

THE WEB

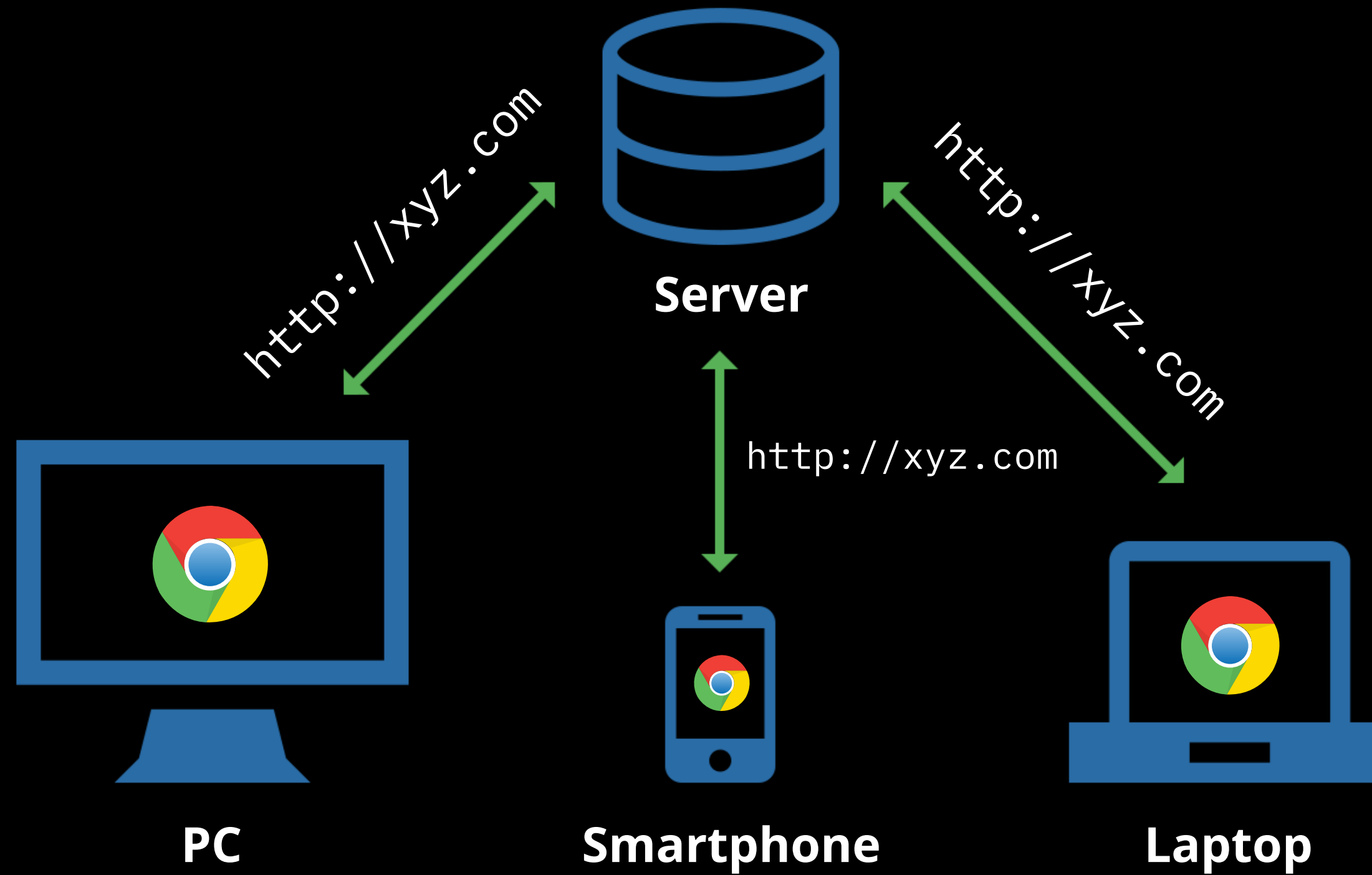
PART 1: INTRODUCTION



What we will Discuss?

- How the web works.
 - Clients and Servers
 - URL
 - HTTP/HTTPS Protocol
- What is website.
 - HTML
 - CSS
 - JavaScript
 - Cookies
 - Local Storage and Database
- Chrome Dev-Tools
- Requests and Responses

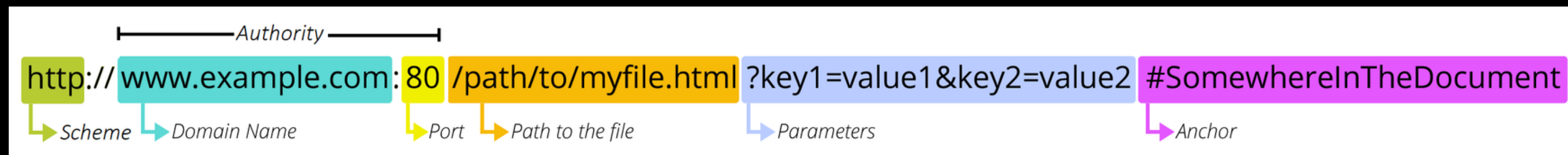
What is Server and Client?



What is URL?



- URL stands for Uniform Resource Locator.
- A URL is nothing more than the address of a given unique resource on the Web.
- In theory, each valid URL points to a unique resource. Such resources can be an HTML page, a CSS document, an image, etc.



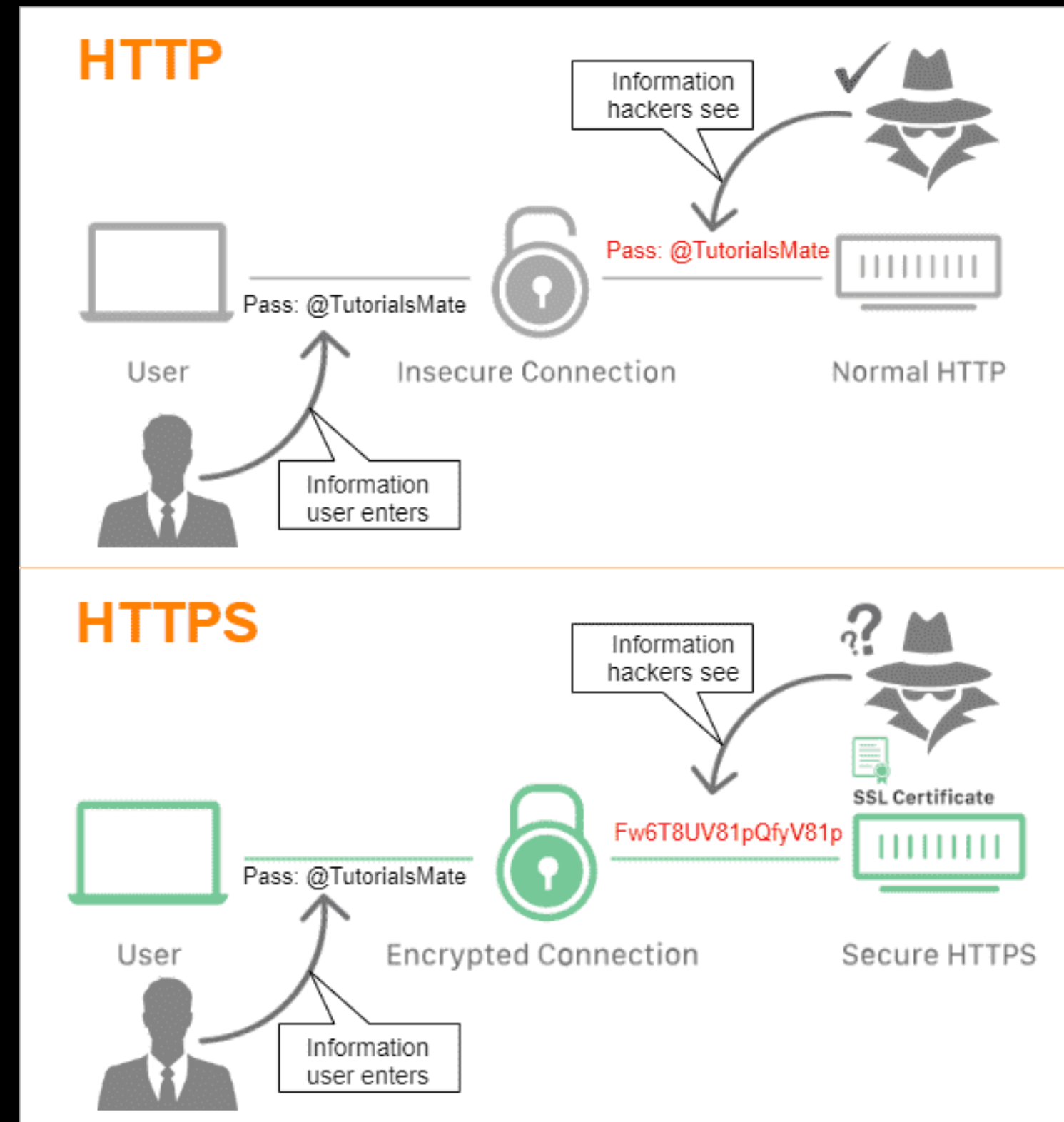
HTTP vs HTTPS

What is HTTP?

- HTTP stands for Hypertext Transfer Protocol.
- HTTP uses TCP (Transmission Control Protocol), generally over port 80.

What is HTTPS?

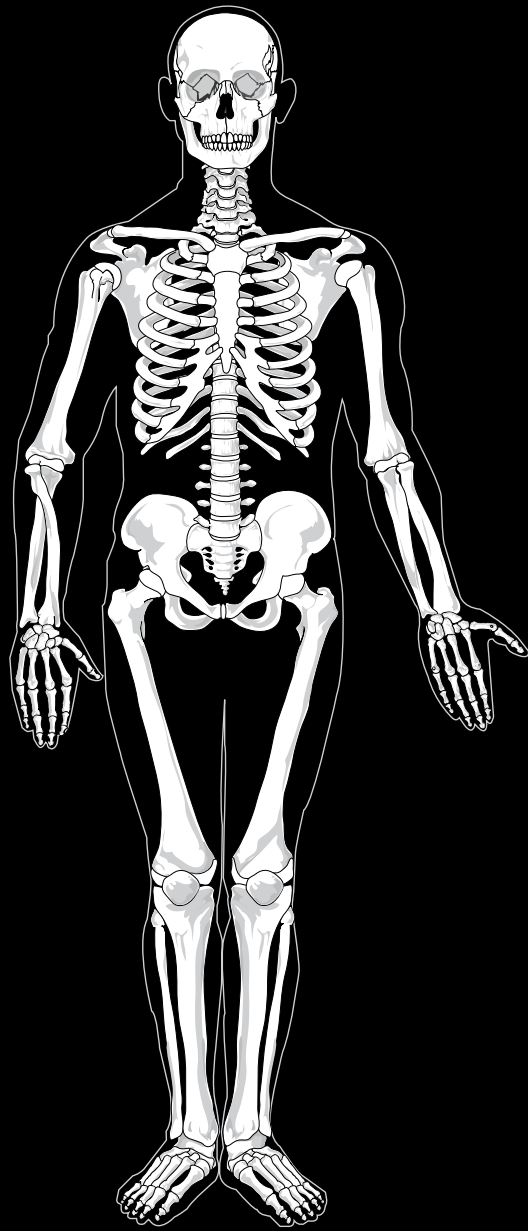
- HTTPS stands for Hypertext Transfer Protocol Secure (also referred to as HTTP over TLS or HTTP over SSL).
- HTTPS also uses TCP (Transmission Control Protocol) to send and receive data packets, but it does so over port 443.



What is the difference between HTTP and HTTPS?

- HTTP URL in your browser's address bar is `http://` and the HTTPS URL is `https://`.
- HTTP is `unsecured` while HTTPS is `secured`.
- HTTP sends data over `port 80` while HTTPS uses `port 443`.
- HTTP operates at `application layer`, while HTTPS operates at `transport layer`.
- `No SSL certificates` are required for HTTP, with HTTPS it is required that you have an `SSL certificate` and it is `signed by a CA`.
- HTTP `doesn't require domain validation`, where as HTTPS requires at `least domain validation` and certain certificates even require legal document validation.
- `No encryption` in HTTP, with HTTPS the data is `encrypted` before sending.

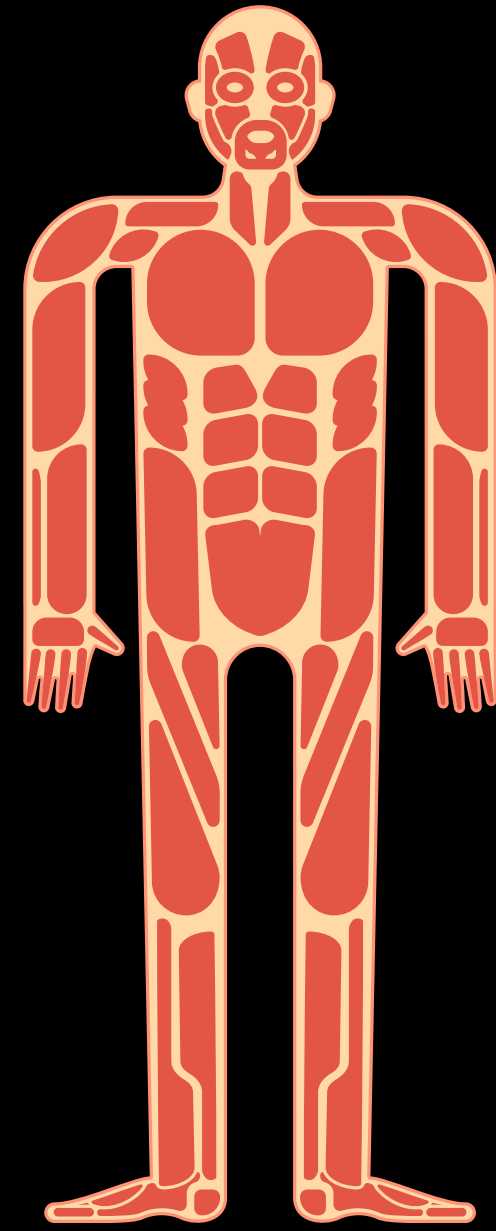
What is a "website"?



HTML
The Bones



Designed by
CSS
The Skin

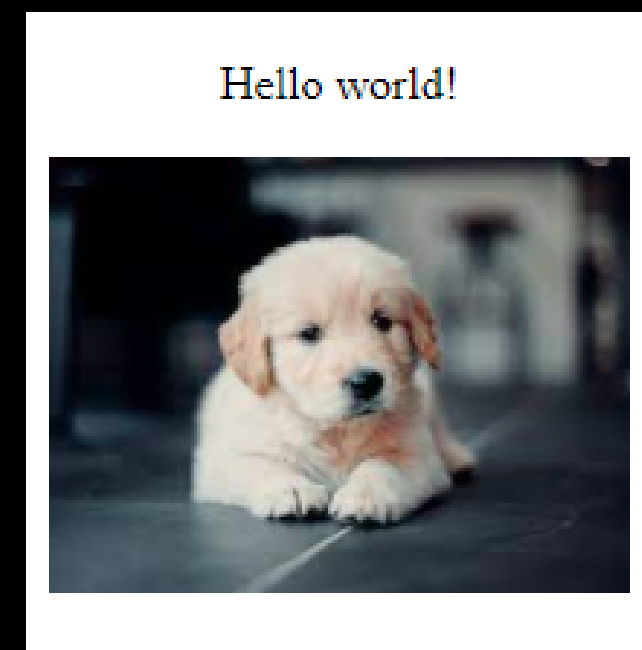


JAVASCRIPT
The Brains

HTML - The Bones

- It defines the layout of websites like images, buttons, and textboxes.
- It also defines where to load the javascript and css from

```
<body>  
  <p>Hello world!</p>  
    
  <script src="script.js"></script>  
</body>
```



CSS - The Skin

- Defines what website elements should look like or position.
- Can be written in the HTML or loaded from external file.

```
img {  
    border-radius: 50%;  
    filter: drop-shadow(0 0 0.75rem  
black);  
}
```

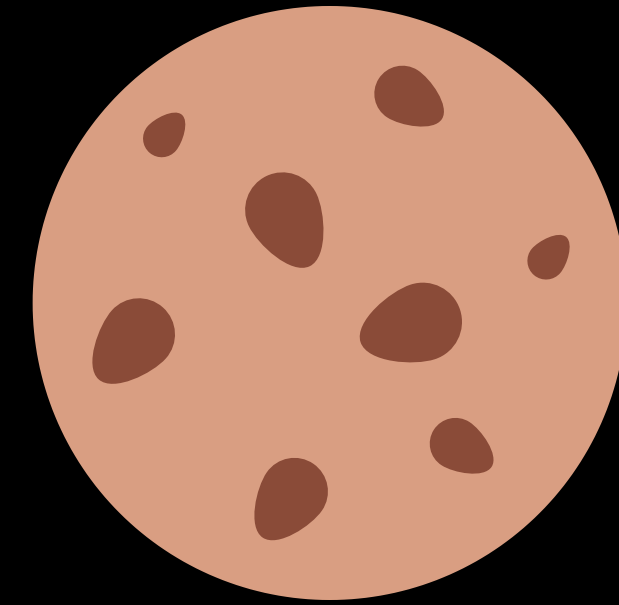


JavaScript - The Brains

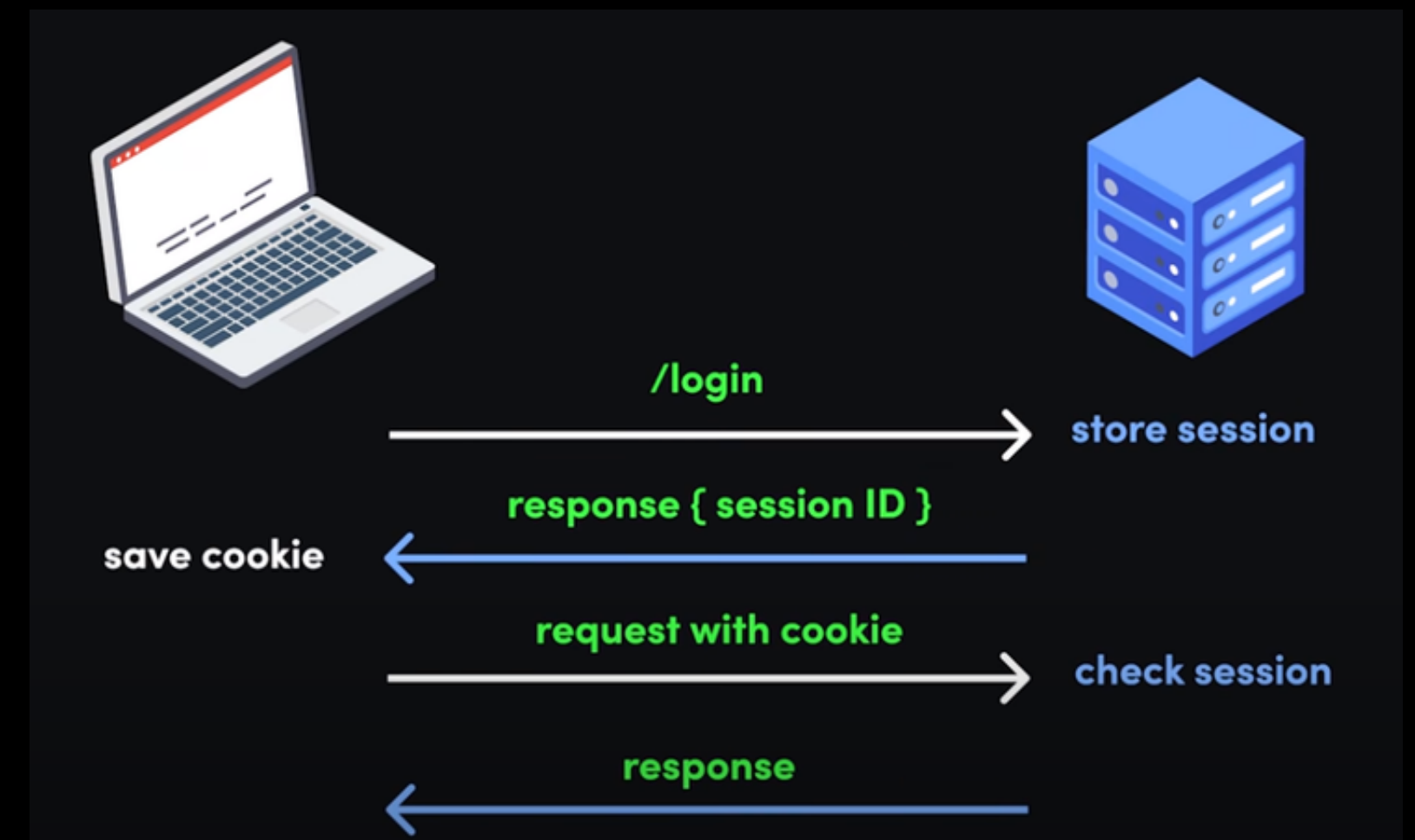
- Scripting language to make website do something
 - Do something when button is pressed
 - Animate things on webpage
 - Make requests to other endpoints

```
document.querySelector('img').addEventListener('click', () => {  
    alert("! click on image !")  
})
```

Cookies



- Small pieces of **information** stored across visits to same web page.
- Maintained by browser, sent along with **requests**.
- Maintain a "**session**" after you log in to a site.

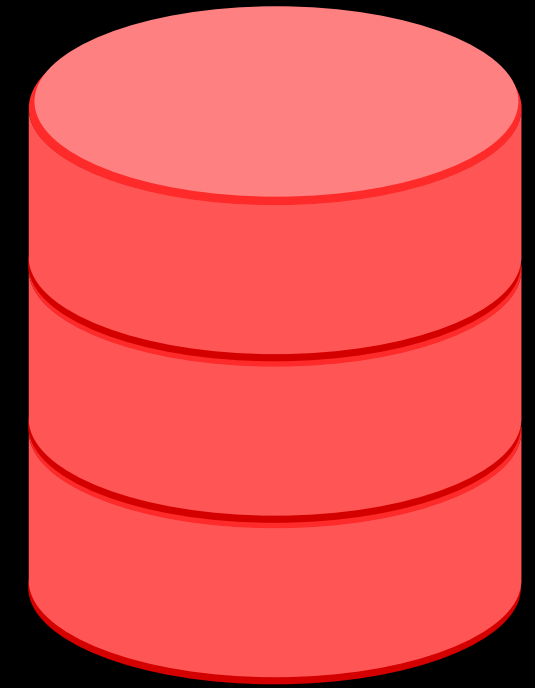


Local Storage

- Store key-value pairs like a cookie
- Not sent with requests to server
- Larger storage size limit (4KB vs 5MB)
- Can persist indefinitely

Database

- Organized collection of structured information, or data, typically stored electronically in a computer system
- Mainly two-types: No-SQL Database and SQL Database.



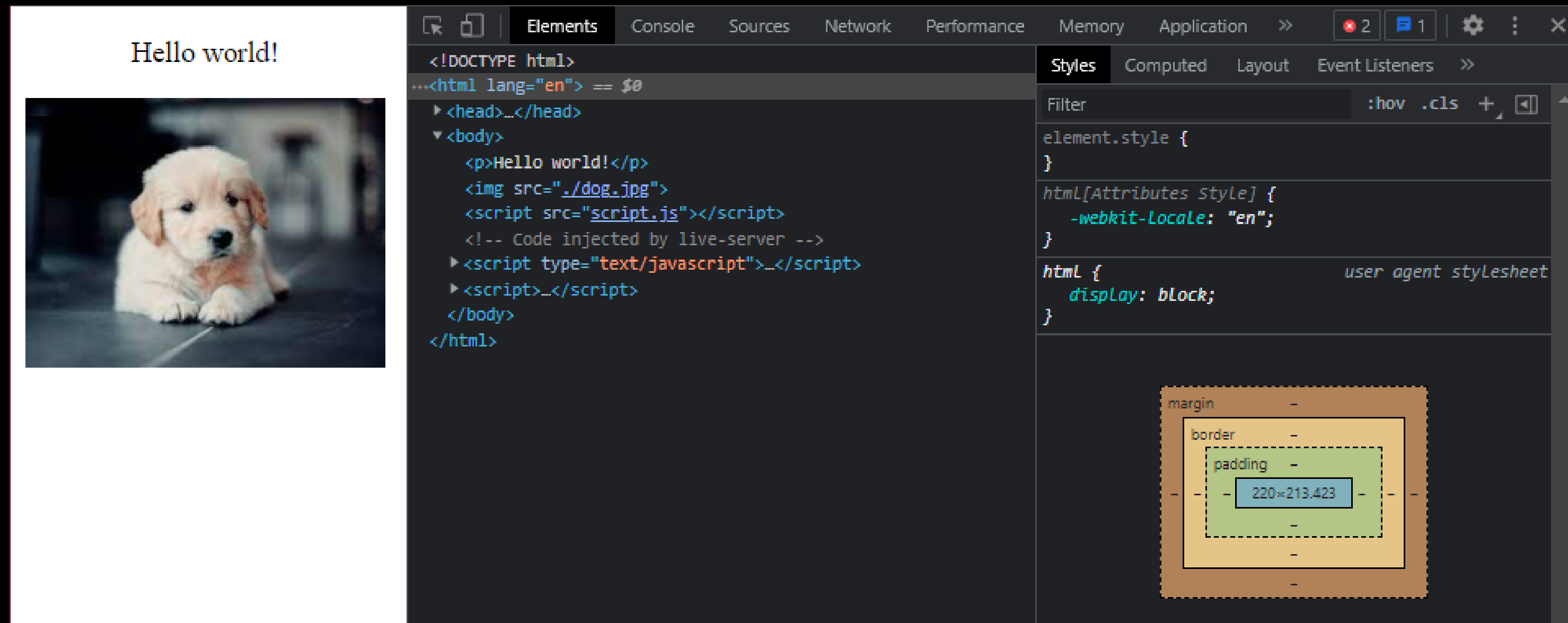
DevTools

- Inspect Element
- Console
- Network
- Application

Note: - It open via **F12, Ctrl + shift + I** etc

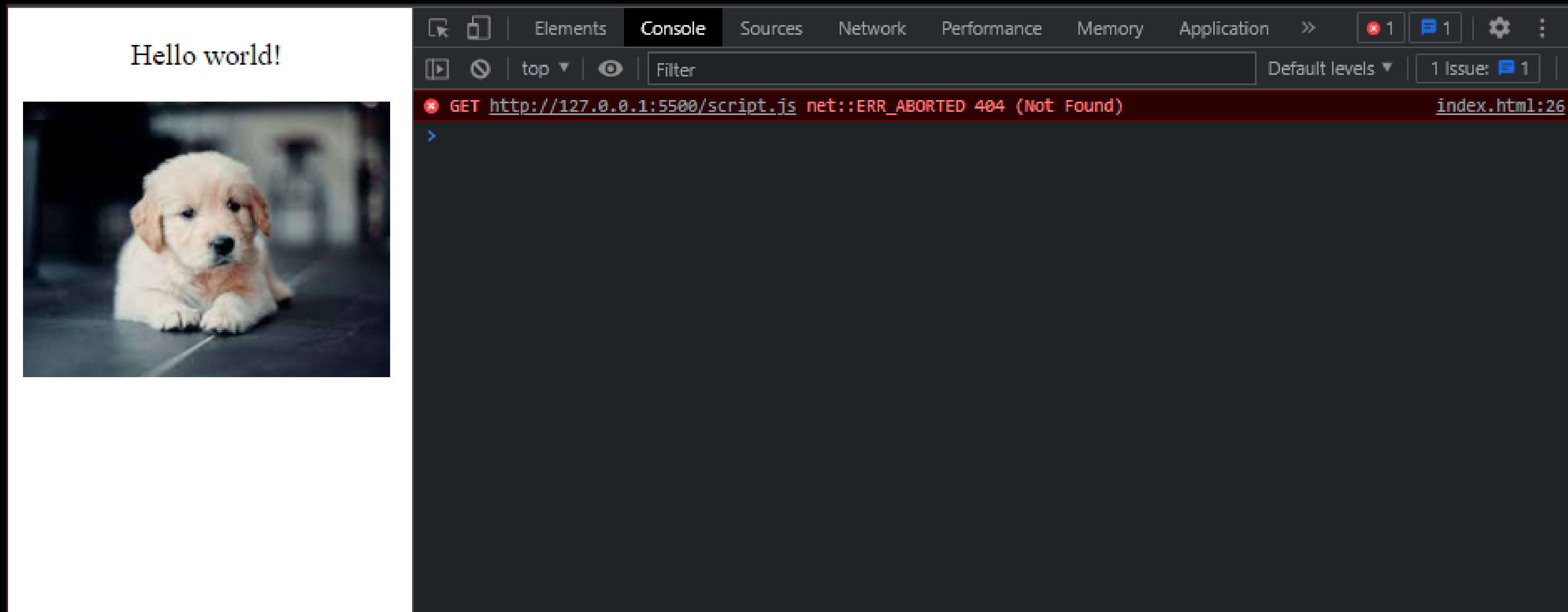
DevTools - Inspect Element

- Inspect HTML of page
- Delete or add elements
- View event listeners and styles (css property)



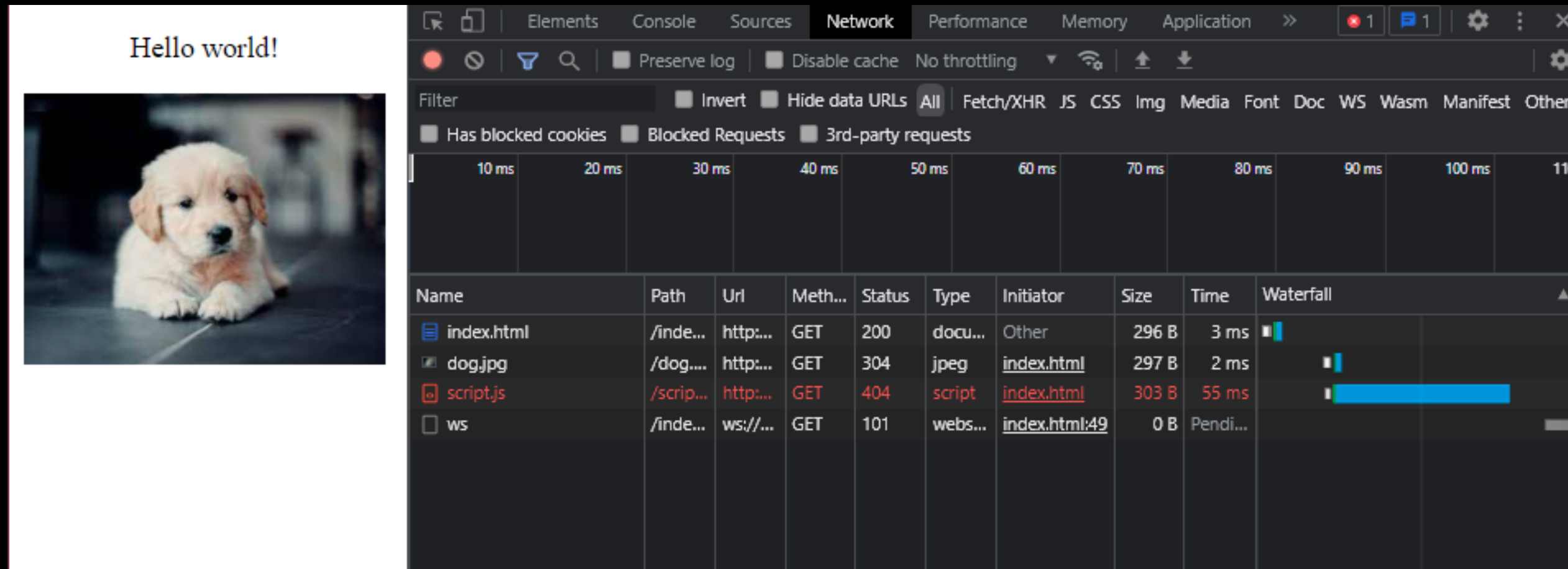
DevTools - Console

- View errors
- Execute your own javascript to interact with page and existing javascript



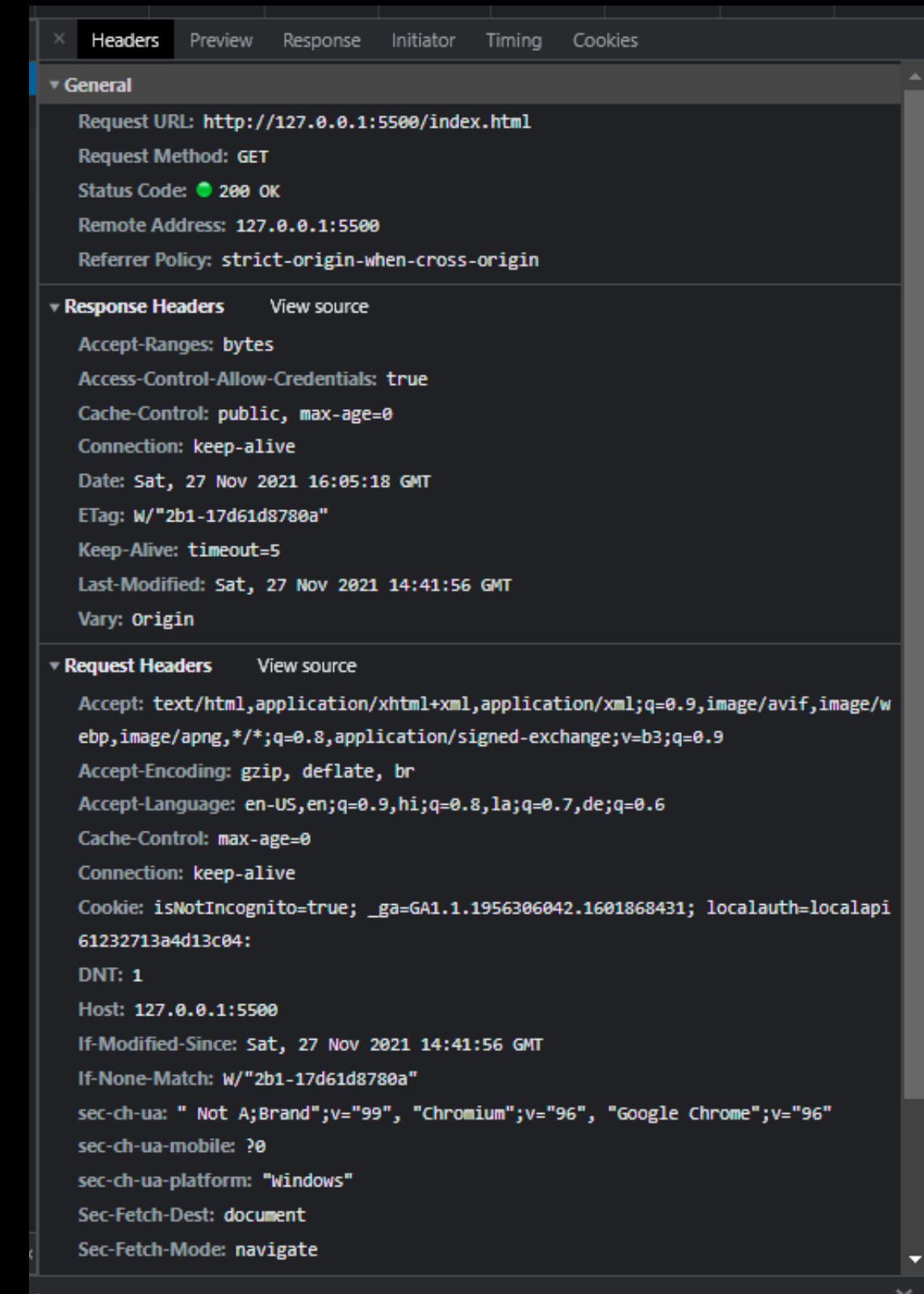
DevTools - Network

- View requests sent from your browser
 - Resources requested from server
 - Login forms
 - File uploads



The screenshot shows a web browser with the text "Hello world!" and a photo of a puppy. The DevTools Network tab is open, displaying a list of requests:

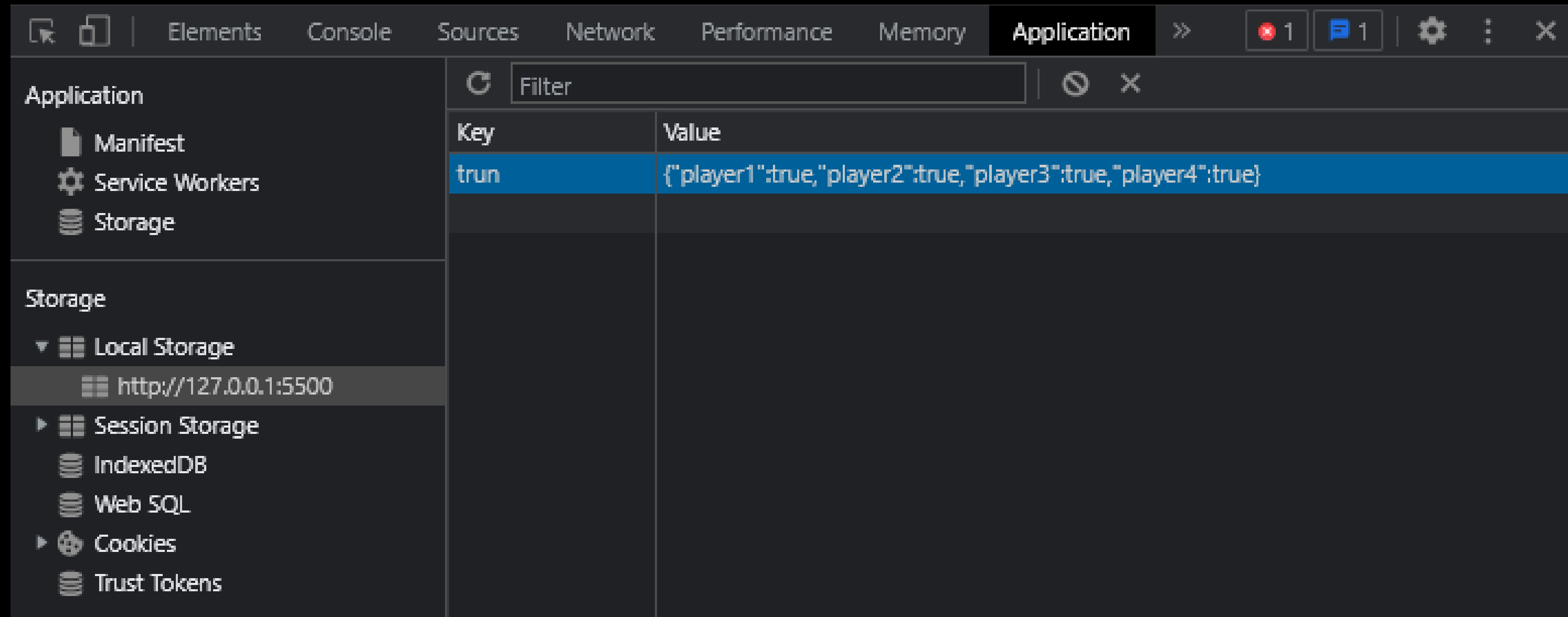
Name	Path	Url	Meth...	Status	Type	Initiator	Size	Time	Waterfall
index.html	/inde...	http...	GET	200	docu...	Other	296 B	3 ms	
dog.jpg	/dog....	http...	GET	304	jpeg	index.html	297 B	2 ms	
script.js	/scrip...	http...	GET	404	script	index.html	303 B	55 ms	
ws	/inde...	ws://...	GET	101	webs...	index.html:49	0 B	Pendi...	



The screenshot shows the details of a request in the DevTools Network tab. The request is for the URL `http://127.0.0.1:5500/index.html` with a status code of 200 OK. The response headers are visible, including `Accept-Ranges: bytes`, `Access-Control-Allow-Credentials: true`, `Cache-Control: public, max-age=0`, `Connection: keep-alive`, `Date: Sat, 27 Nov 2021 16:05:18 GMT`, `ETag: W/"2b1-17d61d8780a"`, `Keep-Alive: timeout=5`, `Last-Modified: Sat, 27 Nov 2021 14:41:56 GMT`, and `Vary: Origin`. The request headers are also visible, including `Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.9`, `Accept-Encoding: gzip, deflate, br`, `Accept-Language: en-US,en;q=0.9,hi;q=0.8,la;q=0.7,de;q=0.6`, `Cache-Control: max-age=0`, `Connection: keep-alive`, `Cookie: isNotIncognito=true; _ga=GA1.1.1956306042.1601868431; localauth=localapi61232713a4d13c04;`, `DNT: 1`, `Host: 127.0.0.1:5500`, `If-Modified-Since: Sat, 27 Nov 2021 14:41:56 GMT`, `If-None-Match: W/"2b1-17d61d8780a"`, `sec-ch-ua: "Not A;Brand";v="99", "Chromium";v="96", "Google Chrome";v="96"`, `sec-ch-ua-mobile: ?0`, `sec-ch-ua-platform: "Windows"`, `Sec-Fetch-Dest: document`, and `Sec-Fetch-Mode: navigate`.

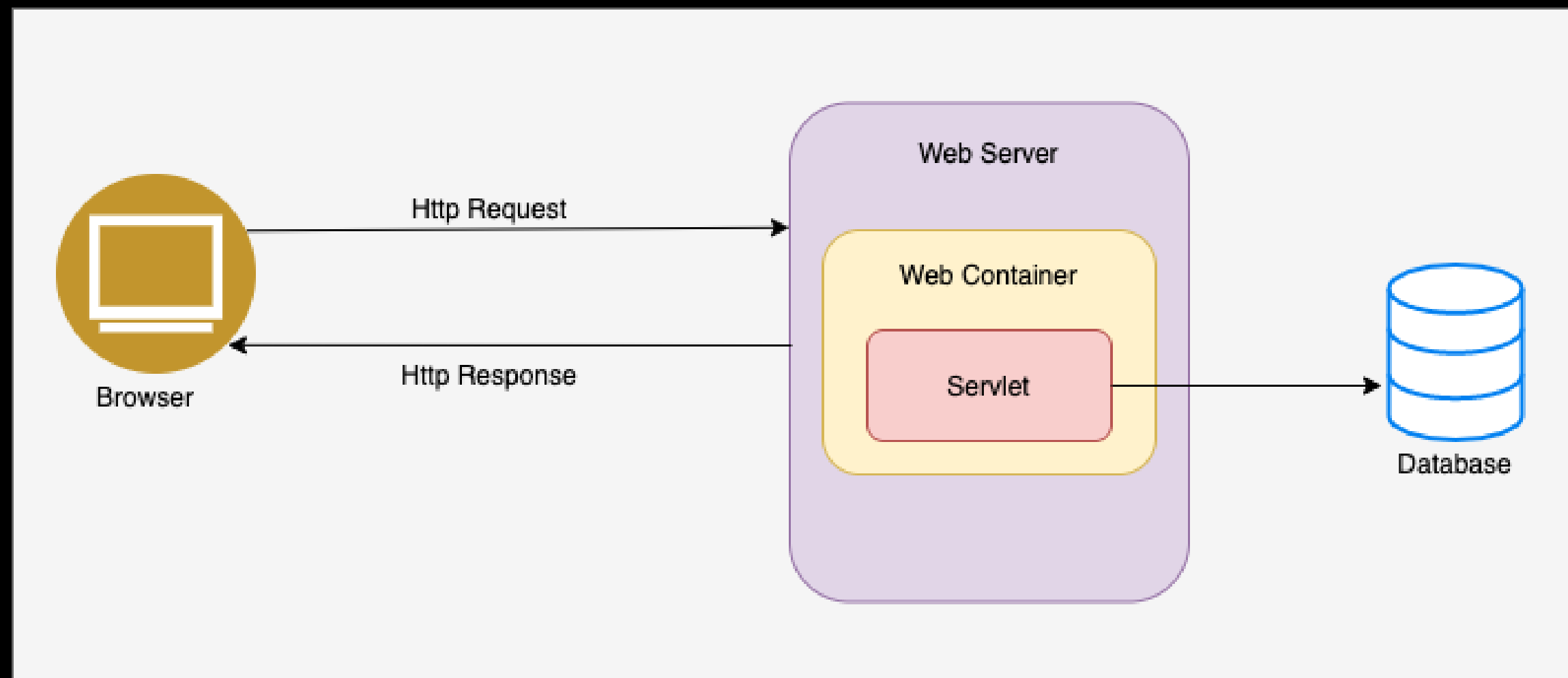
DevTools - Application

- View cookies and local storage for a website
- Modify contents to mess with web service



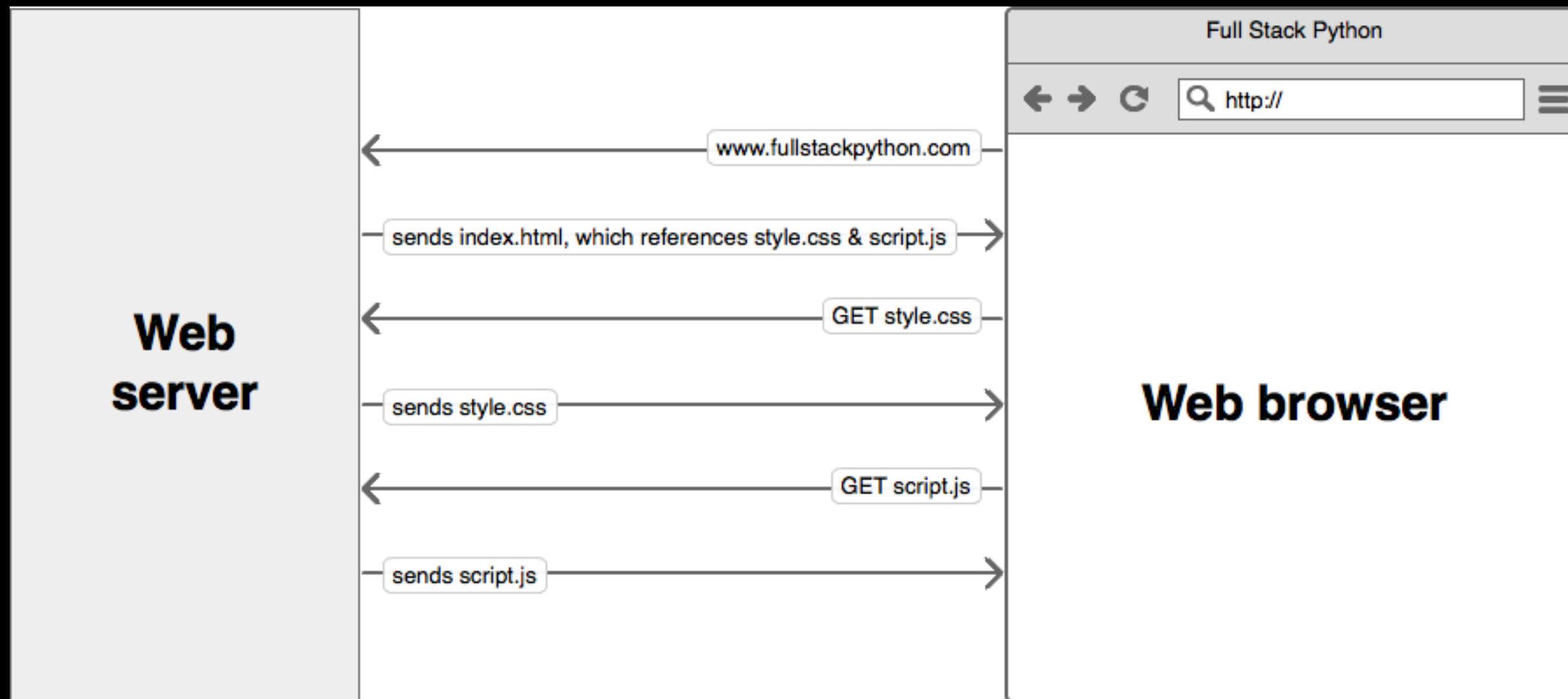
Requests

- A **web request** is a communicative message that is transmitted from **the client, or web browsers, to the servers**. A web request is also known as **HTTP request**.
- Mainly of four types: **GET, POST, DELETE and PUT**.



Responses

- An **HTTP response** is what is **sent by a server to a client** in response to an **HTTP request**.
- These responses contain a **status code** and if the request was successful, the client gets **the requested resource**.



HTTP Status Code

- **1xxs - Informational responses**: The server is thinking through the request.
- **2xxs - Success**: The request was successfully completed and the server gave the browser the expected response.
- **3xxs - Redirection**: You got redirected somewhere else. The request was received, but there's a redirect of some kind.
- **4xxs - Client errors**: Page not found. The site or page couldn't be reached. The request was made, but the page isn't valid – this is an error on the website's side of the conversation and often appears when a page doesn't exist on the site.
- **5xxs - Server errors**: Failure. A valid request was made by the client but the server failed to complete the request

Examples of Status Code

- **200**: The request succeeded. The result meaning of "success" depends on the HTTP method, such as "GET", "POST" etc.
- **301**: The URL of the requested resource has been changed permanently. The new URL is given in the response.
- **304**: This is used for caching purposes. It tells the client that the response has not been modified.
- **401**: The client must authenticate itself to get the requested response.
- **403**: The client does not have access rights to the content.
- **404**: The server can not find the requested resource. In the browser, this means the URL is not recognized.
- **502**: The server, while working as a gateway to get a response needed to handle the request, got an invalid response.
- **504**: This error response is given when the server is acting as a gateway and cannot get a response in time.

HTTP STATUS CODES	
2xx Success	
200	Success / OK
3xx Redirection	
301	Permanent Redirect
302	Temporary Redirect
304	Not Modified
4xx Client Error	
401	Unauthorized Error
403	Forbidden
404	Not Found
405	Method Not Allowed
5xx Server Error	
501	Not Implemented
502	Bad Gateway
503	Service Unavailable
504	Gateway Timeout



THANK YOU

May the source be with you !

