CS315 : Computer Networks Lab

Assignment 10

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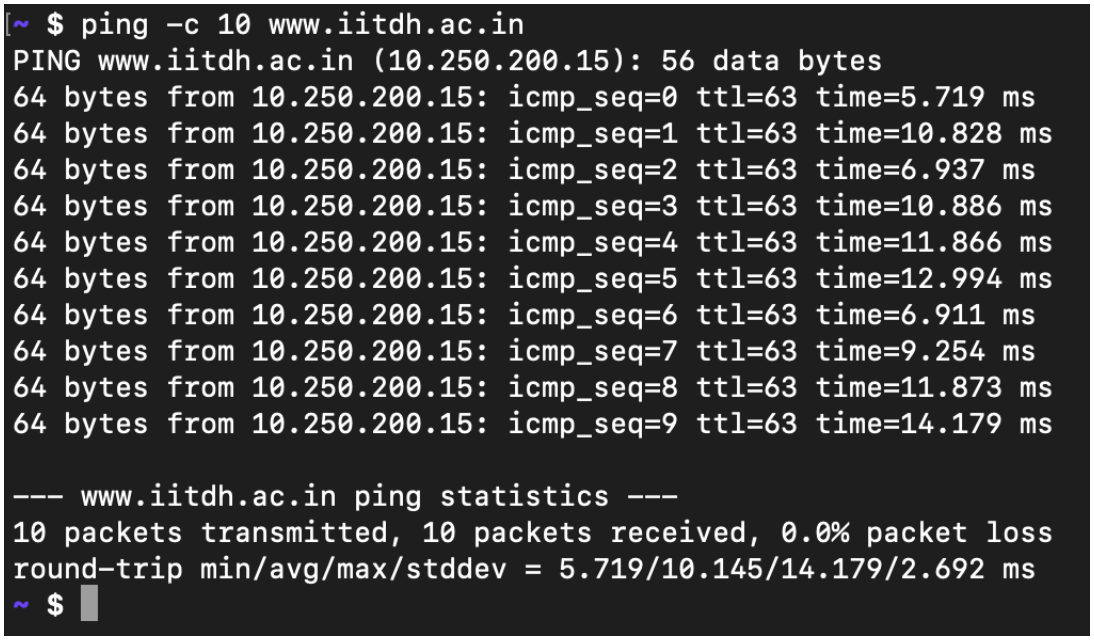
1 Part-1: ICMP and Ping



1. What is the IP address of your host? What is the IP address of the destination host?

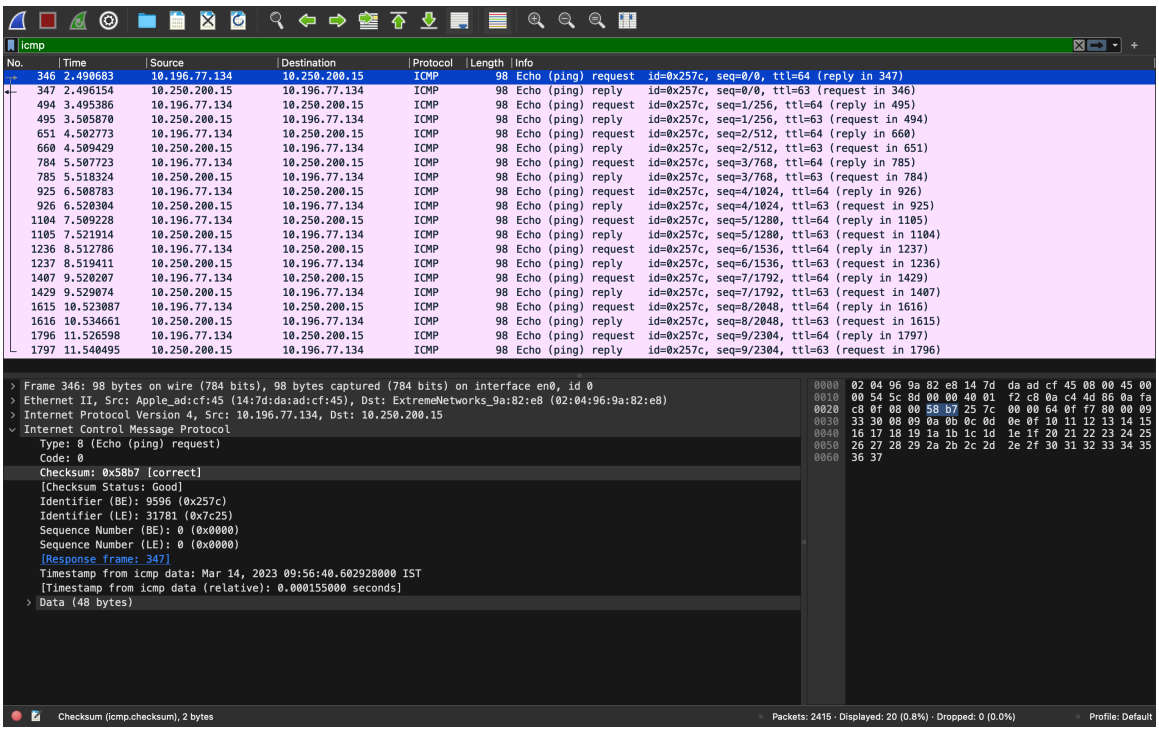
Source IP address: 10.196.77.134
Destination IP address: 10.250.200.15

2. Why is it that an ICMP packet does not have source and destination port numbers?

The ICMP packet does not have source and destination port numbers because it was designed to communicate network-layer information between hosts and routers, not between application layer processes.

3. Examine one of the ping request packets sent by your host. What are the ICMP type and code numbers? What other fields does this ICMP packet have? How many bytes are the checksum, sequence number and identifier fields?

ICMP type : 8 (Echo (ping) request), Code number : 0
This ICMP packet has other fields like Checksum, Identifier (BE), Identifier (LE), Sequence Number (BE), Sequence Number (LE), Timestamp from icmp data and data field.
The checksum, sequence number and identifier fields are 2 bytes each.

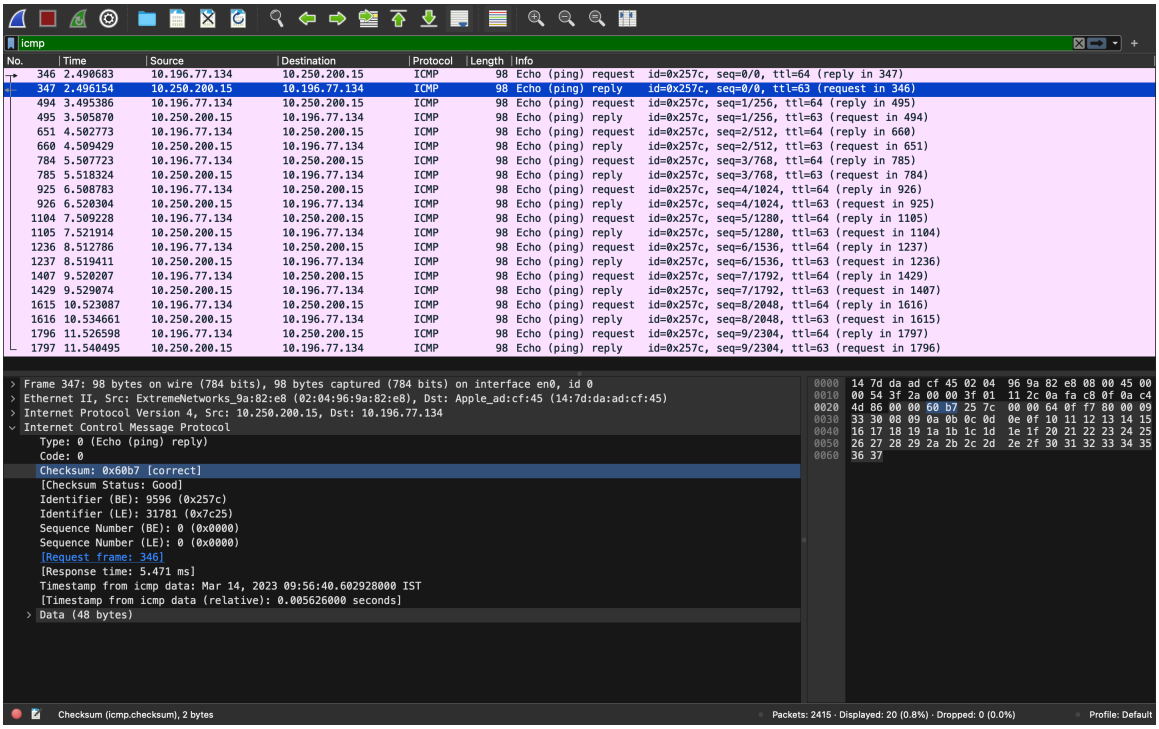


4. Examine the corresponding ping reply packet. What are the ICMP type and code numbers? What other fields does this ICMP packet have? How many bytes are the checksum, sequence number and identifier fields?

ICMP type: 0 (Echo (ping) reply), Code: 0
This ICMP packet has other fields like Checksum, Identifier (BE), Identifier (LE), Sequence

Number (BE), Sequence Number (LE), Response time, Timestamp from icmp data and data field.

The checksum, sequence number and identifier fields are 2 bytes each.



2 Part-2: ICMP and Traceroute

```
~ $ traceroute -I www.google.com
traceroute to www.google.com (142.251.42.36), 64 hops max, 72 byte packets
 1  10.196.3.250 (10.196.3.250)  4.926 ms  6.505 ms  6.282 ms
 2  firewall.iitdh.ac.in (10.250.209.251)  17.380 ms  5.955 ms  6.241 ms
 3  14.139.150.65 (14.139.150.65)  8.046 ms  5.084 ms  5.234 ms
 4  * * *
 5  10.255.238.225 (10.255.238.225)  42.341 ms  47.803 ms  40.101 ms
 6  10.152.7.214 (10.152.7.214)  38.586 ms  40.038 ms  38.643 ms
 7  142.250.172.80 (142.250.172.80)  51.304 ms  53.725 ms  50.435 ms
 8  74.125.37.7 (74.125.37.7)  52.984 ms  49.824 ms  49.035 ms
 9  142.251.69.43 (142.251.69.43)  39.440 ms  39.043 ms  38.729 ms
10  bom12s20-in-f4.1e100.net (142.251.42.36)  47.908 ms  40.478 ms  40.771 ms
~ $
```

1. What is the IP address of your host? What is the IP address of the target destination host?

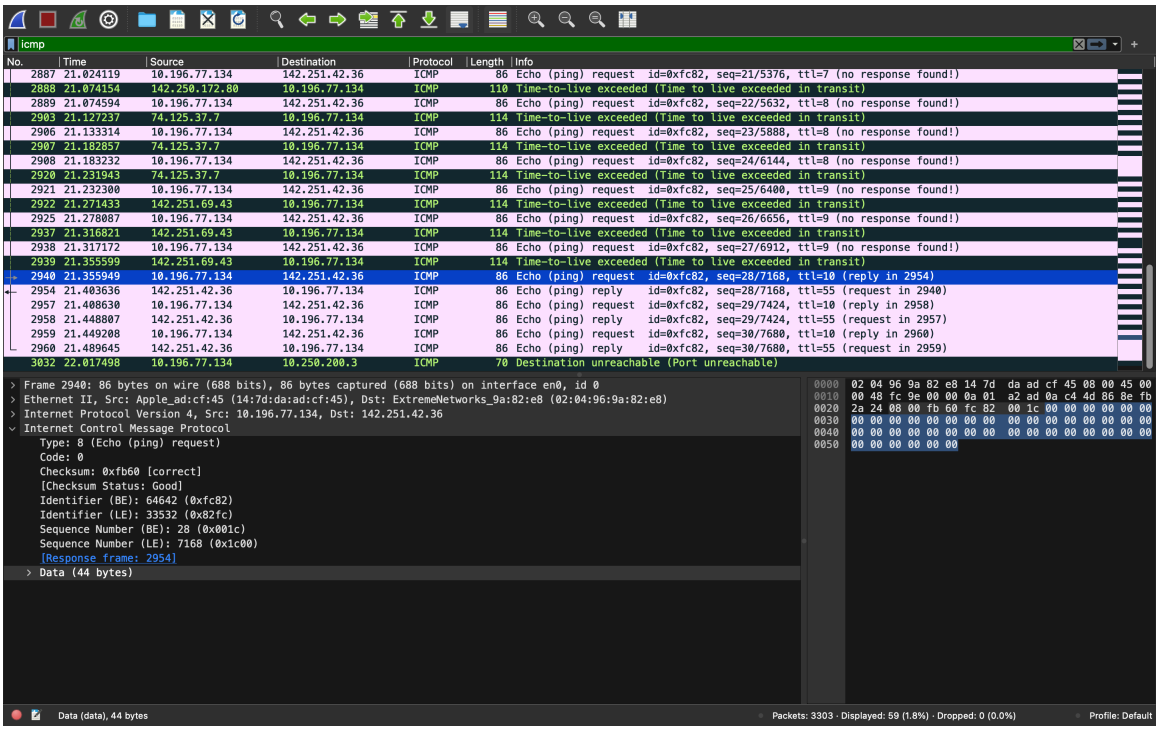
Source IP address: 10.196.77.134
Destination IP address: 142.251.42.36

2. If ICMP sent UDP packets, would the IP protocol number still be 01 for the probe packets? If not, what would it be?

No. If ICMP sent UDP packets instead, the IP protocol number should be 0x11.

3. Examine the ICMP echo packet in your screenshot. Is this different from the ICMP ping query packets in the first half of this lab? If yes, how so?

The ICMP echo packet has the same fields as the ping query packets. Only the 'Timestamp from icmp data' field is not there.

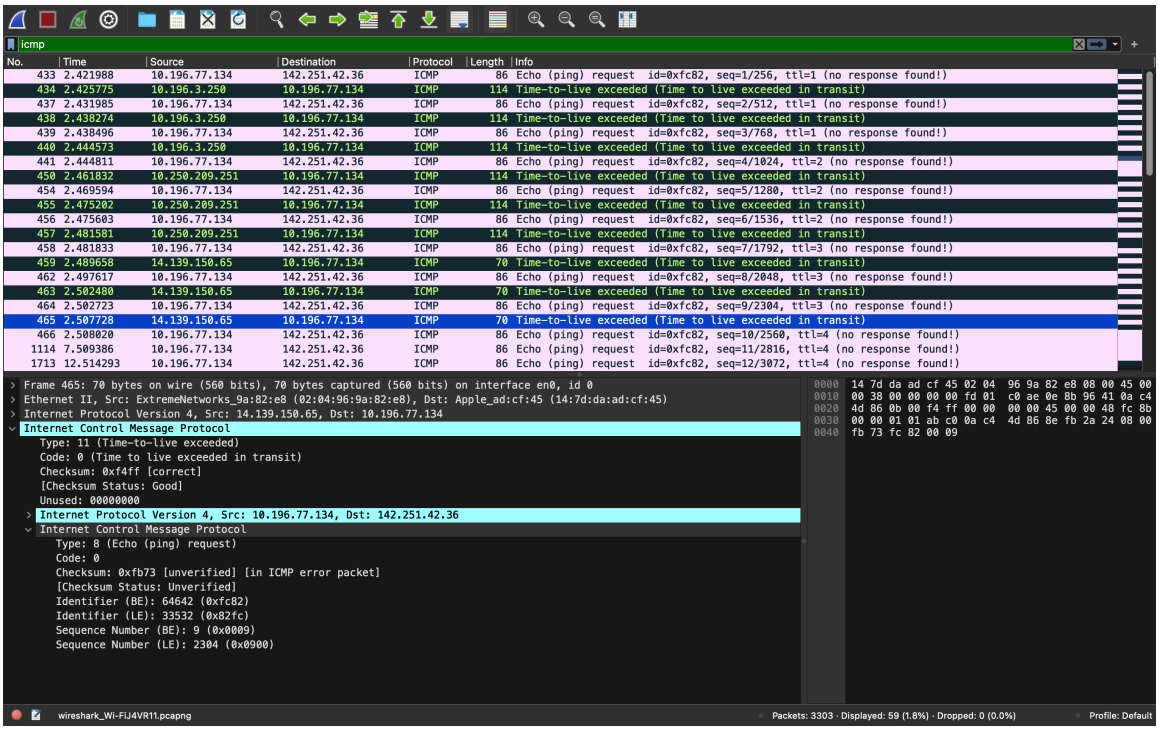


4. Examine the ICMP error packet in your screenshot. It has more fields than the ICMP echo packet. What is included in those fields?

The ICMP error packet has more fields than ICMP echo packet. It contains both the IP header and the first 8 bytes of the original ICMP packet that the error is for.

5. Examine the last three ICMP packets received by the source host. How are these packets different from the ICMP error packets? Why are they different?

The last three ICMP packets are message type 0 (echo reply) rather than 11 (TTL expired). They are different because the datagrams have made it all the way to the destination host before the TTL exceeded/expired.



6. Within the traceroute measurements, is there a link whose delay is significantly longer than others?

There is a link between steps 3 and 5 that has a significantly longer delay. This maybe a transoceanic link.

3 Part-3: UDP Pinger

3.1 Screenshots

```
CS315 CN lab/Submissions/Assignment-10 $ python3 UDPPingerServer.py
*** Server started ***
Started UDP server on port 12000
```

```
CS315 CN lab/Submissions/Assignment-10 $ python3 UDPPingerClient.py
*** Client started ***
Sent Ping #1 Tue Mar 14 11:41:24 2023
Received b'PING #1 TUE MAR 14 11:41:24 2023'
RTT: 0.0021278858184814453 seconds

Sent Ping #2 Tue Mar 14 11:41:24 2023
Received b'PING #2 TUE MAR 14 11:41:24 2023'
RTT: 0.00041103363037109375 seconds

Sent Ping #3 Tue Mar 14 11:41:24 2023
Received b'PING #3 TUE MAR 14 11:41:24 2023'
RTT: 0.00045680999755859375 seconds

Sent Ping #4 Tue Mar 14 11:41:24 2023
Received b'PING #4 TUE MAR 14 11:41:24 2023'
RTT: 0.00040197372436523344 seconds

Sent Ping #5 Tue Mar 14 11:41:24 2023
#5 Requested Time out

Sent Ping #6 Tue Mar 14 11:41:25 2023
Received b'PING #6 TUE MAR 14 11:41:25 2023'
RTT: 0.0005698204040527344 seconds

Sent Ping #7 Tue Mar 14 11:41:25 2023
Received b'PING #7 TUE MAR 14 11:41:25 2023'
RTT: 0.0006730556488037109 seconds

Sent Ping #8 Tue Mar 14 11:41:25 2023
Received b'PING #8 TUE MAR 14 11:41:25 2023'
RTT: 0.0005738735198974609 seconds

Sent Ping #9 Tue Mar 14 11:41:25 2023
Received b'PING #9 TUE MAR 14 11:41:25 2023'
RTT: 0.0008988380432128906 seconds

Sent Ping #10 Tue Mar 14 11:41:25 2023
Received b'PING #10 TUE MAR 14 11:41:25 2023'
RTT: 0.0007731914520263672 seconds

** closing socket **
CS315 CN lab/Submissions/Assignment-10 $
```