



**Date:** 30/07/2025

Lab Practical #09:

Study Packet capture and header analysis by Wireshark (HTTP, TCP, UDP, IP, etc.)

**Practical Assignment #09:**

**1. Explain usage of Wireshark tool.**

**a. Captures Network Traffic**

- I. Wireshark records the data packets that travel over a network (like Wi-Fi or LAN).
- II. It helps in monitoring what is happening in real-time on the network.

**b. Analyzes Packets**

- I. Each packet (small unit of data) can be examined to check details like source, destination, and protocol used.
- II. This is useful to understand how communication happens between different devices.

**c. Troubleshooting Networks**

- I. Helps in finding network issues such as slow speed, connection drops, or wrong configurations.
- II. Can show errors or unusual patterns in data flow, which makes debugging easier.

**d. Supports Many Protocols**

- I. Wireshark can recognize and display hundreds of protocols (HTTP, TCP, UDP, DNS, etc.).
- II. This makes it easy to study how various applications and services communicate.

**e. Filtering and Searching**

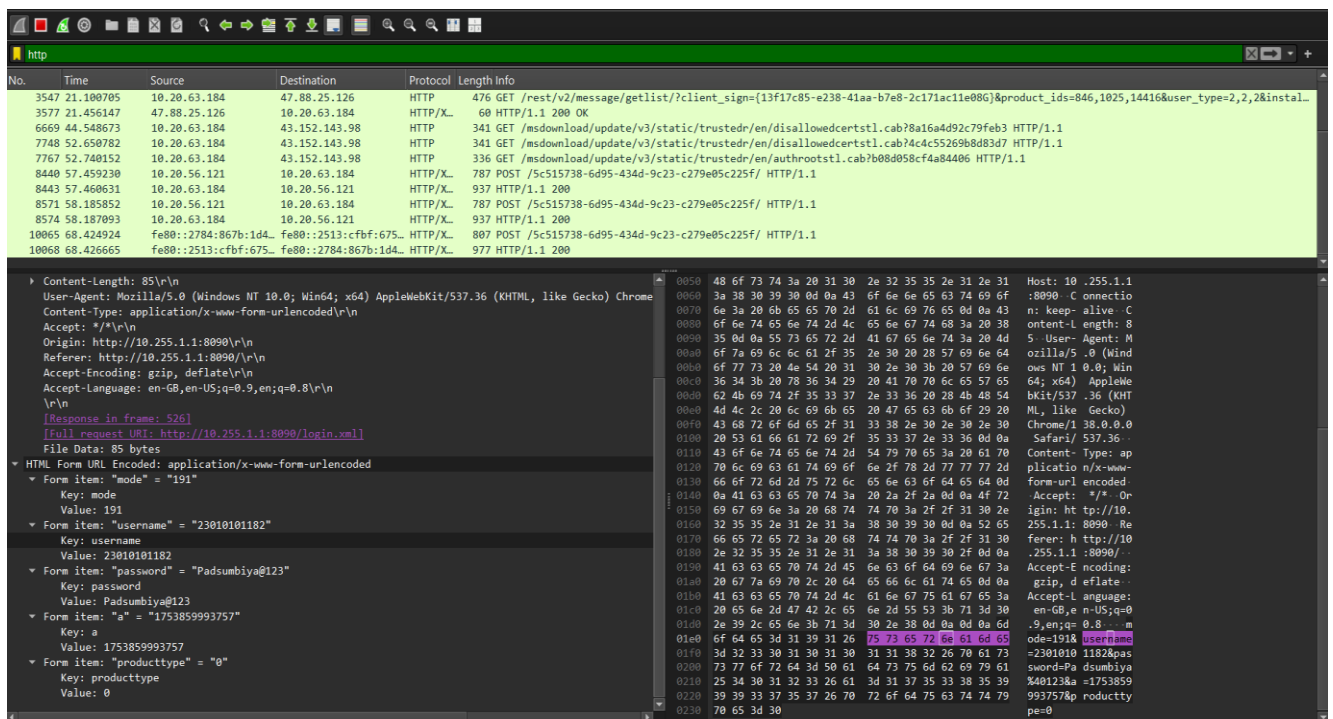
- I. Provides powerful filters to focus on specific data (e.g., only HTTP traffic or packets from a particular IP address).
- II. This feature saves time and allows targeted analysis.

## 2. Packet capture and header analysis by Wireshark (HTTP, TCP, UDP, IP, etc.)

Using Wireshark, we can capture packets and analyze their headers at different layers of the OSI model. Some examples of header analysis include:

- **IP Header:** Contains source IP, destination IP, version, header length, TTL, and protocol type.
- **TCP Header:** Includes source port, destination port, sequence number, acknowledgment number, flags, and window size.
- **UDP Header:** Contains source port, destination port, length, and checksum.
- **HTTP Header:** Includes request type (GET/POST), URL, host, user-agent, cookies, and response codes.

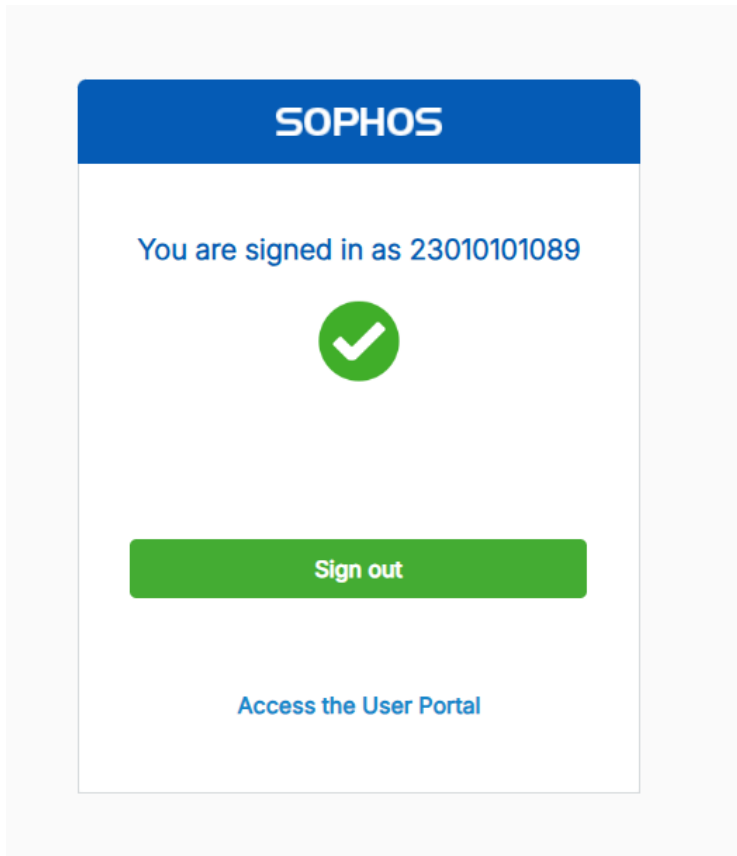
### a. HTTP



The image shows a Wireshark packet capture of an HTTP GET request. The packet list on the left shows a packet from 10.20.63.184 to 10.20.63.126. The packet details pane on the right shows the following information:

- Content-Length:** 85
- User-Agent:** Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/108.0.0.0 Safari/537.36
- Content-Type:** application/x-www-form-urlencoded
- Accept:** \*/\*
- Origin:** http://10.255.1.1:8090
- Referer:** http://10.255.1.1:8090/login.xml
- Accept-Encoding:** gzip, deflate
- Accept-Language:** en-US;q=0.9,en;q=0.8
- [Response in frame: 526]**
- [Full request URI: http://10.255.1.1:8090/login.xml]**
- File Data:** 85 bytes
- HTML Form URL Encoded:** application/x-www-form-urlencoded
- Form item:** mode = "191"
- Form item:** username = "23010101182"
- Form item:** password = "Padsumbiya@123"
- Form item:** a = "1753859993757"
- Form item:** producttype = "0"

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## b. TCP

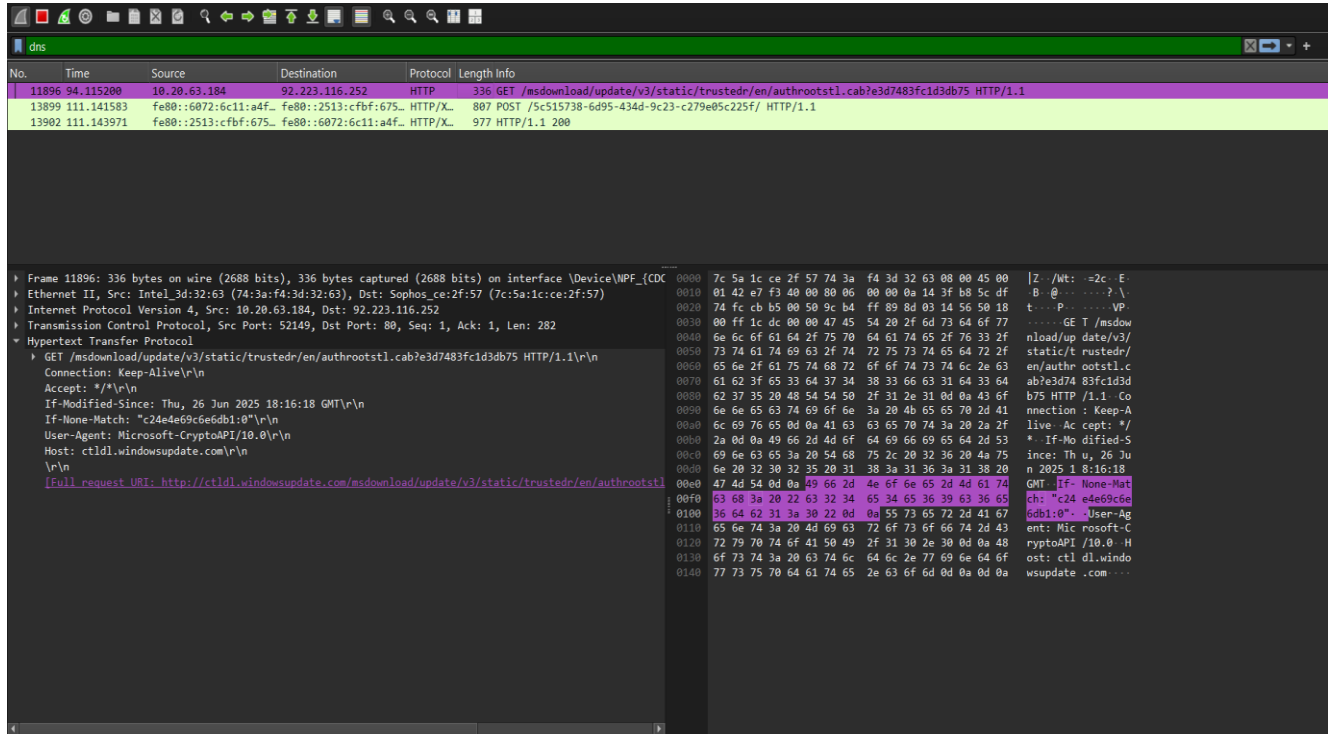
```
tcp
No.    Time    Source          Destination      Protocol Length Info
-----
1282 4.600772 10.20.63.184    23.195.74.50    HTTP           136 GET /ncc.txt HTTP/1.1
1460 4.896888 23.195.74.50    10.20.63.184    HTTP           205 HTTP/1.1 200 OK (text/html)

Frame 1282: 136 bytes on wire (1088 bits), 136 bytes captured (1088 bits) on interface \Device\NPF_{CDCE...
Ethernet II, Src: Intel_3d:32:63 (74:3a:f4:3d:32:63), Dst: Sophos_ce:2f:57 (7c:5a:1c:ce:2f:57)
Internet Protocol Version 4, Src: 10.20.63.184, Dst: 23.195.74.50
Transmission Control Protocol, Src Port: 52255, Dst Port: 80, Seq: 1, Ack: 1, Len: 82
Hypertext Transfer Protocol
  GET /ncc.txt HTTP/1.1\r\n
  Host: ncc.avast.com\r\n
  User-Agent: Avast NCC\r\n
  Accept: */*\r\n
  \r\n
  [Full request URI: http://ncc.avast.com/ncc.txt]

0000  7c 5a 1c ce 2f 57 74 3a f4 3d 32 63 08 00 45 00 |Z.../Wt: ...2c...E
0010  00 7a 98 f6 40 00 00 06 00 00 0a 14 3f b8 17 c3 |.z...@...?...
0020  4a 32 cc 1f 00 50 fa 0e 27 aa d3 2f 5b f2 50 18 |J...P.../[P
0030  00 ff ac 2d 00 00 47 45 54 20 2f 6e 63 63 2e 74 |...GE T /ncc.t
0040  78 74 20 48 54 54 50 2f 31 2e 31 0d 0a 48 6f 73 |xt HTTP/ 1.1 Hos
0050  74 3a 20 6e 63 63 2e 61 76 61 73 74 2e 63 6f 6d |t: ncc.a vast.com
0060  0d 0a 55 73 65 72 2d 41 67 65 6e 74 3a 20 41 76 |..User-A gent: Av
0070  61 73 74 20 4e 43 43 0d 0a 41 63 63 65 70 74 3a |ast NCC- -Accept:
0080  20 2a 2f 2a 0d 0a 0d 0a |*/...
```

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### c. DNS



The image shows a Wireshark packet capture of an HTTP GET request. The packet list pane shows a packet from 10.20.63.184 to 92.223.116.252. The packet details pane shows the following structure:

- Frame 11896: 336 bytes on wire (2688 bits), 336 bytes captured (2688 bits) on interface \Device\NPF\_{CDC...}
- Ethernet II, Src: Intel\_3d:32:63 (74:3a:f4:3d:32:63), Dst: Sophos\_ce:2f:57 (7c:5a:1c:ce:2f:57)
- Internet Protocol Version 4, Src: 10.20.63.184, Dst: 92.223.116.252
- Transmission Control Protocol, Src Port: 52149, Dst Port: 80, Seq: 1, Ack: 1, Len: 282
- Hypertext Transfer Protocol
  - GET /msdownload/update/v3/static/trusted/en/authrootstl.cab?e3d7483fc1d3db75 HTTP/1.1\r\n
  - Connection: Keep-Alive\r\n
  - Accept: \*/\*\r\n
  - If-Modified-Since: Thu, 26 Jun 2025 18:16:18 GMT\r\n
  - If-None-Match: "c24e4e69c6e6db1:0"\r\n
  - User-Agent: Microsoft-CryptoAPI/10.0\r\n
  - Host: ctldl.windowsupdate.com\r\n
  - [Full request URI: http://ctldl.windowsupdate.com/msdownload/update/v3/static/trusted/en/authrootstl.cab?e3d7483fc1d3db75]

The packet bytes pane shows the raw data of the request, including the HTTP headers and the body.

C:\Users\Asus>ping openAi.com

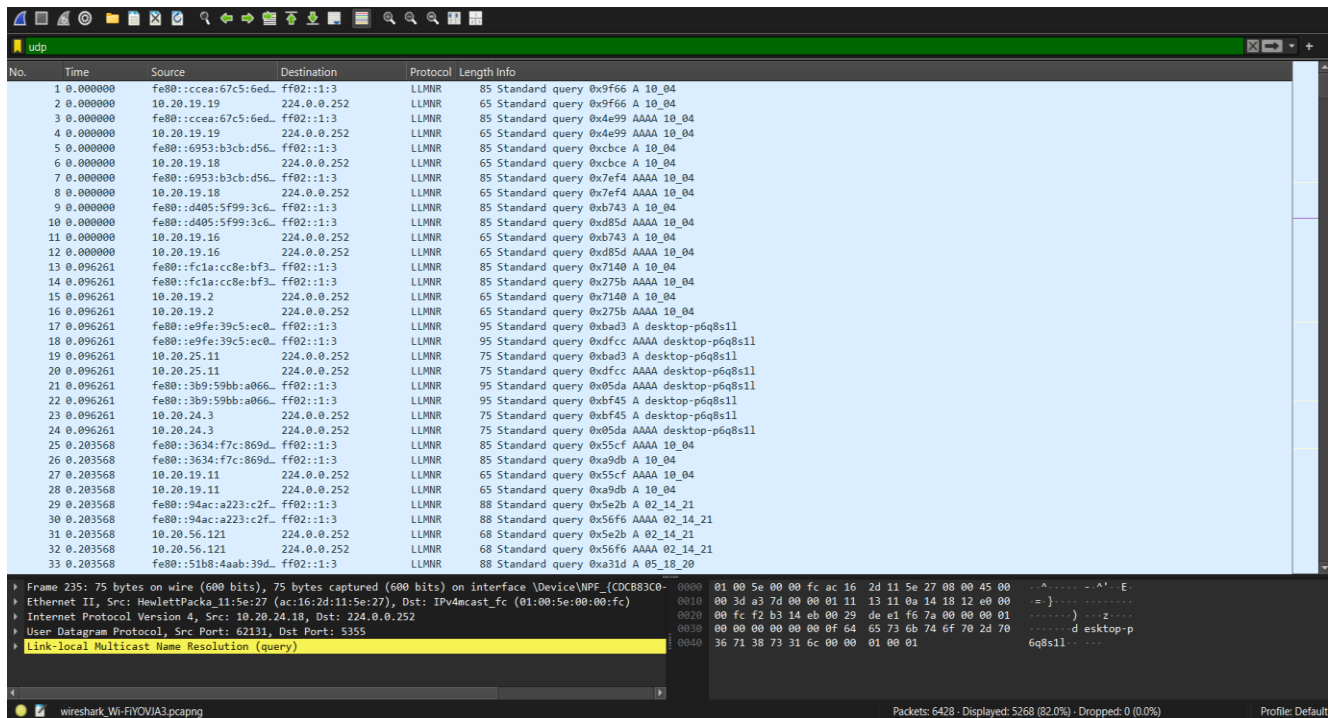
```
Pinging openAi.com [172.64.154.211] with 32 bytes of data:
Reply from 172.64.154.211: bytes=32 time=30ms TTL=60
Reply from 172.64.154.211: bytes=32 time=20ms TTL=60
Reply from 172.64.154.211: bytes=32 time=19ms TTL=60
Reply from 172.64.154.211: bytes=32 time=23ms TTL=60
```

Ping statistics for 172.64.154.211:

```
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 19ms, Maximum = 30ms, Average = 23ms
```

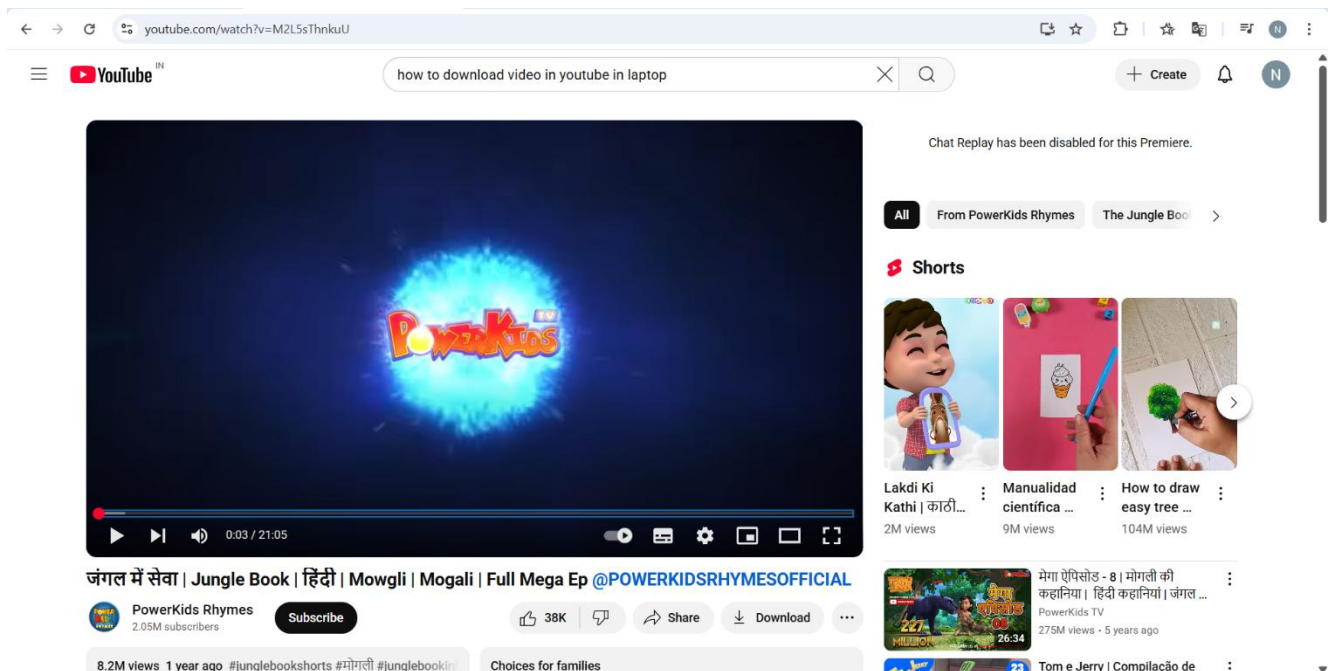
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**d. UDP**



No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	fe80::ccea:67c5:6ed...	ff02::1:3	LLNMR	85	Standard query 0x9f66 A 10_04
2	0.000000	10.20.19.19	224.0.0.252	LLNMR	65	Standard query 0x9f66 A 10_04
3	0.000000	fe80::ccea:67c5:6ed...	ff02::1:3	LLNMR	85	Standard query 0x4e99 AAAA 10_04
4	0.000000	10.20.19.19	224.0.0.252	LLNMR	65	Standard query 0x4e99 AAAA 10_04
5	0.000000	fe80::e953:b3cb:d56...	ff02::1:3	LLNMR	85	Standard query 0xc3ce A 10_04
6	0.000000	10.20.19.18	224.0.0.252	LLNMR	65	Standard query 0xc3ce A 10_04
7	0.000000	fe80::e953:b3cb:d56...	ff02::1:3	LLNMR	85	Standard query 0x7ef4 AAAA 10_04
8	0.000000	10.20.19.18	224.0.0.252	LLNMR	65	Standard query 0x7ef4 AAAA 10_04
9	0.000000	fe80::d405:5f99:3c6...	ff02::1:3	LLNMR	85	Standard query 0xb743 A 10_04
10	0.000000	fe80::d405:5f99:3c6...	ff02::1:3	LLNMR	85	Standard query 0xb743 AAAA 10_04
11	0.000000	10.20.19.16	224.0.0.252	LLNMR	65	Standard query 0xb743 A 10_04
12	0.000000	10.20.19.16	224.0.0.252	LLNMR	65	Standard query 0xb743 AAAA 10_04
13	0.096261	fe80::fc1a:cc8e:bf3...	ff02::1:3	LLNMR	85	Standard query 0x7140 A 10_04
14	0.096261	fe80::fc1a:cc8e:bf3...	ff02::1:3	LLNMR	85	Standard query 0x275b AAAA 10_04
15	0.096261	10.20.19.2	224.0.0.252	LLNMR	65	Standard query 0x7140 A 10_04
16	0.096261	10.20.19.2	224.0.0.252	LLNMR	65	Standard query 0x275b AAAA 10_04
17	0.096261	fe80::e9fe:39c5:ec0...	ff02::1:3	LLNMR	95	Standard query 0xbad3 A desktop-p6q8s11
18	0.096261	fe80::e9fe:39c5:ec0...	ff02::1:3	LLNMR	95	Standard query 0xbad3 AAAA desktop-p6q8s11
19	0.096261	10.20.25.11	224.0.0.252	LLNMR	75	Standard query 0xbad3 A desktop-p6q8s11
20	0.096261	10.20.25.11	224.0.0.252	LLNMR	75	Standard query 0xbad3 AAAA desktop-p6q8s11
21	0.096261	fe80::3b9:59bb:a066...	ff02::1:3	LLNMR	95	Standard query 0x05da AAAA desktop-p6q8s11
22	0.096261	fe80::3b9:59bb:a066...	ff02::1:3	LLNMR	95	Standard query 0xbf45 A desktop-p6q8s11
23	0.096261	10.20.24.3	224.0.0.252	LLNMR	75	Standard query 0xbf45 A desktop-p6q8s11
24	0.096261	10.20.24.3	224.0.0.252	LLNMR	75	Standard query 0x05da AAAA desktop-p6q8s11
25	0.203568	fe80::3634:f7c:869d...	ff02::1:3	LLNMR	85	Standard query 0x55cf AAAA 10_04
26	0.203568	fe80::3634:f7c:869d...	ff02::1:3	LLNMR	85	Standard query 0xa9db A 10_04
27	0.203568	10.20.19.11	224.0.0.252	LLNMR	65	Standard query 0x55cf AAAA 10_04
28	0.203568	10.20.19.11	224.0.0.252	LLNMR	65	Standard query 0xa9db A 10_04
29	0.203568	fe80::94ac:a223:c2f...	ff02::1:3	LLNMR	88	Standard query 0x5e2b A 02_14_21
30	0.203568	fe80::94ac:a223:c2f...	ff02::1:3	LLNMR	88	Standard query 0x56f6 AAAA 02_14_21
31	0.203568	10.20.56.121	224.0.0.252	LLNMR	68	Standard query 0x5e2b A 02_14_21
32	0.203568	10.20.56.121	224.0.0.252	LLNMR	68	Standard query 0x56f6 AAAA 02_14_21
33	0.203568	fe80::51b8:4aab:39d...	ff02::1:3	LLNMR	88	Standard query 0xa31d A 05_18_20

Frame 235: 75 bytes on wire (600 bits), 75 bytes captured (600 bits) on interface \Device\NPF{CDCB83C0-0000-0100-5e00-00fcac162d11} (01:00:5e:27:00:00:45:00) on interface 10.20.24.3  
Ethernet II, Src: Intel(R) Ethernet Controller I210-AT (08:00:27:00:00:00:00:00), Dst: IPv4multicast\_fc (01:00:5e:00:00:fc)  
Internet Protocol Version 4, Src: 10.20.24.3, Dst: 224.0.0.252  
User Datagram Protocol, Src Port: 62131, Dst Port: 5355  
Link-local Multicast Name Resolution (query)  
0000 01 00 5e 00 00 fc ac 16 2d 11 5e 27 00 00 45 00 ...  
0010 00 3d a3 7d 00 00 01 11 13 11 0b 14 18 12 e0 00 ...  
0020 00 fc f2 b3 14 eb 00 29 de e1 f6 7a 00 00 00 01 ...  
0030 00 00 00 00 00 0f 64 65 73 6b 74 6f 70 2d 70 ...  
0040 36 71 38 73 31 6c 00 00 01 00 01 6q8s11 ...



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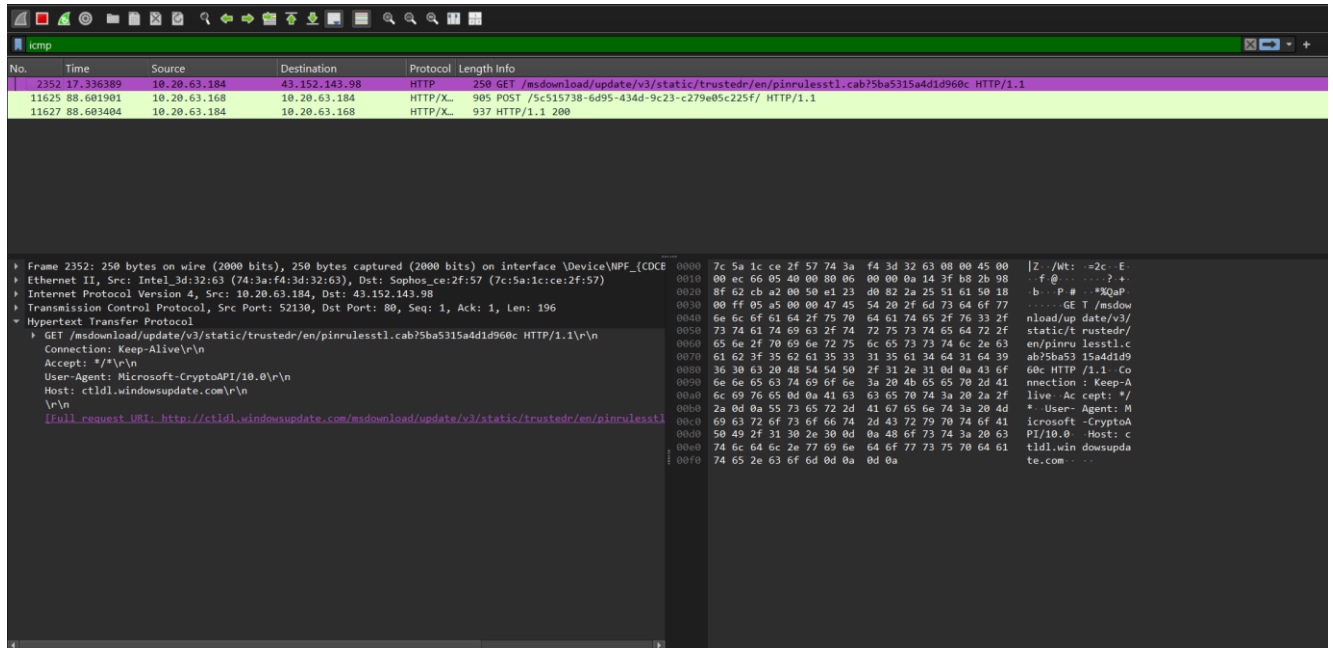
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### e. ICMP



The image shows a Wireshark packet capture window. The top pane shows a list of packets. The selected packet is a GET request from 10.20.63.184 to 10.20.63.168. The middle pane shows the details of the selected packet, including Ethernet II, Internet Protocol Version 4, and Hypertext Transfer Protocol. The bottom pane shows the raw packet data in hexadecimal and ASCII.

C:\Users\Asus>ping openAi.com

Pinging openAi.com [172.64.154.211] with 32 bytes of data:  
Reply from 172.64.154.211: bytes=32 time=30ms TTL=60  
Reply from 172.64.154.211: bytes=32 time=20ms TTL=60  
Reply from 172.64.154.211: bytes=32 time=19ms TTL=60  
Reply from 172.64.154.211: bytes=32 time=23ms TTL=60

Ping statistics for 172.64.154.211:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 19ms, Maximum = 30ms, Average = 23ms