California State University, Monterey Bay

Week 7 – Lab 7
Group 10

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CST311

Introduction to Computer Networks

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Questions and Answers

The following are the list of questions and related answers for this lab.

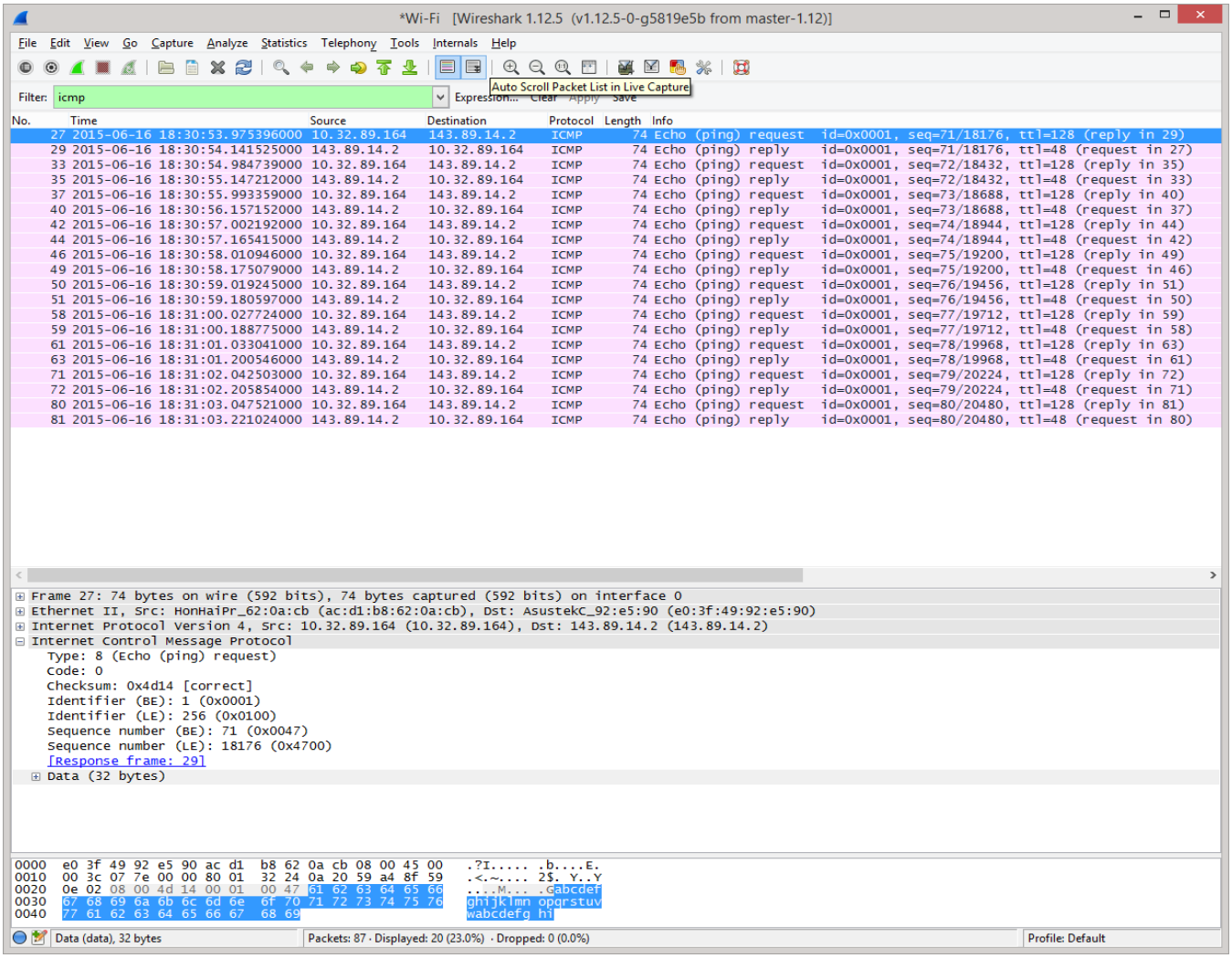
1. ICMP and Ping

```
C:\Windows\system32>ping -n 10 www.ust.hk

Pinging www.ust.hk [143.89.14.2] with 32 bytes of data:
Reply from 143.89.14.2: bytes=32 time=166ms TTL=48
Reply from 143.89.14.2: bytes=32 time=162ms TTL=48
Reply from 143.89.14.2: bytes=32 time=164ms TTL=48
Reply from 143.89.14.2: bytes=32 time=163ms TTL=48
Reply from 143.89.14.2: bytes=32 time=164ms TTL=48
Reply from 143.89.14.2: bytes=32 time=161ms TTL=48
Reply from 143.89.14.2: bytes=32 time=161ms TTL=48
Reply from 143.89.14.2: bytes=32 time=167ms TTL=48
Reply from 143.89.14.2: bytes=32 time=163ms TTL=48
Reply from 143.89.14.2: bytes=32 time=173ms TTL=48

Ping statistics for 143.89.14.2:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 161ms, Maximum = 173ms, Average = 164ms

C:\Windows\system32>
```

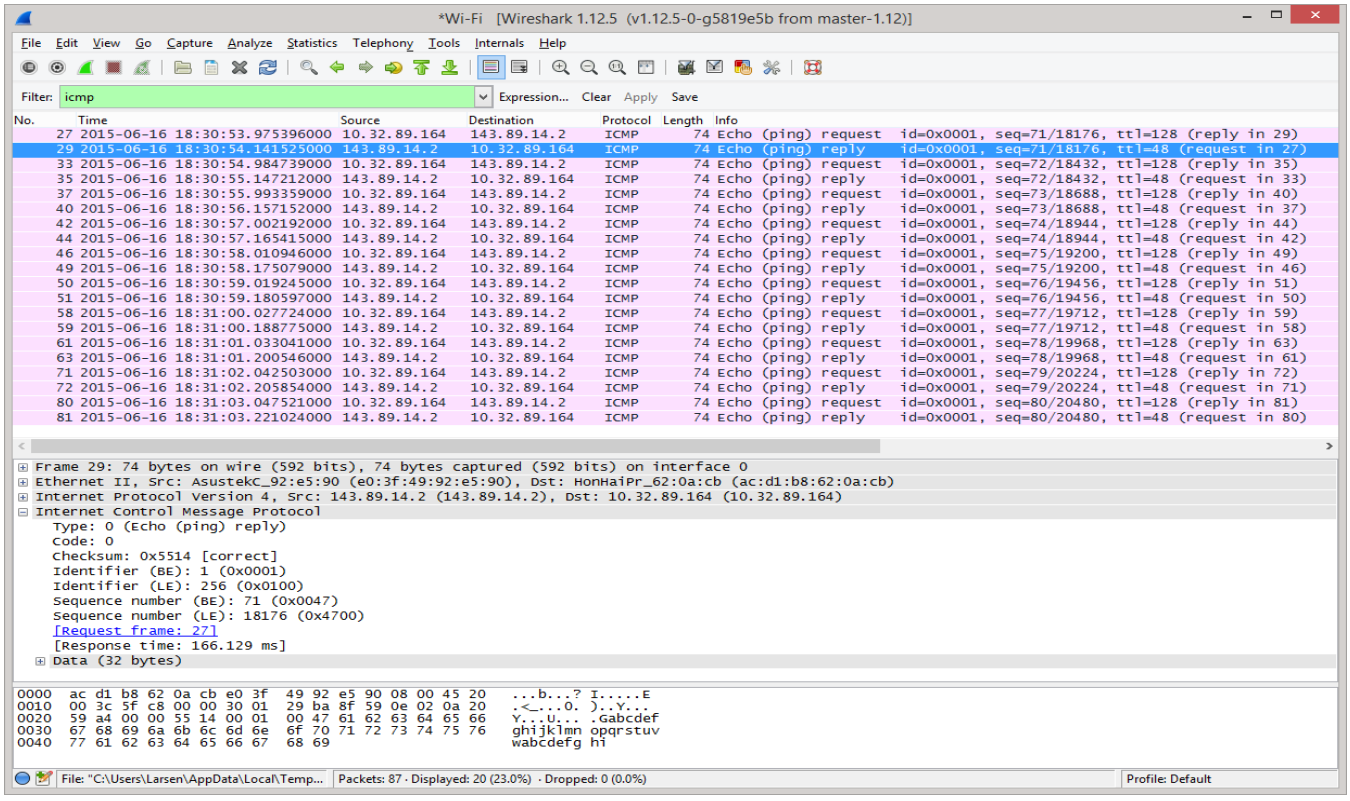


1. What is the IP address of your host? What is the IP address of the destination host?
   - My host IP address is 10.32.89.164
   - The destination host IP address is 143.89.14.2

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.

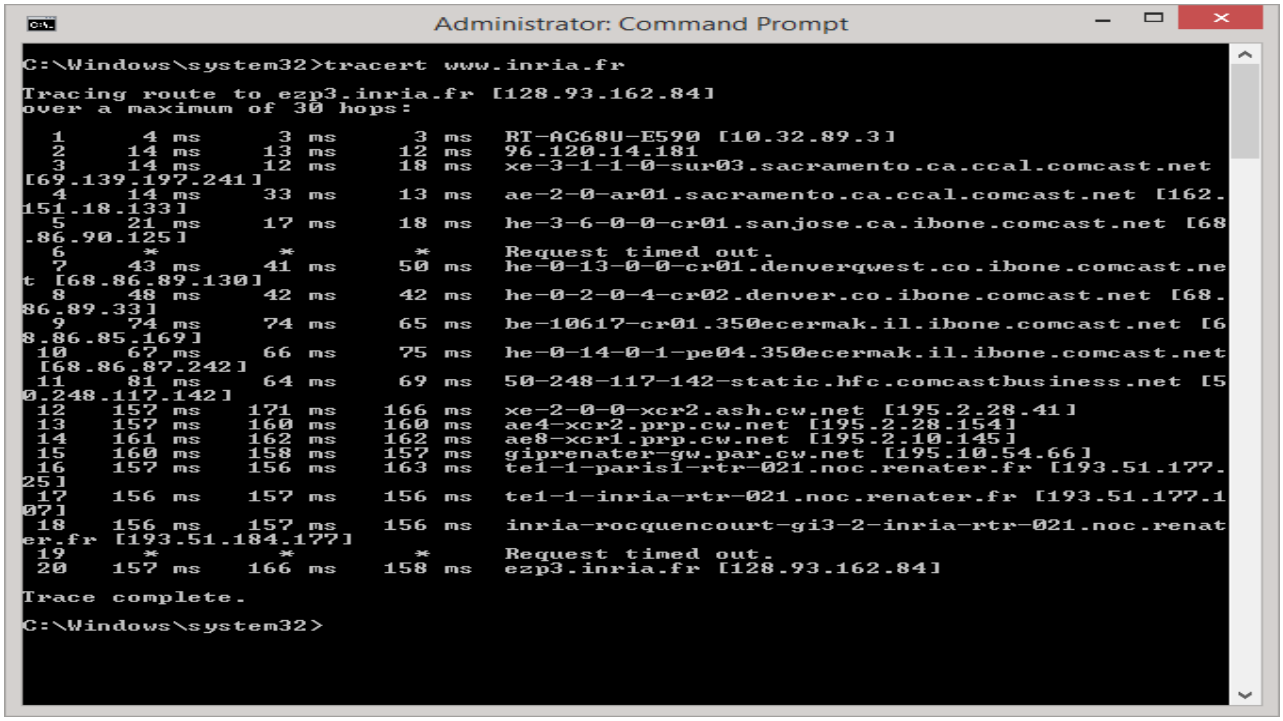
3. Examine one of the ping request packets sent by your host. What are the ICMP type and code numbers? What other fields does this ICMP packet have? How many bytes are the checksum, sequence number and identifier fields?
   - ICMP type is 8, ICMP code is 0.
   - Checksum, identifier, sequence number and data fields.
   - Checksum has 2 bytes, Sequence number has 2 bytes, and Identifier has 2 bytes

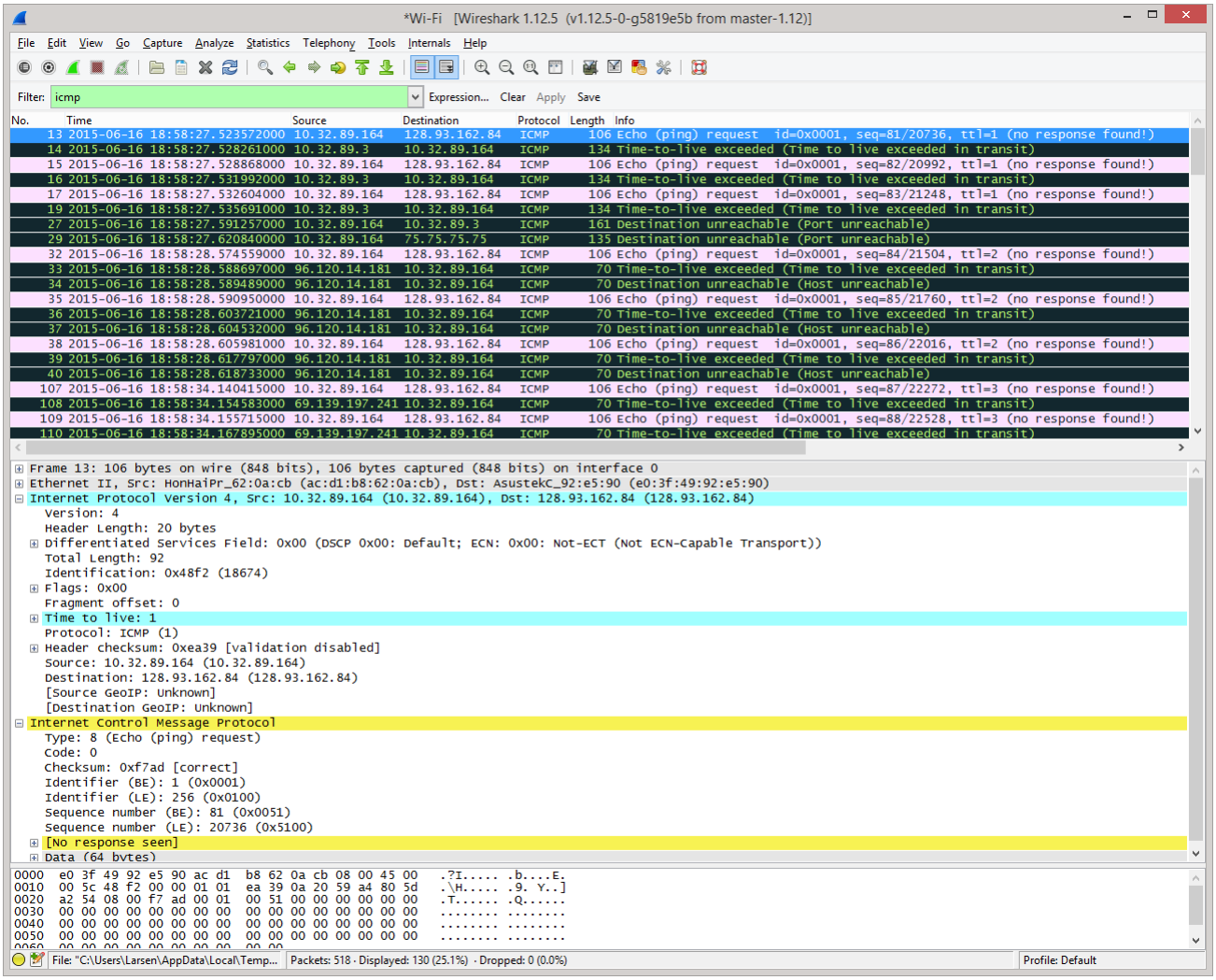
4. Examine the corresponding ping reply packet. What are the ICMP type and code numbers? What other fields does this ICMP packet have? How many bytes are the checksum, sequence number and identifier fields?



   - ICMP type is 0, ICMP code is 0.
   - Checksum, identifier, sequence number and data fields.
   - Checksum has 2 bytes, Sequence number has 2 bytes, and Identifier has 2 bytes

2. ICMP and Traceroute

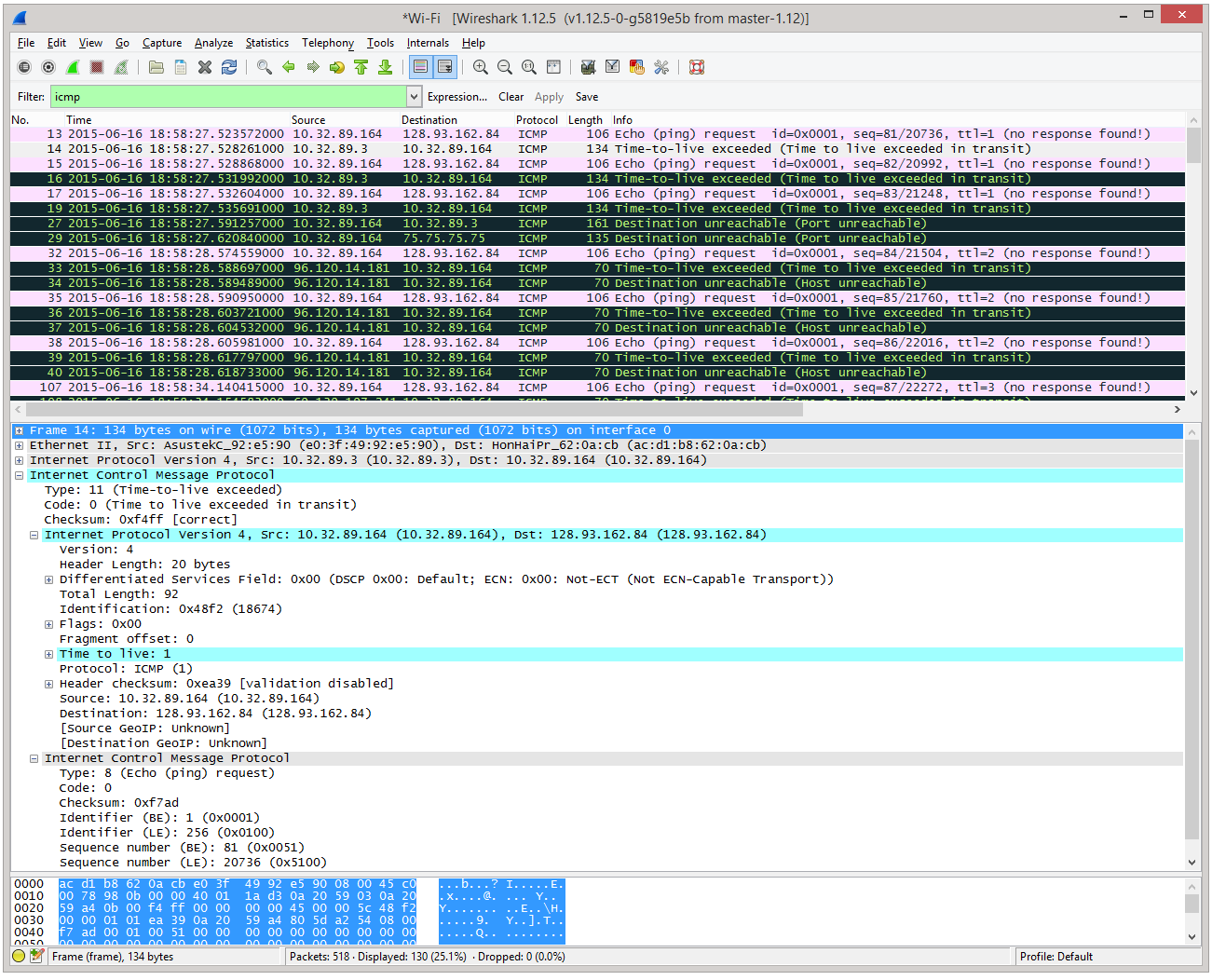




5. What is the IP address of your host? What is the IP address of the target destination host?
   - My host IP address is 10.32.89.164
   - The destination host IP address is 128.93.162.84

6. If ICMP sent UDP packets instead (as in Unix/Linux), would the IP protocol number still be 01 for the probe packets? If not, what would it be?
   - No, the IP protocol number should be 0x11. (see http://www.iana.org/assignments/protocol-numbers/protocol-numbers.xhtml)

7. 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 and the ping query packet have the same fields.



8. Examine the ICMP error packet in your screenshot. It has more fields than the ICMP echo packet. What is included in those fields?
   - The IP header and the first 8 bytes of the original ICMP packet

9. 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 3 packets are type 0, and they are different because all the datagrams made it to the hose before the TTL expired.

10. Within the tracert measurements, is there a link whose delay is significantly longer than others? Refer to the screenshot in Figure 4, is there a link whose delay is significantly longer than others? On the basis of the router names, can you guess the location of the two routers on the end of this link?
    - Yes, in mine from 6 to 7 there was a long delay.
    - Yes, from 9 to 10 in figure 4.
    - In figure 4 the first location is Massachusetts and the second is France.