Wireshark

CPSC 441 - TUTORIAL 4

RACHEL MCLEAN

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*Modified from slides by Reza Gholizadeh

What is Wireshark?

Wireshark is a free and open source packet analyzer

It is used for network troubleshooting, analysis, software and communication protocol development, and education.

Originally named Ethereal, the project was renamed Wireshark in May 2006 due to trademark issues

Functionality

Sources of data:

- Live network connection
- File of already-captured trace

Different types of live networks, including :

- Ethernet (LAN)
- IEEE 802.11 (WLAN)
- loopback

Redefining displayed data with various settings, timers, and filters can be set to provide the facility of filtering the output of the captured traffic

Installation

- Download Wireshark:
  - http://www.wireshark.org/download.html
  - Choose the appropriate version according to your operating system
  - For Windows, during the installation, agree to install WinPcap
- There is a good tutorial on how to capture data using Wireshark:
  - http://wiki.wireshark.org/CaptureSetup

Before Capturing

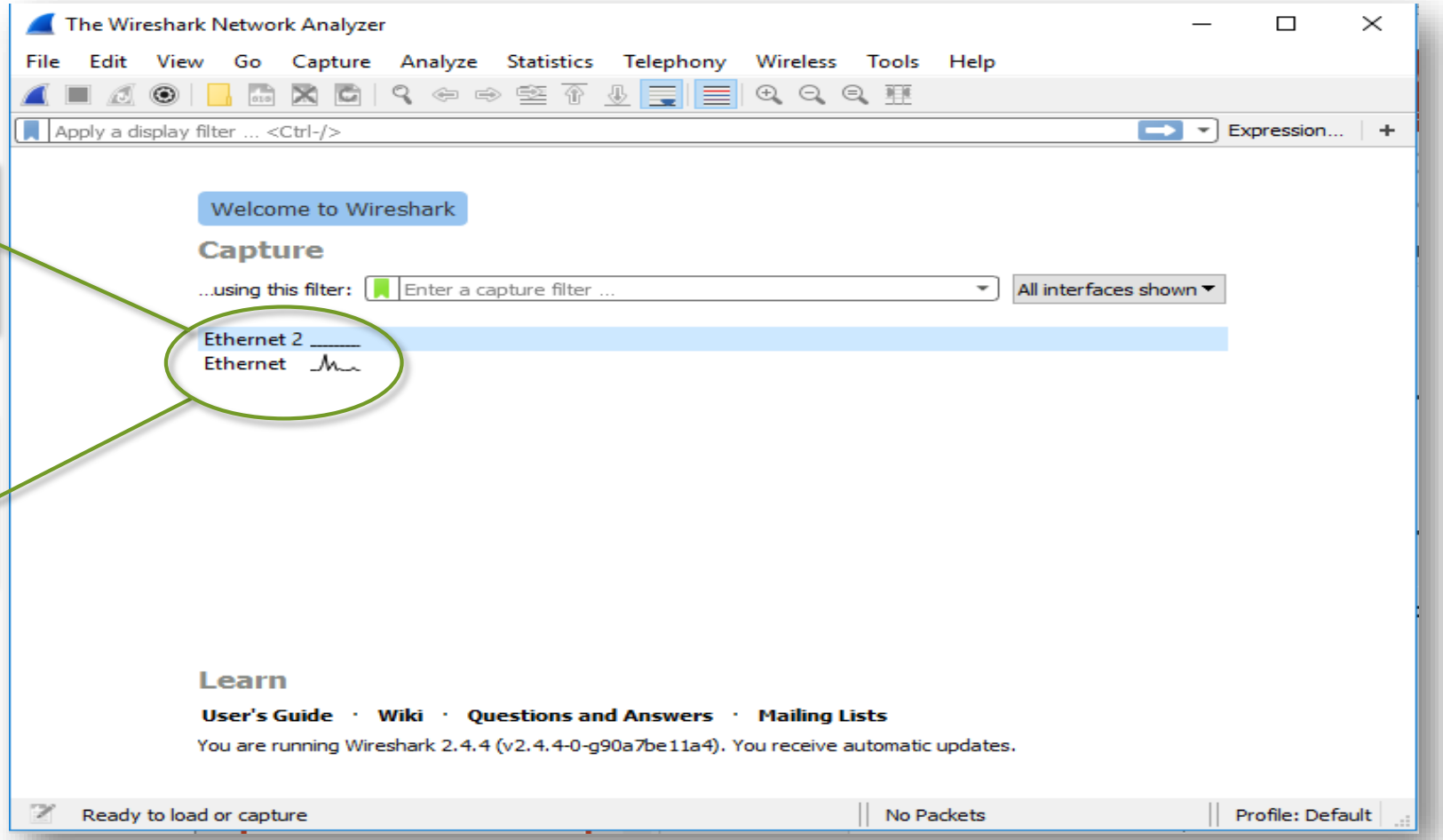
Are you allowed to do this?

- Ensure that you have permission to capture packets from the network you are connected with
- Corporate policies or applicable laws may prohibit capturing data from the network

General Setup

- Operating system must support packet capturing, e.g. capture support is enabled
- You must have sufficient privileges to capture packets, e.g. root / administrator privileges
- Your computer's time and time zone settings should be correct

Choosing network interface

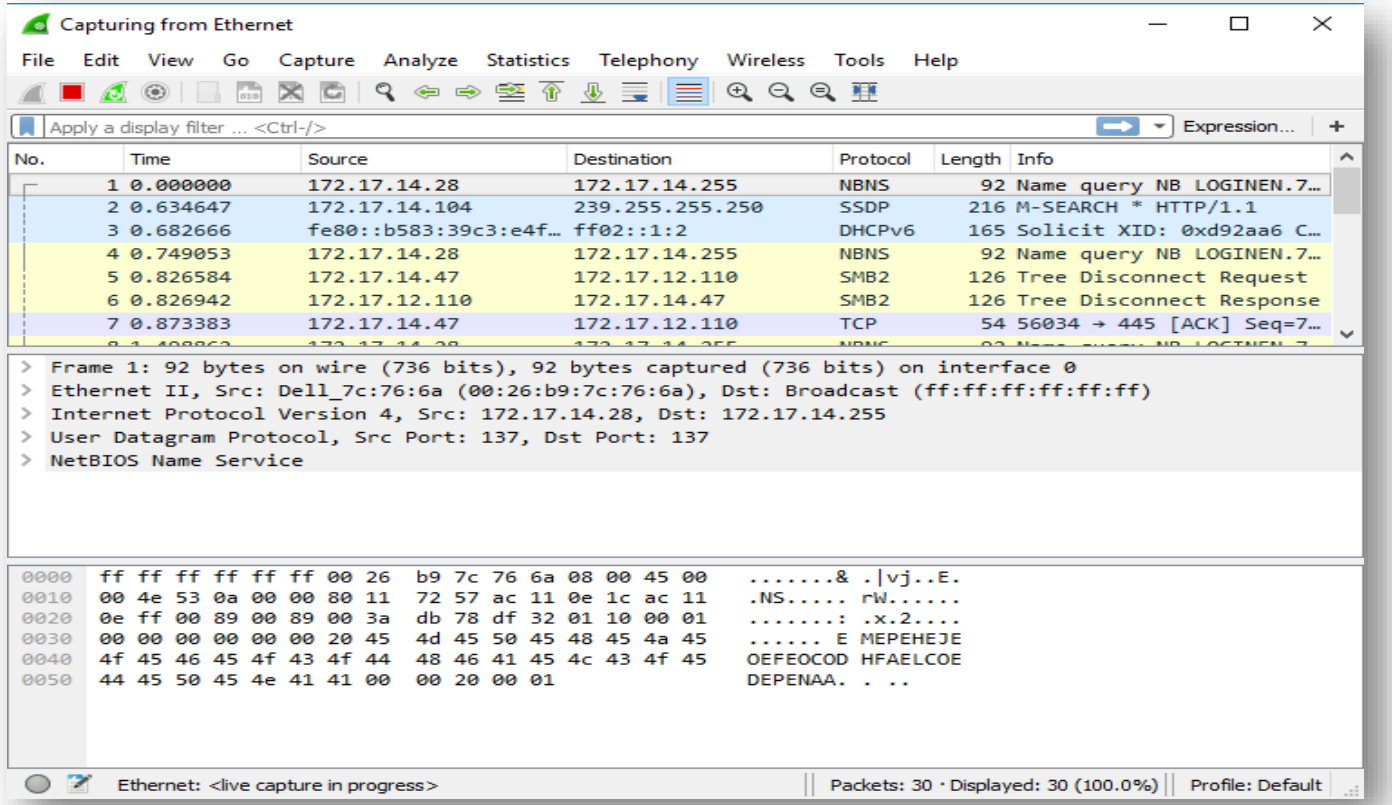


Available Interfaces

Choose the one with traffic

Start capturing packets

After clicking on desired interface, Wireshark starts capturing packets



Analyze Captured Packets

Time of capturing packet

Source IP

Destination IP

Short description of packet

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	172.17.14.28	172.17.14.255	NBNS	92	Name query NB LOGINEN.7…
2	0.634647	172.17.14.104	239.255.255.250	SSDP	216	M-SEARCH * HTTP/1.1
3	0.682666	fe80::b583:39c3:e4f…	ff02::1:2	DHCPv6	165	Solicit XID: 0xd92aa6 C…
4	0.749053	172.17.14.28	172.17.14.255	NBNS	92	Name query NB LOGINEN.7…
5	0.826584	172.17.14.47	172.17.12.110	SMB2	126	Tree Disconnect Request
6	0.826942	172.17.12.110	172.17.14.47	SMB2	126	Tree Disconnect Response
7	0.873383	172.17.14.47	172.17.12.110	TCP	54	56034 → 445 [ACK] Seq=7…

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```
> Frame 7: 54 bytes on wire (432 bits), 54 bytes captured (432 bits) on interface 0
> Ethernet II, Src: Dell_dc:22:2d (34:17:eb:dc:22:2d), Dst: HewlettP_9d:62:00 (58:20:b1:9d:62:00)
> Internet Protocol Version 4, Src: 172.17.14.47, Dst: 172.17.12.110
> Transmission Control Protocol, Src Port: 56034, Dst Port: 445, Seq: 73, Ack: 73, Len: 0
```

Hierarchical View:

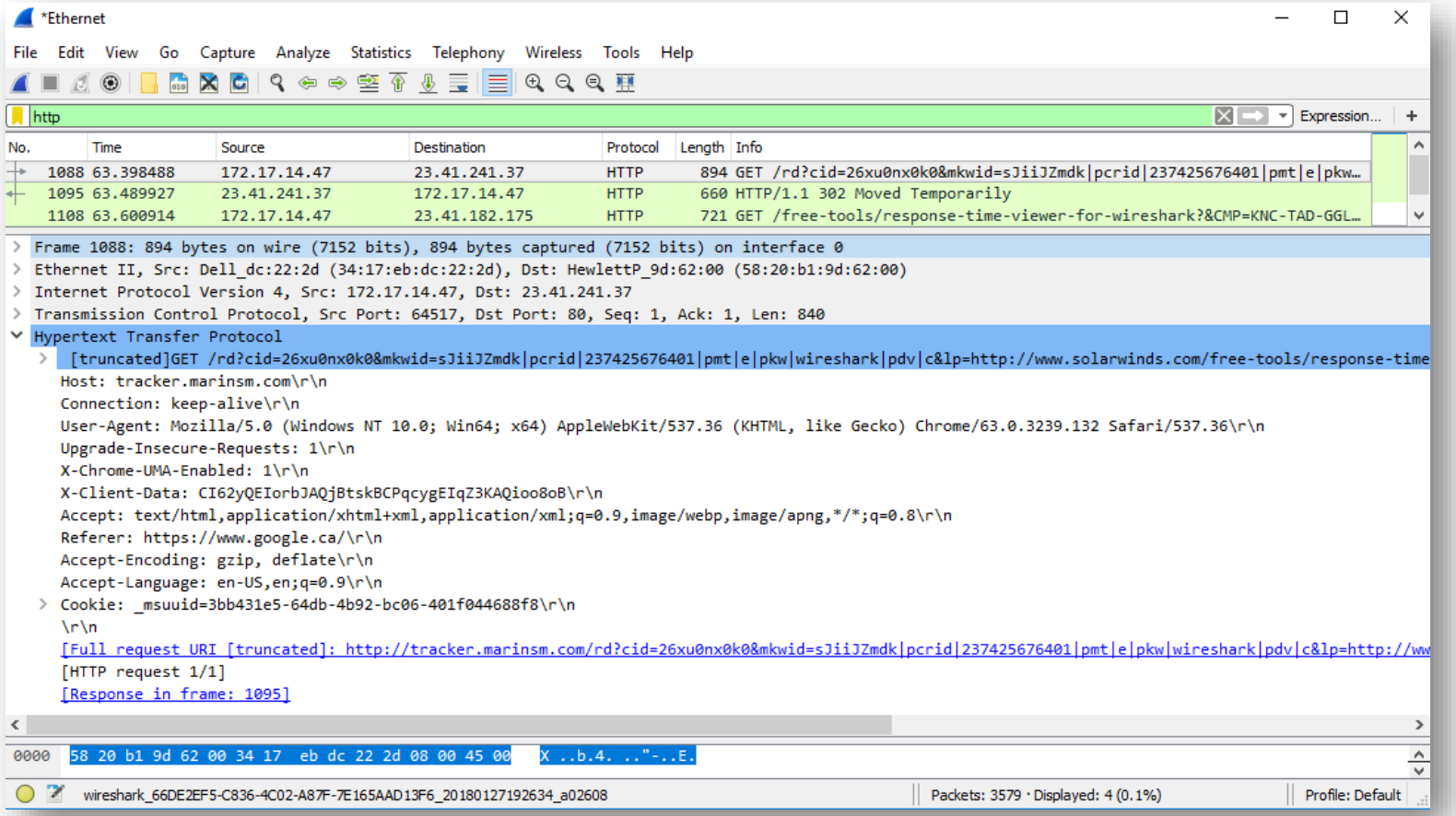
Frame

Ethernet

IP

TCP

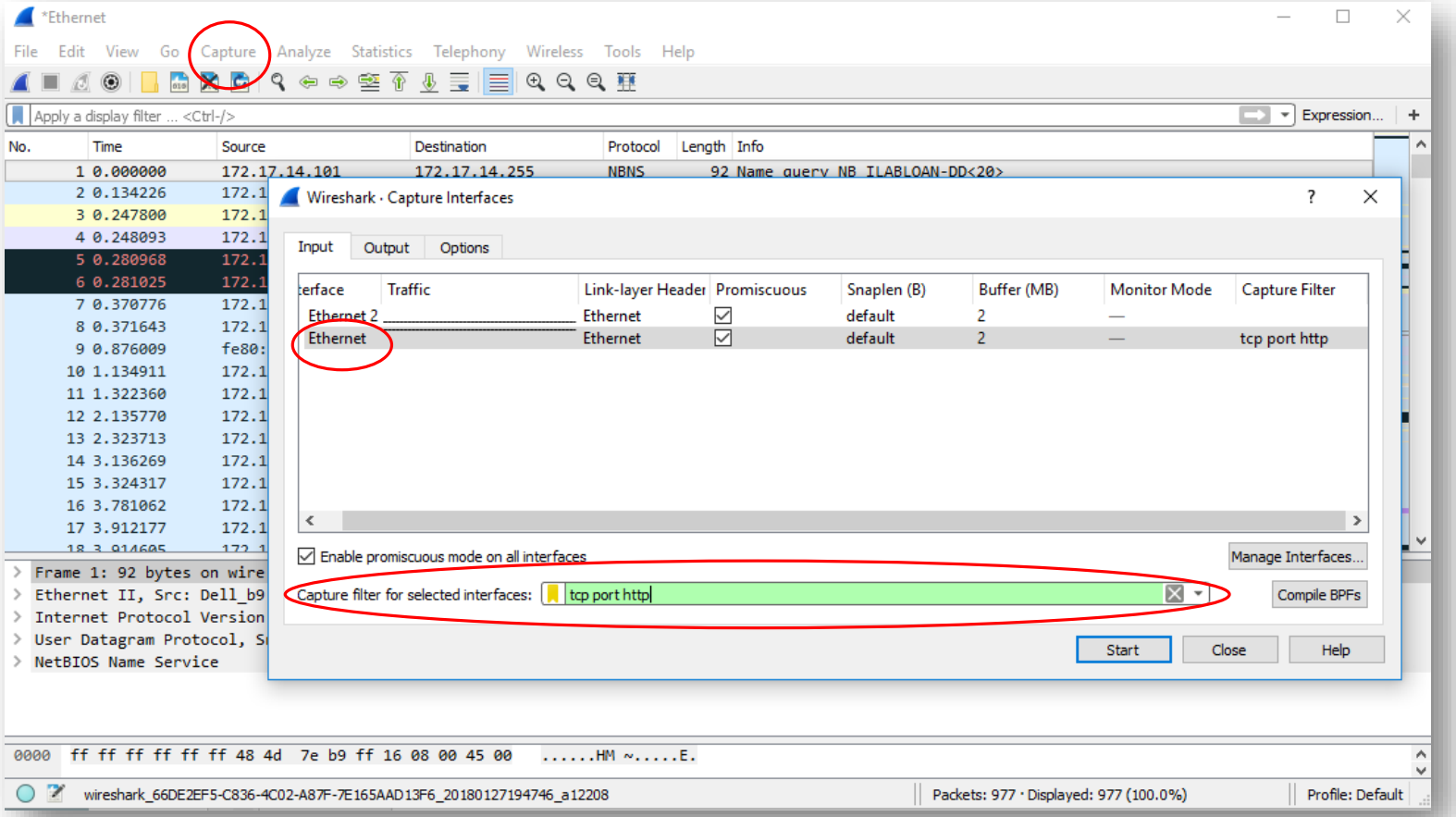
Analyze an HTTP Request



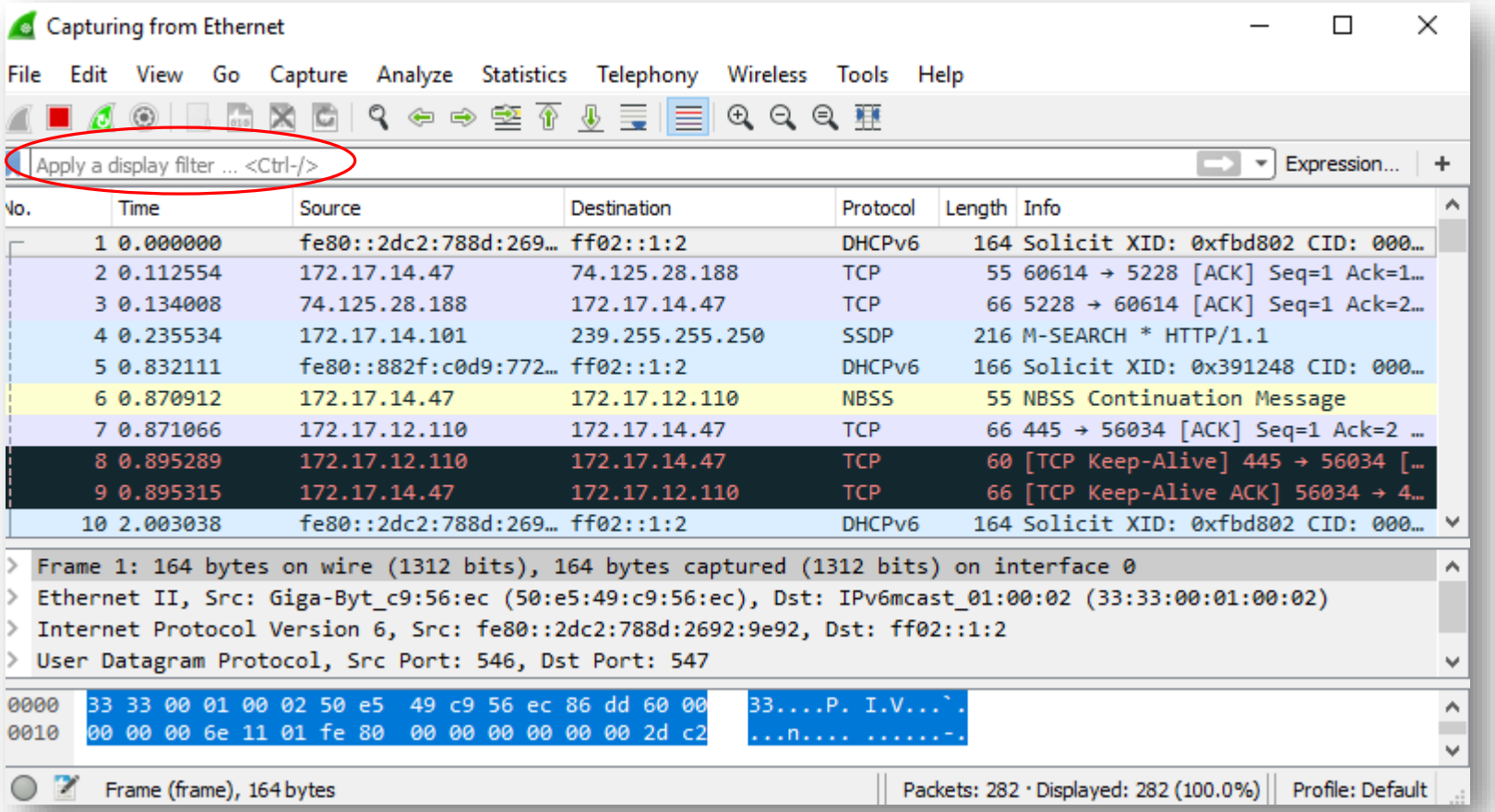
Wireshark Filters

- Capture Filters
  - Removes unwanted packets from a packet trace and only retrieve the packets of interest
- Display Filters
  - Hides unwanted packets based on your filter definition

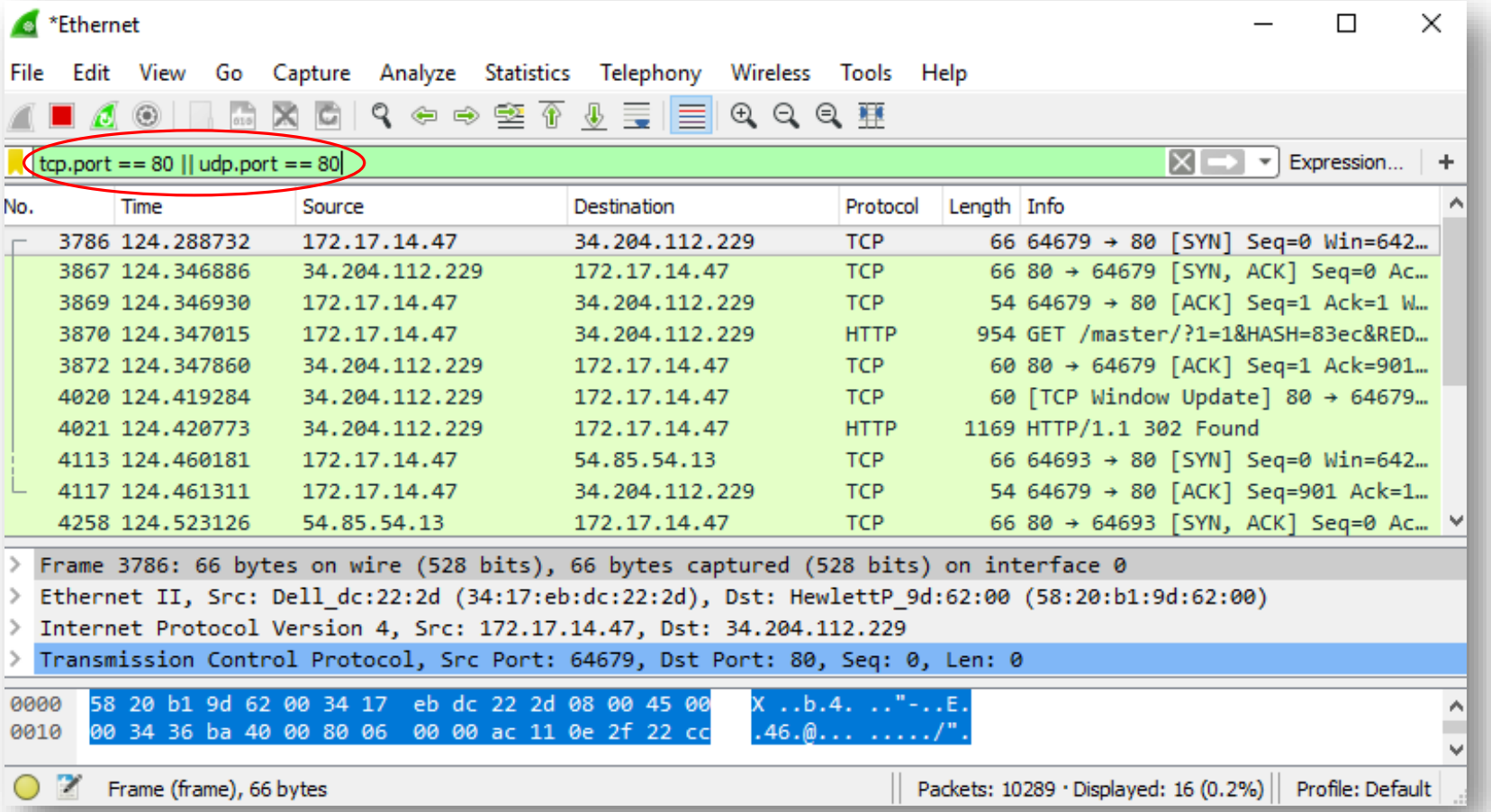
Capture Filter



Display Filter



Display Filter Example



Filter Examples

The operators are similar to programming languages:

- == Equal
- != Not Equal
- > Greater Than
- < Less Than
- >= Greater than or Equal to
- <= Less than or Equal to
- && Logical AND
- || Logical OR
- ! Logical NOT

In display filter:

- `tcp.port == 80`
- `eth.addr == 00:00:5e:00:53:00`
- `tcp.port == 80 || udp.port == 80`
- `tcp.port == 80 && ip.src == 172.17.14.47`
- `http.request.version=="HTTP/1.1"`
- `tcp.dstport == 25`

In capture filter:

- `tcp port 80`
- `ip src host 136.159.5.20`
- `host 136.159.5.1 (source/destination)`
- `(src host 23.36.178.81 and not`
- `dst host 172.17.14.47) and tcp`
- `dst portrange 200-10000`

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Filters: slice operator

- You can take a slice of a field if the field is a text string or a byte array:
  - `http.location[0:12] == “http://pages”`
  - `http.content_type[0:4] == “text”`
  - `http.host contains “pages.cpsc”`

References

https://en.wikipedia.org/wiki/Wireshark

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