```
Time
                                              Destination
                                                                    Protocol Length Info
No.
                       Source
      4 0.184719
                                              128.119.245.12
                       172.20.10.9
                                                                    HTTP
                                                                             557
                                                                                    GET /
wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1
Frame 4: 557 bytes on wire (4456 bits), 557 bytes captured (4456 bits) on interface en0, id 0
Ethernet II, Src: Apple_cd:fc:62 (a4:d1:8c:cd:fc:62), Dst: 4e:57:ca:c5:1e:64 (4e:57:ca:c5:1e:
Internet Protocol Version 4, Src: 172.20.10.9, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 53209, Dst Port: 80, Seq: 1, Ack: 1, Len: 491
    Source Port: 53209
    Destination Port: 80
    [Stream index: 3]
    [TCP Segment Len: 491]
                          (relative sequence number)
    Sequence number: 1
    Sequence number (raw): 3899702826
    [Next sequence number: 492
                                  (relative sequence number)]
    Acknowledgment number: 1
                                (relative ack number)
    Acknowledgment number (raw): 94385721
    1000 .... = Header Length: 32 bytes (8)
    Flags: 0x018 (PSH, ACK)
    Window size value: 2060
    [Calculated window size: 2060]
    [window size scaling factor: -1 (unknown)]
    Checksum: 0x82ce [unverified]
    [Checksum Status: Unverified]
    Urgent pointer: 0
    Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
    [Timestamps]
    TCP payload (491 bytes)
Hypertext Transfer Protocol
    GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1\r\n
        [Expert Info (Chat/Sequence): GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/
1.1\r\n]
        Request Method: GET
        Request URI: /wireshark-labs/HTTP-wireshark-file4.html
        Request Version: HTTP/1.1
    Host: gaia.cs.umass.edu\r\n
    Connection: keep-alive\r\n
    Upgrade-Insecure-Requests: 1\r\n
    User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_5) ApplewebKit/537.36 (KHTML,
like Gecko) Chrome/83.0.4103.97 Safari/537.36\r\n
    Accept: text/html,application/xhtml+xml,application/xml;q=0.9.image/webp,image/appq.*/
*;q=0.8,application/signed-exchange;v=b3;q=0.9\r\n
    Accept-Encoding: gzip, deflate\r\n
    Accept-Language: ru-RU, ru; q=0.9, en-US; q=0.8, en; q=0.7 \ r \ n
    [Full request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html]
    [HTTP request 1/2]
    [Response in frame: 8]
    [Next request in frame: 9]
```

```
Time
                                             Destination
                                                                    Protocol Length Info
No.
                       Source
      8 0.382482
                       128.119.245.12
                                             172.20.10.9
                                                                    HTTP
                                                                             1138
                                                                                    HTTP/1.1
200 OK (text/html)
Frame 8: 1138 bytes on wire (9104 bits), 1138 bytes captured (9104 bits) on interface en0, id
Ethernet II, Src: 4e:57:ca:c5:1e:64 (4e:57:ca:c5:1e:64), Dst: Apple_cd:fc:62 (a4:d1:8c:cd:fc:
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 172.20.10.9
Transmission Control Protocol, Src Port: 80, Dst Port: 53209, Seq: 1, Ack: 492, Len: 1072
   Source Port: 80
   Destination Port: 53209
    [Stream index: 3]
    [TCP Segment Len: 1072]
                          (relative sequence number)
   Sequence number: 1
   Sequence number (raw): 94385721
    [Next sequence number: 1073
                                   (relative sequence number)]
   Acknowledgment number: 492
                                  (relative ack number)
   Acknowledgment number (raw): 3899703317
   1000 .... = Header Length: 32 bytes (8)
   Flags: 0x018 (PSH, ACK)
   Window size value: 235
    [Calculated window size: 235]
    [window size scaling factor: -1 (unknown)]
   Checksum: 0x0acf [unverified]
    [Checksum Status: Unverified]
   Urgent pointer: 0
   Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
    [Timestamps]
   TCP payload (1072 bytes)
Hypertext Transfer Protocol
   HTTP/1.1 200 OK\r\n
        [Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]
        Response Version: HTTP/1.1
        Status Code: 200
        [Status Code Description: OK]
        Response Phrase: OK
   Date: Thu, 11 Jun 2020 22:44:43 GMT\r\n
   Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/7.4.6 mod_perl/2.0.11Perl/
v5.16.3\r\n
   Last-Modified: Thu, 11 Jun 2020 05:59:04 GMT\r
   ETag: "2ca-5a7c8a86862d0"\r\n
   Accept-Ranges: bytes\r\n
   Content-Length: 714\r\n
   Keep-Alive: timeout=5, max=100\r\n
   Connection: Keep-Alive\r\n
   Content-Type: text/html; charset=UTF-8\r\n
    \r\n
    [HTTP response 1/2]
    [Time since request: 0.197763000 seconds]
    [Request in frame: 4]
    [Next request in frame: 9]
    [Next response in frame: 12]
    [Request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html]
    File Data: 714 bytes
Line-based text data: text/html (17 lines)
```

```
Time
                                             Destination
                                                                    Protocol Length Info
No.
                       Source
     9 0.481916
                                             128.119.245.12
                       172.20.10.9
                                                                    HTTP
                                                                             489
                                                                                    GET /
pearson.png HTTP/1.1
Frame 9: 489 bytes on wire (3912 bits), 489 bytes captured (3912 bits) on interface en0, id 0
Ethernet II, Src: Apple_cd:fc:62 (a4:d1:8c:cd:fc:62), Dst: 4e:57:ca:c5:1e:64 (4e:57:ca:c5:1e:
Internet Protocol Version 4, Src: 172.20.10.9, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 53209, Dst Port: 80, Seq: 492, Ack: 1073, Len: 423
   Source Port: 53209
   Destination Port: 80
    [Stream index: 3]
    [TCP Segment Len: 423]
   Sequence number: 492
                            (relative sequence number)
   Sequence number (raw): 3899703317
    [Next sequence number: 915
                                  (relative sequence number)]
   Acknowledgment number: 1073
                                   (relative ack number)
   Acknowledgment number (raw): 94386793
   1000 .... = Header Length: 32 bytes (8)
   Flags: 0x018 (PSH, ACK)
   Window size value: 2048
    [Calculated window size: 2048]
    [window size scaling factor: -1 (unknown)]
   Checksum: 0xd736 [unverified]
    [Checksum Status: Unverified]
   Urgent pointer: 0
   Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
    [Timestamps]
   TCP payload (423 bytes)
Hypertext Transfer Protocol
   GET /pearson.png HTTP/1.1\rn
        [Expert Info (Chat/Sequence): GET /pearson.png HTTP/1.1\r\n]
        Request Method: GET
        Request URI: /pearson.png
        Request Version: HTTP/1.1
   Host: gaia.cs.umass.edu\r\n
   Connection: keep-alive\r\n
   User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_5) AppleWebKit/537.36 (KHTML,
like Gecko) Chrome/83.0.4103.97 Safari/537.36\r\n
   Accept: image/webp,image/apng,image/*,*/*;q=0.8\r\n
   Referer: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html\r\n
   Accept-Encoding: gzip, deflate\r\n
   Accept-Language: ru-RU, ru; q=0.9, en-US; q=0.8, en; q=0.7 r
    \r\n
    [Full request URI: http://gaia.cs.umass.edu/pearson.png]
    [HTTP request 2/2]
    [Prev request in frame: 4]
    [Response in frame: 12]
```

```
Destination
                                                                    Protocol Length Info
No.
        Time
                       Source
     12 0.863579
                       128.119.245.12
                                             172.20.10.9
                                                                    HTTP
                                                                             900
                                                                                    HTTP/1.1
200 OK (PNG)
Frame 12: 900 bytes on wire (7200 bits), 900 bytes captured (7200 bits) on interface en0, id0
Ethernet II, Src: 4e:57:ca:c5:1e:64 (4e:57:ca:c5:1e:64), Dst: Apple_cd:fc:62 (a4:d1:8c:cd:fc:
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 172.20.10.9
Transmission Control Protocol, Src Port: 80, Dst Port: 53209, Seq: 3849, Ack: 915, Len: 834
   Source Port: 80
   Destination Port: 53209
    [Stream index: 3]
    [TCP Segment Len: 834]
   Sequence number: 3849
                             (relative sequence number)
   Sequence number (raw): 94389569
    [Next sequence number: 4683
                                   (relative sequence number)]
   Acknowledgment number: 915
                                  (relative ack number)
   Acknowledgment number (raw): 3899703740
   1000 .... = Header Length: 32 bytes (8)
   Flags: 0x018 (PSH, ACK)
   Window size value: 243
    [Calculated window size: 243]
    [window size scaling factor: -1 (unknown)]
   Checksum: 0xe177 [unverified]
    [Checksum Status: Unverified]
   Urgent pointer: 0
   Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
    [Timestamps]
   TCP payload (834 bytes)
   TCP segment data (834 bytes)
[3 Reassembled TCP Segments (3610 bytes): #10(1388), #11(1388), #12(834)]
Hypertext Transfer Protocol
   HTTP/1.1 200 OK\r\n
        [Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]
        Response Version: HTTP/1.1
        Status Code: 200
        [Status Code Description: OK]
        Response Phrase: OK
   Date: Thu, 11 Jun 2020 22:44:44 GMT\r\n
   Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/7.4.6 mod_perl/2.0.11 Perl/
v5.16.3\r\n
   Last-Modified: Sat, 06 Aug 2016 10:08:14 \text{ GMT}\r\n
   ETag: "cc3-539645c7f1ee7"\r\n
   Accept-Ranges: bytes\r\n
   Content-Length: 3267\r\n
   Keep-Alive: timeout=5, max=99\r\n
   Connection: Keep-Alive\r\n
   Content-Type: image/png\r\n
    \r\n
    [HTTP response 2/2]
    [Time since request: 0.381663000 seconds]
    [Prev request in frame: 4]
    [Prev response in frame: 8]
    [Request in frame: 9]
    [Request URI: http://gaia.cs.umass.edu/pearson.png]
    File Data: 3267 bytes
Portable Network Graphics
```

```
Time
                                             Destination
                                                                    Protocol Length Info
No.
                       Source
     14 1.034635
                                             128.119.245.12
                                                                             503
                       172.20.10.9
                                                                    HTTP
                                                                                    GET /
~kurose/cover_5th_ed.jpg HTTP/1.1
Frame 14: 503 bytes on wire (4024 bits), 503 bytes captured (4024 bits) on interface en0, id0
Ethernet II, Src: Apple_cd:fc:62 (a4:d1:8c:cd:fc:62), Dst: 4e:57:ca:c5:1e:64 (4e:57:ca:c5:1e:
Internet Protocol Version 4, Src: 172.20.10.9, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 53212, Dst Port: 80, Seq: 1, Ack: 1, Len: 437
   Source Port: 53212
   Destination Port: 80
    [Stream index: 4]
    [TCP Segment Len: 437]
                          (relative sequence number)
   Sequence number: 1
   Sequence number (raw): 3300181491
    [Next sequence number: 438
                                  (relative sequence number)]
   Acknowledgment number: 1
                                (relative ack number)
   Acknowledgment number (raw): 4025996995
   1000 .... = Header Length: 32 bytes (8)
   Flags: 0x018 (PSH, ACK)
   Window size value: 2060
    [Calculated window size: 2060]
    [window size scaling factor: -1 (unknown)]
   Checksum: 0x4b22 [unverified]
    [Checksum Status: Unverified]
   Urgent pointer: 0
   Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
    [Timestamps]
   TCP payload (437 bytes)
Hypertext Transfer Protocol
   GET /~kurose/cover_5th_ed.jpg HTTP/1.1\r\n
        [Expert Info (Chat/Sequence): GET /~kurose/cover_5th_ed.jpg HTTP/1.1\r\n]
        Request Method: GET
        Request URI: /~kurose/cover_5th_ed.jpg
        Request Version: HTTP/1.1
   Host: manic.cs.umass.edu\r\n
   Connection: keep-alive\r\n
   User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_5) AppleWebKit/537.36 (KHTML,
like Gecko) Chrome/83.0.4103.97 Safari/537.36\r\n
   Accept: image/webp,image/apng,image/*,*/*;q=0.8\r\n
   Referer: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html\r\n
   Accept-Encoding: gzip, deflate\r\n
   Accept-Language: ru-RU, ru; q=0.9, en-US; q=0.8, en; q=0.7 r
    \r\n
    [Full request URI: http://manic.cs.umass.edu/~kurose/cover_5th_ed.jpg]
    [HTTP request 1/1]
    [Response in frame: 88]
```

JPEG File Interchange Format

```
Time
                                              Destination
                                                                    Protocol Length Info
No.
                       Source
     88 1.694721
                       128.119.245.12
                                              172.20.10.9
                                                                    HTTP
                                                                              1447
                                                                                     HTTP/1.1
200 OK (JPEG JFIF image)
Frame 88: 1447 bytes on wire (11576 bits), 1447 bytes captured (11576 bits) on interface en0,
id 0
Ethernet II, Src: 4e:57:ca:c5:1e:64 (4e:57:ca:c5:1e:64), Dst: Apple_cd:fc:62 (a4:d1:8c:cd:fc:
62)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 172.20.10.9
Transmission Control Protocol, Src Port: 80, Dst Port: 53212, Seq: 99937, Ack: 438, Len: 1381
   Source Port: 80
   Destination Port: 53212
    [Stream index: 4]
    [TCP Segment Len: 1381]
                              (relative sequence number)
   Sequence number: 99937
   Sequence number (raw): 4026096931
    [Next sequence number: 101318
                                      (relative sequence number)]
   Acknowledgment number: 438
                                  (relative ack number)
   Acknowledgment number (raw): 3300181928
   1000 .... = Header Length: 32 bytes (8)
   Flags: 0x018 (PSH, ACK)
   Window size value: 235
    [Calculated window size: 235]
    [window size scaling factor: -1 (unknown)]
   Checksum: 0x9737 [unverified]
    [Checksum Status: Unverified]
   Urgent pointer: 0
   Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
    [Timestamps]
   TCP payload (1381 bytes)
   TCP segment data (1381 bytes)
[73 Reassembled TCP Segments (101317 bytes): #15(1388), #16(1388), #17(1388), #18(1388),
#19(1388), #20(1388), #21(1388), #22(1388), #23(1388), #24(1388), #26(1388), #27(1388),
#28(1388), #29(1388), #30(1388), #31(1388), #32(1388), #33(1388<u>]</u>
Hypertext Transfer Protocol
   HTTP/1.1 200 OK\r\n
        [Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]
        Response Version: HTTP/1.1
        Status Code: 200
        [Status Code Description: OK]
        Response Phrase: OK
   Date: Thu, 11 Jun 2020 22:44:44 GMT\r\n
   Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/7.4.6 mod_perl/2.0.11 Perl/
v5.16.3\r\n
   Last-Modified: Tue, 15 Sep 2009 18:23:27 \text{ GMT}\r\n
   ETag: "18a68-473a1e0e6e5c0"\r\n
   Accept-Ranges: bytes\r\n
   Content-Length: 100968\r\n
   Keep-Alive: timeout=5, max=100\r\n
   Connection: Keep-Alive\r\n
   Content-Type: image/jpeg\r\n
    \r\n
    [HTTP response 1/1]
    [Time since request: 0.660086000 seconds]
    [Request in frame: 14]
    [Request URI: http://manic.cs.umass.edu/~kurose/cover_5th_ed.jpg]
    File Data: 100968 bytes
```