

## ❖ Ping the websites: -

```
C:\WINDOWS\system32\cmd. x + v
Microsoft Windows [Version 10.0.26100.4770]
(c) Microsoft Corporation. All rights reserved.

C:\Users\chavd>ping youtube.com

Pinging youtube.com [2404:6800:4009:829::200e] with 32 bytes of data:
Reply from 2404:6800:4009:829::200e: time=51ms
Reply from 2404:6800:4009:829::200e: time=69ms
Reply from 2404:6800:4009:829::200e: time=77ms
Reply from 2404:6800:4009:829::200e: time=50ms

Ping statistics for 2404:6800:4009:829::200e:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 50ms, Maximum = 77ms, Average = 61ms

C:\Users\chavd>ping google.com

Pinging google.com [2404:6800:4009:821::200e] with 32 bytes of data:
Reply from 2404:6800:4009:821::200e: time=73ms
Reply from 2404:6800:4009:821::200e: time=77ms
Reply from 2404:6800:4009:821::200e: time=74ms
Reply from 2404:6800:4009:821::200e: time=30ms

Ping statistics for 2404:6800:4009:821::200e:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 30ms, Maximum = 77ms, Average = 63ms
```

## ❖ Filter captured packets by protocol (e.g., HTTP, DNS, TCP): -

```
networkcapture.pcapng
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http
No. Time Source Destination Protocol Length Info
---
4313 73.515535 2409:40c1:5:9bc2:89... 2404:6800:4009:821:: HTTP 1031 GET / HTTP/1.1
4475 74.530802 2404:6800:4009:821:: 2409:40c1:5:9bc2:89... HTTP 1070 HTTP/1.1 301 Moved Permanently (text/html)

> Frame 4313: 1031 bytes on wire (8248 bits), 1031 bytes captured (8248 bits) on interface \Device\NPF...
> Ethernet II, Src: CloudNetwork-df:96:91 (50:c2:a8:df:96:91), Dst: aa:a6:2b:0b:e8:e3 (aa:a6:2b:0b:e8:e3)
> Internet Protocol Version 6, Src: 2409:40c1:5:9bc2:8965:3266:11b9:9131, Dst: 2404:6800:4009:821::200e
> Transmission Control Protocol, Src Port: 46286, Dst Port: 80, Seq: 1, Ack: 1, Len: 957
> Hypertext Transfer Protocol

0000 aa a6 2b 0b e8 e3 50 c2 e8 df 96 91 86 dd 60 03 ...:P.....
0010 ef f8 03 d1 06 3f 24 09 40 c1 00 05 9b c2 89 65 ...75: @.....
0020 32 66 11 b9 91 31 24 04 68 00 40 09 08 21 00 00 ... 15: h@...
0030 00 00 00 00 20 0e b4 ce 00 50 d7 b4 57 8c 39 39 ...:P...W...
0040 68 28 50 18 00 ff 02 79 00 00 47 45 54 20 2f 20 ...y GET /
0050 48 54 54 50 2f 31 2e 31 0d 0a 48 6f 73 74 3a 20 ...HTTP/1.1 Host:
0060 67 6f 6f 6f 6f 6f 6f 6f 6f 6d 0d 0a 43 6f 6e 6e ...google.com: Conn
0070 65 63 74 69 6f 6e 3a 20 6b 65 65 70 2d 61 6c 69 ...ection: keep-all
0080 76 65 0d 0a 55 70 67 72 61 64 65 2d 49 6e 73 65 ...ve-upgrade: Inse
0090 63 75 72 65 2d 52 65 71 75 65 73 74 73 3a 20 31 ...cure-Req uests: 1
00a0 0d 0a 55 73 65 72 2d 41 67 65 6e 74 3a 20 4d 6f ...User-Agent: Mo
00b0 7a 69 6c 6c 61 2f 35 2e 30 20 28 57 69 6e 64 6f ...zilla/5.0 (Windo
00c0 77 73 20 4e 54 20 31 30 2e 30 3b 20 57 69 6e 36 ...ws NT 10.0; Win6
00d0 34 3b 20 78 36 34 29 20 41 70 70 6c 65 57 65 62 ...4; x64) AppleWeb
00e0 4b 69 74 2f 35 33 37 2e 33 36 20 28 4b 48 54 4d ...Kit/537.36 (KHTM
00f0 4c 2c 20 6c 69 6b 65 20 47 65 63 6b 6f 29 20 43 ...L, like Gecko) C
0100 68 72 6f 6d 65 2f 31 34 31 2a 30 2a 30 2a 30 20 ...hrome/14.0.0.0
0110 53 61 66 61 72 69 2f 35 33 37 2e 33 36 0d 0a 41 ...Safari/537.36-A
0120 63 63 65 70 74 3a 20 74 65 78 74 2f 68 74 6d 6c ...cept: text/html
0130 2c 61 70 70 6c 69 63 61 74 69 6f 6e 2f 78 68 74 ...application/sh
0140 6d 6c 2b 78 6d 6c 2c 61 70 70 6c 69 63 61 74 69 ...ml+xml, applicati
0150 6f 6e 2f 78 6d 6c 3b 71 3d 30 2e 39 2c 69 6d 61 ...on/xml;q=0.9, ima
0160 67 65 2f 61 76 69 66 2c 69 6d 61 67 65 2f 77 65 ...ge/avif, image/we
0170 62 70 2c 69 6d 61 67 65 2f 61 70 6e 67 2c 2a 2f ...bp,image/apng,/*
0180 2a 3b 71 3d 30 2e 38 2c 61 70 70 6c 69 63 61 74 ...q=0.8, applicati
0190 69 6f 6e 2f 73 69 67 6e 65 64 2d 65 78 63 68 61 ...on/sign ed-excha

Hypertext Transfer Protocol: Protocol
Packets: 8542 - Displayed: 2 (0.0%)
Profile: Default
```

networkcapture.pcapng

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dns

No.	Time	Source	Destination	Protocol	Length	Info
4185	72.541927	2409:40c1:5:9bc2::3e	2409:40c1:5:9bc2:89...	DNS	136	Standard query response 0xf8f6 AAAA play.google.com AAAA 2404:6800:4009:806::200e
4190	72.621337	2409:40c1:5:9bc2::3e	2409:40c1:5:9bc2:89...	DNS	158	Standard query response 0xb86e HTTPS play.google.com SOA ns1.google.com
4208	72.673757	10.158.245.143	10.158.245.1	DNS	129	Standard query response 0xb86e AAAA ogads-pa.clients6.google.com AAAA 2404:6800:4002:82a::200a
4218	72.745890	10.158.245.143	10.158.245.1	DNS	155	Standard query response 0x8012 AAAA lh3.googleusercontent.com CNAME googlehosted.1.googleusercontent.com AAAA 2404:6800:4009:816::200a
4219	72.745890	10.158.245.143	10.158.245.1	DNS	151	Standard query response 0xa77d HTTPS ogads-pa.clients6.google.com SOA ns1.google.com
4220	72.745890	10.158.245.143	10.158.245.1	DNS	184	Standard query response 0x04e3 HTTPS lh3.googleusercontent.com CNAME googlehosted.1.googleusercontent.com SOA ns1.google.com
4226	72.748379	10.158.245.143	10.158.245.1	DNS	117	Standard query response 0x01f4 A ogads-pa.clients6.google.com A 142.251.222.74
4227	72.748379	10.158.245.143	10.158.245.1	DNS	143	Standard query response 0x03c6 A lh3.googleusercontent.com CNAME googlehosted.1.googleusercontent.com A 142.250.194.225
4278	73.315843	10.158.245.143	10.158.245.1	DNS	127	Standard query response 0xb5af AAAA encrypted-tbn0.gstatic.com AAAA 2404:6800:4009:818::200e
4279	73.315843	10.158.245.143	10.158.245.1	DNS	115	Standard query response 0xf3c2 A encrypted-tbn0.gstatic.com A 142.250.70.110
4283	73.325155	10.158.245.143	10.158.245.1	DNS	156	Standard query response 0xeaf1 HTTPS encrypted-tbn0.gstatic.com SOA ns1.google.com
4352	73.753417	10.158.245.143	10.158.245.1	DNS	138	Standard query response 0x813b HTTPS play.google.com SOA ns1.google.com
4355	73.758011	10.158.245.143	10.158.245.1	DNS	104	Standard query response 0xe6dc A play.google.com A 172.217.26.14
5029	76.095669	10.158.245.1	10.158.245.143	DNS	86	Standard query 0xb3e6 A waa-pa.clients6.google.com
5030	76.095843	10.158.245.1	10.158.245.143	DNS	86	Standard query 0xc7f1 AAAA waa-pa.clients6.google.com
5133	76.539020	10.158.245.143	10.158.245.1	DNS	102	Standard query response 0x03e6 A waa-pa.clients6.google.com A 142.250.195.42
5134	76.539020	10.158.245.143	10.158.245.1	DNS	114	Standard query response 0xc7f1 AAAA waa-pa.clients6.google.com AAAA 2404:6800:4009:829::200a
6120	83.519893	10.158.245.1	10.158.245.143	DNS	79	Standard query 0x58cd A accounts.google.com
6121	83.520231	10.158.245.1	10.158.245.143	DNS	79	Standard query 0x458c AAAA accounts.google.com

> Frame 4283: 156 bytes on wire (1248 bits), 156 bytes captured (1248 bits) on interface \Device\NPF\_{959...}

> Ethernet II, Src: ae:a6:2b:0b:e8:e3 (ae:a6:2b:0b:e8:e3), Dst: CloudNetwork\_df:96:91 (50:c2:e8:df:96:91)

> Internet Protocol Version 4, Src: 10.158.245.143, Dst: 10.158.245.1

> Transmission Control Protocol, Src Port: 53, Dst Port: 50884, Seq: 2, Ack: 48, Len: 102

> [2 Reassembled TCP Segments (103 bytes): #4282(1), #4283(102)]

> Domain Name System (response)

Frame (156 bytes) Reassembled TCP (103 bytes)

Packets: 8542 - Displayed: 240 (2.8%)

Profile: Default

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16:44 27-10-2025

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dns

No.	Time	Source	Destination	Protocol	Length	Info
4185	72.541927	2409:40c1:5:9bc2::3e	2409:40c1:5:9bc2:89...	DNS	136	Standard query response 0xf8f6 AAAA play.google.com AAAA 2404:6800:4009:806::200e
4190	72.621337	2409:40c1:5:9bc2::3e	2409:40c1:5:9bc2:89...	DNS	158	Standard query response 0xb86e HTTPS play.google.com SOA ns1.google.com
4208	72.673757	10.158.245.143	10.158.245.1	DNS	129	Standard query response 0xb86e AAAA ogads-pa.clients6.google.com AAAA 2404:6800:4002:82a::200a
4218	72.745890	10.158.245.143	10.158.245.1	DNS	155	Standard query response 0x8012 AAAA lh3.googleusercontent.com CNAME googlehosted.1.googleusercontent.com AAAA 2404:6800:4009:816::200a
4219	72.745890	10.158.245.143	10.158.245.1	DNS	151	Standard query response 0xa77d HTTPS ogads-pa.clients6.google.com SOA ns1.google.com
4220	72.745890	10.158.245.143	10.158.245.1	DNS	184	Standard query response 0x04e3 HTTPS lh3.googleusercontent.com CNAME googlehosted.1.googleusercontent.com SOA ns1.google.com
4226	72.748379	10.158.245.143	10.158.245.1	DNS	117	Standard query response 0x01f4 A ogads-pa.clients6.google.com A 142.251.222.74
4227	72.748379	10.158.245.143	10.158.245.1	DNS	143	Standard query response 0x03c6 A lh3.googleusercontent.com CNAME googlehosted.1.googleusercontent.com A 142.250.194.225
4278	73.315843	10.158.245.143	10.158.245.1	DNS	127	Standard query response 0xb5af AAAA encrypted-tbn0.gstatic.com AAAA 2404:6800:4009:818::200e
4279	73.315843	10.158.245.143	10.158.245.1	DNS	115	Standard query response 0xf3c2 A encrypted-tbn0.gstatic.com A 142.250.70.110
4283	73.325155	10.158.245.143	10.158.245.1	DNS	156	Standard query response 0xeaf1 HTTPS encrypted-tbn0.gstatic.com SOA ns1.google.com
4352	73.753417	10.158.245.143	10.158.245.1	DNS	138	Standard query response 0x813b HTTPS play.google.com SOA ns1.google.com
4355	73.758011	10.158.245.143	10.158.245.1	DNS	104	Standard query response 0xe6dc A play.google.com A 172.217.26.14
5029	76.095669	10.158.245.1	10.158.245.143	DNS	86	Standard query 0xb3e6 A waa-pa.clients6.google.com
5030	76.095843	10.158.245.1	10.158.245.143	DNS	86	Standard query 0xc7f1 AAAA waa-pa.clients6.google.com
5133	76.539020	10.158.245.143	10.158.245.1	DNS	102	Standard query response 0x03e6 A waa-pa.clients6.google.com A 142.250.195.42
5134	76.539020	10.158.245.143	10.158.245.1	DNS	114	Standard query response 0xc7f1 AAAA waa-pa.clients6.google.com AAAA 2404:6800:4009:829::200a
6120	83.519893	10.158.245.1	10.158.245.143	DNS	79	Standard query 0x58cd A accounts.google.com
6121	83.520231	10.158.245.1	10.158.245.143	DNS	79	Standard query 0x458c AAAA accounts.google.com

> Frame 4283: 156 bytes on wire (1248 bits), 156 bytes captured (1248 bits) on interface \Device\NPF\_{959...}

> Ethernet II, Src: ae:a6:2b:0b:e8:e3 (ae:a6:2b:0b:e8:e3), Dst: CloudNetwork\_df:96:91 (50:c2:e8:df:96:91)

> Internet Protocol Version 4, Src: 10.158.245.143, Dst: 10.158.245.1

> Transmission Control Protocol, Src Port: 53, Dst Port: 50884, Seq: 2, Ack: 48, Len: 102

> [2 Reassembled TCP Segments (103 bytes): #4282(1), #4283(102)]

> Domain Name System (response)

Frame (156 bytes) Reassembled TCP (103 bytes)

Packets: 8542 - Displayed: 240 (2.8%)

Profile: Default

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16:44 27-10-2025

❖ Identify at least 3 different protocols in the capture.

The screenshot shows the Wireshark interface with a network capture file named 'networkcapture.pcapng'. The filter bar at the top is set to 'arp'. The packet list on the left shows several ARP requests and replies. The selected packet (No. 3604) is an ARP request from 'CloudNetwork\_df:96:...' to 'CloudNetwork\_df:96:...' with a length of 42 bytes. The packet details pane shows the Ethernet II header and the ARP section. The packet bytes pane displays the raw data in hexadecimal and ASCII.

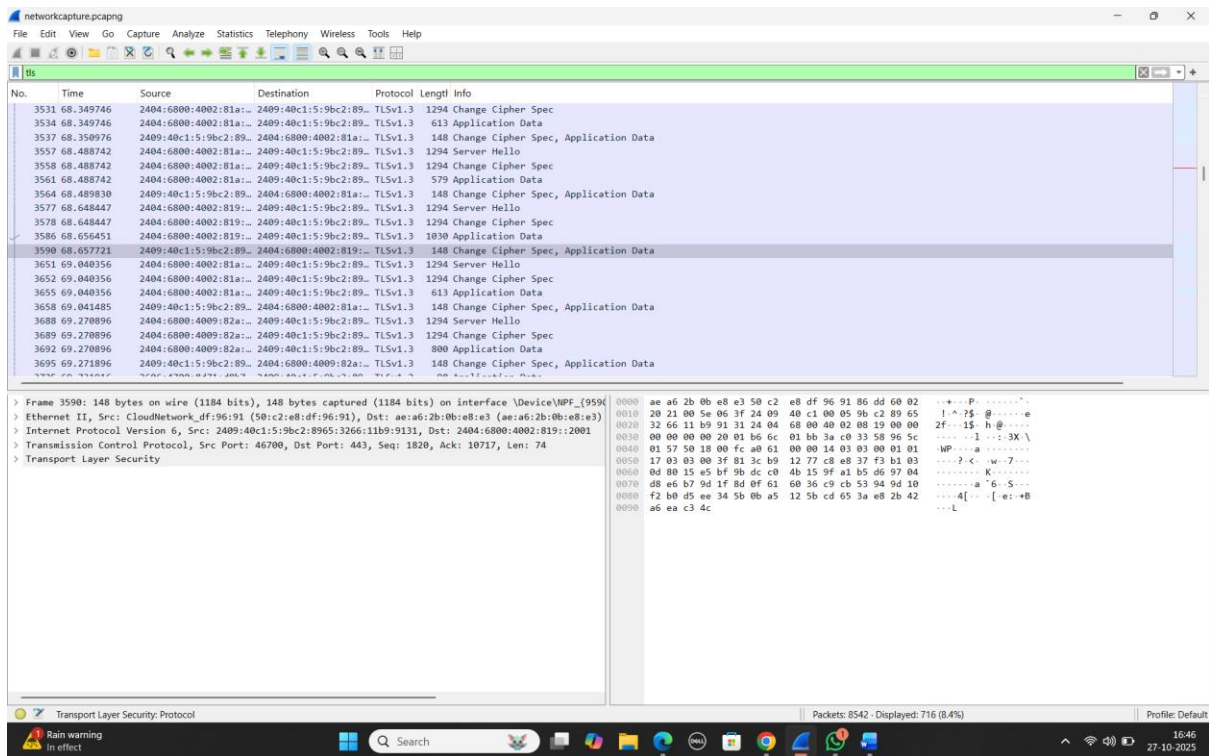
No.	Time	Source	Destination	Protocol	Length	Info
150	29.937405	ae:a6:2b:0b:e8:e3	CloudNetwork_df:96:...	ARP	42	Who has 10.158.245.1? Tell 10.158.245.143
151	29.937471	CloudNetwork_df:96:...	ae:a6:2b:0b:e8:e3	ARP	42	10.158.245.1 is at 50:c2:e8:df:96:91
1750	56.649323	CloudNetwork_df:96:...	ae:a6:2b:0b:e8:e3	ARP	42	Who has 10.158.245.143? Tell 10.158.245.1
1750	56.657912	ae:a6:2b:0b:e8:e3	CloudNetwork_df:96:...	ARP	42	10.158.245.143 is at ae:a6:2b:0b:e8:e3
3603	68.717315	ae:a6:2b:0b:e8:e3	CloudNetwork_df:96:...	ARP	42	Who has 10.158.245.1? Tell 10.158.245.143
3604	68.717335	CloudNetwork_df:96:...	ae:a6:2b:0b:e8:e3	ARP	42	10.158.245.1 is at 50:c2:e8:df:96:91
7584	96.112260	ae:a6:2b:0b:e8:e3	CloudNetwork_df:96:...	ARP	42	Who has 10.158.245.1? Tell 10.158.245.143
7585	96.112303	CloudNetwork_df:96:...	ae:a6:2b:0b:e8:e3	ARP	42	10.158.245.1 is at 50:c2:e8:df:96:91

Frame 3604: 42 bytes on wire (336 bits), 42 bytes captured (336 bits) on interface \Device\NPF\_{959C0C44-...} Ethernet II, Src: CloudNetwork\_df:96:91 (50:c2:e8:df:96:91), Dst: ae:a6:2b:0b:e8:e3 (ae:a6:2b:0b:e8:e3) Address Resolution Protocol (reply)

The screenshot shows the Wireshark interface with a network capture file named 'networkcapture.pcapng'. The filter bar at the top is set to 'udp'. The packet list on the left shows several UDP packets. The selected packet (No. 3602) is a UDP packet from '2404:6800:4002:819:...' to '2404:6800:4009:829:...' with a length of 95 bytes. The packet details pane shows the Ethernet II header, Internet Protocol Version 6, and User Datagram Protocol sections. The packet bytes pane displays the raw data in hexadecimal and ASCII.

No.	Time	Source	Destination	Protocol	Length	Info
3592	68.693451	2404:6800:4002:80b:...	2404:6800:4002:819:...	UDP	454	443 → 53042 Len=392
3593	68.693935	2404:6800:4002:819:...	2404:6800:4002:80b:...	UDP	102	53042 → 443 Len=40
3594	68.695039	2404:6800:4002:81a:...	2404:6800:4002:819:...	QUIC	87	Protected Payload (KPO)
3595	68.697860	2404:6800:4002:819:...	2404:6800:4002:819:...	QUIC	1292	Protected Payload (KPO)
3596	68.697860	2404:6800:4002:819:...	2404:6800:4002:819:...	QUIC	1292	Protected Payload (KPO)
3597	68.697860	2404:6800:4002:819:...	2404:6800:4002:819:...	QUIC	1288	Protected Payload (KPO)
3598	68.697860	2404:6800:4002:819:...	2404:6800:4002:819:...	QUIC	1292	Protected Payload (KPO)
3599	68.698094	2404:6800:4002:819:...	2404:6800:4002:819:...	QUIC	97	Protected Payload (KPO), DCID=f111a94425605c9b
3600	68.698299	2404:6800:4002:819:...	2404:6800:4002:819:...	QUIC	97	Protected Payload (KPO), DCID=f111a94425605c9b
3601	68.707312	2404:6800:4009:829:...	2404:6800:4002:819:...	QUIC	998	Protected Payload (KPO)
3602	68.707682	2404:6800:4002:819:...	2404:6800:4009:829:...	QUIC	95	Protected Payload (KPO), DCID=e452ae2c3be8d95f
3605	68.719840	2404:6800:4002:819:...	2404:6800:4002:819:...	QUIC	1292	Protected Payload (KPO)
3606	68.720195	2404:6800:4002:819:...	2404:6800:4002:819:...	QUIC	93	Protected Payload (KPO), DCID=f111a94425605c9b
3607	68.726902	2404:6800:4009:829:...	2404:6800:4002:819:...	QUIC	190	Protected Payload (KPO)
3608	68.727224	2404:6800:4002:819:...	2404:6800:4009:829:...	QUIC	95	Protected Payload (KPO), DCID=e452ae2c3be8d95f
3609	68.727349	2404:6800:4002:819:...	2404:6800:4009:809:...	QUIC	1292	Initial, DCID=7a4f2e9b65378201, PKN: 10, PING, PING, CRYPTO, PING
3610	68.733184	2404:6800:4002:819:...	2404:6800:4002:81a:...	QUIC	218	Protected Payload (KPO), DCID=ee1db26ec150737e
3611	68.743203	2404:6800:4002:819:...	2404:6800:4002:819:...	QUIC	1292	Protected Payload (KPO)
3612	68.779114	2404:6800:4002:819:...	2404:6800:4002:819:...	QUIC	94	Protected Payload (KPO), DCID=f111a94425605c9b

Frame 3602: 95 bytes on wire (760 bits), 95 bytes captured (760 bits) on interface \Device\NPF\_{959C0C44-...} Ethernet II, Src: CloudNetwork\_df:96:91 (50:c2:e8:df:96:91), Dst: ae:a6:2b:0b:e8:e3 (ae:a6:2b:0b:e8:e3) Internet Protocol Version 6, Src: 2404:6800:4002:819:3266:11b9:9131, Dst: 2404:6800:4009:829:200e User Datagram Protocol, Src Port: 64866, Dst Port: 443 QUIC IETF



## ❖ Summarize your findings and packet details: -

- Number of total packets captured – 8542
- Identified protocols and their purpose - HTTP – for web browsing traffic

DNS – for domain name resolution

TCP/UDP – for transport layer communication

ARP/ICMP – for network discovery and ping requests



