

LAB 07 Application Layer

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CMPS1192 Networking Fundamentals
November 14, 2024

Part A - JS Fetch API

Script Source Code

<https://github.com/andreshungbz/CMPS1192/blob/main/lab/lab-07/fetch-tutorial/script.js>

Console Tab

Application Layer (Layer 7)

Javascript Fetch Walkthrough

Done by Andres Hung and Jennessa Sierra
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The screenshot shows the Chrome DevTools Network Tab. The 'Network' panel is active, displaying a list of network requests. The first request, 'todos', is selected. The 'Headers' sub-panel is open, showing the 'General' section. A red box highlights the 'Request URL', 'Request Method', 'Status Code', 'Remote Address', and 'Referrer Policy' fields. The 'Response Headers' section is also visible below.

Name	Headers	Preview	Response	Initiator	Timing
todos	▼ General				
5	▼ General				
Request URL:		https://jsonplaceholder.typicode.com/todos			
Request Method:		GET			
Status Code:		200 OK			
Remote Address:		104.21.59.19:443			
Referrer Policy:		strict-origin-when-cross-origin			
▼ Response Headers					
Access-Control-Allow-Credentials:		true			
Access-Control-Allow-Origin:		http://127.0.0.1:5500			
Age:		10715			
Alt-Svc:		h3=":443"; ma=86400			
Cache-Control:		max-age=43200			

GET Method
all todos

Network Tab

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[illegible]

Console Tab

Application Layer (Layer 7)

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The screenshot shows the Chrome DevTools Network Tab. The 'Network' panel is active, displaying a list of network requests. The first request, 'todos', is selected. The 'Headers' sub-panel is open, showing the 'General' section. A red box highlights the 'Request URL', 'Request Method', 'Status Code', 'Remote Address', and 'Referrer Policy' fields. The 'Response Headers' section is also visible below.

Name	Headers	Preview	Response	Initiator	Timing
todos	▼ General				
5	Request URL: https://jsonplaceholder.typicode.com/todos/5 Request Method: GET Status Code: 200 OK Remote Address: 172.67.167.151:443 Referrer Policy: strict-origin-when-cross-origin				
	▼ Response Headers				
	Access-Control-Allow-Credentials: true Access-Control-Allow-Origin: http://127.0.0.1:5500 Age: 21 Alt-Svc: h3=":443"; ma=86400 Cache-Control: max-age=43200				

GET Method
one todo

Network Tab

Application Layer (Layer 7)

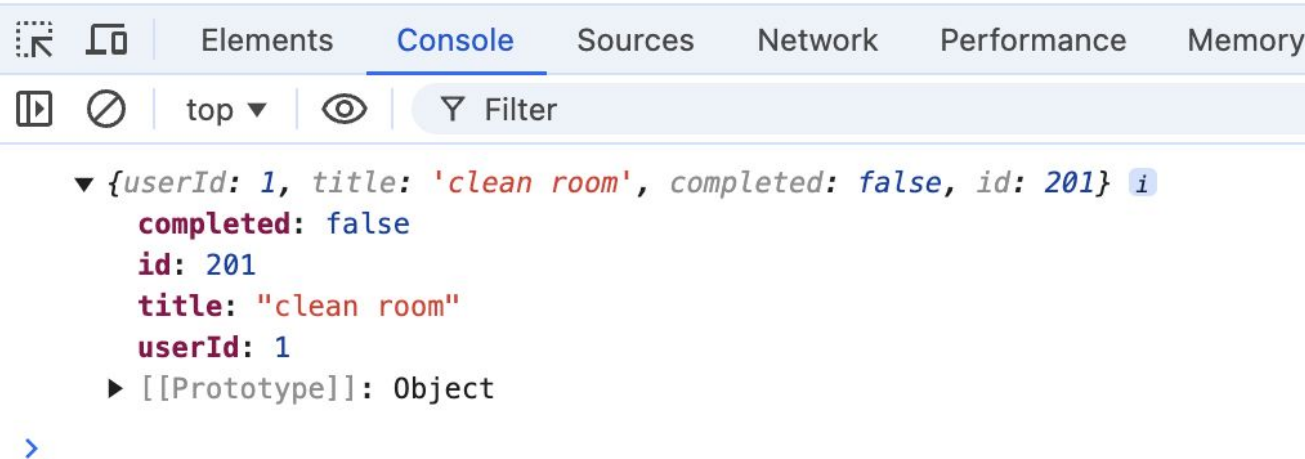
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POST Method

Create new
resource

Console Tab



Application Layer (Layer 7)

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The screenshot shows the Chrome DevTools Network Tab. The 'Network' panel is active, displaying a list of requests. The first request, named 'todos', is selected. The 'Headers' sub-panel is open, showing the 'General' section. A red box highlights the following information:

Request URL:	https://jsonplaceholder.typicode.com/todos
Request Method:	POST
Status Code:	201 Created
Remote Address:	172.67.167.151:443
Referrer Policy:	strict-origin-when-cross-origin

Below the 'General' section, the 'Response Headers' section is visible, showing the following headers:

Access-Control-Allow-Credentials:	true
Access-Control-Allow-Origin:	http://127.0.0.1:5500
Access-Control-Expose-Headers:	Location
Alt-Svc:	h3=":443"; ma=86400
Cache-Control:	no-cache

POST Method

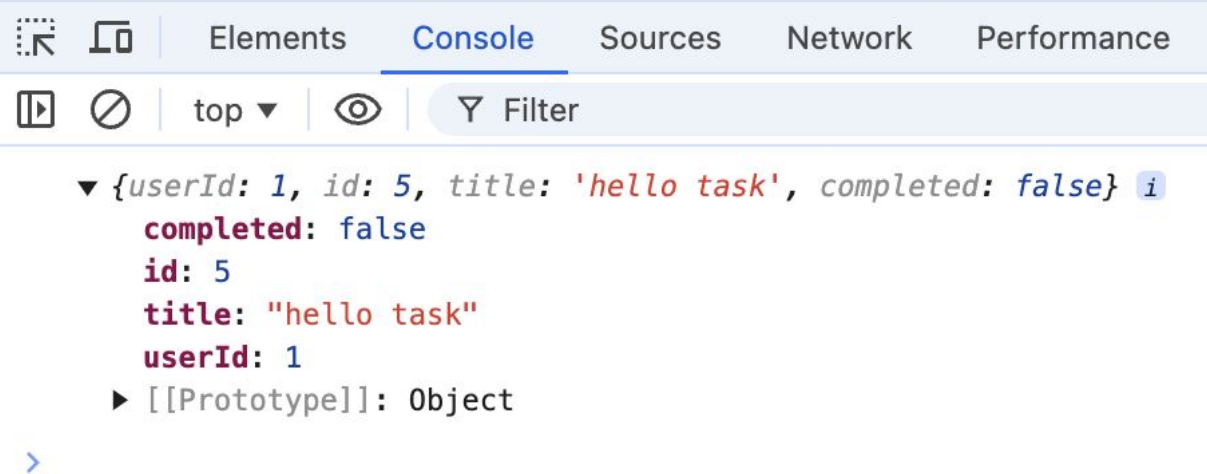
Create new
resource

Network Tab

Application Layer (Layer 7)

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PUT Method

Update
existing
resource
(replace with
new version)

Console Tab

Application Layer (Layer 7)

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The screenshot shows the Chrome DevTools Network Tab. The top toolbar includes tabs for Elements, Console, Sources, Network (selected), Performance, Memory, Application, Security, and Lighthouse. Below the tabs are various settings: a red circle icon, a magnifying glass, checkboxes for 'Preserve log' and 'Disable cache', a 'No throttling' dropdown, and icons for network status and download. A filter bar shows 'Filter' and 'Invert' options, followed by 'More filters' and a list of filter categories: All, Fetch/XHR (selected), Doc, CSS, JS, Font, Img, Media, Manifest, and WS. A timeline view shows a single request at approximately 500 ms. Below the timeline, the 'Name' column lists a request with a status icon and the number '5'. The 'Headers' tab is selected, showing a 'General' section with the following details: Request URL: https://jsonplaceholder.typicode.com/todos/5, Request Method: PUT, Status Code: 200 OK (green circle), Remote Address: 104.21.59.19:443, and Referrer Policy: strict-origin-when-cross-origin. Below this is a 'Response Headers' section with details: Access-Control-Allow-Credentials: true, Access-Control-Allow-Origin: http://127.0.0.1:5500, Alt-Svc: h3=":443"; ma=86400, and Cache-Control: no-cache.

Name	Headers	Payload	Preview	Response	Initiator	Timing
5	<div><div>▼ General</div><div><div>Request URL:</div><div>https://jsonplaceholder.typicode.com/todos/5</div></div><div><div>Request Method:</div><div>PUT</div></div><div><div>Status Code:</div><div>● 200 OK</div></div><div><div>Remote Address:</div><div>104.21.59.19:443</div></div><div><div>Referrer Policy:</div><div>strict-origin-when-cross-origin</div></div></div> <div><div>▼ Response Headers</div><div><div>Access-Control-Allow-Credentials:</div><div>true</div></div><div><div>Access-Control-Allow-Origin:</div><div>http://127.0.0.1:5500</div></div><div><div>Alt-Svc:</div><div>h3=":443"; ma=86400</div></div><div><div>Cache-Control:</div><div>no-cache</div></div></div>					

PUT Method

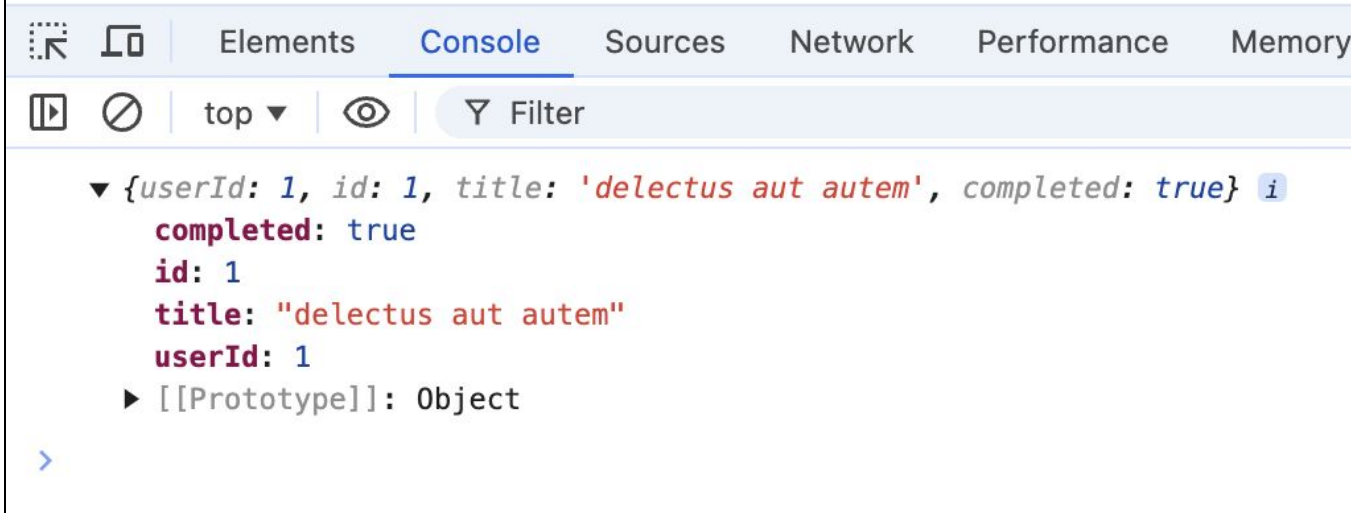
Update
existing
resource
(replace with
new version)

Network Tab

Application Layer (Layer 7)

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PATCH
Method

Update
existing
resource
(specify
changes)

Console Tab

Application Layer (Layer 7)

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The screenshot shows the Chrome DevTools Network Tab. The top toolbar includes tabs for Elements, Console, Sources, Network (selected), Performance, Memory, Application, Security, and Lighthouse. Below the tabs, there are filters for Preserve log, Disable cache, No throttling, and a search icon. A filter bar shows 'Filter' and 'Invert' options, followed by a dropdown for 'More filters' and a list of filter categories: All, Fetch/XHR (selected), Doc, CSS, JS, Font, Img, Media, Manifest, and WS. A timeline at the top shows a request starting at 0 ms and ending at approximately 500 ms. The main panel displays a list of network requests, with the first request (ID 1) selected. The 'Headers' sub-tab is active, showing the 'General' section. A red box highlights the following details:

Request URL:	https://jsonplaceholder.typicode.com/todos/1
Request Method:	PATCH
Status Code:	200 OK
Remote Address:	104.21.59.19:443
Referrer Policy:	strict-origin-when-cross-origin

Below the 'General' section, the 'Response Headers' section is visible, showing the following details:

Access-Control-Allow-Credentials:	true
Access-Control-Allow-Origin:	http://127.0.0.1:5500
Alt-Svc:	h3=":443"; ma=86400
Cache-Control:	no-cache

PATCH
Method

Update
existing
resource
(specify
changes)

Network Tab

Application Layer (Layer 7)

Javascript Fetch Walkthrough

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The screenshot shows the Chrome DevTools Network tab. The top bar includes tabs for Elements, Console, Sources, Network (selected), Performance, Memory, Application, and Security. Below the tabs are various controls: a red stop button, a filter icon, a search icon, checkboxes for 'Preserve log' and 'Disable cache', a 'No throttling' dropdown, and icons for network status and upload/download. A 'Filter' input field is present, along with an 'Invert' checkbox and a 'More filters' dropdown. The filter dropdown is open, showing 'All', 'Fetch/XHR' (selected), 'Doc', 'CSS', 'JS', 'Font', 'Img', and 'Media'. The main area displays a single network request at the 500 ms mark. The request is expanded, showing the 'Response' tab selected. The response content is a JSON object: `{}`. The 'Name' column shows '1' with a red box highlighting the request number and the response content.

Name	Headers	Preview	Response	Initiator	Timing
1			<code>{}</code>		

DELETE
Method

Delete
resource

Console Tab

Application Layer (Layer 7)

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November 7, 2024

The screenshot shows the Chrome DevTools Network Tab. The 'Network' panel is active, displaying a list of network requests. The first request is selected, and its details are shown in the 'Headers' tab. The request is a DELETE method to the URL 'https://jsonplaceholder.typicode.com/todos/1'. The status is 200 OK. The remote address is 104.21.59.19:443. The referrer policy is strict-origin-when-cross-origin. The response headers are also visible, showing access-control-allow-credentials: true, access-control-allow-origin: http://127.0.0.1:5500, alt-svc: h3=':443'; ma=86400, and cache-control: no-cache.

Name	Headers	Preview	Response	Initiator	Timing
1	<div><div>▼ General</div><div><div>Request URL:</div><div>https://jsonplaceholder.typicode.com/todos/1</div></div><div><div>Request Method:</div><div>DELETE</div></div><div><div>Status Code:</div><div>● 200 OK</div></div><div><div>Remote Address:</div><div>104.21.59.19:443</div></div><div><div>Referrer Policy:</div><div>strict-origin-when-cross-origin</div></div></div> <div>▼ Response Headers</div> <div><div>Access-Control-Allow-Credentials:</div><div>true</div></div> <div><div>Access-Control-Allow-Origin:</div><div>http://127.0.0.1:5500</div></div> <div><div>Alt-Svc:</div><div>h3=":443"; ma=86400</div></div> <div><div>Cache-Control:</div><div>no-cache</div></div>				

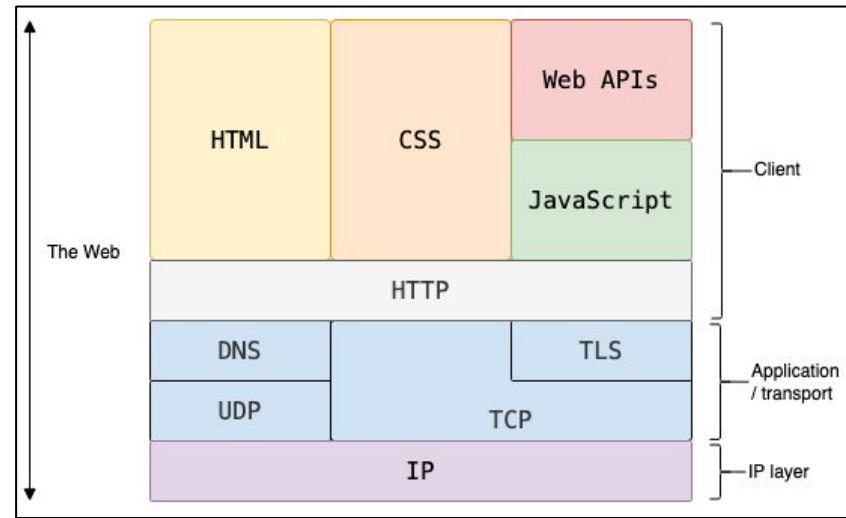
DELETE
Method

Delete
resource

Network Tab

HTTP Overview

- Application layer protocol
- Client-server protocol
- Exchanging data on the Web
- Simple (human-readable before HTTP/2)
- Extensible (using HTTP headers)
- Stateless (requests and responses)
- Not Sessionless (using HTTP cookies)
- Uses TCP (Layer 4) for its reliability.
- HTTPS uses SSL/TLS (layer 6) for security.



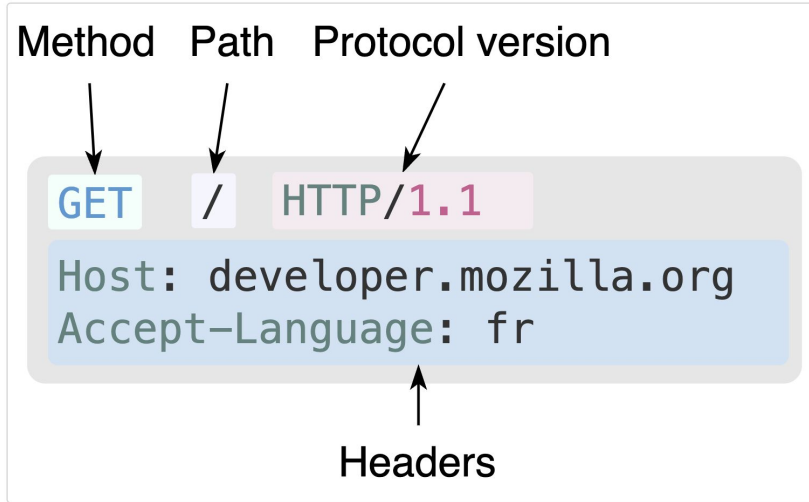
HTTP/1.0

HTTPS/1.1

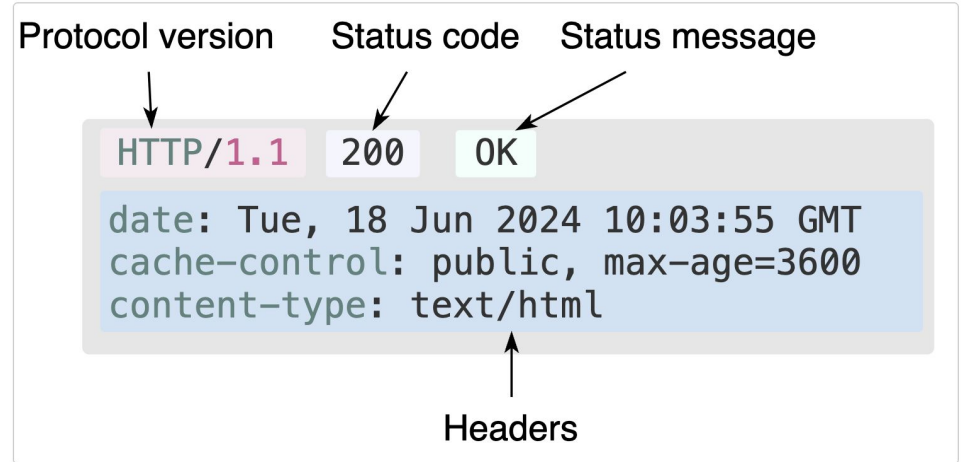
HTTP/2

HTTP/3 (HTTP over QUIC)

Request/Response Messages



Request (Client)



Reponse (Server)

Response Status Codes

1. [Informational responses](#) (100 – 199)
2. [Successful responses](#) (200 – 299)
3. [Redirection messages](#) (300 – 399)
4. [Client error responses](#) (400 – 499)
5. [Server error responses](#) (500 – 599)

200 OK, 201 CREATED

301 MOVED PERMANENTLY

403 FORBIDDEN, 404 NOT FOUND

500 INTERNAL SERVER ERROR

504 GATEWAY TIMEOUT

Other Application Layer Protocols (Layer 7)

- SMTP
- FTP
- SNMP
- IRC

APIs based on HTTP

- Fetch API (JavaScript)
- Server-sent events

```
// GET all todos
fetch('https://jsonplaceholder.typicode.com/todos')
  .then((response) => response.json())
  .then((json) => console.log(json));

// GET todo with specific URI (e.g. id = 5)
fetch('https://jsonplaceholder.typicode.com/todos/5')
  .then((response) => response.json())
  .then((json) => console.log(json));
```

Part B - API Demo Websites

GitHub Pages Links

<https://andreshungbz.github.io/cmpps1192-api-demo/>