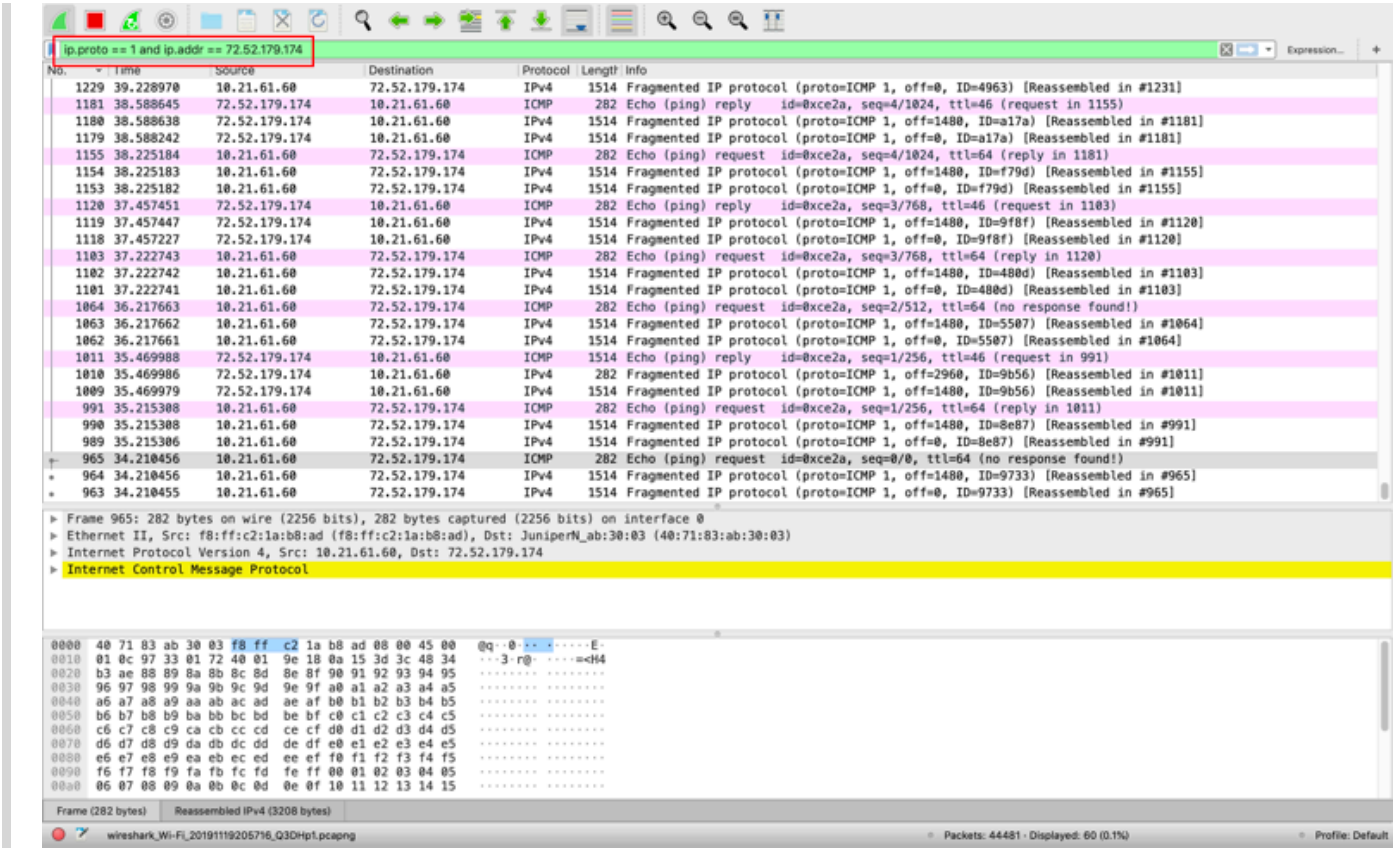
ID: 11712121

1. Initiates an ICMP session to test if www.example.com is reachable(setting the packet size is 3200B), capture the packets.
    - How to initiates an ICMP Echo request with 3200B length?

    Using command `ping www.example.com -s 3200` for *MAC*

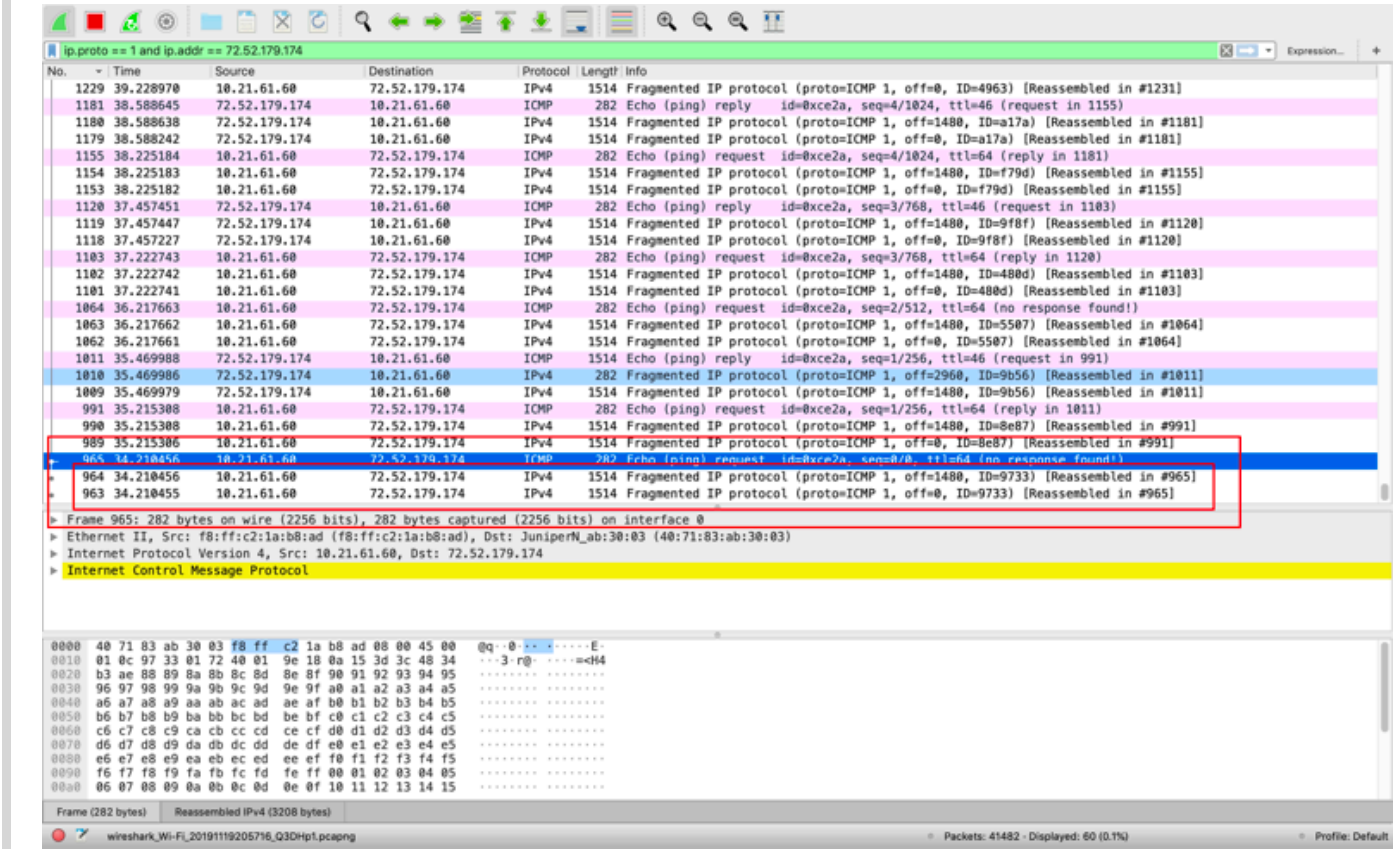
    Using command `ping www.example.com -l 3200` for *Win*





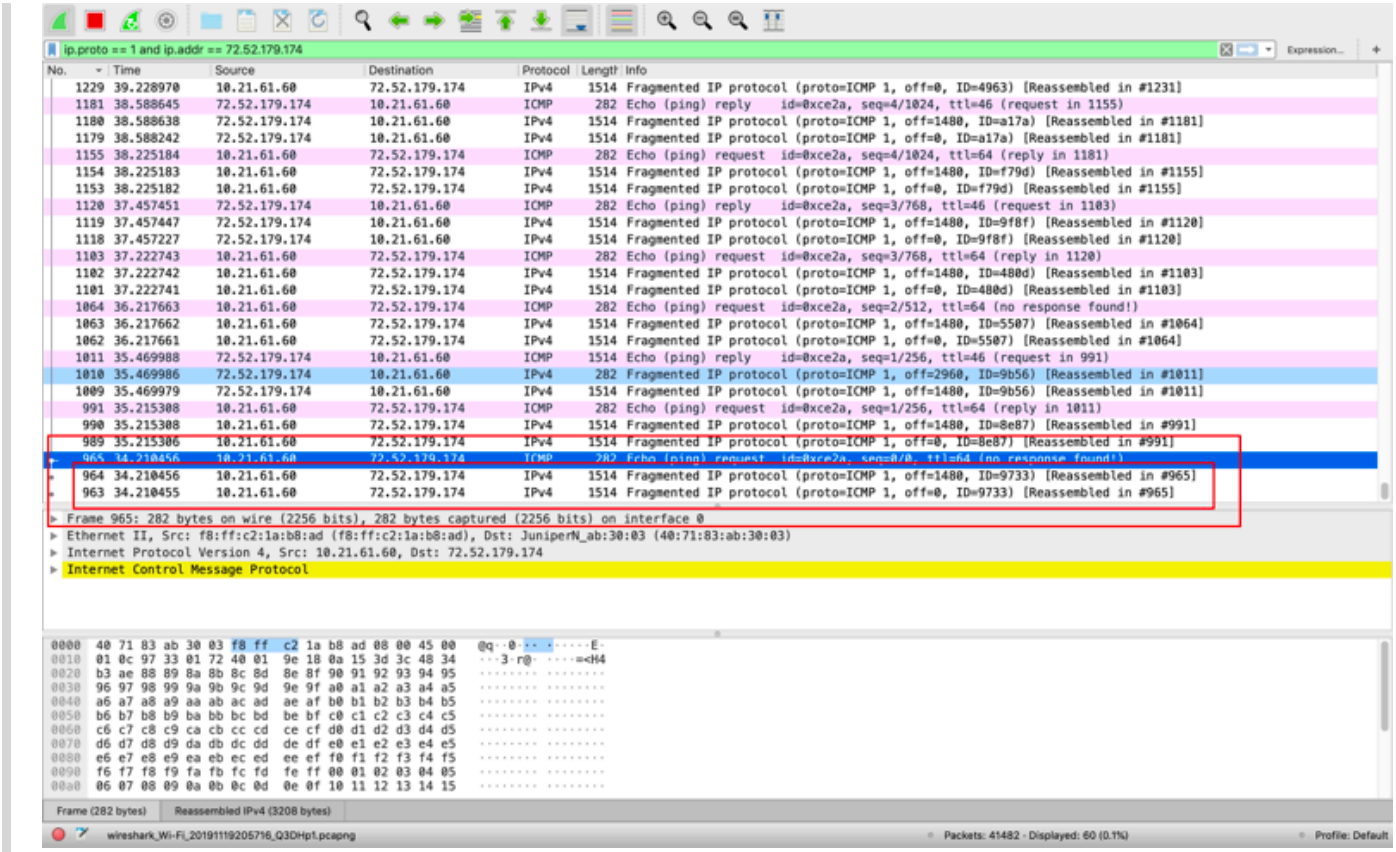
- Is there any fragmentation on the IP packets , how do you find it?

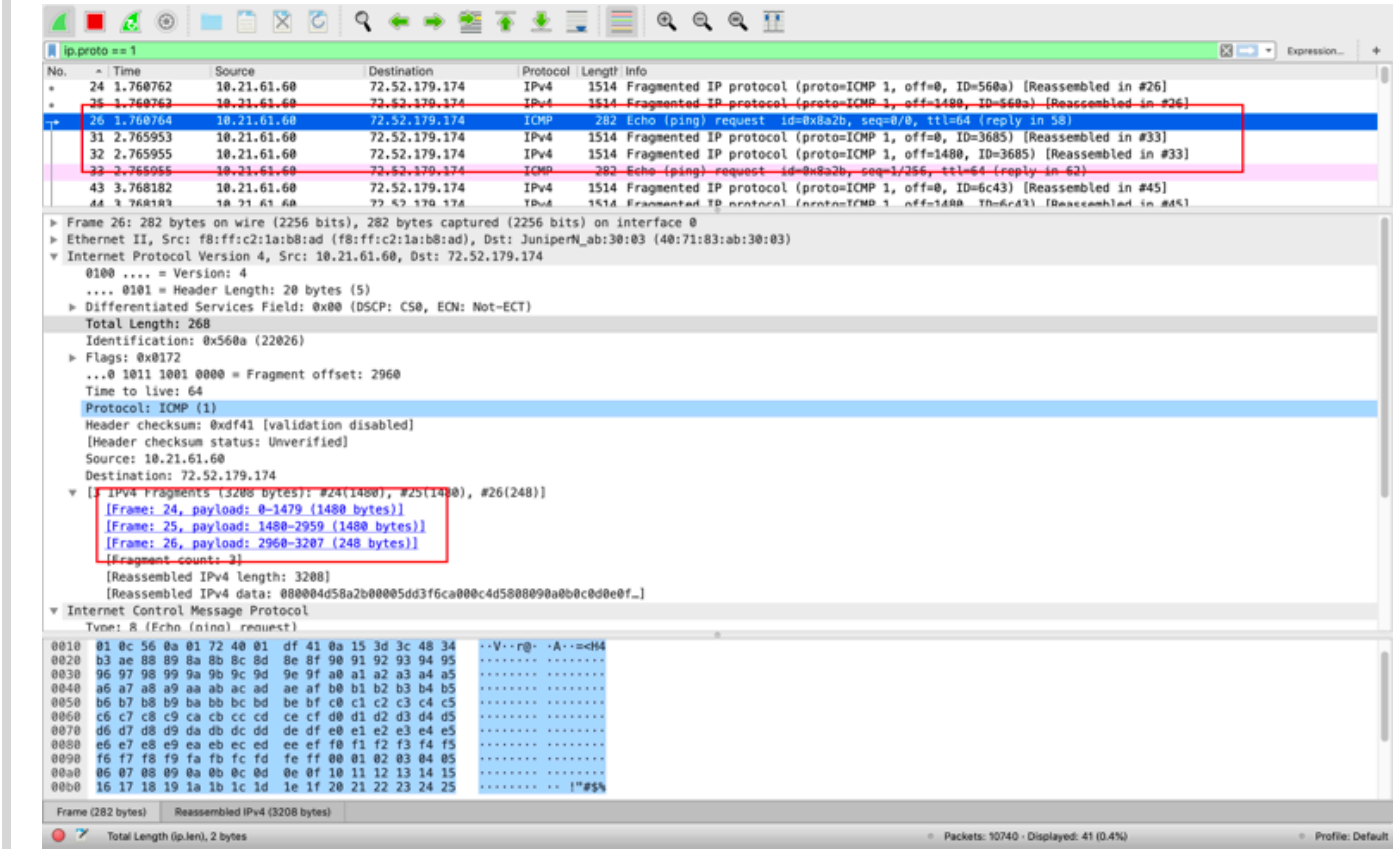
> Yes, there are some fragmentation on the IP packets.
>
> In wireshark, it will mark them as "Fragment IP protocol"



- How many fragments of a 3200B length IP packet?

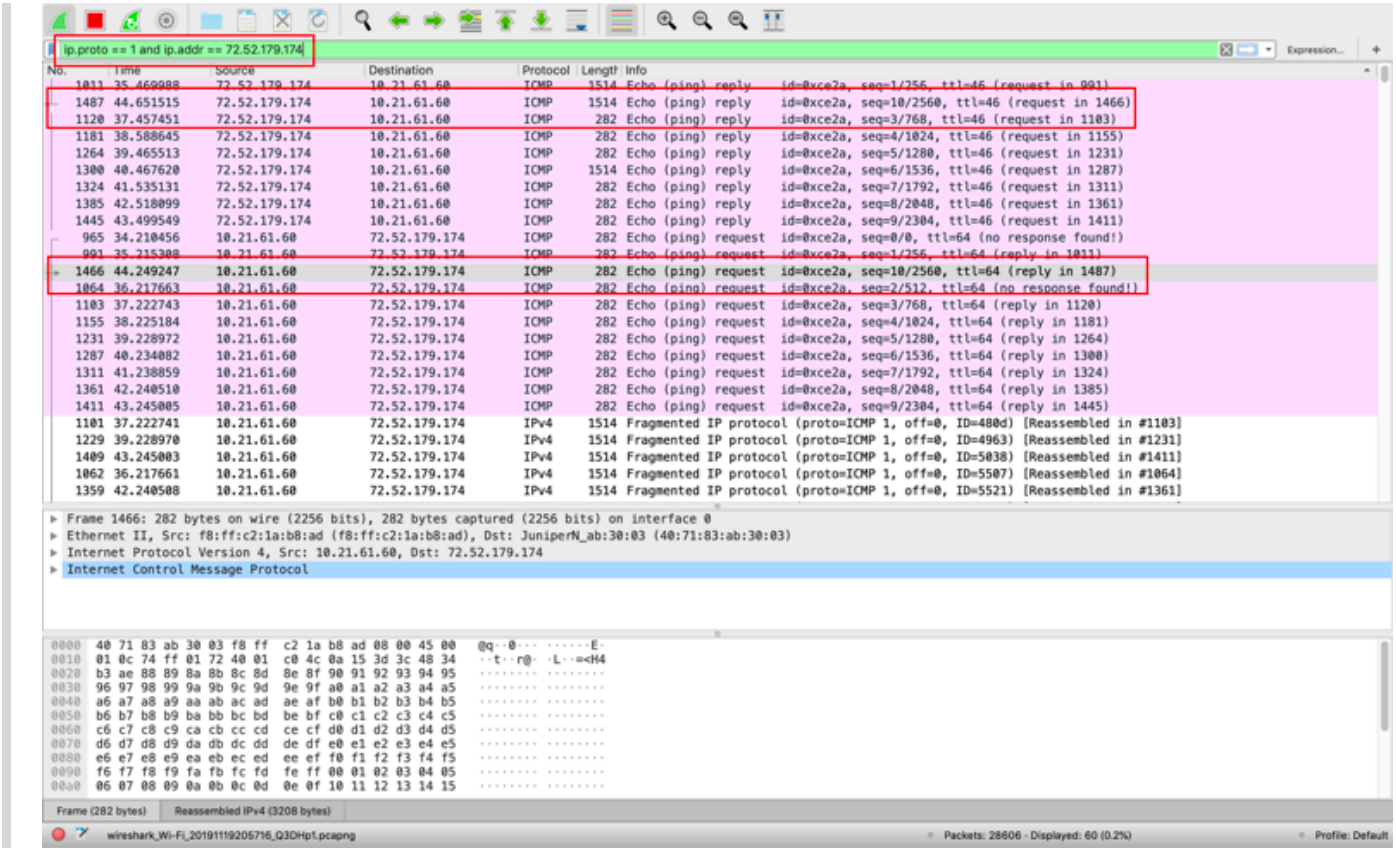
> Three fragments.





- How do you identify the ICMP Echo request and Echo reply?

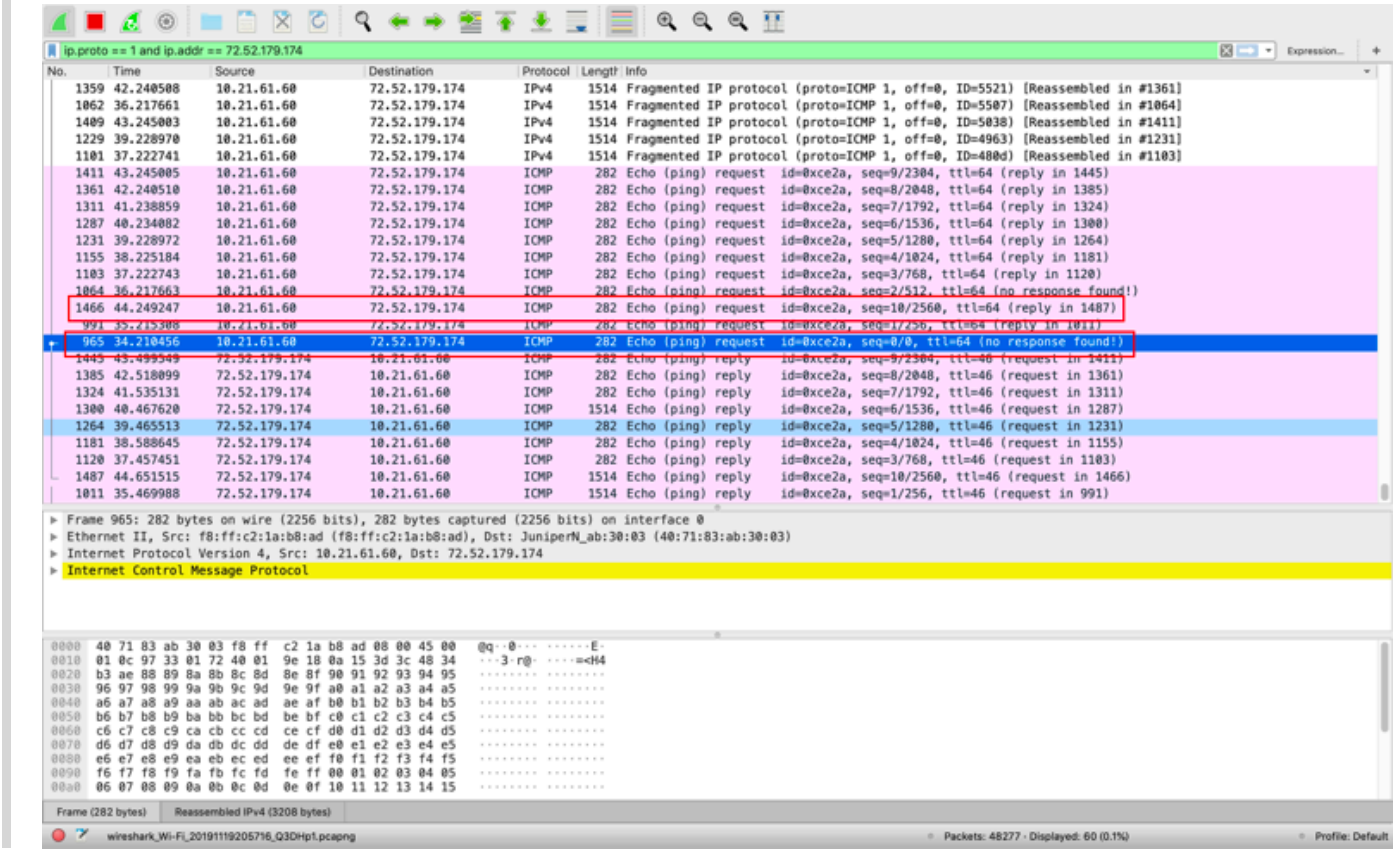
In wireshark, it will specify whether it is a request message or reply message for ICMP segement information.



- For the ICMP Echo request, which fragment is the 1st one, which is the last? How do you identify them?

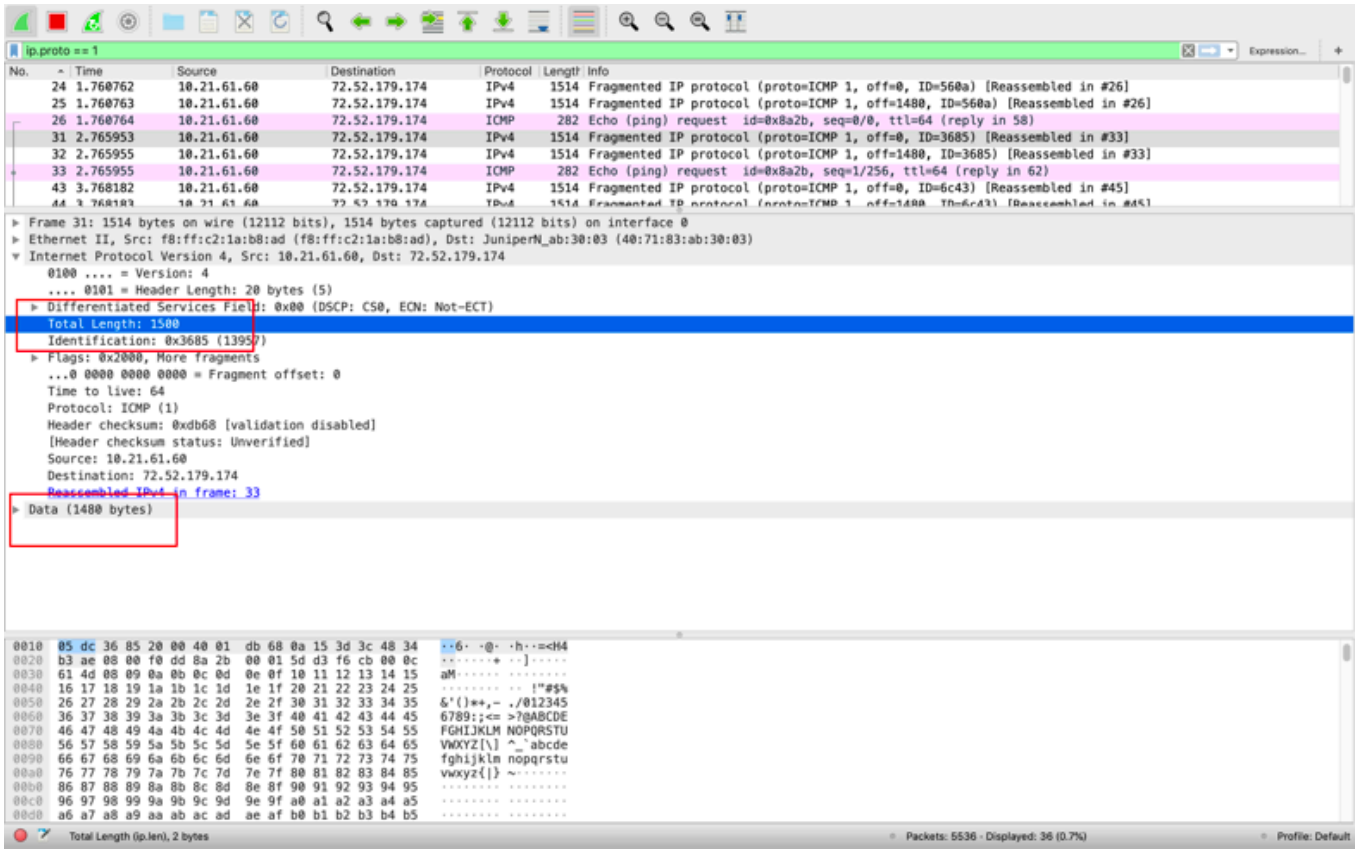
The first request is 965, the last request is 1466

The way to identify them: the first seq is 0/0, the last(10th) is 10/2560

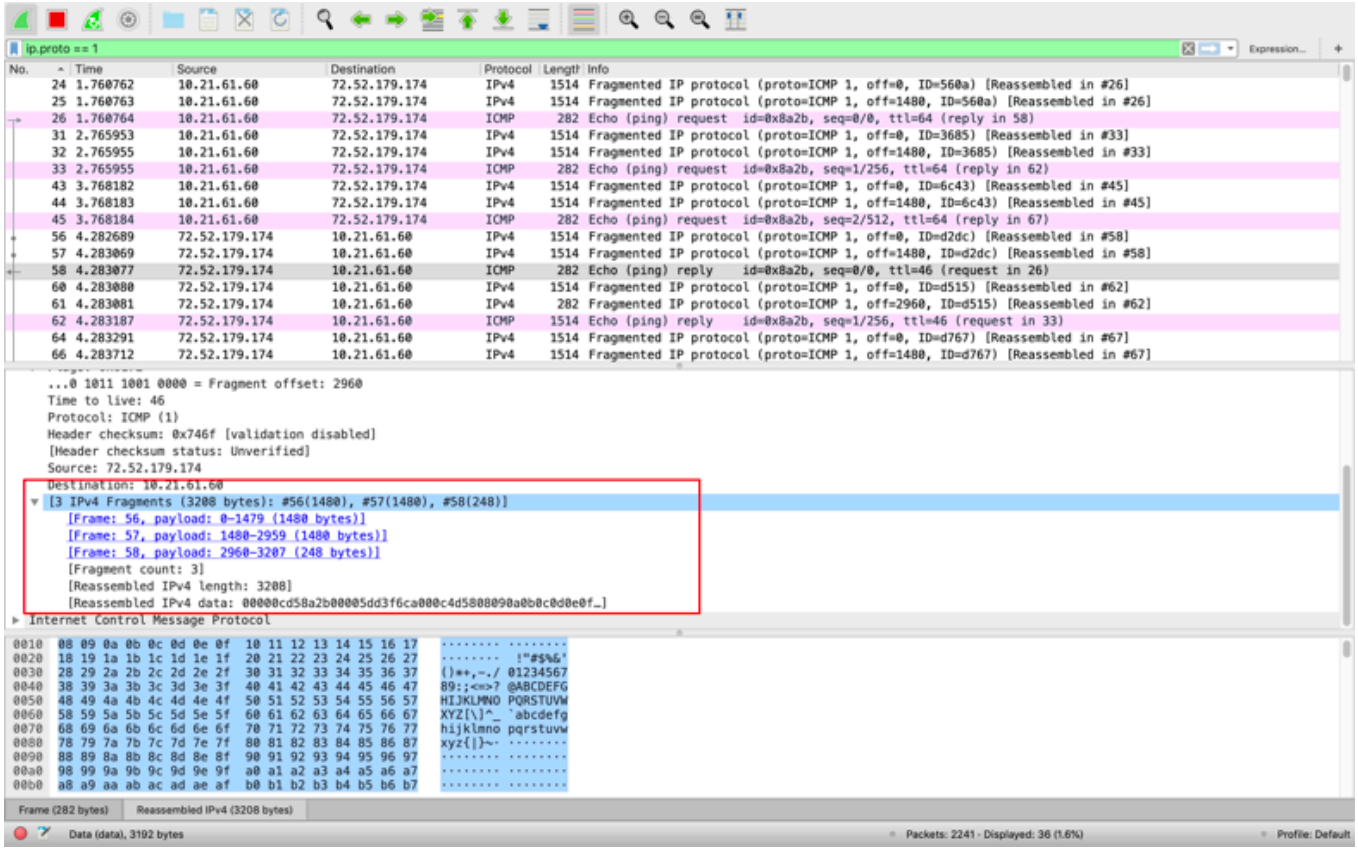


- What's the length of each IP fragment? Is the sum of each fragment's length equal to the original IP packet?

The Data is 1480 Bytes for the first and second fragment, the third is 248 Bytes, and the IP header is 20 Bytes. So the total length of each IP fragment is 1500 Bytes for the first and second fragment, the third is 268 Bytes.



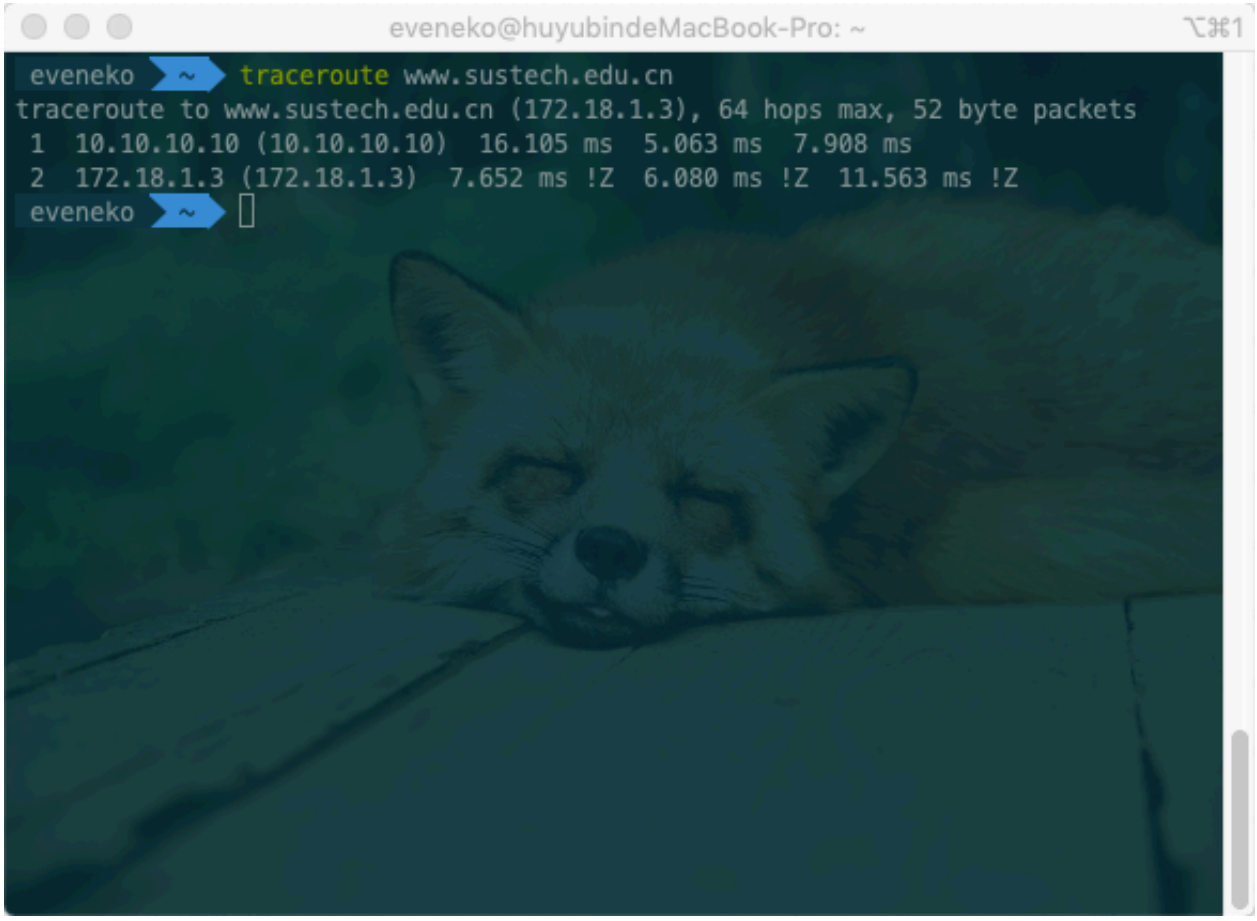
No, The sum of each fragment's length is 3208 Bytes. It does not equel the original IP packet.

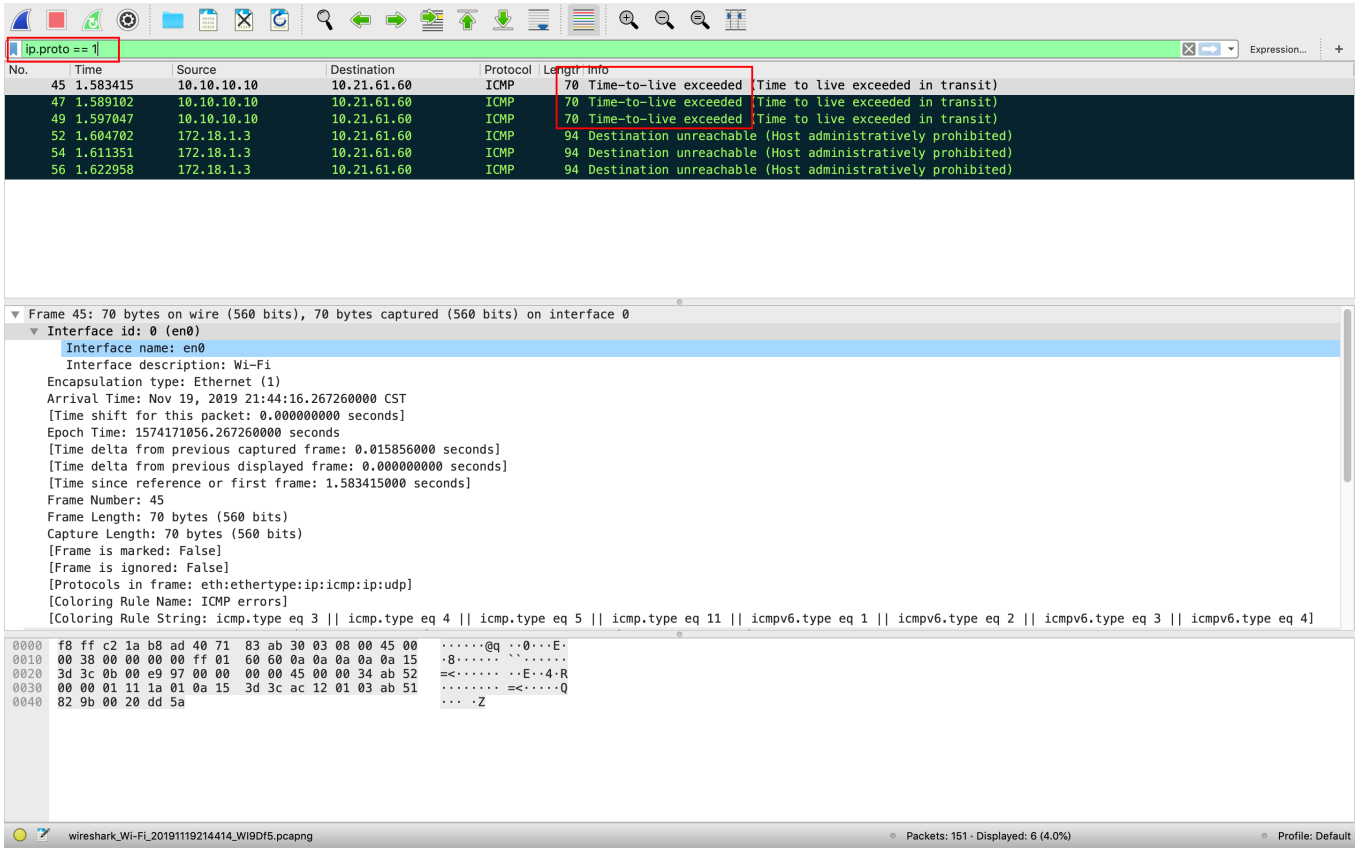


Please add the necessary screenshots and calculation when answering questions.

2. using tracert (windows) / traceroute(linux or MacOS) to trace the route from your host to www.sustech.edu.cn capture the packets while tracing
   - Is there any 'Time-to-live exceeded' ICMP packets?

> Yes, there are some 'Time-to-live exceeded' ICMP packets.



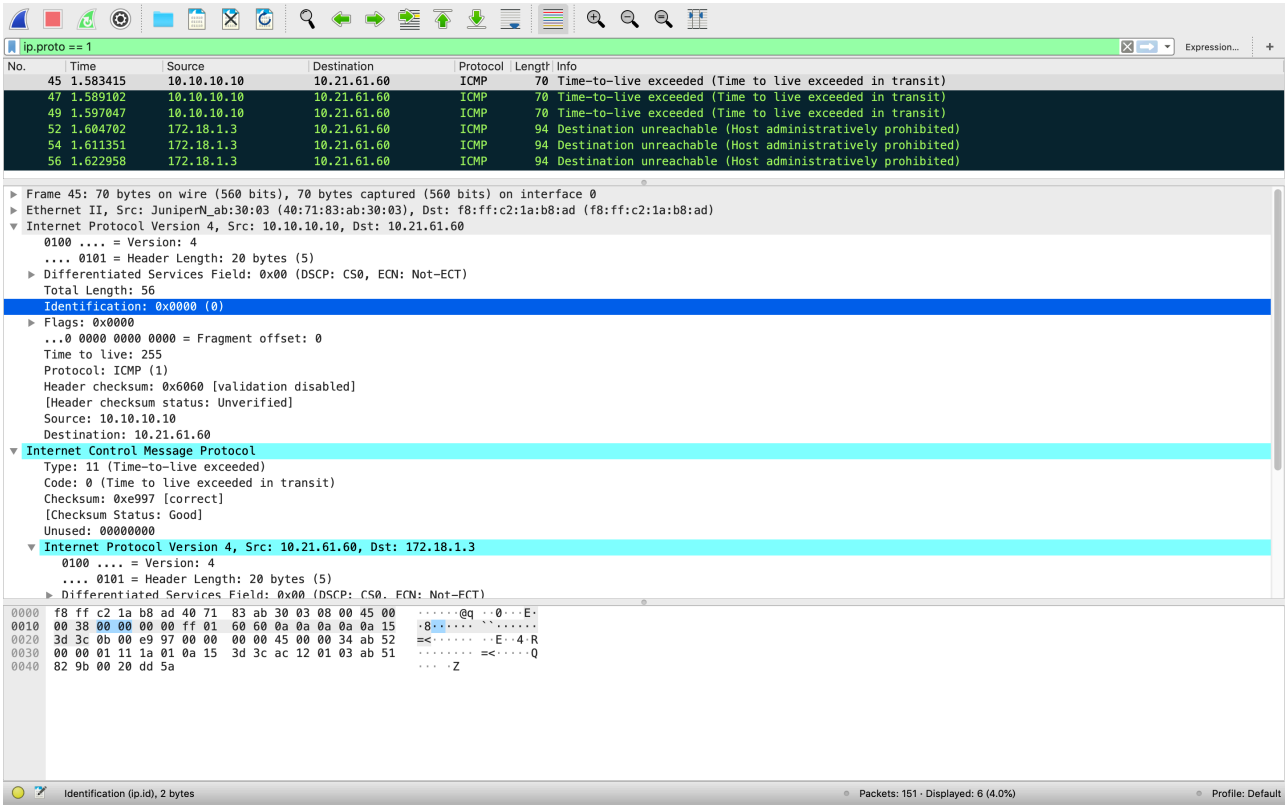


- what's the difference between these packets and normal ICMP packets(such as ICMP echo request)? List at least 3 aspects.

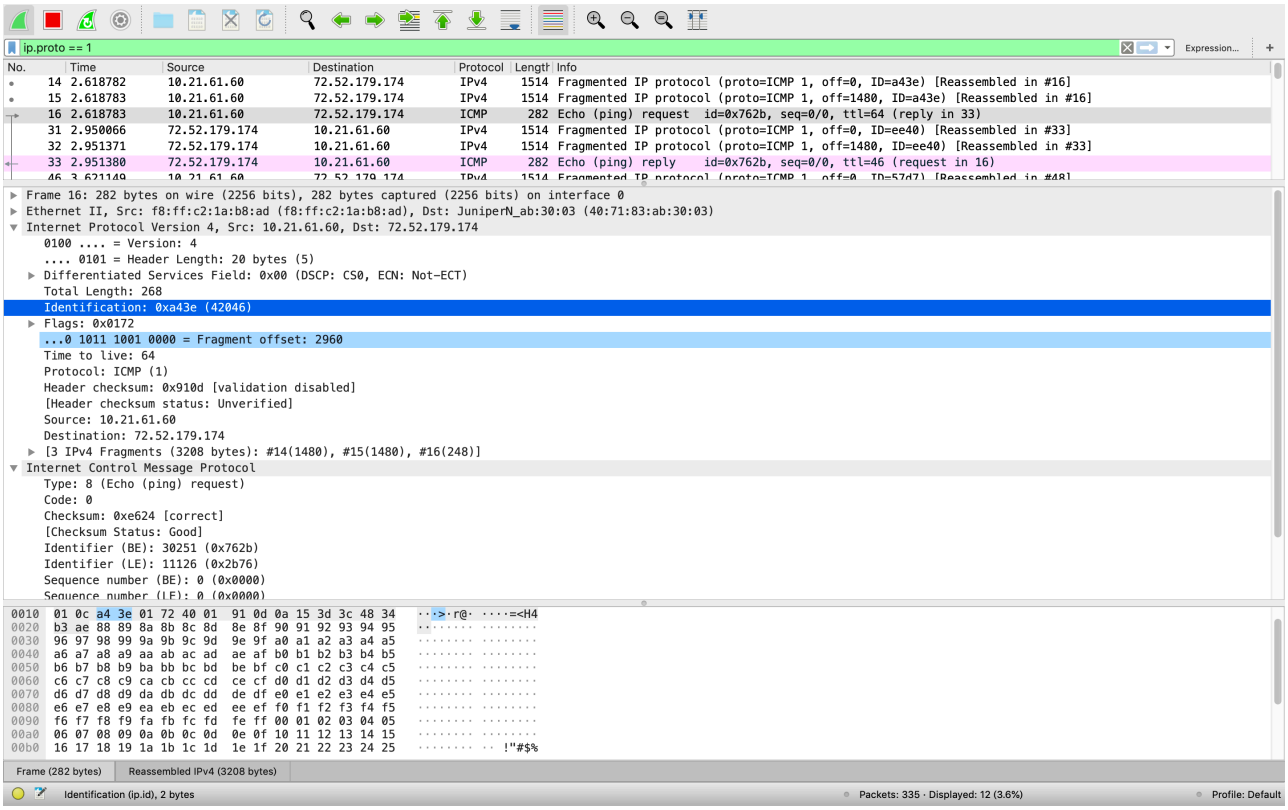
  Please add the necessary screenshots when answering questions.

1. IP level identification

   for these:

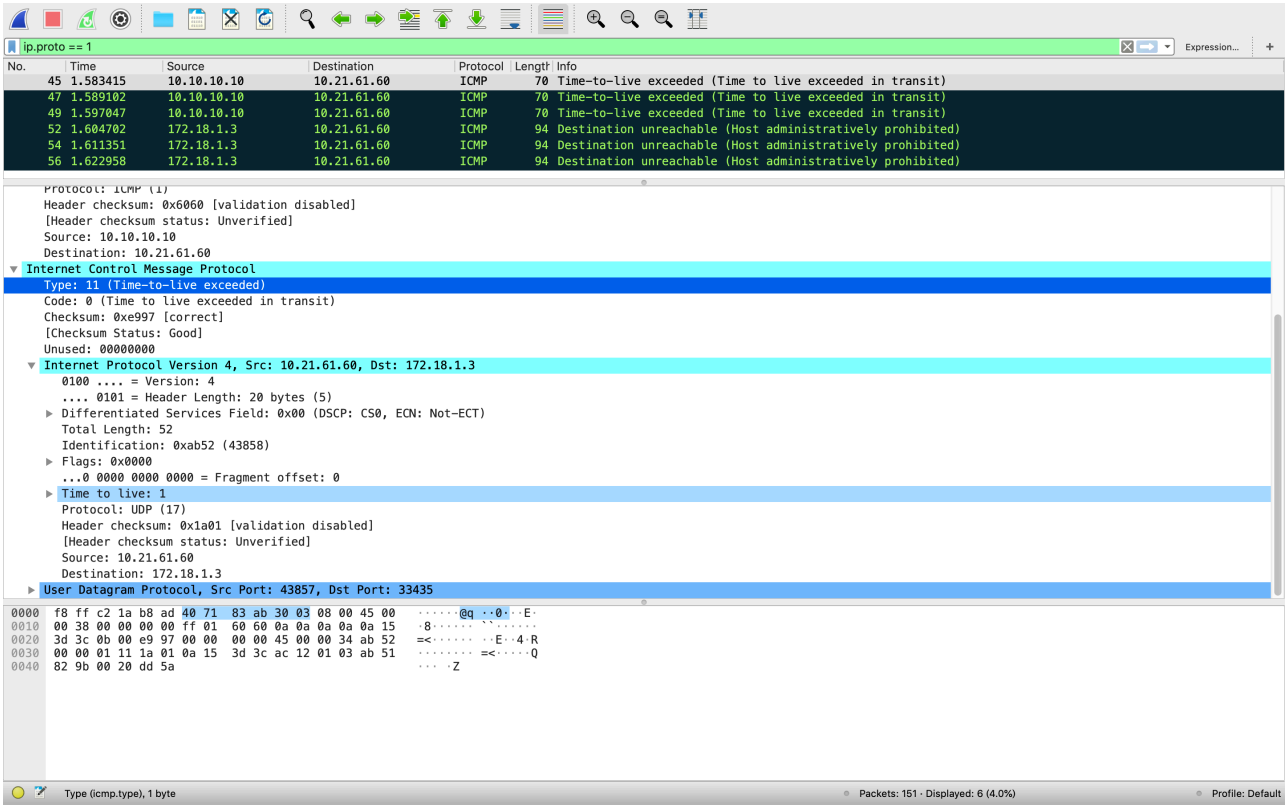


   for normal:

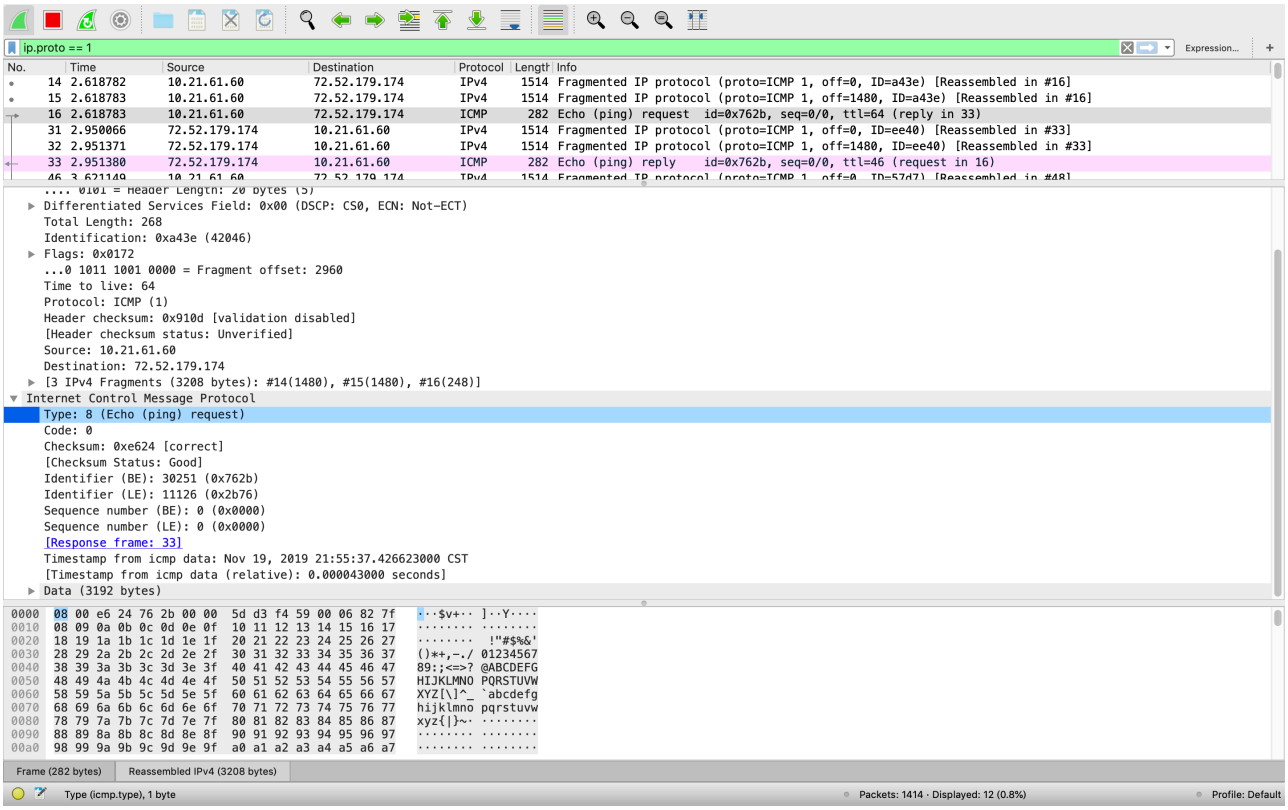


2. ICMP level type:

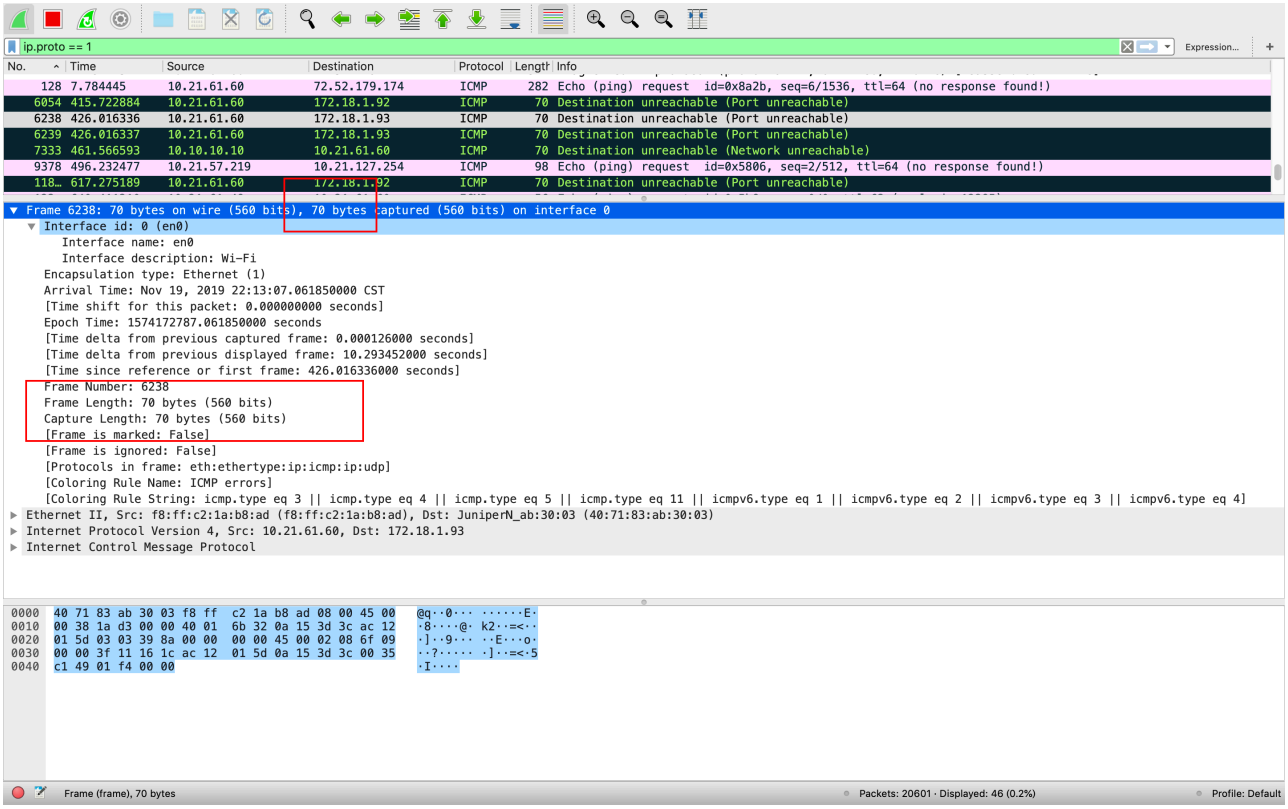
   for these:



for normal:



3. The length, these packets are all 70 Bytes.



3. Initiates a DHCP session
    - How to initiate a DHCP session? How to find the DHCP session packets?

    Using command `ipconfig /release` to Remove the dynamic IP address for *Win*

    Using command `ipconfig /renew` to Re-allocate IP address dynamically for *Win*

    display filter: *dhcp*

```
[redacted]>ipconfig /release

Windows IP Configuration

No operation can be performed on 以太网 while it has its media disconnected.
No operation can be performed on 本地连接* 3 while it has its media disconnected.
No operation can be performed on 本地连接* 2 while it has its media disconnected.

Ethernet adapter 以太网:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter 本地连接* 3:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter 本地连接* 2:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter VMware Network Adapter VMnet1:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::d05:f886:1689:b08e%7
   Default Gateway . . . . . . . . . :

Ethernet adapter VMware Network Adapter VMnet8:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::f05f:87f9:4bc4:117f%11
   Default Gateway . . . . . . . . . :

Wireless LAN adapter WLAN:

   Connection-specific DNS Suffix  . :
   IPv6 Address. . . . . . . . . . . : 2001:da8:201d:1103:22c1:f7ab:3be3:65f2
   Link-local IPv6 Address . . . . . : fe80::193e:dcdf:7bb5:ea81%13
   Default Gateway . . . . . . . . . : fe80::4271:83ff:feab:3003%13
```

```
>ipconfig /renew

Windows IP Configuration

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   Connection-specific DNS Suffix  . :

Wireless LAN adapter 本地连接* 3:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter 本地连接* 2:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter VMware Network Adapter VMnet1:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::d05:f886:1689:b08e%7
   IPv4 Address. . . . . . . . . . . : 192.168.10.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Ethernet adapter VMware Network Adapter VMnet8:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::f05f:87f9:4bc4:117f%11
   IPv4 Address. . . . . . . . . . . : 192.168.78.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Wireless LAN adapter WLAN:

   Connection-specific DNS Suffix  . : sustc.edu.cn
   IPv6 Address. . . . . . . . . . . : 2001:da8:201d:1103:22c1:f7ab:3be3:65f2
   Link-local IPv6 Address . . . . . : fe80::193e:dcdf:7bb5:ea81%13
   IPv4 Address. . . . . . . . . . . : 10.21.81.136
   Subnet Mask . . . . . . . . . . . : 255.255.128.0
   Default Gateway . . . . . . . . . : fe80::4271:83ff:feab:3003%13
```
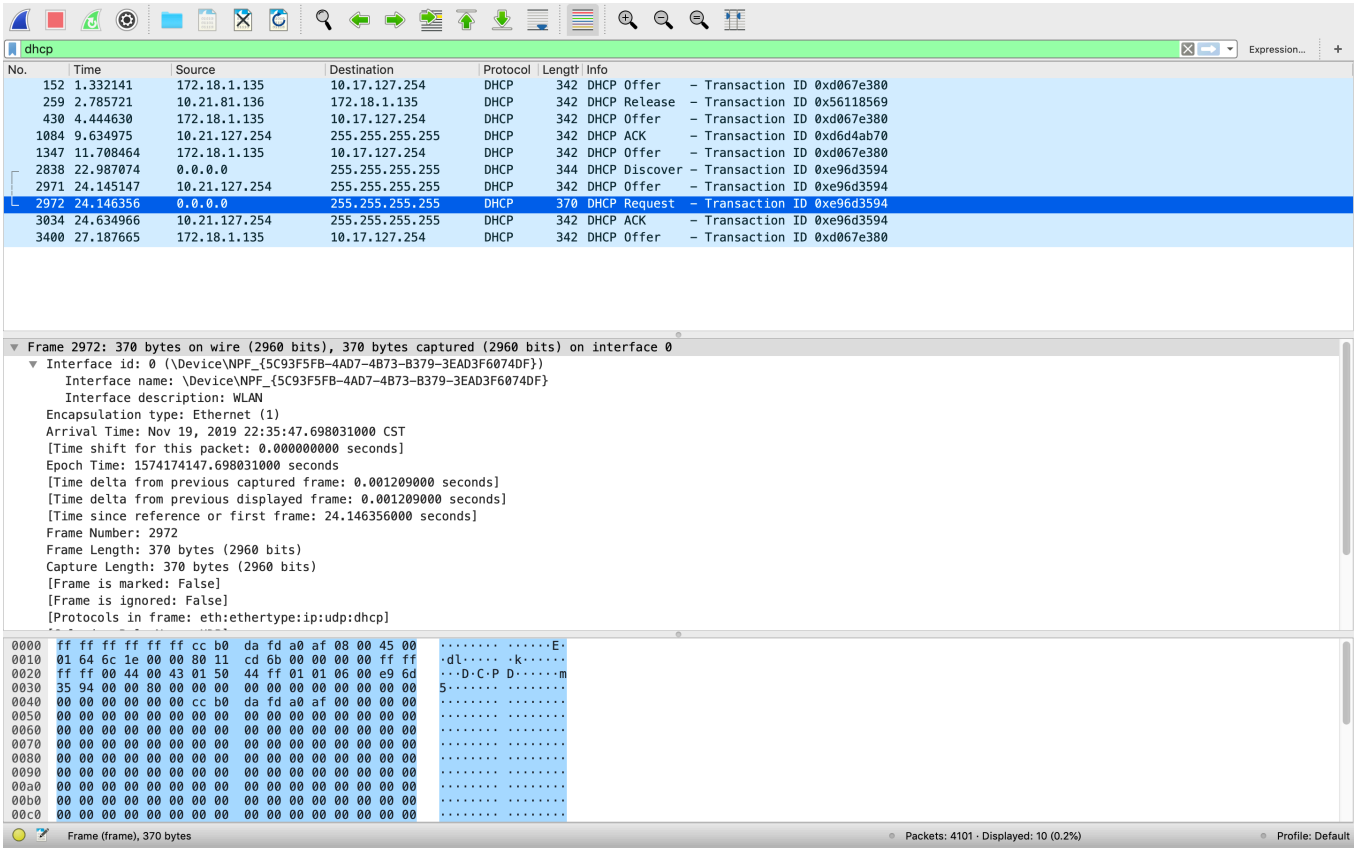

- What ‘s the source IP address and destination IP address of a DHCP request? What is the type of these two IP address?

For a DHCP request, the source IP address is 0.0.0.0 ,and the destination IP address is 255.255.255.255



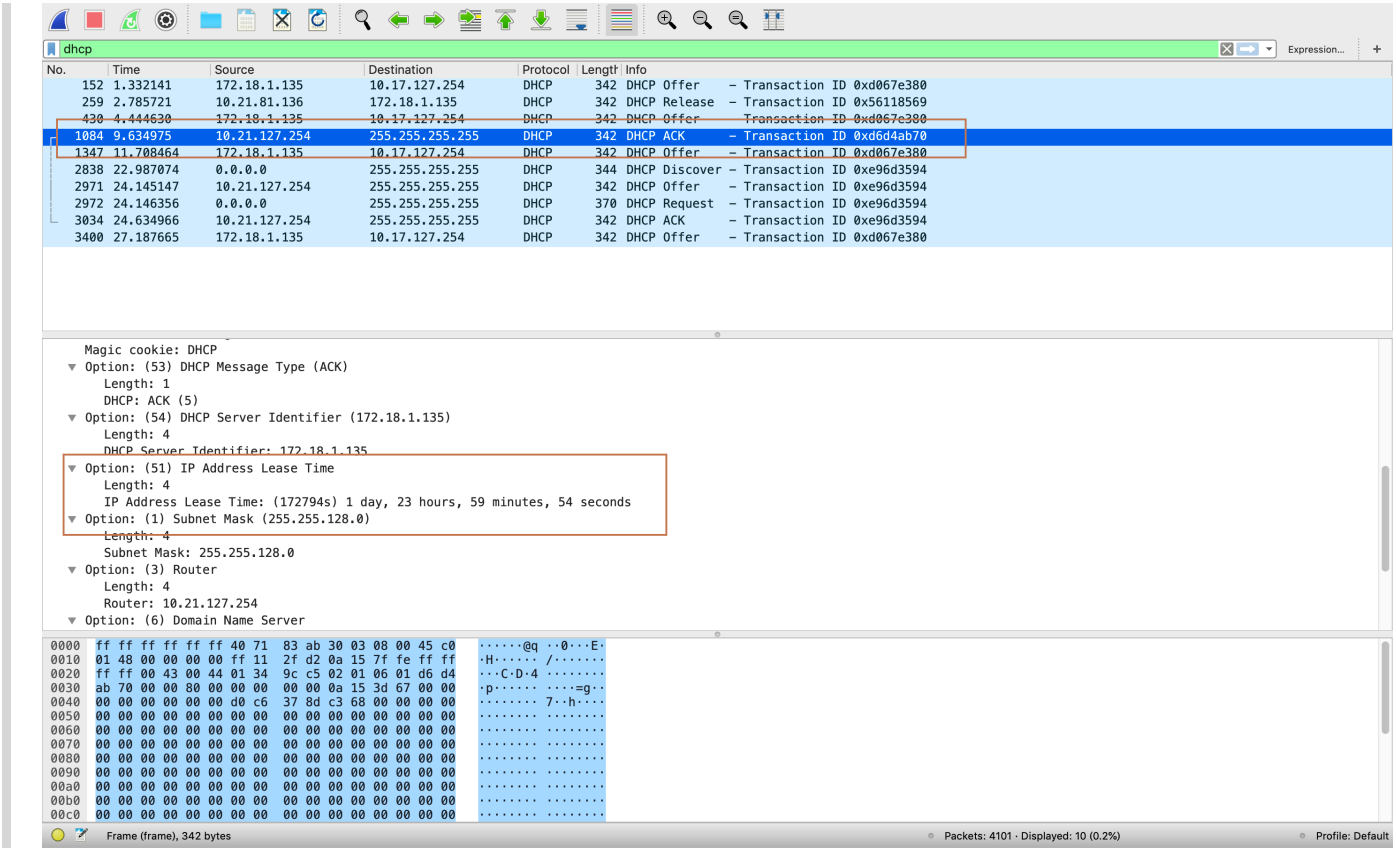
The address 0.0.0.0 is a non-routable meta-address used to designate an invalid, unknown or non-applicable target.
The address 255.255.255.255 is a broadcast address which is a network address at which all devices connected to a multiple-access communications network are enabled to receive datagrams

- What info items are required for a host if it need to contact with others in the Internet?

IP address, Subnet Mask, Default Gateway, DNS Server and Host Name

- How do you find the Lease Time of a dynamic IP address? What's the value of it? In which type of DHCP packet could this field be set?
  Please add the necessary screenshots when answering questions.

In DHCP ACK to find the Lease Time
It is IP (172794s) 1 day, 23 hours, 59 minutes, 54 seconds


dhcp
Expression...
No. Time Source Destination Protocol Length Info
152 1.332141 172.18.1.135 10.17.127.254 DHCP 342 DHCP Offer - Transaction ID 0xd067e380
259 2.785721 10.21.81.136 172.18.1.135 DHCP 342 DHCP Release - Transaction ID 0x56118569
430 4.444630 172.18.1.135 10.17.127.254 DHCP 342 DHCP Offer - Transaction ID 0xd067e380
1084 9.634975 10.21.127.254 255.255.255.255 DHCP 342 DHCP ACK - Transaction ID 0xd6d4ab70
1347 11.708464 172.18.1.135 10.17.127.254 DHCP 342 DHCP Offer - Transaction ID 0xd067e380
2838 22.987074 0.0.0.0 255.255.255.255 DHCP 344 DHCP Discover - Transaction ID 0xe96d3594
2971 24.145147 10.21.127.254 255.255.255.255 DHCP 342 DHCP Offer - Transaction ID 0xe96d3594
2972 24.146356 0.0.0.0 255.255.255.255 DHCP 370 DHCP Request - Transaction ID 0xe96d3594
3034 24.634966 10.21.127.254 255.255.255.255 DHCP 342 DHCP ACK - Transaction ID 0xe96d3594
3400 27.187665 172.18.1.135 10.17.127.254 DHCP 342 DHCP Offer - Transaction ID 0xd067e380
Magic cookie: DHCP
Option: (53) DHCP Message Type (ACK)
Length: 1
DHCP: ACK (5)
Option: (54) DHCP Server Identifier (172.18.1.135)
Length: 4
DHCP Server Identifier: 172.18.1.135
Option: (51) IP Address Lease Time
Length: 4
IP Address Lease Time: (172794s) 1 day, 23 hours, 59 minutes, 54 seconds
Option: (1) Subnet Mask (255.255.128.0)
Length: 4
Subnet Mask: 255.255.128.0
Option: (3) Router
Length: 4
Router: 10.21.127.254
Option: (6) Domain Name Server
0000 ff ff ff ff ff ff 40 71 83 ab 30 03 08 00 45 c0
0010 01 48 00 00 00 00 ff 11 2f d2 0a 15 7f fe ff ff
0020 ff ff 00 43 00 44 01 34 9c c5 02 01 06 01 d6 d4
0030 ab 70 00 00 80 00 00 00 00 00 0a 15 3d 67 00 00
0040 00 00 00 00 00 00 d0 c6 37 8d c3 68 00 00 00 00
0050 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0060 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0070 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0080 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0090 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00a0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00b0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00c0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Frame (frame), 342 bytes
Packets: 4101 · Displayed: 10 (0.2%)
Profile: Default