

LAB 3a

1/ IP address and TCP port number of source:

Src Port: 1161

IP address: 192.168.1.102

```
No.      Time                Source                Destination           Protocol Length Info
199 2004-08-21 20:44:25.867722 192.168.1.102        128.119.245.12        HTTP      104    POST /ethereal-labs/lab3-1-reply.htm HTTP/1.1
(text/plain)
Frame 199: 104 bytes on wire (832 bits), 104 bytes captured (832 bits)
Ethernet II, Src: Actionte_8a:70:1a (00:20:e0:8a:70:1a), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 164041, Ack: 1, Len: 50
  Source Port: 1161
  Destination Port: 80
  [Stream index: 0]
  [TCP Segment Len: 50]
  Sequence Number: 164041 (relative sequence number)
  Sequence Number (raw): 232293053
  [Next Sequence Number: 164091 (relative sequence number)]
  Acknowledgment Number: 1 (relative ack number)
  Acknowledgment number (raw): 883061786
  0101 .... = Header Length: 20 bytes (5)
  Flags: 0x018 (PSH, ACK)
  Window: 17520
  [Calculated window size: 17520]
  [Window size scaling factor: -2 (no window scaling used)]
  Checksum: 0x9f0f [unverified]
  [Checksum Status: Unverified]
  Urgent Pointer: 0
  [SEQ/ACK analysis]
  [Timestamps]
  TCP payload (50 bytes)
  TCP segment data (50 bytes)
[122 Reassembled TCP Segments (164090 bytes): #4(565), #5(1460), #7(1460), #8(1460), #10(1460), #11(1460), #13(1147), #18(1460), #19(1460),
#20(1460), #21(1460), #22(1460), #23(892), #30(1460), #31(1460), #32(1460), #33(1460), #34(1460), #3]
Hypertext Transfer Protocol
MIME Multipart Media Encapsulation, Type: multipart/form-data, Boundary: "-----265001916915724"
```

2/ IP address of gaia.cs.umass.edu: 128.119.245.12

Sending Port: 199

Receive Port: 203

```

No.      Time           Source            Destination      Protocol Length Info
199 2004-08-21 20:44:25.867722 192.168.1.102    128.119.245.12  HTTP      104      POST /ethereal-labs/lab3-1-reply.htm HTTP/1.1
(text/plain)
Frame 199: 104 bytes on wire (832 bits), 104 bytes captured (832 bits)
Ethernet II, Src: Actionte_8a:70:1a (00:20:e0:8a:70:1a), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 164041, Ack: 1, Len: 50
  Source Port: 1161
  Destination Port: 80
  [Stream index: 0]
  [TCP Segment Len: 50]
  Sequence Number: 164041 (relative sequence number)
  Sequence Number (raw): 232293053
  [Next Sequence Number: 164091 (relative sequence number)]
  Acknowledgment Number: 1 (relative ack number)
  Acknowledgment number (raw): 883061786
  0101 .... = Header Length: 20 bytes (5)
  Flags: 0x018 (PSH, ACK)
  Window: 17520
  [Calculated window size: 17520]
  [Window size scaling factor: -2 (no window scaling used)]
  Checksum: 0x9f0f [unverified]
  [Checksum Status: Unverified]
  Urgent Pointer: 0
  [SEQ/ACK analysis]
  [Timestamps]
  TCP payload (50 bytes)
  TCP segment data (50 bytes)
[122 Reassembled TCP Segments (164090 bytes): #4(565), #5(1460), #7(1460), #8(1460), #10(1460), #11(1460), #13(1147), #18(1460), #19(1460),
#20(1460), #21(1460), #22(1460), #23(892), #30(1460), #31(1460), #32(1460), #33(1460), #34(1460), #3]
Hypertext Transfer Protocol
MIME Multipart Media Encapsulation, Type: multipart/form-data, Boundary: "-----265001916915724"

```

The image shows a screenshot of the Wireshark network traffic analysis tool. The top pane displays a list of captured packets. Packet 199 is selected, showing an HTTP POST request to /ethereal-labs/lab3-1-reply.htm. The bottom pane shows the detailed view of this packet, including Ethernet II, Internet Protocol Version 4, and Transmission Control Protocol (TCP) fields. The TCP segment is a POST request with a sequence number of 164041 and an acknowledgment number of 1. The payload is a multipart/form-data request.

No.	Time	Source	Destination	Protocol	Length	Info
196	2004-08-21 20:44:25.771531	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=162309 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
197	2004-08-21 20:44:25.772405	192.168.1.102	128.119.245.12	TCP	326	1161 → 80 [PSH, ACK] Seq=163769 Ack=1 Win=17520 Len=272 [TCP segment of a reassembled PDU]
198	2004-08-21 20:44:25.867638	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=159389 Win=62780 Len=0
199	2004-08-21 20:44:25.867722	192.168.1.102	128.119.245.12	HTTP	104	POST /ethereal-labs/lab3-1-reply.htm HTTP/1.1 (text/plain)
200	2004-08-21 20:44:25.959852	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=162309 Win=62780 Len=0
201	2004-08-21 20:44:26.018268	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=164041 Win=62780 Len=0
202	2004-08-21 20:44:26.026211	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=164091 Win=62780 Len=0
203	2004-08-21 20:44:26.031556	128.119.245.12	192.168.1.102	HTTP	784	HTTP/1.1 200 OK (text/html)
204	2004-08-21 20:44:26.1630718	192.168.1.102	192.168.1.1	SSDP	174	192.168.1.1:1900 → 224.0.0.252:1900 [ST] Seq=164041 Len=174
205	2004-08-21 20:44:26.169463	192.168.1.102	192.168.1.1	SSDP	175	192.168.1.1:1900 → 224.0.0.252:1900 [ST] Seq=164041 Len=175
206	2004-08-21 20:44:26.221522	192.168.1.102	128.119.245.12	TCP	54	1161 → 80 [ACK] Seq=164091 Ack=731 Win=16790 Len=0

Packet 199 Details:

- Ethernet II:** Src: Actionte_8a:70:1a (00:20:e0:8a:70:1a), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
- Internet Protocol Version 4:** Src: 192.168.1.102, Dst: 128.119.245.12
- Transmission Control Protocol:** Src Port: 1161, Dst Port: 80, Seq: 164041, Ack: 1, Len: 50
 - Source Port: 1161
 - Destination Port: 80
 - [Stream index: 0]
 - [TCP Segment Len: 50]
 - Sequence Number: 164041 (relative sequence number)
 - Sequence Number (raw): 232293053
 - [Next Sequence Number: 164091 (relative sequence number)]
 - Acknowledgment Number: 1 (relative ack number)
 - Acknowledgment number (raw): 883061786
 - 0101 = Header Length: 20 bytes (5)
 - Flags: 0x018 (PSH, ACK)
 - Window: 17520
 - [Calculated window size: 17520]
 - [Window size scaling factor: -2 (no window scaling used)]
 - Checksum: 0x9f0f [unverified]
 - [Checksum Status: Unverified]
 - Urgent Pointer: 0
 - [SEQ/ACK analysis]
 - [Timestamps]

3/

IP address: 192.168.0.109

Source Port: 57626

```
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tcp
No. Time Source Destination Protocol Length Info
929 2021-10-23 19:25:24.894193 128.119.245.12 192.168.0.109 TCP 60 80 -> 57626 [ACK] Seq=1 Ack=135689 Win=229632 Len=0
930 2021-10-23 19:25:24.894207 192.168.0.109 128.119.245.12 TCP 1506 57626 -> 80 [ACK] Seq=150209 Ack=1 Win=131328 Len=1452 [TCP segment of a reassembled PDU]
931 2021-10-23 19:25:24.895802 128.119.245.12 192.168.0.109 TCP 60 80 -> 57626 [ACK] Seq=1 Ack=137141 Win=232576 Len=0
932 2021-10-23 19:25:24.895815 192.168.0.109 128.119.245.12 HTTP 1431 POST /wireshark-labs/lab3-1-reply.htm HTTP/1.1 (text/plain)
933 2021-10-23 19:25:24.895968 128.119.245.12 192.168.0.109 TCP 60 80 -> 57626 [ACK] Seq=1 Ack=138593 Win=235520 Len=0
934 2021-10-23 19:25:24.897864 128.119.245.12 192.168.0.109 TCP 60 80 -> 57626 [ACK] Seq=1 Ack=141497 Win=241280 Len=0
935 2021-10-23 19:25:24.915813 192.168.0.109 74.125.250.102 UDP 81 59213 -> 19305 Len=39
936 2021-10-23 19:25:24.924535 74.125.250.102 192.168.0.109 UDP 105 19305 -> 59213 Len=63
937 2021-10-23 19:25:24.945464 74.125.250.102 192.168.0.109 UDP 81 19305 -> 59213 Len=39
938 2021-10-23 19:25:24.949088 74.125.250.102 192.168.0.109 UDP 1171 19305 -> 59213 Len=1129

> Frame 932: 1431 bytes on wire (11448 bits), 1431 bytes captured (11448 bits) on interface \Device\NPF_{D9088395-D95C-4F8F-8B07-C7B87A32C3F6}, id 0
> Ethernet II, Src: IntelCor_c9:e4:5b (dc:71:96:c9:e4:5b), Dst: Tp-LinkT_ic:c1:85 (50:d4:f7:1c:c1:85)
> Internet Protocol Version 4, Src: 192.168.0.109, Dst: 128.119.245.12
> Transmission Control Protocol, Src Port: 57626, Dst Port: 80, Seq: 151661, Ack: 1, Len: 1377
  Source Port: 57626
  Destination Port: 80
  [Stream index: 8]
  [TCP Segment Len: 1377]
  Sequence Number: 151661 (relative sequence number)
  Sequence Number (raw): 129614280
  [Next Sequence Number: 153038 (relative sequence number)]
  Acknowledgment Number: 1 (relative ack number)
  Acknowledgment number (raw): 181321926
  0101 .... = Header Length: 20 bytes (5)
  > Flags: 0x018 (PSH, ACK)
  Window: 513
  [Calculated window size: 131328]
  [Window size scaling factor: 256]
  Checksum: 0x3c15 [unverified]
  [Checksum Status: Unverified]
  Urgent Pointer: 0
  > [SEQ/ACK analysis]
  > [Timestamps]
  TCP payload (1377 bytes)

0020 f5 0c e1 1a 00 50 07 b9 c1 78 0a ce c0 c6 50 18 ....P...X....P.
Frame (1431 bytes) Reassembled TCP (153037 bytes)
```

4/

The sequence number of the TCP SYN segment is 0 that is used to imitate the TCP connection between the client computer and gaia.cs.umass.edu.

In the Flags section, the Syn flag is set to 1 which indicates that this segment is a SYN segment

```
tcp
No. Time Source Destination Protocol Length Info
1 2004-08-21 20:44:20.570381 192.168.1.102 128.119.245.12 TCP 62 1161 -> 80 [SYN] Seq=0 Win=16384 Len=0 MSS=1460 SACK_PERM=1
2 2004-08-21 20:44:20.593553 128.119.245.12 192.168.1.102 TCP 62 80 -> 1161 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SACK_PERM=1
3 2004-08-21 20:44:20.593646 192.168.1.102 128.119.245.12 TCP 54 1161 -> 80 [ACK] Seq=1 Ack=1 Win=17520 Len=0
4 2004-08-21 20:44:20.596858 192.168.1.102 128.119.245.12 TCP 619 1161 -> 80 [PSH, ACK] Seq=1 Ack=1 Win=17520 Len=565 [TCP segment of a reassembled PDU]
5 2004-08-21 20:44:20.612118 192.168.1.102 128.119.245.12 TCP 1514 1161 -> 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
6 2004-08-21 20:44:20.624318 128.119.245.12 192.168.1.102 TCP 60 80 -> 1161 [ACK] Seq=1 Ack=566 Win=6780 Len=0
7 2004-08-21 20:44:20.624407 192.168.1.102 128.119.245.12 TCP 1514 1161 -> 80 [ACK] Seq=2026 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
8 2004-08-21 20:44:20.625071 192.168.1.102 128.119.245.12 TCP 1514 1161 -> 80 [ACK] Seq=3486 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
9 2004-08-21 20:44:20.647675 128.119.245.12 192.168.1.102 TCP 60 80 -> 1161 [ACK] Seq=1 Ack=2026 Win=8760 Len=0
10 2004-08-21 20:44:20.647786 192.168.1.102 128.119.245.12 TCP 1514 1161 -> 80 [ACK] Seq=4946 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]

Sequence Number: 0 (relative sequence number)
Sequence Number (raw): 232129012
[Next Sequence Number: 1 (relative sequence number)]
Acknowledgment Number: 0
Acknowledgment number (raw): 0
0111 .... = Header Length: 28 bytes (7)
> Flags: 0x002 (SYN)
  0000 .... = Reserved: Not set
  ...0 .... = Nonce: Not set
  ...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
  > ....0... = Syn: Set
  ....0... = Fin: Not set
  [TCP Flags: .....S.]
  Window: 16384
  [Calculated window size: 16384]
  Checksum: 0xf6e9 [unverified]
  [Checksum Status: Unverified]
  Urgent Pointer: 0
  > Options: (8 bytes), Maximum segment size, No-Operation (NOP), No-Operation (NOP), SACK permitted
  > [Timestamps]
```

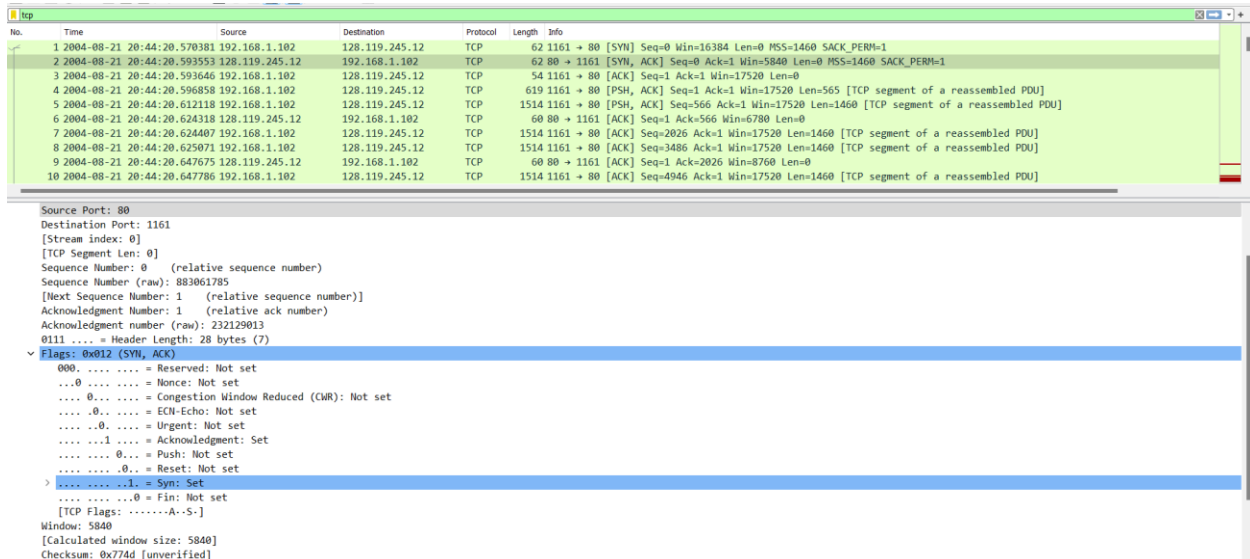
5/

The sequence number of the SYNACK segment sent by gaia.cs.umass.edu to the client computer in reply to the SYN is 0.

The value of the Acknowledgement field in the SYNACK segment is 1.

The value of the ACKnowledgement field in the SYNACK segment is determined by the server
gaia.cs.umass.edu

The segment that identifies the segment as a SYNACK segment is 1

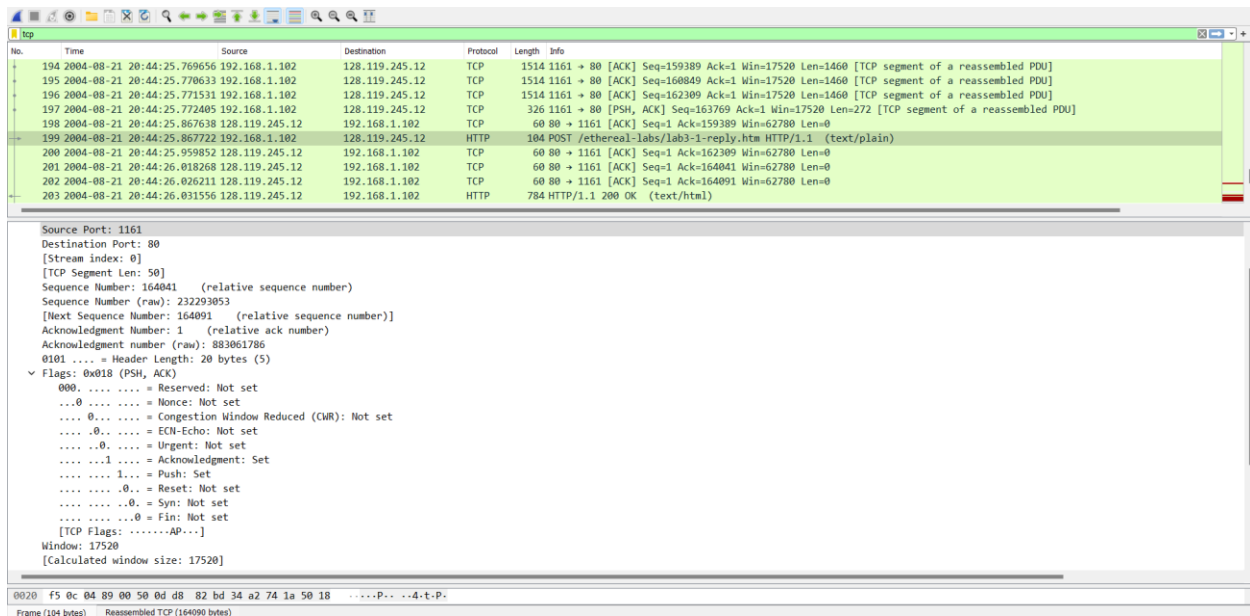


No.	Time	Source	Destination	Protocol	Length	Info
1	2004-08-21 20:44:20.570381	192.168.1.102	128.119.245.12	TCP	62	1161 → 80 [SYN] Seq=0 Win=16384 Len=0 MSS=1460 SACK_PERM=1
2	2004-08-21 20:44:20.593553	128.119.245.12	192.168.1.102	TCP	62	80 → 1161 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SACK_PERM=1
3	2004-08-21 20:44:20.593646	192.168.1.102	128.119.245.12	TCP	54	1161 → 80 [ACK] Seq=1 Ack=1 Win=17520 Len=0
4	2004-08-21 20:44:20.596858	192.168.1.102	128.119.245.12	TCP	619	1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17520 Len=565 [TCP segment of a reassembled PDU]
5	2004-08-21 20:44:20.612118	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
6	2004-08-21 20:44:20.624407	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=566 Win=6780 Len=0
7	2004-08-21 20:44:20.624407	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=2026 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
8	2004-08-21 20:44:20.625071	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=3486 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
9	2004-08-21 20:44:20.647675	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=2026 Win=8760 Len=0
10	2004-08-21 20:44:20.647786	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=4946 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]

Source Port: 80
Destination Port: 1161
[Stream index: 0]
[TCP Segment Len: 0]
Sequence Number: 0 (relative sequence number)
Sequence Number (raw): 883061785
[Next Sequence Number: 1 (relative sequence number)]
Acknowledgment Number: 1 (relative ack number)
Acknowledgment number (raw): 232129013
0111 = Header Length: 28 bytes (7)
▼ Flags: 0x012 (SYN, ACK)
0000 = Reserved: Not set
...0 = Nonce: Not set
....0... = Congestion Window Reduced (CWR): Not set
....0... = ECH-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
[TCP Flags:A..S.]
Window: 5840
[Calculated window size: 5840]
Checksum: 0x774d [unverified]

6/

The sequence number of the TCP segment containing the HTTP POST command is 1



No.	Time	Source	Destination	Protocol	Length	Info
194	2004-08-21 20:44:25.769556	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=159389 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
195	2004-08-21 20:44:25.770633	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=160849 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
196	2004-08-21 20:44:25.771531	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=162309 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
197	2004-08-21 20:44:25.772405	192.168.1.102	128.119.245.12	TCP	326	1161 → 80 [PSH, ACK] Seq=163769 Ack=1 Win=17520 Len=272 [TCP segment of a reassembled PDU]
198	2004-08-21 20:44:25.867638	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=159389 Win=62780 Len=0
199	2004-08-21 20:44:25.867722	192.168.1.102	128.119.245.12	HTTP	104	POST /ethereal-labs/lab3-1-reply.htm HTTP/1.1 (text/plain)
200	2004-08-21 20:44:25.959852	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=162309 Win=62780 Len=0
201	2004-08-21 20:44:26.018268	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=164041 Win=62780 Len=0
202	2004-08-21 20:44:26.026211	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=164091 Win=62780 Len=0
203	2004-08-21 20:44:26.031556	128.119.245.12	192.168.1.102	HTTP	784	HTTP/1.1 200 OK (text/html)

Source Port: 1161
Destination Port: 80
[Stream index: 0]
[TCP Segment Len: 50]
Sequence Number: 164041 (relative sequence number)
Sequence Number (raw): 232293053
[Next Sequence Number: 164091 (relative sequence number)]
Acknowledgment Number: 1 (relative ack number)
Acknowledgment number (raw): 883061786
0101 = Header Length: 20 bytes (5)
▼ Flags: 0x018 (PSH, ACK)
0000 = Reserved: Not set
...0 = Nonce: Not set
....0... = Congestion Window Reduced (CWR): Not set
....0... = ECH-Echo: Not set
....0... = Urgent: Not set
....1... = Acknowledgment: Set
....1... = Push: Set
....0... = Reset: Not set
....0... = Syn: Not set
....0... = Fin: Not set
[TCP Flags:AP...]
Window: 17520
[Calculated window size: 17520]

0020 f5 0c 04 09 00 50 d0 d8 82 bd 34 a2 74 1a 50 18P...4..t..P..
Frame 194 bytes on wire (1552 bytes captured) / Reassembled TCP (164090 bytes)

No.	Time	Source	Destination	Protocol	Length	Info
199	2004-08-21 20:44:25.867722	192.168.1.102	128.119.245.12	HTTP	104	POST /ethereal-labs/lab3-1-reply.htm HTTP/1.1 (text/plain)
200	2004-08-21 20:44:25.959852	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=162309 Win=62780 Len=0
201	2004-08-21 20:44:26.018268	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=164041 Win=62780 Len=0
202	2004-08-21 20:44:26.026211	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=164091 Win=62780 Len=0
203	2004-08-21 20:44:26.031556	128.119.245.12	192.168.1.102	HTTP	784	HTTP/1.1 200 OK (text/html)
204	2004-08-21 20:44:26.168471	192.168.1.100	192.168.1.1	SSDP	174	M-SEARCH * HTTP/1.1
205	2004-08-21 20:44:26.109463	192.168.1.100	192.168.1.1	SSDP	175	M-SEARCH * HTTP/1.1
206	2004-08-21 20:44:26.221522	192.168.1.102	128.119.245.12	TCP	54	1161 → 80 [ACK] Seq=164091 Ack=731 Win=16790 Len=0
207	2004-08-21 20:44:26.671425	192.168.1.100	192.168.1.1	SSDP	174	M-SEARCH * HTTP/1.1
208	2004-08-21 20:44:26.672450	192.168.1.100	192.168.1.1	SSDP	175	M-SEARCH * HTTP/1.1

Source Port:	80
Destination Port:	1161
[Stream index:	0]
[TCP Segment Len:	730]
Sequence Number:	1 (relative sequence number)
Sequence Number (raw):	883061786
[Next Sequence Number:	731 (relative sequence number)]
Acknowledgment Number:	164091 (relative ack number)
Acknowledgment number (raw):	232293183
0101 = Header Length:	20 bytes (5)
Flags:	0x018 (PSH, ACK)
000. = Reserved:	Not set
...0 = Nonce:	Not set
....0... = Congestion Window Reduced (CWR):	Not set
....0... = ECH-Echo:	Not set
....0... = Urgent:	Not set
....1... = Acknowledgment:	Set
....1... = Push:	Set
....0... = Reset:	Not set
....0... = Syn:	Not set
....0... = Fin:	Not set
[TCP Flags:AP...]
Window:	62780
[Calculated window size:	62780]
[Window size scaling factor:	-2 (no window scaling used)]

0020	01 66 00 50 04 89 34 a2 74 1a 0d d8 82 ef 50 18	-f-P-.4: t-....P-
0030	f5 3c a9 20 00 00 48 54 54 50 2f 31 2e 31 20 32	~<~..HT TP/1.1 2

7/ First six segments are 4, 5, 7, 8, 10, 11

Sequence index of segment 4: 1

Sequence index of segment 5: 566

Sequence index of segment 7: 2026

Sequence index of segment 8: 3486

Sequence index of segment 10: 4946

Sequence index of segment 11: 6406

The ACK of 6 first segments: 6, 9, 12, 14, 15, 16

Segment 1: sent: 0.596858 ack: 0.624318

Segment 2: sent: 0.612118 ack: 0.647675

Segment 3: sent: 0.624407 ack: 0.694466

Segment 4: sent: 0.625071 ack: 0.739499

Segment 5: sent: 0.647786 ack: 0.787680

Segment 6: sent: 0.648538 ack: 0.838183

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tcp

No.	Time	Source	Destination	Protocol	Length	Info
1	2004-08-21 20:44:20.570381	192.168.1.102	128.119.245.12	TCP	62	1161 → 80 [SYN] Seq=0 Win=16384 Len=0 MSS=1460 SACK_PERM=1
2	2004-08-21 20:44:20.593553	128.119.245.12	192.168.1.102	TCP	62	80 → 1161 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SACK_PERM=1
3	2004-08-21 20:44:20.593646	192.168.1.102	128.119.245.12	TCP	54	1161 → 80 [ACK] Seq=1 Ack=1 Win=17520 Len=0
4	2004-08-21 20:44:20.596858	192.168.1.102	128.119.245.12	TCP	619	1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17520 Len=565 [TCP segment of a reassembled PDU]
5	2004-08-21 20:44:20.612118	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
6	2004-08-21 20:44:20.624318	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=566 Win=6780 Len=0
7	2004-08-21 20:44:20.624407	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=2026 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
8	2004-08-21 20:44:20.625071	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=3486 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
9	2004-08-21 20:44:20.647675	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=2026 Win=8760 Len=0
10	2004-08-21 20:44:20.647786	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=4946 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
11	2004-08-21 20:44:20.648538	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=6406 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
12	2004-08-21 20:44:20.694466	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=3486 Win=11680 Len=0
13	2004-08-21 20:44:20.694566	192.168.1.102	128.119.245.12	TCP	1201	1161 → 80 [PSH, ACK] Seq=7866 Ack=1 Win=17520 Len=1147 [TCP segment of a reassembled PDU]

Source Port: 1161
Destination Port: 80
[Stream index: 0]
[TCP Segment Len: 1460]
Sequence Number: 566 (relative sequence number)
Sequence Number (raw): 232129578
[Next Sequence Number: 2026 (relative sequence number)]
Acknowledgment Number: 1 (relative ack number)
Acknowledgment number (raw): 883061786
0101 = Header Length: 20 bytes (5)
▼ Flags: 0x018 (PSH, ACK)
0000 = Reserved: Not set
...0 = Nonce: Not set
....0... = Congestion Window Reduced (CWR): Not set
....0... = ECN-Echo: Not set
....0... = Urgent: Not set
....1... = Acknowledgment: Set
....1... = Push: Set
....0... = Reset: Not set
....0... = Syn: Not set
....0... = Fin: Not set
[TCP Flags:AP....]

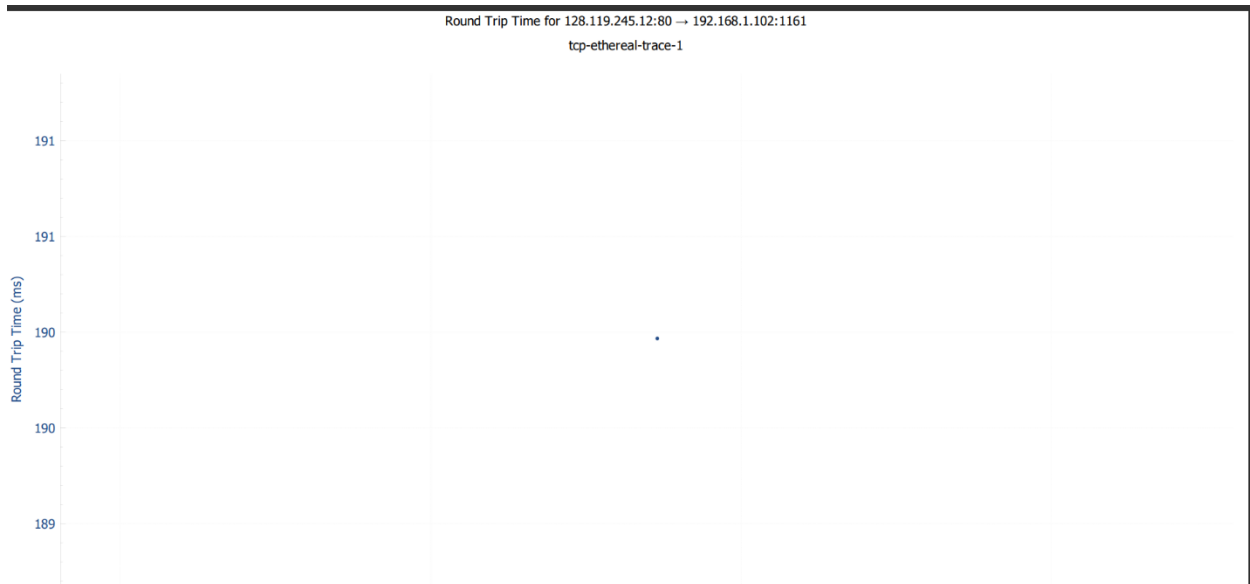
0020 f5 0c 04 89 00 50 0d d6 04 2a 34 a2 74 1a 50 18P...*4.t.P-
0030 44 70 3b e5 00 00 43 6f 6e 74 65 6e 74 2d 54 79 Dp;...Co ntent-ly

Source Port (tcp.arpnet), 2 bytes Packets: 213 · Displayed: 213 (100.0%) Profile: Defa

tcp

No.	Time	Source	Destination	Protocol	Length	Info
1	2004-08-21 20:44:20.570381	192.168.1.102	128.119.245.12	TCP	62	1161 → 80 [SYN] Seq=0 Win=16384 Len=0 MSS=1460 SACK_PERM=1
2	2004-08-21 20:44:20.593553	128.119.245.12	192.168.1.102	TCP	62	80 → 1161 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SACK_PERM=1
3	2004-08-21 20:44:20.593646	192.168.1.102	128.119.245.12	TCP	54	1161 → 80 [ACK] Seq=1 Ack=1 Win=17520 Len=0
4	2004-08-21 20:44:20.596858	192.168.1.102	128.119.245.12	TCP	619	1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17520 Len=565 [TCP segment of a reassembled PDU]
5	2004-08-21 20:44:20.612118	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
6	2004-08-21 20:44:20.624318	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=566 Win=6780 Len=0
7	2004-08-21 20:44:20.624407	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=2026 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
8	2004-08-21 20:44:20.625071	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=3486 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
9	2004-08-21 20:44:20.647675	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=2026 Win=8760 Len=0
10	2004-08-21 20:44:20.647786	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=4946 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
11	2004-08-21 20:44:20.648538	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=6406 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
12	2004-08-21 20:44:20.694466	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=3486 Win=11680 Len=0
13	2004-08-21 20:44:20.694566	192.168.1.102	128.119.245.12	TCP	1201	1161 → 80 [PSH, ACK] Seq=7866 Ack=1 Win=17520 Len=1147 [TCP segment of a reassembled PDU]
14	2004-08-21 20:44:20.739499	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=4946 Win=14600 Len=0
15	2004-08-21 20:44:20.787680	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=6406 Win=17520 Len=0
16	2004-08-21 20:44:20.838183	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=7866 Win=20440 Len=0
17	2004-08-21 20:44:20.875188	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=9013 Win=23360 Len=0
18	2004-08-21 20:44:20.875421	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=9013 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
19	2004-08-21 20:44:20.876194	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=10473 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
20	2004-08-21 20:44:20.877073	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=11933 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
21	2004-08-21 20:44:20.877952	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=13393 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
22	2004-08-21 20:44:20.879080	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=14853 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
23	2004-08-21 20:44:20.879934	192.168.1.102	128.119.245.12	TCP	946	1161 → 80 [PSH, ACK] Seq=16313 Ack=1 Win=17520 Len=892 [TCP segment of a reassembled PDU]

Source Port: 80
Destination Port: 1161
[Stream index: 0]



8/ Length of 1st segment: 619

Length of 5 remained segment: 1514

No.	Time	Source	Destination	Protocol	Length	Info
1	2004-08-21 20:44:20.570381	192.168.1.102	128.119.245.12	TCP	62	1161 → 80 [SYN] Seq=0 Win=16384 Len=0 MSS=1460 SACK_PERM=1
2	2004-08-21 20:44:20.593553	128.119.245.12	192.168.1.102	TCP	62	80 → 1161 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SACK_PERM=1
3	2004-08-21 20:44:20.593646	192.168.1.102	128.119.245.12	TCP	54	1161 → 80 [ACK] Seq=1 Ack=1 Win=17520 Len=0
4	2004-08-21 20:44:20.596958	192.168.1.102	128.119.245.12	TCP	619	1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17520 Len=565 [TCP segment of a reassembled PDU]
5	2004-08-21 20:44:20.612118	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
6	2004-08-21 20:44:20.624318	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=566 Win=6780 Len=0
7	2004-08-21 20:44:20.624407	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=2026 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
8	2004-08-21 20:44:20.625071	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=3486 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
9	2004-08-21 20:44:20.647765	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=2026 Win=8760 Len=0
10	2004-08-21 20:44:20.647786	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=4946 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
11	2004-08-21 20:44:20.648538	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=6486 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
12	2004-08-21 20:44:20.694466	128.119.245.12	192.168.1.102	TCP	60	80 → 1161 [ACK] Seq=1 Ack=3486 Win=11680 Len=0
13	2004-08-21 20:44:20.694566	192.168.1.102	128.119.245.12	TCP	1281	1161 → 80 [PSH, ACK] Seq=7866 Ack=1 Win=17520 Len=1147 [TCP segment of a reassembled PDU]

Source Port: 1161
Destination Port: 80
[Stream index: 0]
[TCP Segment Len: 1460]
Sequence Number: 566 (relative sequence number)
Sequence Number (raw): 232129578
[Next Sequence Number: 2026 (relative sequence number)]
Acknowledgment Number: 1 (relative ack number)
Acknowledgment number (raw): 883061786
0101 = Header Length: 20 bytes (5)
Flags: 0x018 (PSH, ACK)
0000 = Reserved: Not set
...0 = Nonce: Not set
....0... = Congestion Window Reduced (CWR): Not set
....0... = ECH-Echo: Not set
....0... = Urgent: Not set
....1... = Acknowledgment: Set
....1... = Push: Set
....0... = Reset: Not set
....0... = Syn: Not set
....0... = Fin: Not set
[TCP Flags:AP...]

0020 f5 0c 04 89 00 50 d6 04 2a 34 a2 74 1a 50 18P...*4:t:P:
0030 44 70 3b e5 00 00 43 6f 6e 74 65 6e 74 2d 54 79	Dp;...Content-Type

Source Port (tcp.port): 2 bytes

Packets: 213 · Displayed: 213 (100.0%)

Profile: Default

9/

The minimum amount of available buffer space advertised at the receiver for the entire trace is indicated first ACK from the server, its value is 5840 bytes.

The sender is never throttled due to lacking of receiver buffer space.

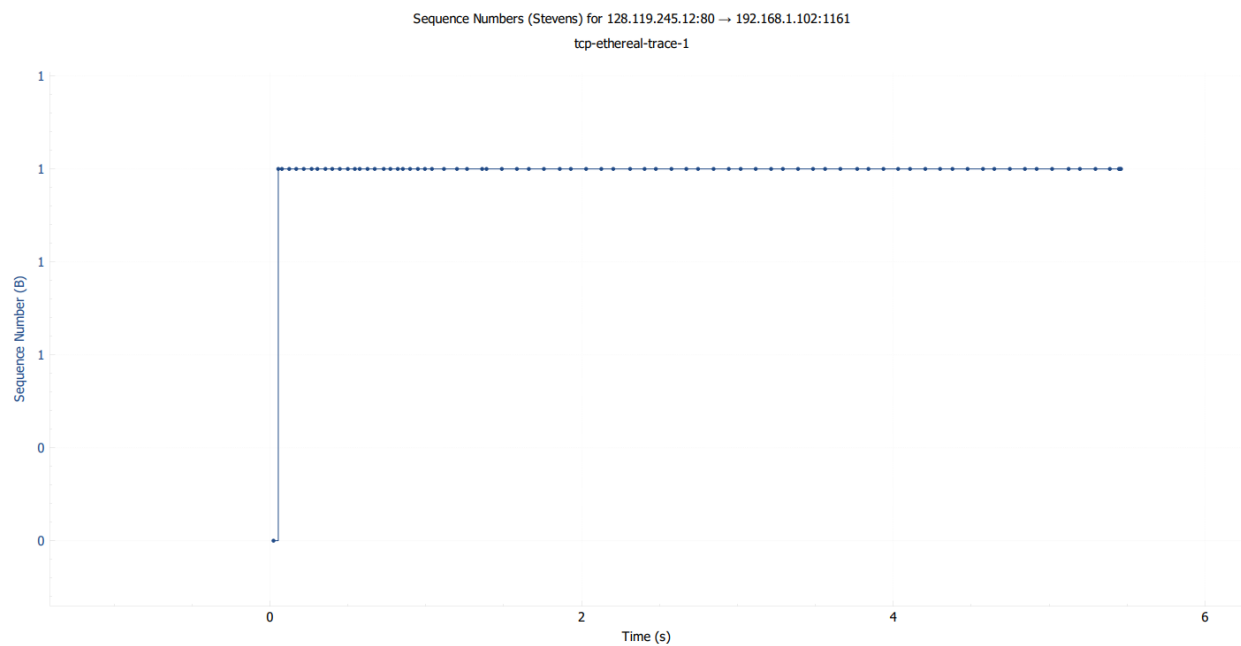
2	2004-08-21 20:44:20.593553	128.119.245.12	192.168.1.102	TCP	62 80 → 1161 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SACK_PERM=1
3	2004-08-21 20:44:20.593646	192.168.1.102	128.119.245.12	TCP	54 1161 → 80 [ACK] Seq=1 Ack=1 Win=17520 Len=0
4	2004-08-21 20:44:20.596858	192.168.1.102	128.119.245.12	TCP	619 1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17520 Len=565 [TCP segment of a reassembled PDU]
5	2004-08-21 20:44:20.612118	192.168.1.102	128.119.245.12	TCP	1514 1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
6	2004-08-21 20:44:20.624318	128.119.245.12	192.168.1.102	TCP	60 80 → 1161 [ACK] Seq=1 Ack=566 Win=6780 Len=0
7	2004-08-21 20:44:20.624407	192.168.1.102	128.119.245.12	TCP	1514 1161 → 80 [ACK] Seq=2026 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
8	2004-08-21 20:44:20.625071	192.168.1.102	128.119.245.12	TCP	1514 1161 → 80 [ACK] Seq=3486 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
9	2004-08-21 20:44:20.647675	128.119.245.12	192.168.1.102	TCP	60 80 → 1161 [ACK] Seq=1 Ack=2026 Win=8760 Len=0
10	2004-08-21 20:44:20.647786	192.168.1.102	128.119.245.12	TCP	1514 1161 → 80 [ACK] Seq=4946 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
11	2004-08-21 20:44:20.648538	192.168.1.102	128.119.245.12	TCP	1514 1161 → 80 [ACK] Seq=6406 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
12	2004-08-21 20:44:20.694466	128.119.245.12	192.168.1.102	TCP	60 80 → 1161 [ACK] Seq=1 Ack=3486 Win=11680 Len=0
13	2004-08-21 20:44:20.694566	192.168.1.102	128.119.245.12	TCP	1201 1161 → 80 [PSH, ACK] Seq=7866 Ack=1 Win=17520 Len=1147 [TCP segment of a reassembled PDU]
14	2004-08-21 20:44:20.739499	128.119.245.12	192.168.1.102	TCP	60 80 → 1161 [ACK] Seq=1 Ack=4946 Win=14600 Len=0
15	2004-08-21 20:44:20.787680	128.119.245.12	192.168.1.102	TCP	60 80 → 1161 [ACK] Seq=1 Ack=6406 Win=17520 Len=0
16	2004-08-21 20:44:20.838183	128.119.245.12	192.168.1.102	TCP	60 80 → 1161 [ACK] Seq=1 Ack=7866 Win=20440 Len=0
17	2004-08-21 20:44:20.875188	128.119.245.12	192.168.1.102	TCP	60 80 → 1161 [ACK] Seq=1 Ack=9013 Win=23360 Len=0
18	2004-08-21 20:44:20.875421	192.168.1.102	128.119.245.12	TCP	1514 1161 → 80 [ACK] Seq=9013 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
19	2004-08-21 20:44:20.876194	192.168.1.102	128.119.245.12	TCP	1514 1161 → 80 [ACK] Seq=10473 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
20	2004-08-21 20:44:20.877073	192.168.1.102	128.119.245.12	TCP	1514 1161 → 80 [ACK] Seq=11933 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
21	2004-08-21 20:44:20.877952	192.168.1.102	128.119.245.12	TCP	1514 1161 → 80 [ACK] Seq=13393 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
22	2004-08-21 20:44:20.879080	192.168.1.102	128.119.245.12	TCP	1514 1161 → 80 [ACK] Seq=14853 Ack=1 Win=17520 Len=1460 [TCP segment of a reassembled PDU]
23	2004-08-21 20:44:20.879934	192.168.1.102	128.119.245.12	TCP	946 1161 → 80 [PSH, ACK] Seq=16313 Ack=1 Win=17520 Len=892 [TCP segment of a reassembled PDU]

```

.....0..... = Urgent: Not set
.....1..... = Acknowledgment: Set
.....0... = Push: Not set
.....0... = Reset: Not set
> .....1... = Syn: Set
.....0... = Fin: Not set
[ TCP Flags: .....A..S.. ]
Window: 5840
[ Calculated window size: 5840 ]
Checksum: 0x774d [unverified]
[ Checksum Status: Unverified ]
Urgent Pointer: 0

```

10/



There are no retransmitted segments in the trace file which in the time sequence graph (stevens).

11/

The difference between the acknowledged sequence numbers of two consecutive ACK indicates the data received by the server between these two ACK.

The receiver is ACKing every other segment. For example, segment of No. 14 acknowledged data.

13/

Sequence Numbers (Stevens) for 128.119.245.12:80 → 192.168.1.102:1161
tcp-ethereal-trace-1

