

EEM413_Lab5

Wireshark interface showing a packet capture. The packet list on the left shows several packets. Packet 277 is selected, and its details are shown in the middle pane. The packet is an Ethernet II frame, an Internet Protocol (IP) packet, and a Transmission Control Protocol (TCP) segment. The source IP is 192.168.1.121 and the destination IP is 128.119.245.12. The source port is 49438 and the destination port is 80. The packet length is 66 bytes.

No.	Time	Source	Destination	Protocol	Info
276	12.241023	192.168.1.121	128.119.245.12	TCP	49425 > https [FIN, ACK] Seq=1383 Ack=3403 Win=0 Len=0
277	12.396465	192.168.1.121	128.119.245.12	TCP	49425 > https [ACK] Seq=5405 Ack=1386 Win=64151 Len=0
278	16.261244	192.168.1.121	128.119.245.12	TCP	49427 > http [SYN] Seq=0 win=8192 len=0 MSS=1460
279	16.436888	128.119.245.12	192.168.1.121	TCP	http > 49427 [SYN, ACK] Seq=0 Ack=1 win=5840 Len=0
280	16.437179	192.168.1.121	128.119.245.12	TCP	49427 > http [ACK] Seq=1 Ack=1 win=17424 Len=0
281	16.439361	192.168.1.121	128.119.245.12	HTTP	POST /etherbase-labs/lab3-1-reply.htm HTTP/1.1 (
282	16.610854	128.119.245.12	192.168.1.121	TCP	http > 49427 [ACK] Seq=1 Ack=795 win=7428 Len=0
283	16.611166	128.119.245.12	192.168.1.121	TCP	http > 49427 [ACK] Seq=1 Ack=987 win=9016 Len=0
284	16.611832	128.119.245.12	192.168.1.121	TCP	[TCP segment of a reassembled PDU]
285	16.612367	128.119.245.12	192.168.1.121	HTTP	HTTP/1.1 200 OK (text/html)
286	16.612403	192.168.1.121	128.119.245.12	TCP	49427 > http [ACK] Seq=987 Ack=725 win=16700 Len=0
287	22.177986	Pirelli18-f8:ba:85	Broadcast	ARP	Who has 192.168.1.121? Tell 192.168.1.1
288	22.178013	00:22:fb:bc:b3:ae	Pirelli18-f8:ba:85	ARP	192.168.1.121 is at 00:22:fb:bc:b3:ae

Frame 277 (66 bytes on wire, 66 bytes captured)

- Ethernet II, Src: 00:22:fb:bc:b3:ae (00:22:fb:bc:b3:ae), Dst: Pirelli18-f8:ba:85 (00:1d:8b:f8:ba:85)
- Internet Protocol, Src: 192.168.1.121 (192.168.1.121), Dst: 128.119.245.12 (128.119.245.12)
- Version: 4
- Header length: 20 bytes
- Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
- Total Length: 52
- Identification: 0x0e97 (3735)
- Flags: 0x04 (Don't Fragment)
- Fragment offset: 0
- Time to live: 128
- Protocol: TCP (0x06)

0000 00 1d 8b f8 ba 85 00 22 fb bc b3 ae 08 00 45 00 E.
0010 00 34 0e 97 40 00 80 06 b4 87 c0 a8 01 79 80 77 .4..@...p...y.w
0020 f5 0c c1 13 00 50 ea 28 4f 24 00 00 00 00 80 02 P.(0\$.....
0030 20 00 1c 00 00 02 04 05 b4 01 03 03 02 01 01[.....

1) IP numaramız: 192.168.1.121

Source port numarası: 49438

Wireshark interface showing a packet capture. The packet list on the left shows several packets. Packet 191 is selected, and its details are shown in the middle pane. The packet is an Ethernet II frame, an Internet Protocol (IP) packet, and a Transmission Control Protocol (TCP) segment. The source IP is 192.168.1.121 and the destination IP is 128.119.245.12. The source port is 49438 and the destination port is 80. The packet length is 54 bytes.

No.	Time	Source	Destination	Protocol	Info
191	00.34.0e.97.40.00.80.06	192.168.1.121	128.119.245.12	TCP	49438 > http [ACK] Seq=308 Ack=152453 Win=0 Len=0

Frame 191 (54 bytes on wire, 54 bytes captured)

- Ethernet II, Src: 00:22:fb:bc:b3:ae (00:22:fb:bc:b3:ae), Dst: Pirelli18-f8:ba:85 (00:1d:8b:f8:ba:85)
- Internet Protocol, Src: 192.168.1.121 (192.168.1.121), Dst: 128.119.245.12 (128.119.245.12)
- Transmission Control Protocol, Src Port: 49438 (49438), Dst Port: http (80), Seq: 308, Ack: 152453, Len: 0
- Source port: 49438 (49438)
- Destination port: http (80)
- Sequence number: 308 (relative sequence number)
- Acknowledgement number: 152453 (relative ack number)
- Header length: 20 bytes
- Flags: 0x10 (ACK)
- Window size: 218120 (scaled)
- Checksum: 0x5bd0 [correct]

0000 00 1d 8b f8 ba 85 00 22 fb bc b3 ae 08 00 45 00 E.
0010 00 28 0f ba 40 00 80 06 b3 70 c0 a8 01 79 80 77 .(..@...p...y.w
0020 f5 0c c1 1e 00 50 bd 80 93 98 cf 8e 65 45 50 10 P...eEP..
0030 d5 02 5b d0 00 00[.....

2) IP adresi: 128.119.245.12 ve port numarası 80 (HTTP)

3) Source IP adres: 192.168.1.121 ve port numarası 49438'dir

4) Sıra numarası olarak 0 ile işaretlenir. Syn flag :1

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# Ethernet II, Src: PirelliB-f8:ba:85:00:22:fb (00:1d:8b:f8:ba:85), Dst: 00:22:fb:bc:b3:ae (00:11:19:24:51:12)
# Transmission Control Protocol, Src Port: 49438 (49438), Dst Port: http (80), Seq: 0, Len: 0
  Source port: 49438 (49438)
  Destination port: http (80)
  Sequence number: 0 (relative sequence number)
  Header length: 32 bytes
# Flags: 0x02 (SYN)
  0... .. = Congestion Window Reduced (CWR): Not set
  .0.. .. = ECN-Echo: Not set
  ..0. .. = Urgent: Not set
  ...0 .. = Acknowledgment: Not set
  ....0... = Push: Not set
  .... .0.. = Reset: Not set
  .... ..1. = Syn: Set
  .... ...0 = Fin: Not set
  Window size: 8192
# Checksum: 0x061d [correct]
# Options: (12 bytes)
0000  00 1d 8b f8 ba 85 00 22 fb bc b3 ae 08 00 45 00  ....".....E.
0010  00 34 0f 76 40 00 80 06 b3 a8 c0 a8 01 79 80 77  .4.v@... ..y.w
0020  f5 0c c1 1e 00 50 bd 80 92 64 00 00 00 80 02  ....P...d.....
0030  20 00 06 1d 00 00 02 04 05 b4 01 03 03 02 01 01  .........
0040  02 02  ....
File: "C:\Users\Eren\AppData\Local\Te...  Packets: 386 Displayed: 386 Marked: 0 Dropped: 0  Profile: Default

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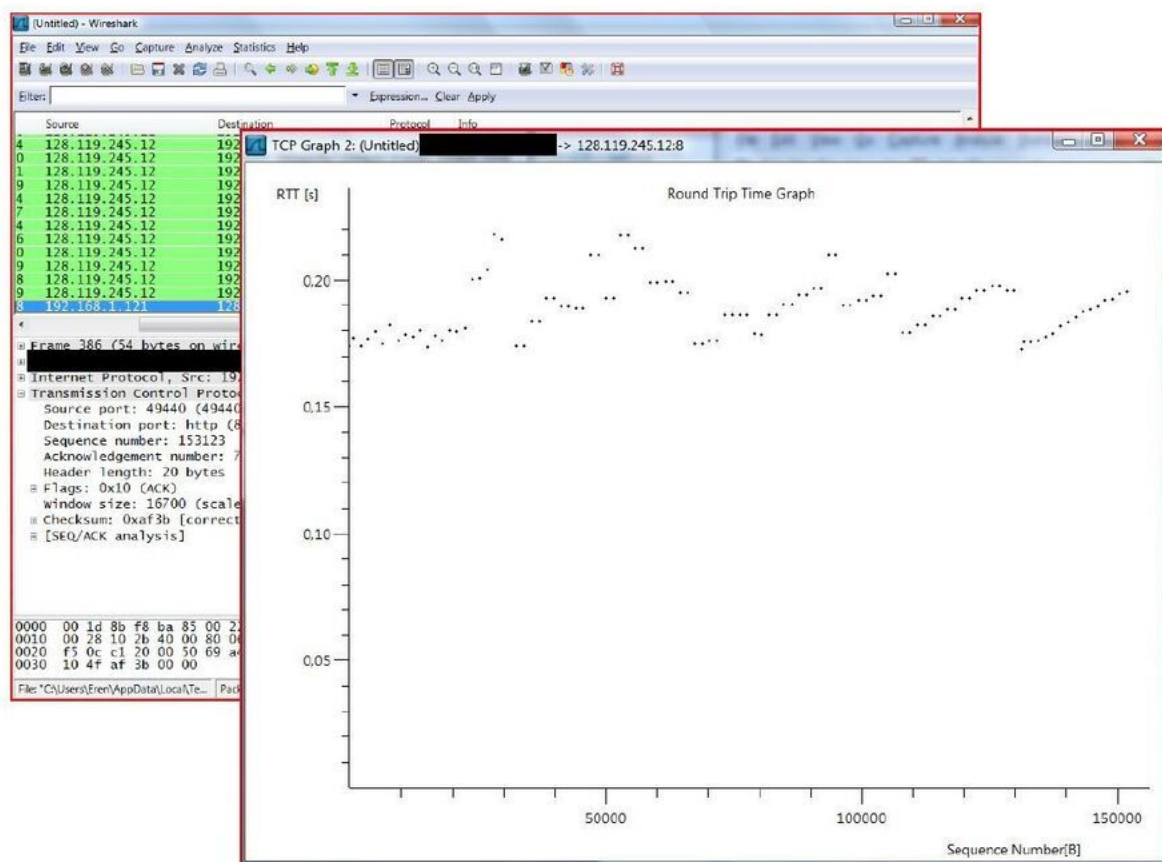
5) Sıra numarası 0 olarak ayarlanır. Syn ve Ack flag'leri set yapılır.

```

# Frame 2 (66 bytes on wire, 66 bytes captured)
# Ethernet II, Src: PirelliB-f8:ba:85:00:1d:8b (00:1d:8b:f8:ba:85), Dst: 00:22:fb:bc:b3:ae (00:22:fb:bc:b3:ae)
# Internet Protocol, Src: 128.119.245.12 (128.119.245.12), Dst: 192.168.1.121 (192.168.1.121)
# Transmission Control Protocol, Src Port: http (80), Dst Port: 49438 (49438), Seq: 0, Ack: 1, Len: 0
  Source port: http (80)
  Destination port: 49438 (49438)
  Sequence number: 0 (relative sequence number)
  Acknowledgement number: 1 (relative ack number)
  Header length: 32 bytes
# Flags: 0x12 (SYN, ACK)
  0... .. = Congestion Window Reduced (CWR): Not set
  .0.. .. = ECN-Echo: Not set
  ..0. .. = Urgent: Not set
  ...1 .. = Acknowledgment: Set
  ....0... = Push: Not set
  .... .0.. = Reset: Not set
  .... ..1. = Syn: Set
  .... ...0 = Fin: Not set
  Window size: 8192
# Checksum: 0x061d [correct]
# Options: (12 bytes)
0000  00 22 fb bc b3 ae 00 1d 8b f8 ba 85 08 00 45 00  ....".....E.
0010  00 34 00 00 40 00 31 06 12 1f 80 77 f5 0c c0 a8  .4..@.1. ....w...
0020  01 79 00 50 c1 1e cf 8c 11 c0 bd 80 92 65 80 12  .y.P.....e....
0030  16 d0 2d f7 00 00 02 04 05 ac 01 01 04 02 01 03  ..-.....
0040  02 02  ....
File: "C:\Users\Eren\AppData\Local\Te...  Packets: 386 Displayed: 386 Marked: 0 Dropped: 0  Profile: Default

```

6) sequence number: 153123


$$7) \text{ EstimatedRTT} = (1 - \alpha) \text{ EstimatedRTT} + \alpha \text{ SampleRTT}$$

8) İlk altı TCP segmentin uzunluğu 20 byte.

9) Son ACK onay kaynağı 6012 olarak görünüyor.

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Frame 10 (1506 bytes on wire, 1506 bytes captured)
Ethernet II, Src: PirrelliB_f8:ba:85 (00:1d:8b:f8:ba:85), Dst: 00:22:fb:bc:b3:ae (00:22:fb:bc:b3:ae)
Internet Protocol, Src: 128.119.245.12 (128.119.245.12), Dst: 192.168.1.121 (192.168.1.121)
Transmission Control Protocol, Src Port: http (80), Dst Port: 49438 (49438), Seq: 3219, Ack: 308, Len: 1452
  Source port: http (80)
  Destination port: 49438 (49438)
  Sequence number: 3219 (relative sequence number)
  [Next sequence number: 4671 (relative sequence number)]
  Acknowledgement number: 308 (relative ack number)
  Header length: 20 bytes
  Flags: 0x10 (ACK)
  Window size: 6912 (scaled)
  Checksum: 0xbd24 [correct]
  [Reassembled PDU in frame: 190]
  TCP segment data (1452 bytes)

0020  01 79 00 50 c1 1e cf 8c 1e 53 bd 80 93 98 50 10  .y.P....S....P.
0030  06 c0 bd 24 00 00 20 68 6f 75 73 65 21 27 20 28  .$...h ousel' (
0040  57 68 69 63 68 20 77 61 73 20 76 65 72 79 20 6c  which wa s very l
0050  69 6b 65 6c 79 0d 0a 74 72 75 65 2e 29 0d 0a 0d  ikely..t rue.)...
0060  0a 70 70 44 6e 77 6a 7e 70 64 6e 77 6a 7e 70 64  from down d

Window size (tcp.window_size), 2 bytes | Packets: 386 Displayed: 386 Marked: 0 Dropped: 0 | Profile: Default
```

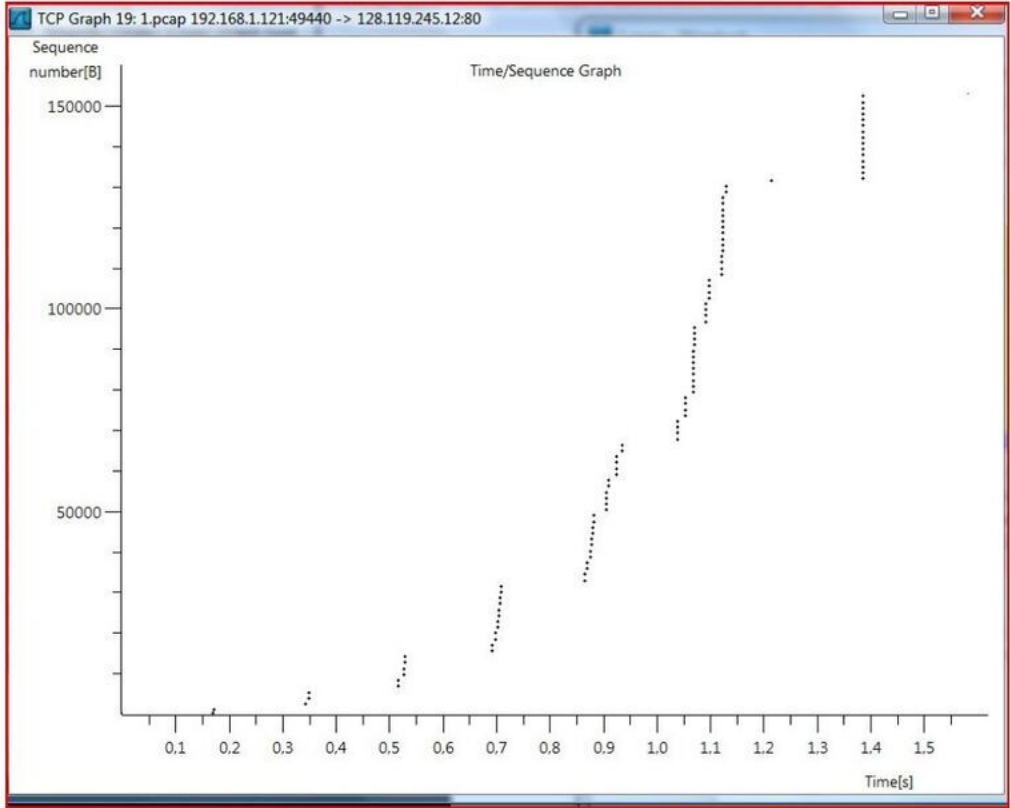
10) Bilgisayarımızda herhangi bir transfer gözüküyor. Yeniden göndermek için sıra numarasını kontrol etmek gerekiyor.

11) ACK'in kaynağı kendi segmentinde görünüyor.

12) Gönderilen byte 152198

$$\text{Troughput} = \frac{\text{Gönderim zamanı}}{\text{Gönderim zamanı}} = \frac{152198}{17.152008 - 16.955966} = 776354 \text{ bps}$$

13) Aktarımın yavaşça başlayıp, daha sonra hızlandığını görebiliriz. Ayrıca oluşan sıkışıklıkta grafiğin sağ tarafında görülebilmekte.



14) Transfer yavaşça başladı ve giderek hızlanarak son buldu. Transfer sırasında ki sıkışıklık grafikte sağ tarafa görülebilmekte.