```
    40 2.840039       100.65.91.96          128.119.245.12        HTTP     420    GET /wireshark-labs/protected_pages/HTTP-
wiresharkfile5.html HTTP/1.1
Frame 40: 420 bytes on wire (3360 bits), 420 bytes captured (3360 bits) on interface 0
    Interface id: 0 (\Device\NPF_{0C90F0D5-9FC6-44A5-BB98-7375F9677D1C})
    Encapsulation type: Ethernet (1)
    Arrival Time: Jan 19, 2016 19:06:12.859389000 Eastern Standard Time
    [Time shift for this packet: 0.000000000 seconds]
    Epoch Time: 1453248372.859389000 seconds
    [Time delta from previous captured frame: 0.000192000 seconds]
    [Time delta from previous displayed frame: 0.742018000 seconds]
    [Time since reference or first frame: 2.840039000 seconds]
    Frame Number: 40
    Frame Length: 420 bytes (3360 bits)
    Capture Length: 420 bytes (3360 bits)
    [Frame is marked: False]
    [Frame is ignored: False]
    [Protocols in frame: eth:ethertype:ip:tcp:http]
    [Coloring Rule Name: HTTP]
    [Coloring Rule String: http || tcp.port == 80 || http2]
Ethernet II, Src: Microsof_16:a0:9a (30:59:b7:16:a0:9a), Dst: LannerEl_27:0e:f5 (00:90:0b:27:0e:f5)
    Destination: LannerEl_27:0e:f5 (00:90:0b:27:0e:f5)
        Address: LannerEl_27:0e:f5 (00:90:0b:27:0e:f5)
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Source: Microsof_16:a0:9a (30:59:b7:16:a0:9a)
        Address: Microsof_16:a0:9a (30:59:b7:16:a0:9a)
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Type: IPv4 (0x0800)
Internet Protocol Version 4, Src: 100.65.91.96, Dst: 128.119.245.12
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes
    Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
        0000 00.. = Differentiated Services Codepoint: Default (0)
        .... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
    Total Length: 406
    Identification: 0x1bd5 (7125)
    Flags: 0x02 (Don't Fragment)
        0... .... = Reserved bit: Not set
        .1.. .... = Don't fragment: Set
        ..0. .... = More fragments: Not set
    Fragment offset: 0
    Time to live: 128
    Protocol: TCP (6)
    Header checksum: 0xa867 [validation disabled]
        [Good: False]
        [Bad: False]
    Source: 100.65.91.96
    Destination: 128.119.245.12
    [Source GeoIP: Unknown]
    [Destination GeoIP: Unknown]
Transmission Control Protocol, Src Port: 53920 (53920), Dst Port: 80 (80), Seq: 1, Ack: 1, Len: 366
    Source Port: 53920
    Destination Port: 80
    [Stream index: 9]
    [TCP Segment Len: 366]
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 367    (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
        [TCP Flags: *******AP***]
    Window size value: 1024
    [Calculated window size: 1024]
    [Window size scaling factor: -1 (unknown)]
    Checksum: 0x6907 [validation disabled]
        [Good Checksum: False]
        [Bad Checksum: False]
    Urgent pointer: 0
    [SEQ/ACK analysis]
        [Bytes in flight: 366]
Hypertext Transfer Protocol
```

```
GET /wireshark-labs/protected_pages/HTTP-wiresharkfile5.html HTTP/1.1\r\n
    [Expert Info (Chat/Sequence): GET /wireshark-labs/protected_pages/HTTP-wiresharkfile5.html HTTP/1.1\r\n]
        [GET /wireshark-labs/protected_pages/HTTP-wiresharkfile5.html HTTP/1.1\r\n]
        [Severity level: Chat]
        [Group: Sequence]
    Request Method: GET
    Request URI: /wireshark-labs/protected_pages/HTTP-wiresharkfile5.html
    Request Version: HTTP/1.1
Accept: text/html, application/xhtml+xml, image/jxr, */*\r\n
Accept-Language: en-CA,en;q=0.8,zh-Hans-CN;q=0.5,zh-Hans;q=0.3\r\n
User-Agent: Mozilla/5.0 (Windows NT 10.0; WOW64; Trident/7.0; Touch; rv:11.0) like Gecko\r\n
Accept-Encoding: gzip, deflate\r\n
Host: gaia.cs.umass.edu\r\n
Connection: Keep-Alive\r\n
\r\n
[Full request URI: http://gaia.cs.umass.edu/wireshark-labs/protected_pages/HTTP-wiresharkfile5.html]
[HTTP request 1/1]
[Response in frame: 43]
```

```
    43 2.867445       128.119.245.12        100.65.91.96          HTTP     773    HTTP/1.1 401 Unauthorized  (text/html)
Frame 43: 773 bytes on wire (6184 bits), 773 bytes captured (6184 bits) on interface 0
    Interface id: 0 (\Device\NPF_{0C90F0D5-9FC6-44A5-BB98-7375F9677D1C})
    Encapsulation type: Ethernet (1)
    Arrival Time: Jan 19, 2016 19:06:12.886795000 Eastern Standard Time
    [Time shift for this packet: 0.000000000 seconds]
    Epoch Time: 1453248372.886795000 seconds
    [Time delta from previous captured frame: 0.000001000 seconds]
    [Time delta from previous displayed frame: 0.027406000 seconds]
    [Time since reference or first frame: 2.867445000 seconds]
    Frame Number: 43
    Frame Length: 773 bytes (6184 bits)
    Capture Length: 773 bytes (6184 bits)
    [Frame is marked: False]
    [Frame is ignored: False]
    [Protocols in frame: eth:ethertype:ip:tcp:http:data-text-lines]
    [Coloring Rule Name: HTTP]
    [Coloring Rule String: http || tcp.port == 80 || http2]
Ethernet II, Src: LannerEl_27:0e:f5 (00:90:0b:27:0e:f5), Dst: Microsof_16:a0:9a (30:59:b7:16:a0:9a)
    Destination: Microsof_16:a0:9a (30:59:b7:16:a0:9a)
        Address: Microsof_16:a0:9a (30:59:b7:16:a0:9a)
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Source: LannerEl_27:0e:f5 (00:90:0b:27:0e:f5)
        Address: LannerEl_27:0e:f5 (00:90:0b:27:0e:f5)
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Type: IPv4 (0x0800)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 100.65.91.96
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes
    Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
        0000 00.. = Differentiated Services Codepoint: Default (0)
        .... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
    Total Length: 759
    Identification: 0x2e63 (11875)
    Flags: 0x02 (Don't Fragment)
        0... .... = Reserved bit: Not set
        .1.. .... = Don't fragment: Set
        ..0. .... = More fragments: Not set
    Fragment offset: 0
    Time to live: 48
    Protocol: TCP (6)
    Header checksum: 0xe478 [validation disabled]
        [Good: False]
        [Bad: False]
    Source: 128.119.245.12
    Destination: 100.65.91.96
    [Source GeoIP: Unknown]
    [Destination GeoIP: Unknown]
Transmission Control Protocol, Src Port: 80 (80), Dst Port: 53920 (53920), Seq: 1, Ack: 367, Len: 719
    Source Port: 80
    Destination Port: 53920
    [Stream index: 9]
    [TCP Segment Len: 719]
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 720    (relative sequence number)]
    Acknowledgment number: 367    (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
        [TCP Flags: *******AP***]
    Window size value: 237
    [Calculated window size: 237]
    [Window size scaling factor: -1 (unknown)]
    Checksum: 0xca2b [validation disabled]
        [Good Checksum: False]
        [Bad Checksum: False]
    Urgent pointer: 0
    [SEQ/ACK analysis]
        [Bytes in flight: 719]
Hypertext Transfer Protocol
    HTTP/1.1 401 Unauthorized\r\n
```

```
        [Expert Info (Chat/Sequence): HTTP/1.1 401 Unauthorized\r\n]
            [HTTP/1.1 401 Unauthorized\r\n]
            [Severity level: Chat]
            [Group: Sequence]
        Request Version: HTTP/1.1
        Status Code: 401
        Response Phrase: Unauthorized
    Date: Wed, 20 Jan 2016 00:06:07 GMT\r\n
    Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.1e-fips PHP/5.4.16 mod_perl/2.0.9dev Perl/v5.16.3\r\n
    WWW-Authenticate: Basic realm="wireshark-students only"\r\n
    Content-Length: 381\r\n
        [Content length: 381]
    Keep-Alive: timeout=5, max=100\r\n
    Connection: Keep-Alive\r\n
    Content-Type: text/html; charset=iso-8859-1\r\n
    \r\n
    [HTTP response 1/1]
    [Time since request: 0.027406000 seconds]
    [Request in frame: 40]
Line-based text data: text/html
    <!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">\n
    <html><head>\n
    <title>401 Unauthorized</title>\n
    </head><body>\n
    <h1>Unauthorized</h1>\n
    <p>This server could not verify that you\n
    are authorized to access the document\n
    requested.  Either you supplied the wrong\n
    credentials (e.g., bad password), or your\n
    browser doesn't understand how to supply\n
    the credentials required.</p>\n
    </body></html>\n
```

```
     99 16.895471      100.65.91.96          128.119.245.12        HTTP     479    GET /wireshark-labs/protected_pages/HTTP-
wiresharkfile5.html HTTP/1.1
Frame 99: 479 bytes on wire (3832 bits), 479 bytes captured (3832 bits) on interface 0
    Interface id: 0 (\Device\NPF_{0C90F0D5-9FC6-44A5-BB98-7375F9677D1C})
    Encapsulation type: Ethernet (1)
    Arrival Time: Jan 19, 2016 19:06:26.914821000 Eastern Standard Time
    [Time shift for this packet: 0.000000000 seconds]
    Epoch Time: 1453248386.914821000 seconds
    [Time delta from previous captured frame: 0.000418000 seconds]
    [Time delta from previous displayed frame: 14.028026000 seconds]
    [Time since reference or first frame: 16.895471000 seconds]
    Frame Number: 99
    Frame Length: 479 bytes (3832 bits)
    Capture Length: 479 bytes (3832 bits)
    [Frame is marked: False]
    [Frame is ignored: False]
    [Protocols in frame: eth:ethertype:ip:tcp:http]
    [Coloring Rule Name: HTTP]
    [Coloring Rule String: http || tcp.port == 80 || http2]
Ethernet II, Src: Microsof_16:a0:9a (30:59:b7:16:a0:9a), Dst: LannerEl_27:0e:f5 (00:90:0b:27:0e:f5)
    Destination: LannerEl_27:0e:f5 (00:90:0b:27:0e:f5)
        Address: LannerEl_27:0e:f5 (00:90:0b:27:0e:f5)
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Source: Microsof_16:a0:9a (30:59:b7:16:a0:9a)
        Address: Microsof_16:a0:9a (30:59:b7:16:a0:9a)
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Type: IPv4 (0x0800)
Internet Protocol Version 4, Src: 100.65.91.96, Dst: 128.119.245.12
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes
    Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
        0000 00.. = Differentiated Services Codepoint: Default (0)
        .... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
    Total Length: 465
    Identification: 0x1bdb (7131)
    Flags: 0x02 (Don't Fragment)
        0... .... = Reserved bit: Not set
        .1.. .... = Don't fragment: Set
        ..0. .... = More fragments: Not set
    Fragment offset: 0
    Time to live: 128
    Protocol: TCP (6)
    Header checksum: 0xa826 [validation disabled]
        [Good: False]
        [Bad: False]
    Source: 100.65.91.96
    Destination: 128.119.245.12
    [Source GeoIP: Unknown]
    [Destination GeoIP: Unknown]
Transmission Control Protocol, Src Port: 53927 (53927), Dst Port: 80 (80), Seq: 1, Ack: 1, Len: 425
    Source Port: 53927
    Destination Port: 80
    [Stream index: 15]
    [TCP Segment Len: 425]
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 426    (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
        [TCP Flags: *******AP***]
    Window size value: 1024
    [Calculated window size: 262144]
    [Window size scaling factor: 256]
    Checksum: 0xd8c1 [validation disabled]
        [Good Checksum: False]
        [Bad Checksum: False]
    Urgent pointer: 0
    [SEQ/ACK analysis]
        [iRTT: 0.029510000 seconds]
        [Bytes in flight: 425]
```

```
Hypertext Transfer Protocol
    GET /wireshark-labs/protected_pages/HTTP-wiresharkfile5.html HTTP/1.1\r\n
        [Expert Info (Chat/Sequence): GET /wireshark-labs/protected_pages/HTTP-wiresharkfile5.html HTTP/1.1\r\n]
            [GET /wireshark-labs/protected_pages/HTTP-wiresharkfile5.html HTTP/1.1\r\n]
            [Severity level: Chat]
            [Group: Sequence]
        Request Method: GET
        Request URI: /wireshark-labs/protected_pages/HTTP-wiresharkfile5.html
        Request Version: HTTP/1.1
    Accept: text/html, application/xhtml+xml, image/jxr, */*\r\n
    Accept-Language: en-CA,en;q=0.8,zh-Hans-CN;q=0.5,zh-Hans;q=0.3\r\n
    User-Agent: Mozilla/5.0 (Windows NT 10.0; WOW64; Trident/7.0; Touch; rv:11.0) like Gecko\r\n
    Accept-Encoding: gzip, deflate\r\n
    Host: gaia.cs.umass.edu\r\n
    Connection: Keep-Alive\r\n
    Authorization: Basic d2lyZXNoYXJrLXN0dWRlbnRzOm5ldHdvcms=\r\n
        Credentials: wireshark-students:network
    \r\n
    [Full request URI: http://gaia.cs.umass.edu/wireshark-labs/protected_pages/HTTP-wiresharkfile5.html]
    [HTTP request 1/1]
    [Response in frame: 101]
```

```
    101 16.923770      128.119.245.12        100.65.91.96          HTTP     585    HTTP/1.1 404 Not Found  (text/html)
Frame 101: 585 bytes on wire (4680 bits), 585 bytes captured (4680 bits) on interface 0
    Interface id: 0 (\Device\NPF_{0C90F0D5-9FC6-44A5-BB98-7375F9677D1C})
    Encapsulation type: Ethernet (1)
    Arrival Time: Jan 19, 2016 19:06:26.943120000 Eastern Standard Time
    [Time shift for this packet: 0.000000000 seconds]
    Epoch Time: 1453248386.943120000 seconds
    [Time delta from previous captured frame: 0.002339000 seconds]
    [Time delta from previous displayed frame: 0.028299000 seconds]
    [Time since reference or first frame: 16.923770000 seconds]
    Frame Number: 101
    Frame Length: 585 bytes (4680 bits)
    Capture Length: 585 bytes (4680 bits)
    [Frame is marked: False]
    [Frame is ignored: False]
    [Protocols in frame: eth:ethertype:ip:tcp:http:data-text-lines]
    [Coloring Rule Name: HTTP]
    [Coloring Rule String: http || tcp.port == 80 || http2]
Ethernet II, Src: LannerEl_27:0e:f5 (00:90:0b:27:0e:f5), Dst: Microsof_16:a0:9a (30:59:b7:16:a0:9a)
    Destination: Microsof_16:a0:9a (30:59:b7:16:a0:9a)
        Address: Microsof_16:a0:9a (30:59:b7:16:a0:9a)
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Source: LannerEl_27:0e:f5 (00:90:0b:27:0e:f5)
        Address: LannerEl_27:0e:f5 (00:90:0b:27:0e:f5)
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Type: IPv4 (0x0800)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 100.65.91.96
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes
    Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
        0000 00.. = Differentiated Services Codepoint: Default (0)
        .... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
    Total Length: 571
    Identification: 0xab85 (43909)
    Flags: 0x02 (Don't Fragment)
        0... .... = Reserved bit: Not set
        .1.. .... = Don't fragment: Set
        ..0. .... = More fragments: Not set
    Fragment offset: 0
    Time to live: 48
    Protocol: TCP (6)
    Header checksum: 0x6812 [validation disabled]
        [Good: False]
        [Bad: False]
    Source: 128.119.245.12
    Destination: 100.65.91.96
    [Source GeoIP: Unknown]
    [Destination GeoIP: Unknown]
Transmission Control Protocol, Src Port: 80 (80), Dst Port: 53927 (53927), Seq: 1, Ack: 426, Len: 531
    Source Port: 80
    Destination Port: 53927
    [Stream index: 15]
    [TCP Segment Len: 531]
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 532    (relative sequence number)]
    Acknowledgment number: 426    (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
        [TCP Flags: *******AP***]
    Window size value: 237
    [Calculated window size: 30336]
    [Window size scaling factor: 128]
    Checksum: 0x8d79 [validation disabled]
        [Good Checksum: False]
        [Bad Checksum: False]
    Urgent pointer: 0
    [SEQ/ACK analysis]
        [iRTT: 0.029510000 seconds]
        [Bytes in flight: 531]
Hypertext Transfer Protocol
```

```
    HTTP/1.1 404 Not Found\r\n
        [Expert Info (Chat/Sequence): HTTP/1.1 404 Not Found\r\n]
            [HTTP/1.1 404 Not Found\r\n]
            [Severity level: Chat]
            [Group: Sequence]
        Request Version: HTTP/1.1
        Status Code: 404
        Response Phrase: Not Found
    Date: Wed, 20 Jan 2016 00:06:22 GMT\r\n
    Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.1e-fips PHP/5.4.16 mod_perl/2.0.9dev Perl/v5.16.3\r\n
    Content-Length: 253\r\n
        [Content length: 253]
    Keep-Alive: timeout=5, max=100\r\n
    Connection: Keep-Alive\r\n
    Content-Type: text/html; charset=iso-8859-1\r\n
    \r\n
    [HTTP response 1/1]
    [Time since request: 0.028299000 seconds]
    [Request in frame: 99]
Line-based text data: text/html
    <!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">\n
    <html><head>\n
    <title>404 Not Found</title>\n
    </head><body>\n
    <h1>Not Found</h1>\n
    <p>The requested URL /wireshark-labs/protected_pages/HTTP-wiresharkfile5.html was not found on this server.</p>\n
    </body></html>\n
```