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ARP USING WIRESHARK

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Aim :- To understand ARP(Address Resolution Protocol) using wireshark.

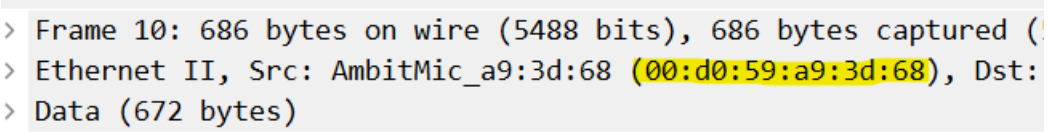
Tools Required :- Windows OS , Wireshark.

Procedure :-

Using arp.pcap file.

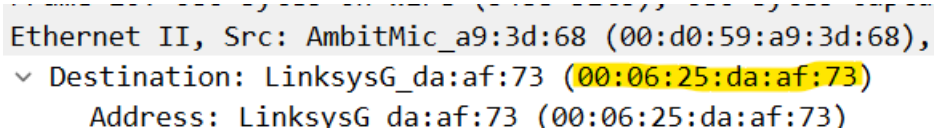
1. Answer the following questions based on the contents of the Ethernet frame containing the HTTP GET message.

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



The 48-bit Ethernet address is : 00:d0:59:a9:3d:68

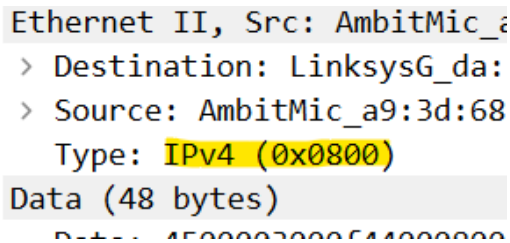
b. What is the 48-bit destination address in the Ethernet frame? Is this the Ethernet address of gaia.cs.umass.edu? What device has this as its Ethernet address?



The 48-bit Ethernet address is : 00:06:25:da:af:73

It is the address of router or gateway that getting request from the source computer.

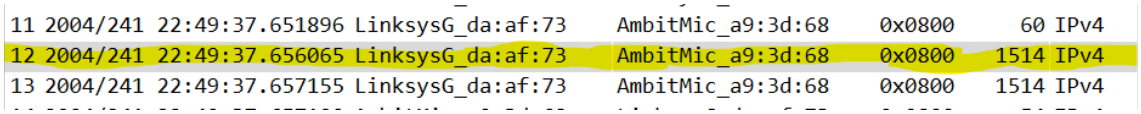
c. Give the hexadecimal value for the two-byte Frame type field. What upper layer protocol does this correspond to?

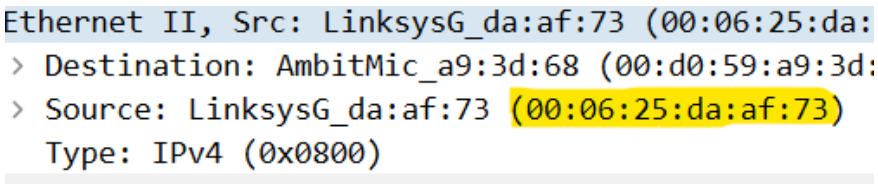


The hexadecimal value is : 0x0800 and it corresponds to IPv4 protocol.

2. Answer the following questions based on the contents of the Ethernet frame containing the first byte of the HTTP response message.

a. What is the value of the Ethernet source address?

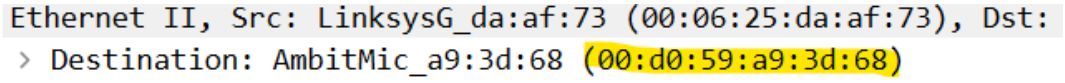




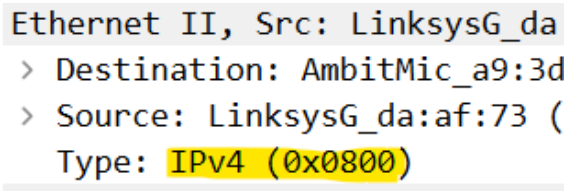
Value of Ethernet source address is : 00:06:25:da:af:73

b. What is the destination address in the Ethernet frame? Is this the Ethernet address of your computer?

The destination address is : 00:d0:59:a9:3d:68



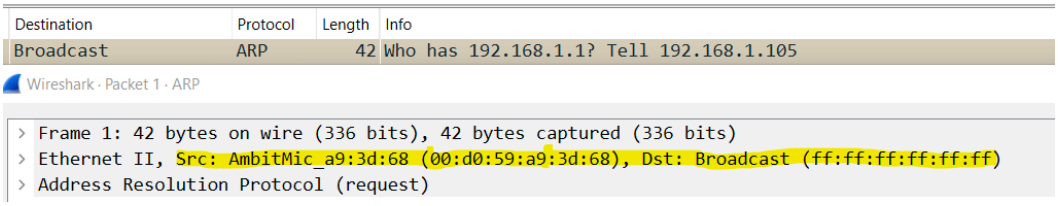
c. Give the hexadecimal value for the two-byte Frame type field. What upper layer protocol does this correspond to?



Hexadecimal value: 0x0800 corresponding to IPv4 protocol.

3. Answer the following questions based on the contents of the ARP Request packets.

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



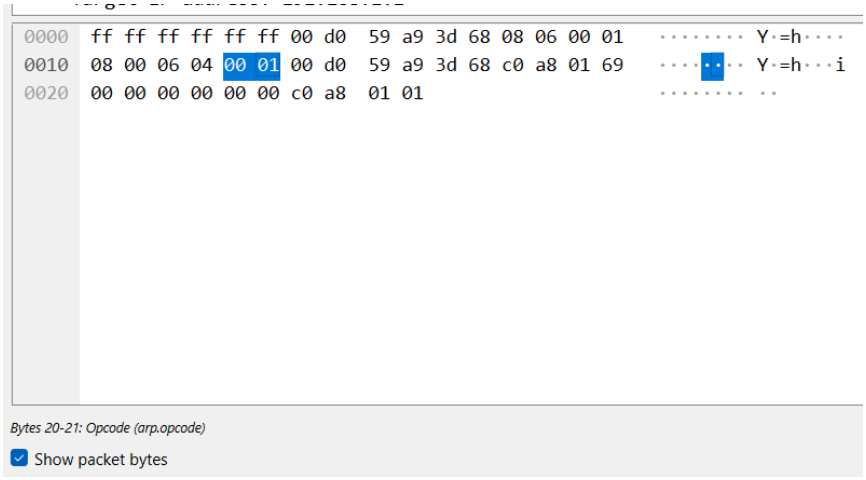
Source address : 00:d0:59:a9:3d:68
Destination address : ff:ff:ff:ff:ff:ff

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

Hexadecimal value : 0x0806

```
Ethernet II, Src: AmbitMic_a9:3d:68 (00:d0:59:a9:3d:68), Dst: Broadcast
  > Destination: Broadcast (ff:ff:ff:ff:ff:ff)
  > Source: AmbitMic_a9:3d:68 (00:d0:59:a9:3d:68)
    Type: ARP (0x0806)
```

c. How many bytes from the very beginning of the Ethernet frame does the ARP opcode field begin?



As shown Bytes 20-21 is the Opcode byte and ARP opcode field begins at 20th Byte.

d. What is the value of the opcode field within the ARP-payload part of the Ethernet frame in which an ARP request is made?

```
Opcode: request (1)
Sender MAC address: AmbitMic_a9:3d:68 (00:d0:59:a9:3d:68)
Sender IP address: 192.168.1.105
Target MAC address: 00:00:00_00:00:00 (00:00:00:00:00:00)
Target IP address: 192.168.1.1
```

```
0000  ff ff ff ff ff ff 00 d0  59 a9 3d 68 08 06 00 01    ·····Y·=h····
0010  08 00 06 04 00 01 00 d0  59 a9 3d 68 c0 a8 01 69    ·····Y·=h···i
0020  00 00 00 00 00 00 c0 a8  01 01                      ·····
```

e. Does the ARP message contain the IP address of the sender?

```
Address Resolution Protocol (request)
   Hardware type: Ethernet (1)
   Protocol type: IPv4 (0x0800)
   Hardware size: 6
   Protocol size: 4
   Opcode: request (1)
   Sender MAC address: AmbitMic_a9:3d:68 (00:d0:59:a9:3d:68)
   Sender IP address: 192.168.1.105
```

Yes , It is 192.168.1.105

f. Where in the ARP request does the "question" appear – the Ethernet address of the machine whose corresponding IP address is being queried?

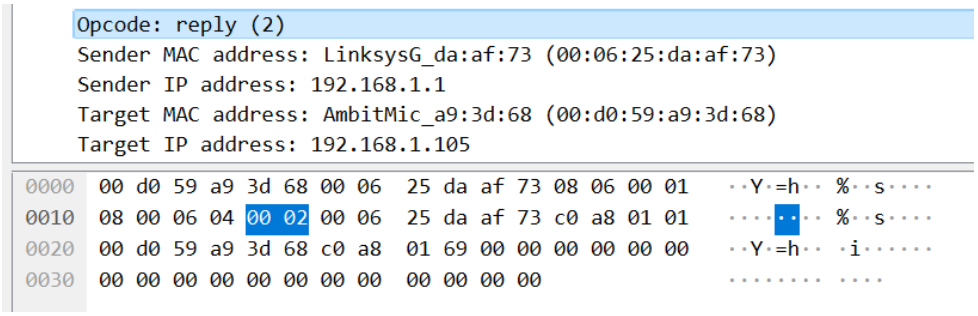
```
Who has 192.168.1.1? Tell 192.168.1.105
Wireshark · Packet 1 · ARP

      .... ...0 .... .... .... .... = IG bit: Individual addr
   Type: ARP (0x0806)
Address Resolution Protocol (request)
   Hardware type: Ethernet (1)
   Protocol type: IPv4 (0x0800)
   Hardware size: 6
   Protocol size: 4
   Opcode: request (1)
   Sender MAC address: AmbitMic_a9:3d:68 (00:d0:59:a9:3d:68)
   Sender IP address: 192.168.1.105
   Target MAC address: 00:00:00_00:00:00 (00:00:00:00:00:00)
   Target IP address: 192.168.1.1
```

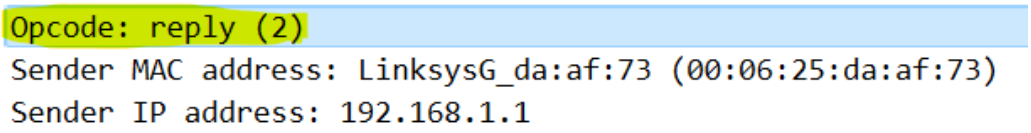
4. Answer the following questions based on the contents of the ARP Reply packets.

a. How many bytes from the very beginning of the Ethernet frame does the ARP opcode field begin?

It begins at 20th field.

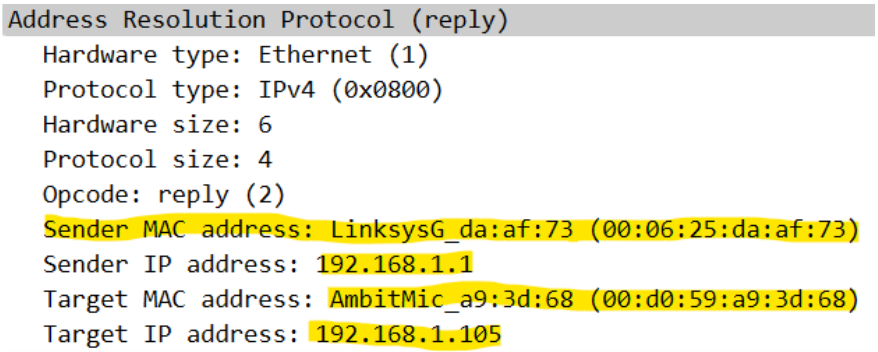


b. What is the value of the opcode field within the ARP-payload part of the Ethernet frame in which an ARP response is made?



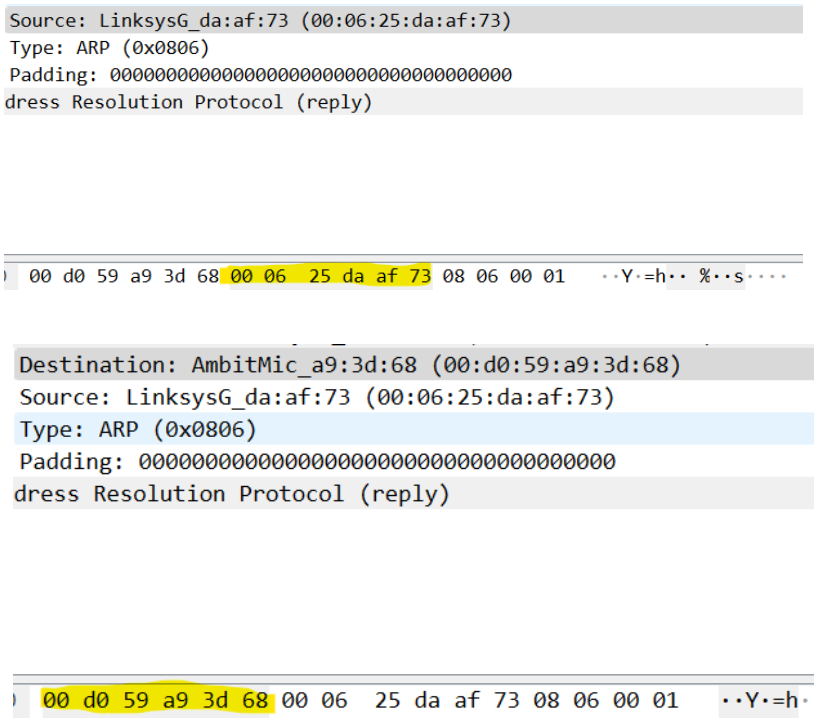
Value of Opcode field is : 2

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?



This packet has answer of IP address of machine having Ethernet address whose corresponding IP address is being queried.

d. What are the hexadecimal values for the source and destination addresses in the Ethernet frame containing the ARP reply message?



Hexadecimal values of Source address : 00 06 25 da af 73
Hexadecimal values of Destination address : 00 d0 59 a9 3d 68

e. 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?

As this traffic is captured from the computer of IP .105. There is no ARP reply for the 6th packet request. Because ARP request is sent as Broadcast. But the reply/response is sent as Unicast by the corresponding computer.

As reply is sent as Unicast, Other computers can't capture the reply message of that computer. Thus , we couldn't see the ARP reply.

Result **:** Thus , understanding Address Resolution Protocol (ARP) using wireshark is successfully done.