

Finn Saunders-Zurn

CSCI 351 Data Comm & Networks

HW 1

First Few Packets:

```
PS C:\Users\finn\csci351\hwd> & C:\Python311\python.exe c:\Users\finn\csci351\hwd\pkssniffer.py -r 1-30-25-WiFi.pcap -c 5
reading: 1-30-25-WiFi.pcap
5 packets analyzed
packets:
{'size': '78', 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0800', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '64', 'id': '0xd022', 'flags': '0x00', 'frag_offset': '0', 'ttl': '128', 'protocol': '17', 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '8.8.8.8', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': '51566', 'dest_port': '53'}
{'size': '158', 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0800', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '144', 'id': '0xa0c7', 'flags': '0x00', 'frag_offset': '0', 'ttl': '123', 'protocol': '17', 'header_checksum': '0xcddd', 'src_ip': '8.8.8.8', 'dest_ip': '172.16.11.24', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': '53', 'dest_port': '51566'}
{'size': '1292', 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0800', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '1278', 'id': '0xce5e', 'flags': '0x02', 'frag_offset': '0', 'ttl': '128', 'protocol': '17', 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '162.159.130.233', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': '51480', 'dest_port': '443'}
{'size': '117', 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0800', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '103', 'id': '0xce5f', 'flags': '0x02', 'frag_offset': '0', 'ttl': '120', 'protocol': '17', 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '162.159.130.233', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': '51480', 'dest_port': '443'}
{'size': '521', 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0800', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '507', 'id': '0xce60', 'flags': '0x02', 'frag_offset': '0', 'ttl': '128', 'protocol': '17', 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '162.159.130.233', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': '51480', 'dest_port': '443'}
PS C:\Users\finn\csci351\hwd>
```

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	172.16.11.24	8.8.8.8	DNS	78	Standard query 0xaf73 A cdn.discordapp.com
2	0.022462	8.8.8.8	172.16.11.24	DNS	158	Standard query response 0xaf73 A cdn.discordapp.com A 162.159.130.233 A 162.159.135.233 A 162.159.133.233 A 162.159.134.233 A 162.159.129.233
3	0.024075	172.16.11.24	162.159.130.233	QUIC	1292	Initial, 0CID=dd4f5a93121056ff, PKN: 1, PING, PING, PING, PADDING, CRYPTO, PADDING, PING, PING, CRYPTO, CRYPTO, PADDING, PING, CRYPTO, PADDING, CRYPTO
4	0.024340	172.16.11.24	162.159.130.233	QUIC	117	0-RTT, 0CID=dd4f5a93121056ff
5	0.024673	172.16.11.24	162.159.130.233	QUIC	521	0-RTT, 0CID=dd4f5a93121056ff

Last Few Packets:

```
PS C:\Users\finn\csci351\hwd> & C:\Python311\python.exe c:\Users\finn\csci351\hwd\pkssniffer.py -r 1-30-25-WiFi.pcap -c 10
reading: 1-30-25-WiFi.pcap
10 packets analyzed
filtering on port: 50769
packets:
{'size': '55', 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0800', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '41', 'id': '0xe277', 'flags': '0x02', 'frag_offset': '0', 'ttl': '128', 'protocol': '6', 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '23.223.17.175', 'protocol_type': 'TCP', 'encapsulated': 'tcp', 'src_port': '56120', 'dest_port': '443'}
{'size': '66', 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0800', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '52', 'id': '0x5b07', 'flags': '0xa2', 'frag_offset': '0', 'ttl': '54', 'protocol': '6', 'header_checksum': '0x0907', 'src_ip': '23.223.17.175', 'dest_ip': '172.16.11.24', 'protocol_type': 'TCP', 'encapsulated': 'tcp', 'src_port': '443', 'dest_port': '56120'}
{'size': '167', 'dest_mac': '01:00:5e:7f:ff:fa', 'src_mac': '9c:58:84:02:0c:3a', 'type': '0x0800', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '153', 'id': '0x22cc', 'flags': '0x00', 'frag_offset': '0', 'ttl': '255', 'protocol': '17', 'header_checksum': '0xf108', 'src_ip': '172.16.11.20', 'dest_ip': '230.255.255.250', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': '58699', 'dest_port': '1900'}
{'size': '87', 'dest_mac': '01:00:5e:00:00:fb', 'src_mac': '9c:58:84:02:0c:3a', 'type': '0x0800', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '73', 'id': '0x31d9', 'flags': '0x00', 'frag_offset': '0', 'ttl': '255', 'protocol': '17', 'header_checksum': '0xf1aa', 'src_ip': '172.16.11.20', 'dest_ip': '224.0.0.251', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': '5353', 'dest_port': '5353'}
{'size': '351', 'dest_mac': '01:00:5e:00:00:fb', 'src_mac': 'a8:16:9d:24:10:78', 'type': '0x0800', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '337', 'id': '0x8e86', 'flags': '0x02', 'frag_offset': '0', 'ttl': '255', 'protocol': '17', 'header_checksum': '0x53c6', 'src_ip': '172.16.11.67', 'dest_ip': '224.0.0.251', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': '5353', 'dest_port': '5353'}
PS C:\Users\finn\csci351\hwd>
```

Filtering on these 10 packets:

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	162.159.130.234	172.16.11.24	TLSv1.2	96	Application Data
2	0.052308	172.16.11.24	162.159.130.234	TCP	54	50769 → 443 [ACK] Seq=1 Ack=43 Win=513 Len=0
3	0.083384	142.250.81.238	172.16.11.24	UDP	329	443 → 51561 Len=287
4	0.086620	172.16.11.24	142.250.81.238	UDP	495	51561 → 443 Len=453
5	0.135755	142.250.81.238	172.16.11.24	UDP	71	443 → 51561 Len=29
6	0.145405	172.16.11.24	142.250.81.238	UDP	75	51561 → 443 Len=33
7	0.149439	142.250.81.238	172.16.11.24	UDP	151	443 → 51561 Len=109
8	0.161127	172.16.11.24	142.250.81.238	UDP	79	51561 → 443 Len=37
9	0.181411	142.250.81.238	172.16.11.24	UDP	67	443 → 51561 Len=25
10	0.278772	172.16.11.24	23.222.17.174	TLSv1.2	1418	Application Data

Host filter:

```
PS C:\Users\finn\csci351\hwd> & C:\Python311\python.exe c:\Users\finn\csci351\hwd\pkssniffer.py -r 2-4-WiFi.pcap -c 10 -host 162.159.130.234
reading: 2-4-WiFi.pcap
10 packets analyzed
filtering on host: 162.159.130.234
packets:
{'size': '96', 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0800', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '82', 'id': '0x885f', 'flags': '0x02', 'frag_offset': '0', 'ttl': '56', 'protocol': '6', 'header_checksum': '0xdd94', 'src_ip': '162.159.130.234', 'dest_ip': '172.16.11.24', 'protocol_type': 'TCP', 'encapsulated': 'tcp', 'src_port': '443', 'dest_port': '50769'}
{'size': '54', 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0800', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '40', 'id': '0x4aea', 'flags': '0xa2', 'frag_offset': '0', 'ttl': '128', 'protocol': '6', 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '162.159.130.234', 'protocol_type': 'TCP', 'encapsulated': 'tcp', 'src_port': '50769', 'dest_port': '443'}
PS C:\Users\finn\csci351\hwd>
```

Port filter:

```
PS C:\Users\finn\csci351\hwd> & C:\Python311\python.exe c:\Users\finn\csci351\hwd\pkssniffer.py -r 2-4-WiFi.pcap -c 10 -port 50769
reading: 2-4-WiFi.pcap
10 packets analyzed
filtering on port: 50769
packets:
{'size': '96', 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0800', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '82', 'id': '0x885f', 'flags': '0x02', 'frag_offset': '0', 'ttl': '56', 'protocol': '6', 'header_checksum': '0xdd94', 'src_ip': '162.159.130.234', 'dest_ip': '172.16.11.24', 'protocol_type': 'TCP', 'encapsulated': 'tcp', 'src_port': '443', 'dest_port': '50769'}
{'size': '54', 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0800', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '40', 'id': '0x4aea', 'flags': '0xa2', 'frag_offset': '0', 'ttl': '128', 'protocol': '6', 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '162.159.130.234', 'protocol_type': 'TCP', 'encapsulated': 'tcp', 'src_port': '50769', 'dest_port': '443'}
PS C:\Users\finn\csci351\hwd>
```

Ip filter: (Not sure if this is correct, my filter checks for ip version = 4)

```
PS C:\Users\Finn\csi351\Uhd> C:\Python311\python.exe c:\Users\finn\csi351\hd\pknsiffer.py -r 2-4-Wifi.pcap -c 10 -lp
reading: 2-4-Wifi.pcap
10 packets analyzed
filtering on ip
packets:
{'size': 96, 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 62, 'id': '0xb085', 'flags': '0x02', 'frag_offset': 0, 'src_port': 443, 'dest_port': 50769},
{'size': 54, 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 40, 'id': '0xb0aa', 'flags': '0x02', 'frag_offset': 0, 'src_port': 50769, 'dest_port': 443},
{'size': 329, 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 315, 'id': '0xb000', 'flags': '0x02', 'frag_offset': 0, 'src_port': 443, 'dest_port': 51561},
{'size': 495, 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 481, 'id': '0xb478', 'flags': '0x02', 'frag_offset': 0, 'src_port': 51561, 'dest_port': 443},
{'size': 495, 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 481, 'id': '0xb000', 'flags': '0x02', 'frag_offset': 0, 'src_port': 443, 'dest_port': 51561},
{'size': 58, 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 61, 'id': '0xb479', 'flags': '0x02', 'frag_offset': 0, 'src_port': 51561, 'dest_port': 443},
{'size': 151, 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 137, 'id': '0xb000', 'flags': '0x02', 'frag_offset': 0, 'src_port': 443, 'dest_port': 51561},
{'size': 79, 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 65, 'id': '0xb47a', 'flags': '0x02', 'frag_offset': 0, 'src_port': 51561, 'dest_port': 443},
{'size': 67, 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 53, 'id': '0xb000', 'flags': '0x02', 'frag_offset': 0, 'src_port': 443, 'dest_port': 51561},
{'size': 1418, 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 1404, 'id': '0xb0b6', 'flags': '0x02', 'frag_offset': 0, 'src_port': 443, 'dest_port': 51100}
```

TCP filter:

```
P5.C:\Users\finm\csi351\hwd & C:\Python311\python.exe c:\Users\finm\csi351\hwd\pknsiffer.py -- 2-4-Wifi.pcap -c 10 -tcp
reading: 2-4-Wifi.pcap
10 packets analyzed
filtering on tcp
packets:
{'size': '96', 'dest_mac': '08:04:5d:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0000', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '82', 'id': '0x85f5', 'flags': '0x02', 'frag_offset': '0', 'ttl': '64', 'protocol': '6', 'header_checksum': '0x0d5f', 'src_ip': '162.159.130.234', 'dest_ip': '172.16.11.24', 'protocol_type': 'TCP', 'encapsulated': 'tcp', 'src_port': '50769', 'dest_port': '50769', 'src_mac_hex': '48a98a3fb85e', 'src_mac_hex_upper': '48A98A3FB85E', 'src_ip_hex': 'A29E867A', 'src_ip_hex_upper': 'A29E867A', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '40', 'id': '0xb0ae', 'flags': '0x02', 'frag_offset': '0', 'ttl': '128', 'protocol': '6', 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '162.159.130.234', 'protocol_type': 'TCP', 'encapsulated': 'tcp', 'src_port': '50769', 'dest_port': '443'}
{'size': '1418', 'dest_mac': '48:a9:8a:3f:b8:58', 'src_mac': '08:04:5d:76:b8:58', 'type': '0x0000', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '1404', 'id': '0xb0ba', 'flags': '0x02', 'frag_offset': '0', 'ttl': '128', 'protocol': '6', 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '23.222.17.174', 'protocol_type': 'TCP', 'encapsulated': 'tcp', 'src_port': '51100', 'dest_port': '443'}
```

UDP filter:

```
PS C:\Users\Finn\csi351\hwd> & C:\Python311\python.exe c:\Users\Finn\csi351\hwd\pknsiffer.py -r 2-4-Wifi.pcap -c 10 -udp
Reading: 2-4-Wifi.pcap
10 packets analyzed
filtering on udp
packets:
{'size': 329, 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 315, 'id': '0x0000', 'flags': '0x02', 'frag_offset': '0', 'ttl': 58, 'protocol': 17, 'header_checksum': '0xa7a1', 'src_ip': '142.250.81.238', 'dest_ip': '172.16.11.24', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': 443, 'dest_port': 51561},
{'size': 495, 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 481, 'id': '0x5478', 'flags': '0x02', 'frag_offset': '0', 'ttl': 128, 'protocol': 17, 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '142.250.81.238', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': 51561, 'dest_port': 443},
{'size': 71, 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 57, 'id': '0x0000', 'flags': '0x02', 'frag_offset': '0', 'ttl': 58, 'protocol': 17, 'header_checksum': '0xa8a3', 'src_ip': '142.250.81.238', 'dest_ip': '172.16.11.24', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': 443, 'dest_port': 51561},
{'size': 75, 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 61, 'id': '0x479', 'flags': '0x02', 'frag_offset': '0', 'ttl': 128, 'protocol': 17, 'header_checksum': '172.16.11.24', 'src_ip': '172.16.11.24', 'dest_ip': '142.250.81.238', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': 51561, 'dest_port': 443},
{'size': 151, 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 137, 'id': '0x0000', 'flags': '0x02', 'frag_offset': '0', 'ttl': 58, 'protocol': 17, 'header_checksum': '0xa853', 'src_ip': '142.250.81.238', 'dest_ip': '172.16.11.24', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': 443, 'dest_port': 51561},
{'size': 79, 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 65, 'id': '0x5474', 'flags': '0x02', 'frag_offset': '0', 'ttl': 128, 'protocol': 17, 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '142.250.81.238', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': 51561, 'dest_port': 443},
{'size': 67, 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0000', 'version': '4', 'header_len': 20, 'tos': '0x00', 'total_len': 53, 'id': '0x0000', 'flags': '0x02', 'frag_offset': '0', 'ttl': 58, 'protocol': 17, 'header_checksum': '0xa7a7', 'src_ip': '142.250.81.238', 'dest_ip': '172.16.11.24', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': 443, 'dest_port': 51561}
```

ICMP filter: (Had to filter on different packets)

2247	35.407813	17.16.11.24	8.8.8.8	DNS	79 Standard query qtype=6 Google.com
2248	35.427459	8.8.8.8	17.16.11.24	DNS	86 Standard query response qtype=6 Google.com A 142.251.40.110
2249	35.427459	8.8.8.8	17.16.11.24	DNS	86 Standard query response qtype=6 Google.com A 142.251.40.110
2250	35.437628	17.16.11.24	17.16.11.24	ICMP	134 Time to live exceeded [Time to live exceeded in fragIn]
2251	35.431617	17.16.11.24	142.251.40.110	ICMP	10 Echo [ping] request [dst=DW001, seq=217109, ttl=1 (no response found)]
2252	35.431617	17.16.11.24	142.251.40.110	ICMP	10 Echo [ping] request [dst=DW001, seq=217109, ttl=1 (no response found)]
2253	35.440190	17.16.11.24	142.251.40.110	ICMP	108 Echo [ping] request [dst=DW001, seq=220181, ttl=1 (no response found)]
2254	35.440190	17.16.11.24	142.251.40.110	ICMP	108 Echo [ping] request [dst=DW001, seq=220181, ttl=1 (no response found)]
2255	35.444297	17.16.11.24	8.8.8.8	DNS	84 Standard query qtype=PTB PTR 1.1.16.172.in-addr.arpa
2256	35.450579	8.8.8.8	17.16.11.24	DNS	84 Standard query response qtype=PTB no such name PTR 1.1.16.172.in-addr.arpa
2257	35.450579	8.8.8.8	17.16.11.24	DNS	84 Standard query response qtype=PTB no such name PTR 1.1.16.172.in-addr.arpa
2258	35.466219	17.16.11.24	142.251.40.234	UDP	71 55452 + 443 Len=29
2259	35.468107	142.251.40.234	17.16.11.24	UDP	67 443 + 55452 Len=25
2260	35.467207	17.16.11.24	142.251.40.234	UDP	67 443 + 55452 Len=25
2261	35.717127	142.251.40.234	17.16.11.24	UDP	67 443 + 55452 Len=25
2262	35.717127	17.16.11.24	142.251.40.234	UDP	67 443 + 55452 Len=25
2263	35.875580	17.16.11.24	17.16.11.24	NMFS	92 Name query HISTAT+ C000-C000-C000-C000-C000-C000-C000-C000-C000
2264	35.763767	17.16.11.24	17.16.11.24	UDP	10 Destination unreachable [Host unreachable]
2265	35.763767	17.16.11.24	17.16.11.24	UDP	10 Destination unreachable [Host unreachable]

```
PS C:\Users\Finn\cscl351\hwd> C:\Python311\python.exe c:\Users\Finn\cscl351\hwd\pknsniffer.py -r 2-4-Wifi-pcap -iwp
reading: 2.4-Wifi-pcap
2484 packets analyzed
filtering on icmp
packets:
{'size': '106', 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x8000', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '92', 'id': '0xa8bd', 'flags': '0x00', 'frag_offset': '0', 'ttl': '1', 'protocol': '1', 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '142.251.40.110', 'protocol_type': 'Icmp', 'encapsulated': 'icmp', 'src_port': '53', 'dest_port': '53247', 'size': '134', 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x8000', 'version': '4', 'header_len': '20', 'tos': '0xc0', 'total_len': '120', 'id': '0xdd4d', 'flags': '0x00', 'frag_offset': '0', 'ttl': '64', 'protocol': '1', 'header_checksum': '0x2e40', 'src_ip': '172.16.11.1', 'dest_ip': '172.16.11.24', 'protocol_type': 'Icmp', 'encapsulated': 'icmp', 'src_port': '53', 'dest_port': '53247', 'size': '106', 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x8000', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '92', 'id': '0xa8be', 'flags': '0x00', 'frag_offset': '0', 'ttl': '1', 'protocol': '1', 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '142.251.40.110', 'protocol_type': 'Icmp', 'encapsulated': 'icmp', 'src_port': '53', 'dest_port': '53247', 'size': '134', 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x8000', 'version': '4', 'header_len': '20', 'tos': '0xc0', 'total_len': '120', 'id': '0xdd4d', 'flags': '0x00', 'frag_offset': '0', 'ttl': '64', 'protocol': '1', 'header_checksum': '0x2e3e', 'src_ip': '172.16.11.1', 'dest_ip': '172.16.11.24', 'protocol_type': 'Icmp', 'encapsulated': 'icmp', 'src_port': '53', 'dest_port': '53247', 'size': '106', 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x8000', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '92', 'id': '0xa8bf', 'flags': '0x00', 'frag_offset': '0', 'ttl': '1', 'protocol': '1', 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '142.251.40.110', 'protocol_type': 'Icmp', 'encapsulated': 'icmp', 'src_port': '53', 'dest_port': '53247', 'size': '134', 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x8000', 'version': '4', 'header_len': '20', 'tos': '0xc0', 'total_len': '120', 'id': '0xdd4d', 'flags': '0x00', 'frag_offset': '0', 'ttl': '64', 'protocol': '1', 'header_checksum': '0x2e3e', 'src_ip': '172.16.11.1', 'dest_ip': '172.16.11.24', 'protocol_type': 'Icmp', 'encapsulated': 'icmp', 'src_port': '53', 'dest_port': '53247', 'size': '120', 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x8000', 'version': '4', 'header_len': '20', 'tos': '0xc0', 'total_len': '106', 'id': '0xddf8', 'flags': '0x00', 'frag_offset': '0', 'ttl': '64', 'protocol': '1', 'header_checksum': '0x2e21', 'src_ip': '172.16.11.1', 'dest_ip': '172.16.11.24', 'protocol_type': 'Icmp', 'encapsulated': 'icmp', 'src_port': '137', 'dest_port': '137', 'size': '120', 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x8000', 'version': '4', 'header_len': '20', 'tos': '0xc0', 'total_len': '106', 'id': '0xdda9', 'flags': '0x00', 'frag_offset': '0', 'ttl': '64', 'protocol': '1', 'header_checksum': '0x2df0', 'src_ip': '172.16.11.1', 'dest_ip': '172.16.11.24', 'protocol_type': 'Icmp', 'encapsulated': 'icmp', 'src_port': '137', 'dest_port': '137'}
```

## Net filter:

```
PS C:\Users\Finn\csc1351\hwd> & C:/Python311/python.exe c:/Users/Finn/csc1351/hwd/pkssniffer.py -r 2-4-Wifi.pcap -c 10 -net 142.250.81.1
reading: 2-4-Wifi.pcap
10 packets analyzed
filtering on network: 142.250.81
packets:
{'size': '329', 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0000', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '315', 'id': '0x0000', 'flags': '0x02', 'frag_offset':
: '0', 'ttl': '58', 'protocol': '17', 'header_checksum': '0xa7a1', 'src_ip': '142.250.81.238', 'dest_ip': '172.16.11.24', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': '443', 'dest_port': '51561'}
{'size': '495', 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0000', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '481', 'id': '0x5478', 'flags': '0x02', 'frag_offset':
: '0', 'ttl': '128', 'protocol': '17', 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '142.250.81.238', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': '51561', 'dest_port': '443'}
{'size': '71', 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0000', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '57', 'id': '0x0000', 'flags': '0x02', 'frag_offset':
: '0', 'ttl': '58', 'protocol': '17', 'header_checksum': '0xa8a3', 'src_ip': '142.250.81.238', 'dest_ip': '172.16.11.24', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': '443', 'dest_port': '51561'}
{'size': '75', 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0000', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '61', 'id': '0x5479', 'flags': '0x02', 'frag_offset':
: '0', 'ttl': '128', 'protocol': '17', 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '142.250.81.238', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': '51561', 'dest_port': '443'}
{'size': '151', 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0000', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '137', 'id': '0x0000', 'flags': '0x02', 'frag_offset':
: '0', 'ttl': '58', 'protocol': '17', 'header_checksum': '0xa853', 'src_ip': '142.250.81.238', 'dest_ip': '172.16.11.24', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': '443', 'dest_port': '51561'}
{'size': '79', 'dest_mac': '48:a9:8a:3f:b8:5e', 'src_mac': '80:45:dd:76:b8:58', 'type': '0x0000', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '65', 'id': '0x547a', 'flags': '0x02', 'frag_offset':
: '0', 'ttl': '128', 'protocol': '17', 'header_checksum': '0x0000', 'src_ip': '172.16.11.24', 'dest_ip': '142.250.81.238', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': '51561', 'dest_port': '443'}
{'size': '67', 'dest_mac': '80:45:dd:76:b8:58', 'src_mac': '48:a9:8a:3f:b8:5e', 'type': '0x0000', 'version': '4', 'header_len': '20', 'tos': '0x00', 'total_len': '53', 'id': '0x0000', 'flags': '0x02', 'frag_offset':
: '0', 'ttl': '58', 'protocol': '17', 'header_checksum': '0xa8a7', 'src_ip': '142.250.81.238', 'dest_ip': '172.16.11.24', 'protocol_type': 'UDP', 'encapsulated': 'udp', 'src_port': '443', 'dest_port': '51561'}
```