

Session 7

Exercise 1: Ethernet

a

The 48-bit Ethernet address from my computer is `10:7C:61:C2:01:97`.

```
▼ Ethernet II, Src: ASUSTekCOMPU_c2:01:97 (10:7c:61:c2:01:97), Dst: All-HSRP-routers_03 (00:00:0c:07:ac:03)
  ▼ Destination: All-HSRP-routers_03 (00:00:0c:07:ac:03)
    .... ..0. .... = LG bit: Globally unique address (factory default)
    .... ..0. .... = IG bit: Individual address (unicast)
  ▼ Source: ASUSTekCOMPU_c2:01:97 (10:7c:61:c2:01:97)
    .... ..0. .... = LG bit: Globally unique address (factory default)
    .... ..0. .... = IG bit: Individual address (unicast)
Type: IPv4 (0x0800)
[Stream index: 1]
```

b

The 48-bit destination address is `00:00:0C:07:AC:03` and it belongs to `All-HSRP-routers_03`.

```
▼ Ethernet II, Src: ASUSTekCOMPU_c2:01:97 (10:7c:61:c2:01:97), Dst: All-HSRP-routers_03 (00:00:0c:07:ac:03)
  ▼ Destination: All-HSRP-routers_03 (00:00:0c:07:ac:03)
    .... ..0. .... = LG bit: Globally unique address (factory default)
    .... ..0. .... = IG bit: Individual address (unicast)
  ▼ Source: ASUSTekCOMPU_c2:01:97 (10:7c:61:c2:01:97)
    .... ..0. .... = LG bit: Globally unique address (factory default)
    .... ..0. .... = IG bit: Individual address (unicast)
Type: IPv4 (0x0800)
[Stream index: 1]
```

c

The hexadecimal value of the Frame type is `0x0800` which is used for `IPv4` and is on the internet layer.

```
▼ Ethernet II, Src: ASUSTekCOMPU_c2:01:97 (10:7c:61:c2:01:97), Dst: All-HSRP-routers_03 (00:00:0c:07:ac:03)
  ▼ Destination: All-HSRP-routers_03 (00:00:0c:07:ac:03)
    .... ..0. .... = LG bit: Globally unique address (factory default)
    .... ..0. .... = IG bit: Individual address (unicast)
  ▼ Source: ASUSTekCOMPU_c2:01:97 (10:7c:61:c2:01:97)
    .... ..0. .... = LG bit: Globally unique address (factory default)
    .... ..0. .... = IG bit: Individual address (unicast)
Type: IPv4 (0x0800)
[Stream index: 1]
```

d

The 48-bit destination address is `80:6A:00:6D:E8:9F` and it belongs to `Cisco_6d:e8:9f`.

```
▼ Ethernet II, Src: Cisco_6d:e8:9f (80:6a:00:6d:e8:9f), Dst: ASUSTekCOMPU_c2:01:97 (10:7c:61:c2:01:97)
  ▼ Destination: ASUSTekCOMPU_c2:01:97 (10:7c:61:c2:01:97)
    ....0. .... = LG bit: Globally unique address (factory default)
    ....0. .... = IG bit: Individual address (unicast)
  ▼ Source: Cisco_6d:e8:9f (80:6a:00:6d:e8:9f)
    ....0. .... = LG bit: Globally unique address (factory default)
    ....0. .... = IG bit: Individual address (unicast)
Type: IPv4 (0x0800)
[Stream index: 2]
```

e

0 appears in the 68th byte in the Ethernet frame.

```
0030  01 f5 6a 3d 00 00 48 54  54 50 2f 31 2e 31 20 32  j=...HT TP/1.1 2
0040  30 30 20 4f 4b 0d 0a 53  65 72 76 65 72 3a 20 6e  OK...S erver: n
0050  67 69 6e 70 2f 31 2e 32  32 2e 31 0d 0a 44 61 74  ginx/1.2 2.1..Dat
```

Exercise 2: ARP

a

Interface `143.129.40.79` is the current IPv4 address of the Ethernet adapter.

Interface `172.17.144.1` is an internal IPv4 address of my WSL.

- **Internet Address:** IP-address of the device.
- **Physical Address:** MAC-address of the device.
- **Type:** type of ARP entry, which can be dynamic or static.
 - Dynamic: entries are automatically added by the system when it communicates with other devices on the network.
 - Static: entries are manually added and remain in the ARP table until they are manually removed.

```

Interface: 143.129.40.79 --- 0x13
  Internet Address      Physical Address      Type
143.129.40.78          bc-0f-f3-5d-48-ac     dynamic
143.129.40.83          d8-bb-c1-24-e9-01     dynamic
143.129.40.105         04-7c-16-38-22-14     dynamic
143.129.40.254         00-00-0c-07-ac-03     dynamic
143.129.40.255         ff-ff-ff-ff-ff-ff     static
224.0.0.2              01-00-5e-00-00-02     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: 172.17.144.1 --- 0x2b
  Internet Address      Physical Address      Type
172.17.159.255         ff-ff-ff-ff-ff-ff     static
224.0.0.2              01-00-5e-00-00-02     static
224.0.0.22             01-00-5e-00-00-16     static
224.0.0.251            01-00-5e-00-00-fb     static
239.255.255.250        01-00-5e-7f-ff-fa     static

```

b

In `arp -d *`, `-d` means `delete` and `*` means `all`.

```

Interface: 143.129.40.79 --- 0x13
  Internet Address      Physical Address      Type
143.129.40.254         00-00-0c-07-ac-03     dynamic
224.0.0.2              01-00-5e-00-00-02     static
224.0.0.22             01-00-5e-00-00-16     static

Interface: 172.17.144.1 --- 0x2b
  Internet Address      Physical Address      Type
224.0.0.2              01-00-5e-00-00-02     static
224.0.0.22             01-00-5e-00-00-16     static

```

c

Source address: `BC:0F:F3:5D:48:AC`, belongs to `HP_5d:48:ac`.

FF:FF:FF:FF:FF:FF

is a broadcast.

```
Ethernet II, Src: HP_5d:48:ac (bc:0f:f3:5d:48:ac), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
▼ Destination: Broadcast (ff:ff:ff:ff:ff:ff)
    .... ..1. .... = LG bit: Locally administered address (this is NOT the factory default)
    .... ..1. .... = IG bit: Group address (multicast/broadcast)
▼ Source: HP_5d:48:ac (bc:0f:f3:5d:48:ac)
    .... ..0. .... = LG bit: Globally unique address (factory default)
    .... ..0. .... = IG bit: Individual address (unicast)
Type: ARP (0x0806)
[Stream index: 9]
Padding: 00000000000000000000000000000000
```

d

0x0806

ARP

link

```
Ethernet II, Src: HP_5d:48:ac (bc:0f:f3:5d:48:ac), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
  Destination: Broadcast (ff:ff:ff:ff:ff:ff)
    .... ..1. .... = LG bit: Locally administered address (this is NOT the factory default)
    .... ..1. .... = IG bit: Group address (multicast/broadcast)
  Source: HP_5d:48:ac (bc:0f:f3:5d:48:ac)
    .... ..0. .... = LG bit: Globally unique address (factory default)
    .... ..0. .... = IG bit: Individual address (unicast)
Type: ARP (0x0806)
[Stream index: 9]
Padding: 00000000000000000000000000000000
```

e

There doesn't seem to be an ARP-reply in my recordings in Wireshark, hereby the results are purely speculative.

10:7C:61:C2:01:97

, belongs to my computer.

BC:0F:F3:5D:48:AC

, belongs to `HP_5d:48:ac`.