Wireshark 101 Labs

Portfolio Samples

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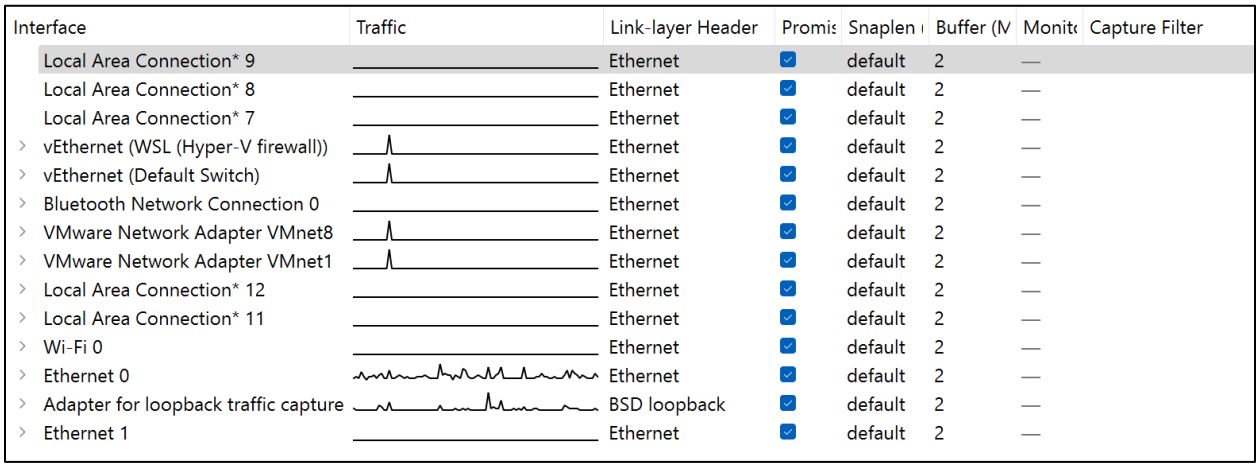
LAB 2: CAPTURE AND CLASSIFY YOUR OWN BACKGROUND TRAFFIC

i. Insert a screenshot of active interfaces and answer the following:

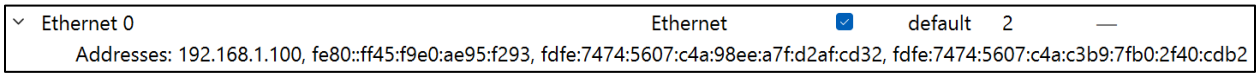


Interface	Traffic	Link-layer Header	Promis	Snaplen	Buffer (M	Monit	Capture Filter
Local Area Connection* 9		Ethernet	☑	default	2	—	
Local Area Connection* 8		Ethernet	☑	default	2	—	
Local Area Connection* 7		Ethernet	☑	default	2	—	
vEthernet (WSL (Hyper-V firewall))		Ethernet	☑	default	2	—	
vEthernet (Default Switch)		Ethernet	☑	default	2	—	
Bluetooth Network Connection 0		Ethernet	☑	default	2	—	
VMware Network Adapter VMnet8		Ethernet	☑	default	2	—	
VMware Network Adapter VMnet1		Ethernet	☑	default	2	—	
Local Area Connection* 12		Ethernet	☑	default	2	—	
Local Area Connection* 11		Ethernet	☑	default	2	—	
Wi-Fi 0		Ethernet	☑	default	2	—	
Ethernet 0		Ethernet	☑	default	2	—	
Adapter for loopback traffic capture		BSD loopback	☑	default	2	—	
Ethernet 1		Ethernet	☑	default	2	—	

a. How many different types of interfaces do you have? Explain what they all are.

There are 14 listed interfaces. `Ethernet 0` and `1` are physical interfaces that are built into my motherboard (the board also has built-in Wi-Fi and Bluetooth interfaces, but these are disabled in BIOS due to some problems I'm working through with Linux dual booting). The listed `Wi-Fi 0` and `Bluetooth 0` interfaces are also physical. I have a PCIe Wi-Fi/Bluetooth adapter with firmware that plays nice with Linux slotted into my motherboard. I believe that the rest of the interfaces are virtual. The `loopback` interface is for local communication (the device communicating with itself). Both `VMware` interfaces were created by VMware Workstation and are used for VM networking (VMware, 2019). Similarly, the `vEthernet` interfaces are used by Hyper-V – one appears to be for my Ubuntu WSL environment (Harwood et al., 2021). I honestly wasn't sure about the `Local Area Connection` interfaces, and I'm still not completely satisfied with the answer I found. However, I believe that these are also virtual interfaces. According to a StackExchange answer, Windows automatically creates these for its own purposes and sets them as hidden (Mittal, 2014).

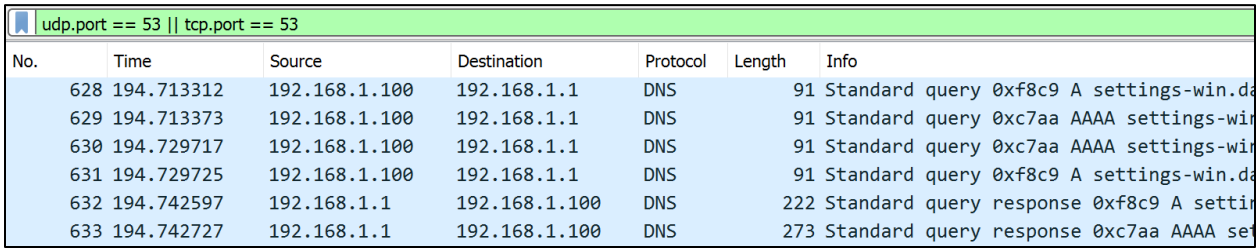
b. Provide a screenshot of one interface's detailed characteristics.



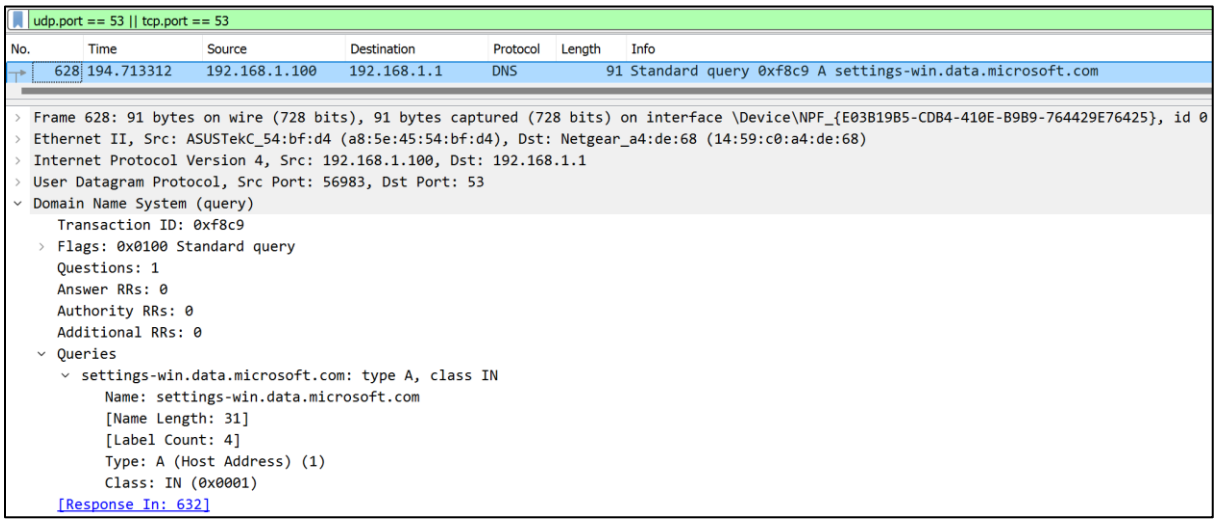
I was unable to locate any additional views that show more detailed information about a specific interface in Wireshark. Hovering the mouse cursor over an interface or expanding the arrow does show associated addresses though.

ii. Insert screenshots that show:

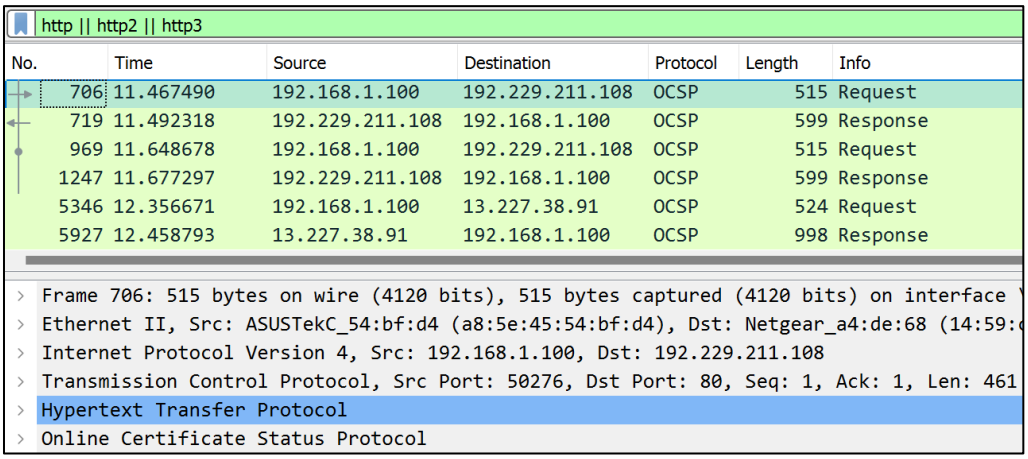
a. Only DNS (port 53) traffic filtered.



b. A DNS packet that initiated a DNS request.

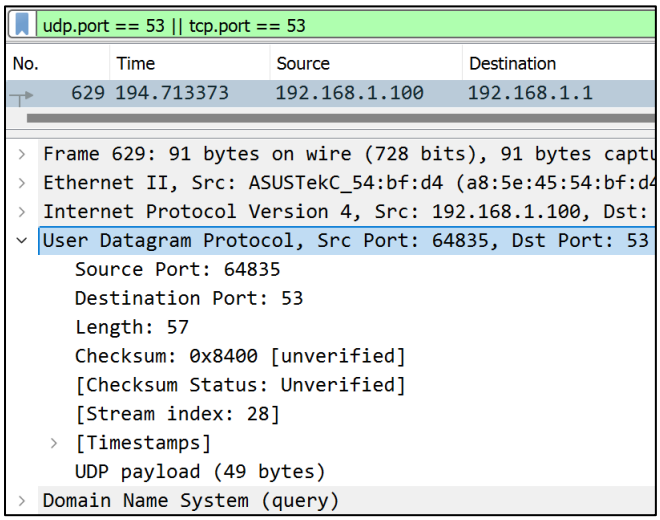


iii. Insert a screenshot that shows only HTTP (port `80`) traffic filtered.



My original 5-minute background capture did not include any HTTP traffic, I started a new capture and browsed to a webpage to generate the traffic in the screenshot above.

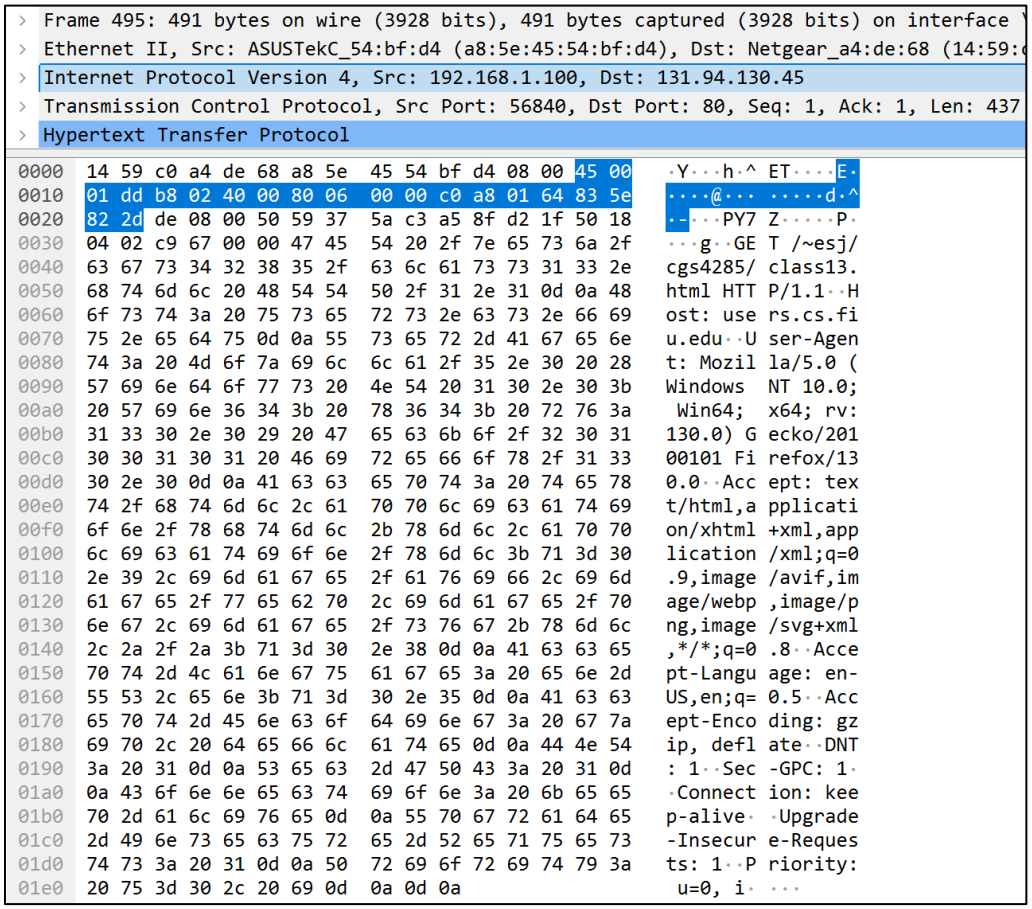
iv. Insert a screenshot that shows the source and destination port of a packet and answer the following:



a. Can you tell the direction of a packet by the source and destination port? How?

I think that it is *possible* to determine the direction of a packet based on its source and destination port because of reserved and ephemeral ports, but I'm not certain if it is *always possible* (I'm leaning towards no). If a packet's source port is some well-known port number like `80` or `443` and the destination port is some larger port number in the ephemeral range, it stands to reason that the packet is likely outbound from a web server/inbound to a client. The opposite (outbound from a client/inbound to a web server) would likely be true in this example when the source and destination ports are swapped (Rosenberg, 2003; Johnson, 2019). It seems like this logic could break down if the client forces a well-known port number to be used instead of an ephemeral port number (is this possible? I don't see why not), or potentially in some other edge cases that are unknown to me.

v. Insert an example screenshot and answer the following:



a. Where does the actual "packet" PDU begin and end in a trace file?

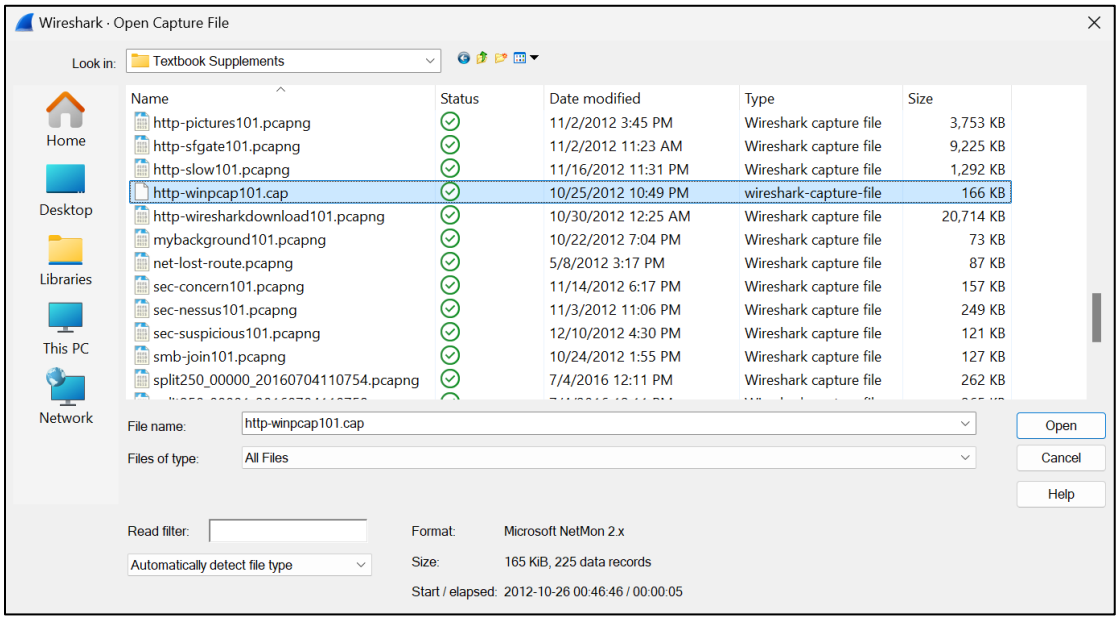
I was uncertain if this question was referring to how packets are actually stored in the `.pcapng` file format, or if it meant where the "data" actually begins/ends on the individual packet level as seen in Wireshark. In the context of part B of this question, I interpreted it as the latter. The "packet" PDU label is used loosely, but technically refers to protocol data units at the network layer as we've learned. Each "layer" adds a header with the required/necessary information. In the screenshot above, the IPv4 header is selected; this marks the beginning of the layer 3 packet, which itself contains a layer 4 segment/datagram.

b. Explain the difference between the PDUs of packet, frame, and a segment.

As mentioned in part A, "frame," "packet," and "segment" (or "datagram") technically refer to PDUs at layers 2, 3, and 4 respectively. A frame is the PDU at the data link layer. A frame contains a packet, which itself contains a segment/datagram. A packet is the PDU at the network layer and contains a segment/datagram, and so on.

LAB 3: OPEN A NETWORK CAPTURE FILE

i. Provide a screenshot of completed step 2.



CHAPTER 0 CHALLENGE

0-1. How many packets are in this trace file?

Packets: 20 · Displayed: 20 (100.0%)

According to the information displayed at the bottom of the screen in Wireshark, there are 20 packets in the trace file.

0-2. What IP hosts are making a TCP connection in frames 1, 2, and 3?

No.	Time	Source	Destination	Protocol
1	0.000000	192.168.1.108	50.19.229.205	TCP
2	0.092419	50.19.229.205	192.168.1.108	TCP
3	0.092521	192.168.1.108	50.19.229.205	TCP

In frames 1, 2, and 3, IP hosts `192.168.1.108` and `50.19.229.205` are making a TCP connection.

0-3. What HTTP command is sent in frame 4?

```
> Frame 4: 1384 bytes on wire (11072 bits), 1384 bytes captured (11072 bits) on interface unknown, id 0
> Ethernet II, Src: HonHaiPr_68:74:f6 (90:4c:e5:68:74:f6), Dst: Cisco-Li_d9:94:c0 (00:1d:7e:d9:94:c0)
> Internet Protocol Version 4, Src: 192.168.1.108, Dst: 50.19.229.205
> Transmission Control Protocol, Src Port: 60139, Dst Port: 80, Seq: 1, Ack: 1, Len: 1330
v Hypertext Transfer Protocol
  > GET /Tracking/V3/Instream/Impression/?start|2873|72147|75904|9028|26105|undefined|1338|3379|807|BBE
```

In frame 4, the HTTP command is `GET`.

0-4. What is the length of the largest frame in this trace file?

No.	Time	Source	Destination	Protocol	Length
15	11.175009	192.168.1.108	50.19.229.205	HTTP	1428
12	3.675382	192.168.1.108	50.19.229.205	HTTP	1428
4	0.094027	192.168.1.108	50.19.229.205	HTTP	1384

Sorting the "Length" column from largest to smallest shows two frames tied for largest at 1,428 bytes.

0-5. What protocols are seen in the Protocol column?

No.	Time	Source	Destination	Protocol
1	0.000000	192.168.1.108	50.19.229.205	TCP
2	0.092419	50.19.229.205	192.168.1.108	TCP
3	0.092521	192.168.1.108	50.19.229.205	TCP
4	0.094027	192.168.1.108	50.19.229.205	HTTP

The only protocols seen in this file are TCP and HTTP.

0-6. What responses are sent by the HTTP server?

ip.dst == 192.168.1.108

No.	Time	Source	Destination	Protocol	Length	Info
2	0.092419	50.19.229.205	192.168.1.108	TCP	66	80 → 60139 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0
5	0.196174	50.19.229.205	192.168.1.108	TCP	54	80 → 60139 [ACK] Seq=1 Ack=1331 Win=8960 Len=0
6	0.204299	50.19.229.205	192.168.1.108	HTTP	607	HTTP/1.1 302 Found
8	0.326624	50.19.229.205	192.168.1.108	HTTP	607	HTTP/1.1 302 Found
10	0.674498	50.19.229.205	192.168.1.108	HTTP	607	[TCP Spurious Retransmission] HTTP/1.1 302 Found
13	3.776869	50.19.229.205	192.168.1.108	HTTP	607	HTTP/1.1 302 Found
16	11.283854	50.19.229.205	192.168.1.108	HTTP	607	HTTP/1.1 302 Found
18	70.319743	50.19.229.205	192.168.1.108	TCP	54	80 → 60139 [FIN, ACK] Seq=2213 Ack=5405 Win=1766

The HTTP server responds with `302 Found`.

0-7. Is there any IPv6 traffic in this trace file?

No.	Time	Source	Destination
1	0.000000	192.168.1.108	50.19.229.205
2	0.092419	50.19.229.205	192.168.1.108
3	0.092521	192.168.1.108	50.19.229.205
4	0.094027	192.168.1.108	50.19.229.205
5	0.196174	50.19.229.205	192.168.1.108
6	0.204299	50.19.229.205	192.168.1.108
7	0.221142	192.168.1.108	50.19.229.205
8	0.326624	50.19.229.205	192.168.1.108
9	0.600950	192.168.1.108	50.19.229.205
10	0.674498	50.19.229.205	192.168.1.108
11	0.674551	192.168.1.108	50.19.229.205
12	3.675382	192.168.1.108	50.19.229.205
13	3.776869	50.19.229.205	192.168.1.108
14	3.975053	192.168.1.108	50.19.229.205
15	11.175009	192.168.1.108	50.19.229.205
16	11.283854	50.19.229.205	192.168.1.108
17	11.478274	192.168.1.108	50.19.229.205
18	70.319743	50.19.229.205	192.168.1.108
19	70.319865	192.168.1.108	50.19.229.205
20	74.757892	192.168.1.108	50.19.229.205

No, it appears that all the source and destination addresses are IPv4.

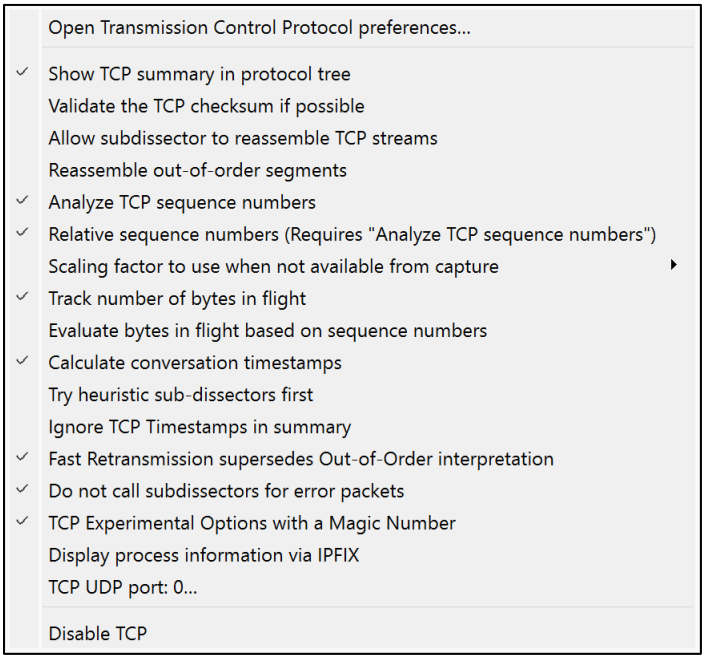
LAB 4: ADD HTTP HOST FIELD AS A COLUMN

i. Provide a screenshot of completed step 6.

No.	Time	Source	Destination	Protocol	Length	Host
15	8.974846	24.6.173.220	199.181.132.249	HTTP	342	www.disney.com
5723	14.380454	24.6.173.220	68.71.216.36	HTTP	1791	weblogger01.data.…
5941	14.550770	24.6.173.220	66.235.138.59	HTTP	1952	w88.go.com
5730	14.381594	24.6.173.220	66.235.138.59	HTTP	1579	w88.go.com
1859	12.099824	24.6.173.220	68.71.209.50	HTTP	379	tredir.go.com
3456	13.588623	24.6.173.220	199.181.131.249	HTTP	338	search.disney.com
4876	14.117914	24.6.173.220	74.217.240.83	HTTP	431	pix04.revsci.net
3445	13.525109	24.6.173.220	74.217.240.83	HTTP	335	js.revsci.net
32	11.415512	24.6.173.220	199.181.132.249	HTTP	338	disney.com

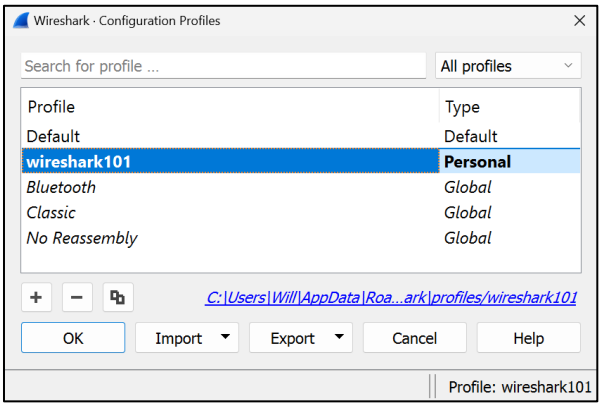
LAB 5: SET KEY WIRESHARK PREFERENCES

i. Follow all the steps in the lab and provide a complete screenshot of step 9.



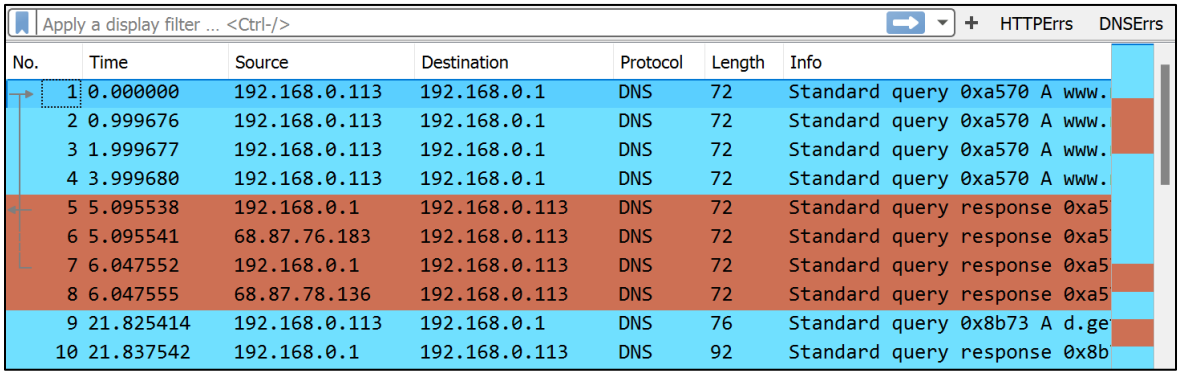
LAB 6: CREATE NEW PROFILE BASED ON THE DEFAULT PROFILE

i. Make a profile labeled wireshark101 and provide a screenshot.



LAB 7: IMPORT A DNS/HTTP ERRORS PROFILE

i. Provide a screenshot of completed step 6.



LAB 8: SPOT PATH AND SERVER LATENCY PROBLEMS

i. Provide a screenshot of completed step 7.

No.	Time	TCP Delta	Source	Destination	Protocol
354	118.195308	118.195308000	24.6.173.220	69.4.231.53	TCP
210	29.006113	41.640641000	69.4.231.53	24.6.173.220	HTTP
34	0.006965	36.357656000	69.4.231.53	24.6.173.220	HTTP
16	18.096205	18.096205000	24.6.173.220	69.4.231.53	TCP
30	0.015479	18.052142000	69.4.231.53	24.6.173.220	HTTP
23	17.965049	17.965049000	69.4.231.53	24.6.173.220	HTTP
204	0.512248	14.907886000	69.4.231.53	24.6.173.220	TCP
202	1.115240	14.812617000	69.4.231.53	24.6.173.220	TCP
1098	14.745399	14.745399000	69.4.231.53	24.6.173.220	TCP

CHAPTER 1 CHALLENGE

1-1. In which frame number does the client request the default webpage (“/”)

No.	Time	Source	Destination	Protocol	Info
13	0.001319	24.6.169.43	24.6.173.220	HTTP	GET / HTTP/1.1
14	0.030997	24.6.173.220	24.6.169.43	HTTP	HTTP/1.1 200 OK
15	0.000510	24.6.173.220	24.6.169.43	HTTP	Continuation
17	0.000118	24.6.173.220	24.6.169.43	HTTP	Continuation
18	0.039374	24.6.169.43	24.6.173.220	HTTP	GET /style.css HTTP/1.1

Frame 13.

1-2. What response code does the server send in frame 17?

No.	Time	Source	Destination	Protocol	Info
14	0.030997	24.6.173.220	24.6.169.43	HTTP	HTTP/1.1 200 OK
15	0.000510	24.6.173.220	24.6.169.43	HTTP	Continuation
17	0.000118	24.6.173.220	24.6.169.43	HTTP	Continuation
18	0.039374	24.6.169.43	24.6.173.220	HTTP	GET /style.css HTTP/1.1

The response code is `200 OK`.

1-3. What is the largest TCP delta value seen in this trace file?

No.	Time	TCP Delta	Source	Destination	Protocol
285	0.285165	15.438012000	24.6.169.43	24.6.173.220	HTTP
286	0.001057	15.406091000	24.6.169.43	24.6.173.220	HTTP
287	0.000002	15.296079000	24.6.169.43	24.6.173.220	HTTP
279	2.688634	15.139514000	24.6.169.43	24.6.173.220	HTTP
264	4.865139	11.988774000	24.6.169.43	24.6.173.220	HTTP

Using the TCP Delta column that we set up in lab 8, frame 285 has the largest delta value at `15.438012000`.

1-4. How many `SYN` packets arrived after at least a 1 second Delay

tcp.flags.syn == 1

No.	Time	TCP Delta	Source	Destination	Protocol	Info
3	6.006083	6.006083000	24.6.169.43	24.6.173.220	TCP	[TCP Retransmission] 63286 → 87 [SYN]
6	5.999911	5.999911000	24.6.169.43	24.6.173.220	TCP	[TCP Retransmission] 63287 → 87 [SYN]
2	3.000825	3.000825000	24.6.169.43	24.6.173.220	TCP	[TCP Retransmission] 63286 → 87 [SYN]
5	2.995490	2.995490000	24.6.169.43	24.6.173.220	TCP	[TCP Retransmission] 63287 → 87 [SYN]
21	0.000737	0.000737000	24.6.173.220	24.6.169.43	TCP	87 → 63290 [SYN, ACK] Seq=0 Ack=1 Win=
27	0.000115	0.000450000	24.6.173.220	24.6.169.43	TCP	87 → 63293 [SYN, ACK] Seq=0 Ack=1 Win=

Still in the same view (sorted largest to smallest by TCP delta value), I applied `tcp.flags.syn == 1` as a display filter. It looks like four `SYN` packets arrived after at least a 1 second delay.

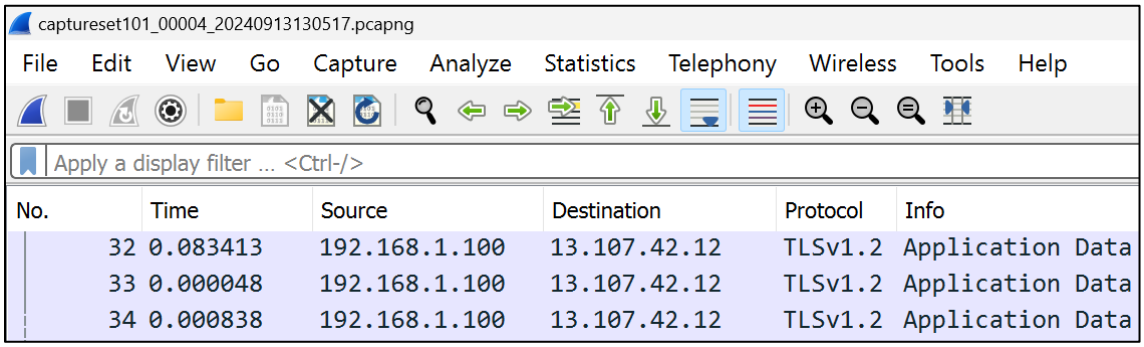
1-5. *(not in book)* Research and provide a chart of 5 valid HTTP/1.1 Status Codes. In your own words, include the code number, definition, and a brief example of when one might see it. Cite all sources in APA format.

HTTP Status Codes		
Code	**Category**	**Description**
1xx	Informational	For informational purposes only, a request was received and is processing
2xx	Success	Requested was processed successfully
3xx	Redirection	More action is needed before request can process successfully
4xx	Client Error	Client-side error; the request contains a syntax mistake or cannot be processed
5xx	Server Error	Server-side error; the request is good but cannot be processed
Code		**Description**
`201 Created`		The request was successfully processed and a new resource was created (e.g., new user account)
`404 Not Found`		Server could not find requested resource (e.g., client requests a page that has moved URLs without any redirection)
`301 Moved Permanently`		The resource has been moved to a new URL (e.g., a client requested www.website.com/info, but it is now www.website.com/about)
`502 Bad Gateway`		A proxy/gateway server got an invalid response from upstream (e.g., a networking micsonfiguration causes a communication issue)
`403 Forbidden`		The request is good but is not fulfilled (e.g., wrong credentials are provided or user has insufficient permissions)

The table above is based on RFC9110 (sections 15.1 – 15.6), the IANA HTTP status code registry, and Mozilla documentation (Fielding et al., 2022; IANA, 2022; Mozilla Developer Network, 2024).

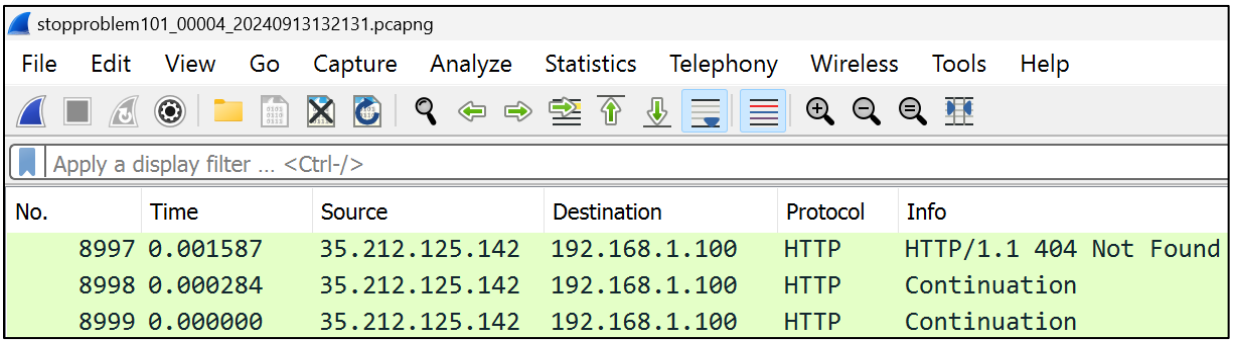
LAB 9: CAPTURE TO FILE SETS

i. Follow all the steps in the lab and provide a complete screenshot of step 7.



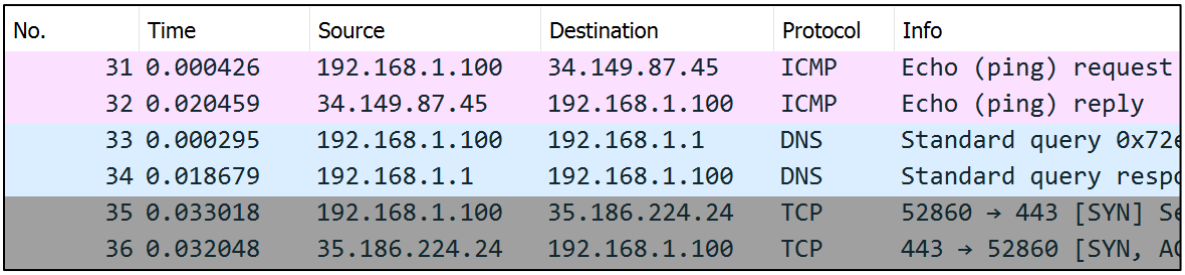
LAB 10: USE RING BUFFER TO CONSERVE DRIVE SPACE

i. Follow all the steps in the lab and provide a complete screenshot of step 10.



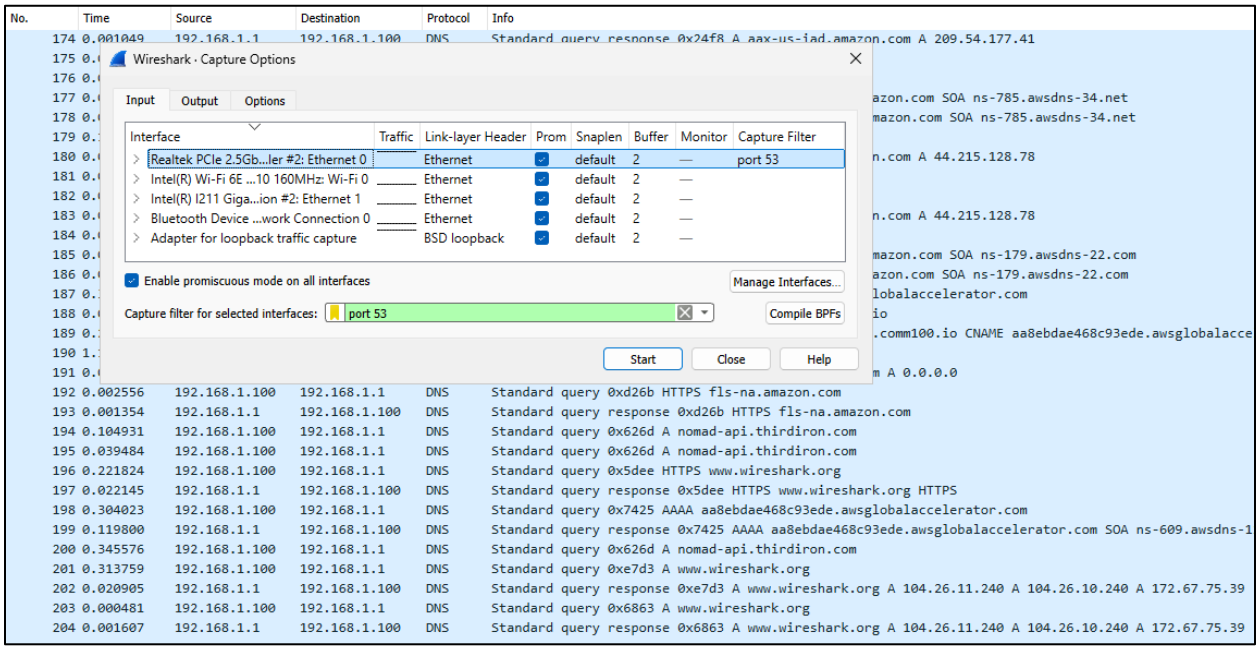
LAB 11: CAPTURE ONLY TRAFFIC TO OR FROM YOUR IP ADDRESS

i. Follow all the steps in the lab and provide a complete screenshot of step 6



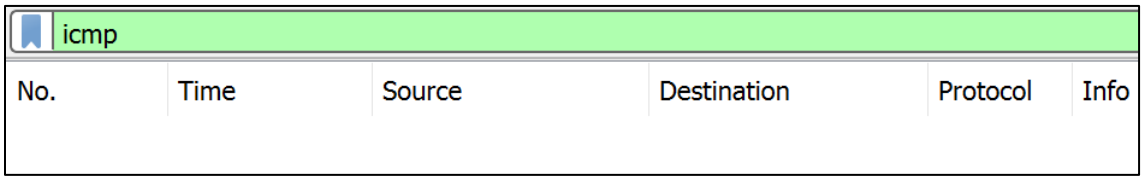
LAB 13: CREATE, SAVE, AND APPLY A DNS CAPTURE FILTER

i. Follow all the steps in the lab and provide a complete screenshot of step 10.



CHAPTER 2 CHALLENGE

2-1. Did you capture any ICMP traffic?



No ICMP packets were captured.

2-2. What protocols are listed for your browsing session to `www.ChapelleU.com`? (redirects to `www.chappell-university.com`)

No.	Time	Source	Destination	Protocol	Info
1	0.000000	192.168.1.100	18.236.36.28	TCP	54512 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
2	0.081897	18.236.36.28	192.168.1.100	TCP	80 → 54512 [SYN, ACK] Seq=0 Ack=1 Win=26883 Len=0 MSS=1460 SACK_PE
3	0.000040	192.168.1.100	18.236.36.28	TCP	54512 → 80 [ACK] Seq=1 Ack=1 Win=262656 Len=0
4	0.000085	192.168.1.100	18.236.36.28	HTTP	GET / HTTP/1.1

I couldn't connect to an HTTP version of `www.chappell-university.com` (only HTTPS), so I browsed to `www.testingmcafeesites.com` instead to generate this traffic.

The TCP and HTTP protocols are listed for the browsing session.

2-3. How many ICMP packets did you capture?

No.	Time	Source	Destination	Protocol	Info
1	0.000000	192.168.1.100	34.149.87.45	ICMP	Echo (ping) request id=0x0001, seq=25/6400, ttl=128 (reply in 2)
2	0.020650	34.149.87.45	192.168.1.100	ICMP	Echo (ping) reply id=0x0001, seq=25/6400, ttl=56 (request in 1)
3	0.988892	192.168.1.100	34.149.87.45	ICMP	Echo (ping) request id=0x0001, seq=26/6656, ttl=128 (reply in 4)
4	0.019450	34.149.87.45	192.168.1.100	ICMP	Echo (ping) reply id=0x0001, seq=26/6656, ttl=56 (request in 3)
5	0.995769	192.168.1.100	34.149.87.45	ICMP	Echo (ping) request id=0x0001, seq=27/6912, ttl=128 (reply in 6)
6	0.019963	34.149.87.45	192.168.1.100	ICMP	Echo (ping) reply id=0x0001, seq=27/6912, ttl=56 (request in 5)
7	0.981919	192.168.1.100	34.149.87.45	ICMP	Echo (ping) request id=0x0001, seq=28/7168, ttl=128 (reply in 8)
8	0.018964	34.149.87.45	192.168.1.100	ICMP	Echo (ping) reply id=0x0001, seq=28/7168, ttl=56 (request in 7)

8 ICMP packets were captured (4 requests and 4 replies).

2-4. What ICMP Type and Code numbers are listed in your Trace File?

```
Internet Control Message Protocol
    Type: 8 (Echo (ping) request)
    Code: 0
```

```
Internet Control Message Protocol
    Type: 0 (Echo (ping) reply)
    Code: 0
```

The requests show `Type 8/Code 0`, and the replies show `Type 0/Code 0`.

2-5. *(not in book)* Research ICMP Types and Codes. Provide a concise explanation for each of the following Type 3 Code conditions; what does it mean exactly? Explain the specifics of why one would get this response.

Type	Code	
3	0	Network unreachable
	1	Host unreachable
	3	Port unreachable
	5	Source route failed
	7	Destination host unknown
	10	Communication with destination host is administratively prohibited
	12	Destination host unreachable for type of service

a. Type 3/Code 0 -- Network unreachable

The destination network is unreachable – no packets could be routed there. This could happen when a router tries to forward a packet to the correct network, but then finds that there isn't any path in its routing table or it's too far away to reach (MartinGarcia & Lyon, n.d., ICMP Codes Section; Osterloh, 2002, p. 4).

b. Type 3/Code 1 -- Host unreachable

The host's network is reachable, but the actual host is not. This could happen when a router tries to deliver a packet to a disconnected host. The router then checks to see if it has a MAC address for the host on the local network, attempts to find the MAC address using ARP, receives no reply, and replies with Host Unreachable (MartinGarcia & Lyon, n.d., ICMP Codes Section; Osterloh, 2002, p. 4).

c. Type 3/Code 3 -- Port unreachable

The network and the host are reachable, but the specific port on the host is not. A packet gets routed and delivered to a host, but the destination port is closed/invalid, or the process isn't running (MartinGarcia & Lyon, n.d., ICMP Codes Section; Osterloh, 2002, p. 4).

d. Type 3/Code 5 -- Source route failed

Source routing is a kind of routing where the path that a packet takes is specified before it is sent (Red Hat, n.d.). The Source Route Failed response occurs when the destination can't be reached by the source route (MartinGarcia & Lyon, n.d., ICMP Codes Section; Osterloh, 2002, p. 4).

e. Type 3/Code 7 -- Destination host unknown

The destination host is not known by the router on its network. A packet is received by a router, but the address is bad, or the destination is unknown. It sends this message in that event (MartinGarcia & Lyon, n.d., ICMP Codes Section; Osterloh, 2002, p. 4).

f. Type 3/Code 10 -- Communication with destination host is administratively prohibited

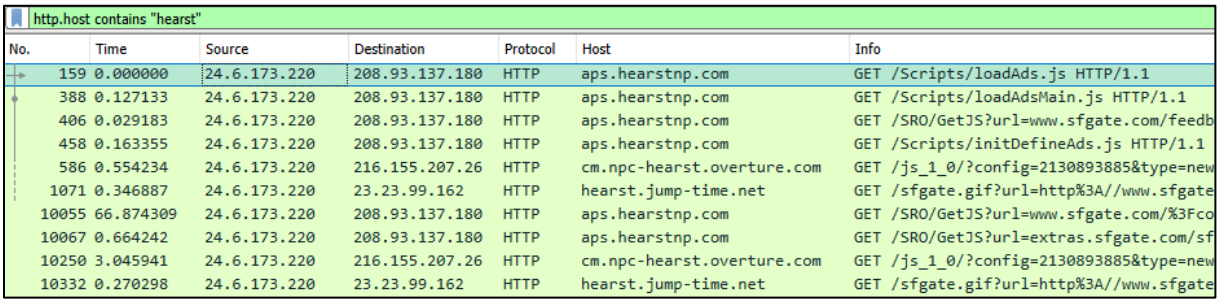
The destination network and host are reachable, but the last hop router is denying communication with the destination host – it is not allowing traffic to pass (MartinGarcia & Lyon, n.d., ICMP Codes Section; Osterloh, 2002, p. 4).

g. Type 3/Code 12 -- Destination host unreachable for type of service

The destination network is reachable, but the destination host is not because the specified type of service (TOS) in the IP header (second byte) isn't available. The host cannot provide that service (MartinGarcia & Lyon, n.d., ICMP Codes Section; Osterloh, 2002, p. 4; Thomas, 2014).

LAB 14: USE AUTO-COMPLETE TO FIND TRAFFIC TO A SPECIFIC HTTP SERVER

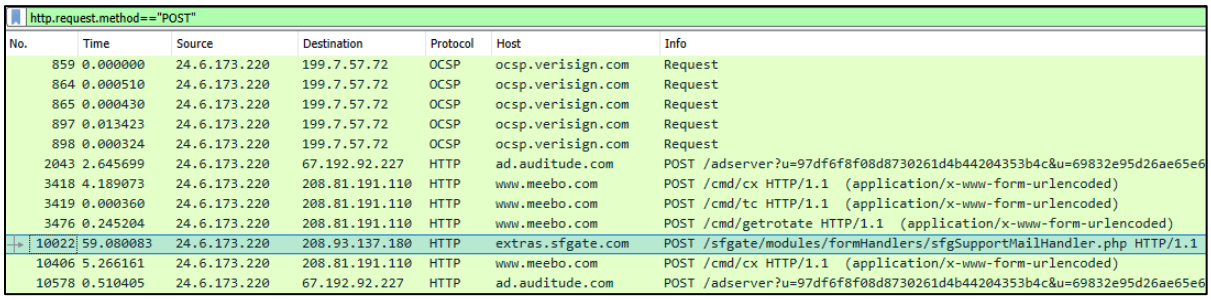
i. Follow all the steps in the lab and provide a complete screenshot of step 5.



http.host contains "hearst"

No.	Time	Source	Destination	Protocol	Host	Info
159	0.000000	24.6.173.220	208.93.137.180	HTTP	aps.hearstnp.com	GET /Scripts/loadAds.js HTTP/1.1
388	0.127133	24.6.173.220	208.93.137.180	HTTP	aps.hearstnp.com	GET /Scripts/loadAdsMain.js HTTP/1.1
406	0.029183	24.6.173.220	208.93.137.180	HTTP	aps.hearstnp.com	GET /SRO/GetJS?url=www.sfgate.com/feedb
458	0.163355	24.6.173.220	208.93.137.180	HTTP	aps.hearstnp.com	GET /Scripts/initDefineAds.js HTTP/1.1
586	0.554234	24.6.173.220	216.155.207.26	HTTP	cm.npc-hearst.overture.com	GET /js_1_0/?config=2130893885&type=new
1071	0.346887	24.6.173.220	23.23.99.162	HTTP	hearst.jump-time.net	GET /sfgate.gif?url=http%3A//www.sfgate
10055	66.874309	24.6.173.220	208.93.137.180	HTTP	aps.hearstnp.com	GET /SRO/GetJS?url=www.sfgate.com/%3Fco
10067	0.664242	24.6.173.220	208.93.137.180	HTTP	aps.hearstnp.com	GET /SRO/GetJS?url=extras.sfgate.com/sf
10250	3.045941	24.6.173.220	216.155.207.26	HTTP	cm.npc-hearst.overture.com	GET /js_1_0/?config=2130893885&type=new
10332	0.270298	24.6.173.220	23.23.99.162	HTTP	hearst.jump-time.net	GET /sfgate.gif?url=http%3A//www.sfgate

ii. Follow all the steps in the lab and provide a complete screenshot of step 6.

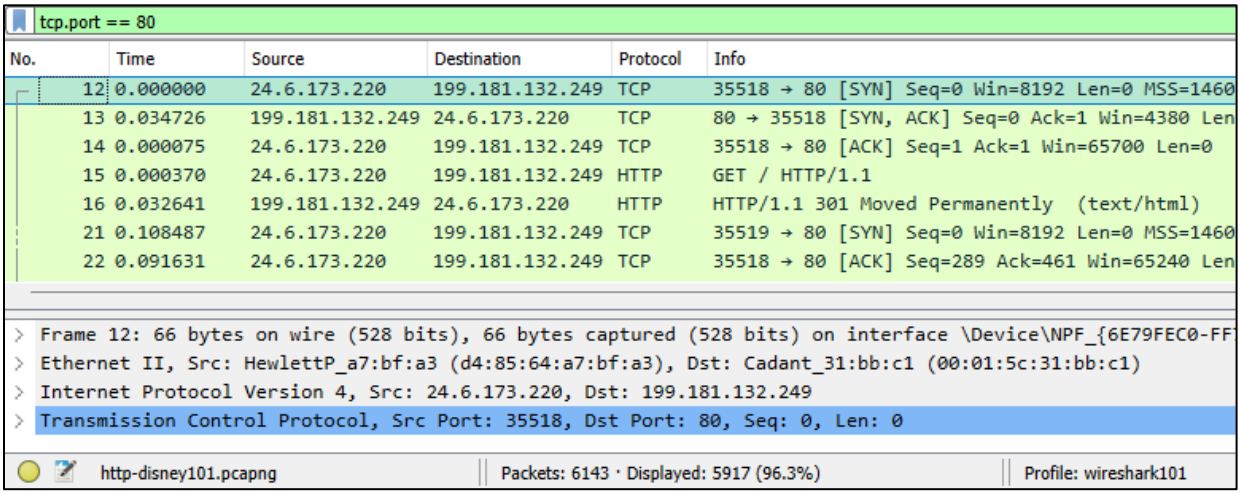


http.request.method=="POST"

No.	Time	Source	Destination	Protocol	Host	Info
859	0.000000	24.6.173.220	199.7.57.72	OCSP	ocsp.verisign.com	Request
864	0.000510	24.6.173.220	199.7.57.72	OCSP	ocsp.verisign.com	Request
865	0.000430	24.6.173.220	199.7.57.72	OCSP	ocsp.verisign.com	Request
897	0.013423	24.6.173.220	199.7.57.72	OCSP	ocsp.verisign.com	Request
898	0.000324	24.6.173.220	199.7.57.72	OCSP	ocsp.verisign.com	Request
2043	2.645699	24.6.173.220	67.192.92.227	HTTP	ad.auditude.com	POST /adserver?u=97df6f8f08d8730261d4b44204353b4c&u=69832e95d26ae65e6
3418	4.189073	24.6.173.220	208.81.191.110	HTTP	www.meebo.com	POST /cmd/cx HTTP/1.1 (application/x-www-form-urlencoded)
3419	0.000360	24.6.173.220	208.81.191.110	HTTP	www.meebo.com	POST /cmd/tc HTTP/1.1 (application/x-www-form-urlencoded)
3476	0.245204	24.6.173.220	208.81.191.110	HTTP	www.meebo.com	POST /cmd/getrotate HTTP/1.1 (application/x-www-form-urlencoded)
10022	59.080083	24.6.173.220	208.93.137.180	HTTP	extras.sfgate.com	POST /sfgate/modules/formHandlers/sfgSupportMailHandler.php HTTP/1.1
10406	5.266161	24.6.173.220	208.81.191.110	HTTP	www.meebo.com	POST /cmd/cx HTTP/1.1 (application/x-www-form-urlencoded)
10578	0.510405	24.6.173.220	67.192.92.227	HTTP	ad.auditude.com	POST /adserver?u=97df6f8f08d8730261d4b44204353b4c&u=69832e95d26ae65e6

LAB 16: FILTER ON HTTP TRAFFIC THE RIGHT WAY

i. Follow all the steps in the lab and provide a complete screenshot of step 3.



tcp.port == 80

No.	Time	Source	Destination	Protocol	Info
12	0.000000	24.6.173.220	199.181.132.249	TCP	35518 → 80 [SYN] Seq=0 Win=8192 Len=0 MSS=1460
13	0.034726	199.181.132.249	24.6.173.220	TCP	80 → 35518 [SYN, ACK] Seq=0 Ack=1 Win=4380 Len
14	0.000075	24.6.173.220	199.181.132.249	TCP	35518 → 80 [ACK] Seq=1 Ack=1 Win=65700 Len=0
15	0.000370	24.6.173.220	199.181.132.249	HTTP	GET / HTTP/1.1
16	0.032641	199.181.132.249	24.6.173.220	HTTP	HTTP/1.1 301 Moved Permanently (text/html)
21	0.108487	24.6.173.220	199.181.132.249	TCP	35519 → 80 [SYN] Seq=0 Win=8192 Len=0 MSS=1460
22	0.091631	24.6.173.220	199.181.132.249	TCP	35518 → 80 [ACK] Seq=289 Ack=461 Win=65240 Len

> Frame 12: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface \Device\NPF_{6E79FEC0-FF
> Ethernet II, Src: HewlettP_a7:bf:a3 (d4:85:64:a7:bf:a3), Dst: Cadant_31:bb:c1 (00:01:5c:31:bb:c1)
> Internet Protocol Version 4, Src: 24.6.173.220, Dst: 199.181.132.249
> Transmission Control Protocol, Src Port: 35518, Dst Port: 80, Seq: 0, Len: 0

http-disney101.pcapng | Packets: 6143 · Displayed: 5917 (96.3%) | Profile: wireshark101

Screenshot edited to include packet display count

LAB 17: FILTER ON TRAFFIC TO OR FROM ONLINE BACKUP SUBNETS

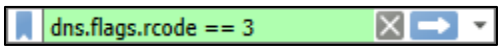
i. Follow all the steps in the lab and provide a complete screenshot of step 3.

ip.addr == 216.115.74.0/24

No.	Time	Source	Destination	Protocol	Info
118	0.000000	24.6.173.220	216.115.74.235	TCP	1145 → 80 [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=4 SACK_PERM=1
119	0.031742	216.115.74.235	24.6.173.220	TCP	80 → 1145 [SYN, ACK] Seq=0 Ack=1 Win=3900 Len=0 MSS=1300 WS=1 SACK_PERM=1
120	0.000331	24.6.173.220	216.115.74.235	TCP	1145 → 80 [ACK] Seq=1 Ack=1 Win=66300 Len=0
121	0.000576	24.6.173.220	216.115.74.235	HTTP	GET /php/updateMetric.php?product_key=MABPEME000-6E2P-2ACJ-3KP3-JF0E-009F&
122	0.037863	216.115.74.235	24.6.173.220	HTTP	HTTP/1.1 200 OK (text/html)
123	0.003173	24.6.173.220	216.115.74.235	TCP	1145 → 80 [RST, ACK] Seq=227 Ack=581 Win=0 Len=0
131	2.218194	24.6.173.220	216.115.74.235	TCP	1146 → 80 [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=4 SACK_PERM=1
132	0.031846	216.115.74.235	24.6.173.220	TCP	80 → 1146 [SYN, ACK] Seq=0 Ack=1 Win=3900 Len=0 MSS=1300 WS=1 SACK_PERM=1
133	0.000395	24.6.173.220	216.115.74.235	TCP	1146 → 80 [ACK] Seq=1 Ack=1 Win=66300 Len=0

LAB 18: FILTER ON DNS NAME ERRORS OR HTTP 404 RESPONSES

i. Follow all the steps in the lab and provide a complete screenshot of step 2



ii. Follow all the steps in the lab and provide a complete screenshot of step 4.

(dns.flags.rcode == 3) || (http.response.code == 404)

No.	Time	Source	Destination	Protocol	Info
9	0.000000	198.66.239.146	24.6.173.220	HTTP	HTTP/1.1 404 Not Found (text/html)
18	9.902010	75.75.75.75	24.6.173.220	DNS	Standard query response 0x8e30 No such name
27	15.749441	198.66.239.146	24.6.173.220	HTTP	HTTP/1.1 404 Not Found (text/html)

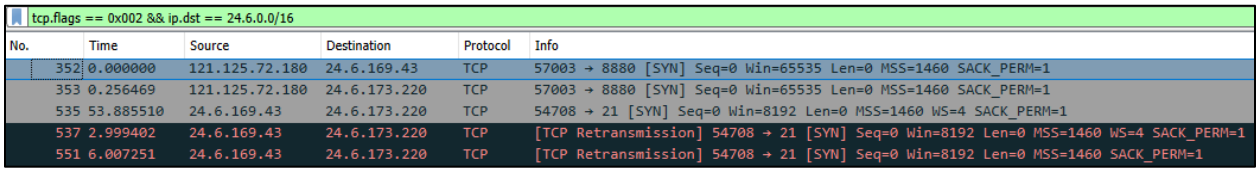
LAB 19: DETECT BACKGROUND FILE TRANSFERS ON STARTUP

i. Follow all the steps in the lab and provide a complete screenshot of step 4.

No.	Time	Source	Destination	Protocol	Info
309	0.009279	2001:558:6045:…	2001:558:feed:…	DNS	Standard query 0xb240 A dl-client709.dropbox.com
310	0.012170	2001:558:feed:…	2001:558:6045:…	DNS	Standard query response 0xb240 A dl-client709.dropbox.com A 50.17.223.168
311	0.000784	24.6.169.43	50.17.223.168	TCP	54693 → 443 [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=4 SACK_PERM=1
312	0.029152	108.160.161.163	24.6.169.43	TCP	80 → 54690 [ACK] Seq=179 Ack=397 Win=16896 Len=0
313	0.070578	50.17.223.168	24.6.169.43	TCP	443 → 54693 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SACK_PERM=1 WS=128
314	0.000784	24.6.169.43	50.17.223.168	TCP	54693 → 443 [ACK] Seq=1 Ack=1 Win=65700 Len=0

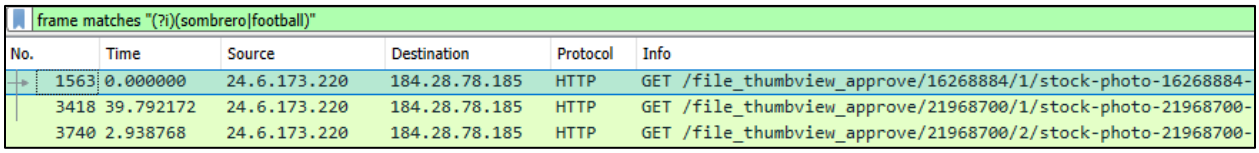
LAB 20: LOCATE TCP CONNECTION ATTEMPTS TO A CLIENT

i. Follow all the steps in the lab and provide a complete screenshot of step 3.



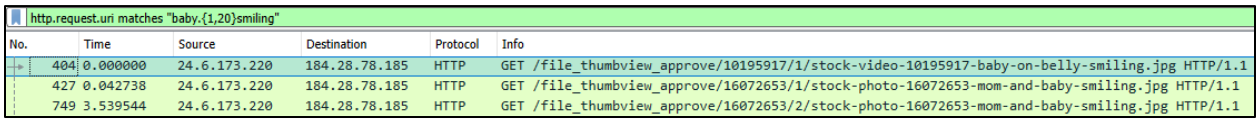
LAB 21: FILTER TO LOCATE A SET OF KEY WORDS IN A TRACE FILE

i. Follow all the steps in the lab and provide a complete screenshot of step 3.



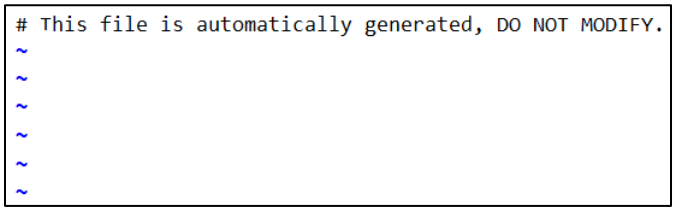
LAB 22: FILTER WITH WILDCARDS BETWEEN WORDS

i. Follow all the steps in the lab and provide a complete screenshot of step 3.



LAB 23: IMPORT DISPLAY FILTERS INTO A PROFILE

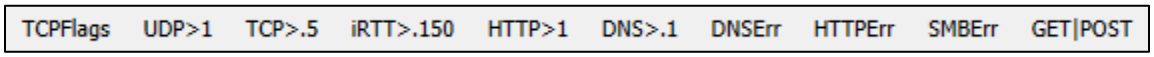
i. Follow all the steps in the lab and provide a complete screenshot of step 3.



My file was initially empty (besides a comment)

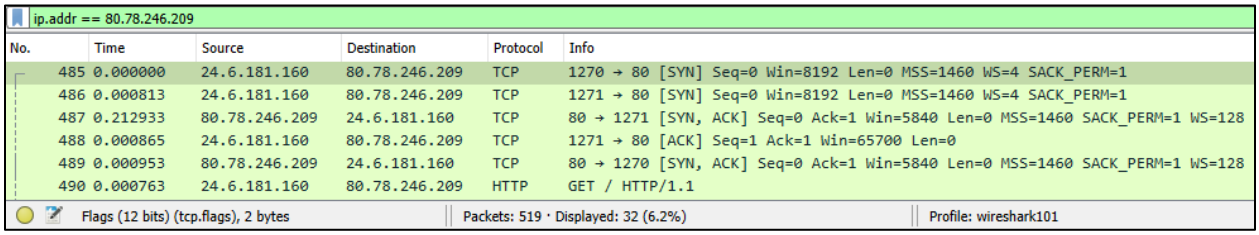
LAB 24: CREATE AND IMPORT HTTP FILER EXP BUTTONS

i. Follow all the steps in the lab and provide a complete screenshot of step 7.



CHAPTER 3 CHALLENGE

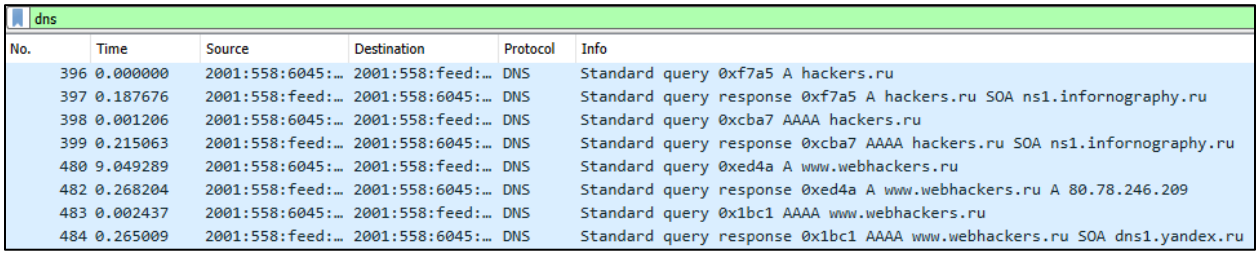
3-1. How many frames travel to or from `80.78.246.209`?



Screenshot edited to include packet display count

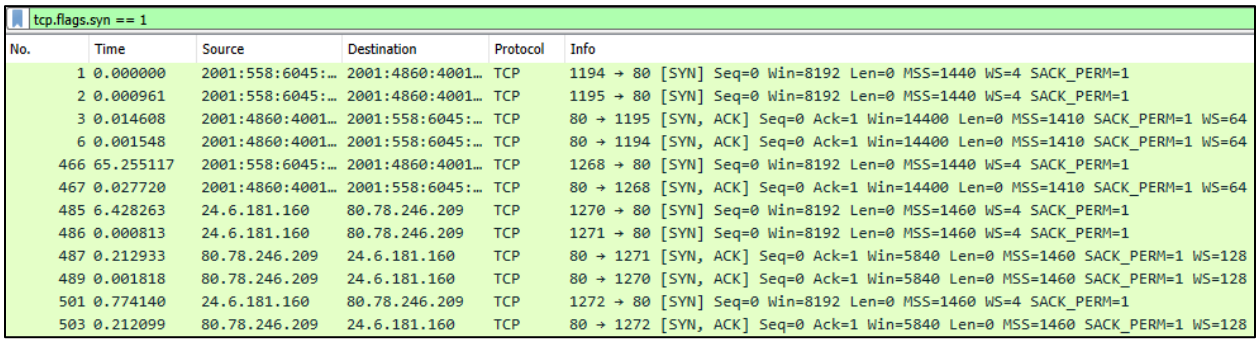
I used the display filter `ip.addr == 80.78.246.209` to find that 32 frames travelled to or from that IP address.

3-2. How many DNS packets are in this trace file?



I used a `dns` display filter to find that there are 8 DNS packets in the file.

3-3. How many frames have the TCP SYN bit set to `1`?

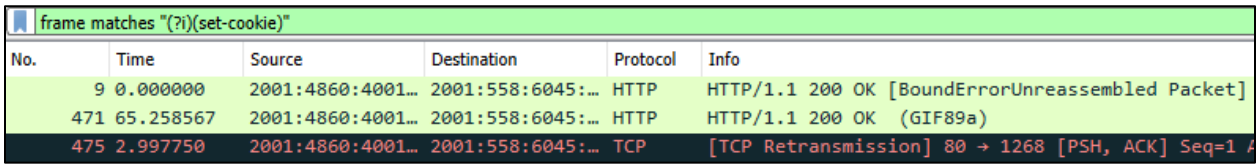


tcp.flags.syn == 1

No.	Time	Source	Destination	Protocol	Info
1	0.000000	2001:558:6045:…	2001:4860:4001…	TCP	1194 → 80 [SYN] Seq=0 Win=8192 Len=0 MSS=1440 WS=4 SACK_PERM=1
2	0.000961	2001:558:6045:…	2001:4860:4001…	TCP	1195 → 80 [SYN] Seq=0 Win=8192 Len=0 MSS=1440 WS=4 SACK_PERM=1
3	0.014608	2001:4860:4001…	2001:558:6045:…	TCP	80 → 1195 [SYN, ACK] Seq=0 Ack=1 Win=14400 Len=0 MSS=1410 SACK_PERM=1 WS=64
6	0.001548	2001:4860:4001…	2001:558:6045:…	TCP	80 → 1194 [SYN, ACK] Seq=0 Ack=1 Win=14400 Len=0 MSS=1410 SACK_PERM=1 WS=64
466	65.255117	2001:558:6045:…	2001:4860:4001…	TCP	1268 → 80 [SYN] Seq=0 Win=8192 Len=0 MSS=1440 WS=4 SACK_PERM=1
467	0.027720	2001:4860:4001…	2001:558:6045:…	TCP	80 → 1268 [SYN, ACK] Seq=0 Ack=1 Win=14400 Len=0 MSS=1410 SACK_PERM=1 WS=64
485	6.428263	24.6.181.160	80.78.246.209	TCP	1270 → 80 [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=4 SACK_PERM=1
486	0.000813	24.6.181.160	80.78.246.209	TCP	1271 → 80 [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=4 SACK_PERM=1
487	0.212933	80.78.246.209	24.6.181.160	TCP	80 → 1271 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SACK_PERM=1 WS=128
489	0.001818	80.78.246.209	24.6.181.160	TCP	80 → 1270 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SACK_PERM=1 WS=128
501	0.774140	24.6.181.160	80.78.246.209	TCP	1272 → 80 [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=4 SACK_PERM=1
503	0.212099	80.78.246.209	24.6.181.160	TCP	80 → 1272 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SACK_PERM=1 WS=128

Using the `tcp.flags.syn == 1` display filter, there are 12 frames with the `SYN` bit set.

3-4. How many frames contain a string `set-cookie` in upper or lower case?

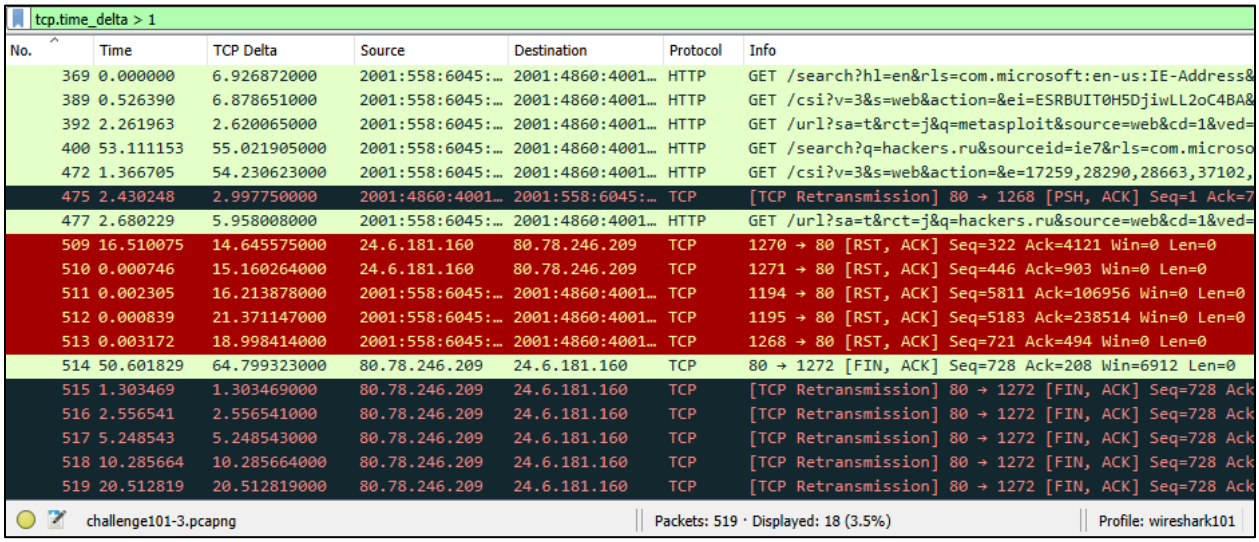


frame matches "(?i)(set-cookie)"

No.	Time	Source	Destination	Protocol	Info
9	0.000000	2001:4860:4001…	2001:558:6045:…	HTTP	HTTP/1.1 200 OK [BoundErrorUnreassembled Packet]
471	65.258567	2001:4860:4001…	2001:558:6045:…	HTTP	HTTP/1.1 200 OK (GIF89a)
475	2.997750	2001:4860:4001…	2001:558:6045:…	TCP	[TCP Retransmission] 80 → 1268 [PSH, ACK] Seq=1 A

3 frames contain `set-cookie` in upper or lower case. In lab 21, we used `frame matches "(?i)(sombrero|football)"` to find regex matches for frames containing the string "sombrero" or "football" (case insensitive). I used the same filter edited to match "set-cookie" instead.

3-5. How many frames contain the TCP delta time greater than 1 second?



tcp.time_delta > 1

No.	Time	TCP Delta	Source	Destination	Protocol	Info
369	0.000000	6.926872000	2001:558:6045:…	2001:4860:4001…	HTTP	GET /search?hl=en&rls=com.microsoft:en-us:IE-Address&
389	0.526390	6.878651000	2001:558:6045:…	2001:4860:4001…	HTTP	GET /csi?v=3&s=web&action=&ei=ESRBUIT0H5DjiwLL2oC4BA&
392	2.261963	2.620065000	2001:558:6045:…	2001:4860:4001…	HTTP	GET /url?sa=t&rct=j&q=metasploit&source=web&cd=1&ved=
400	53.111153	55.021905000	2001:558:6045:…	2001:4860:4001…	HTTP	GET /search?q=hackers.ru&sourceid=ie7&rls=com.microso
472	1.366705	54.230623000	2001:558:6045:…	2001:4860:4001…	HTTP	GET /csi?v=3&s=web&action=&e=17259,28290,28663,37102,
475	2.430248	2.997750000	2001:4860:4001…	2001:558:6045:…	TCP	[TCP Retransmission] 80 → 1268 [PSH, ACK] Seq=1 Ack=7
477	2.680229	5.958008000	2001:558:6045:…	2001:4860:4001…	HTTP	GET /url?sa=t&rct=j&q=hackers.ru&source=web&cd=1&ved=
509	16.510075	14.645575000	24.6.181.160	80.78.246.209	TCP	1270 → 80 [RST, ACK] Seq=322 Ack=4121 Win=0 Len=0
510	0.000746	15.160264000	24.6.181.160	80.78.246.209	TCP	1271 → 80 [RST, ACK] Seq=446 Ack=903 Win=0 Len=0
511	0.002305	16.213878000	2001:558:6045:…	2001:4860:4001…	TCP	1194 → 80 [RST, ACK] Seq=5811 Ack=106956 Win=0 Len=0
512	0.000839	21.371147000	2001:558:6045:…	2001:4860:4001…	TCP	1195 → 80 [RST, ACK] Seq=5183 Ack=238514 Win=0 Len=0
513	0.003172	18.998414000	2001:558:6045:…	2001:4860:4001…	TCP	1268 → 80 [RST, ACK] Seq=721 Ack=494 Win=0 Len=0
514	50.601829	64.799323000	80.78.246.209	24.6.181.160	TCP	80 → 1272 [FIN, ACK] Seq=728 Ack=208 Win=6912 Len=0
515	1.303469	1.303469000	80.78.246.209	24.6.181.160	TCP	[TCP Retransmission] 80 → 1272 [FIN, ACK] Seq=728 Ack
516	2.556541	2.556541000	80.78.246.209	24.6.181.160	TCP	[TCP Retransmission] 80 → 1272 [FIN, ACK] Seq=728 Ack
517	5.248543	5.248543000	80.78.246.209	24.6.181.160	TCP	[TCP Retransmission] 80 → 1272 [FIN, ACK] Seq=728 Ack
518	10.285664	10.285664000	80.78.246.209	24.6.181.160	TCP	[TCP Retransmission] 80 → 1272 [FIN, ACK] Seq=728 Ack
519	20.512819	20.512819000	80.78.246.209	24.6.181.160	TCP	[TCP Retransmission] 80 → 1272 [FIN, ACK] Seq=728 Ack

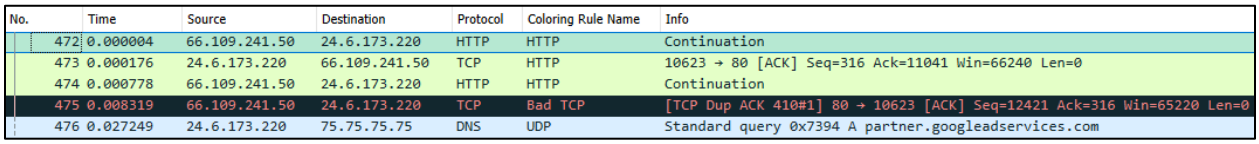
challenge101-3.pcapng | Packets: 519 · Displayed: 18 (3.5%) | Profile: wireshark101

Screenshot edited to include packet display count

18 frames have a TCP delta time greater than 1 second. In a previous lab (from a different week), we applied `tcp.time_delta` as a column. I re-enabled the column, then prepared a display filter using the context menus in Wireshark. I edited the filter to be `tcp.time_delta > 1` and applied it.

LAB 25: ADD A COLUMN TO DISPLAY COLORING RULES IN USE

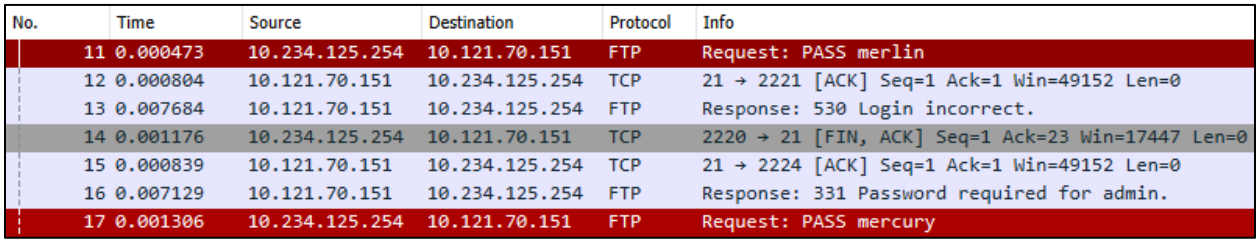
i. Follow all the steps in the lab and provide a screenshot of step 4.



No.	Time	Source	Destination	Protocol	Coloring Rule Name	Info
472	0.000004	66.109.241.50	24.6.173.220	HTTP	HTTP	Continuation
473	0.000176	24.6.173.220	66.109.241.50	TCP	HTTP	10623 → 80 [ACK] Seq=316 Ack=11041 Win=66240 Len=0
474	0.000778	66.109.241.50	24.6.173.220	HTTP	HTTP	Continuation
475	0.008319	66.109.241.50	24.6.173.220	TCP	Bad TCP	[TCP Dup ACK 410#1] 80 → 10623 [ACK] Seq=12421 Ack=316 Win=65220 Len=0
476	0.027249	24.6.173.220	75.75.75.75	DNS	UDP	Standard query 0x7394 A partner.googleadservices.com

LAB 26: BUILD A COLORING RULE

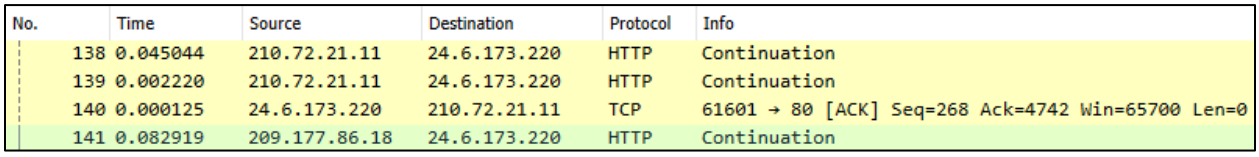
i. Follow all the steps in the lab and provide a screenshot of step 5.



No.	Time	Source	Destination	Protocol	Info
11	0.000473	10.234.125.254	10.121.70.151	FTP	Request: PASS merlin
12	0.000804	10.121.70.151	10.234.125.254	TCP	21 → 2221 [ACK] Seq=1 Ack=1 Win=49152 Len=0
13	0.007684	10.121.70.151	10.234.125.254	FTP	Response: 530 Login incorrect.
14	0.001176	10.234.125.254	10.121.70.151	TCP	2220 → 21 [FIN, ACK] Seq=1 Ack=23 Win=17447 Len=0
15	0.000839	10.121.70.151	10.234.125.254	TCP	21 → 2224 [ACK] Seq=1 Ack=1 Win=49152 Len=0
16	0.007129	10.121.70.151	10.234.125.254	FTP	Response: 331 Password required for admin.
17	0.001306	10.234.125.254	10.121.70.151	FTP	Request: PASS mercury

LAB 27: CREATE TEMPORARY CONVERSATION COLORING RULES

i. Follow all the steps in the lab and provide a screenshot of step 5.



No.	Time	Source	Destination	Protocol	Info
138	0.045044	210.72.21.11	24.6.173.220	HTTP	Continuation
139	0.002220	210.72.21.11	24.6.173.220	HTTP	Continuation
140	0.000125	24.6.173.220	210.72.21.11	TCP	61601 → 80 [ACK] Seq=268 Ack=4742 Win=65700 Len=0
141	0.082919	209.177.86.18	24.6.173.220	HTTP	Continuation

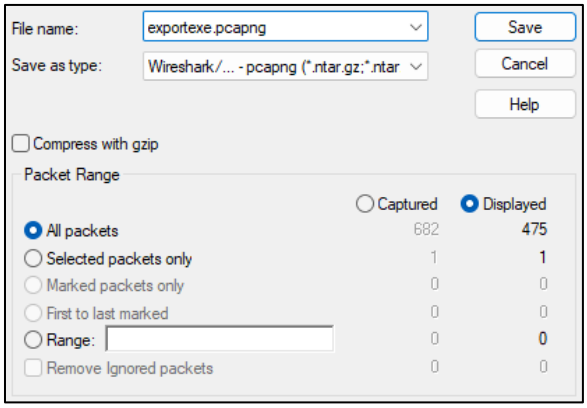
LAB 28: USE THE INTELLIGENT SCROLLBAR TO QUICKLY FIND PROBLEMS

i. Follow all the steps in the lab and provide a screenshot of step 4.

No.	Time	Source	Destination	Protocol	Info
1	0.000000	161.58.73.170	12.234.12.108	HTTP	HTTP/1.0 401 Authorization Required (text/html)
2	0.000083	161.58.73.170	12.234.12.108	TCP	80 → 1124 [FIN, ACK] Seq=1306 Ack=1 Win=49152 Len=0
3	0.000038	12.234.12.108	161.58.73.170	TCP	1124 → 80 [ACK] Seq=1 Ack=1307 Win=63207 Len=0
4	10.536317	12.234.12.108	161.58.73.170	TCP	1124 → 80 [FIN, ACK] Seq=1 Ack=1307 Win=63207 Len=0
5	0.000629	12.234.12.108	161.58.73.170	TCP	1125 → 80 [SYN] Seq=0 Win=64512 Len=0 MSS=1460 SACK_PERM=1
6	0.096437	161.58.73.170	12.234.12.108	TCP	80 → 1124 [ACK] Seq=1307 Ack=2 Win=49152 Len=0
7	2.869444	12.234.12.108	161.58.73.170	TCP	[TCP Retransmission] 1125 → 80 [SYN] Seq=0 Win=64512 Len=0 MSS=1460 SACK_PERM=1
8	6.008476	12.234.12.108	161.58.73.170	TCP	[TCP Retransmission] 1125 → 80 [SYN] Seq=0 Win=64512 Len=0 MSS=1460 SACK_PERM=1
9	0.156745	161.58.73.170	12.234.12.108	TCP	80 → 1125 [SYN, ACK] Seq=0 Ack=1 Win=49152 Len=0 MSS=1460 SACK_PERM=1
10	0.000079	12.234.12.108	161.58.73.170	TCP	1125 → 80 [ACK] Seq=1 Ack=1 Win=64512 Len=0
11	0.000291	12.234.12.108	161.58.73.170	HTTP	GET /stats HTTP/1.1
12	0.087260	161.58.73.170	12.234.12.108	TCP	80 → 1125 [ACK] Seq=1 Ack=382 Win=49152 Len=0

LAB 29: EXPORT A SINGLE TCP CONVERSATION

i. Follow all the steps in the lab and provide a screenshot of step 4.



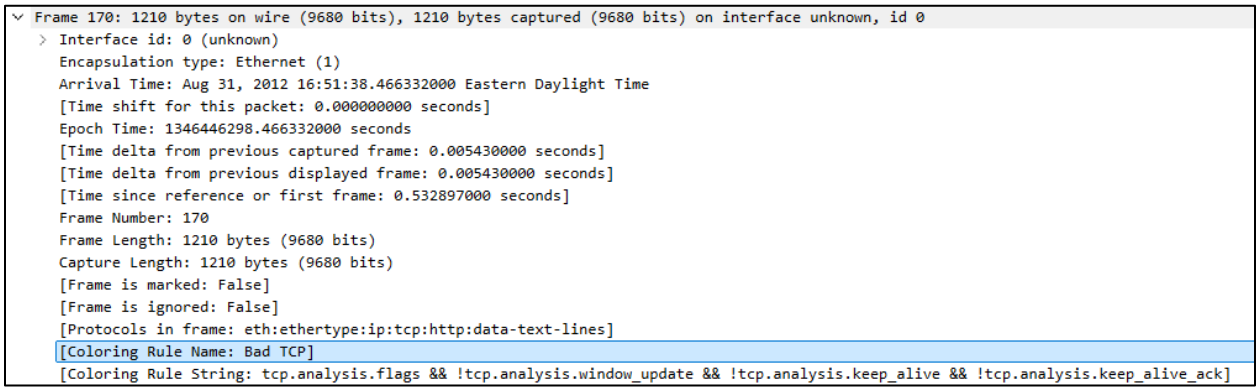
LAB 30: EXPORT A LIST OF HTTP HOST FIELD VALUES FROM A TRACE FILE

i. Follow all the steps in the lab and provide a screenshot of step 7.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	No.	Time	Source	Destination	Host	Protocol	Info								
2	8	0	24.6.173.220	208.48.81.133	www.freewebsites.com.au	HTTP	GET / HTTP/1.1								
3	11	0.100123	24.6.173.220	208.48.81.133	www.freewebsites.com.au	HTTP	GET /unique/track.js?referrer=about%3Ablank HTTP/1.1								
4	14	0.042474	24.6.173.220	208.48.81.133	www.freewebsites.com.au	HTTP	GET /?pagesection=body HTTP/1.1								
5	18	0.021377	24.6.173.220	208.48.81.133	www.freewebsites.com.au	HTTP	GET /?pagesection=forsale HTTP/1.1								
6	25	0.061105	24.6.173.220	208.48.81.133	www.freewebsites.com.au	HTTP	GET /common/fabulousdomains/skins/fab/images/banner/fabulous_sale_bottom.gif HTTP/1.1								
7	26	0.000379	24.6.173.220	208.48.81.133	www.freewebsites.com.au	HTTP	GET /common/fabulousdomains/skins/fab/images/banner/sale_buynow.png HTTP/1.1								
8	35	0.052922	24.6.173.220	208.48.81.133	www.freewebsites.com.au	HTTP	GET /common/fabulousdomains/skins/fab/images/banner/sale_bg.png HTTP/1.1								

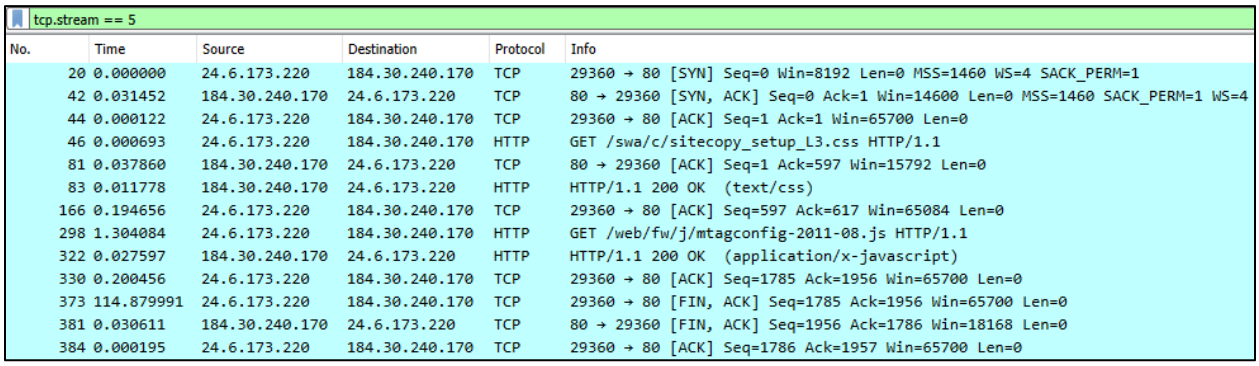
CHAPTER 4 CHALLENGE

4-1. What coloring rule does frame 170 match?



Frame 170 matches the Bad TCP coloring rule.

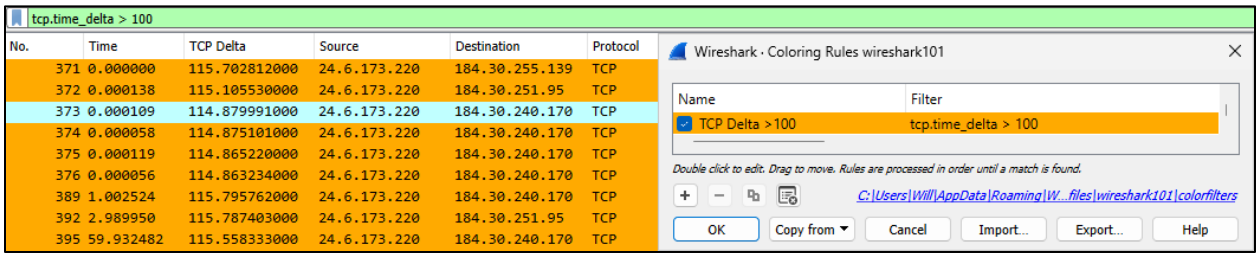
4-2. Temporarily color TCP stream 5 with a light blue background and apply a filter on this traffic. How many packets match your filter?



No.	Time	Source	Destination	Protocol	Info
20	0.000000	24.6.173.220	184.30.240.170	TCP	29360 → 80 [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=4 SACK_PERM=1
42	0.031452	184.30.240.170	24.6.173.220	TCP	80 → 29360 [SYN, ACK] Seq=0 Ack=1 Win=14600 Len=0 MSS=1460 SACK_PERM=1 WS=4
44	0.000122	24.6.173.220	184.30.240.170	TCP	29360 → 80 [ACK] Seq=1 Ack=1 Win=65700 Len=0
46	0.000693	24.6.173.220	184.30.240.170	HTTP	GET /swa/c/sitecopy_setup_L3.css HTTP/1.1
81	0.037860	184.30.240.170	24.6.173.220	TCP	80 → 29360 [ACK] Seq=1 Ack=597 Win=15792 Len=0
83	0.011778	184.30.240.170	24.6.173.220	HTTP	HTTP/1.1 200 OK (text/css)
166	0.194656	24.6.173.220	184.30.240.170	TCP	29360 → 80 [ACK] Seq=597 Ack=617 Win=65084 Len=0
298	1.304084	24.6.173.220	184.30.240.170	HTTP	GET /web/fw/j/mtagconfig-2011-08.js HTTP/1.1
322	0.027597	184.30.240.170	24.6.173.220	HTTP	HTTP/1.1 200 OK (application/x-javascript)
330	0.200456	24.6.173.220	184.30.240.170	TCP	29360 → 80 [ACK] Seq=1785 Ack=1956 Win=65700 Len=0
373	114.879991	24.6.173.220	184.30.240.170	TCP	29360 → 80 [FIN, ACK] Seq=1785 Ack=1956 Win=65700 Len=0
381	0.030611	184.30.240.170	24.6.173.220	TCP	80 → 29360 [FIN, ACK] Seq=1956 Ack=1786 Win=18168 Len=0
384	0.000195	24.6.173.220	184.30.240.170	TCP	29360 → 80 [ACK] Seq=1786 Ack=1957 Win=65700 Len=0

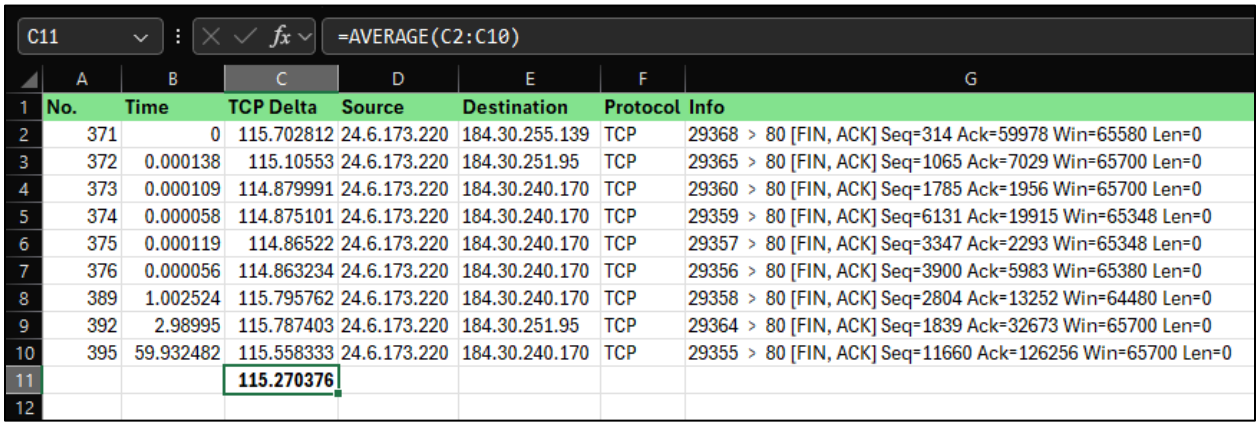
13 packets match the `tcp.stream == 5` display filter.

4-3. Create and apply a coloring rule for TCP delta delays greater than 100 seconds. How many frames match this coloring rule?



There are 9 matches for this rule. In frame 373, the background color is overridden by the colorized conversation from the previous question.

4-4. Export this filtered TCP delta information in CSV format. Using Excel, what is the average TCP delta time? Screenshot your Excel worksheet.

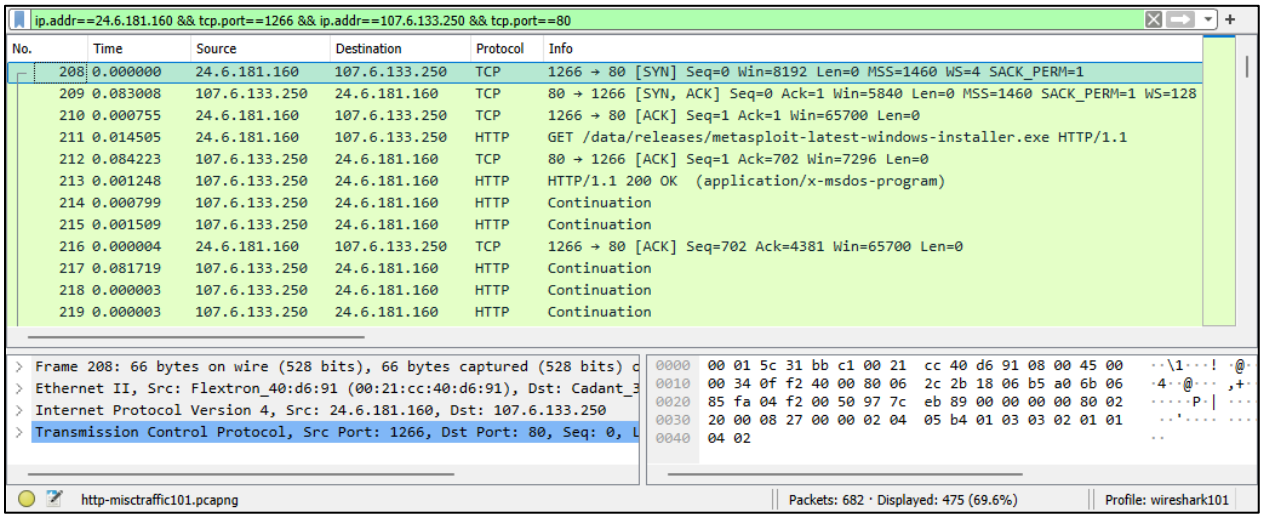


	A	B	C	D	E	F	G
1	No.	Time	TCP Delta	Source	Destination	Protocol	Info
2	371	0	115.702812	24.6.173.220	184.30.255.139	TCP	29368 > 80 [FIN, ACK] Seq=314 Ack=59978 Win=65580 Len=0
3	372	0.000138	115.10553	24.6.173.220	184.30.251.95	TCP	29365 > 80 [FIN, ACK] Seq=1065 Ack=7029 Win=65700 Len=0
4	373	0.000109	114.879991	24.6.173.220	184.30.240.170	TCP	29360 > 80 [FIN, ACK] Seq=1785 Ack=1956 Win=65700 Len=0
5	374	0.000058	114.875101	24.6.173.220	184.30.240.170	TCP	29359 > 80 [FIN, ACK] Seq=6131 Ack=19915 Win=65348 Len=0
6	375	0.000119	114.86522	24.6.173.220	184.30.240.170	TCP	29357 > 80 [FIN, ACK] Seq=3347 Ack=2293 Win=65348 Len=0
7	376	0.000056	114.863234	24.6.173.220	184.30.240.170	TCP	29356 > 80 [FIN, ACK] Seq=3900 Ack=5983 Win=65380 Len=0
8	389	1.002524	115.795762	24.6.173.220	184.30.240.170	TCP	29358 > 80 [FIN, ACK] Seq=2804 Ack=13252 Win=64480 Len=0
9	392	2.98995	115.787403	24.6.173.220	184.30.251.95	TCP	29364 > 80 [FIN, ACK] Seq=1839 Ack=32673 Win=65700 Len=0
10	395	59.932482	115.558333	24.6.173.220	184.30.240.170	TCP	29355 > 80 [FIN, ACK] Seq=11660 Ack=126256 Win=65700 Len=0
11			**115.270376**				
12							

Using Excel, I found that the average TCP delta time in the export is 115.270376 seconds.

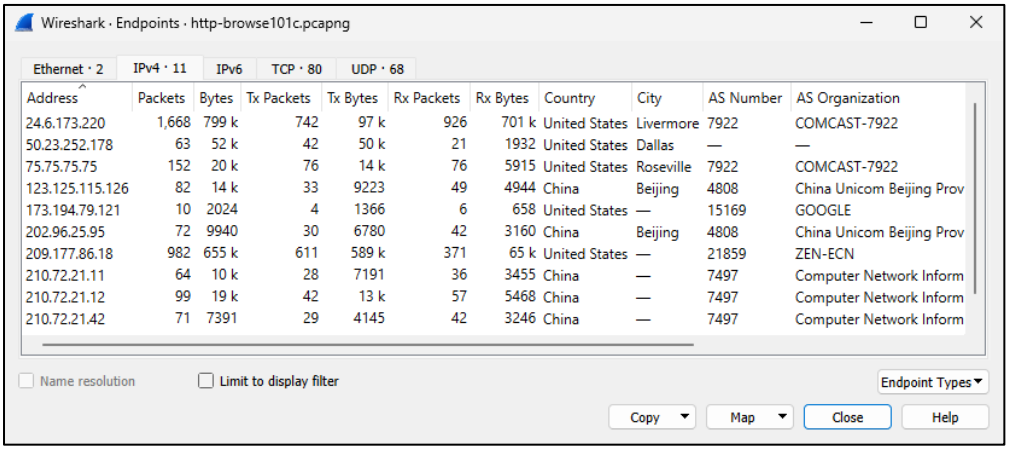
LAB 31: FILTER ON MOST ACTIVE TCP CONVERSATION

i. Follow all the steps in the lab and provide a screenshot of step 5.

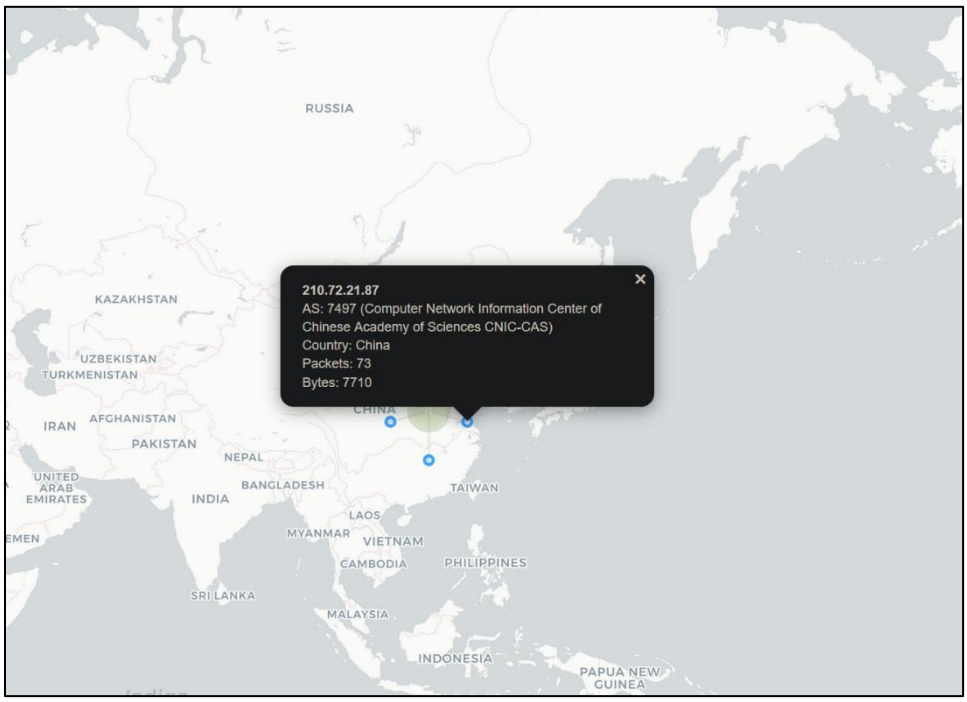


LAB 32: SET UP GEOIP TO MAP TARGETS GLOBALLY

i. Follow all the steps in the lab and provide a screenshot of step 4.

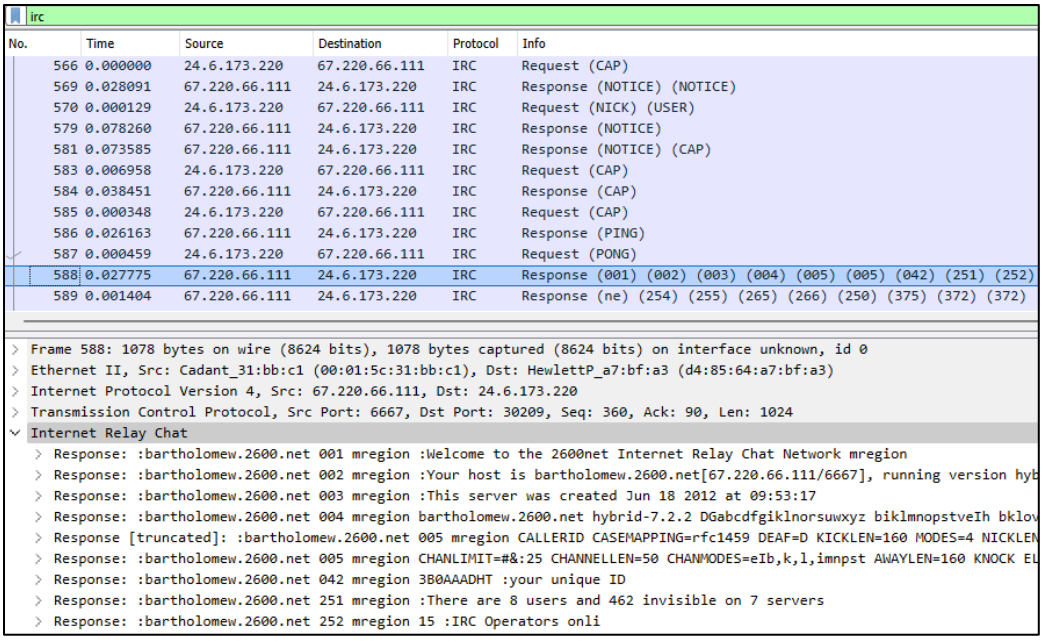


ii. Follow the steps and provide a screenshot of step 5 (any plot point).
Note: one may have to change permission of the file to open (`sudo chmod 775`).



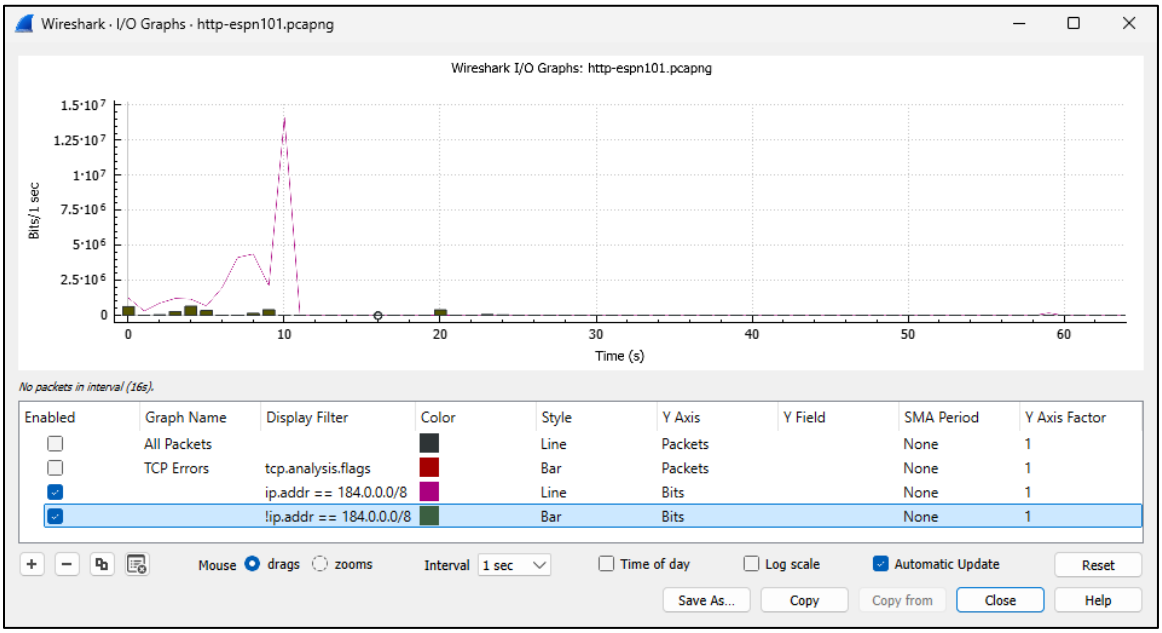
LAB 33: DETECT SUSPICIOUS PROTOCOLS OR APPLICATIONS

i. Follow all the steps in the lab and provide a screenshot of step 3.



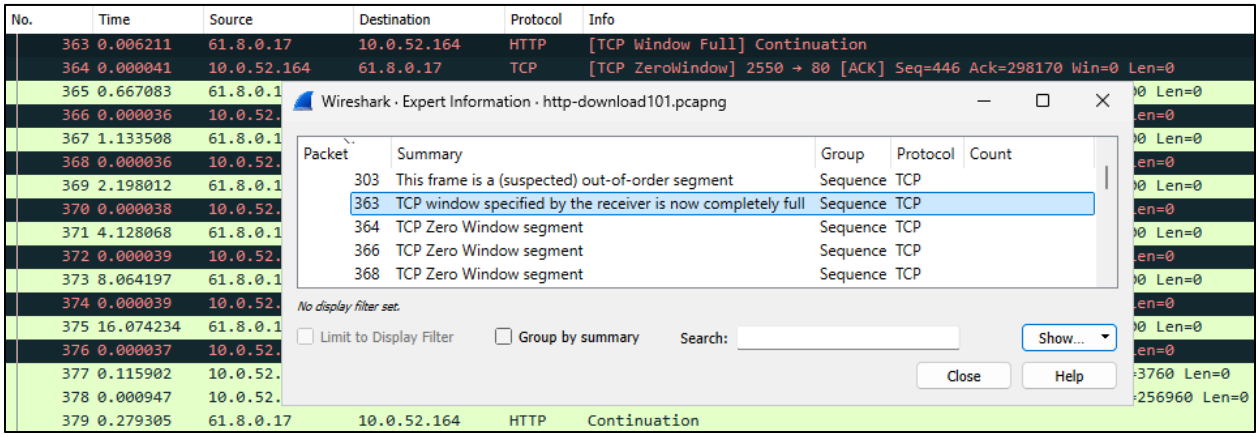
LAB 34: COMPARE TRAFFIC TO/FROM A SUBNET TO OTHER TRAFFIC

i. Follow all the steps in the lab and provide a screenshot of step 5.



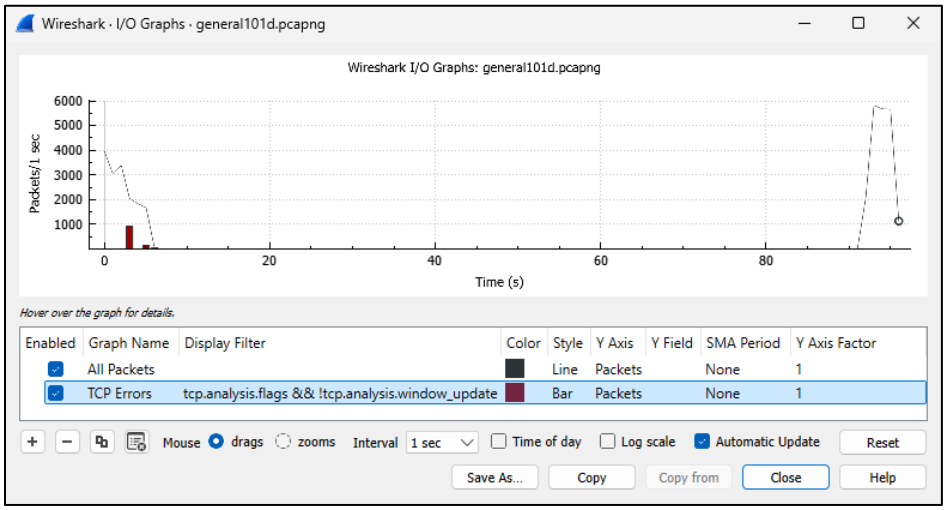
LAB 35: IDENTIFY AN OVERLOADED CLIENT

i. Follow all the steps in the lab and provide a screenshot of step 4.



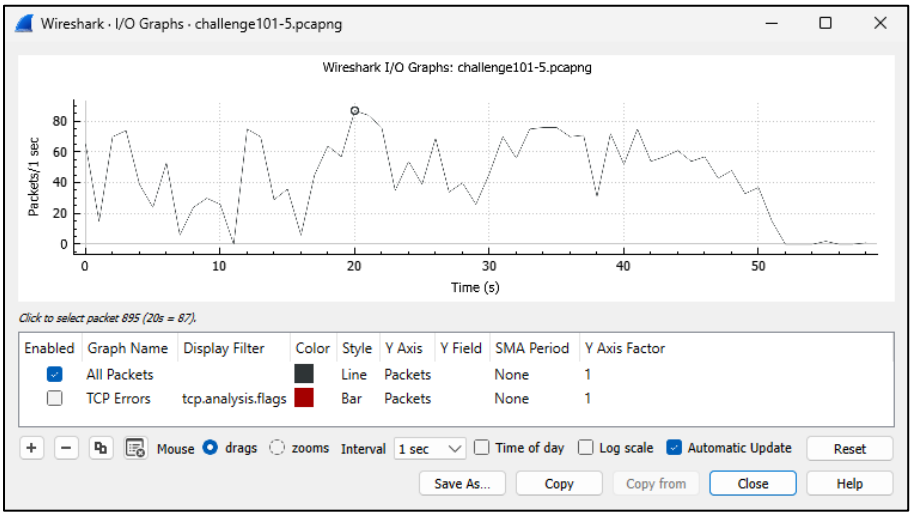
LAB 36: DETECT AND GRAPH FILE TRANSFER PROBLEMS

i. Follow all the steps in the lab and provide a screenshot of step 5.



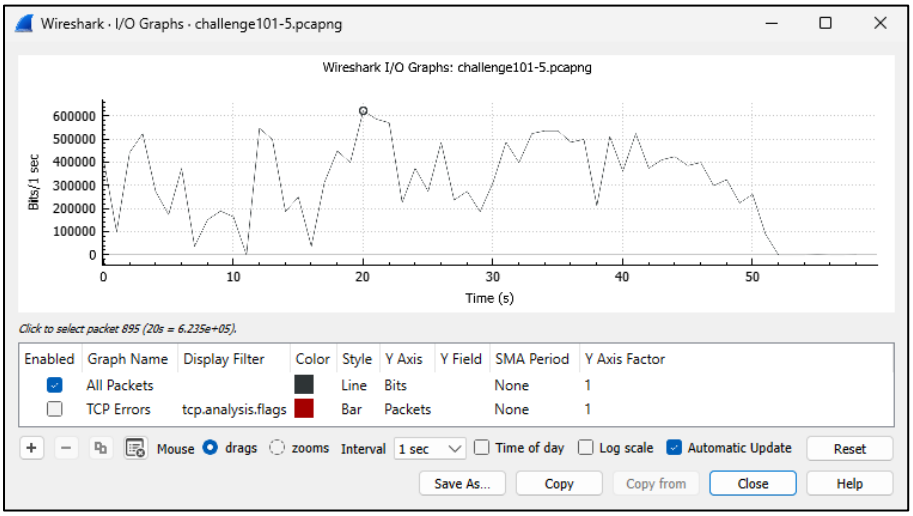
CHAPTER 5 CHALLENGE

5-1. Create an IO graph for this trace file. What is the highest packets-per-second value seen in this trace file?



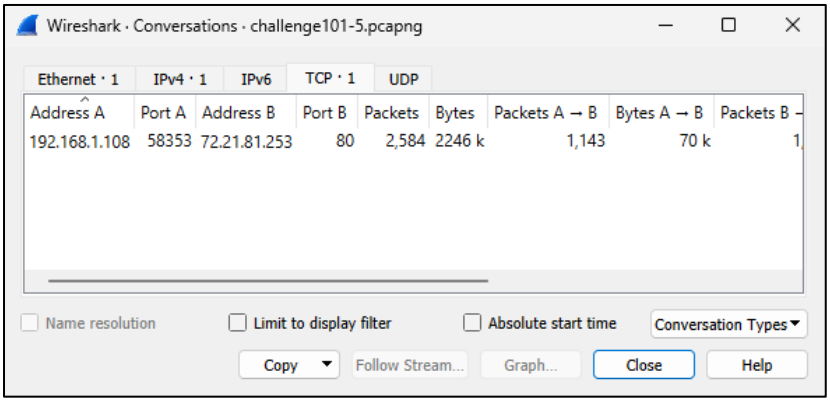
The highest packets-per-second value is about 87.

5-2. What is the highest bits-per-second value seen in this trace file?



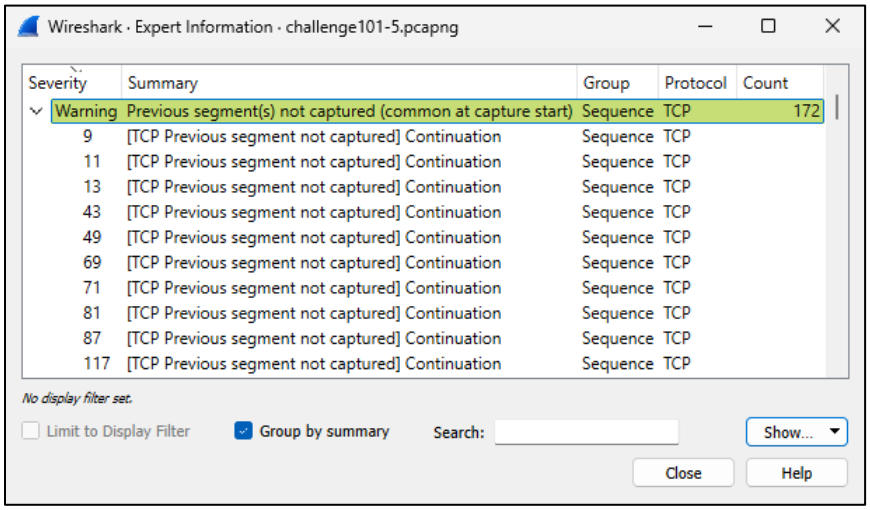
Changing the Y axis to Bits/s, the highest value is about 6.235e^5 (623,500 bits-per-second).

5-3. How many TCP conversations are in this trace file?



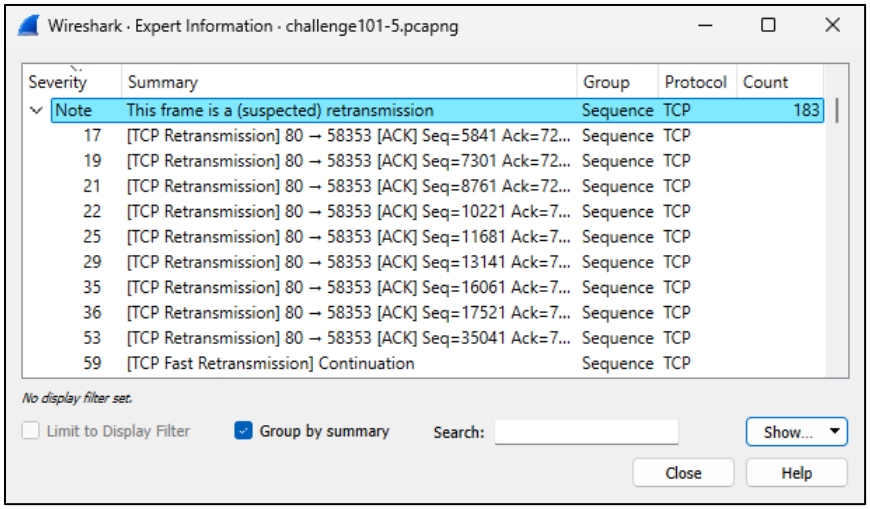
There is one TCP conversation in this trace file.

5-4. How many times has "Previous segment not captured" been detected in this trace file?



The "Previous segment(s) not captured" warning has been detected 172 times in this trace file.

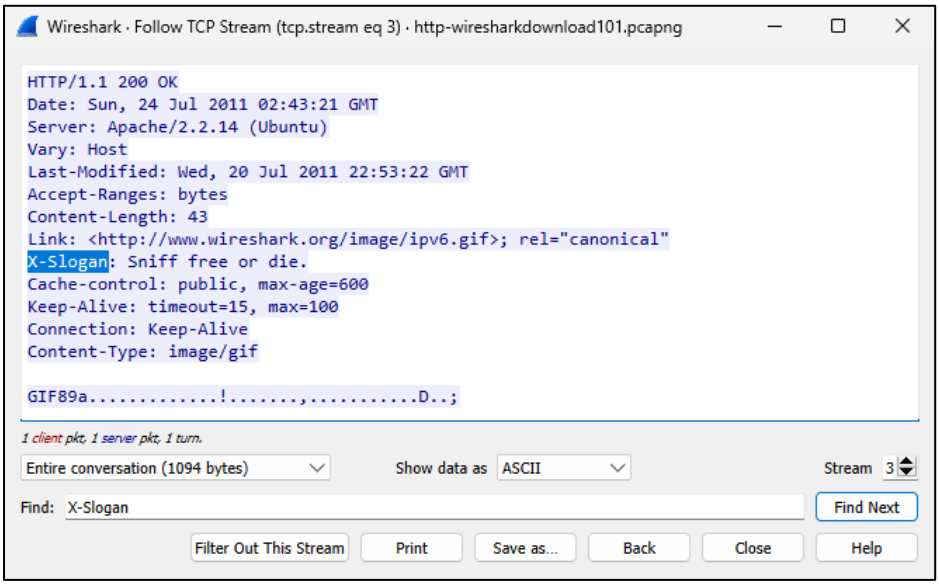
5-5. How many retransmissions and fast retransmissions are seen in this trace file?



There are 183 counts of the "(suspected) retransmission" note. After expanding the note, we can see that this number includes fast retransmissions.

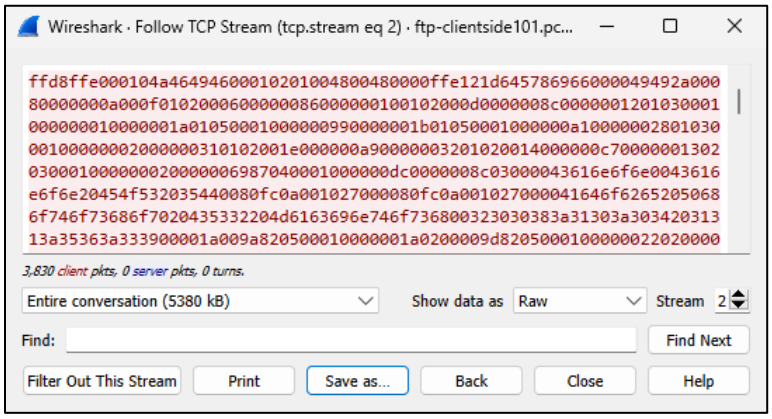
LAB 37: USE REASSEMBLY TO FIND A WEB SITE'S HIDDEN HTTP MESSAGE

i. Follow all the steps in the lab and provide a screenshot of step 5.



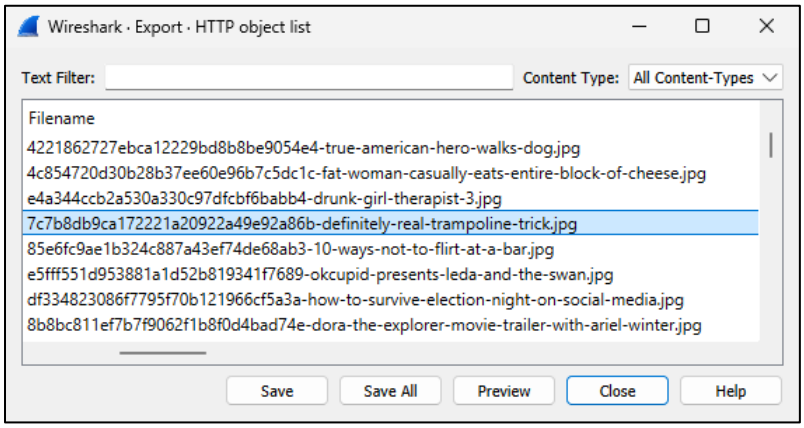
LAB 38: EXTRACT A FILE FROM AN FTP TRANSFER

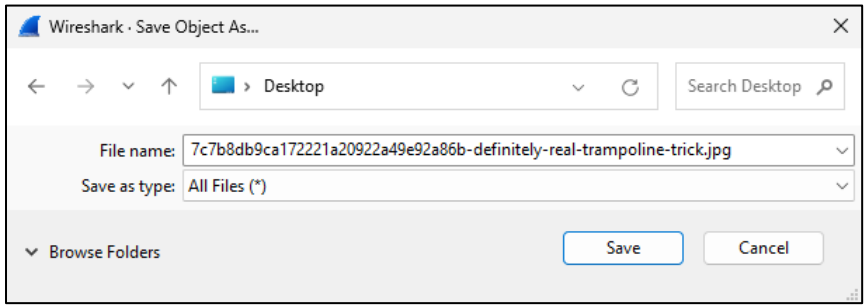
i. Follow all the steps in the lab and provide screenshots of steps 7 and 9.



LAB 39: CARVE OUT A HTTP OBJECT FROM A WEB BROWSING SESSION

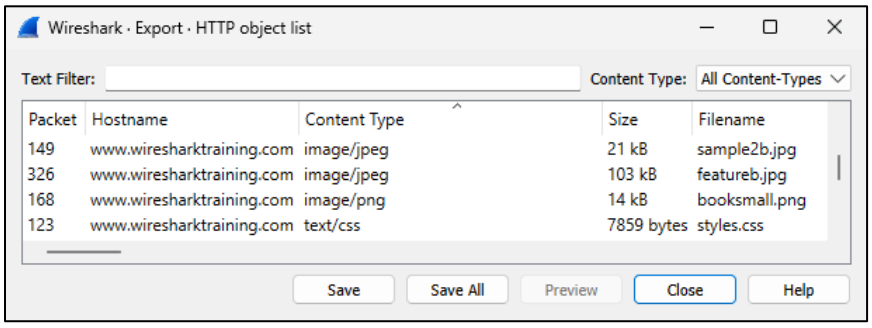
i. Follow all the steps in the lab and provide screenshots of steps 4 and 5.





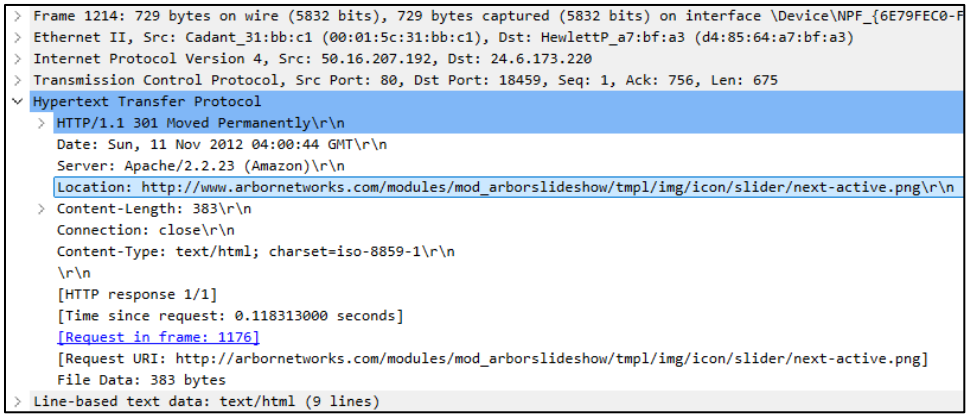
CHAPTER 6 CHALLENGE

6-1. What two `.jpg` files can be exported from this trace file?



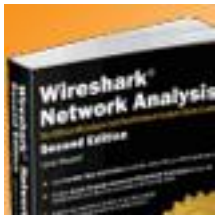
`sample2b.jpg` and `featureb.jpg` can be exported from the trace file.

6-2. On what HTTP server and in what directory does `next-active.png` reside?



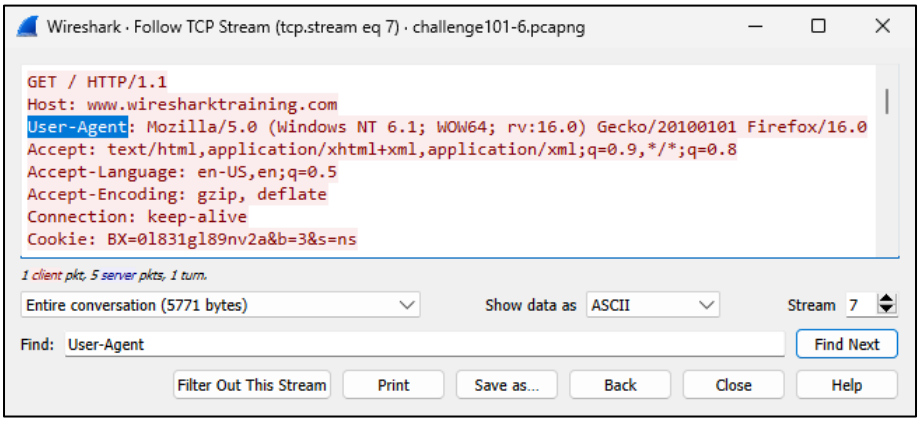
`www.arbornetworks.com` in the `/modules/mod_arborslideshow/tmpl/img/icon/slider/` directory.

6-3. Export `booksmall.png` from this trace file. What is in the image?



It's a low-resolution image of part of the book.

6-4. Reassemble TCP stream 7. What type of browser is the client using in this stream?



Based on the value for `User-Agent`, a Firefox browser was used.

LAB 40: READ ANALYSIS NOTES IN A MALICIOUS REDIRECTION TRACE FILE

i. Follow all the steps in the lab and provide a complete screenshot of step 3.

Comment	Packet comments listed below.	Comment	Frame	19
1	This is the original search query for the "Peter Lik for sale" ...	Comment	Frame	
5	In this response, the server sends numerous thumbnail im...	Comment	Frame	
7	Now we clicked on the image load the expanded thumbna...	Comment	Frame	
12	We get the expanded image through Google - there are a ...	Comment	Frame	
14	We clicked on the web link associated with the expanded i...	Comment	Frame	
15	Here we begin connecting to www.artbrokerage.com at 66...	Comment	Frame	
18	We request an 850x600 size of a Peter Lik photo.	Comment	Frame	
21	Now we are making a request to www.ulisseide.org.	Comment	Frame	
23	This TCP connection is used to get the image file from artb...	Comment	Frame	
67	Here's the redirection to the malicious site. See the Locatio...	Comment	Frame	
68	We removed the DNS queries from the trace file - we must...	Comment	Frame	
75	Our malicious host is redirecting us to run a CGI script (in.c...	Comment	Frame	
79	And here we go... this is the ugly connection.	Comment	Frame	
84	Please oh please hit us over the head with a baseball bat! ...	Comment	Frame	
87	They're dropping a cookie on our drive and giving us a lin...	Comment	Frame	
96	Well that didn't go so well for them... our Symantec softwa...	Comment	Frame	
104	And another termination triggered by Symantec.	Comment	Frame	
117	Yes, Symantec is screaming with messages on our system...	Comment	Frame	
159	We're just returning to Google after a little sidetrack to the...	Comment	Frame	

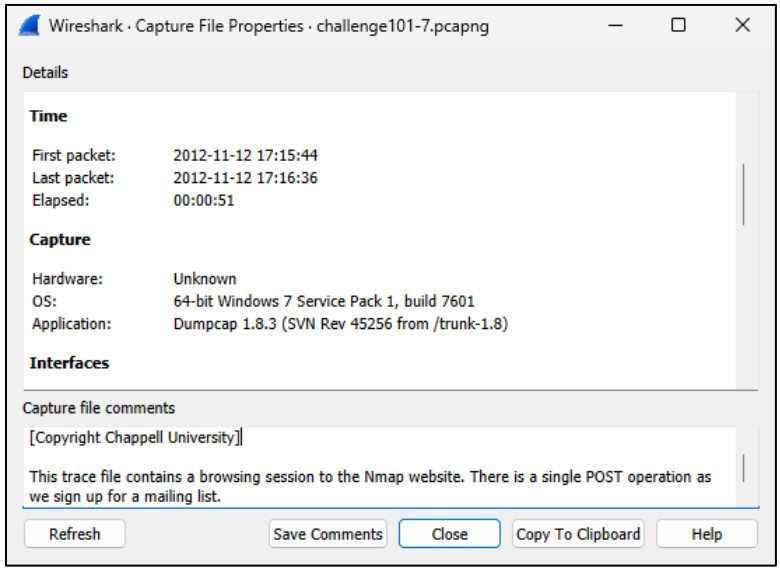
LAB 41: EXPORT MALICIOUS REDIRECTION PACKET COMMENTS

i. Follow all the steps in the lab and provide a screenshot of step 6.

No.	Time	Source	Destination	Host	Protocol	Coloring Rule Name	Comment	Info
1	0	24.6.173.220	74.125.224.84	www.google.com	HTTP	HTTP	This is the original search query for the "Peter Lik for sale" images.	GET /sbd?q=peter+lik+for+sale&um=1&hl=en&client=firefox-a&sa=N&rls=
5	0.062672	74.125.224.84	24.6.173.220		HTTP	HTTP	In this response, the server sends numerous thumbnail images along wit	Continuation
7	0.47505	24.6.173.220	74.125.224.84	www.google.com	HTTP	HTTP	Now we clicked on the image load the expanded thumbnail from Google.	GET /imgres?imgurl=http://www.artbrokerage.com/artthumb/likp_35911
12	0.043454	74.125.224.84	24.6.173.220		HTTP	HTTP	We get the expanded image through Google - there are a lot of web displa	Continuation
14	0.024838	24.6.173.220	77.93.251.49		TCP	HTTP	We clicked on the web link associated with the expanded image. This lau	50316 > 80 [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=4 SACK_PERM=1
15	0.002104	24.6.173.220	66.11.147.48		TCP	HTTP	Here we begin connecting to www.artbrokerage.com at 66.11.147.48. The	50317 > 80 [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=4 SACK_PERM=1
18	0.103595	24.6.173.220	66.11.147.48	www.artbrokerage.com	HTTP	HTTP	We request an 850x600 size of a Peter Lik photo.	GET /artthumb/likp_35911_2/850x600/Peter_Lik_Beyond_Paradise.jpg HTT
21	0.086025	24.6.173.220	77.93.251.49	www.ulisseide.org	HTTP	HTTP	Now we are making a request to www.ulisseide.org.	GET /stat/gthyu/index.php?p=peter-lik-inner-peace-for-sale HTTP/1.1
23	0.161477	66.11.147.48	24.6.173.220		HTTP	HTTP	This TCP connection is used to get the image file from artbrokerage.com.	HTTP/1.1 200 OK [BoundErrorUnreassembled Packet]
67	0.580651	77.93.251.49	24.6.173.220		HTTP	HTTP	Here's the redirection to the malicious site. See the Location line. We are	HTTP/1.1 302 Found
68	0.00217	24.6.173.220	95.169.190.217		TCP	HTTP	We removed the DNS queries from the trace file - we must have looked up	50319 > 80 [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=4 SACK_PERM=1
75	0.382179	95.169.190.217	24.6.173.220		HTTP	HTTP	Our malicious host is redirecting us to run a CGI script (in.cgi). We'll hav	HTTP/1.1 302 Found
79	0.003645	24.6.173.220	95.169.190.217		TCP	HTTP	And here we go... this is the ugly connection.	50320 > 80 [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=4 SACK_PERM=1
84	0.196512	24.6.173.220	95.169.190.217		HTTP	HTTP	Please oh please hit us over the head with a baseball bat! We ask for the	Continuation
87	0.210788	95.169.190.217	24.6.173.220		HTTP	HTTP	They're dropping a cookie on our drive and giving us a link to a .info site i	HTTP/1.1 200 OK (text/html)
96	0.24408	24.6.173.220	78.41.203.19		TCP	TCP RST	Well that didn't go so well for them... our Symantec software terminated t	50321 > 80 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
104	0.181295	24.6.173.220	78.41.203.19		TCP	TCP RST	And another termination triggered by Symantec.	50324 > 80 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
117	0.283123	24.6.173.220	78.41.203.19		TCP	TCP RST	Yes, Symantec is screaming with messages on our system...	50326 > 80 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
159	12.732243	24.6.173.220	74.125.224.84	www.google.com	HTTP	HTTP	We're just returning to Google after a little sidetrack to the dark side...	GET /gen_204?atyp=i&ct=backbutton&cad=&ei=ejsdTsWPN4OmsQOfo9W

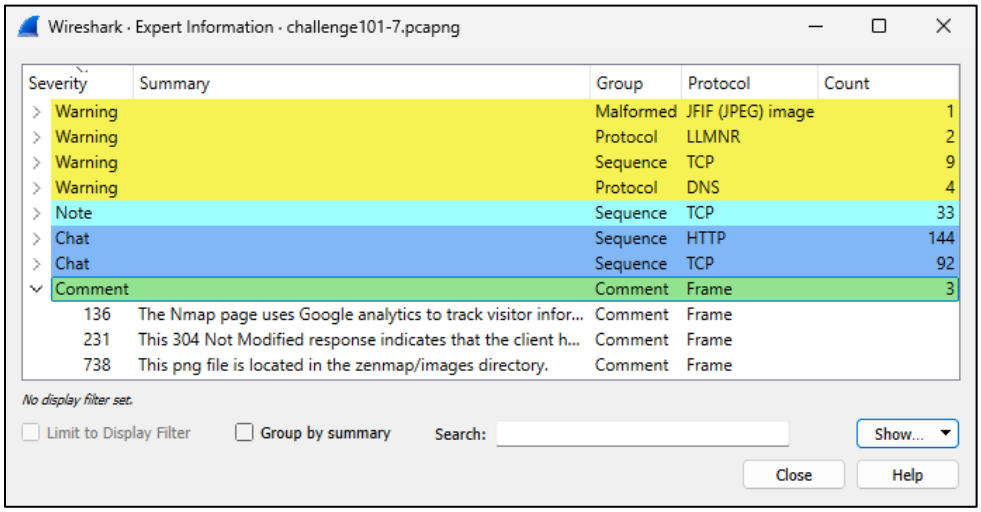
CHAPTER 7 CHALLENGE

7-1. What information is contained in the trace file annotation?



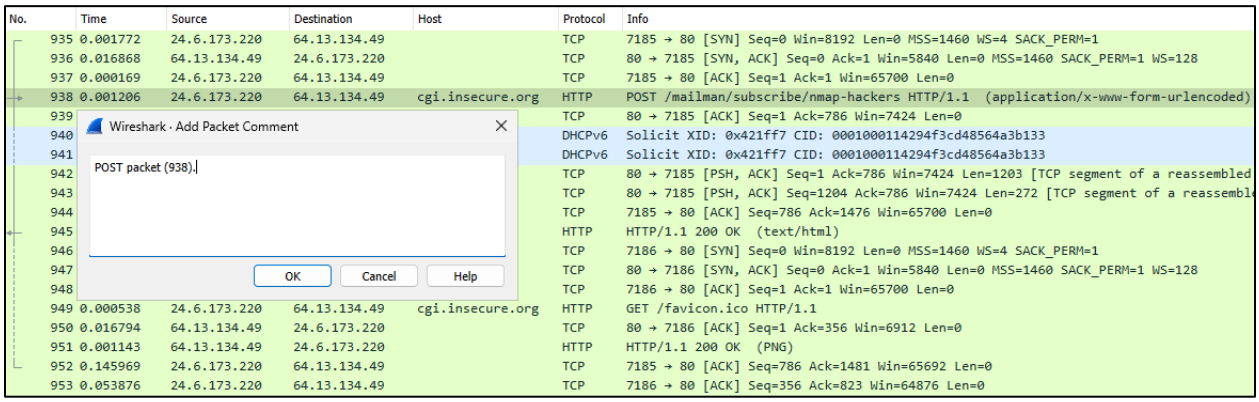
A comment describes what's happening in the trace file. Other information (such as the capture time, interface details, and file name/size) is also available under the Details section.

7-2. What packet comments are contained in this trace file?



There are three packet comments in the file (on frames 136, 231, and 738).

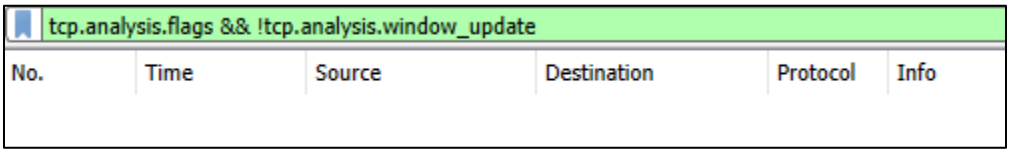
7-3. Add a comment to the POST message in this trace file. What packet did you alter?



The packet with the POST message was number 938.

LAB 42: SPLIT A FILE AND WORK WITH FILTERED FILE SETS

i. Follow all the steps in the lab and provide a screenshot of step 6.



LAB 43: MERGE A SET OF FILES USING A WILDCARD

i. Follow all the steps in the lab and provide a screenshot of step 3.

```
PS C:\Cyber\Traces\409> mergecap -w .\http-downloadaset.pcapng .\Wk_7_WS_http-download-a20000*.*
PS C:\Cyber\Traces\409> dir .\http-downloadaset.pcapng

        Directory: C:\Cyber\Traces\409


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a---         10/21/2024  12:46 PM      172113216 http-downloadaset.pcapng
```

LAB 44: USE TSHARK TO CAPTURE TO FILE SETS WITH AN AUTOSTOP CONDITION

i. Follow all the steps in the lab and provide a screenshot of step 5.

```
PS C:\Cyber\Traces\409> dir mytshark*.*

        Directory: C:\Cyber\Traces\409


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a---         10/21/2024  12:53 PM        4399160 mytshark_00001_20241021125230.pcapng
-a---         10/21/2024  12:53 PM          93924 mytshark_00002_20241021125301.pcapng
-a---         10/21/2024  12:54 PM         119432 mytshark_00003_20241021125331.pcapng
-a---         10/21/2024  12:54 PM        1379256 mytshark_00004_20241021125401.pcapng
-a---         10/21/2024  12:55 PM         624504 mytshark_00005_20241021125432.pcapng
-a---         10/21/2024  12:55 PM          51508 mytshark_00006_20241021125502.pcapng
```

LAB 45: USE TSHARK TO EXTRACT HTTP GET REQUESTS

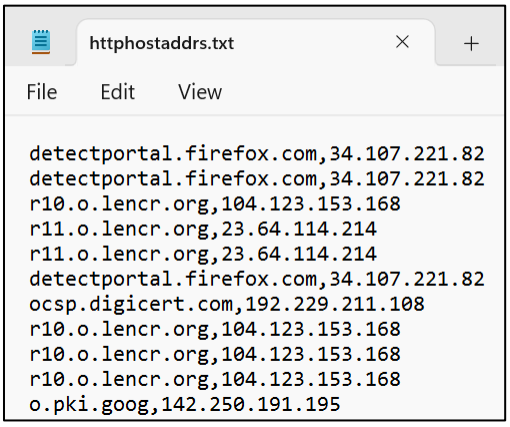
i. Create an Excel export of `stats.txt` file and provide a sorted screenshot of results (part 8.6).

	A	B	C
1	Protocol Hierarchy Statistics		
2	Filter:		
3			
4	**Protocol**	**Frames**	**Bytes**
5	eth	1493	804985
6	ip	1469	803375
7	tcp	1095	694222
8	tls	597	631808
9	udp	374	109153
10	dns	212	25484
11	quic	151	80979
12	quic	24	23323
13	http	22	13383
14	data	19	1140
15	ocsp	16	11326
16	data	15	9861
17	data	5	1672
18	ssdp	4	848
19	data-text-lines	3	892
20	ipv6	3	350
21	udp	3	350
22	mdns	2	210
23	mdns	2	140
24	arp	2	120
25	snmp	1	140

I'm not sure if I understood the instructions correctly, but I used the data in the `stats.txt` file to create a table in Excel. The values are sorted by frames first and then by bytes (both from largest to smallest), but this kind of makes the hierarchy confusing at-a-glance. I looked for ways to sort the values while still retaining a hierarchy (like you can do in the hierarchy statistics window natively within Wireshark) but couldn't find a reasonable solution.

LAB 46: USE TSHARK TO EXTRACT HTTP HOST NAMES AND IP ADDRESSES

i. Follow all the steps in the lab and provide a screenshot of step 4.



CHAPTER 8 CHALLENGE

8-1. What Tshark parameters should you use to list active interfaces on your WS system?

```
PS C:\Cyber\Traces\409> tshark -D
1. \Device\NPF_{CE9E8B45-60A6-46B0-B523-7E3072D62905} (Local Area Connection* 9)
2. \Device\NPF_{2BAD2549-99CA-498D-8220-9202232639FC} (Local Area Connection* 8)
3. \Device\NPF_{EAE66B2D-B099-448F-8520-FC9300CFA55A} (Local Area Connection* 7)
4. \Device\NPF_{8E3FC44C-D55C-423D-BD17-5E508F5CF467} (vEthernet (WSL (Hyper-V firewall)))
5. \Device\NPF_{D10D470F-050E-4C77-9C4E-02D52597B5F0} (vEthernet (Default Switch))
6. \Device\NPF_{5F2CE87F-5C16-4A47-A31F-E87B87533201} (Bluetooth Network Connection 0)
7. \Device\NPF_{91F6BFCD-BC7E-45B7-B07D-53508C11FCB3} (VMware Network Adapter VMnet8)
8. \Device\NPF_{FC141F81-0CF6-4626-AB64-F3ED0F2B888B} (VMware Network Adapter VMnet1)
9. \Device\NPF_{153ADED8-F651-4BBB-BBF9-6A28FCC05897} (Local Area Connection* 12)
10. \Device\NPF_{7912AAA7-736F-48E4-9F15-B8A463CD2AF3} (Local Area Connection* 11)
11. \Device\NPF_{DA81636E-5594-48E4-9CFE-DB82B8396CC5} (Wi-Fi 0)
12. \Device\NPF_{E03B19B5-CDB4-410E-B9B9-764429E76425} (Ethernet 0)
13. \Device\NPF_Loopback (Adapter for loopback traffic capture)
14. \Device\NPF_{CEE937BE-027F-4458-B9CC-27C32E9C861C} (Ethernet 1)
```

You can use `tshark -D` to get a list of active interfaces.

8-2. Using Tshark to extract protocol hierarchy information, how many UDP frames are in `challenge101-8.pcapng`?

```
PS C:\Cyber\Traces\409> tshark -r .\challenge101-8.pcapng -qz io,phs | Select-String udp

    udp                                      frames:62 bytes:8074

PS C:\Cyber\Traces\409>
```

There are 62 UDP frames in `challenge101-8.pcapng`.

8-3. Use Tshark to export all DNS Packets from `challenge101-8.pcapng` to a new trace file called `ch8dns.pcapng`. How many packets were exported?

```
PS C:\Cyber\Traces\409> tshark -r ".\challenge101-8.pcapng" -Y "dns" -w "ch8dns.pcapng"
PS C:\Cyber\Traces\409> capinfos .\ch8dns.pcapng | Select-String packets

Number of packets:   62
Average packet rate: 3 packets/s
                     Number of packets = 62
```

Adapting a command from lab 45 to this context, 62 DNS packets were exported from the `challenge101-8.pcapng` capture to `ch8dns.pcapng`.

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