# Student Information

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# Screenshots

Put **ICMP request**, **ICMP reply** and **route table** screenshots in this section.

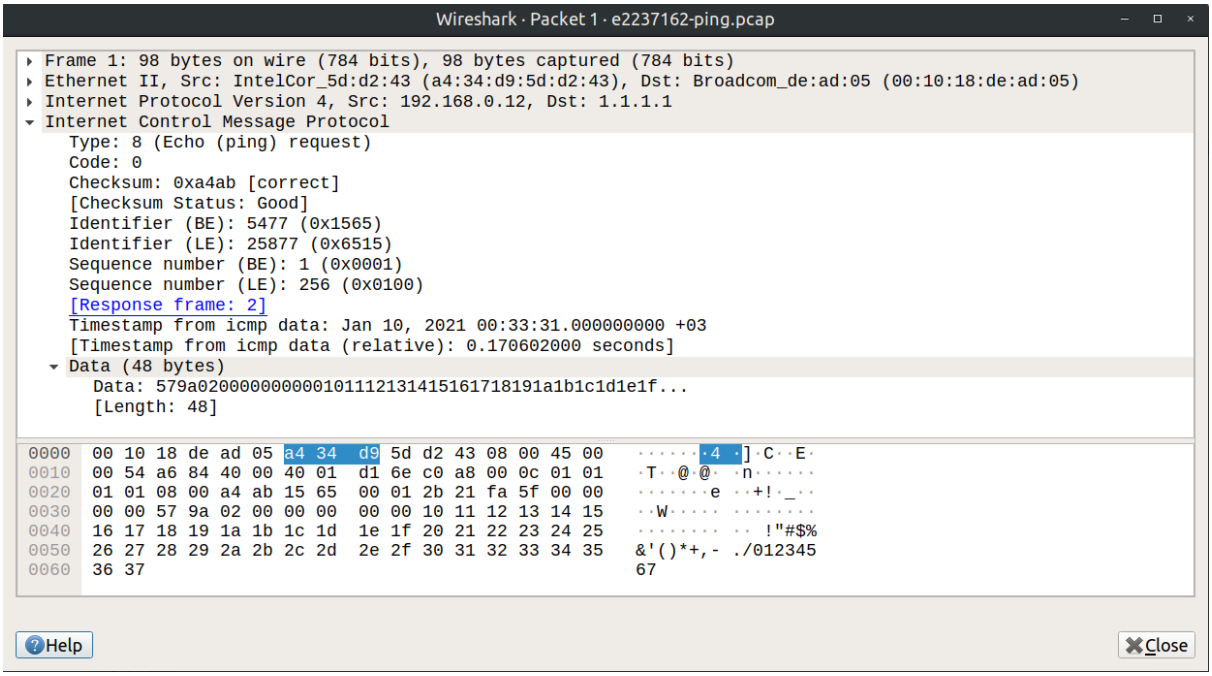


Figure 1: ICMP Request - Packet 1

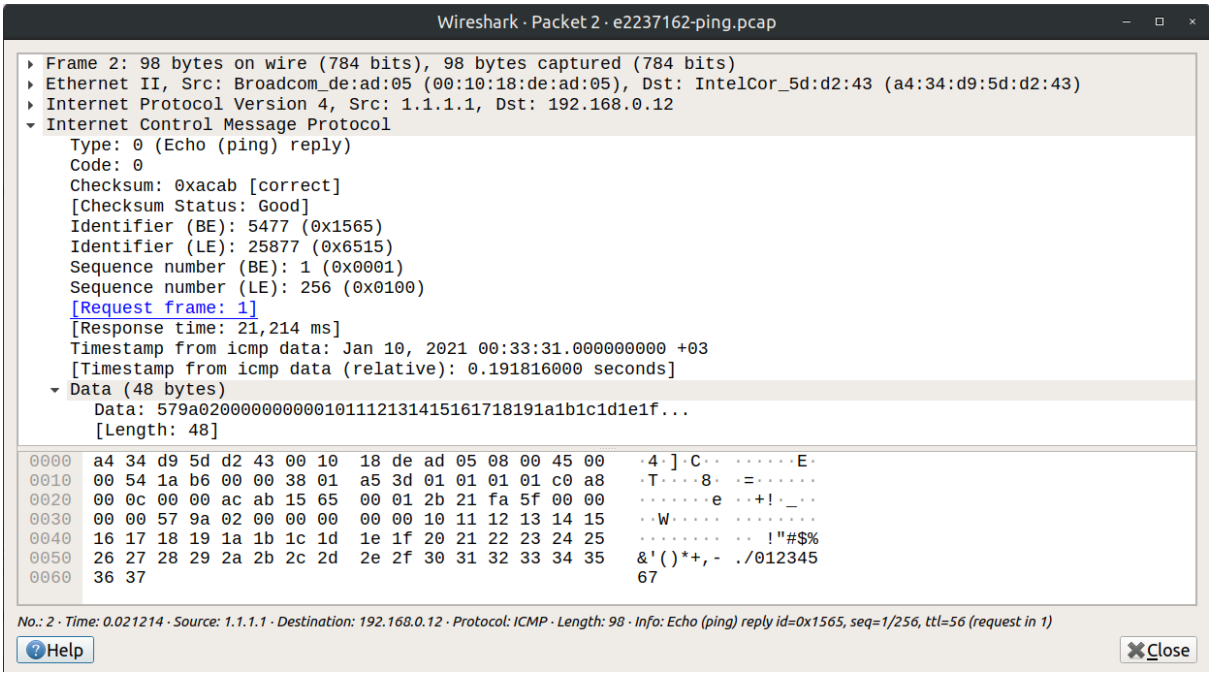


Figure 2: ICMP Reply - Packet 2

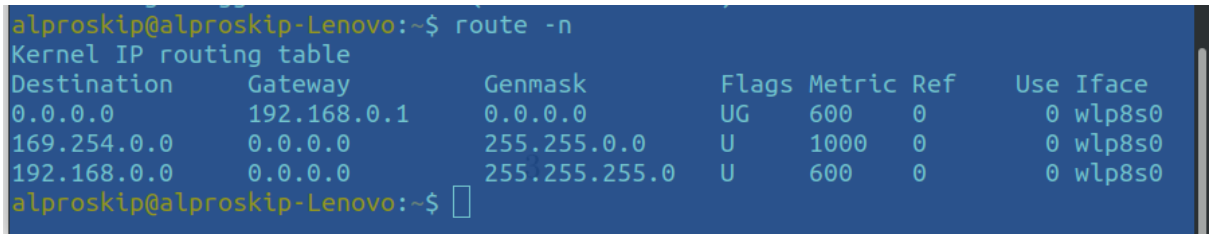


Figure 3: Routing Table

# Answers

## 1. (10 Points)

For ICMP requests, source is 192.168.0.12 and the destination is 1.1.1.1
For ICMP replies, source is 1.1.1.1 and the destination is 192.168.0.12

## 2. (20 Points)

ICMP is referred as a supporting protocol which used to send messages that carry status information such as error, failure or success. Destination unreachable messages from previous homework would be a good example. ICMP is a network layer protocol (not a transport layer protocol like UDP or TCP) which is the reason for that it does not have any source or destination port numbers, they are not use to exchange data between hosts. Port numbers are useful for directing the incoming data to the correct application but for sending messages that indicate status information they are not needed.

## 3a. (15 Points)

As the name suggests, ICMP carries control messages and information about that message is indicated with type and code fields. Message is identified by the type field and code field carries additional information. For example Destination Unreachable message is type 3 and there are several code values for that type such as code 1 - destination host unreachable.

## 3b. (15 Points)

Request packet has type 8 and code 0, reply packet has type 0 and code 0. Type 8 is Echo Request and it only has one code value which is 0 and it indicates Echo request (used to ping). For the reply packet type 0 means Echo Reply also has one code value 0 indicating Echo reply (used to ping).

## 4. (20 Points)

As packet information indicates, 98 bytes are captured (it can be seen from both packet bytes section or in frame 1 header at the top).
Ethernet II has 14 bytes.
IPv4 has 20 bytes.
Rest of the bytes are 98 - 14 - 20 = 64 used in ICMP header. Type and code are each 1 byte long. Checksum, Identifier and Sequence number are 2 bytes each. Timestamp is 8 bytes long. Data is 48 bytes long.
Getting it all together: 2*1 + 2*3 + 8 + 48 = 64 bytes which is correct.

## 5. (20 Points)

If we delete the first row of the kernel routing table then our packets would be dropped and we could not send ping requests.

When the destination address 1.1.1.1 is used with genmasks, none o the resulting IP addresses match with the destinations in the column of kernel routing table. Since there is no matching IP address, we use default address to send our ICMP request and that is the first row on the kernel routing table. When there is no match, the packet is forwarded to gateway and the gateway in default case is actually the IP address of my wifi router.