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

Answer: b4:2e:99:1b:08:38 is the 48-bit Ethernet address of my computer.

**Graphical user interface, text, application, email

Description automatically generated  
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.]**

Answer: The 48-bit destination address is 3c:37:86:8f:e9:ac which comes from my Netgear device connected to my PC. This is **not** the Ethernet address of gaia.cs.umass.edu. **3. Give the hexadecimal value for the two-byte Frame type field. What upper layer  
protocol does this correspond to?**

Answer: 0x0800. The upper layer protocol is IPv4 as shown in the image below.

**A picture containing diagram

Description automatically generated  
4. How many bytes from the very start of the Ethernet frame does the ASCII “G” in  
“GET” appear in the Ethernet frame?**

The ASCII “G” in “GET” appears 54 bytes from the very start of the Ethernet frame.

Text

Description automatically generated

There are 14 bytes of Ethernet frames:

****

20 bytes of IP header:

****

20 bytes of TCP header:

****

**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?**

HTTP Response:

**Graphical user interface, text, application

Description automatically generated**

Answer: 3c:37:86:8f:e9:ac is the address of my Netgear router ethernet port. **6. What is the destination address in the Ethernet frame? Is this the Ethernet address  
of your computer?**

Answer: b4:2e:99:1b:08:38 is the Ethernet source address. No, it is the address of my Ethernet port from my motherboard. **7. Give the hexadecimal value for the two-byte Frame type field. What upper layer  
protocol does this correspond to?**

Answer: 0x0800. The upper layer protocol is IPv4 as shown in the image below.

**Text, letter

Description automatically generated  
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?**

Answer: 52 byte.

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

Text

Description automatically generated

Internet Address: Contains the IP address

Physical Address: MAC address

Type: prototype type

**10. What are the hexadecimal values for the source and destination addresses in the  
Ethernet frame containing the ARP request message?**

Answer: Source: 00:fc:8b:c7:d2:4e, 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?**

Answer: Text, letter

Description automatically generated

0x0806 **12.   
a) How many bytes from the very beginning of the Ethernet frame does the  
ARP opcode field begin?**

Answer: 20 bytes from the very beginning of the frames. **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?**

Answer: 0x0001 **c) Does the ARP message contain the IP address of the sender?**

Answer: Yes. ARP message contains the IP address of the sender  **d) Where in the ARP request does the “question” appear – the Ethernet  
address of the machine whose corresponding IP address is being queried?**

Answer: 

The target MAC address is set to 00:00:00\_00:00:00 **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?**

**Table

Description automatically generated**

Asnwer: 20 bytes from the very beginning of the Ethernet frame. **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?**

Answer: 0x0002 **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?**

Answer: In the sender MAC address  **14. What are the hexadecimal values for the source and destination addresses in the  
Ethernet frame containing the ARP reply message?**

Answer:

Source: b4:2e:99:1b:08:38

Destination: 3c:37:86:8f:e9:ac **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?**

Answer: There is no reply in this trace because we are not at the same machine that send the request. ARP request is broadcast, but the ARP reply is sent back directly to the sender’s Ethernet address.