



General

FA2026 • 2026-09-06

Web Hacking I

Cameron and Ray

Announcements

- Fall CTF 2026
 - Intro hacking competition run by SIGPwny
 - September 20st, 12–6 PM



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Table of Contents

- How websites work
 - The bones, skin, and brain of the internet
 - HTML
 - CSS
 - JavaScript
- How the web works
 - Clients and Servers
- Cookies, local storage
- Chrome Devtools
- Challenge walkthrough



How Websites Work

The bones, skin, and brains of the Internet



How Websites Work

- Websites are displayed by the browser using:
 - HTML
 - CSS
 - Javascript



HTML - The Bones

- Defines the *layout* of websites
 - Where are the images, buttons, and textboxes?
- Defines where to load the JavaScript and CSS from

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



CSS - The Skin

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

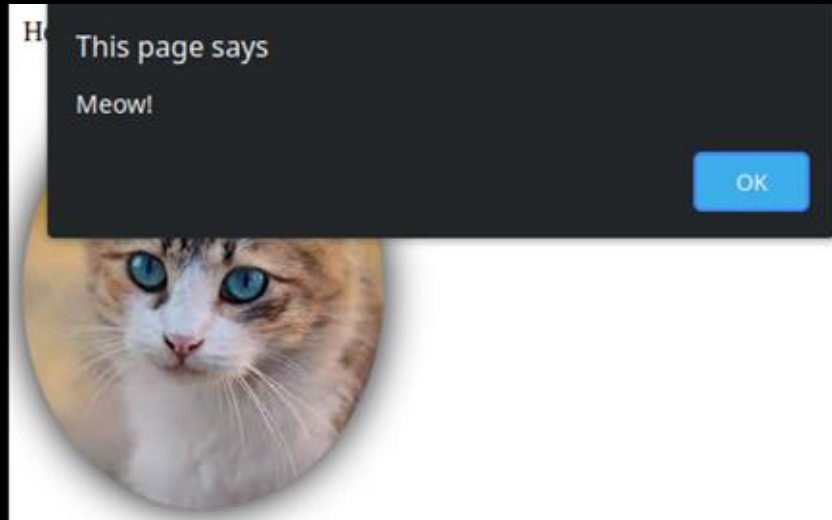
```
img {  
  border-radius: 50%;  
  filter: drop-shadow(0 0 0.75rem black);  
}
```



JavaScript - The Brains

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

```
document.getElementById("cat").onclick = () => alert("Meow!");
```



How the Web Works

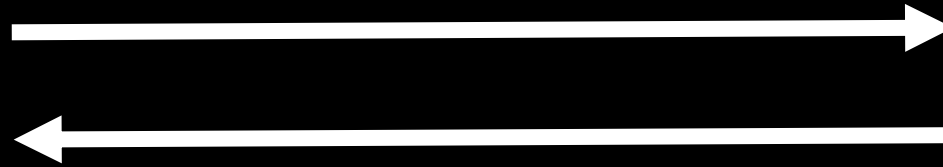


How the Web Works



Browser

`https://example.com/index.html`



Server

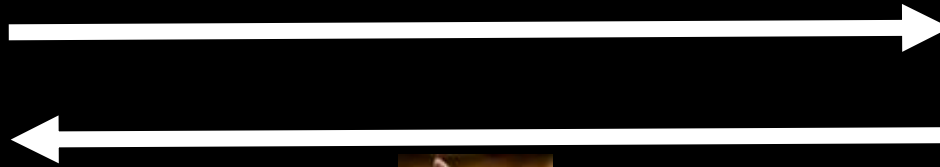


How the Web Works



Browser

`https://example.com/cat.jpg`



Server



How the Web Works



Cookies and Local Storage



Cookies

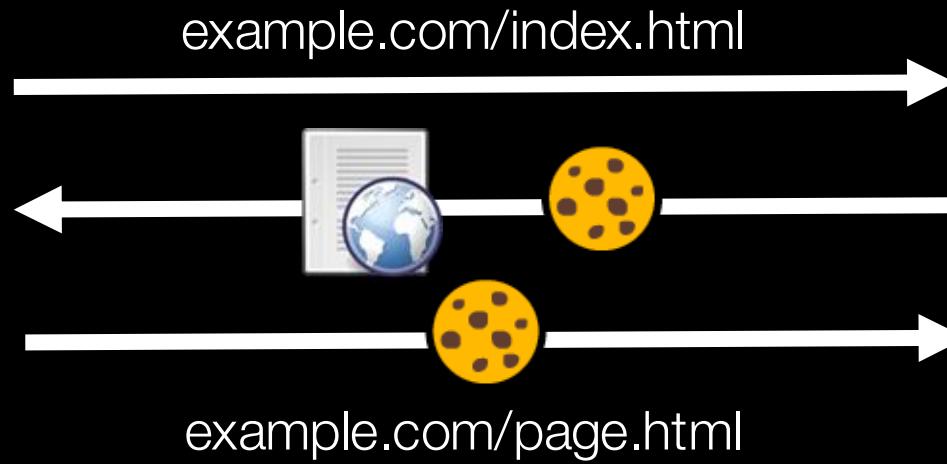
- Small pieces of information stored across visits to same site
- Maintained by browser, sent along with requests
- Main usages:
 - Maintain a "session" after you log in to a site
 - Track you for advertising purposes



Cookies 🍪



Browser



Server



Local/Session Storage

- Store key/value pairs like a cookie
- *Not* sent with requests to server
 - Managed by JavaScript
- Local storage can persist indefinitely
- Session storage persists until the browser is closed

```
localStorage.setItem('sig', 'pwny');    → localStorage.getItem('sig'); // pwny  
sessionStorage.setItem('sig', 'pwny'); → sessionStorage.getItem('sig'); // pwny
```

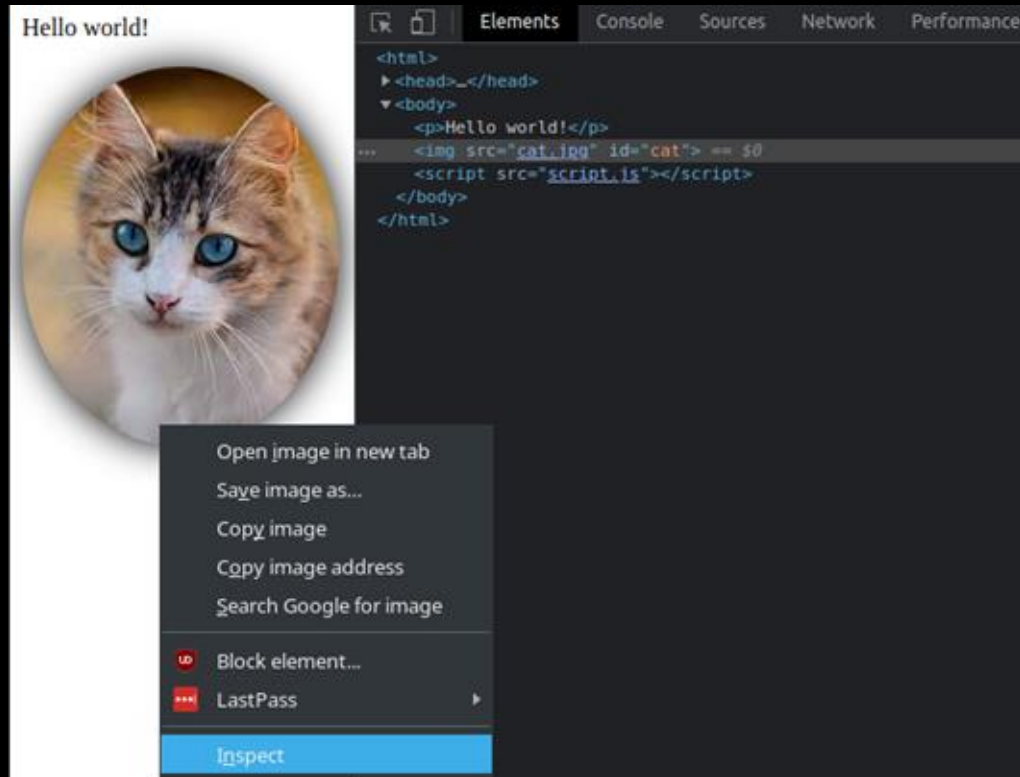


Important Tools

We're showing Chrome, but it's similar on Firefox



Devtools - Inspect Element



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

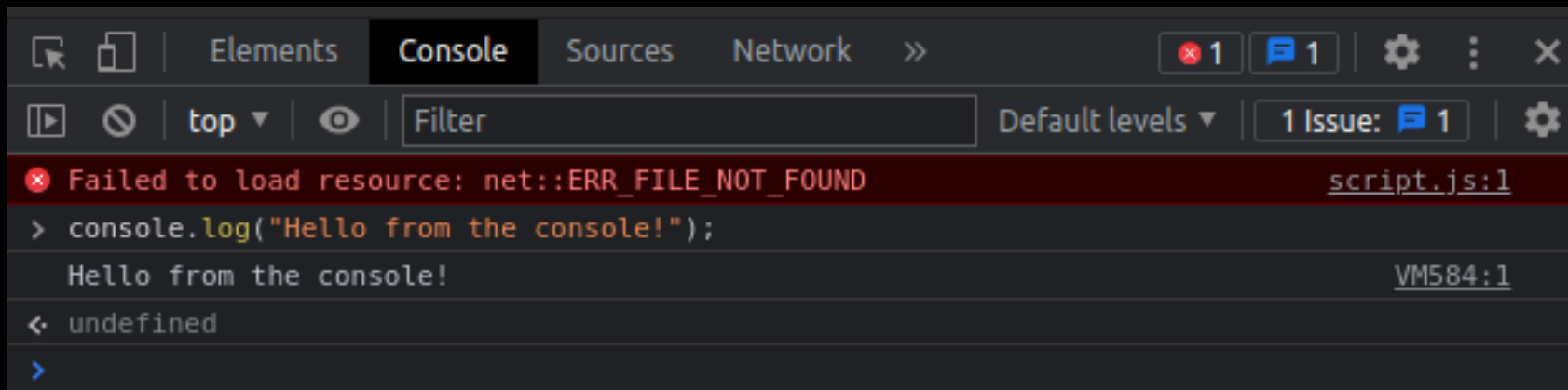
Try it!



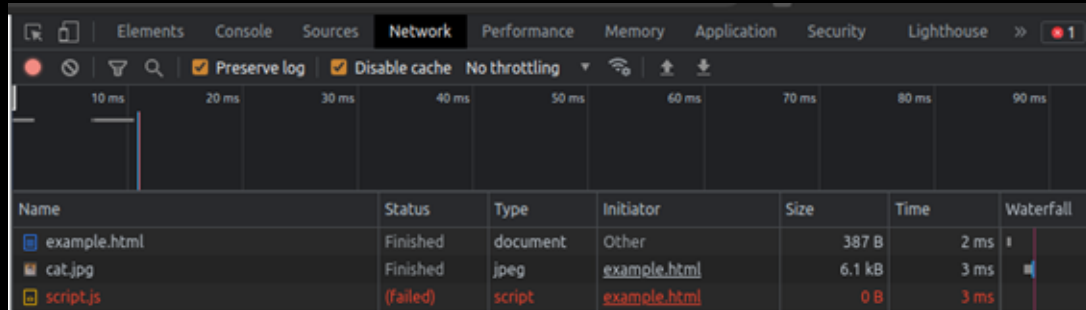
Devtools - Console

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

```
console.log("Hello world!");
```

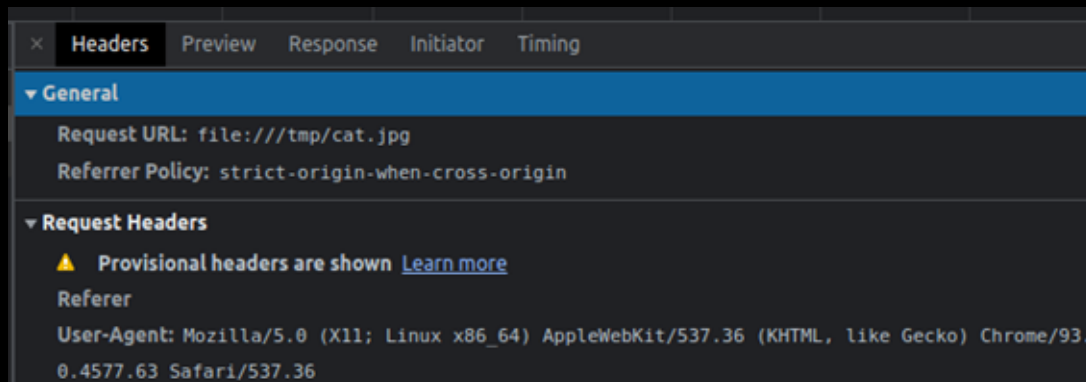


Devtools - Network



The screenshot shows the Chrome DevTools Network tab. At the top, there's a toolbar with icons for refreshing, filtering, and search, along with checkboxes for 'Preserve log', 'Disable cache', and a dropdown for 'No throttling'. Below this is a waterfall chart showing the timing of requests. The table below the chart lists the following requests:

Name	Status	Type	Initiator	Size	Time	Waterfall
example.html	Finished	document	Other	387 B	2 ms	
cat.jpg	Finished	jpeg	example.html	6.1 kB	3 ms	
script.js	(failed)	script	example.html	0 B	3 ms	



The screenshot shows the 'Headers' tab for a selected request. The tabs at the top are 'Headers', 'Preview', 'Response', 'Initiator', and 'Timing'. The 'General' section is expanded, showing the following information:

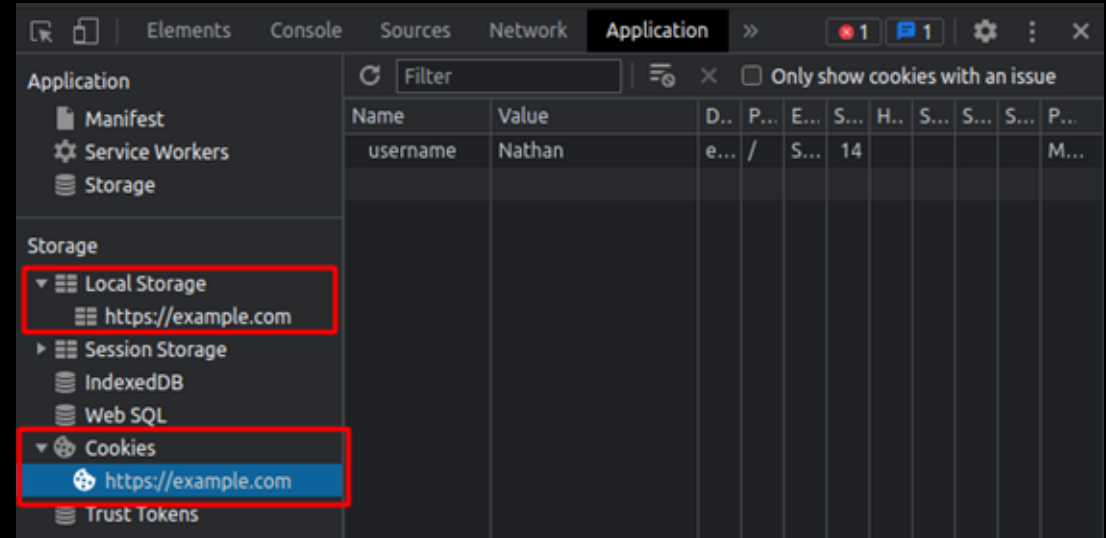
General
Request URL: file:///tmp/cat.jpg
Referrer Policy: strict-origin-when-cross-origin
Request Headers
⚠ Provisional headers are shown Learn more
Referer
User-Agent: Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/93.0.4577.63 Safari/537.36

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



Devtools - Application

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



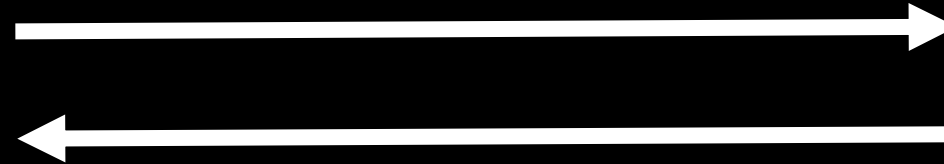
Final Note: Client-side vs Server-side

cookies, storage,
rendering of HTML/CSS,
JS execution



Change with
Devtools

requests



responses

backend databases,
distribution of
HTML/CSS/JS



Server



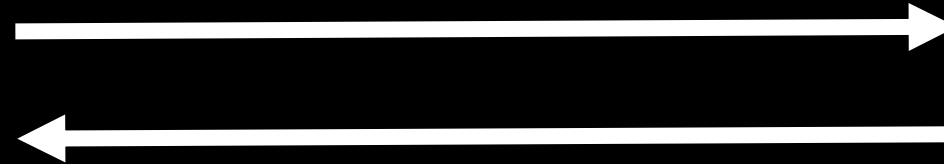
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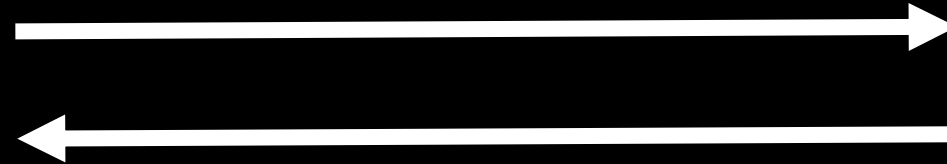
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Change with
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Server



Next Meetings

2026-09-10 • This Thursday

- Web Hacking II
- Learn how to break websites with malicious inputs using attacks such as SQL injection and cross-site scripting!

2026-09-13 • Next Sunday

- Open Source Intelligence
- Gathering information about targets from online!



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Meeting content can be found at
sigpwny.com/meetings.

Go solve challenges at
ctf.sigpwny.com!

