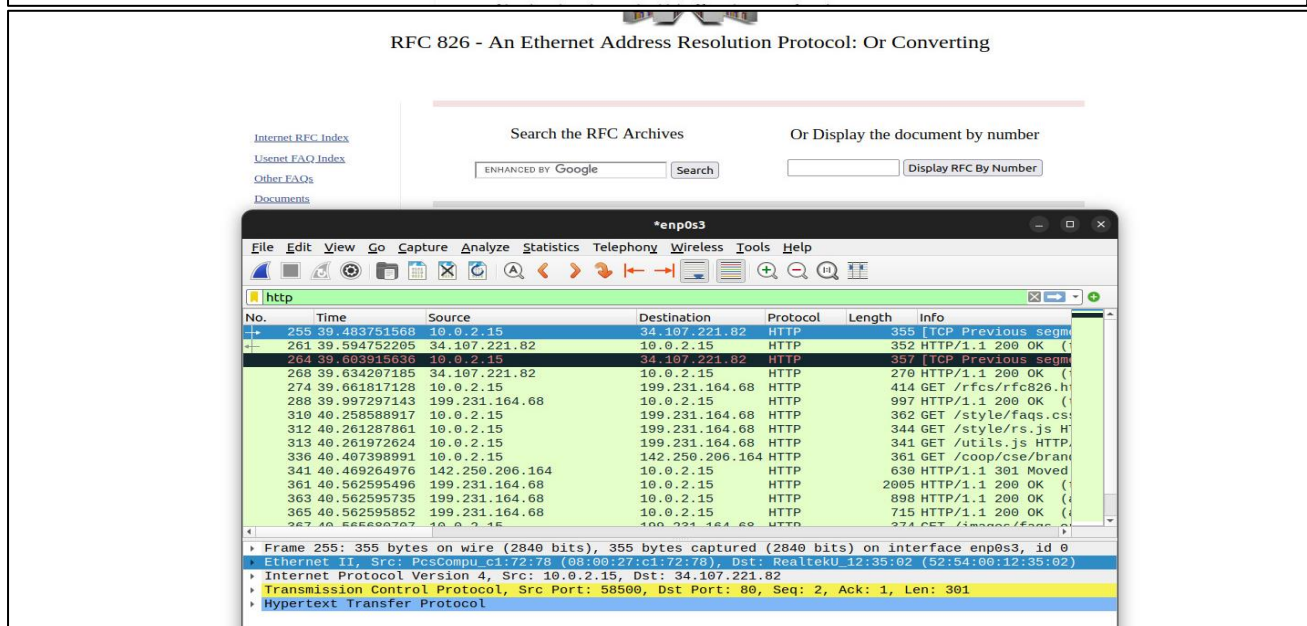
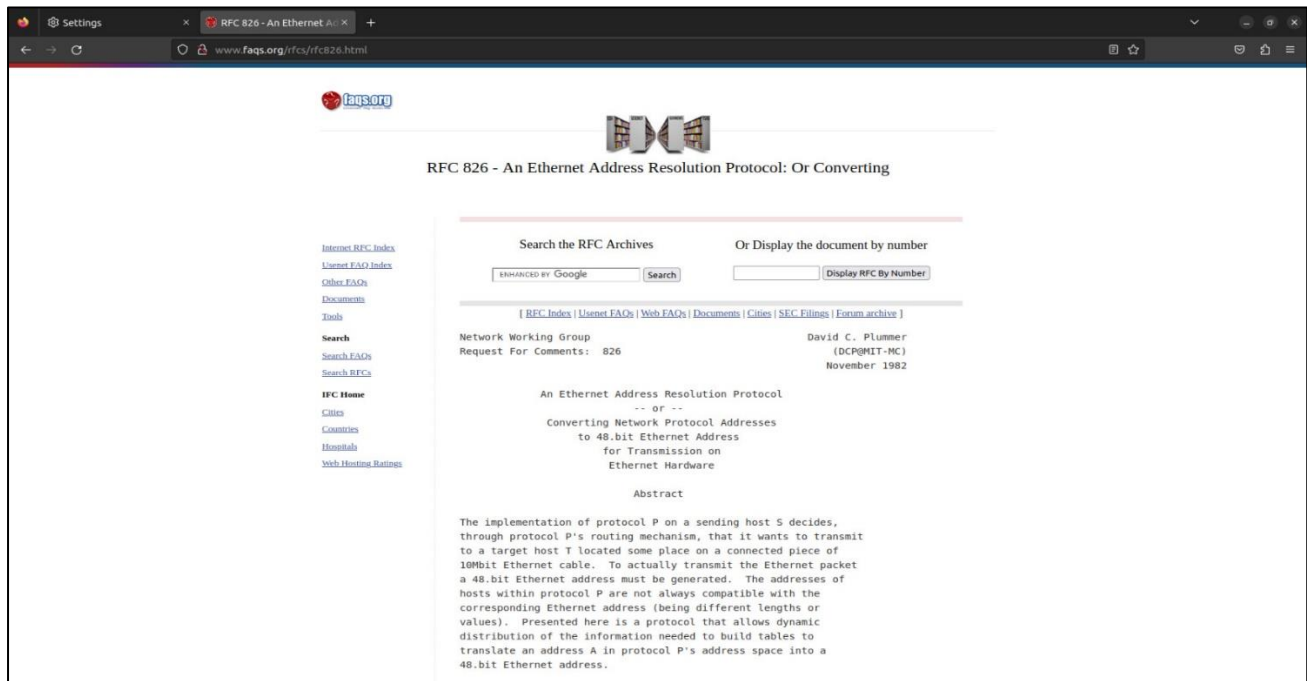


CN ASSIGNMENT 3

Aim: Investigate the Ethernet protocol and the ARP protocol.

Find the packet numbers (the leftmost column in the upper Wireshark window) of the HTTP GET message that was sent from your computer to the URL above, as well as the beginning of the HTTP response message sent to your computer.

You should see a screen that looks something like this (where the selected in the screen shot below contains the HTTP GET message)



Destination	Protocol	Length	Info
34.107.221.82	HTTP	355	[TCP Previous segment not captured] GET /canonical.html HT
10.0.2.15	HTTP	352	HTTP/1.1 200 OK (text/html)
34.107.221.82	HTTP	357	[TCP Previous segment not captured] GET /success.txt?ipv4
10.0.2.15	HTTP	270	HTTP/1.1 200 OK (text/plain)
199.231.164.68	HTTP	414	GET /rfcs/rfc826.html HTTP/1.1
10.0.2.15	HTTP	997	HTTP/1.1 200 OK (text/html)
199.231.164.68	HTTP	362	GET /style/faqs.css HTTP/1.1
199.231.164.68	HTTP	344	GET /style/rs.js HTTP/1.1
199.231.164.68	HTTP	341	GET /utils.js HTTP/1.1
142.250.206.164	HTTP	361	GET /coop/cse/brand?form=cse-search-box&lang=en HTTP/1.1
10.0.2.15	HTTP	630	HTTP/1.1 301 Moved Permanently (text/html)
10.0.2.15	HTTP	2005	HTTP/1.1 200 OK (text/css)
10.0.2.15	HTTP	898	HTTP/1.1 200 OK (application/javascript)
10.0.2.15	HTTP	715	HTTP/1.1 200 OK (application/javascript)
10.0.2.15	HTTP	274	GET /images/faq.png HTTP/1.1

▶ Frame 274: 414 bytes on wire (3312 bits), 414 bytes captured (3312 bits) on interface enp0s3, id 0
 ▼ Ethernet II, Src: PcsCompu_c1:72:78 (08:00:27:c1:72:78), Dst: RealtekU_12:35:02 (52:54:00:12:35:02)
 Destination: RealtekU_12:35:02 (52:54:00:12:35:02)
 Address: RealtekU_12:35:02 (52:54:00:12:35:02)
 1. = LG bit: Locally administered address (this is NOT the factory default)
 0. = IG bit: Individual address (unicast)
 Source: PcsCompu_c1:72:78 (08:00:27:c1:72:78)
 Address: PcsCompu_c1:72:78 (08:00:27:c1:72:78)
 0. = LG bit: Globally unique address (factory default)
 0. = IG bit: Individual address (unicast)
 Type: IPv4 (0x0800)
 ▶ Internet Protocol Version 4, Src: 10.0.2.15, Dst: 199.231.164.68
 ▶ Transmission Control Protocol, Src Port: 50626, Dst Port: 80, Seq: 1, Ack: 1, Len: 360
 ▶ Hypertext Transfer Protocol

272	39.661188928	RealtekU_12:35:02	PcsCompu_c1:7...	0x0800	60	IPv4
273	39.661234502	PcsCompu_c1:72:78	RealtekU_12:3...	0x0800	54	IPv4
274	39.661817128	PcsCompu_c1:72:78	RealtekU_12:3...	0x0800	414	IPv4
275	39.662381985	RealtekU_12:35:02	PcsCompu_c1:7...	0x0800	60	IPv4
276	39.662972425	RealtekU_12:35:02	PcsCompu_c1:7...	0x0800	60	IPv4

▶ Frame 274: 414 bytes on wire (3312 bits), 414 bytes captured (3312 bits) on interface enp0s3, id 0
 ▼ Ethernet II, Src: PcsCompu_c1:72:78 (08:00:27:c1:72:78), Dst: RealtekU_12:35:02 (52:54:00:12:35:02)
 Destination: RealtekU_12:35:02 (52:54:00:12:35:02)
 Address: RealtekU_12:35:02 (52:54:00:12:35:02)
 1. = LG bit: Locally administered address (this is NOT the factory default)
 0. = IG bit: Individual address (unicast)
 Source: PcsCompu_c1:72:78 (08:00:27:c1:72:78)
 Address: PcsCompu_c1:72:78 (08:00:27:c1:72:78)
 0. = LG bit: Globally unique address (factory default)
 0. = IG bit: Individual address (unicast)
 Type: IPv4 (0x0800)
 ▶ Data (400 bytes)

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

08:00:27:c1:72:78

2. What is the 48-bit destination address in the Ethernet frame? Is this the Ethernet address of the website with the RFC? (Hint: the answer is no). What device has this as its Ethernet address?

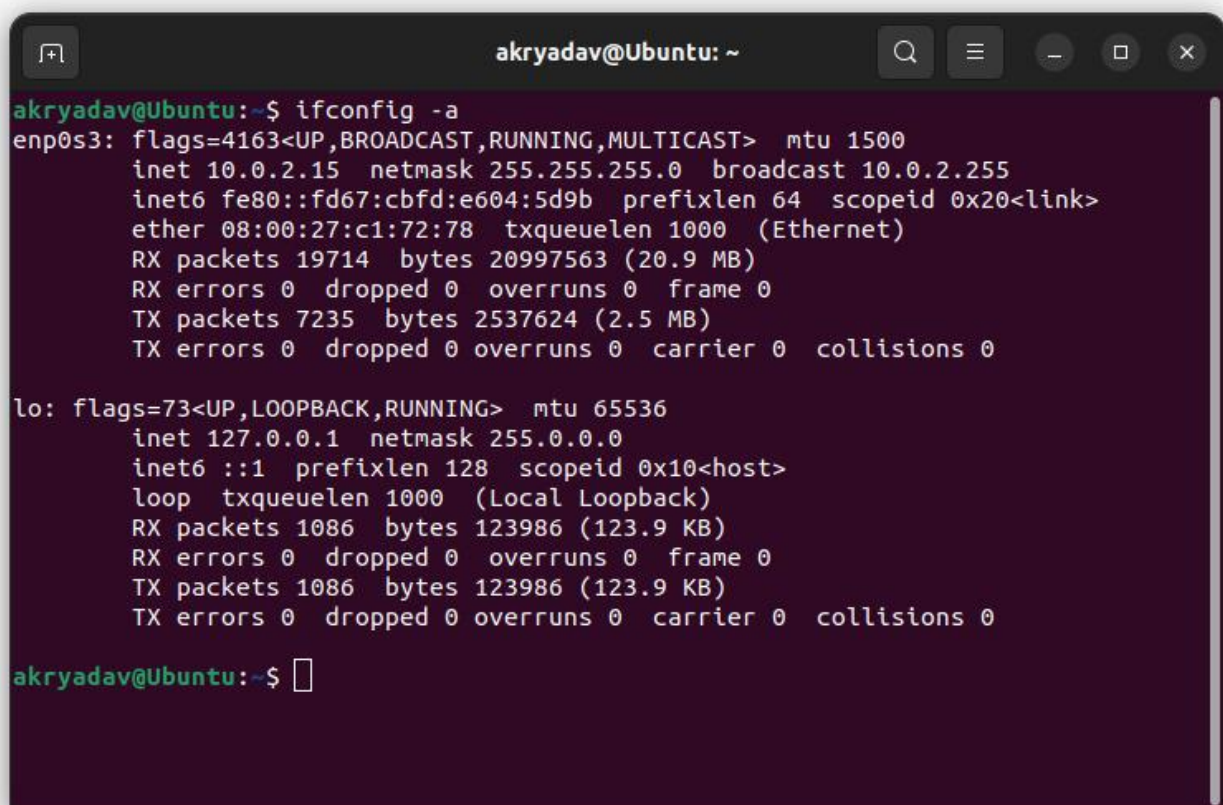
52:54:00:12:35:02

3. What is the frame number?

274

4. What is the frame type?

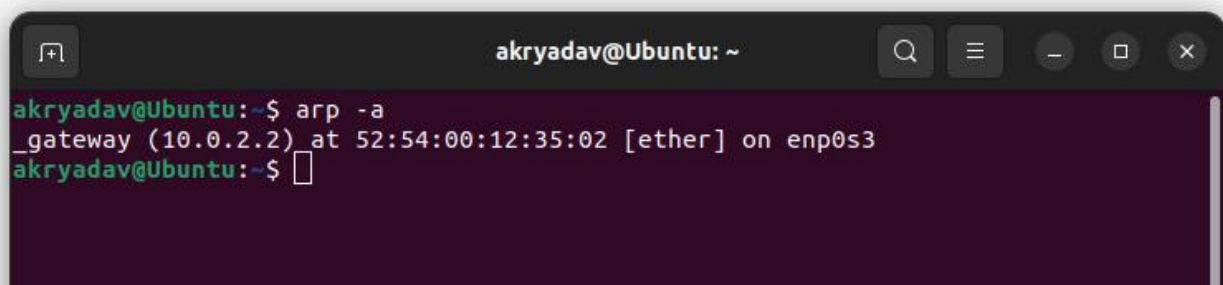
IPv4 (0x0800)

5. Verify the ethernet address of the computer matches with that showed on ifconfig.A terminal window titled 'akryadav@Ubuntu: ~' with search, menu, and window control icons. It displays the output of the 'ifconfig -a' command. The output shows details for the 'enp0s3' interface (Ethernet) and the 'lo' interface (Local Loopback). The 'enp0s3' interface has an IP of 10.0.2.15, a netmask of 255.255.255.0, and a MAC address of 08:00:27:c1:72:78. The 'lo' interface has an IP of 127.0.0.1 and a netmask of 255.0.0.0.

```
akryadav@Ubuntu:~$ ifconfig -a
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
    inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
    inet6 fe80::fd67:cbfd:e604:5d9b  prefixlen 64  scopeid 0x20<link>
    ether 08:00:27:c1:72:78  txqueuelen 1000  (Ethernet)
    RX packets 19714  bytes 20997563 (20.9 MB)
    RX errors 0  dropped 0  overruns 0  frame 0
    TX packets 7235  bytes 2537624 (2.5 MB)
    TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
    inet 127.0.0.1  netmask 255.0.0.0
    inet6 ::1  prefixlen 128  scopeid 0x10<host>
    loop txqueuelen 1000  (Local Loopback)
    RX packets 1086  bytes 123986 (123.9 KB)
    RX errors 0  dropped 0  overruns 0  frame 0
    TX packets 1086  bytes 123986 (123.9 KB)
    TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

akryadav@Ubuntu:~$
```

6. Use arp to find the mac address of the gateway or the router that you are connected with.A terminal window titled 'akryadav@Ubuntu: ~' with search, menu, and window control icons. It displays the output of the 'arp -a' command, showing the ARP table entry for the gateway at 10.0.2.2, which has a MAC address of 52:54:00:12:35:02.

```
akryadav@Ubuntu:~$ arp -a
_gateway (10.0.2.2) at 52:54:00:12:35:02 [ether] on enp0s3
akryadav@Ubuntu:~$
```