SIT202: Computer Networks and Communication
Active Class Task

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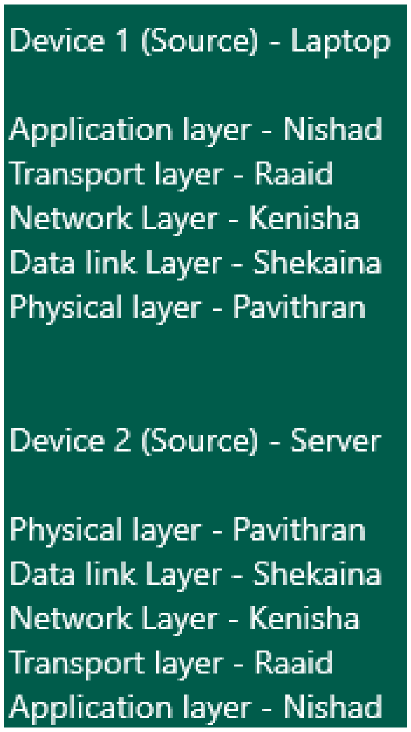
Members in this group activity task:

1. Nishad – BSCP|CS|71|138
2. Kenisha – DFCS|DK|62|203
3. Shekaina – BSCP|CS|71|139
4. Raaid – DFCS|DK|62|206
5. Pavithran – ACNSA|DK|61|168

Activity 1

1. Communication protocols allow different network devices to communicate with each other. The five layers of the tcp/ip model is as follows,
    - Application Layer
    - Transport Layer
    - Network Layer
    - Data – Link Layer
    - Physical Layer
2. The screenshots of the roleplay in order are as followed,



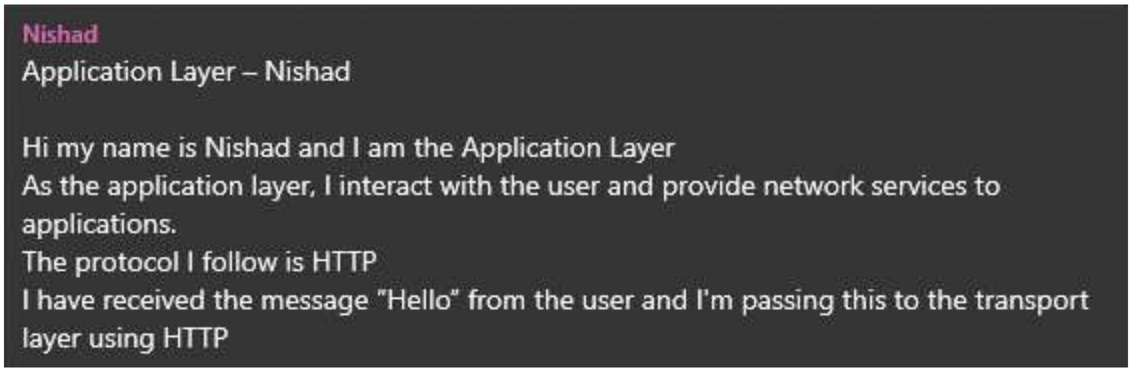
Device 1 (Source) - Laptop

Application layer - Nishad
Transport layer - Raaid
Network Layer - Kenisha
Data link Layer - Shekaina
Physical layer - Pavithran

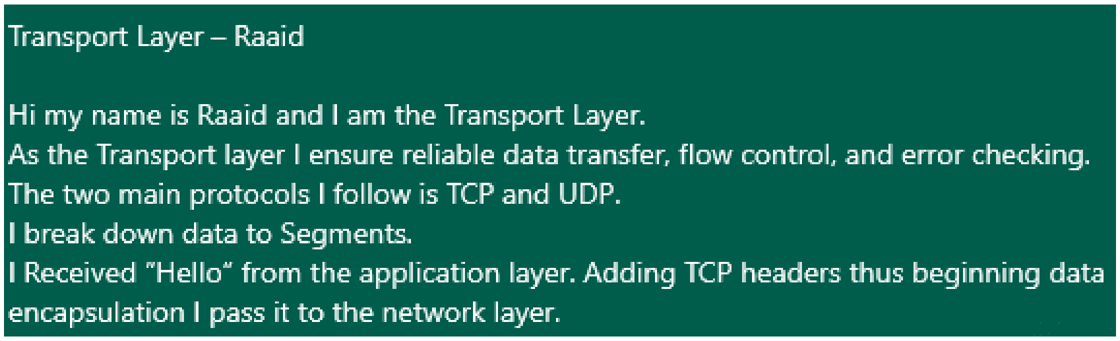
Device 2 (Source) - Server

Physical layer - Pavithran
Data link Layer - Shekaina
Network Layer - Kenisha
Transport layer - Raaid
Application layer - Nishad

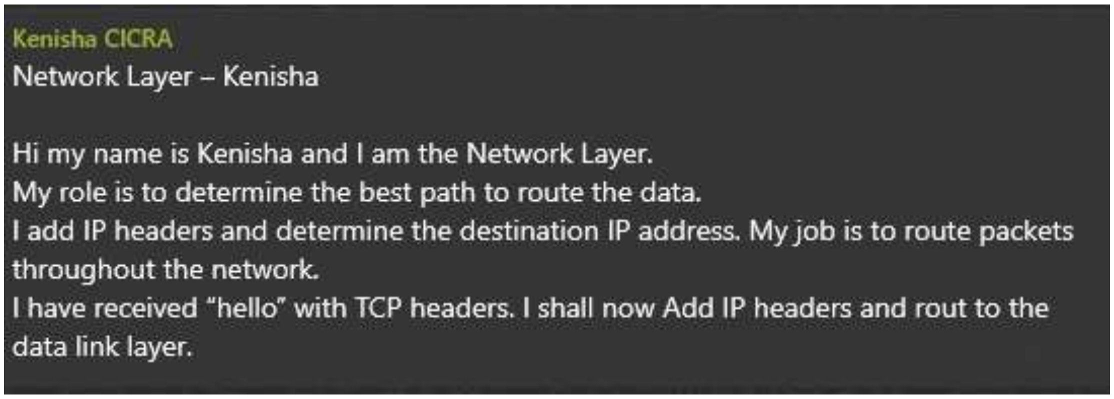
Device 1 (Source) - Laptop


Nishad
Application Layer – Nishad

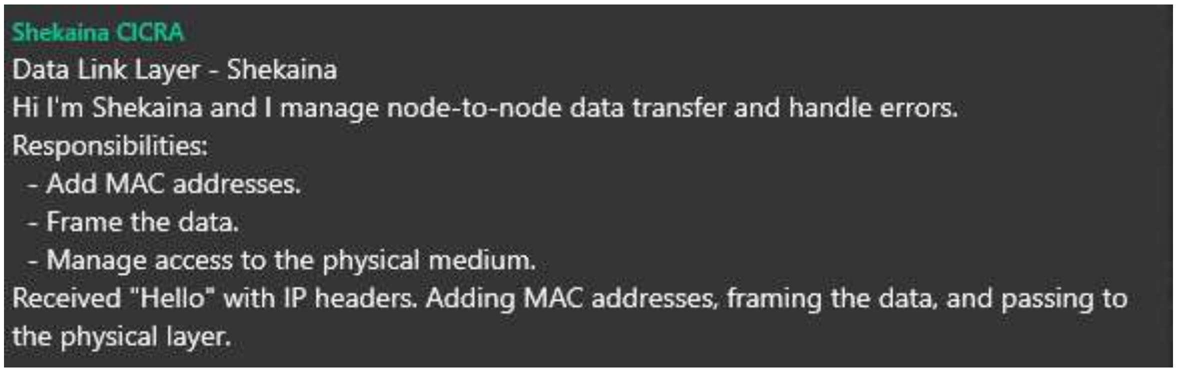
Hi my name is Nishad and I am the Application Layer
As the application layer, I interact with the user and provide network services to applications.
The protocol I follow is HTTP
I have received the message "Hello" from the user and I'm passing this to the transport layer using HTTP


Transport Layer – Raaid

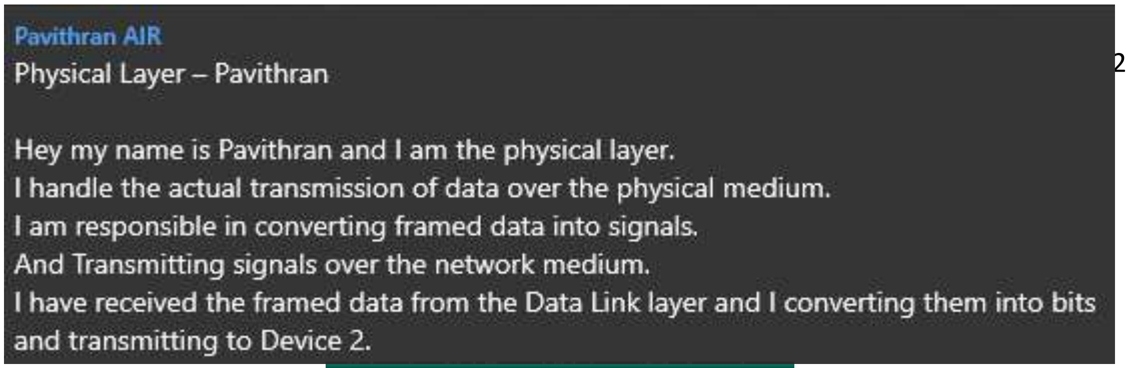
Hi my name is Raaid and I am the Transport Layer.
As the Transport layer I ensure reliable data transfer, flow control, and error checking.
The two main protocols I follow is TCP and UDP.
I break down data to Segments.
I Received "Hello" from the application layer. Adding TCP headers thus beginning data encapsulation I pass it to the network layer.


Kenisha CICRA
Network Layer – Kenisha

Hi my name is Kenisha and I am the Network Layer.
My role is to determine the best path to route the data.
I add IP headers and determine the destination IP address. My job is to route packets throughout the network.
I have received "hello" with TCP headers. I shall now Add IP headers and rout to the data link layer.


Shekaina CICRA
Data Link Layer - Shekaina
Hi I'm Shekaina and I manage node-to-node data transfer and handle errors.
Responsibilities:
- Add MAC addresses.
- Frame the data.
- Manage access to the physical medium.

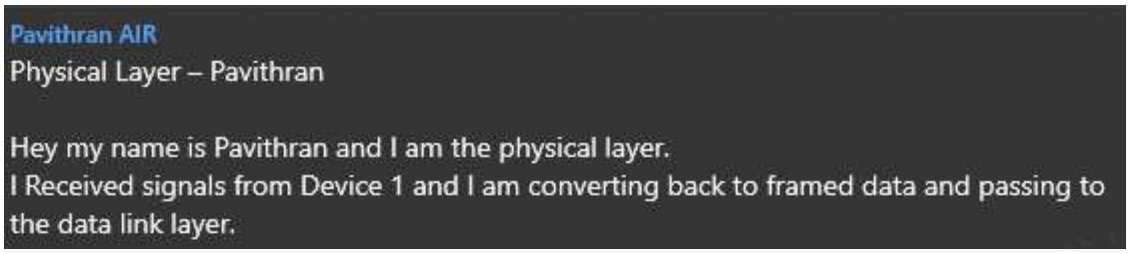
Received "Hello" with IP headers. Adding MAC addresses, framing the data, and passing to the physical layer.



Pavithran AIR
Physical Layer – Pavithran

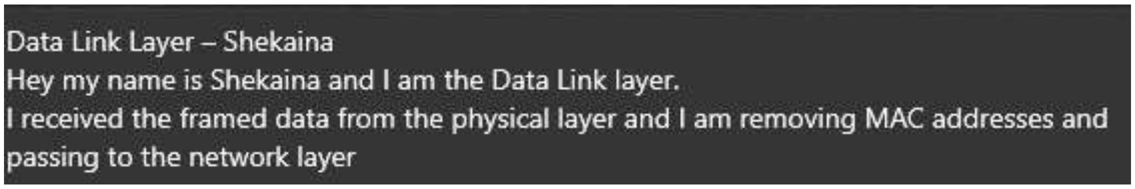
Hey my name is Pavithran and I am the physical layer.
I handle the actual transmission of data over the physical medium.
I am responsible in converting framed data into signals.
And Transmitting signals over the network medium.
I have received the framed data from the Data Link layer and I converting them into bits and transmitting to Device 2.

Device 2 (Destination) – Server

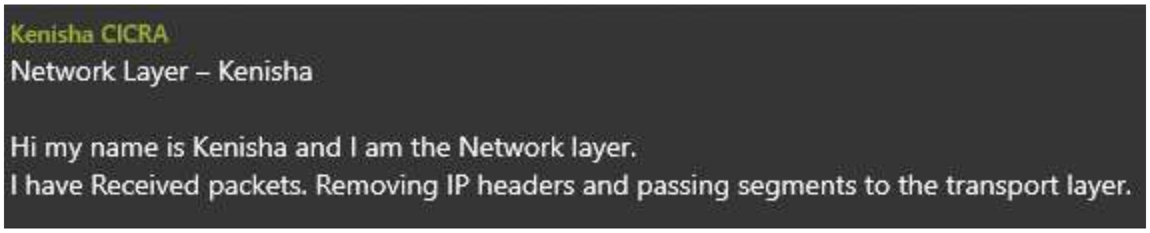


Pavithran AIR
Physical Layer – Pavithran

Hey my name is Pavithran and I am the physical layer.
I Received signals from Device 1 and I am converting back to framed data and passing to the data link layer.

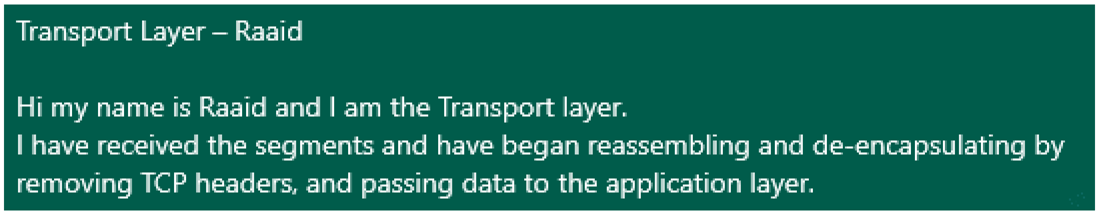


Data Link Layer – Shekaina
Hey my name is Shekaina and I am the Data Link layer.
I received the framed data from the physical layer and I am removing MAC addresses and passing to the network layer



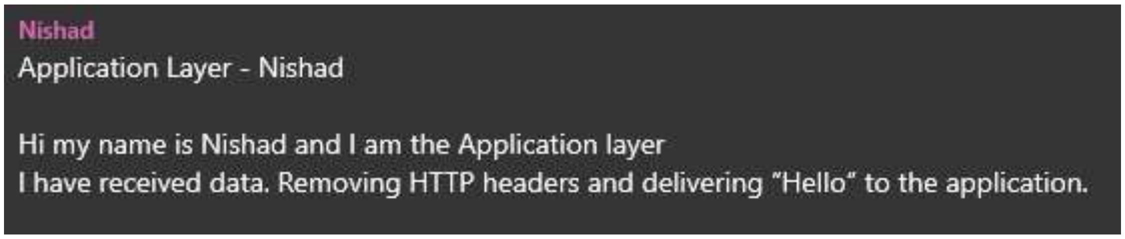
Kenisha CICRA
Network Layer – Kenisha

Hi my name is Kenisha and I am the Network layer.
I have Received packets. Removing IP headers and passing segments to the transport layer.



Transport Layer – Raaid

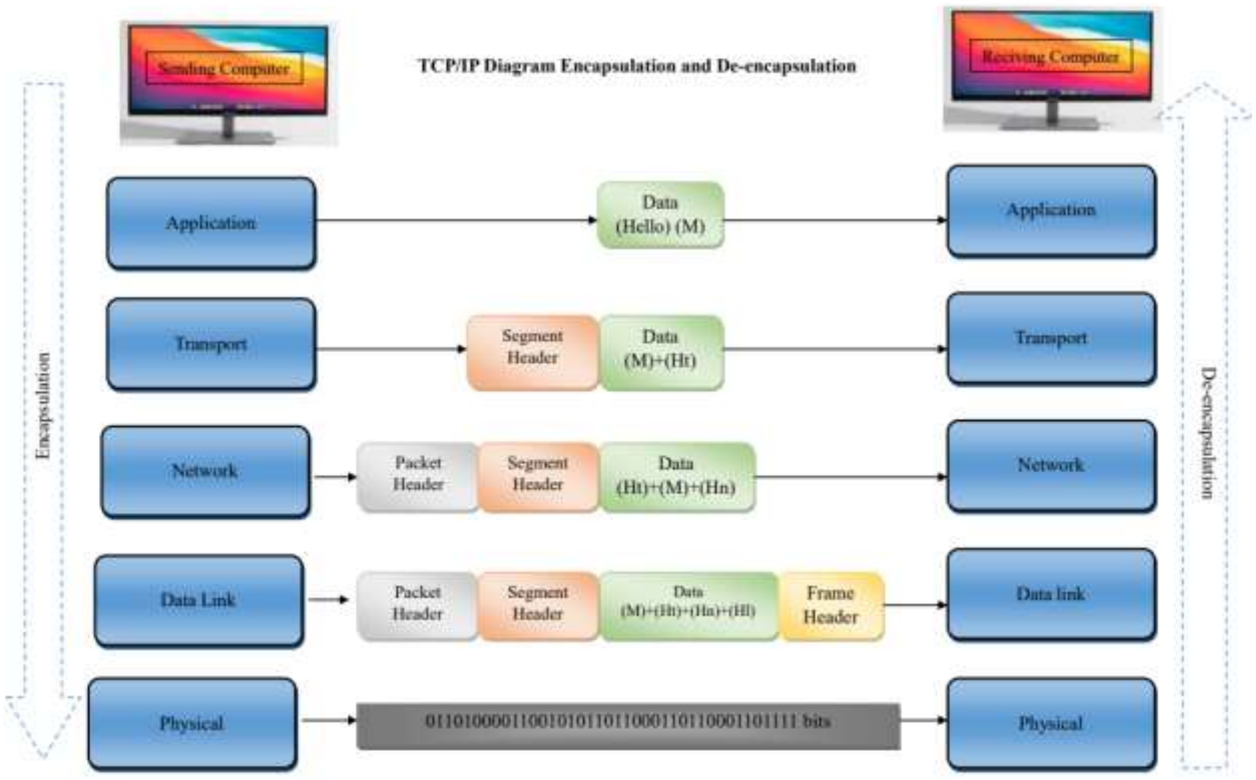
Hi my name is Raaid and I am the Transport layer.
I have received the segments and have began reassembling and de-encapsulating by removing TCP headers, and passing data to the application layer.



Nishad
Application Layer - Nishad

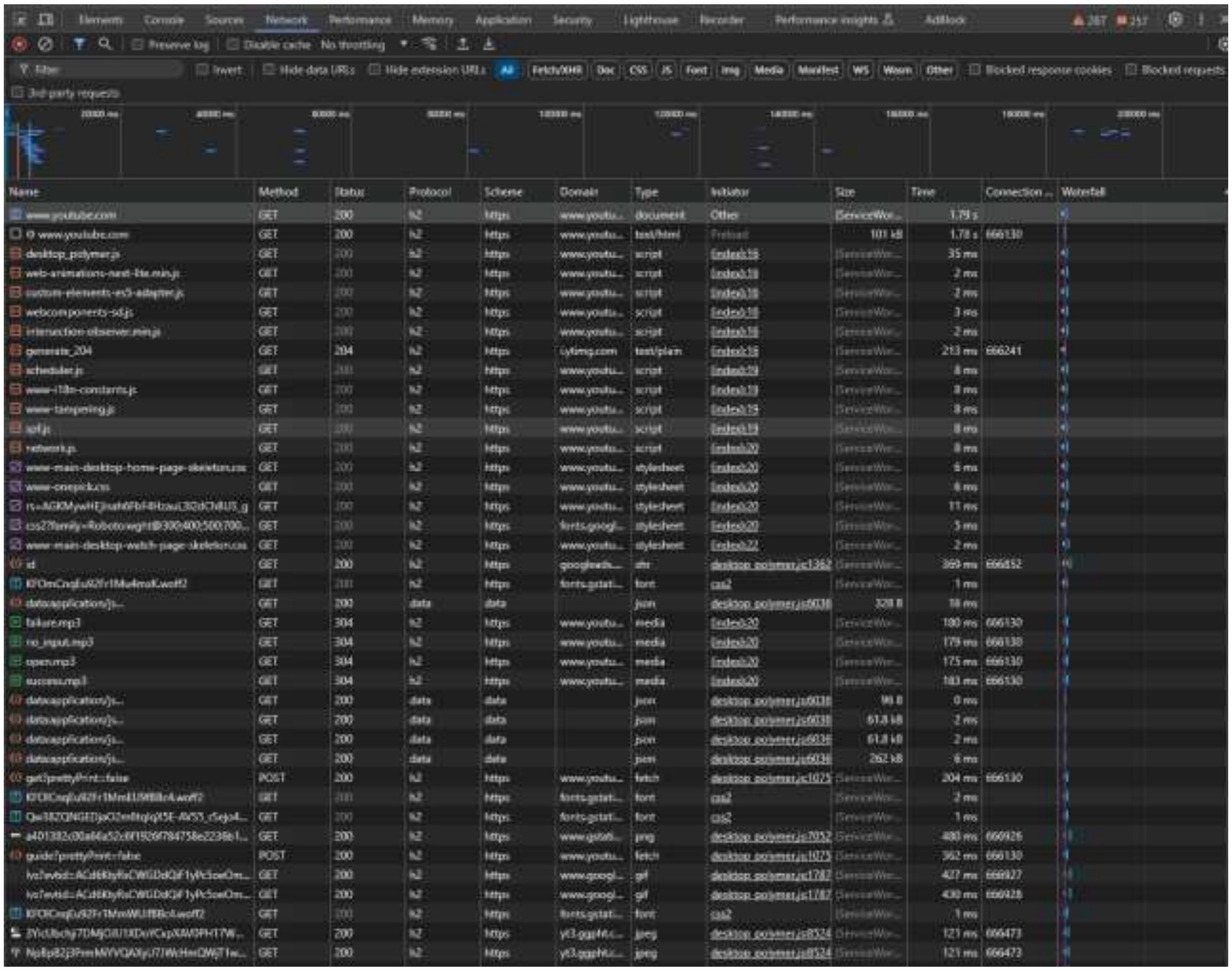
Hi my name is Nishad and I am the Application layer
I have received data. Removing HTTP headers and delivering "Hello" to the application.

Below contains the diagram explaining the relationship between each layer when sending the "Hello" message from source to destination

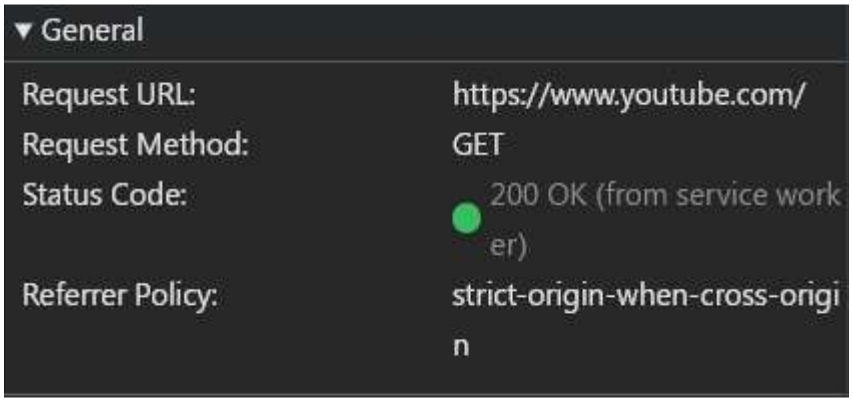


Activity 2

The webpage used for this task is, https://www.youtube.com/

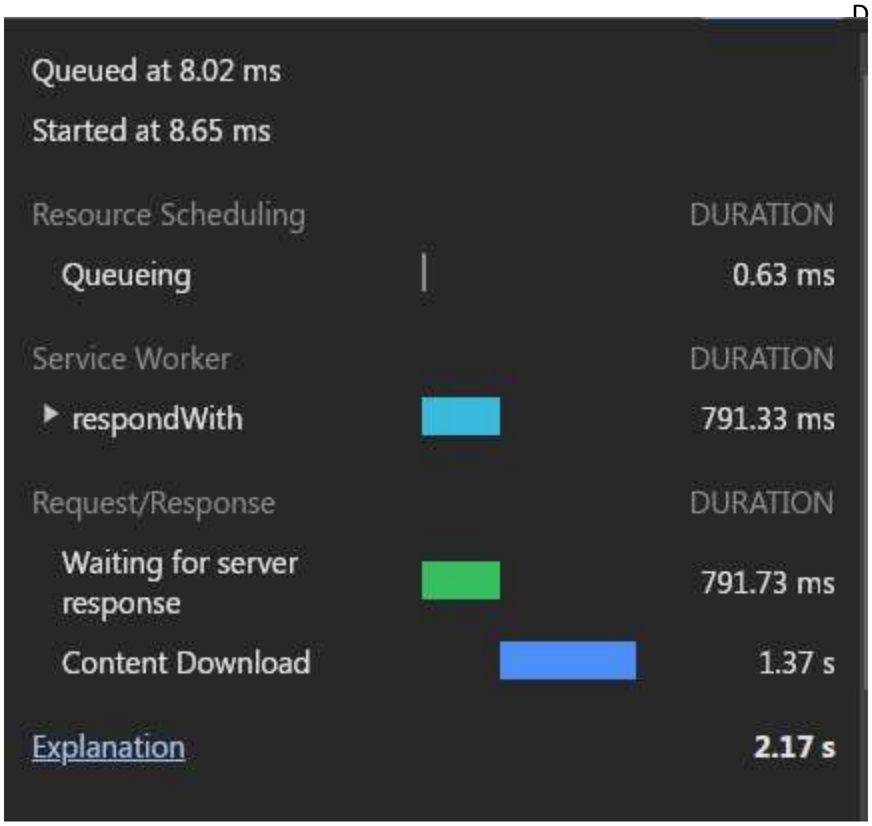


Name	Method	Status	Protocol	Scheme	Domain	Type	Initiator	Size	Time	Connection ...	Waterfall
www.youtube.com	GET	200	h2	https	www.youtu...	document	Other	(ServiceWor...	1.79 s		
⚙ www.youtube.com	GET	200	h2	https	www.youtu...	text/html	Preload	101 kB	1.78 s	666130	
desktop_polymer.js	GET	200	h2	https	www.youtu...	script	(index):18	(ServiceWor...	35 ms		
web-animations-next-lite.min.js	GET	200	h2	https	www.youtu...	script	(index):18	(ServiceWor...	2 ms		
custom-elements-es5-adapter.js	GET	200	h2	https	www.youtu...	script	(index):18	(ServiceWor...	2 ms		
webcomponents-sd.js	GET	200	h2	https	www.youtu...	script	(index):18	(ServiceWor...	3 ms		
intersection-observer.min.js	GET	200	h2	https	www.youtu...	script	(index):18	(ServiceWor...	2 ms		
generate_204	GET	204	h2	https	i.ytimg.com	text/plain	(index):18	(ServiceWor...	213 ms	666241	
scheduler.js	GET	200	h2	https	www.youtu...	script	(index):19	(ServiceWor...	8 ms		
www-i18n-constants.js	GET	200	h2	https	www.youtu...	script	(index):19	(ServiceWor...	8 ms		
www-tampering.js	GET	200	h2	https	www.youtu...	script	(index):19	(ServiceWor...	8 ms		
spf.js	GET	200	h2	https	www.youtu...	script	(index):19	(ServiceWor...	8 ms		
network.js	GET	200	h2	https	www.youtu...	script	(index):20	(ServiceWor...	8 ms		
www-main-desktop-home-page-skeleton.css	GET	200	h2	https	www.youtu...	stylesheet	(index):20	(ServiceWor...	6 ms		
www-onepick.css	GET	200	h2	https	www.youtu...	stylesheet	(index):20	(ServiceWor...	6 ms		
rs=AGKMywHEjnah6FbF4HtzauL3I2dChlU5_g	GET	200	h2	https	www.youtu...	stylesheet	(index):20	(ServiceWor...	11 ms		
css2?family=Roboto:wght@300;400;500;700...	GET	200	h2	https	fonts.googl...	stylesheet	(index):20	(ServiceWor...	5 ms		
www-main-desktop-watch-page-skeleton.css	GET	200	h2	https	www.youtu...	stylesheet	(index):22	(ServiceWor...	2 ms		
id	GET	200	h2	https	googleads...	xhr	desktop_polymer.js:1362	(ServiceWor...	369 ms	666852	
KFOmCnqEu92Fr1Mu4mxK.woff2	GET	200	h2	https	fonts.gstat...	font	css2	(ServiceWor...	1 ms		
data:application/js...	GET	200	data	data		json	desktop_polymer.js:6038	328 B	18 ms		
failure.mp3	GET	304	h2	https	www.youtu...	media	(index):20	(ServiceWor...	180 ms	666130	
no_input.mp3	GET	304	h2	https	www.youtu...	media	(index):20	(ServiceWor...	179 ms	666130	
open.mp3	GET	304	h2	https	www.youtu...	media	(index):20	(ServiceWor...	175 ms	666130	
success.mp3	GET	304	h2	https	www.youtu...	media	(index):20	(ServiceWor...	183 ms	666130	
data:application/js...	GET	200	data	data		json	desktop_polymer.js:6038	96 B	0 ms		
data:application/js...	GET	200	data	data		json	desktop_polymer.js:6038	61.8 kB	2 ms		
data:application/js...	GET	200	data	data		json	desktop_polymer.js:6038	61.8 kB	2 ms		
data:application/js...	GET	200	data	data		json	desktop_polymer.js:6038	262 kB	6 ms		
get?prettyPrint=false	POST	200	h2	https	www.youtu...	fetch	desktop_polymer.js:1075	(ServiceWor...	204 ms	666130	
KFOlCnqEu92Fr1MmEU9fBBc4.woff2	GET	200	h2	https	fonts.gstat...	font	css2	(ServiceWor...	2 ms		
Qw3BZQNGEDjaO2m8tqlqX5E-AVS5_rSejo4...	GET	200	h2	https	fonts.gstat...	font	css2	(ServiceWor...	1 ms		
a401382c00a84a52c8f1926f784758e2238b1...	GET	200	h2	https	www.gstati...	png	desktop_polymer.js:7052	(ServiceWor...	480 ms	666926	
guide?prettyPrint=false	POST	200	h2	https	www.youtu...	fetch	desktop_polymer.js:1075	(ServiceWor...	362 ms	666130	
lvo?evtid=ACd6KtyRsCWGDdQiF1yPc5oeOm...	GET	200	h2	https	www.googl...	gif	desktop_polymer.js:1787	(ServiceWor...	427 ms	666927	
lvo?evtid=ACd6KtyRsCWGDdQiF1yPc5oeOm...	GET	200	h2	https	www.googl...	gif	desktop_polymer.js:1787	(ServiceWor...	430 ms	666928	
KFOlCnqEu92Fr1MmWUlfBBc4.woff2	GET	200	h2	https	fonts.gstat...	font	css2	(ServiceWor...	1 ms		
3YicUbchj7DMjOlU1lDo/CcpXAW0PHT7W...	GET	200	h2	https	yt3.ggpht.c...	jpeg	desktop_polymer.js:8524	(ServiceWor...	121 ms	666473	
Np8p82j3PmMYVQAXyU7JWcHeQWjT1w...	GET	200	h2	https	yt3.ggpht.c...	jpeg	desktop_polymer.js:8524	(ServiceWor...	121 ms	666473	



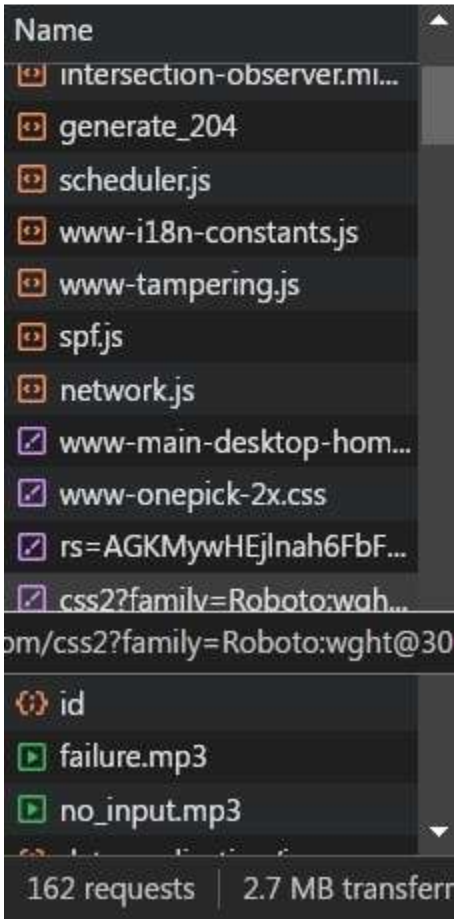
▼ General

Request URL:	https://www.youtube.com/
Request Method:	GET
Status Code:	● 200 OK (from service worker)
Referrer Policy:	strict-origin-when-cross-origin



Queued at 8.02 ms
Started at 8.65 ms

Resource Scheduling		DURATION
Queueing		0.63 ms
Service Worker		**DURATION**
respondWith		791.33 ms
Request/Response		**DURATION**
Waiting for server response		791.73 ms
Content Download		1.37 s
Explanation		**2.17 s**

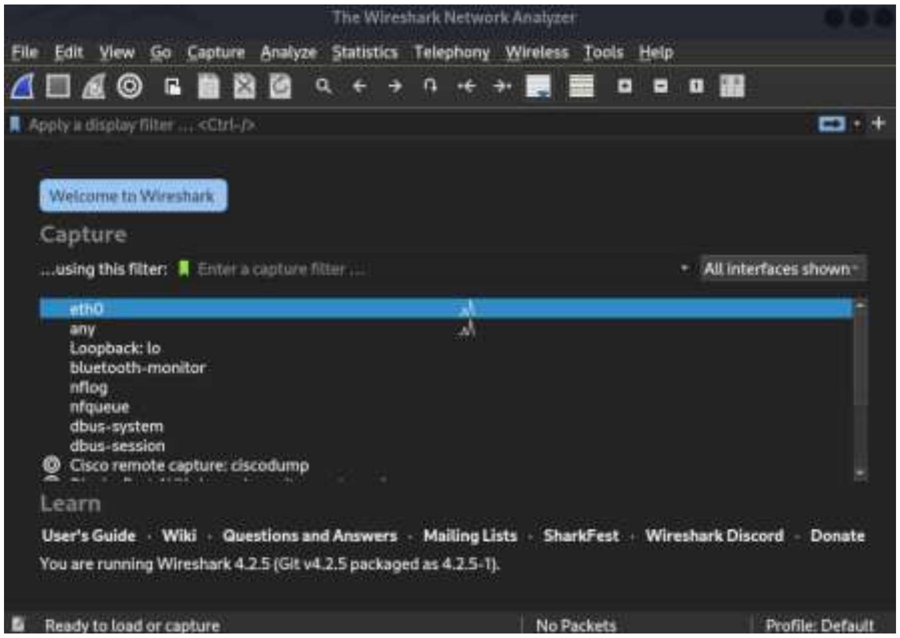


```
Name
intersection-observer.mi...
generate_204
scheduler.js
www-i18n-constants.js
www-tampering.js
spf.js
network.js
www-main-desktop-hom...
www-onepick-2x.css
rs=AGKMywHEjlnah6FbF...
css2?family=Roboto:wgh...
om/css2?family=Roboto:wght@30
id
failure.mp3
no_input.mp3
162 requests | 2.7 MB transferr
```

When I visited "https://www.youtube.com/" my browser requested numerous resources, including the main HTML content, JavaScript scripts, and CSS stylesheets. Both the HTTP/1.1 and H2 protocols were used for these requests. The Network analysis tool's waterfall view provided a thorough history of these requests, showing the order in which resources were loaded and the overall load time.

Activity 3

1. The webpage used for this task is, http://httpforever.com/
2.

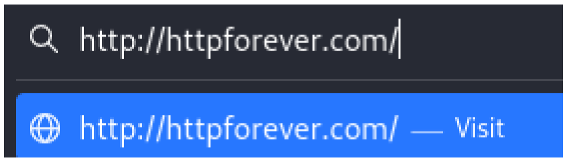

The Wireshark Network Analyzer
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter … <Ctrl-/>
Welcome to Wireshark
Capture
Learn
User's Guide · Wiki · Questions and Answers · Mailing Lists · SharkFest · Wireshark Discord · Donate

...using this filter: Enter a capture filter … All interfaces shown

eth0
any
Loopback: lo
bluetooth-monitor
nflog
nfqueue
dbus-system
dbus-session
Cisco remote capture: ciscodump

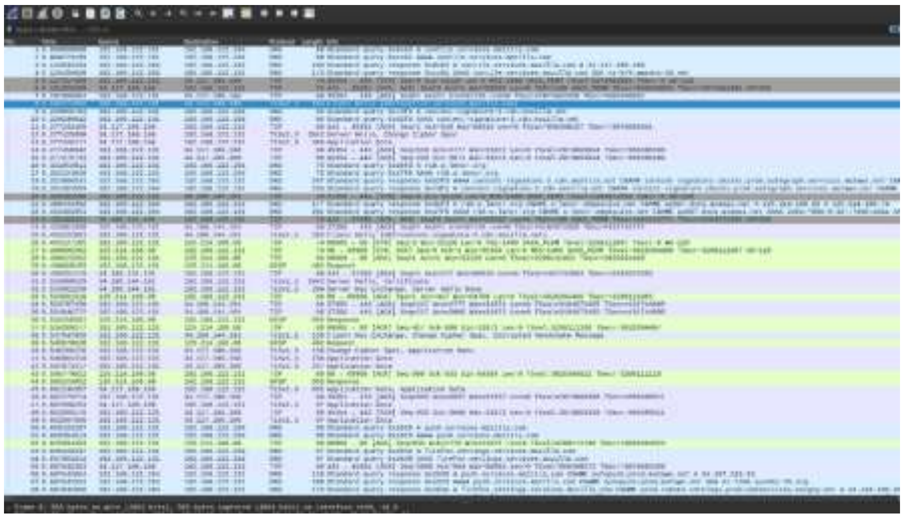
You are running Wireshark 4.2.5 (Git v4.2.5 packaged as 4.2.5-1).

Ready to load or capture | No Packets | Profile: Default



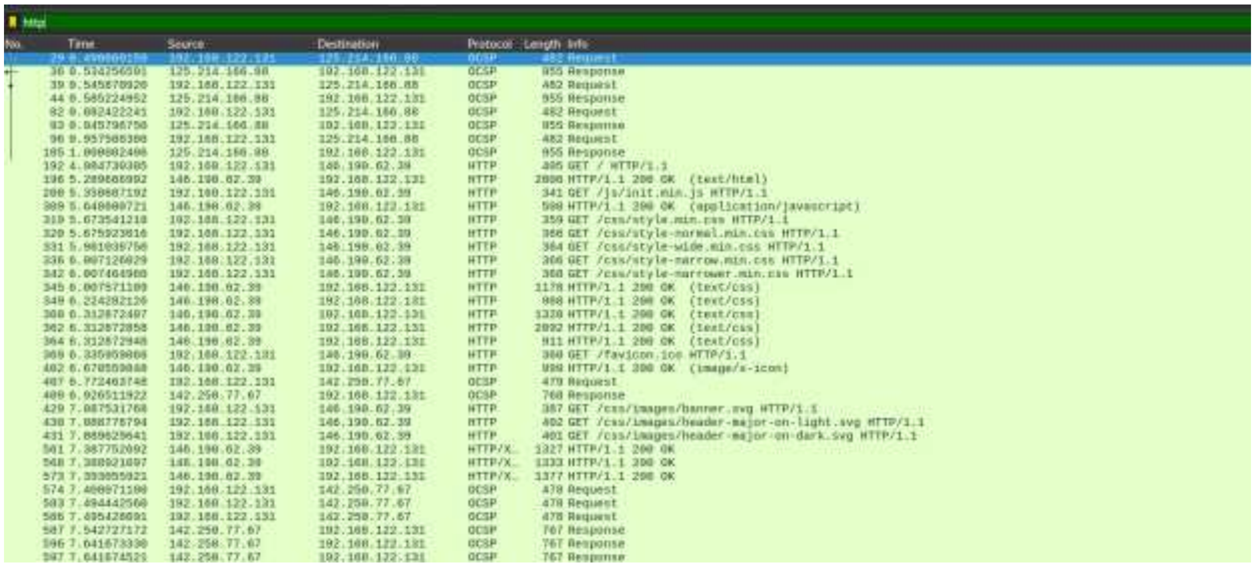
http://httpforever.com/

http://httpforever.com/ — Visit



[illegible]

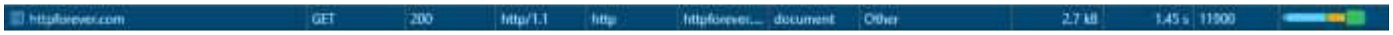
```
http
No.   http.request.method == "OK"          Destination          Protocol  Length  Info
      http.request.method == "GET"
```



```
http
No.   Time          Source            Destination       Protocol  Length Info
   29 0.490060150   192.168.122.131   125.214.166.88    OCSP       482 Request
   36 0.534256591   125.214.166.88    192.168.122.131   OCSP       855 Response
   39 0.545870920   192.168.122.131   125.214.166.88    OCSP       482 Request
   44 0.585224952   125.214.166.88    192.168.122.131   OCSP       855 Response
   82 0.882422241   192.168.122.131   125.214.166.88    OCSP       482 Request
   83 0.945796750   125.214.166.88    192.168.122.131   OCSP       855 Response
   96 0.957508300   192.168.122.131   125.214.166.88    OCSP       482 Request
  105 1.000082400   125.214.166.88    192.168.122.131   OCSP       855 Response
  192 4.984730305   192.168.122.131   146.190.62.39     HTTP       405 GET / HTTP/1.1
  196 5.289686992   146.190.62.39     192.168.122.131   HTTP      2806 HTTP/1.1 200 OK  (text/html)
  200 5.330887192   192.168.122.131   146.190.62.39     HTTP       341 GET /js/init.min.js HTTP/1.1
  309 5.648080721   146.190.62.39     192.168.122.131   HTTP       588 HTTP/1.1 200 OK  (application/javascript)
  319 5.673541218   192.168.122.131   146.190.62.39     HTTP       359 GET /css/style.min.css HTTP/1.1
  320 5.675923616   192.168.122.131   146.190.62.39     HTTP       366 GET /css/style-normal.min.css HTTP/1.1
  331 5.981039750   192.168.122.131   146.190.62.39     HTTP       364 GET /css/style-wide.min.css HTTP/1.1
  336 6.007126029   192.168.122.131   146.190.62.39     HTTP       366 GET /css/style-narrow.min.css HTTP/1.1
  342 6.007464980   192.168.122.131   146.190.62.39     HTTP       368 GET /css/style-narrower.min.css HTTP/1.1
  345 6.007571109   146.190.62.39     192.168.122.131   HTTP      1178 HTTP/1.1 200 OK  (text/css)
  349 6.224282120   146.190.62.39     192.168.122.131   HTTP       888 HTTP/1.1 200 OK  (text/css)
  360 6.312872407   146.190.62.39     192.168.122.131   HTTP      1328 HTTP/1.1 200 OK  (text/css)
  362 6.312872858   146.190.62.39     192.168.122.131   HTTP      2092 HTTP/1.1 200 OK  (text/css)
  364 6.312872948   146.190.62.39     192.168.122.131   HTTP       911 HTTP/1.1 200 OK  (text/css)
  369 6.335059808   192.168.122.131   146.190.62.39     HTTP       380 GET /favicon.ico HTTP/1.1
  402 6.678559088   146.190.62.39     192.168.122.131   HTTP       989 HTTP/1.1 200 OK  (image/x-icon)
  407 6.772463748   192.168.122.131   142.250.77.67     OCSP       479 Request
  409 6.926511922   142.250.77.67     192.168.122.131   OCSP       768 Response
  429 7.087531768   192.168.122.131   146.190.62.39     HTTP       387 GET /css/images/banner.svg HTTP/1.1
  430 7.088776794   192.168.122.131   146.190.62.39     HTTP       402 GET /css/images/header-major-on-light.svg HTTP/1.1
  431 7.089629641   192.168.122.131   146.190.62.39     HTTP       401 GET /css/images/header-major-on-dark.svg HTTP/1.1
  561 7.387752092   146.190.62.39     192.168.122.131   HTTP/X…   1327 HTTP/1.1 200 OK
  568 7.388921097   146.190.62.39     192.168.122.131   HTTP/X…   1333 HTTP/1.1 200 OK
  573 7.393055921   146.190.62.39     192.168.122.131   HTTP/X…   1377 HTTP/1.1 200 OK
  574 7.400071100   192.168.122.131   142.250.77.67     OCSP       478 Request
  583 7.494442560   192.168.122.131   142.250.77.67     OCSP       478 Request
  586 7.495428691   192.168.122.131   142.250.77.67     OCSP       478 Request
  587 7.542727172   142.250.77.67     192.168.122.131   OCSP       767 Response
  596 7.641673330   142.250.77.67     192.168.122.131   OCSP       767 Response
  597 7.641674521   142.250.77.67     192.168.122.131   OCSP       767 Response
```

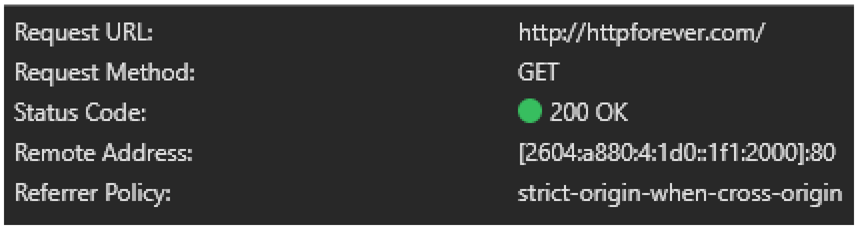
3. OCSP
   DNS
   TCP
   HTTP

4. Time since request: 0.304936687 seconds. The time taken for an OK response for a GET request is approximately 0.3 seconds
5. The IP address of the webserver is 146.190.62.29
6. Yes, you are able to find similar information in Chrome's developer tools.



```
httpforever.com   GET   200   http/1.1   http   httpforever...   document   Other   2.7 kB   1.45 s   11000
```

As you can see this is the get request for the webserver and if we double click and open up general info we can we can see the status OK as shown below.



Request URL:	http://httpforever.com/
Request Method:	GET
Status Code:	● 200 OK
Remote Address:	[2604:a880:4:1d0::1f1:2000]:80
Referrer Policy:	strict-origin-when-cross-origin