

## NETWORKS ASSIGNMENT-4

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# Packet Capturing Using Wireshark

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## PartA: Initials

1. Take a screenshot of this result. How many packets were transmitted from the IITG web server to your client in this?

Ans: 44.

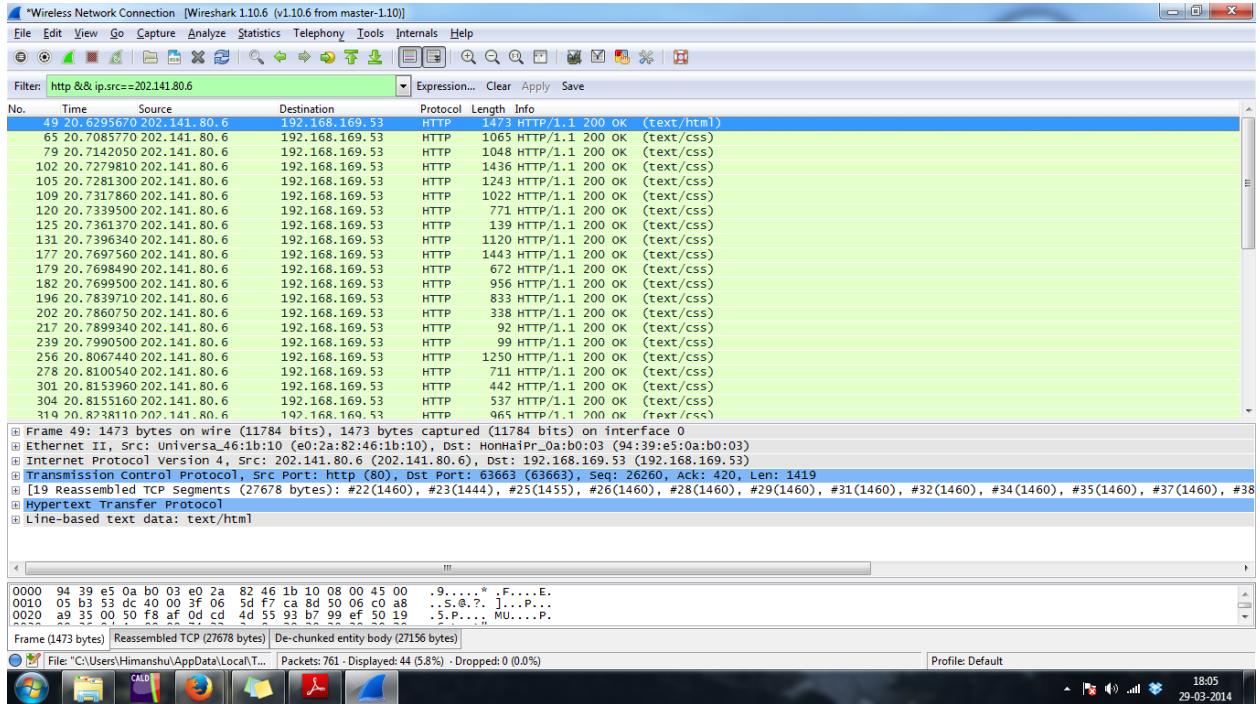


Figure 1: Packets transmitted from iitg web server

## The Basic HTTP GET/response Interaction

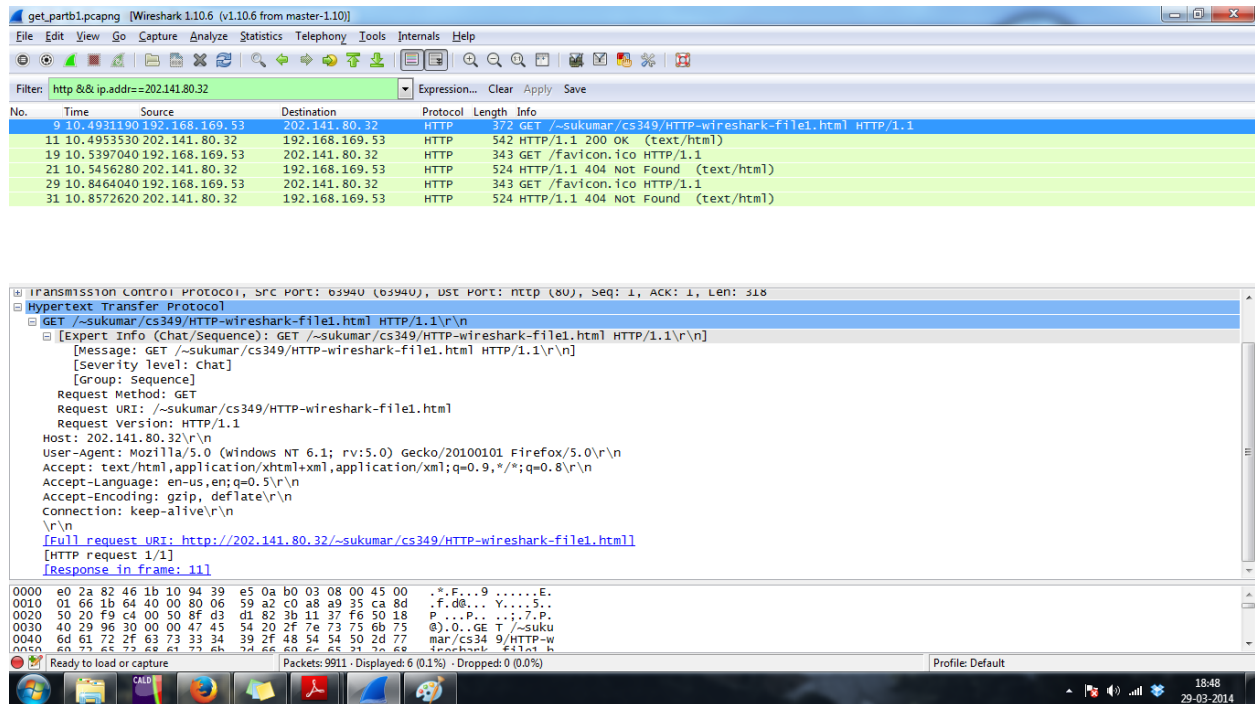


Figure 2: Get message display

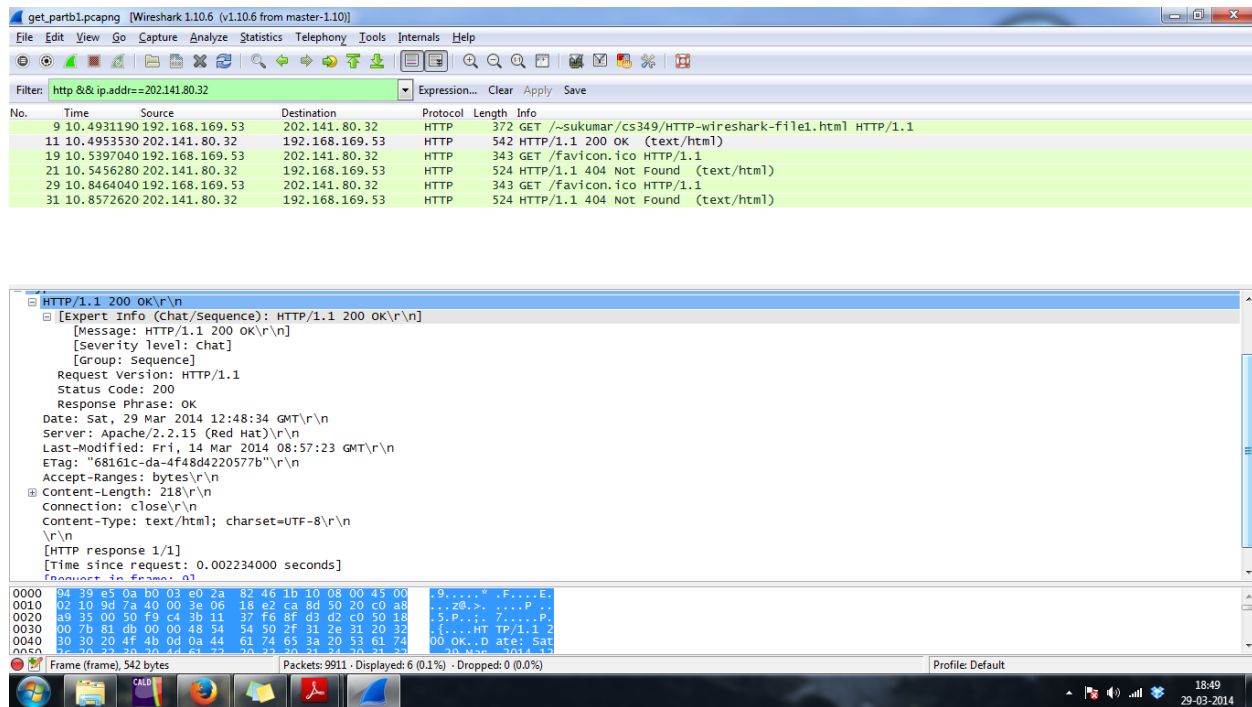


Figure 3: Response message display

No.	Time	Source	Destination	Protocol	Length	Info
9	10.493119000	192.168.169.53	202.141.80.32	HTTP	372	GET /~sukumar/cs349/HTTP-wireshark-file1.html HTTP/1.1
<b>Frame 9:</b> 372 bytes on wire (2976 bits), 372 bytes captured (2976 bits) on interface 0 Ethernet II, Src: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa_46:1b:10 (e0:2a:82:46:1b:10) Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32) Transmission Control Protocol, Src Port: 63940 (63940), Dst Port: http (80), Seq: 1, Ack: 1, Len: 318 Hypertext Transfer Protocol GET /~sukumar/cs349/HTTP-wireshark-file1.html HTTP/1.1\r\n             Host: 202.141.80.32\r\n             User-Agent: Mozilla/5.0 (Windows NT 6.1; rv:5.0) Gecko/20100101 Firefox/5.0\r\n             Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8\r\n             Accept-Language: en-us,en;q=0.5\r\n             Accept-Encoding: gzip, deflate\r\n             Connection: keep-alive\r\n             \r\n             [Full request URI: http://202.141.80.32/~sukumar/cs349/HTTP-wireshark-file1.html] [HTTP request 1/1]						

```
[Response in frame: 11]
```

No.	Time	Source	Destination	
	Protocol Length Info			
11	10.495353000	202.141.80.32	192.168.169.53	HTTP
	542	HTTP/1.1 200 OK	(text/html)	

**Frame 11:** 542 bytes on wire (4336 bits), 542 bytes captured (4336 bits) on interface 0

Ethernet II, Src: Universa\_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03)

Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst: 192.168.169.53 (192.168.169.53)

Transmission Control Protocol, Src Port: http (80), Dst Port: 63940 (63940), Seq: 1, Ack: 319, Len: 488

Hypertext Transfer Protocol

HTTP/1.1 200 OK\r\n

Date: Sat, 29 Mar 2014 12:48:34 GMT\r\n

Server: Apache/2.2.15 (Red Hat)\r\n

Last-Modified: Fri, 14 Mar 2014 08:57:23 GMT\r\n

ETag: "68161c-da-4f48d4220577b"\r\n

Accept-Ranges: bytes\r\n

Content-Length: 218\r\n

Connection: close\r\n

Content-Type: text/html; charset=UTF-8\r\n

\r\n

[HTTP response 1/1]

[Time since request: 0.002234000 seconds]

[Request in frame: 9]

Line-based text data: text/html

Listing 1: HTTP GET/RESPONSE interaction

**Q1. Is your browser running HTTP version 1.0 or 1.1? What version of HTTP is the server running.**

Ans: BOTH ARE RUNNING HTTP 1.1

**Q2. What languages (if any) does your browser indicate that it can accept to the server?**

Ans: ACCEPT-LANGUAGE: EN-US

**Q3. What is the IP address of your computer?**

Ans: THE IP ADDRESS OF OUR COMPUTER IS 192.168.169.53

**Q4. What is the status code returned from the server to your browser?**

Ans: 200 OK (TEXT/HTML)

**Q5. When was the HTML file that you are retrieving last modified at the server?**

Ans: LAST-MODIFIED: FRI , 14 MAR 2014 08:57:23 GMT

**Q6. How many bytes of content are being returned to your browser?**

Ans: CONTENT-LENGTH: 218

**Q7. By inspecting the raw data in the packet content window, do you see any headers within the data that are not displayed in the packet-listing window? If so, name one.**  
**ANS: NO ALL OF THE HEADERS CAN BE FOUND IN THE RAW DATA.**

## The HTTP CONDITIONAL GET/response Interaction

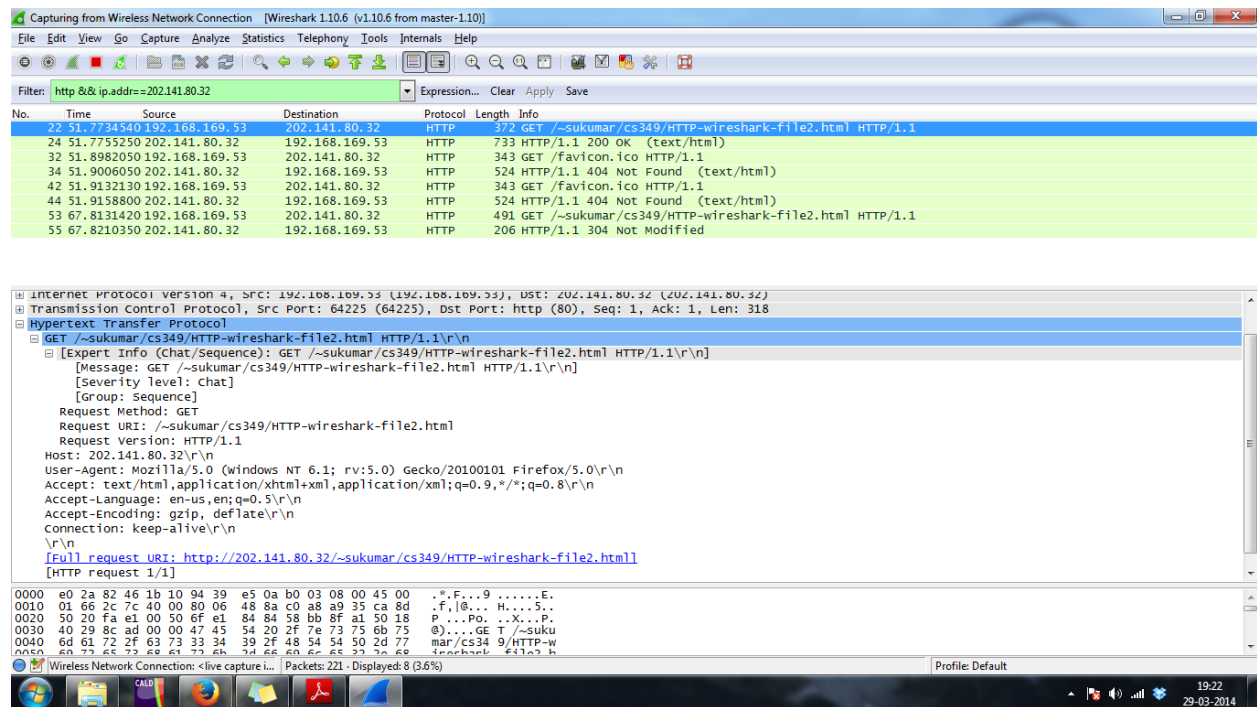


Figure 4: First get message display

No.	Time	Source	Destination
	Protocol Length Info		
	22 51.773454000	192.168.169.53	202.141.80.32 HTTP
	372	GET /~sukumar/cs349/HTTP-wireshark-file2.html	HTTP/1.1
<b>Frame 22:</b> 372 bytes on wire (2976 bits), 372 bytes captured (2976 bits) on interface 0			
Ethernet II, Src: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa_46:1b:10 (e0:2a:82:46:1b:10)			
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)			
Transmission Control Protocol, Src Port: 64225 (64225), Dst Port: http (80), Seq: 1, Ack: 1, Len: 318			
Hypertext Transfer Protocol			
GET /~sukumar/cs349/HTTP-wireshark-file2.html HTTP/1.1\r\n			
[Expert Info (Chat/Sequence): GET /~sukumar/cs349/HTTP-wireshark-file2.html HTTP/1.1\r\n]			

```

[Message: GET /~sukumar/cs349/HTTP-wireshark-file2.html HTTP
/1.1\r\n]
[Severity level: Chat]
[Group: Sequence]
Request Method: GET
Request URI: /~sukumar/cs349/HTTP-wireshark-file2.html
Request Version: HTTP/1.1
Host: 202.141.80.32\r\n
User-Agent: Mozilla/5.0 (Windows NT 6.1; rv:5.0) Gecko/20100101
Firefox/5.0\r\n
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q
=0.8\r\n
Accept-Language: en-us,en;q=0.5\r\n
Accept-Encoding: gzip, deflate\r\n
Connection: keep-alive\r\n
\r\n
[Full request URI: http://202.141.80.32/~sukumar/cs349/HTTP-wireshark-
file2.html]
[HTTP request 1/1]
[Response in frame: 24]

```

No.	Time	Source	Destination
	Protocol Length Info		
24	51.775525000	202.141.80.32	192.168.169.53 HTTP
	733	HTTP/1.1 200 OK (text/html)	

**Frame 24:** 733 bytes on wire (5864 bits), 733 bytes captured (5864 bits) on interface 0

Ethernet II, Src: Universa\_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03)

Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst: 192.168.169.53 (192.168.169.53)

Transmission Control Protocol, Src Port: http (80), Dst Port: 64225 (64225), Seq: 1, Ack: 319, Len: 679

Hypertext Transfer Protocol

HTTP/1.1 200 OK\r\n

[Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]

[Message: HTTP/1.1 200 OK\r\n]

[Severity level: Chat]

[Group: Sequence]

Request Version: HTTP/1.1

Status Code: 200

Response Phrase: OK

Date: Sat, 29 Mar 2014 13:41:21 GMT\r\n

Server: Apache/2.2.15 (Red Hat)\r\n

Last-Modified: Fri, 14 Mar 2014 08:57:23 GMT\r\n

ETag: "68161d-198-4f48d4220865c"\r\n

Accept-Ranges: bytes\r\n

Content-Length: 408\r\n

Connection: close\r\n

Content-Type: text/html; charset=UTF-8\r\n

\r\n

[HTTP response 1/1]

[Time since request: 0.002071000 seconds]

[Request in frame: 22]

Line-based text data: text/html

```
<html><head>\n
<meta http-equiv="content-type" content="text/html; charset=UTF-8"></
head><body>Congratulations again! Now you've downloaded the file
lab2-2.html. <br>\n
<p>\n
If you download this multiple times on your browser, a complete copy <
br>\n
will only be sent once by the server due to the inclusion of the IN-
MODIFIED-SINCE<br>\n
field in your browser's HTTP GET request to the server.\n
\n
\n
</p></body></html>
```

No.	Time	Source	Destination
	Protocol Length Info		
53	67.813142000	192.168.169.53	202.141.80.32 HTTP
	491	GET /~sukumar/cs349/HTTP-wireshark-file2.html	HTTP/1.1

Frame 53: 491 bytes on wire (3928 bits), 491 bytes captured (3928 bits) on interface 0

Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)

Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)

Transmission Control Protocol, Src Port: 64232 (64232), Dst Port: http (80), Seq: 1, Ack: 1, Len: 437

Hypertext Transfer Protocol

GET /~sukumar/cs349/HTTP-wireshark-file2.html HTTP/1.1\r\n

[Expert Info (Chat/Sequence): GET /~sukumar/cs349/HTTP-wireshark-file2.html HTTP/1.1\r\n]

[Message: GET /~sukumar/cs349/HTTP-wireshark-file2.html HTTP/1.1\r\n]

[Severity level: Chat]

[Group: Sequence]

Request Method: GET

Request URI: /~sukumar/cs349/HTTP-wireshark-file2.html

Request Version: HTTP/1.1

Host: 202.141.80.32\r\n

User-Agent: Mozilla/5.0 (Windows NT 6.1; rv:5.0) Gecko/20100101

Firefox/5.0\r\n

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,\*/\*;q=0.8\r\n

Accept-Language: en-us,en;q=0.5\r\n

Accept-Encoding: gzip, deflate\r\n

Connection: keep-alive\r\n

If-Modified-Since: Fri, 14 Mar 2014 08:57:23 GMT\r\n

If-None-Match: "68161d-198-4f48d4220865c"\r\n

Cache-Control: max-age=0\r\n

\r\n

[Full request URI: http://202.141.80.32/~sukumar/cs349/HTTP-wireshark-file2.html]



```

[HTTP request 1/1]
[Response in frame: 55]

No.      Time      Source      Destination
Protocol Length Info
55 67.821035000 202.141.80.32 192.168.169.53 HTTP
206 HTTP/1.1 304 Not Modified

Frame 55: 206 bytes on wire (1648 bits), 206 bytes captured (1648 bits) on
interface 0
Ethernet II, Src: Universa_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr_0a:
b0:03 (94:39:e5:0a:b0:03)
Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst:
192.168.169.53 (192.168.169.53)
Transmission Control Protocol, Src Port: http (80), Dst Port: 64232
(64232), Seq: 1, Ack: 438, Len: 152
Hypertext Transfer Protocol
HTTP/1.1 304 Not Modified\r\n
[Expert Info (Chat/Sequence): HTTP/1.1 304 Not Modified\r\n]
[Message: HTTP/1.1 304 Not Modified\r\n]
[Severity level: Chat]
[Group: Sequence]
Request Version: HTTP/1.1
Status Code: 304
Response Phrase: Not Modified
Date: Sat, 29 Mar 2014 13:41:38 GMT\r\n
Server: Apache/2.2.15 (Red Hat)\r\n
Connection: close\r\n
ETag: "68161d-198-4f48d4220865c"\r\n
\r\n
[HTTP response 1/1]
[Time since request: 0.007893000 seconds]
[Request in frame: 53]

```

Listing 2: HTTP CONDITIONAL GET/RESPONSE Interaction

**Q1. Inspect the contents of the first HTTP GET request from your browser to the server. Do you see an “IF-MODIFIED-SINCE” line in the HTTP GET?**

*Ans: No , we don’t see an “IF-MODIFIED-SINCE” line in the HTTP GET as we are loading for first time ; so there is no question of modification.*

**Q2. Inspect the contents of the server response. Did the server explicitly return the contents of the file? How can you tell?**

*Ans: Yes because we can see the contents in the “Line-based text data” field.*

**Q3. Now inspect the contents of the second HTTP GET request from your browser to the server. Do you see an “IF-MODIFIED-SINCE:” line in the HTTP GET? If so, what information follows the “IF-MODIFIED-SINCE:” header?**

*Ans: Yes. The information followed is: Fri, 14 Fri 2014 08:57:23 GMT which is the date of the last modification of the file from the previous GET request.*

**Q4. What is the HTTP status code and phrase returned from the server in response to this second HTTP GET? Did the server explicitly return the contents of the file? Explain.**

*Ans: The status code and phrase returned from the server is HTTP/1.1 304 Not Modified. The server didn't explicitly return the contents of the file since the browser loaded it from its cache. (Also, the file was not modified since the first time we requested it)*

## Retrieving Long Documents

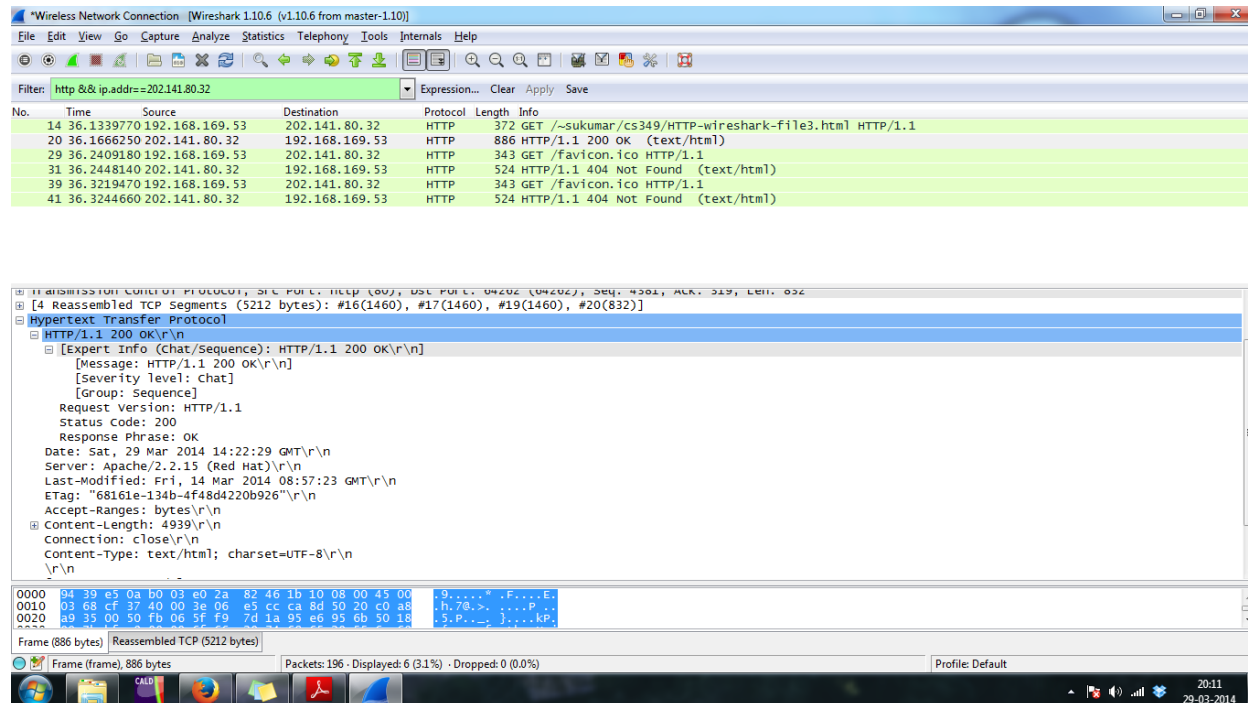


Figure 5: response display

No.	Time	Source	Destination
Protocol Length Info			
14	36.133977000	192.168.169.53	202.141.80.32
	372	GET /~sukumar/cs349/HTTP-wireshark-file3.html	HTTP/1.1
<b>Frame 14:</b> 372 bytes on wire (2976 bits), 372 bytes captured (2976 bits) on interface 0 Ethernet II, Src: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa_46:1b:10 (e0:2a:82:46:1b:10) Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32) Transmission Control Protocol, Src Port: 64262 (64262), Dst Port: http (80), Seq: 1, Ack: 1, Len: 318 Hypertext Transfer Protocol GET /~sukumar/cs349/HTTP-wireshark-file3.html HTTP/1.1\r\n           [Expert Info (Chat/Sequence): GET /~sukumar/cs349/HTTP-wireshark-file3.html HTTP/1.1\r\n]			

```

[Message: GET /~sukumar/cs349/HTTP-wireshark-file3.html HTTP
/1.1\r\n]
[Severity level: Chat]
[Group: Sequence]
Request Method: GET
Request URI: /~sukumar/cs349/HTTP-wireshark-file3.html
Request Version: HTTP/1.1
Host: 202.141.80.32\r\n
User-Agent: Mozilla/5.0 (Windows NT 6.1; rv:5.0) Gecko/20100101
Firefox/5.0\r\n
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q
=0.8\r\n
Accept-Language: en-us,en;q=0.5\r\n
Accept-Encoding: gzip, deflate\r\n
Connection: keep-alive\r\n
\r\n
[Full request URI: http://202.141.80.32/~sukumar/cs349/HTTP-wireshark-
file3.html]
[HTTP request 1/1]
[Response in frame: 20]

```

No.	Time	Source	Destination
	Protocol Length Info		
20	36.166625000	202.141.80.32	192.168.169.53 HTTP
	886	HTTP/1.1 200 OK (text/html)	

**Frame 20:** 886 bytes on wire (7088 bits), 886 bytes captured (7088 bits) on interface 0

Ethernet II, Src: Universa\_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03)

Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst: 192.168.169.53 (192.168.169.53)

Transmission Control Protocol, Src Port: http (80), Dst Port: 64262 (64262), Seq: 4381, Ack: 319, Len: 832

**[4 Reassembled TCP Segments (5212 bytes): #16(1460), #17(1460), #19(1460), #20(832)]**

Hypertext Transfer Protocol

**HTTP/1.1 200 OK\r\n**

[Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]

[Message: HTTP/1.1 200 OK\r\n]

[Severity level: Chat]

[Group: Sequence]

Request Version: HTTP/1.1

Status Code: 200

Response Phrase: OK

Date: Sat, 29 Mar 2014 14:22:29 GMT\r\n

Server: Apache/2.2.15 (Red Hat)\r\n

Last-Modified: Fri, 14 Mar 2014 08:57:23 GMT\r\n

ETag: "68161e-134b-4f48d4220b926"\r\n

Accept-Ranges: bytes\r\n

Content-Length: 4939\r\n

[Content length: 4939]

Connection: close\r\n

Content-Type: text/html; charset=UTF-8\r\n

```
\r\n
[HTTP response 1/1]
[Time since request: 0.032648000 seconds]
[Request in frame: 14]
Line-based text data: text/html
```

Listing 3: HTTP Retrieving Long Documents

**Q1. How many HTTP GET request messages were sent by your browser?**

*Ans: There was 1 HTTP GET request message sent by my browser.*

**Q2. How many data-containing TCP segments were needed to carry the single HTTP response?**

*Ans: There were 4 data containing TCP segments containing 1460 ,1460 ,1460 and 832 bytes respectively for a total of 5212 bytes.*

**Q3. What is the status code and phrase associated with the response to the HTTP GET request?**

*Ans: The status code to the response is 200 OK, just like a single packet response.*

**Q4. Are there any HTTP status lines in the transmitted data associated with a TCP-induced “Continuation”?**

*Ans: No, the transmitted data of TCP is only the content data. The headers in the GET and OK request are the only two that indicate HTTP status lines.*

## PARTC: UDP

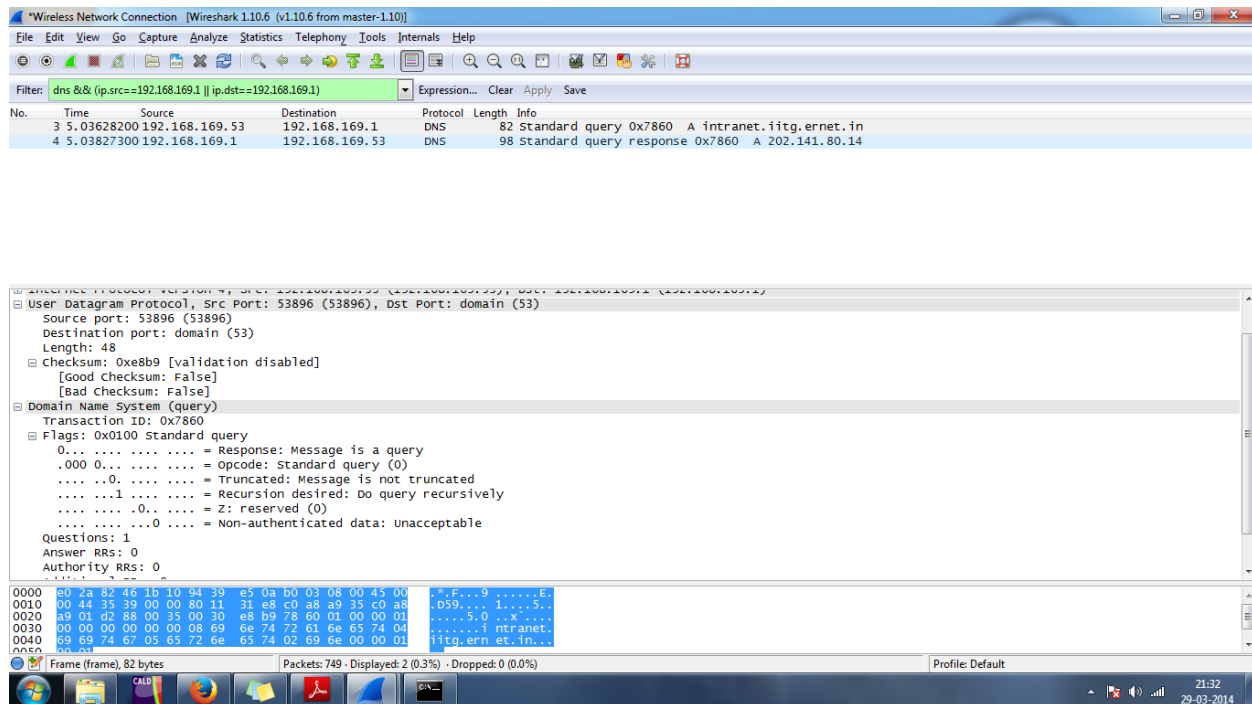


Figure 6: UDP segment display

No.	Time	Source	Destination
	Protocol Length Info		
3	5.036282000	192.168.169.53	192.168.169.1
	82	Standard query 0x7860	A intranet.iitg.ernet.in
<b>Frame 3:</b> 82 bytes on wire (656 bits), 82 bytes captured (656 bits) on interface 0			
Ethernet II, Src: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa_46:1b:10 (e0:2a:82:46:1b:10)			
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 192.168.169.1 (192.168.169.1)			
Version: 4			
Header length: 20 bytes			
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00: Not-ECT (Not ECN-Capable Transport))			
Total Length: 68			
Identification: 0x3539 (13625)			
Flags: 0x00			
Fragment offset: 0			
Time to live: 128			
<b>Protocol: UDP (17)</b>			
Header checksum: 0x31e8 [validation disabled]			
Source: 192.168.169.53 (192.168.169.53)			
Destination: 192.168.169.1 (192.168.169.1)			

```

[Source GeoIP: Unknown]
[Destination GeoIP: Unknown]
User Datagram Protocol, Src Port: 53896 (53896), Dst Port: domain (53)
Source port: 53896 (53896)
Destination port: domain (53)
Length: 48
Checksum: 0xe8b9 [validation disabled]
[Good Checksum: False]
[Bad Checksum: False]
Domain Name System (query)
[Response In: 4]
Transaction ID: 0x7860
Flags: 0x0100 Standard query
  0... .. = Response: Message is a query
.000 0... .. = Opcode: Standard query (0)
.... ..0. .... = Truncated: Message is not truncated
.... ...1 .... = Recursion desired: Do query recursively
.... ....0.. .... = Z: reserved (0)
.... .... ...0 .... = Non-authenticated data: Unacceptable
Questions: 1
Answer RRs: 0
Authority RRs: 0
Additional RRs: 0
Queries
  intranet.iitg.ernet.in: type A, class IN
    Name: intranet.iitg.ernet.in
    Type: A (Host address)
    Class: IN (0x0001)

No.      Time      Source      Destination
Protocol Length Info
  4 5.038273000 192.168.169.1 192.168.169.53 DNS
      98      Standard query response 0x7860 A 202.141.80.14

Frame 4: 98 bytes on wire (784 bits), 98 bytes captured (784 bits) on
interface 0
Ethernet II, Src: Universa_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr_0a:
b0:03 (94:39:e5:0a:b0:03)
Internet Protocol Version 4, Src: 192.168.169.1 (192.168.169.1), Dst:
192.168.169.53 (192.168.169.53)
Version: 4
Header length: 20 bytes
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00:
Not-ECT (Not ECN-Capable Transport))
Total Length: 84
Identification: 0x1508 (5384)
Flags: 0x00
Fragment offset: 0
Time to live: 128
Protocol: UDP (17)
Header checksum: 0x5209 [validation disabled]
Source: 192.168.169.1 (192.168.169.1)
Destination: 192.168.169.53 (192.168.169.53)
[Source GeoIP: Unknown]

```

```

    [Destination GeoIP: Unknown]
User Datagram Protocol, Src Port: domain (53), Dst Port: 53896 (53896)
Source port: domain (53)
Destination port: 53896 (53896)
Length: 64
Checksum: 0x37e8 [validation disabled]
    [Good Checksum: False]
    [Bad Checksum: False]
Domain Name System (response)
    [Request In: 3]
    [Time: 0.001991000 seconds]
    Transaction ID: 0x7860
    Flags: 0x8580 Standard query response, No error
        1... .... = Response: Message is a response
        .000 0... = Opcode: Standard query (0)
        .... .1.. = Authoritative: Server is an authority for
            domain
        .... ..0. = Truncated: Message is not truncated
        .... ...1 = Recursion desired: Do query recursively
        .... .... 1... = Recursion available: Server can do recursive
            queries
        .... .... .0.. = Z: reserved (0)
        .... .... ..0. = Answer authenticated: Answer/authority
            portion was not authenticated by the server
        .... .... ...0 = Non-authenticated data: Unacceptable
        .... .... .... 0000 = Reply code: No error (0)
    Questions: 1
    Answer RRs: 1
    Authority RRs: 0
    Additional RRs: 0
    Queries
        intranet.iitg.ernet.in: type A, class IN
            Name: intranet.iitg.ernet.in
            Type: A (Host address)
            Class: IN (0x0001)
    Answers

```

Listing 4: UDP segments display

a. Select one packet. From this packet, determine how many fields there are in the UDP header. Name these fields as they are named in the Wireshark display of segment fields.

Ans: The UDP header contains 4 fields: source port, destination port, length, and checksum.

b. What are the source and destination port numbers, in both decimal and hexadecimal format.

Ans: Source Port : 53896 (0xd288)

Destination Port : 53(0x0035)

c. What is the value in the Length field in both decimal and hexadecimal format. What is the meaning of this value ?

Ans: The value in Length field is 48(0x30)

This value in the Length field defines the total length of user datagram (header plus data)

d. What is the protocol number for UDP? Give your answer in both hexadecimal and decimal notation.

Ans: The protocol number for UDP is 17 (0x11)

e. Examine a pair of UDP packets in which the first packet is sent by your host and the second packet is a reply to the first packet. Describe the relationship between the port numbers in the two packets.

Ans: The source port of the UDP packet sent by the host is the same as the destination port of the reply packet, and conversely the destination port of the UDP packet sent by the host is the same as the source port of the reply packet.

## PARTD : TCP

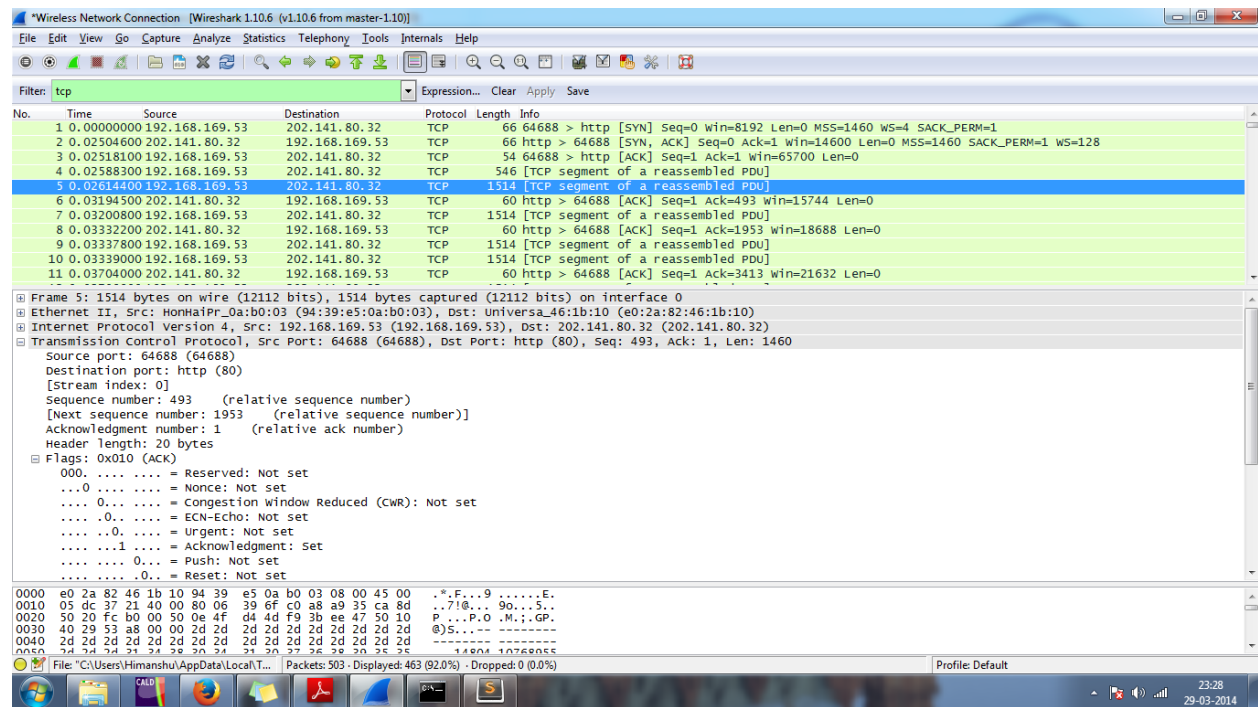


Figure 7: TCP first few segments

1. Print out a captured packet and indicate where you see the information that answers the following:

a) What is the IP address and TCP port number used by your client computer (source) to transfer the file to 202.141.80.32?

Ans: IP address : 192.168.169.53

Port number : 64688

b) What is the IP address and TCP port number used by the server?



IP address : 202.141.0.32

Port number : 80 (http)

**2. Print out a captured packet and indicate where you see the information that answers the following:**

```
No.      Time            Source                Destination
  Protocol Length Info
    1 0.000000000 192.168.169.53      202.141.80.32      TCP
      66      64688 > http [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=4
      SACK_PERM=1

Frame 1: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on
interface 0
Ethernet II, Src: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa_46
:1b:10 (e0:2a:82:46:1b:10)
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst:
202.141.80.32 (202.141.80.32)
Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http
(80), Seq: 0, Len: 0
  Source port: 64688 (64688)
  Destination port: http (80)
  [Stream index: 0]
  Sequence number: 0 (relative sequence number)
  Header length: 32 bytes
  Flags: 0x002 (SYN)
    000. .... = 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
    .... .... ..1. = Syn: Set
    .... .... ...0 = Fin: Not set
  Window size value: 8192
  [Calculated window size: 8192]
  Checksum: 0xecd9 [validation disabled]
  Options: (12 bytes), Maximum segment size, No-Operation (NOP), Window
scale, No-Operation (NOP), No-Operation (NOP), SACK permitted
```

Listing 5: TCP SYN segment

**a) What is the sequence number of the TCP SYN segment that is used to initiate the TCP connection between the client computer and 202.141.80.32?**

*Ans: Sequence number of the TCP SYN segment is used to initiate the TCP connection between the client computer and 202.141.0.32. The value is 0 in this trace.*

**b) What is it in the segment that identifies the segment as a SYN segment?**

*Ans: The SYN flag is set to 1 and it indicates that this segment is a SYN segment.*

3. Print out a captured packet and indicate where you see the information that answers the following:

```

No.      Time                Source                Destination
Protocol Length Info
  2 0.025046000      202.141.80.32      192.168.169.53      TCP
      66      http > 64688 [SYN, ACK] Seq=0 Ack=1 Win=14600 Len=0
      MSS=1460 SACK_PERM=1 WS=128

Frame 2: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on
interface 0
Ethernet II, Src: Universa_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr_0a:
b0:03 (94:39:e5:0a:b0:03)
Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst:
192.168.169.53 (192.168.169.53)
Transmission Control Protocol, Src Port: http (80), Dst Port: 64688
(64688), Seq: 0, Ack: 1, Len: 0
Source port: http (80)
Destination port: 64688 (64688)
[Stream index: 0]
Sequence number: 0      (relative sequence number)
Acknowledgment number: 1      (relative ack number)
Header length: 32 bytes
Flags: 0x012 (SYN, ACK)
  000. .... = 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
  .... .... 0... = Push: Not set
  .... .... .0.. = Reset: Not set
  .... .... ..1. = Syn: Set
  .... .... ...0 = Fin: Not set
Window size value: 14600
[Calculated window size: 14600]
Checksum: 0xec38 [validation disabled]
Options: (12 bytes), Maximum segment size, No-Operation (NOP), No-
Operation (NOP), SACK permitted, No-Operation (NOP), Window scale
[SEQ/ACK analysis]

```

Listing 6: TCP SYNACK segment

a) What is the sequence number of the SYNACK segment sent by 202.141.80.32 to the client computer in reply to the SYN?

*Ans: Sequence number of the SYNACK segment from 202.141.80.32 to the client computer in reply to the SYN has the value of 0 in this trace.*

b) What is the value of the ACKnowledgement field in the SYNACK segment?

*Ans: The value of the ACKnowledgement field in the SYNACK segment is 1.*

c) How did 202.141.80.32 server determine that value?

Ans: The value of the ACKnowledgement field in the SYNACK segment is determined by 202.141.80.32 by adding 1 to the initial sequence number of SYN segment from the client computer (i.e. the sequence number of the SYN segment initiated by the client computer is 0).

**d) What is it in the segment that identifies the segment as a SYNACK segment?**

Ans: The SYN flag and Acknowledgement flag in the segment are set to 1 and they indicate that this segment is a SYNACK segment.

**4. Print out a captured packet and indicate where you see the information that answers the following:**

```

No.      Time          Source          Destination
Protocol Length Info
  1 0.000000000 192.168.169.53 202.141.80.32 TCP
      66      64688 > http [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=4
      SACK_PERM=1

Frame 1: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on
interface 0
Ethernet II, Src: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa_46
:1b:10 (e0:2a:82:46:1b:10)
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst:
202.141.80.32 (202.141.80.32)
Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http
(80), Seq: 0, Len: 0
Source port: 64688 (64688)
Destination port: http (80)
[Stream index: 0]
Sequence number: 0 (relative sequence number)
Header length: 32 bytes
Flags: 0x002 (SYN)
  000. .... = 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
  .... .... ..1. = Syn: Set
    [Expert Info (Chat/Sequence): Connection establish request (
      SYN): server port http]
      [Message: Connection establish request (SYN): server port
        http]
      [Severity level: Chat]
      [Group: Sequence]
  .... .... ...0 = Fin: Not set
Window size value: 8192
[Calculated window size: 8192]
Checksum: 0xcd9 [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]

```

Options: (12 bytes), Maximum segment size, No-Operation (NOP), Window scale, No-Operation (NOP), No-Operation (NOP), SACK permitted

No.	Time	Source	Destination
Protocol Length Info			
2	0.025046000	202.141.80.32	192.168.169.53 TCP
	66	http > 64688 [SYN, ACK] Seq=0 Ack=1 Win=14600 Len=0	
		MSS=1460 SACK_PERM=1 WS=128	

**Frame 2:** 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0

Ethernet II, Src: Universa\_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03)

Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst: 192.168.169.53 (192.168.169.53)

Transmission Control Protocol, Src Port: http (80), Dst Port: 64688 (64688), Seq: 0, Ack: 1, Len: 0

Source port: http (80)

Destination port: 64688 (64688)

[Stream index: 0]

Sequence number: 0 (relative sequence number)

Acknowledgment number: 1 (relative ack number)

Header length: 32 bytes

Flags: 0x012 (SYN, ACK)

000. .... = 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

.... .... 0... = Push: Not set

.... .... .0.. = Reset: Not set

.... .... ..1. = Syn: Set

[Expert Info (Chat/Sequence): Connection establish acknowledge (SYN+ACK): server port http]

[Message: Connection establish acknowledge (SYN+ACK): server port http]

[Severity level: Chat]

[Group: Sequence]

.... .... ...0 = Fin: Not set

Window size value: 14600

[Calculated window size: 14600]

Checksum: 0xec38 [validation disabled]

[Good Checksum: False]

[Bad Checksum: False]

Options: (12 bytes), Maximum segment size, No-Operation (NOP), No-Operation (NOP), SACK permitted, No-Operation (NOP), Window scale

[SEQ/ACK analysis]

[This is an ACK to the segment in frame: 1]

[The RTT to ACK the segment was: 0.025046000 seconds]

No.	Time	Source	Destination
Protocol Length Info			
3	0.025181000	192.168.169.53	202.141.80.32 TCP

54            64688 > http [ACK] Seq=1 Ack=1 Win=65700 Len=0

**Frame 3:** 54 bytes on wire (432 bits), 54 bytes captured (432 bits) on interface 0  
Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)  
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)  
Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 1, Ack: 1, Len: 0  
Source port: 64688 (64688)  
Destination port: http (80)  
[Stream index: 0]  
Sequence number: 1        (relative sequence number)  
Acknowledgment number: 1        (relative ack number)  
Header length: 20 bytes  
Flags: 0x010 (ACK)  
    000. .... = 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  
    .... .... 0... = Push: Not set  
    .... .... .0.. = Reset: Not set  
    .... .... ..0. = Syn: Not set  
    .... .... ...0 = Fin: Not set  
Window size value: 16425  
[Calculated window size: 65700]  
[Window size scaling factor: 4]  
Checksum: 0x25ea [validation disabled]  
    [Good Checksum: False]  
    [Bad Checksum: False]  
[SEQ/ACK analysis]  
    [This is an ACK to the segment in frame: 2]  
    [The RTT to ACK the segment was: 0.000135000 seconds]

No.	Time	Source	Destination
Protocol Length Info			
4	0.025883000	192.168.169.53	202.141.80.32        TCP
	546	[TCP segment of a reassembled PDU]	

**Frame 4:** 546 bytes on wire (4368 bits), 546 bytes captured (4368 bits) on interface 0  
Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)  
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)  
Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 1, Ack: 1, Len: 492  
Source port: 64688 (64688)  
Destination port: http (80)  
[Stream index: 0]  
Sequence number: 1        (relative sequence number)

```

[Next sequence number: 493      (relative sequence number)]
Acknowledgment number: 1      (relative ack number)
Header length: 20 bytes
Flags: 0x018 (PSH, ACK)
  000. .... = 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
Window size value: 16425
[Calculated window size: 65700]
[Window size scaling factor: 4]
Checksum: 0xd9c5 [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
[SEQ/ACK analysis]
  [Bytes in flight: 492]
TCP segment data (492 bytes)

```

No.	Time	Source	Destination
Protocol Length Info			
5	0.026144000	192.168.169.53	202.141.80.32
	1514	[TCP segment of a reassembled PDU]	

**Frame 5:** 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0

Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)

Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)

Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 493, Ack: 1, Len: 1460

Source port: 64688 (64688)

Destination port: http (80)

[Stream index: 0]

Sequence number: 493 (relative sequence number)

[Next sequence number: 1953 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Header length: 20 bytes

Flags: 0x010 (ACK)

```

  000. .... = 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
  .... .... 0... = Push: Not set
  .... .... .0.. = Reset: Not set
  .... .... ..0. = Syn: Not set

```

```

    .... .... ...0 = Fin: Not set
Window size value: 16425
[Calculated window size: 65700]
[Window size scaling factor: 4]
Checksum: 0x53a8 [validation disabled]
    [Good Checksum: False]
    [Bad Checksum: False]
[SEQ/ACK analysis]
    [Bytes in flight: 1952]
[Reassembled PDU in frame: 454]
TCP segment data (1460 bytes)

```

No.	Time	Source	Destination
6	0.031945000	202.141.80.32	192.168.169.53
	60	http > 64688 [ACK] Seq=1 Ack=493 Win=15744 Len=0	

```

Frame 6: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on
interface 0
Ethernet II, Src: Universa_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr_0a:
b0:03 (94:39:e5:0a:b0:03)
Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst:
192.168.169.53 (192.168.169.53)
Transmission Control Protocol, Src Port: http (80), Dst Port: 64688
(64688), Seq: 1, Ack: 493, Len: 0
Source port: http (80)
Destination port: 64688 (64688)
[Stream index: 0]
Sequence number: 1      (relative sequence number)
Acknowledgment number: 493      (relative ack number)
Header length: 20 bytes
Flags: 0x010 (ACK)
    000. .... .... = 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
    .... .... 0... = Push: Not set
    .... .... .0.. = Reset: Not set
    .... .... ..0. = Syn: Not set
    .... .... ...0 = Fin: Not set
Window size value: 123
[Calculated window size: 15744]
[Window size scaling factor: 128]
Checksum: 0x63ac [validation disabled]
    [Good Checksum: False]
    [Bad Checksum: False]
[SEQ/ACK analysis]
    [This is an ACK to the segment in frame: 4]
    [The RTT to ACK the segment was: 0.006062000 seconds]

```

Listing 7: TCP first six segments

**What is the sequence number of the TCP segment containing the HTTP POST command?**

*Ans : Segment Number 4 is the TCP segment containing the HTTP POST command. The sequence number of this segment has the value of 1.*

**Consider the TCP segment containing the HTTP POST as the first segment in the TCP connection.**

**a) What are the sequence numbers of the first six segments in the TCP connection (including the segment containing the HTTP POST)? At what time was each segment sent?**

*Ans: The HTTP POST segment is considered as the first segment. The Segments 1 to 6 are Frame No. 4, 5, 7, 9, 10, and 12 in this trace respectively. The sequence numbers along with the time are tabulated below:*

Segment no	Frame no.	Sequence no.(Bytes)	Sent time
1	4	1	0.025883
2	5	493	0.02644
3	7	1953	0.032008
4	9	3413	0.033378
5	10	4873	0.03339
6	12	6333	0.037099

**b) When was the ACK for each segment received?**

*Ans: The ACKs of segments 1 – 6 are No. 6, 8, 11, 14, 17, and 20 in this trace. Therefore , the corresponding values when they are received are tabulated below :*

Segment no	Frame no.	Ack recvd time
1	6	0.031945
2	8	0.033322
3	11	0.037040
4	14	0.044923
5	17	0.045843
6	20	0.046547

**c) Do you see evidence of the use of cumulative ACKs in your trace? Explain.**

*Ans: Yes we see evidence of the use of cumulative ACKs in our trace. After the server sends an Ack for segment in frame 12, we receive 3 duplicate Acks for the next frame. Since the TCP follows faster retransmission mechanism so, my host sends the frame number 13 again. After receiving frame no. 13 , server directly sends an ACK for the segment in frame 16. Therefore , without acknowledging 13,14,15 it acknowledges the frame no. 16 and hence follow cumulative Acks.*

**d) Given the difference between when each TCP segment was sent, and when its acknowledgement was received, what is the RTT value for each of the six segments?**

*Ans: The response time for each of them are tabulated below:*



Sent time	Received time	RTT time
0.025883	0.031945	0.006062
0.02644	0.033322	0.007178
0.032008	0.037040	0.005032
0.033378	0.044923	0.011545
0.03339	0.045843	0.012453
0.037099	0.046547	0.009448

**e) What is the length of each of the first six TCP segments?**

*Ans: Length of the first TCP segment (containing the HTTP POST): 446 bytes Length of each of the other five TCP segments: 1514 bytes (MSS)*

**f) What is the minimum amount of available buffer space advertised at the receiver for the entire trace? Does the lack of receiver buffer space ever throttle the sender?**

*Ans: The minimum amount of buffer space (receiver window) advertised at receiver for the entire trace is 14600 bytes, which shows in the first acknowledgement from the server. This receiver window grows steadily to 15744 for segment 6, 18688 for segment 8 and so on. The maximum window size the server advertises is 139136. Since at each packet acknowledgement server advertises more and more window size, the sender is never throttled.*

**g) Are there any retransmitted segments in the trace file? What did you check for (in the trace) in order to answer this question? How much data does the receiver typically acknowledge in an ACK? Can you identify cases where the receiver is ACKing every other received segment? Explain.**

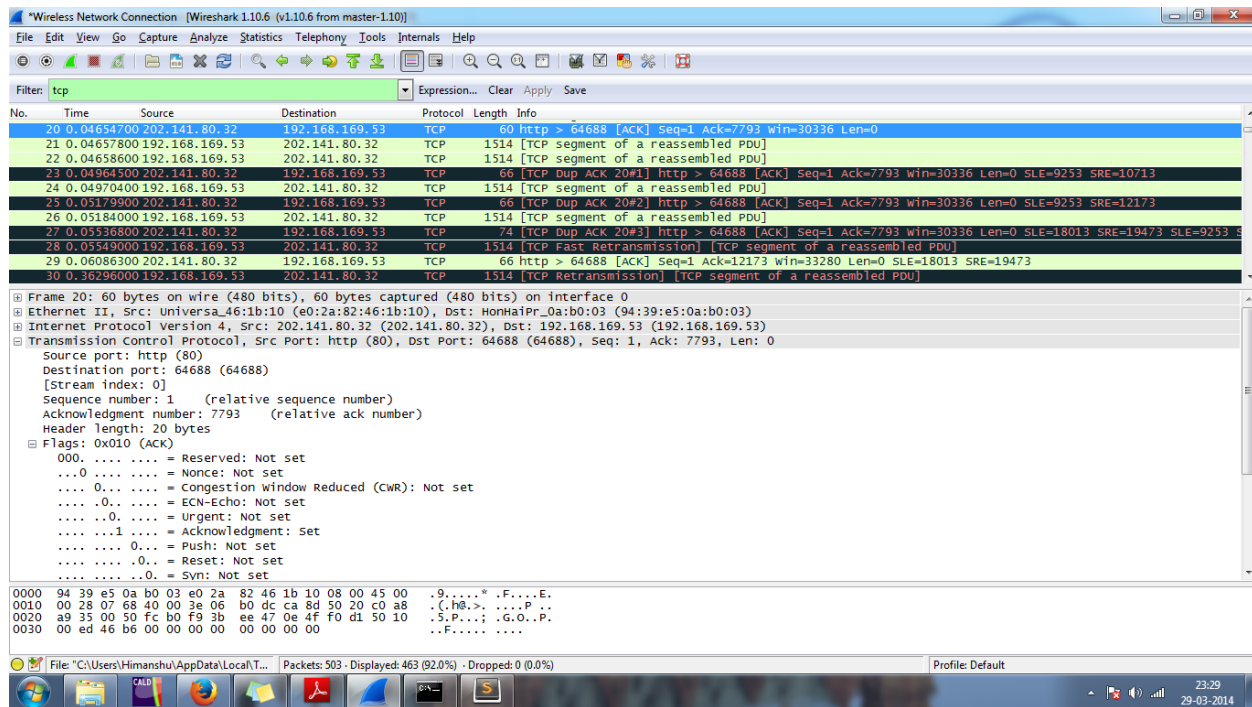


Figure 8: TCP first few segments

Ans: Yes, there are retransmitted packets in the trace file. We check for TCP Fast Retransmission Packet. Since, after receiving 3 Duplicate Acks, TCP retransmit the packet, I have to search for 3 Duplicate Acks or retransmitted packets. Frame no. 28 is a fast retransmission packet in our output.

Ack Segment no.	Ack Sequence no.	Acknowledged Data
1	493	493
2	1953	1460
3	3413	1460
4	4873	1460
5	6333	1460
6	7793	1460
7	7793	0
8	7793	0
9	7793	0
10	12173	4380
11	13633	1460

From the above table it is clear that receiver typically acknowledges 1460 bytes of data. In my case, receiver is never ACKing every other segment. From the above table, after fast retransmission, receiver ACKs  $3 * 1460 = 4380$  bytes of data together and I searched through the whole file to find  $2 * 1460 = 2920$  bytes of data but I was not able to find it. From the above table receiver directly ACKS 4380 bytes of data due to cumulative ACK.

The first 30 frames can be found below:

No.	Time	Source	Destination
Protocol Length Info			
1	0.000000000	192.168.169.53	202.141.80.32 TCP
	66	64688 > http [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=4 SACK_PERM=1	
Frame 1: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0			
Ethernet II, Src: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa_46:1b:10 (e0:2a:82:46:1b:10)			
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)			
Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 0, Len: 0			
Source port: 64688 (64688)			
Destination port: http (80)			
[Stream index: 0]			
Sequence number: 0 (relative sequence number)			
Header length: 32 bytes			
Flags: 0x002 (SYN)			
000. .... = 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			
.... .... ..1. = Syn: Set			
[Expert Info (Chat/Sequence): Connection establish request (SYN): server port http]			
[Message: Connection establish request (SYN): server port http]			
[Severity level: Chat]			
[Group: Sequence]			
.... .... ...0 = Fin: Not set			
Window size value: 8192			
[Calculated window size: 8192]			
Checksum: 0xcd9 [validation disabled]			
[Good Checksum: False]			
[Bad Checksum: False]			
Options: (12 bytes), Maximum segment size, No-Operation (NOP), Window scale, No-Operation (NOP), No-Operation (NOP), SACK permitted			

No.	Time	Source	Destination
Protocol Length Info			
2	0.025046000	202.141.80.32	192.168.169.53 TCP
	66	http > 64688 [SYN, ACK] Seq=0 Ack=1 Win=14600 Len=0 MSS=1460 SACK_PERM=1 WS=128	
Frame 2: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0			

```

Ethernet II, Src: Universa_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr_0a:
b0:03 (94:39:e5:0a:b0:03)
Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst:
192.168.169.53 (192.168.169.53)
Transmission Control Protocol, Src Port: http (80), Dst Port: 64688
(64688), Seq: 0, Ack: 1, Len: 0
Source port: http (80)
Destination port: 64688 (64688)
[Stream index: 0]
Sequence number: 0      (relative sequence number)
Acknowledgment number: 1  (relative ack number)
Header length: 32 bytes
Flags: 0x012 (SYN, ACK)
    000. .... = 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
    .... .... 0... = Push: Not set
    .... .... .0.. = Reset: Not set
    .... .... ..1. = Syn: Set
    [Expert Info (Chat/Sequence): Connection establish acknowledge
      (SYN+ACK): server port http]
    [Message: Connection establish acknowledge (SYN+ACK):
      server port http]
    [Severity level: Chat]
    [Group: Sequence]
    .... .... ...0 = Fin: Not set
Window size value: 14600
[Calculated window size: 14600]
Checksum: 0xec38 [validation disabled]
    [Good Checksum: False]
    [Bad Checksum: False]
Options: (12 bytes), Maximum segment size, No-Operation (NOP), No-
Operation (NOP), SACK permitted, No-Operation (NOP), Window scale
[SEQ/ACK analysis]
    [This is an ACK to the segment in frame: 1]
    [The RTT to ACK the segment was: 0.025046000 seconds]

```

No.	Time	Source	Destination
Protocol Length Info			
3	0.025181000	192.168.169.53	202.141.80.32 TCP
	54	64688 > http [ACK] Seq=1 Ack=1 Win=65700 Len=0	

```

Frame 3: 54 bytes on wire (432 bits), 54 bytes captured (432 bits) on
interface 0
Ethernet II, Src: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa_46
:1b:10 (e0:2a:82:46:1b:10)
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst:
202.141.80.32 (202.141.80.32)
Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http
(80), Seq: 1, Ack: 1, Len: 0
Source port: 64688 (64688)

```

```

Destination port: http (80)
[Stream index: 0]
Sequence number: 1      (relative sequence number)
Acknowledgment number: 1  (relative ack number)
Header length: 20 bytes
Flags: 0x010 (ACK)
  000. .... = 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
  .... .... 0... = Push: Not set
  .... .... .0.. = Reset: Not set
  .... .... ..0. = Syn: Not set
  .... .... ...0 = Fin: Not set
Window size value: 16425
[Calculated window size: 65700]
[Window size scaling factor: 4]
Checksum: 0x25ea [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
[SEQ/ACK analysis]
  [This is an ACK to the segment in frame: 2]
  [The RTT to ACK the segment was: 0.000135000 seconds]

```

No.	Time	Source	Destination
	Protocol Length Info		
4	0.025883000	192.168.169.53	202.141.80.32
	546	[TCP segment of a reassembled PDU]	

```

Frame 4: 546 bytes on wire (4368 bits), 546 bytes captured (4368 bits) on
interface 0
Ethernet II, Src: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa_46
:1b:10 (e0:2a:82:46:1b:10)
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst:
202.141.80.32 (202.141.80.32)
Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http
(80), Seq: 1, Ack: 1, Len: 492
Source port: 64688 (64688)
Destination port: http (80)
[Stream index: 0]
Sequence number: 1      (relative sequence number)
[Next sequence number: 493] (relative sequence number)
Acknowledgment number: 1  (relative ack number)
Header length: 20 bytes
Flags: 0x018 (PSH, ACK)
  000. .... = 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
Window size value: 16425
[Calculated window size: 65700]
[Window size scaling factor: 4]
Checksum: 0xd9c5 [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
[SEQ/ACK analysis]
  [Bytes in flight: 492]
TCP segment data (492 bytes)

```

No.	Time	Source	Destination
Protocol Length Info			
5	0.026144000	192.168.169.53	202.141.80.32
	1514	[TCP segment of a reassembled PDU]	

Frame 5: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0

Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)

Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)

Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 493, Ack: 1, Len: 1460

Source port: 64688 (64688)

Destination port: http (80)

[Stream index: 0]

Sequence number: 493 (relative sequence number)

[Next sequence number: 1953 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Header length: 20 bytes

Flags: 0x010 (ACK)

000. .... = 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

.... .... 0... = Push: Not set

.... .... .0.. = Reset: Not set

.... .... ..0. = Syn: Not set

.... .... ...0 = Fin: Not set

Window size value: 16425

[Calculated window size: 65700]

[Window size scaling factor: 4]

Checksum: 0x53a8 [validation disabled]

[Good Checksum: False]

[Bad Checksum: False]

[SEQ/ACK analysis]

[Bytes in flight: 1952]

[Reassembled PDU in frame: 454]

TCP segment data (1460 bytes)

No.	Time	Source	Destination
Protocol Length Info			
6	0.031945000	202.141.80.32	192.168.169.53 TCP
	60	http > 64688 [ACK] Seq=1 Ack=493 Win=15744 Len=0	

Frame 6: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0  
Ethernet II, Src: Universa\_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03)  
Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst: 192.168.169.53 (192.168.169.53)  
Transmission Control Protocol, Src Port: http (80), Dst Port: 64688 (64688), Seq: 1, Ack: 493, Len: 0  
Source port: http (80)  
Destination port: 64688 (64688)  
[Stream index: 0]  
Sequence number: 1 (relative sequence number)  
**Acknowledgment number: 493** (relative ack number)  
Header length: 20 bytes  
Flags: 0x010 (ACK)  
000. .... = 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  
.... .... 0... = Push: Not set  
.... .... .0.. = Reset: Not set  
.... .... ..0. = Syn: Not set  
.... .... ...0 = Fin: Not set  
Window size value: 123  
[Calculated window size: 15744]  
[Window size scaling factor: 128]  
Checksum: 0x63ac [validation disabled]  
[Good Checksum: False]  
[Bad Checksum: False]  
[SEQ/ACK analysis]  
**[This is an ACK to the segment in frame: 4]**  
**[The RTT to ACK the segment was: 0.006062000 seconds]**

No.	Time	Source	Destination
Protocol Length Info			
7	0.032008000	192.168.169.53	202.141.80.32 TCP
	1514	[TCP segment of a reassembled PDU]	

Frame 7: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0  
Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)  
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)  
Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 1953, Ack: 1, Len: 1460

```

Source port: 64688 (64688)
Destination port: http (80)
[Stream index: 0]
Sequence number: 1953      (relative sequence number)
[Next sequence number: 3413      (relative sequence number)]
Acknowledgment number: 1      (relative ack number)
Header length: 20 bytes
Flags: 0x010 (ACK)
    000. .... = 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
    .... .... 0... = Push: Not set
    .... .... .0.. = Reset: Not set
    .... .... ..0. = Syn: Not set
    .... .... ...0 = Fin: Not set
Window size value: 16425
[Calculated window size: 65700]
[Window size scaling factor: 4]
Checksum: 0x56c0 [validation disabled]
    [Good Checksum: False]
    [Bad Checksum: False]
[SEQ/ACK analysis]
    [Bytes in flight: 2920]
[Reassembled PDU in frame: 454]
TCP segment data (1460 bytes)

```

No.	Time	Source	Destination
Protocol Length Info			
8	0.033322000	202.141.80.32	192.168.169.53 TCP
	60	http > 64688 [ACK] Seq=1 Ack=1953 Win=18688 Len=0	

```

Frame 8: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on
interface 0
Ethernet II, Src: Universa_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr_0a:
b0:03 (94:39:e5:0a:b0:03)
Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst:
192.168.169.53 (192.168.169.53)
Transmission Control Protocol, Src Port: http (80), Dst Port: 64688
(64688), Seq: 1, Ack: 1953, Len: 0
Source port: http (80)
Destination port: 64688 (64688)
[Stream index: 0]
Sequence number: 1      (relative sequence number)
Acknowledgment number: 1953      (relative ack number)
Header length: 20 bytes
Flags: 0x010 (ACK)
    000. .... = 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
....  .... 0... = Push: Not set
....  .... .0.. = Reset: Not set
....  .... ..0. = Syn: Not set
....  .... ...0 = Fin: Not set
Window size value: 146
[Calculated window size: 18688]
[Window size scaling factor: 128]
Checksum: 0x5de1 [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
[SEQ/ACK analysis]
  [This is an ACK to the segment in frame: 5]
  [The RTT to ACK the segment was: 0.007178000 seconds]

```

No.	Time	Source	Destination
Protocol Length Info			
9	0.033378000	192.168.169.53	202.141.80.32
	1514	[TCP segment of a reassembled PDU]	

Frame 9: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0

Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)

Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)

Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 3413, Ack: 1, Len: 1460

Source port: 64688 (64688)

Destination port: http (80)

[Stream index: 0]

**Sequence number: 3413** (relative sequence number)

[Next sequence number: 4873 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Header length: 20 bytes

Flags: 0x010 (ACK)

000. .... = 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

.... .... 0... = Push: Not set

.... .... .0.. = Reset: Not set

.... .... ..0. = Syn: Not set

.... .... ...0 = Fin: Not set

Window size value: 16425

[Calculated window size: 65700]

[Window size scaling factor: 4]

Checksum: 0x0cc1 [validation disabled]

[Good Checksum: False]

[Bad Checksum: False]

[SEQ/ACK analysis]

[Bytes in flight: 2920]

[Reassembled PDU in frame: 454]  
TCP segment data (1460 bytes)

No.	Time	Source	Destination
Protocol Length Info			
10	0.033390000	192.168.169.53	202.141.80.32 TCP
	1514	[TCP segment of a reassembled PDU]	

Frame 10: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0

Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)

Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)

Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 4873, Ack: 1, Len: 1460

Source port: 64688 (64688)

Destination port: http (80)

[Stream index: 0]

Sequence number: 4873 (relative sequence number)

[Next sequence number: 6333 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Header length: 20 bytes

Flags: 0x010 (ACK)

000. .... = 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

.... .... 0... = Push: Not set

.... .... .0.. = Reset: Not set

.... .... ..0. = Syn: Not set

.... .... ...0 = Fin: Not set

Window size value: 16425

[Calculated window size: 65700]

[Window size scaling factor: 4]

Checksum: 0xe9b2 [validation disabled]

[Good Checksum: False]

[Bad Checksum: False]

[SEQ/ACK analysis]

[Bytes in flight: 4380]

[Reassembled PDU in frame: 454]

TCP segment data (1460 bytes)

No.	Time	Source	Destination
Protocol Length Info			
11	0.037040000	202.141.80.32	192.168.169.53 TCP
	60	http > 64688 [ACK] Seq=1 Ack=3413 Win=21632 Len=0	

Frame 11: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0

Ethernet II, Src: Universa\_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03)

```

Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst:
  192.168.169.53 (192.168.169.53)
Transmission Control Protocol, Src Port: http (80), Dst Port: 64688
  (64688), Seq: 1, Ack: 3413, Len: 0
  Source port: http (80)
  Destination port: 64688 (64688)
  [Stream index: 0]
  Sequence number: 1      (relative sequence number)
  Acknowledgment number: 3413      (relative ack number)
  Header length: 20 bytes
  Flags: 0x010 (ACK)
    000. .... = 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
    .... .... 0... = Push: Not set
    .... .... .0.. = Reset: Not set
    .... .... ..0. = Syn: Not set
    .... .... ...0 = Fin: Not set
  Window size value: 169
  [Calculated window size: 21632]
  [Window size scaling factor: 128]
  Checksum: 0x5816 [validation disabled]
    [Good Checksum: False]
    [Bad Checksum: False]
  [SEQ/ACK analysis]
    [This is an ACK to the segment in frame: 7]
    [The RTT to ACK the segment was: 0.005032000 seconds]

```

No.	Time	Source	Destination
Protocol Length Info			
12	0.037099000	192.168.169.53	202.141.80.32
	1514	[TCP segment of a reassembled PDU]	

```

Frame 12: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits
) on interface 0
Ethernet II, Src: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa_46
:1b:10 (e0:2a:82:46:1b:10)
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst:
  202.141.80.32 (202.141.80.32)
Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http
  (80), Seq: 6333, Ack: 1, Len: 1460
  Source port: 64688 (64688)
  Destination port: http (80)
  [Stream index: 0]
  Sequence number: 6333      (relative sequence number)
  [Next sequence number: 7793      (relative sequence number)]
  Acknowledgment number: 1      (relative ack number)
  Header length: 20 bytes
  Flags: 0x010 (ACK)
    000. .... = 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
..... .... 0... = Push: Not set
..... .... .0.. = Reset: Not set
..... .... ..0. = Syn: Not set
..... .... ...0 = Fin: Not set
Window size value: 16425
[Calculated window size: 65700]
[Window size scaling factor: 4]
Checksum: 0x8ed8 [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
[SEQ/ACK analysis]
  [Bytes in flight: 4380]
[Reassembled PDU in frame: 454]
TCP segment data (1460 bytes)

```

No.	Time	Source	Destination
Protocol Length Info			
13	0.037110000	192.168.169.53	202.141.80.32
	1514	[TCP segment of a reassembled PDU]	

Frame 13: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0

Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)

Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)

Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 7793, Ack: 1, Len: 1460

Source port: 64688 (64688)

Destination port: http (80)

[Stream index: 0]

**Sequence number: 7793** (relative sequence number)

[Next sequence number: 9253 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Header length: 20 bytes

Flags: 0x010 (ACK)

000. .... .. = 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

..... .... 0... = Push: Not set

..... .... .0.. = Reset: Not set

..... .... ..0. = Syn: Not set

..... .... ...0 = Fin: Not set

Window size value: 16425

[Calculated window size: 65700]

[Window size scaling factor: 4]

Checksum: 0xe586 [validation disabled]

```

    [Good Checksum: False]
    [Bad Checksum: False]
    [SEQ/ACK analysis]
    [Bytes in flight: 5840]
    [Reassembled PDU in frame: 454]
    TCP segment data (1460 bytes)

```

No.	Time	Source	Destination
Protocol Length Info			
14	0.044923000	202.141.80.32	192.168.169.53 TCP
	60	http > 64688 [ACK] Seq=1 Ack=4873 Win=24448 Len=0	

```

Frame 14: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on
interface 0
Ethernet II, Src: Universa_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr_0a:
b0:03 (94:39:e5:0a:b0:03)
Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst:
192.168.169.53 (192.168.169.53)
Transmission Control Protocol, Src Port: http (80), Dst Port: 64688
(64688), Seq: 1, Ack: 4873, Len: 0
Source port: http (80)
Destination port: 64688 (64688)
[Stream index: 0]
Sequence number: 1 (relative sequence number)
Acknowledgment number: 4873 (relative ack number)
Header length: 20 bytes
Flags: 0x010 (ACK)
    000. .... = 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
    .... .... 0... = Push: Not set
    .... .... .0.. = Reset: Not set
    .... .... ..0. = Syn: Not set
    .... .... ...0 = Fin: Not set
Window size value: 191
[Calculated window size: 24448]
[Window size scaling factor: 128]
Checksum: 0x524c [validation disabled]
    [Good Checksum: False]
    [Bad Checksum: False]
    [SEQ/ACK analysis]
    [This is an ACK to the segment in frame: 9]
    [The RTT to ACK the segment was: 0.011545000 seconds]

```

No.	Time	Source	Destination
Protocol Length Info			
15	0.044993000	192.168.169.53	202.141.80.32 TCP
	1514	[TCP segment of a reassembled PDU]	

```

Frame 15: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits
) on interface 0

```

```

Ethernet II, Src: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa_46
:1b:10 (e0:2a:82:46:1b:10)
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst:
202.141.80.32 (202.141.80.32)
Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http
(80), Seq: 9253, Ack: 1, Len: 1460
Source port: 64688 (64688)
Destination port: http (80)
[Stream index: 0]
Sequence number: 9253 (relative sequence number)
[Next sequence number: 10713 (relative sequence number)]
Acknowledgment number: 1 (relative ack number)
Header length: 20 bytes
Flags: 0x010 (ACK)
  000. .... = 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
  .... .... 0... = Push: Not set
  .... .... .0.. = Reset: Not set
  .... .... ..0. = Syn: Not set
  .... .... ...0 = Fin: Not set
Window size value: 16425
[Calculated window size: 65700]
[Window size scaling factor: 4]
Checksum: 0x2461 [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
[SEQ/ACK analysis]
  [Bytes in flight: 5840]
[Reassembled PDU in frame: 454]
TCP segment data (1460 bytes)

```

No.	Time	Source	Destination
Protocol Length Info			
16	0.045007000	192.168.169.53	202.141.80.32 TCP
	1514	[TCP segment of a reassembled PDU]	

```

Frame 16: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits
) on interface 0
Ethernet II, Src: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa_46
:1b:10 (e0:2a:82:46:1b:10)
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst:
202.141.80.32 (202.141.80.32)
Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http
(80), Seq: 10713, Ack: 1, Len: 1460
Source port: 64688 (64688)
Destination port: http (80)
[Stream index: 0]
Sequence number: 10713 (relative sequence number)
[Next sequence number: 12173 (relative sequence number)]
Acknowledgment number: 1 (relative ack number)

```

```

Header length: 20 bytes
Flags: 0x010 (ACK)
  000. .... = 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
  .... .... 0... = Push: Not set
  .... .... .0.. = Reset: Not set
  .... .... ..0. = Syn: Not set
  .... .... ...0 = Fin: Not set
Window size value: 16425
[Calculated window size: 65700]
[Window size scaling factor: 4]
Checksum: 0xf7fd [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
[SEQ/ACK analysis]
  [Bytes in flight: 7300]
[Reassembled PDU in frame: 454]
TCP segment data (1460 bytes)

```

No.	Time	Source	Destination
17	0.045843000	202.141.80.32	192.168.169.53
60 http > 64688 [ACK] Seq=1 Ack=6333 Win=27392 Len=0			

```

Frame 17: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on
interface 0
Ethernet II, Src: Universa_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr_0a:
b0:03 (94:39:e5:0a:b0:03)
Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst:
192.168.169.53 (192.168.169.53)
Transmission Control Protocol, Src Port: http (80), Dst Port: 64688
(64688), Seq: 1, Ack: 6333, Len: 0
Source port: http (80)
Destination port: 64688 (64688)
[Stream index: 0]
Sequence number: 1 (relative sequence number)
Acknowledgment number: 6333 (relative ack number)
Header length: 20 bytes
Flags: 0x010 (ACK)
  000. .... = 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
  .... .... 0... = Push: Not set
  .... .... .0.. = Reset: Not set
  .... .... ..0. = Syn: Not set
  .... .... ...0 = Fin: Not set
Window size value: 214

```

```

[Calculated window size: 27392]
[Window size scaling factor: 128]
Checksum: 0x4c81 [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
[SEQ/ACK analysis]
  [This is an ACK to the segment in frame: 10]
  [The RTT to ACK the segment was: 0.012453000 seconds]

```

No.	Time	Source	Destination
Protocol Length Info			
18	0.045900000	192.168.169.53	202.141.80.32
	1514	[TCP segment of a reassembled PDU]	

Frame 18: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0

Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)

Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)

Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 12173, Ack: 1, Len: 1460

Source port: 64688 (64688)

Destination port: http (80)

[Stream index: 0]

**Sequence number: 12173** (relative sequence number)

[Next sequence number: 13633 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Header length: 20 bytes

Flags: 0x010 (ACK)

000. .... = 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

.... .... 0... = Push: Not set

.... .... .0.. = Reset: Not set

.... .... ..0. = Syn: Not set

.... .... ...0 = Fin: Not set

Window size value: 16425

[Calculated window size: 65700]

[Window size scaling factor: 4]

Checksum: 0x6a83 [validation disabled]

[Good Checksum: False]

[Bad Checksum: False]

[SEQ/ACK analysis]

[Bytes in flight: 7300]

[Reassembled PDU in frame: 454]

TCP segment data (1460 bytes)

No.	Time	Source	Destination
Protocol Length Info			
19	0.045915000	192.168.169.53	202.141.80.32
			TCP



1514 [TCP segment of a reassembled PDU]

Frame 19: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0  
Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)  
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)  
Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 13633, Ack: 1, Len: 1460  
Source port: 64688 (64688)  
Destination port: http (80)  
[Stream index: 0]  
**Sequence number: 13633** (relative sequence number)  
[Next sequence number: 15093 (relative sequence number)]  
Acknowledgment number: 1 (relative ack number)  
Header length: 20 bytes  
Flags: 0x010 (ACK)  
000. .... = 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  
.... .... 0... = Push: Not set  
.... .... .0.. = Reset: Not set  
.... .... ..0. = Syn: Not set  
.... .... ...0 = Fin: Not set  
Window size value: 16425  
[Calculated window size: 65700]  
[Window size scaling factor: 4]  
Checksum: 0x4cd1 [validation disabled]  
[Good Checksum: False]  
[Bad Checksum: False]  
[SEQ/ACK analysis]  
[Bytes in flight: 8760]  
[Reassembled PDU in frame: 454]  
TCP segment data (1460 bytes)

No.	Time	Source	Destination
	Protocol Length Info		
20	0.046547000	202.141.80.32	192.168.169.53 TCP
	60	http > 64688 [ACK] Seq=1 Ack=7793 Win=30336 Len=0	

Frame 20: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0  
Ethernet II, Src: Universa\_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03)  
Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst: 192.168.169.53 (192.168.169.53)  
Transmission Control Protocol, Src Port: http (80), Dst Port: 64688 (64688), Seq: 1, Ack: 7793, Len: 0  
Source port: http (80)  
Destination port: 64688 (64688)

```

[Stream index: 0]
Sequence number: 1      (relative sequence number)
Acknowledgment number: 7793      (relative ack number)
Header length: 20 bytes
Flags: 0x010 (ACK)
  000. .... = 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
  .... .... 0... = Push: Not set
  .... .... .0.. = Reset: Not set
  .... .... ..0. = Syn: Not set
  .... .... ...0 = Fin: Not set
Window size value: 237
[Calculated window size: 30336]
[Window size scaling factor: 128]
Checksum: 0x46b6 [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
[SEQ/ACK analysis]
  [This is an ACK to the segment in frame: 12]
  [The RTT to ACK the segment was: 0.009448000 seconds]

```

No.	Time	Source	Destination
Protocol Length Info			
21	0.046578000	192.168.169.53	202.141.80.32
	1514	[TCP segment of a reassembled PDU]	

Frame 21: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0

Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)

Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)

Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 15093, Ack: 1, Len: 1460

Source port: 64688 (64688)

Destination port: http (80)

[Stream index: 0]

```

Sequence number: 15093      (relative sequence number)
[Next sequence number: 16553      (relative sequence number)]
Acknowledgment number: 1      (relative ack number)
Header length: 20 bytes
Flags: 0x010 (ACK)

```

```

  000. .... = 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
  .... .... 0... = Push: Not set
  .... .... .0.. = Reset: Not set

```

```

.... .... ..0. = Syn: Not set
.... .... ...0 = Fin: Not set
Window size value: 16425
[Calculated window size: 65700]
[Window size scaling factor: 4]
Checksum: 0x7998 [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
[SEQ/ACK analysis]
  [Bytes in flight: 8760]
[Reassembled PDU in frame: 454]
TCP segment data (1460 bytes)

```

No.	Time	Source	Destination
Protocol Length Info			
22	0.046586000	192.168.169.53	202.141.80.32
	1514	[TCP segment of a reassembled PDU]	

Frame 22: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0

Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)

Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)

Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 16553, Ack: 1, Len: 1460

Source port: 64688 (64688)

Destination port: http (80)

[Stream index: 0]

**Sequence number: 16553** (relative sequence number)

[Next sequence number: 18013 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Header length: 20 bytes

Flags: 0x010 (ACK)

000. .... .... = 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

.... .... 0... = Push: Not set

.... .... .0.. = Reset: Not set

.... .... ..0. = Syn: Not set

.... .... ...0 = Fin: Not set

Window size value: 16425

[Calculated window size: 65700]

[Window size scaling factor: 4]

Checksum: 0xff3c [validation disabled]

[Good Checksum: False]

[Bad Checksum: False]

[SEQ/ACK analysis]

[Bytes in flight: 10220]

[Reassembled PDU in frame: 454]

TCP segment data (1460 bytes)

No.	Time	Source	Destination
Protocol Length Info			
23	0.049645000	202.141.80.32	192.168.169.53 TCP
	66	[TCP Dup ACK 20#1] http > 64688 [ACK] Seq=1 Ack=7793 Win=30336 Len=0 SLE=9253 SRE=10713	
Frame 23: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0			
Ethernet II, Src: Universa_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03)			
Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst: 192.168.169.53 (192.168.169.53)			
Transmission Control Protocol, Src Port: http (80), Dst Port: 64688 (64688), Seq: 1, Ack: 7793, Len: 0			
Source port: http (80)			
Destination port: 64688 (64688)			
[Stream index: 0]			
Sequence number: 1 (relative sequence number)			
Acknowledgment number: 7793 (relative ack number)			
Header length: 32 bytes			
Flags: 0x010 (ACK)			
000. .... = 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			
.... .... 0... = Push: Not set			
.... .... .0.. = Reset: Not set			
.... .... ..0. = Syn: Not set			
.... .... ...0 = Fin: Not set			
Window size value: 237			
[Calculated window size: 30336]			
[Window size scaling factor: 128]			
Checksum: 0x0141 [validation disabled]			
[Good Checksum: False]			
[Bad Checksum: False]			
Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), SACK			
[SEQ/ACK analysis]			
[TCP Analysis Flags]			
[This is a TCP duplicate ack]			
[Duplicate ACK #: 1]			
[Duplicate to the ACK in frame: 20]			
[Expert Info (Note/Sequence): Duplicate ACK (#1)]			
[Message: Duplicate ACK (#1)]			
[Severity level: Note]			
[Group: Sequence]			
No.	Time	Source	Destination
Protocol Length Info			
24	0.049704000	192.168.169.53	202.141.80.32 TCP
	1514	[TCP segment of a reassembled PDU]	

```

Frame 24: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits
) on interface 0
Ethernet II, Src: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa_46
:1b:10 (e0:2a:82:46:1b:10)
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst:
202.141.80.32 (202.141.80.32)
Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http
(80), Seq: 18013, Ack: 1, Len: 1460
Source port: 64688 (64688)
Destination port: http (80)
[Stream index: 0]
Sequence number: 18013      (relative sequence number)
[Next sequence number: 19473      (relative sequence number)]
Acknowledgment number: 1      (relative ack number)
Header length: 20 bytes
Flags: 0x010 (ACK)
    000. .... .... = 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
    .... .... 0... = Push: Not set
    .... .... .0.. = Reset: Not set
    .... .... ..0. = Syn: Not set
    .... .... ...0 = Fin: Not set
Window size value: 16425
[Calculated window size: 65700]
[Window size scaling factor: 4]
Checksum: 0x87ab [validation disabled]
    [Good Checksum: False]
    [Bad Checksum: False]
[SEQ/ACK analysis]
    [Bytes in flight: 11680]
[Reassembled PDU in frame: 454]
TCP segment data (1460 bytes)

```

No.	Time	Source	Destination
		Protocol Length Info	
25	0.051799000	202.141.80.32	192.168.169.53 TCP
	66	[TCP Dup ACK 20#2] http > 64688 [ACK] Seq=1 Ack=7793	
		Win=30336 Len=0 SLE=9253 SRE=12173	

```

Frame 25: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on
interface 0
Ethernet II, Src: Universa_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr_0a:
b0:03 (94:39:e5:0a:b0:03)
Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst:
192.168.169.53 (192.168.169.53)
Transmission Control Protocol, Src Port: http (80), Dst Port: 64688
(64688), Seq: 1, Ack: 7793, Len: 0
Source port: http (80)
Destination port: 64688 (64688)
[Stream index: 0]

```

```

Sequence number: 1      (relative sequence number)
Acknowledgment number: 7793      (relative ack number)
Header length: 32 bytes
Flags: 0x010 (ACK)
  000. .... = 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
  .... .... 0... = Push: Not set
  .... .... .0.. = Reset: Not set
  .... .... ..0. = Syn: Not set
  .... .... ...0 = Fin: Not set
Window size value: 237
[Calculated window size: 30336]
[Window size scaling factor: 128]
Checksum: 0xfb8c [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), SACK
[SEQ/ACK analysis]
  [TCP Analysis Flags]
    [This is a TCP duplicate ack]
  [Duplicate ACK #: 2]
  [Duplicate to the ACK in frame: 20]
    [Expert Info (Note/Sequence): Duplicate ACK (#2)]
      [Message: Duplicate ACK (#2)]
      [Severity level: Note]
      [Group: Sequence]

```

No.	Time	Source	Destination
	Protocol Length Info		
26	0.051840000	192.168.169.53	202.141.80.32
	1514	[TCP segment of a reassembled PDU]	

Frame 26: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0

Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)

Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)

Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 19473, Ack: 1, Len: 1460

Source port: 64688 (64688)

Destination port: http (80)

[Stream index: 0]

Sequence number: 19473 (relative sequence number)

[Next sequence number: 20933 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Header length: 20 bytes

Flags: 0x010 (ACK)

000. .... = 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
.... .... 0... = Push: Not set
.... .... .0.. = Reset: Not set
.... .... ..0. = Syn: Not set
.... .... ...0 = Fin: Not set

```

```

Window size value: 16425
[Calculated window size: 65700]
[Window size scaling factor: 4]
Checksum: 0xaf84 [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
[SEQ/ACK analysis]
  [Bytes in flight: 13140]
[Reassembled PDU in frame: 454]
TCP segment data (1460 bytes)

```

No.	Time	Source	Destination
Protocol Length Info			
27	0.055368000	202.141.80.32	192.168.169.53 TCP
74 [TCP Dup ACK 20#3] http > 64688 [ACK] Seq=1 Ack=7793			
Win=30336 Len=0 SLE=18013 SRE=19473 SLE=9253 SRE=12173			

```

Frame 27: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on
interface 0
Ethernet II, Src: Universa_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr_0a:
b0:03 (94:39:e5:0a:b0:03)
Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst:
192.168.169.53 (192.168.169.53)
Transmission Control Protocol, Src Port: http (80), Dst Port: 64688
(64688), Seq: 1, Ack: 7793, Len: 0
Source port: http (80)
Destination port: 64688 (64688)
[Stream index: 0]
Sequence number: 1 (relative sequence number)
Acknowledgment number: 7793 (relative ack number)
Header length: 40 bytes
Flags: 0x010 (ACK)
  000. .... .... = 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
  .... .... 0... = Push: Not set
  .... .... .0.. = Reset: Not set
  .... .... ..0. = Syn: Not set
  .... .... ...0 = Fin: Not set
Window size value: 237
[Calculated window size: 30336]
[Window size scaling factor: 128]
Checksum: 0x87ae [validation disabled]

```

```

    [Good Checksum: False]
    [Bad Checksum: False]
Options: (20 bytes), No-Operation (NOP), No-Operation (NOP), SACK
[SEQ/ACK analysis]
    [TCP Analysis Flags]
        [This is a TCP duplicate ack]
        [Duplicate ACK #: 3]
        [Duplicate to the ACK in frame: 20]
        [Expert Info (Note/Sequence): Duplicate ACK (#3)]
            [Message: Duplicate ACK (#3)]
            [Severity level: Note]
            [Group: Sequence]

```

No.	Time	Source	Destination
	Protocol Length Info		
28	0.055490000	192.168.169.53	202.141.80.32
	1514	[TCP Fast Retransmission]	[TCP segment of a reassembled PDU]

**Frame 28:** 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0

Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)

Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)

Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 7793, Ack: 1, Len: 1460

Source port: 64688 (64688)

Destination port: http (80)

[Stream index: 0]

Sequence number: 7793 (relative sequence number)

[Next sequence number: 9253 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Header length: 20 bytes

Flags: 0x010 (ACK)

000. .... = 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

.... .... 0... = Push: Not set

.... .... .0.. = Reset: Not set

.... .... ..0. = Syn: Not set

.... .... ...0 = Fin: Not set

Window size value: 16425

[Calculated window size: 65700]

[Window size scaling factor: 4]

Checksum: 0xe586 [validation disabled]

[Good Checksum: False]

[Bad Checksum: False]

[SEQ/ACK analysis]

[Bytes in flight: 13140]

[TCP Analysis Flags]



```

[This frame is a (suspected) fast retransmission]
  [Expert Info (Note/Sequence): Fast retransmission (
    suspected)]
    [Message: Fast retransmission (suspected)]
    [Severity level: Note]
    [Group: Sequence]
  [This frame is a (suspected) retransmission]
[Reassembled PDU in frame: 454]
TCP segment data (1460 bytes)

```

No.	Time	Source	Destination
Protocol Length Info			
29	0.060863000	202.141.80.32	192.168.169.53 TCP
	66	http > 64688 [ACK] Seq=1 Ack=12173 Win=33280 Len=0 SLE=18013 SRE=19473	

```

Frame 29: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on
interface 0
Ethernet II, Src: Universa_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr_0a:
b0:03 (94:39:e5:0a:b0:03)
Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst:
192.168.169.53 (192.168.169.53)
Transmission Control Protocol, Src Port: http (80), Dst Port: 64688
(64688), Seq: 1, Ack: 12173, Len: 0
Source port: http (80)
Destination port: 64688 (64688)
[Stream index: 0]
Sequence number: 1 (relative sequence number)
Acknowledgment number: 12173 (relative ack number)
Header length: 32 bytes
Flags: 0x010 (ACK)
  000. .... = 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
  .... .... 0... = Push: Not set
  .... .... .0.. = Reset: Not set
  .... .... ..0. = Syn: Not set
  .... .... ...0 = Fin: Not set
Window size value: 260
[Calculated window size: 33280]
[Window size scaling factor: 128]
Checksum: 0xab9d [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), SACK
[SEQ/ACK analysis]
  [This is an ACK to the segment in frame: 16]
  [The RTT to ACK the segment was: 0.015856000 seconds]

```

No.	Time	Source	Destination
Protocol Length Info			

```

30 0.362960000      192.168.169.53      202.141.80.32      TCP
    1514      [TCP Retransmission] [TCP segment of a reassembled PDU
]

Frame 30: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits
) on interface 0
Ethernet II, Src: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa_46
:1b:10 (e0:2a:82:46:1b:10)
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst:
202.141.80.32 (202.141.80.32)
Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http
(80), Seq: 12173, Ack: 1, Len: 1460
Source port: 64688 (64688)
Destination port: http (80)
[Stream index: 0]
Sequence number: 12173      (relative sequence number)
[Next sequence number: 13633      (relative sequence number)]
Acknowledgment number: 1      (relative ack number)
Header length: 20 bytes
Flags: 0x010 (ACK)
    000. .... .... = 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
    .... .... 0... = Push: Not set
    .... .... .0.. = Reset: Not set
    .... .... ..0. = Syn: Not set
    .... .... ...0 = Fin: Not set
Window size value: 16425
[Calculated window size: 65700]
[Window size scaling factor: 4]
Checksum: 0x6a83 [validation disabled]
    [Good Checksum: False]
    [Bad Checksum: False]
[SEQ/ACK analysis]
    [Bytes in flight: 8760]
    [TCP Analysis Flags]
        [This frame is a (suspected) retransmission]
            [Expert Info (Note/Sequence): Retransmission (suspected)]
                [Message: Retransmission (suspected)]
                [Severity level: Note]
                [Group: Sequence]
            [The RTO for this segment was: 0.311120000 seconds]
            [RTO based on delta from frame: 26]
[Reassembled PDU in frame: 454]
TCP segment data (1460 bytes)

No.      Time      Source      Destination
Protocol Length Info
31 0.367629000      202.141.80.32      192.168.169.53      TCP
    66      http > 64688 [ACK] Seq=1 Ack=13633 Win=36224 Len=0 SLE
=18013 SRE=19473

```

```

Frame 31: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on
interface 0
Ethernet II, Src: Universa_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr_0a:
b0:03 (94:39:e5:0a:b0:03)
Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst:
192.168.169.53 (192.168.169.53)
Transmission Control Protocol, Src Port: http (80), Dst Port: 64688
(64688), Seq: 1, Ack: 13633, Len: 0
Source port: http (80)
Destination port: 64688 (64688)
[Stream index: 0]
Sequence number: 1      (relative sequence number)
Acknowledgment number: 13633      (relative ack number)
Header length: 32 bytes
Flags: 0x010 (ACK)
    000. .... = 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
    .... .... 0... = Push: Not set
    .... .... .0.. = Reset: Not set
    .... .... ..0. = Syn: Not set
    .... .... ...0 = Fin: Not set
Window size value: 283
[Calculated window size: 36224]
[Window size scaling factor: 128]
Checksum: 0xa5d2 [validation disabled]
    [Good Checksum: False]
    [Bad Checksum: False]
Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), SACK
[SEQ/ACK analysis]
    [This is an ACK to the segment in frame: 18]
    [The RTT to ACK the segment was: 0.321729000 seconds]

```

No.	Time	Source	Destination
Protocol Length Info			
32	0.367704000	192.168.169.53	202.141.80.32
	1514	[TCP segment of a reassembled PDU]	

```

Frame 32: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits
) on interface 0
Ethernet II, Src: HonHaiPr_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa_46
:1b:10 (e0:2a:82:46:1b:10)
Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst:
202.141.80.32 (202.141.80.32)
Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http
(80), Seq: 20933, Ack: 1, Len: 1460
Source port: 64688 (64688)
Destination port: http (80)
[Stream index: 0]
Sequence number: 20933      (relative sequence number)

```

```

[Next sequence number: 22393      (relative sequence number)]
Acknowledgment number: 1      (relative ack number)
Header length: 20 bytes
Flags: 0x010 (ACK)
  000. .... = 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
  .... .... 0... = Push: Not set
  .... .... .0.. = Reset: Not set
  .... .... ..0. = Syn: Not set
  .... .... ...0 = Fin: Not set
Window size value: 16425
[Calculated window size: 65700]
[Window size scaling factor: 4]
Checksum: 0x254e [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
[SEQ/ACK analysis]
  [Bytes in flight: 8760]
[Reassembled PDU in frame: 454]
TCP segment data (1460 bytes)

```

No.	Time	Source	Destination
Protocol Length Info			
33	0.367717000	192.168.169.53	202.141.80.32
	1514	[TCP segment of a reassembled PDU]	

Frame 33: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0

Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)

Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)

Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 22393, Ack: 1, Len: 1460

Source port: 64688 (64688)

Destination port: http (80)

[Stream index: 0]

**Sequence number: 22393** (relative sequence number)

[Next sequence number: 23853 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Header length: 20 bytes

Flags: 0x010 (ACK)

```

  000. .... = 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
  .... .... 0... = Push: Not set
  .... .... .0.. = Reset: Not set

```

```

..... ..0. = Syn: Not set
..... ..0 = Fin: Not set
Window size value: 16425
[Calculated window size: 65700]
[Window size scaling factor: 4]
Checksum: 0xc540 [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
[SEQ/ACK analysis]
  [Bytes in flight: 10220]
[Reassembled PDU in frame: 454]
TCP segment data (1460 bytes)

```

No.	Time	Source	Destination
34	0.377763000	202.141.80.32	192.168.169.53
74 [TCP Dup ACK 31#1] http > 64688 [ACK] Seq=1 Ack=13633			
Win=36224 Len=0 SLE=20933 SRE=22393 SLE=18013 SRE=19473			

```

Frame 34: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on
interface 0
Ethernet II, Src: Universa_46:1b:10 (e0:2a:82:46:1b:10), Dst: HonHaiPr_0a:
b0:03 (94:39:e5:0a:b0:03)
Internet Protocol Version 4, Src: 202.141.80.32 (202.141.80.32), Dst:
192.168.169.53 (192.168.169.53)
Transmission Control Protocol, Src Port: http (80), Dst Port: 64688
(64688), Seq: 1, Ack: 13633, Len: 0
Source port: http (80)
Destination port: 64688 (64688)
[Stream index: 0]
Sequence number: 1 (relative sequence number)
Acknowledgment number: 13633 (relative ack number)
Header length: 40 bytes
Flags: 0x010 (ACK)
  000. .... = 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
  .... .... 0... = Push: Not set
  .... .... .0.. = Reset: Not set
  .... .... ..0. = Syn: Not set
  .... .... ...0 = Fin: Not set
Window size value: 283
[Calculated window size: 36224]
[Window size scaling factor: 128]
Checksum: 0x1b24 [validation disabled]
  [Good Checksum: False]
  [Bad Checksum: False]
Options: (20 bytes), No-Operation (NOP), No-Operation (NOP), SACK
[SEQ/ACK analysis]
  [TCP Analysis Flags]
    [This is a TCP duplicate ack]

```

[Duplicate ACK #: 1]

[Duplicate to the ACK in frame: 31]

[Expert Info (Note/Sequence): Duplicate ACK (#1)]

[Message: Duplicate ACK (#1)]

[Severity level: Note]

[Group: Sequence]

No.	Time	Source	Destination
	Protocol Length Info		
35	0.377839000	192.168.169.53	202.141.80.32 TCP
	1514	[TCP Retransmission]	[TCP segment of a reassembled PDU]

Frame 35: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface 0

Ethernet II, Src: HonHaiPr\_0a:b0:03 (94:39:e5:0a:b0:03), Dst: Universa\_46:1b:10 (e0:2a:82:46:1b:10)

Internet Protocol Version 4, Src: 192.168.169.53 (192.168.169.53), Dst: 202.141.80.32 (202.141.80.32)

Transmission Control Protocol, Src Port: 64688 (64688), Dst Port: http (80), Seq: 13633, Ack: 1, Len: 1460

Source port: 64688 (64688)

Destination port: http (80)

[Stream index: 0]

Sequence number: 13633 (relative sequence number)

[Next sequence number: 15093 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Header length: 20 bytes

Flags: 0x010 (ACK)

000. .... = 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

.... .... 0... = Push: Not set

.... .... .0.. = Reset: Not set

.... .... ..0. = Syn: Not set

.... .... ...0 = Fin: Not set

Window size value: 16425

[Calculated window size: 65700]

[Window size scaling factor: 4]

Checksum: 0x4cd1 [validation disabled]

[Good Checksum: False]

[Bad Checksum: False]

[SEQ/ACK analysis]

[Bytes in flight: 10220]

[TCP Analysis Flags]

[This frame is a (suspected) retransmission]

[Expert Info (Note/Sequence): Retransmission (suspected)]

[Message: Retransmission (suspected)]

[Severity level: Note]

[Group: Sequence]

[The RTT for this segment was: 0.010122000 seconds]

```
[RTO based on delta from frame: 33]
[Reassembled PDU in frame: 454]
TCP segment data (1460 bytes)
```

Listing 8: UDP segments display