

Http communication protocols

Layer	Protocol
Application	http
Transport	tcp
Network	IP
Data Link	Ethernet / WPA2
Physical	----

http request

Hypertext Transfer Protocol

```
GET /~cpresser/cs102/notes/10-06-2025_NetworkTools.pdf HTTP/1.1\r\n
Host: public.gettysburg.edu\r\n
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:129.0) Gecko/20100101 Firefox/129.0\r\n
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image\r\n
Accept-Language: en-US,en;q=0.5\r\n
Accept-Encoding: gzip, deflate\r\n
Connection: keep-alive\r\n
Referer: http://public.gettysburg.edu/~cpresser/cs102/notes/\r\n
[truncated]Cookie: _ga=GA1.2.1795882821.1522094035; _ga_3T4EQLFYG0=GS2.1.s1747423718$oa\r\n
Cookie pair: _ga=GA1.2.1795882821.1522094035\r\n
Cookie pair: _ga_3T4EQLFYG0=GS2.1.s1747423718$oa$g1$t1747423795$j44$l0$h0$dvE1Ygy5Mvi7\r\n
Cookie pair: _sctr=1%7C1747368000000\r\n
Cookie pair: _tt_enable_cookie=1\r\n
Cookie pair: _ttp=mAQy_29naGtQEdV2t82BSC6f9v9.tt.1\r\n
Cookie pair: ttcsid_CJSV5ABC77U5TJETRKK0=1747423719873::mPHDFwYd05fVTUuq82NP.1.1747423\r\n
Cookie pair: ttcsid=1747423719873::vYgKiAnBXXcB78Y7if5R.1.1747423734243\r\n
Cookie pair: _scid_r=h1Y63AvsXV2Sm0HbfIwi_UXr9lfIwm_oN3Q_NQ\r\n
Upgrade-Insecure-Requests: 1\r\n
Priority: u=0, i\r\n
\r\n
```

HTTP Request
GET: ...

tcp segment

```
Transmission Control Protocol, Src Port: 51650 (51650), Dst Port: http (80),
Source Port: 51650 (51650)
Destination Port: http (80)
[Stream index: 3]
[Conversation completeness: Incomplete, DATA (15)]
[TCP Segment Len: 911]
Sequence Number: 1      (relative sequence number)
Sequence Number (raw): 2161859628
[Next Sequence Number: 912      (relative sequence number)]
Acknowledgment Number: 1      (relative ack number)
Acknowledgment number (raw): 4154380460
1000 .... = Header Length: 32 bytes (8)
▸ Flags: 0x018 (PSH, ACK)
Window: 64240
[Calculated window size: 64240]
[Window size scaling factor: -2 (no window scaling used)]
▸ Checksum: 0x4a52 incorrect, should be 0x2d98(maybe caused by "TCP checksum
[Checksum Status: Bad]
[Calculated Checksum: 0x2d98]
Urgent Pointer: 0
▸ Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
▸ [Timestamps]
▸ [SEQ/ACK analysis]
TCP payload (911 bytes)
```

TCP Header
Source: 51650
Dest: 80

HTTP Request
GET: ...

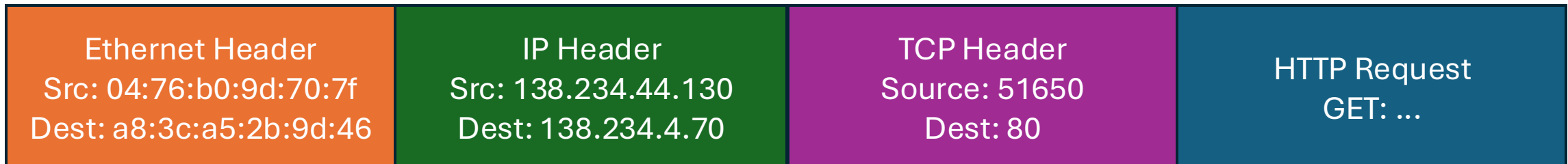
IP packet

```
Internet Protocol Version 4, Src: rodlapppp.cs.gettysburg.edu (138
0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
▸ Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
Total Length: 963
Identification: 0x69aa (27050)
▸ Flags: 0x40, Don't fragment
...0 0000 0000 0000 = Fragment Offset: 0
Time to Live: 64
Protocol: TCP (6)
Header Checksum: 0x86ee [validation disabled]
[Header checksum status: Unverified]
Source Address: rodlapppp.cs.gettysburg.edu (138.234.44.130)
Destination Address: bal-public2.gettysburg.edu (138.234.4.70)
```

IP Header Src: 138.234.44.130 Dest: 138.234.4.70	TCP Header Source: 51650 Dest: 80	HTTP Request GET: ...
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Ethernet Frame

```
Ethernet II, Src: a8:3c:a5:2b:9d:46 (a8:3c:a5:2b:9d:  
  Destination: Cisco_9d:70:7f (04:76:b0:9d:70:7f)  
  Source: a8:3c:a5:2b:9d:46 (a8:3c:a5:2b:9d:46)  
  Type: IPv4 (0x0800)
```



http response

Hypertext Transfer Protocol

```
HTTP/1.1 200 OK\r\n
Date: Wed, 08 Oct 2025 12:31:23 GMT\r\n
Server: Apache/2.4.62 (Rocky Linux) OpenSSL/3.2.2\r\n
Last-Modified: Mon, 06 Oct 2025 15:00:35 GMT\r\n
ETag: "24ba7-6407eb6b2c523"\r\n
Accept-Ranges: bytes\r\n
Content-Length: 150439\r\n
  [Content length: 150439]
Keep-Alive: timeout=5, max=100\r\n
Connection: Keep-Alive\r\n
Content-Type: application/pdf\r\n
\r\n
[HTTP response 1/1]
[Time since request: 0.007595000 seconds]
[Request in frame: 84]
[Request URI: http://public.gettysburg.edu/~cpresser/cs]
File Data: 14165 bytes
```

Ethernet Header

Src: a8:3c:a5:2b:9d:46
Dest: 04:76:b0:9d:70:7f

IP Header

Src: 138.234.4.70
Dest: 138.234.44.130

TCP Header

Source: 80
Dest: 51550

HTTP Response
200 OK

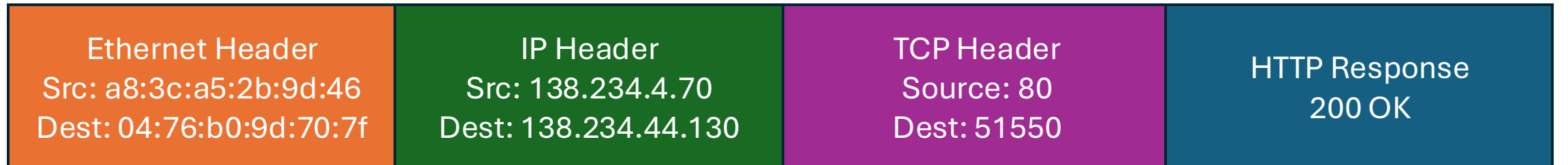
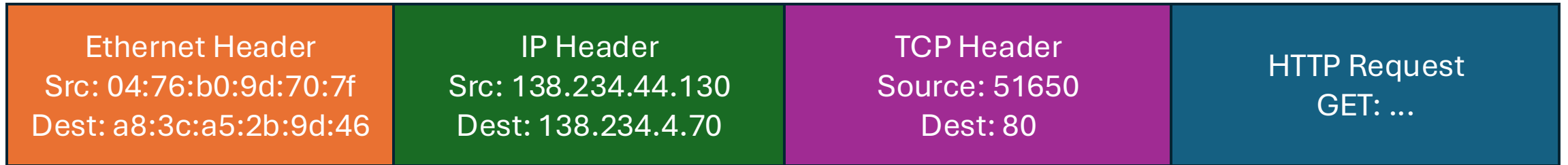
Request/Response

Data Link

Network

Transport

Application



Request on Network

