1. What is the 48-bit Ethernet address of your computer?

54:26:96:df:b5:89

2. What is the 48-bit destination address in the Ethernet frame? Is this the Ethernet

address of gaia.cs.umass.edu? (Hint: the answer is no). What device has this as its

Ethernet address? [Note: this is an important question, and one that students

sometimes get wrong. Re-read pages 468-469 in the text and make sure you

understand the answer here.]

2c:30:33:4b:85:3c

No, it is the mac address of my local switch.

3. Give the hexadecimal value for the two-byte Frame type field. What upper layer

protocol does this correspond to?

0x00000800 Layer 3, IPv4

4. How many bytes from the very start of the Ethernet frame does the ASCII “G” in

“GET” appear in the Ethernet frame?

65 bytes, the G – E – T are labelled in wireshark as the 66th, 67th, and 68th byte in the frame.

5. What is the value of the Ethernet source address? Is this the address of your

computer, or of gaia.cs.umass.edu (Hint: the answer is no). What device has this

as its Ethernet address?

2c:30:33:4b:85:3c

Address of my local switch.

6. What is the destination address in the Ethernet frame? Is this the Ethernet address

of your computer?

54:26:96:df:b5:89

Yes it is.

7. Give the hexadecimal value for the two-byte Frame type field. What upper layer

protocol does this correspond to?

0x00000800 Layer 3, ipv4.

8. How many bytes from the very start of the Ethernet frame does the ASCII “O” in

“OK” (i.e., the HTTP response code) appear in the Ethernet frame?

596 bytes

9. Write down the contents of your computer’s ARP cache. What is the meaning of each column value?

? (192.168.1.1) at 2c:30:33:4b:85:3c on en0 ifscope [ethernet]

? (192.168.1.5) at ac:3a:7a:9f:e0:9b on en0 ifscope [ethernet]

10. What are the hexadecimal values for the source and destination addresses in the

Ethernet frame containing the ARP request message?

Source: 54:26:96:df:b5:89

Destination: ff:ff:ff:ff:ff:ff

11. Give the hexadecimal value for the two-byte Ethernet Frame type field. What

upper layer protocol does this correspond to?

0x00000806, Type ARP

12. Download the ARP specification from

ftp://ftp.rfc-editor.org/in-notes/std/std37.txt. A readable, detailed discussion of

ARP is also at http://www.erg.abdn.ac.uk/users/gorry/course/inet-pages/arp.html.

a) How many bytes from the very beginning of the Ethernet frame does the

ARP opcode field begin?

20 bytes

b) What is the value of the opcode field within the ARP-payload part of the

Ethernet frame in which an ARP request is made?

Request (1)

c) Does the ARP message contain the IP address of the sender?

Yes, 192.168.1.8

d) Where in the ARP request does the “question” appear – the Ethernet

address of the machine whose corresponding IP address is being queried?

Sent to a NULL mac requesting a specific IP (my default gateway).

13. Now find the ARP reply that was sent in response to the ARP request.

a) How many bytes from the very beginning of the Ethernet frame does the

ARP opcode field begin?

20 bytes again

b) What is the value of the opcode field within the ARP-payload part of the

Ethernet frame in which an ARP response is made?

Reply (2)

c) Where in the ARP message does the “answer” to the earlier ARP request

appear – the IP address of the machine having the Ethernet address whose

corresponding IP address is being queried?

Sender Mac, and Sender IP

14. What are the hexadecimal values for the source and destination addresses in the

Ethernet frame containing the ARP reply message?  
Destination: 54:26:96:df:b5:89

Source: 2c:30:33:4b:85:3c

15. Open the ethernet-ethereal-trace-1 trace file in

http://gaia.cs.umass.edu/wireshark-labs/wireshark-traces.zip. The first and second

ARP packets in this trace correspond to an ARP request sent by the computer

running Wireshark, and the ARP reply sent to the computer running Wireshark by

the computer with the ARP-requested Ethernet address. But there is yet another

computer on this network, as indicated by packet 6 – another ARP request. Why

is there no ARP reply (sent in response to the ARP request in packet 6) in the

packet trace?

Because only the requester sees the ARP reply message, because it is destined for the requestors IP address.