

Trường Đại Học Bách Khoa Tp.Hồ Chí Minh  
Khoa Khoa Học và Kỹ Thuật Máy Tính

**ĐẠI HỌC QUỐC GIA TP. HỒ CHÍ MINH**  
**TRƯỜNG ĐẠI HỌC BÁCH KHOA**  
**KHOA KHOA HỌC VÀ KỸ THUẬT MÁY TÍNH**



**BÁO CÁO**  
**MẠNG MÁY TÍNH THỰC HÀNH (CO3094)**

---

**LAB 6**

---

GV hướng dẫn: Bùi Xuân Giang

SV thực hiện: Trịnh Thị Mỹ Lệ

Thành phố Hồ Chí Minh, Tháng 3 năm 2025

## 1. Question 1

**Question:** What is the 48-bit Ethernet address of your computer?

**Answer:** The Ethernet of my computer is (28:c5:d2:d3:7a:b6)

```
▶ Frame 659: 538 bytes on wire (4304 bits), 538 bytes captured (4304 bits) on interface \Device\NPF_{DEF...}
▼ Ethernet II, Src: Intel_d3:7a:b6 (28:c5:d2:d3:7a:b6), Dst: RuijieNetwor_f7:9e:c9 (c0:a4:76:f7:9e:c9)
  ▶ Destination: RuijieNetwor_f7:9e:c9 (c0:a4:76:f7:9e:c9)
  ▶ Source: Intel_d3:7a:b6 (28:c5:d2:d3:7a:b6)
  Type: IPv4 (0x0800)
  [Stream index: 0]
▶ Internet Protocol Version 4, Src: 192.168.110.231, Dst: 128.119.245.12
▶ Transmission Control Protocol, Src Port: 57368, Dst Port: 80, Seq: 1, Ack: 1, Len: 484
▶ Hypertext Transfer Protocol
```

## 2. Question 2

**Question:** 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?

**Answer:** dst address is (c0:a4:76:f7:9e:c9). No, it is the address of my home router, which is the link used to gett off the subnet

```
▶ Frame 659: 538 bytes on wire (4304 bits), 538 bytes captured (4304 bits) on interface \Device\NPF_{DEF...}
▼ Ethernet II, Src: Intel_d3:7a:b6 (28:c5:d2:d3:7a:b6), Dst: RuijieNetwor_f7:9e:c9 (c0:a4:76:f7:9e:c9)
  ▶ Destination: RuijieNetwor_f7:9e:c9 (c0:a4:76:f7:9e:c9)
  ▶ Source: Intel_d3:7a:b6 (28:c5:d2:d3:7a:b6)
  Type: IPv4 (0x0800)
  [Stream index: 0]
▶ Internet Protocol Version 4, Src: 192.168.110.231, Dst: 128.119.245.12
▶ Transmission Control Protocol, Src Port: 57368, Dst Port: 80, Seq: 1, Ack: 1, Len: 484
▶ Hypertext Transfer Protocol
```

## 3. Question 3

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

**Answer:**

- Hex value is 0x0800
- Upper layer protocol is IP

#### 4. Question 4

**Question:** How many bytes from the very start of the Ethernet frame does the ASCII “G” in “GET” appear in the Ethernet frame?

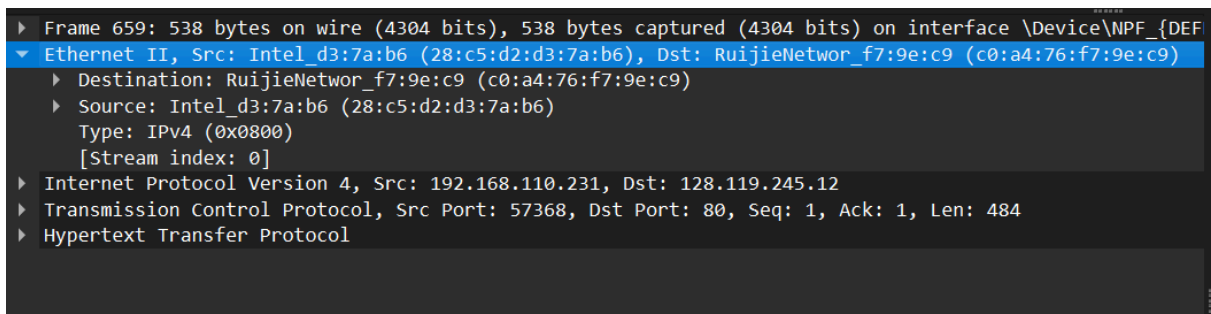
**Answer:** 48 bytes

#### 5. Question 5

**Question:** 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?

**Answer:**

- 28:c5:d2:d3:7a:b6
- This address is not the address of my computer or gaia.cs.umass.edu. This is the address of my router.



```
▶ Frame 659: 538 bytes on wire (4304 bits), 538 bytes captured (4304 bits) on interface \Device\NPF_{DEF...}
▼ Ethernet II, Src: Intel_d3:7a:b6 (28:c5:d2:d3:7a:b6), Dst: RuijieNetwor_f7:9e:c9 (c0:a4:76:f7:9e:c9)
  ▶ Destination: RuijieNetwor_f7:9e:c9 (c0:a4:76:f7:9e:c9)
  ▶ Source: Intel_d3:7a:b6 (28:c5:d2:d3:7a:b6)
    Type: IPv4 (0x0800)
    [Stream index: 0]
  ▶ Internet Protocol Version 4, Src: 192.168.110.231, Dst: 128.119.245.12
  ▶ Transmission Control Protocol, Src Port: 57368, Dst Port: 80, Seq: 1, Ack: 1, Len: 484
  ▶ Hypertext Transfer Protocol
```

#### 6. Question 6

**Question:** What is the destination address in the Ethernet frame? Is this the Ethernet address of your computer?

**Answer:**

- c0:a4:76:f7:9e:c9
- My own address

```
▶ Frame 659: 538 bytes on wire (4304 bits), 538 bytes captured (4304 bits) on interface \Device\NPF_{DEF
▼ Ethernet II, Src: Intel_d3:7a:b6 (28:c5:d2:d3:7a:b6), Dst: RuijieNetwor_f7:9e:c9 (c0:a4:76:f7:9e:c9)
  ▶ Destination: RuijieNetwor_f7:9e:c9 (c0:a4:76:f7:9e:c9)
  ▶ Source: Intel_d3:7a:b6 (28:c5:d2:d3:7a:b6)
    Type: IPv4 (0x0800)
    [Stream index: 0]
  ▶ Internet Protocol Version 4, Src: 192.168.110.231, Dst: 128.119.245.12
  ▶ Transmission Control Protocol, Src Port: 57368, Dst Port: 80, Seq: 1, Ack: 1, Len: 484
  ▶ Hypertext Transfer Protocol
```

## 7. Question 7

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

**Answer:** 0x0800, corresponds to IPv4

## 8. Question 8

**Question:** 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:** 13 bytes

## 9. Question 9

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

**Answer:** The Internet Address column contains the IP address, the Physical Address column contains the MAC address, and the type indicates the protocol type

```
C:\Users\MY LE>arp -a

Interface: 192.168.81.1 --- 0xd
Internet Address      Physical Address      Type
192.168.81.254        00-50-56-e0-f8-2e    dynamic
192.168.81.255        ff-ff-ff-ff-ff-ff    static
224.0.0.22            01-00-5e-00-00-16    static
224.0.0.251           01-00-5e-00-00-fb    static
224.0.0.252           01-00-5e-00-00-fc    static
239.255.255.250       01-00-5e-7f-ff-fa    static
255.255.255.255       ff-ff-ff-ff-ff-ff    static

Interface: 192.168.223.1 --- 0xe
Internet Address      Physical Address      Type
192.168.223.254       00-50-56-ea-48-1a    dynamic
192.168.223.255       ff-ff-ff-ff-ff-ff    static
224.0.0.22            01-00-5e-00-00-16    static
224.0.0.251           01-00-5e-00-00-fb    static
224.0.0.252           01-00-5e-00-00-fc    static
239.255.255.250       01-00-5e-7f-ff-fa    static
255.255.255.255       ff-ff-ff-ff-ff-ff    static

Interface: 192.168.137.134 --- 0x12
Internet Address      Physical Address      Type
192.168.137.1         be-a8-a6-63-bf-37    dynamic
192.168.137.255       ff-ff-ff-ff-ff-ff    static
224.0.0.2             01-00-5e-00-00-02    static
```

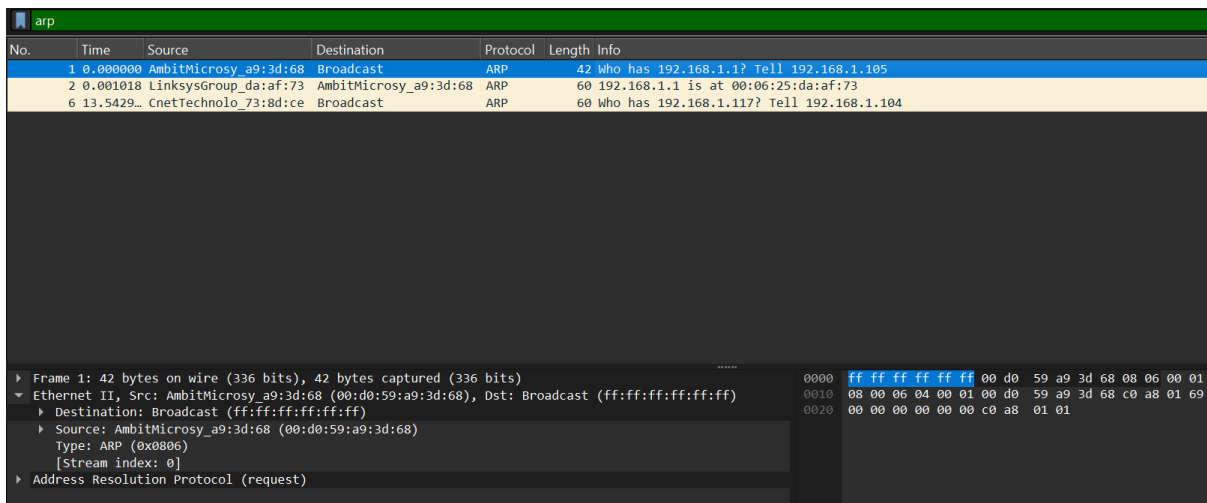
## 10. Question 10

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

**Answer:**

src address: 00:d0:59:a9:3d:68

dst address: ff:ff:ff:ff:ff:ff



No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	AmbitMicrosy_a9:3d:68	Broadcast	ARP	42	Who has 192.168.1.1? Tell 192.168.1.105
2	0.001018	LinksysGroup_da:af:73	AmbitMicrosy_a9:3d:68	ARP	60	192.168.1.1 is at 00:06:25:da:af:73
6	13.5429...	CnetTechnolo_73:8d:ce	Broadcast	ARP	60	Who has 192.168.1.117? Tell 192.168.1.104

Frame 1: 42 bytes on wire (336 bits), 42 bytes captured (336 bits)	
Ethernet II, Src: AmbitMicrosy_a9:3d:68 (00:d0:59:a9:3d:68), Dst: Broadcast (ff:ff:ff:ff:ff:ff)	
Destination: Broadcast (ff:ff:ff:ff:ff:ff)	
Source: AmbitMicrosy_a9:3d:68 (00:d0:59:a9:3d:68)	
Type: ARP (0x0806)	
[Stream index: 0]	
Address Resolution Protocol (request)	

0000	ff ff ff ff ff ff	00 d0	59 a9 3d 68 06 00 01
0010	08 00 06 04 00 01 00 d0	59 a9 3d 68 c0 a8 01 69	
0020	00 00 00 00 00 00 c0 a8	01 01	

## 11. Question 11

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

**Answer:** 0x0806

## 12. Question 12a

**Question:** How many bytes from the very beginning of the Ethernet frame does the ARP opcode field begin?

**Answer:** Ethernet 14 bytes

Trường Đại Học Bách Khoa Tp.Hồ Chí Minh  
Khoa Khoa Học và Kỹ Thuật Máy Tính

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	AmbitMicrosy_a9:3d:68	Broadcast	ARP	42	Who has 192.168.1.1? Tell 192.168.1.105
2	0.001018	LinksysGroup_da:af:73	AmbitMicrosy_a9:3d:68	ARP	60	192.168.1.1 is at 00:06:25:da:af:73
6	13.5429...	CnetTechnolo_73:8d:ce	Broadcast	ARP	60	Who has 192.168.1.117? Tell 192.168.1.104

Frame 1: 42 bytes on wire (336 bits), 42 bytes captured (336 bits) on interface 0  
Ethernet II, Src: AmbitMicrosy\_a9:3d:68 (00:d0:59:a9:3d:68), Dst: Broadcast (ff:ff:ff:ff:ff:ff)  
Destination: Broadcast (ff:ff:ff:ff:ff:ff)  
Source: AmbitMicrosy\_a9:3d:68 (00:d0:59:a9:3d:68)  
Type: ARP (0x0806)  
[Stream index: 0]  
Address Resolution Protocol (request)

0000 ff ff ff ff ff 00 d0 59 a9 3d 68 08 06 00 01 00 00 00 00 00 00 c0 a8 01 01  
0010 08 00 06 04 00 01 00 d0 59 a9 3d 68 c0 a8 01 69  
0020 00 00 00 00 00 00 c0 a8 01 01

## 12. Question 12b

**Question:** 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:** 00 01 (hex)

## 12. Question 12c

**Question:** Does the ARP message contain the IP address of the sender?

**Answer:** Yes, ARP message containing the IP address 192.168.1.105 for the sender

## 12. Question 12d

**Question:** Where in the ARP request does the “question” appear – the Ethernet address of the machine whose corresponding IP address is being queried?

**Answer:** Target IP address: 192.168.1.1

## 13. Question 13a

**Question:** How many bytes from the very beginning of the Ethernet frame does the ARP opcode field begin?



**Answer:** 0x0002

**Answer:**

- Destination Address: 00:0b:59:a9:3d:68
- Source Address: 00:06:25:da:af:73

### 15. Question 15

**Question:** Why is there no ARP reply (sent in response to the ARP request in packet 6) in the packet trace?

**Answer:** Because the ARP request is broadcast, but the ARP reply is not broadcast. The reply will be sent to the computer who made the request directly