Networks

Lab2 - HTTP protocol

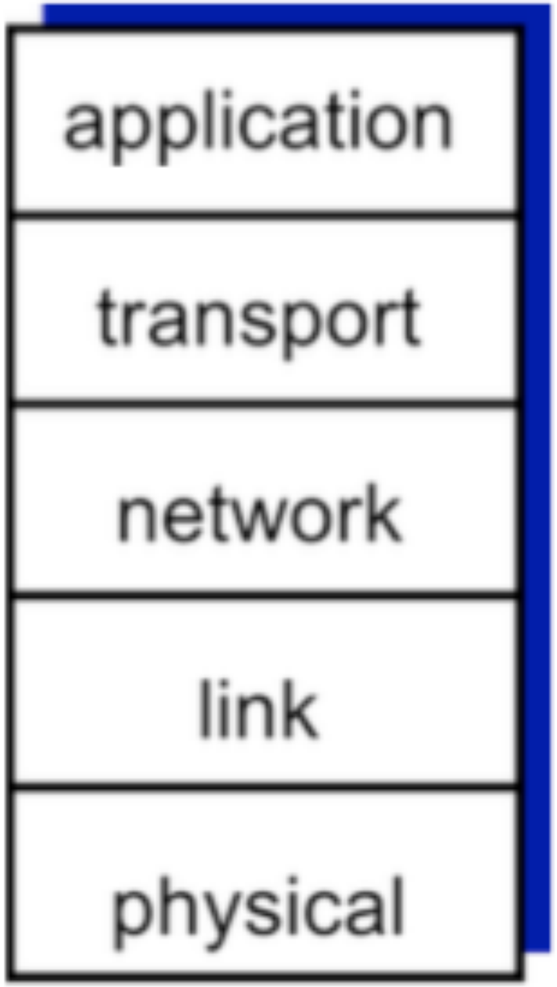
Lab goal:

1 - Explore HTTP protocol

2 - Explore Persistent and Non-Persistent HTTP connection

3 - Compare HTTP vs HTTPS connection

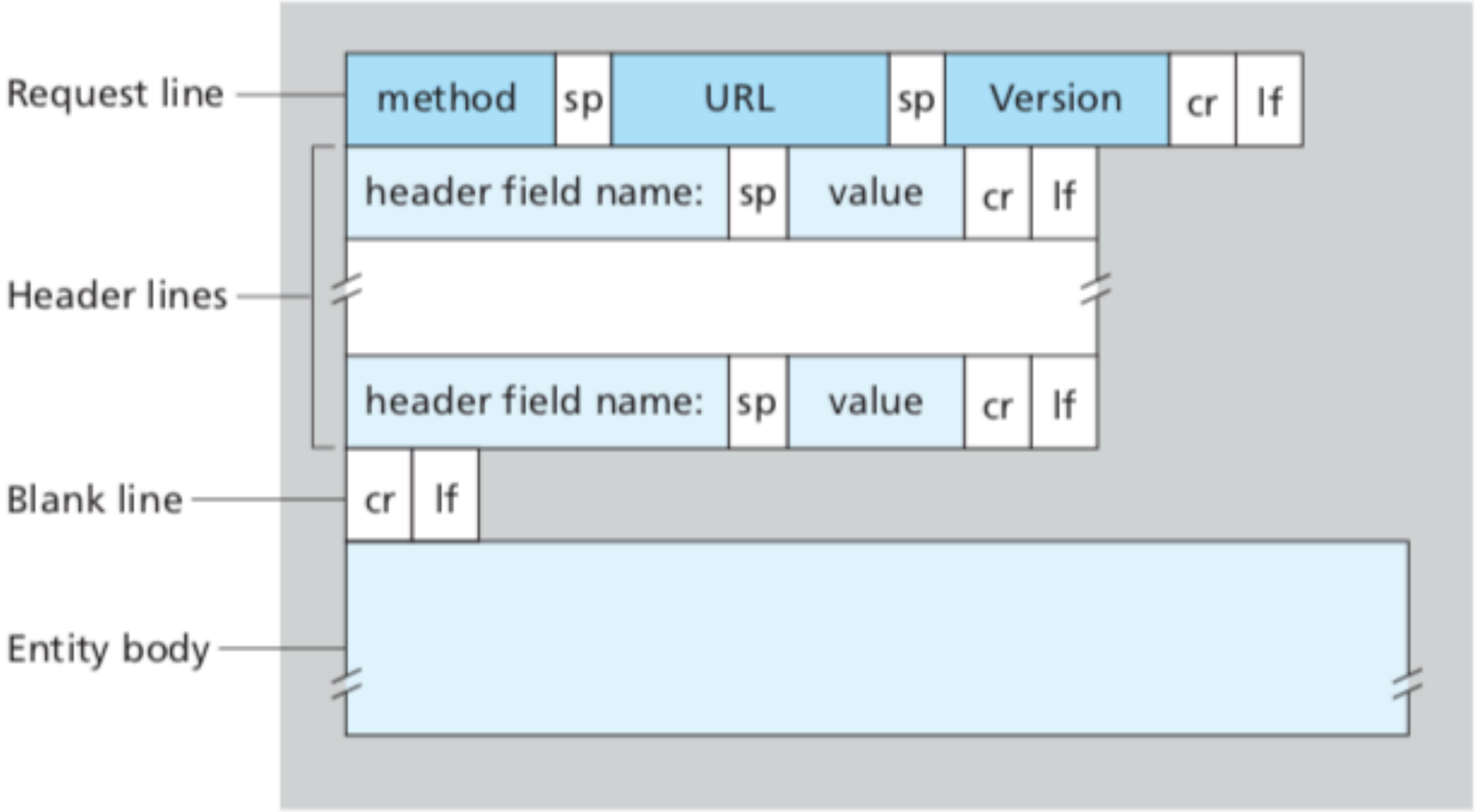
TCP/IP stack



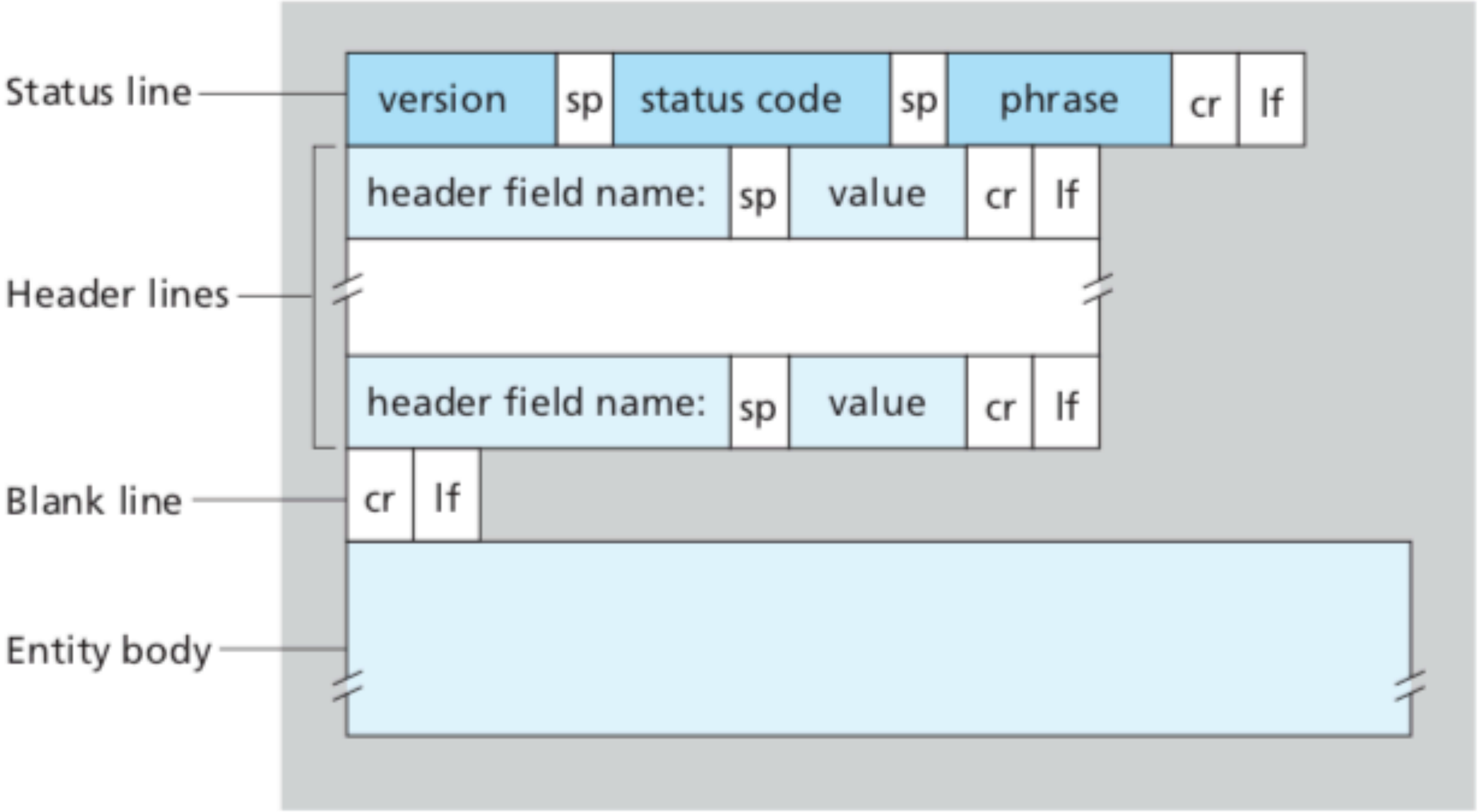
HTTP DNS

TCP

General format of an HTTP request message

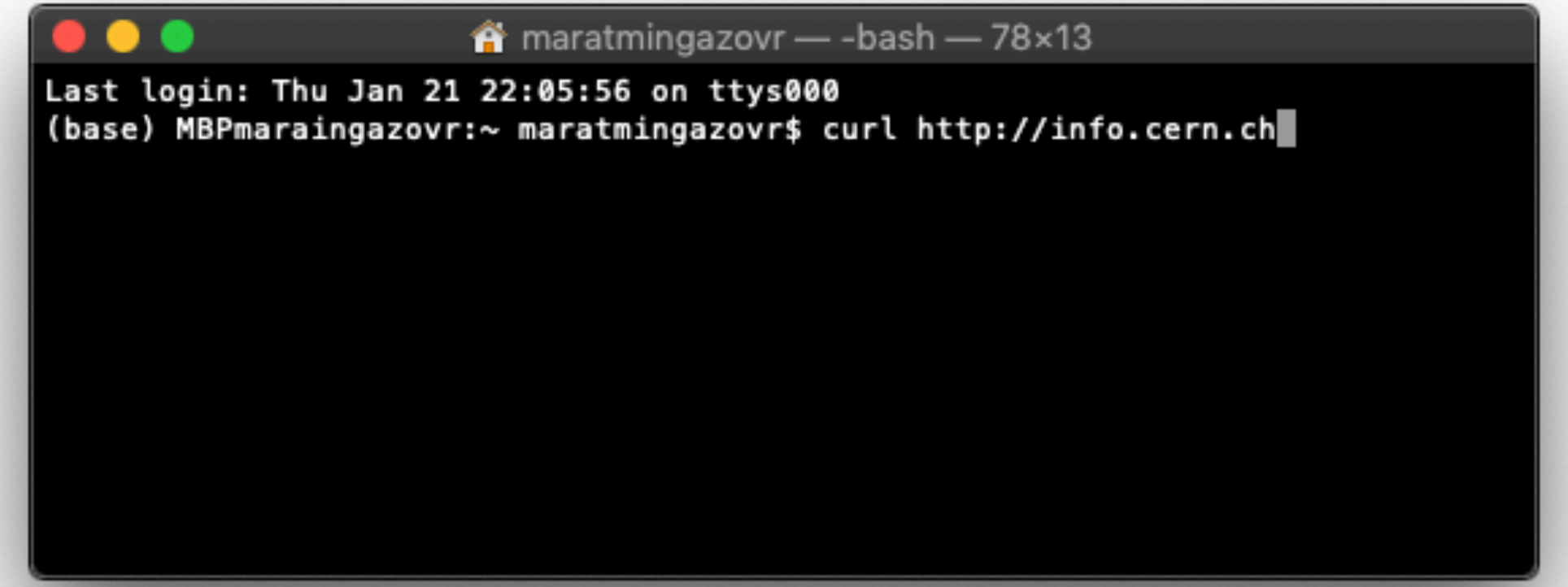


General format of an HTTP response message

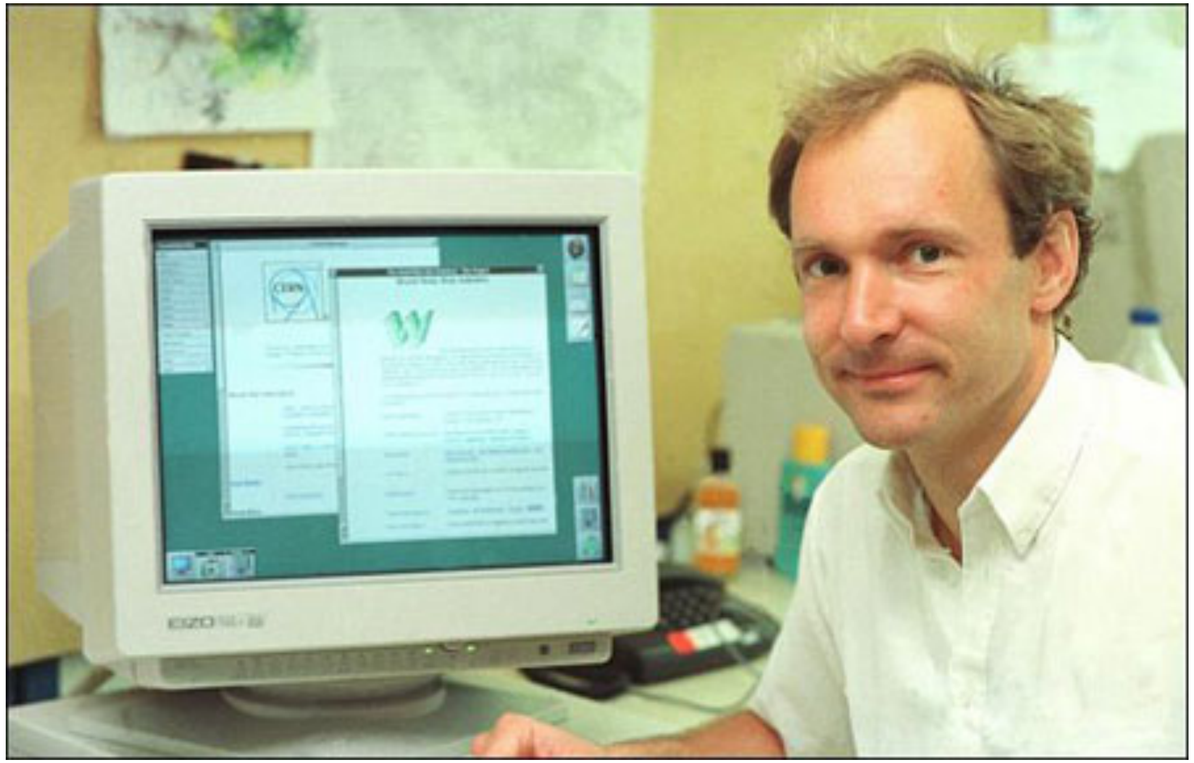


Task 1. Open the terminal and send GET request to info.cern.ch
Analyze what happened on the network

1 - You can use different tools to send GET request. For example **CURL**
2 - To send a **GET** request, type **curl http://info.cern.ch**



What is info.cern.ch web-site?



Tim Berners-Lee
is an English computer scientist
best known as the inventor of the
World Wide Web.

Berners-Lee published the first web site,
which described the project itself,
on 20 December 1990;
it was available to the Internet
from the CERN network.

info.cern.ch was the address of the world's
first-ever website and web server,
running on a NeXT computer at CERN.

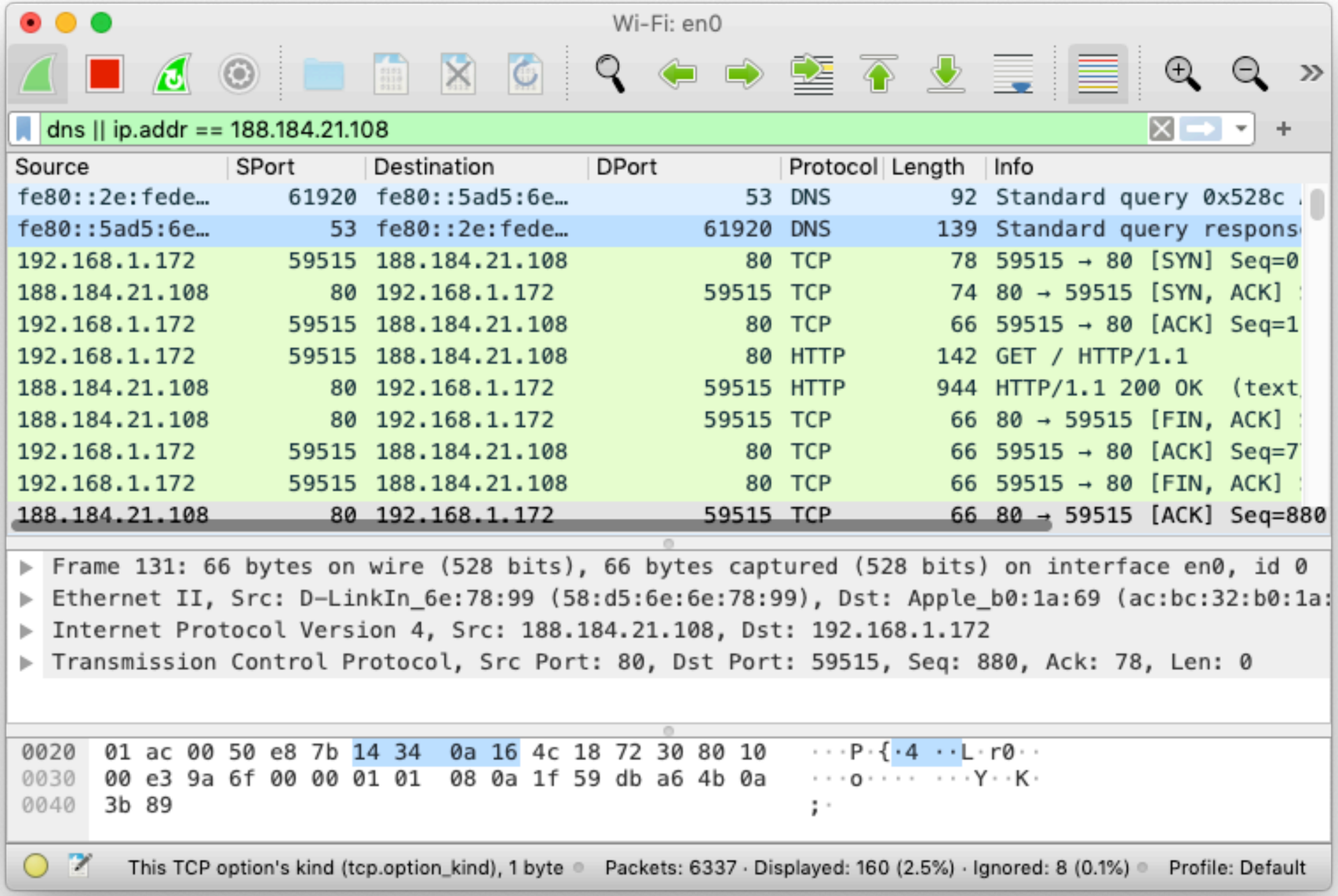
From human point of view we just got the response

maratmingazovr — -bash — 86×24

```
Last login: Fri Jan 22 15:43:03 on ttys001
(base) MBPmaraingazovr:~ maratmingazovr$ curl http://info.cern.ch
<html><head></head><body><header>
<title>http://info.cern.ch</title>
</header>

<h1>http://info.cern.ch - home of the first website</h1>
<p>From here you can:</p>
<ul>
<li><a href="http://info.cern.ch/hypertext/WWW/TheProject.html">Browse the first websi
te</a></li>
<li><a href="http://line-mode.cern.ch/www/hypertext/WWW/TheProject.html">Browse the fi
rst website using the line-mode browser simulator</a></li>
<li><a href="http://home.web.cern.ch/topics/birth-web">Learn about the birth of the we
b</a></li>
<li><a href="http://home.web.cern.ch/about">Learn about CERN, the physics laboratory w
here the web was born</a></li>
</ul>
</body></html>
(base) MBPmaraingazovr:~ maratmingazovr$
```

But what's going on inside the network ?



DNS request

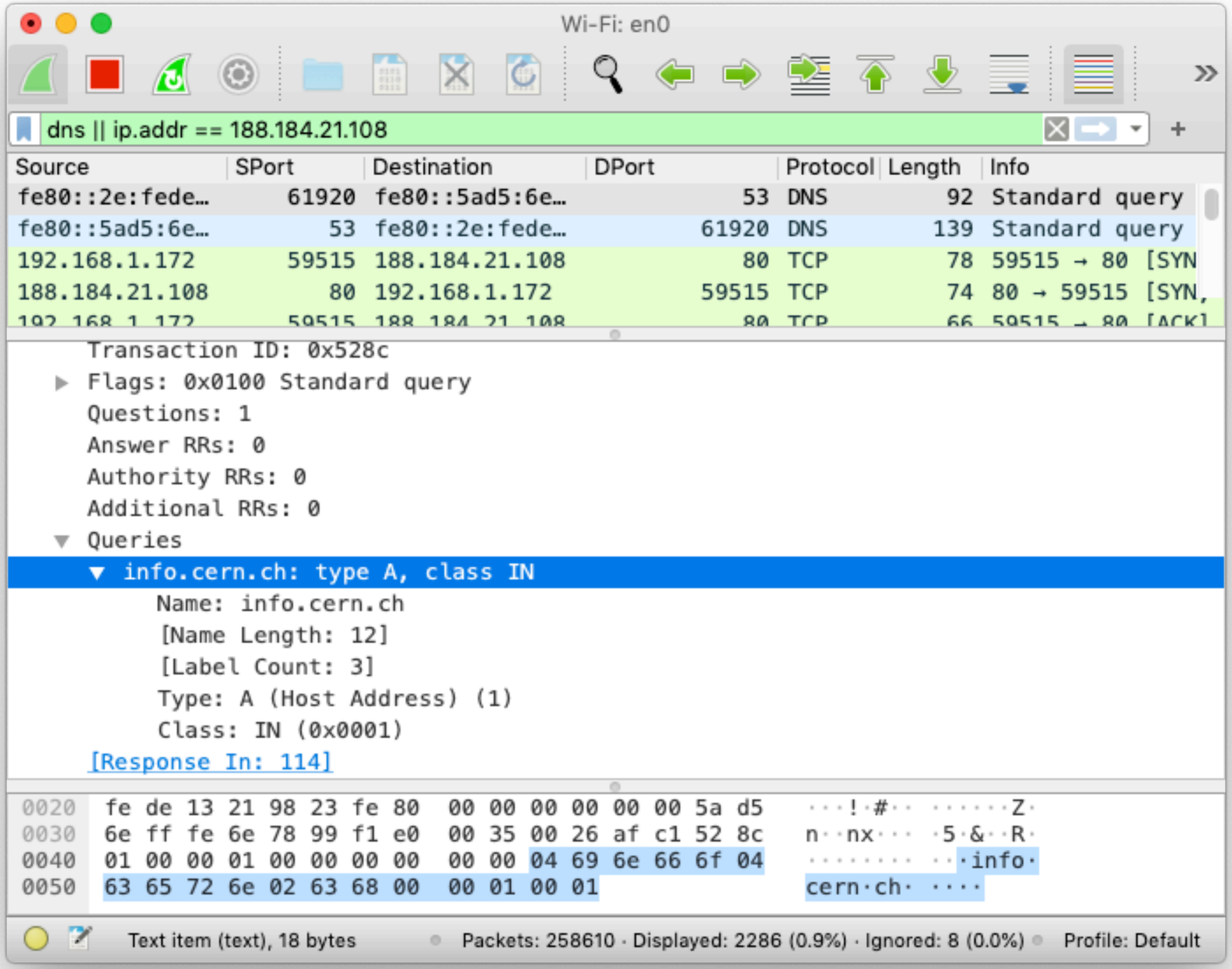
Connection establishment
Three-way handshake

Client send GET request

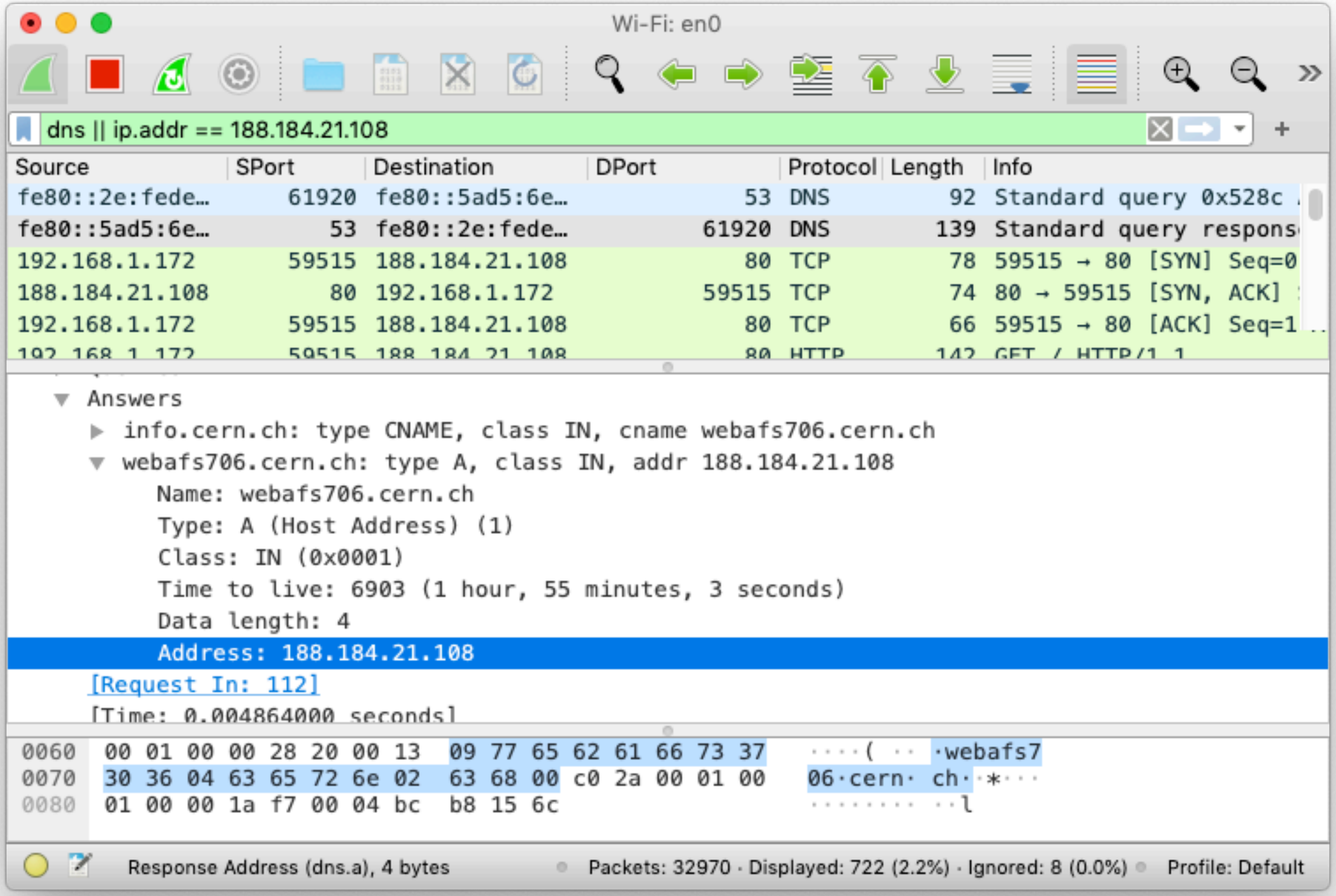
Server send Response

Connection termination
Graceful Connection
Release

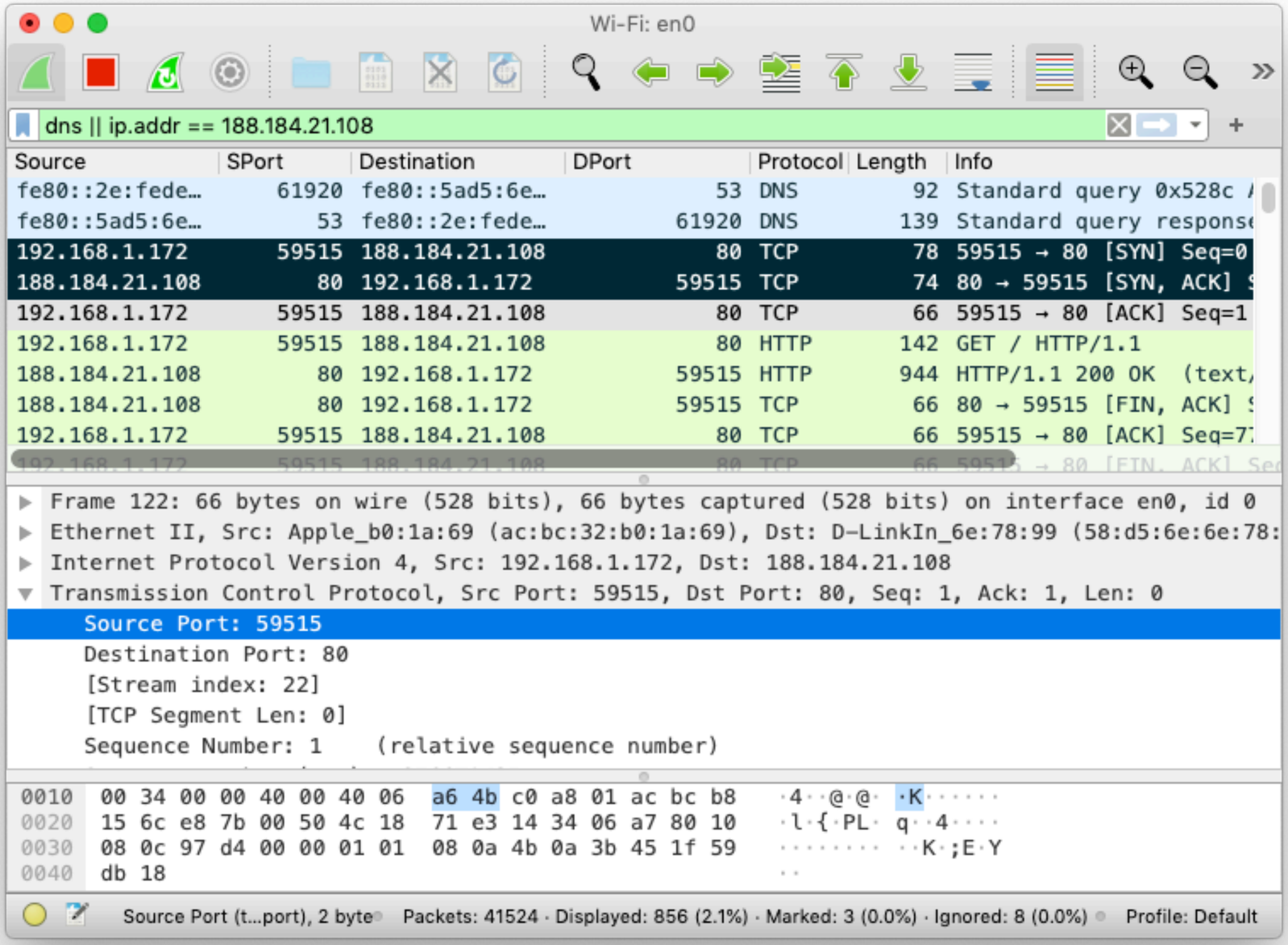
Step 1. Send DNS request.



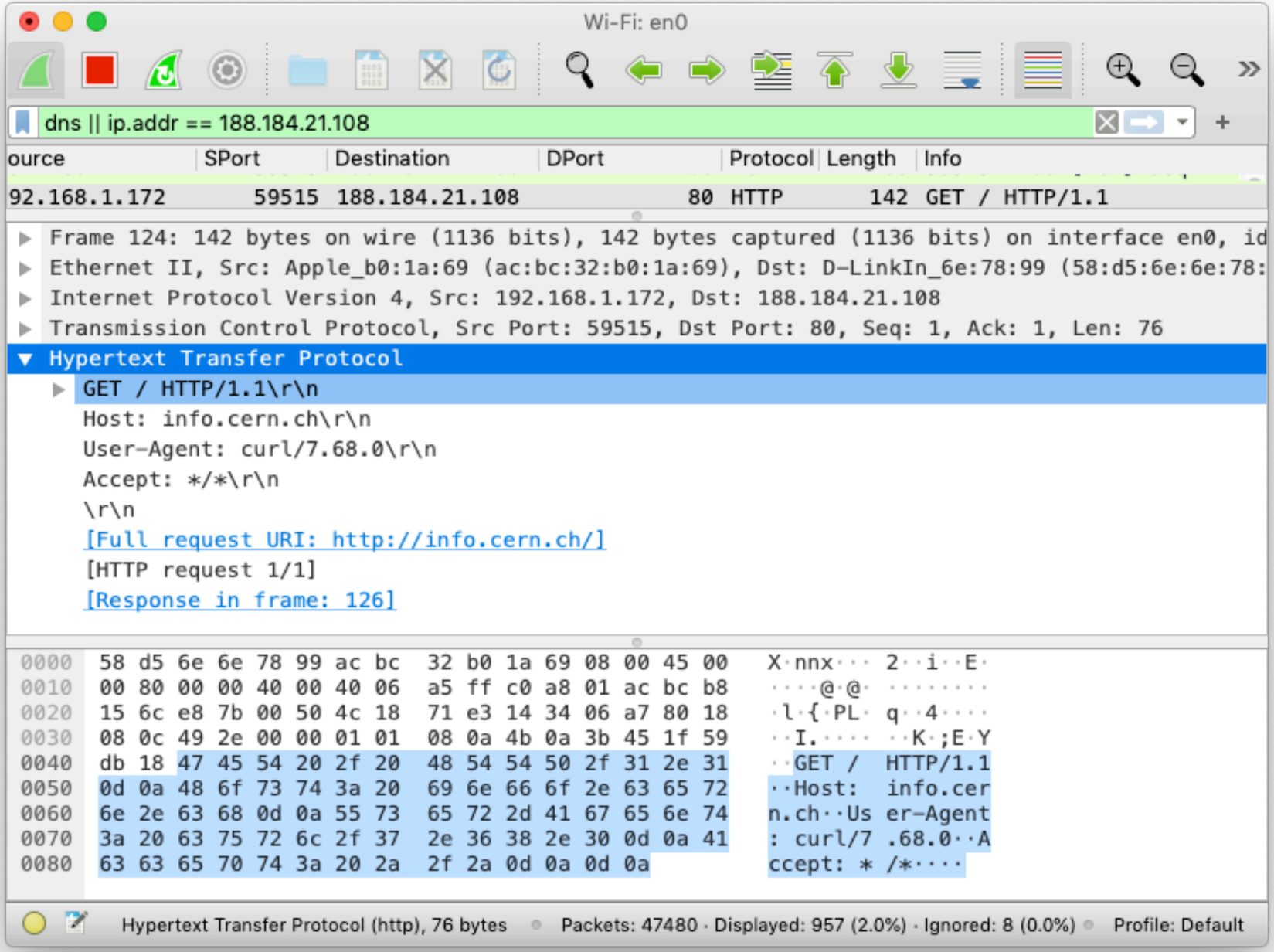
Step 2. DNS response give ip address of info.cern.ch



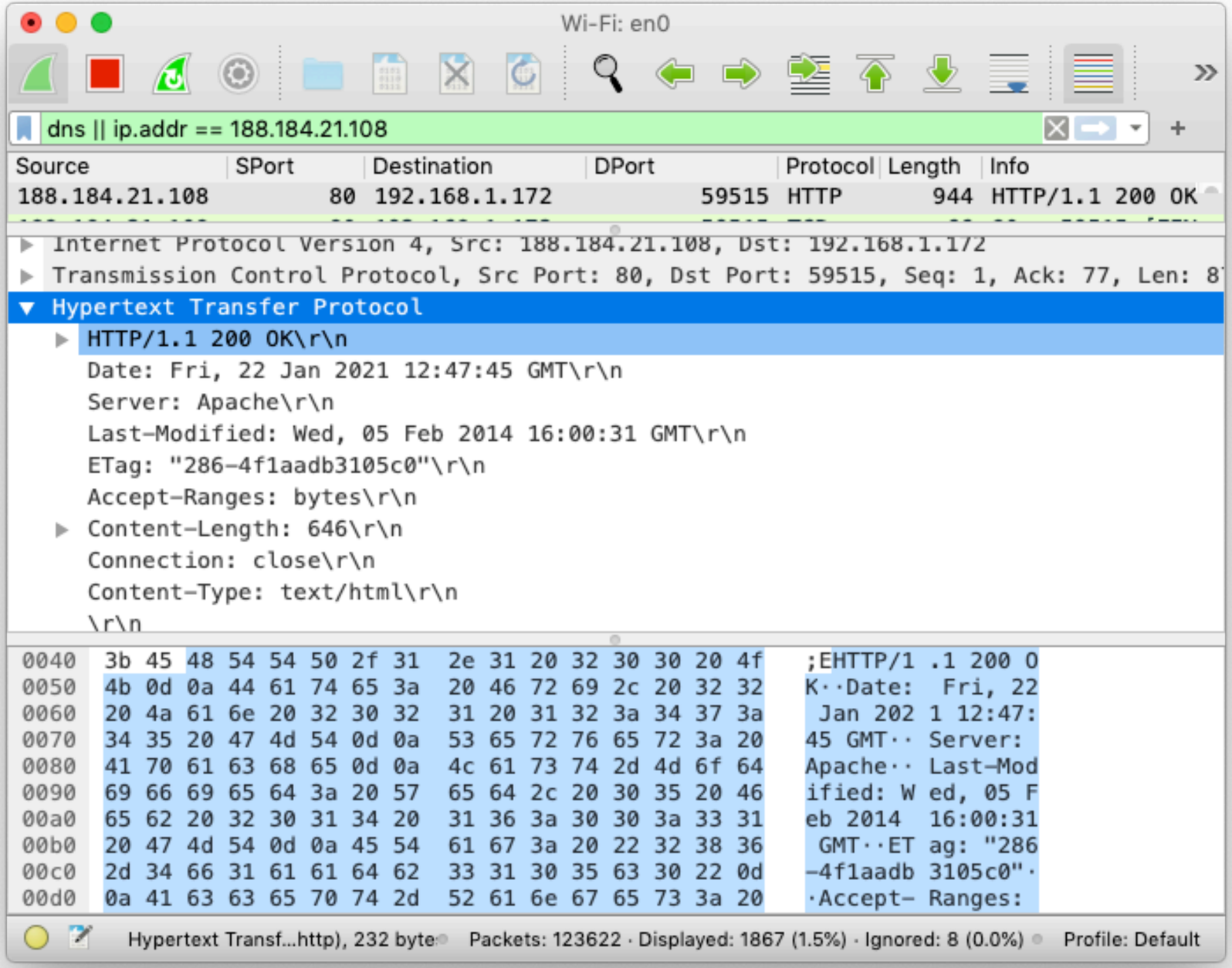
Step 3. TCP connection establishment. Three-way handshake



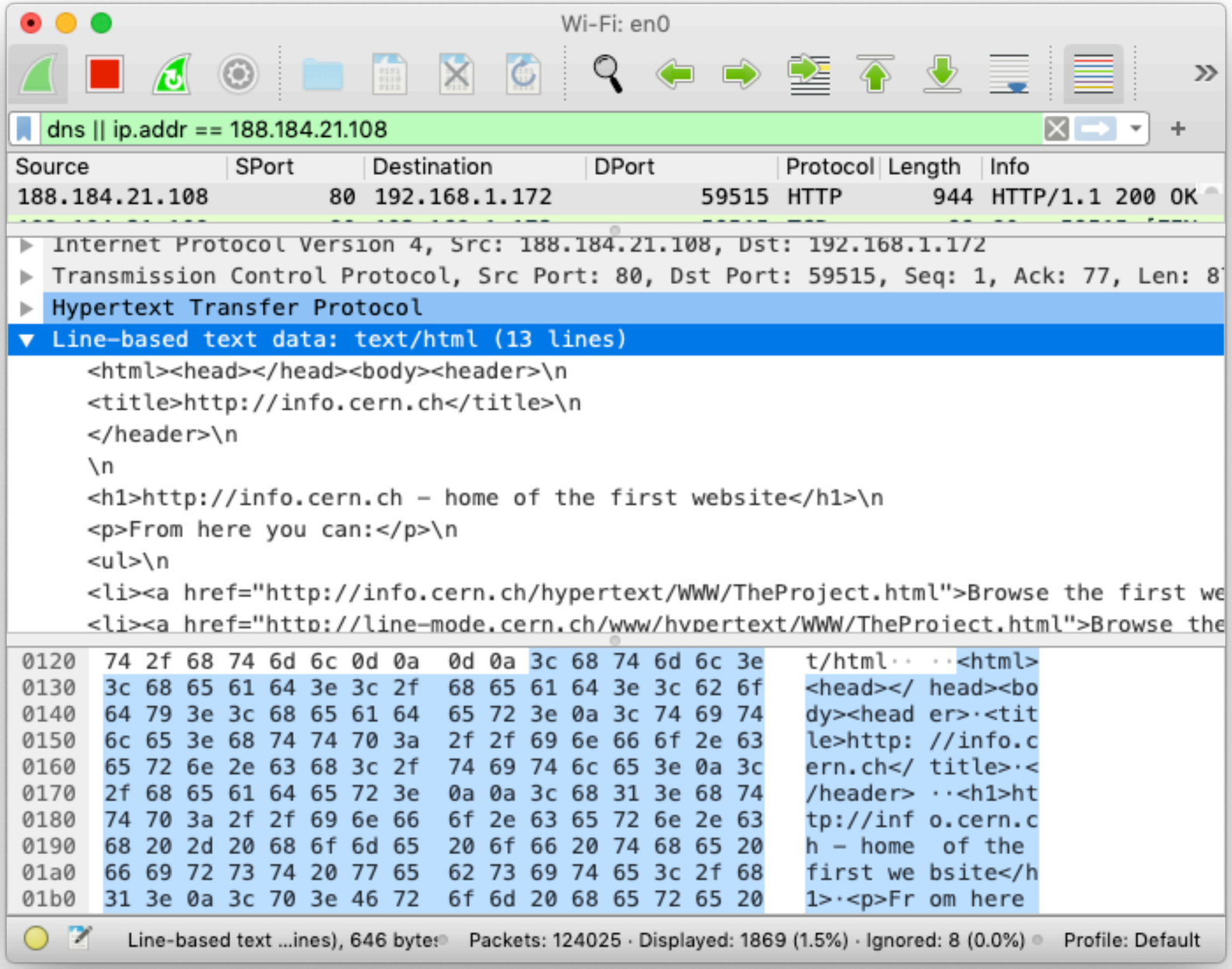
Step 4. Client send GET request.



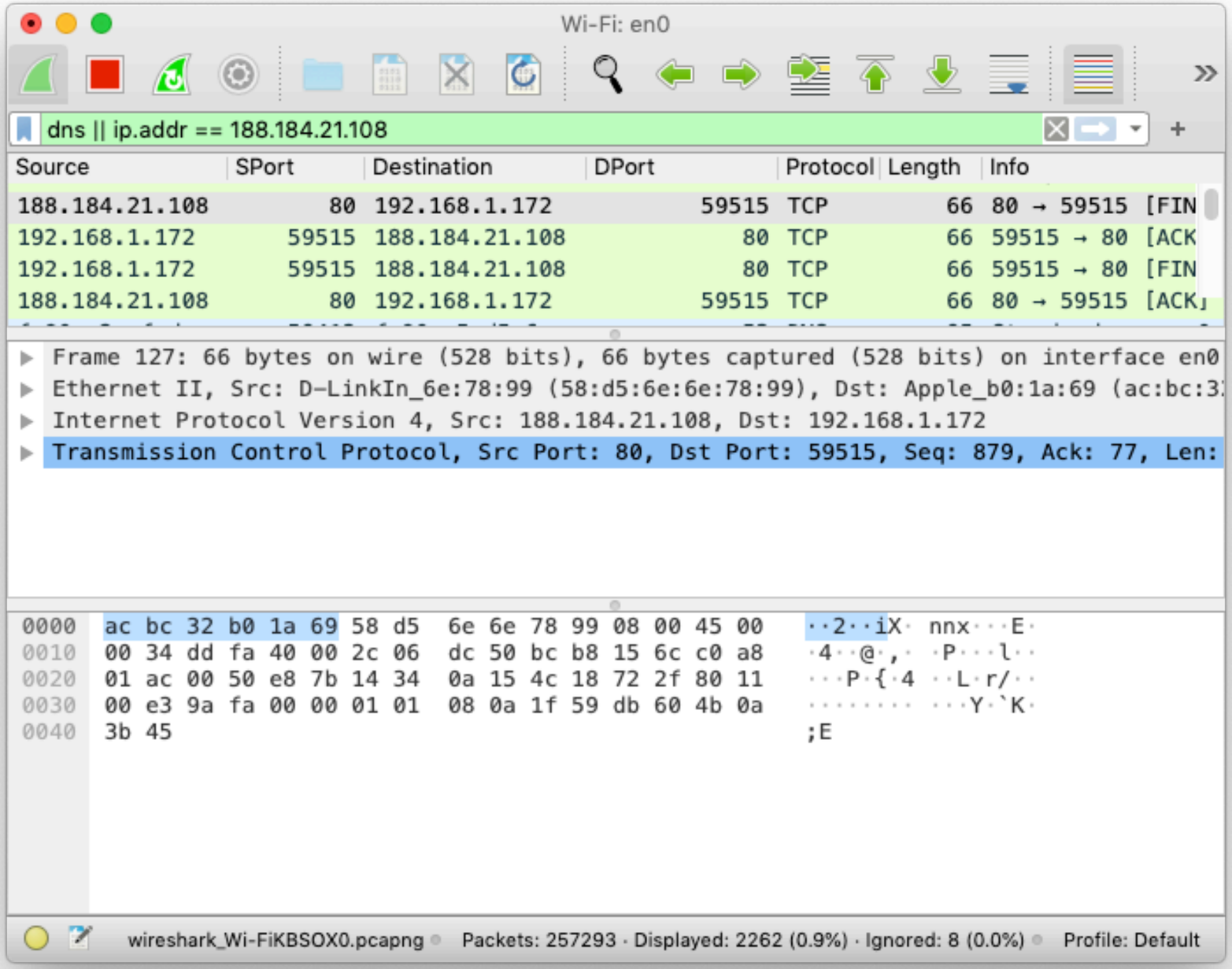
Step 5. Server send Response (Header).



Step 5. Server send Response (Body).



Step 6. Connection termination.



Task 2. Explore persistent and non-persistent http connection

1 - Establish persistent http connection

```
curl http://info.cern.ch
-H "Connection: keep-alive"
-H "Keep-Alive: timeout=5, max=100"
```

2 - Establish non-persistent http connection:

```
curl http://info.cern.ch
-H "Connection: close"
```

3 - Compare this two connection in terms of WireShark packets.

Task 3. Explore **https** connection

1 - Send https request **curl https://www.google.com/**

2 - Compare http and https packets. What is the difference ?