

NEXT LEVEL WEB DEVELOPMENT I

Responsive Web Anwendungen mit HTML5 und JavaScript

EVGENIJ TEREHOV

- Full-Stack Web-Developer seit 1999
- Dipl.-Wirt.-Inf. (FH)
- Senior IT Berater: EXXETA AG (bis 2014)
- Co-Founder & CTO bettervest.de (seit 2013)
- Founder und Orga: KarlsruheJS und FrankfurtJS
- Speaker, Consultant
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KARLSRUHE

JS

seit 2011



FRANKFURT

JS

seit 2014

AltaVista HOME - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Stop

Bookmarks Location: <http://www.altavista.com/>

AltaVista® Connections The most powerful and useful guide to the Net October 23, 1999 PDT

My AltaVista Shopping.com Zip2.com

Ask AltaVista® a question. Or enter a few words in any language ▾

Search For: Web Pages Images Video Audio

Help Advanced Text Search

Search tip: use image search

Example: When precisely will the new millennium begin?

ALTAVISTA CHANNELS - [My AltaVista](#) - [Finance](#) - [Travel](#) - [Shopping](#) - [Careers](#) - [Health](#) - [News](#) - [Entertainment](#)

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[Automotive](#)
[Business & Finance](#)
[Computers & Internet](#)

ALTAVISTA HIGHLIGHTS

POWER SEARCH

► [BIG changes coming to AltaVista **10/25** -Info inside!](#)

TRY THESE SEARCHES...

Search for [Halloween](#) in images

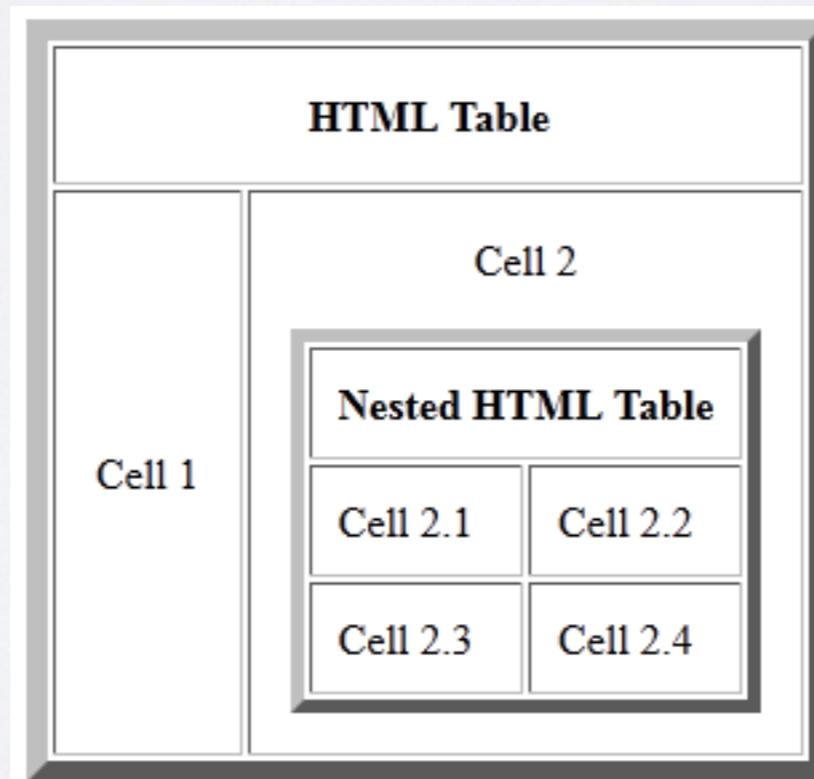
Document Done



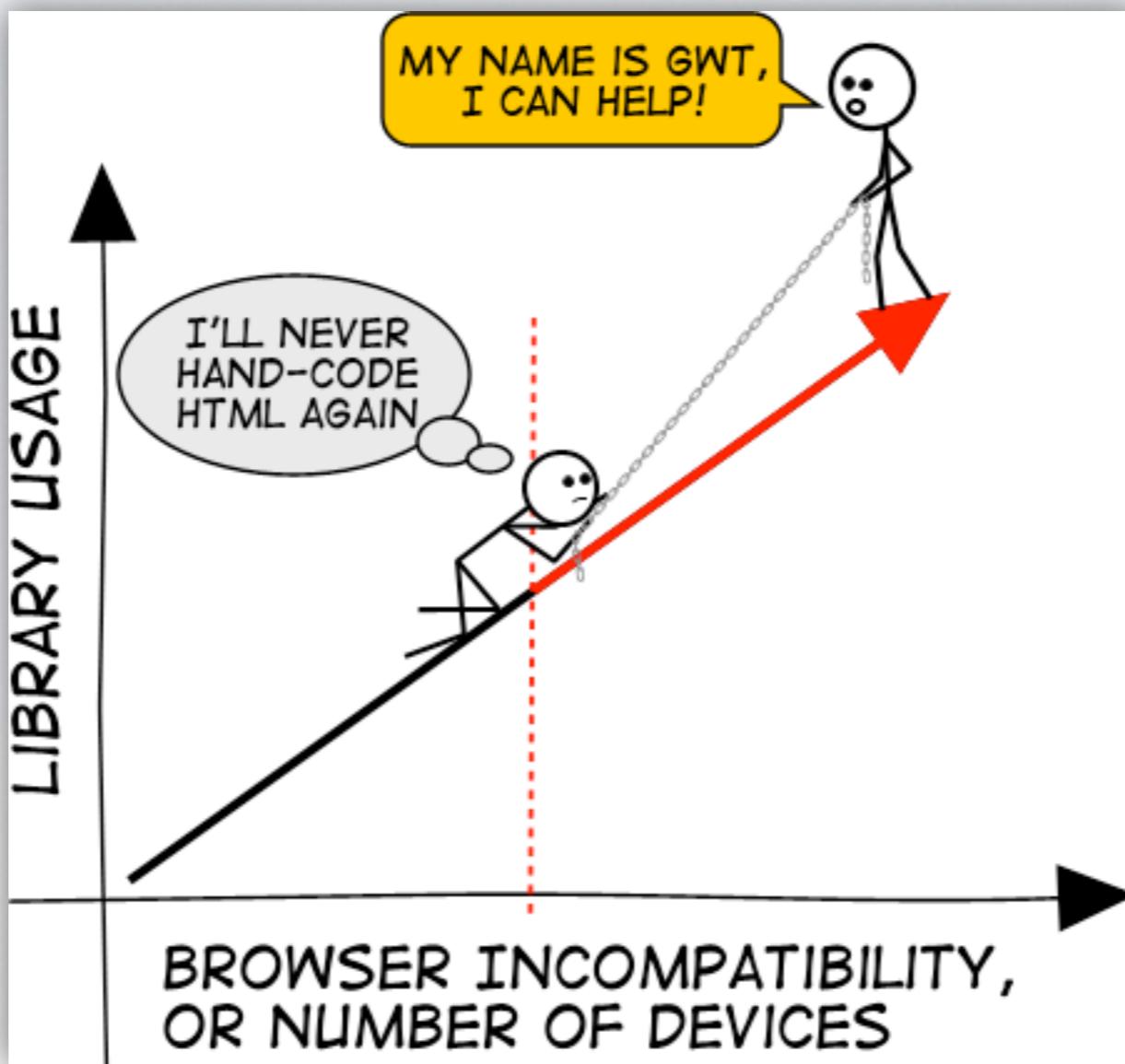
Comic Sans MS



TABLE-LAYOUTS!



LÖSUNG?



widget/Window.html

http://demo.qooxdoo.org/0.8/demobrowser/#widget~Window.html

Google

Demo Browser

qooxdoo 0.8 - pre

Run Previous Next Own Window Theme Debug HTML Code JS Code Log File

widget/Window.html

layout

legacy

progressive

root

showcase

table

Table

Table Cell_Editor

Table Conditional

Smart GWT Showcase

http://www.smartclient.com/smartsuite/showcase/#featured_complete_app

First Window

Welcome to your first own Window.
Have fun!

Page 1 Page 2 Page 3

Second Window

The second

Forms Other Generic 1 Generic 2 Generic 3 Generic 4

MenuBar + ToolBar

File Edit Tools View Help

New Copy Cut Paste Toggle Left Center Right

Help

Button + ToggleButton

Button (enabled): Click 1

Button (disabled): Click 2

RadioButton + CheckBox

CheckBox (enabled): Check 1

CheckBox (enabled): Check 2

CheckBox (disabled): Check 3

TextField + ComboBox

Text Field (enabled): Editable text...

Text Field (disabled): Disabled text...

ComboBox (enabled): Item #10

ComboBox (disabled): Disabled

Text Area

Write text here:

Editable multi-line text...

Line 2...

Line 3...

Spinner + DateField + ToolTip

Spinner (enabled): 0

Spinner (disabled): 0

DateField (enabled):

DateField (disabled):

ToolTip: Hover me

June 2010

S M T W T F S

21	30	31	1	2	3	4	5
22	6	7	8	9	10	11	12
23	13	14	15	16	17	18	19
24	20	21	22	23	24	25	26
25	27	28	29	30	1	2	3
26	4	5	6	7	8	9	10

Table

ID	Value
0	Item #0
1	Item #1
2	Item #2
3	Item #3

1 of 1000 rows

Office Supply Categories

- Office Paper Products
- General Office Products
- Office Machines and Electronics
 - Office Machine Sundries
 - Calculators and Accessories
 - Handheld Pocket
 - Portable Printout/display
 - Binding Machines
 - Spiral Binding Machines
 - Thermal Binding Machine
 - Overhead Projectors
 - Dictating Equipment
 - Shredders
 - Trimmers and Guillotines
 - Laminating Machines
 - Organisers
- Computer Consumables
- Office Filing and Storage

Find Items

Find SKU: Item: Use Category

Office Supply Items

Name	SKU	Description	Category	Units	Unit Cost	In Stock	Next Shipment
Calculator Canon La37h 8 Digit Sr	10963200	8 digit, memory, % and square root Handheld Pocket	Ea	\$13.14			
Calculator Canon Be122/be123 1	10963500	Same functions as KS123. Size 1 Handheld Pocket	Ea	\$78.20			
Calculator Canon Ls25h 8 Digit Sr	10963600	8 digit, memory and % & function Handheld Pocket	Ea	\$9.85			
Calculator Canon Ks122/123 12 L	10964400	12 digit, bit display, dual power, g Handheld Pocket	Ea	\$69.96			
Calculator Canon Hs102h 10 Digit	10964700	10 digit, upright display, dual pow. Handheld Pocket	Ea	\$37.02			
Calculator Canon Ls1000h 10 Dig	10964900	10 digit, grand total memory, full Handheld Pocket	Ea	\$57.61			
Calculator Sharp EL243a 8 Digit Sr	11007900	8 digit, large LCD, hard cover, tw Handheld Pocket	Ea	\$5.75			
Calculator Sharp EL376ab 8 Digit Sr	11053200	8 digit, large LCD and large keys, Handheld Pocket	Ea	\$8.81			
Calculator Sharp EL344g 8 Digit Sr	11096500	8 digit, solar power, stylish metal Handheld Pocket	Ea	\$23.82			
Calculator Sharp EL733a Finance	11143800	10 digit display (8 mantissa and 2 Handheld Pocket	Ea	\$53.62			
Calculator Sharp EL480g Business	11189700	10 digit, twn power, large LCD, s Handheld Pocket	Ea	\$23.62			
Calculator Canon Ls80h 8 Digit Sr	11190000	8 digit, single line memory, dual pi Handheld Pocket	Ea	\$18.44			
Calculator Sharp EL2120r 12 Digit	11279700	12 digit similar to the EL387R. Hug Handheld Pocket	Ea	\$51.33			
Calculator Sharp EL331ab 10 Digit	11314900	10 digit version of the EL330AB. Handheld Pocket	Ea	\$20.27			
Calculator Sharp EL387y 12 Digit	11325000	12 digit, large LCD display with pi Handheld Pocket	Ea	\$40.42			

Instructions

To use this application:

- Select a folder in the Office Supply Categories tree to display items in that category.
- Select an item in the Office Supply Items list to view or edit item details.
- Select the View or Edit tab in the Item Details window as appropriate.
- Edit information in the Edit pane of the Item Details window and click 'Save Item' to save your changes; or
- Double-click on item Name, Description, Units, or Unit Cost to edit information in place in the Office Supply Items list.
- Right-click on any item in the Office Supply Items list to Show Details, Edit, or Delete that item.
- Drag an item from the Office Supply Items list to a folder in the Office Supply Categories tree to recategorize the item.

View Edit

Item: Calculator Canon Ls1000h 10 Digit Dual Power

SKU: 10964900

Description: 10 digit, grand total memory, full size keys, % & square root functions, dual powered. Size 138.5x198.5x35mm

Category: Handheld Pocket

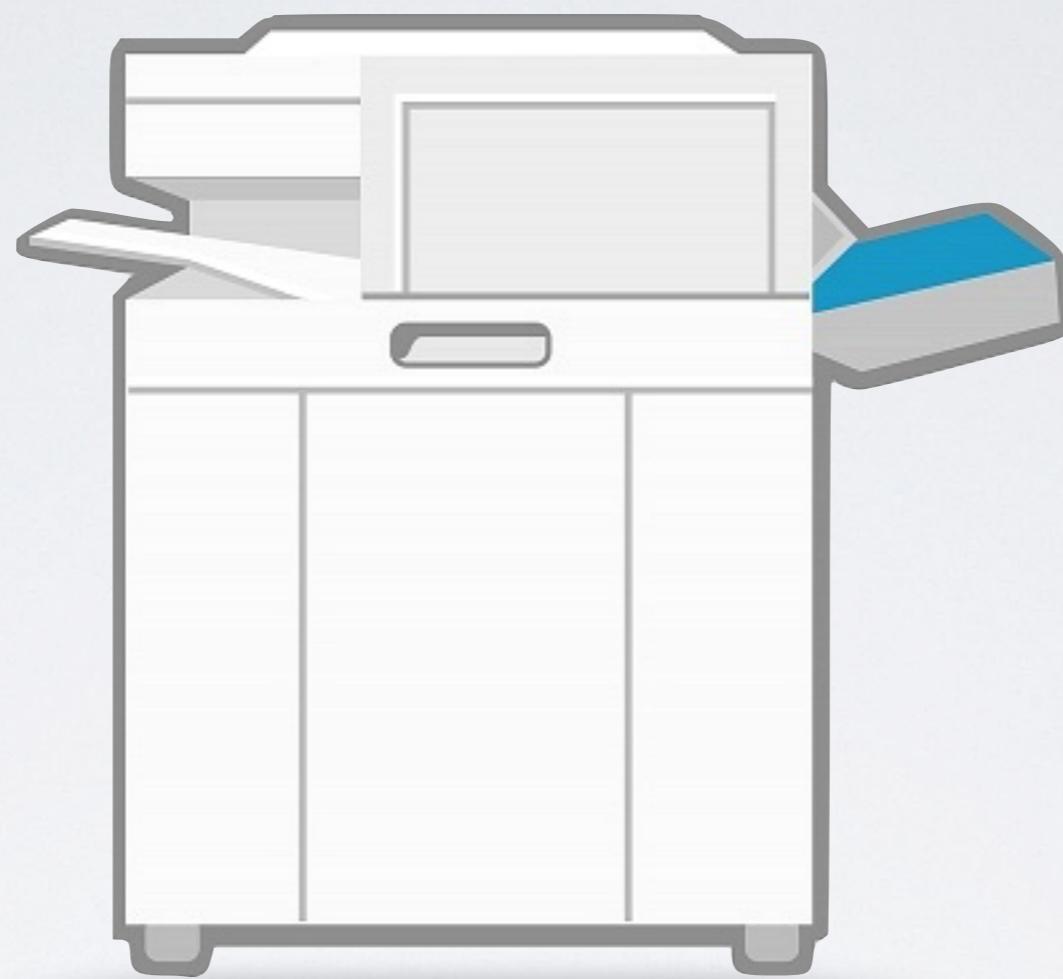
Units: Ea

Unit Cost: \$7.61

In Stock:

Next Shipment:

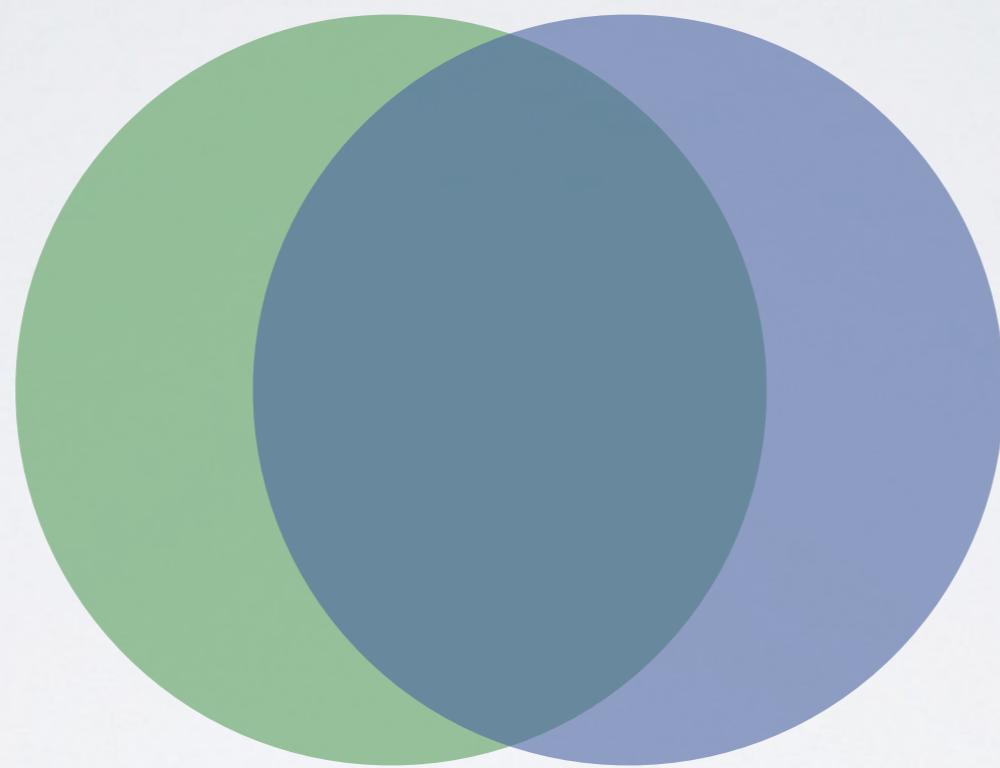
Web 2.0 = Desktop 1.0?



Kopieren?



Gedankenmodell
des Benutzers



Funktionsweise der
Applikation

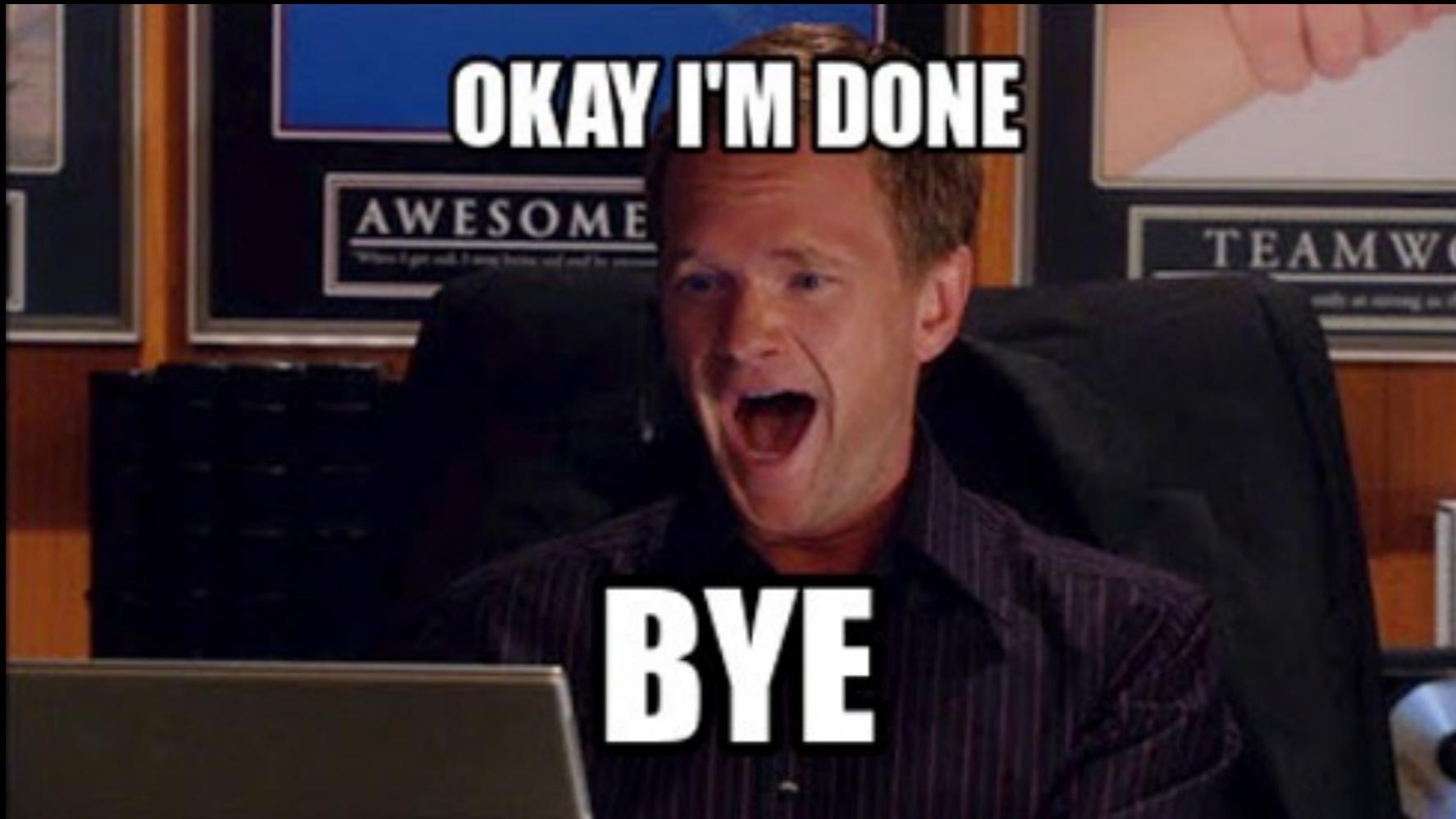


→ Vor dem Bildschirm sitzt immer ein Mensch!
Technologie verstehen!

OKAY I'M DONE

AWESOME

BYE



The screenshot shows the EXXETA Consulting and Technologies website. At the top, there's a navigation bar with links for 'Warum EXXETA', 'Unternehmen', 'Leistungen', 'Referenzen', 'Karriere', 'News', and 'Kontakt'. A search bar is also present. The main banner features four business professionals (three men and one woman) smiling and looking at something off-camera. A central text overlay reads 'EXXETA gehört zu den Top Beratungsfirmen in Deutschland' with a 'Mehr Infos' button. Below the banner, there are three main sections: 'Unsere Referenzen' (with a bar chart graphic), 'Gestalten Sie Ihre Karriere selbst' (with an image of a person watering a small plant), and 'Mit Partnern für Ihren Erfolg' (with an image of two people in suits shaking hands). The footer contains links for 'Zu den Leistungen ...', 'Weitere Stellenangebote ...', 'Weitere News ...', and 'Mehr Infos'.

www.exxeta.com

Land: Deutschland | Schweiz

EXXETA
CONSULTING AND TECHNOLOGIES

Warum EXXETA | Unternehmen | Leistungen | Referenzen | Karriere | News | Kontakt

Wonach suchen Sie?

EXXETA gehört zu den Top Beratungsfirmen in Deutschland

Mehr Infos

Unsere Referenzen

Gestalten Sie Ihre Karriere selbst

Mit Partnern für Ihren Erfolg

Unsere Expertise - Ihr Nutzen

EXXETA verbindet Business- und IT-Welt. Wir sind Ihr Partner von der Strategiumsetzung bis zur Optimierung Ihrer Systemlandschaft. Unser Portfolio:

- // Industry Consulting in den Branchen:
Automotive, Energy, Financial Services und Transport & Logistics
- // Management Consulting
- // IT Consulting
- // Methodology Consulting

Zu den Leistungen ...

Weitere Stellenangebote ...

Weitere News ...

Aktuelle Informationen rund um EXXETA und unsere Leistungen.

- // EXXETA erreicht erneut Microsoft Gold Partner Status
- // Talente fördern mit dem Deutschlandstipendium
- // EXXETA ist ISO 9001 zertifiziert
- // EXXETA @ JAX – Spannende Vorträge

Bestenliste Beratungsfirmen | Ihre Karriere bei EXXETA | Artikel: Continuous Delivery

Mehr Infos

THE FUTURE IS LANDING





Simple HTTP Server

```
var http = require('http');
var fs = require('fs');

http.createServer(function (request, response) {
  var file = __dirname + '/index.html';
  fs.readFile(file, function (err, data) {
    if (err) throw err;
    response.end(data);
  });
}).listen(3000);

console.log('Simple HTTP Server running on port 3000');
```

seit 2013



bettervest
nachhaltig · effizient · rentabel

Erste Crowdfundingplattform,
über die Bürger Energieeffizienzprojekte
öffentlichtswirksam finanzieren &
an den Einsparungen partizipieren



bettervest
nachhaltig · effizient · rentabel



Screenshot of the bettervest website showing a project page for a fitness studio.

Header: bettervest nachhaltig · effizient · rentabel

User Info: Hallo Evgenij Terehov, Logout, Mein Profil

Navigation: Start, Projekte, FAQs, Über uns, Blog, Meine Investitionen, Kontakt, Projekt anmelden

Project Title: Bodystreet Filialen München - Leopoldstraße, Luitpoldpark, Münchner Freiheit und Sternstraße

Image: A man and a woman working out on a cardio machine.

Key Metrics (reached):

- 10% Rendite
- 7.3t CO₂ Einsparung
- 6 Jahre Laufzeit
- 61% effizienter
- 16,700€ benötigt

Finanzierungsrechner (Financing Calculator):

Investment amount: 1000€

Graph showing projected annual payments over 6 years:

Jährliche Auszahlung: 229.61€

Jahr	Tilgung	Zinsen	Restwert
0	0	0	1,000
1	129.61	100	870.39
2	142.57	87.04	727.82
3	156.82	72.78	570
4	172.51	57.1	398.49
5	189.76	39.85	208.73
6	208.73	20.87	0
	1000€	377.64€	

Project Description:

In diesem Projekt wird gleich in vier Bodystreet-Filialen in München: Leopoldstraße, Luitpoldpark, Münchner Freiheit und Sternstraße, die konventionelle Beleuchtung komplett durch energieeffiziente LEDs ausgetauscht, was zu 61% Energieeinsparung bei der Beleuchtung führt. Die benötigte Gesamtsumme für die Umrüstung des Studios beträgt 16.700€. Die Laufzeit des Projektes beträgt 6 Jahre bei einer Rendite von 10% für die Investoren.

Testimonial:

HTML5

Technologies: bettervest nachhaltig · effizient · rentabel

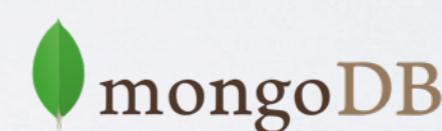
Bottom Text:

„Wir haben das Fitnesstraining nachhaltiger und effizienter gemacht. Jetzt machen wir dasselbe mit unserer Ökobilanz.“

Bottom Image: A small circular portrait of a smiling man.



bettervest
nachhaltig · effizient · rentabel



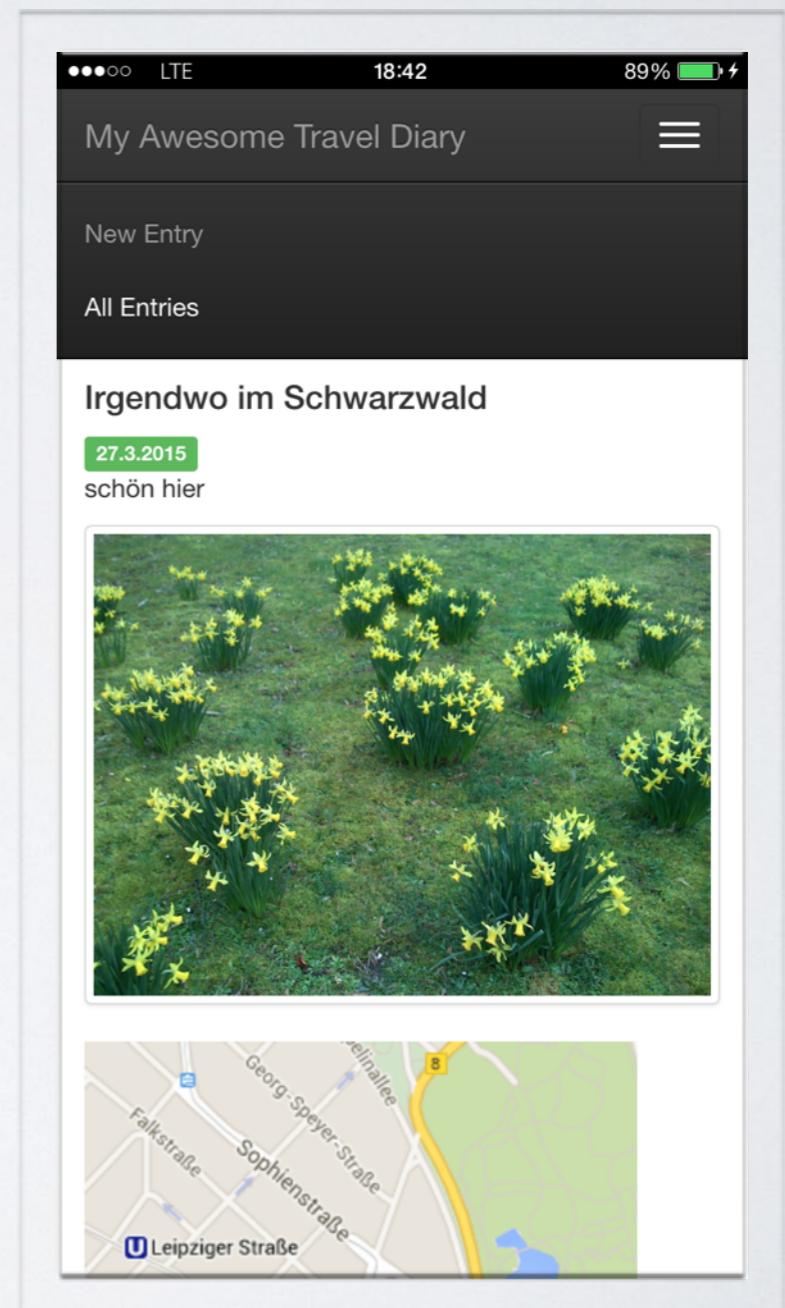
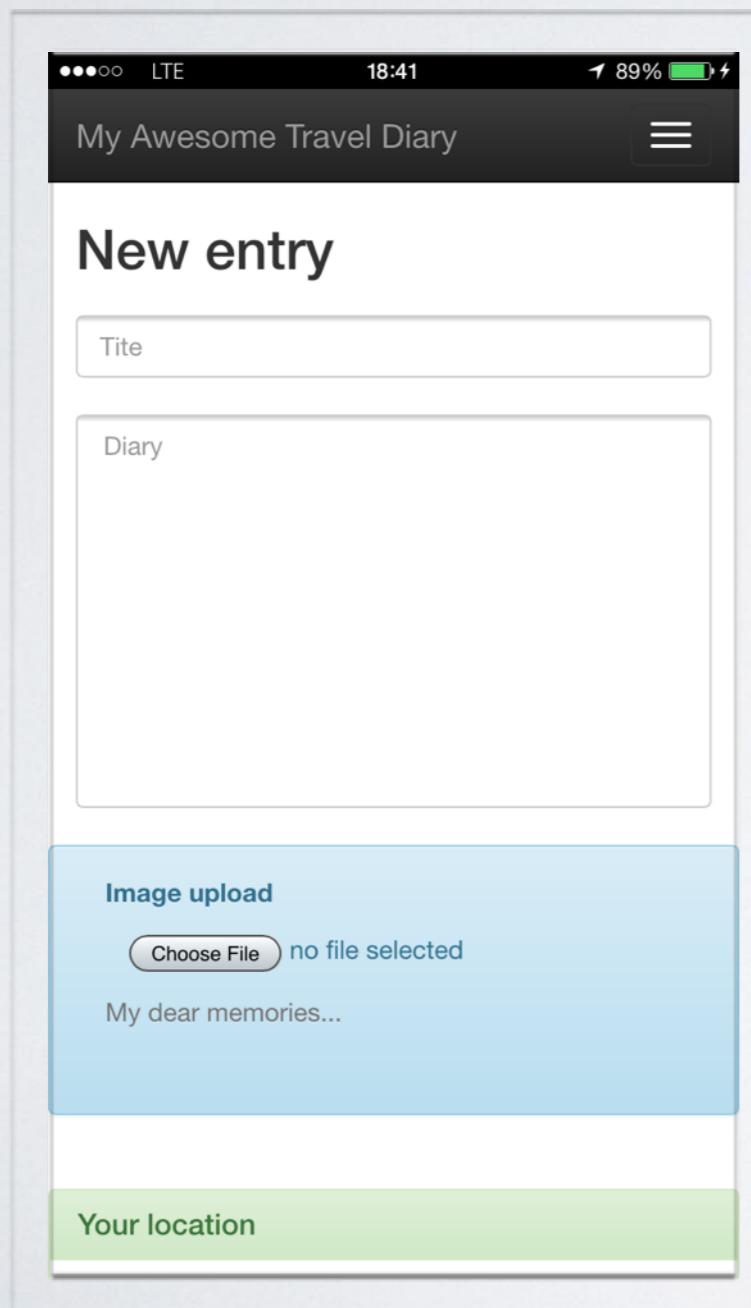
CLOUD & HEAT
THE CLOUD THAT HEATS HOMES WORLDWIDE

AGENDA

- History of the Web 30 min
- Hands on: Responsive App 45min
- HTML5 APIs 2,5h (mit Pause)
- Hands on: HTML5 APIs 3h

HANDS ON

— MY TRAVEL DIARY —



HANDS ON

— MY TRAVEL DIARY —

PT I:
Responsive Website mit
Bootstrap oder CSS Media Queries

HISTORY OF THE WEB

90s



Browser:
Mosaic / Netscape!



2000s



WebApps

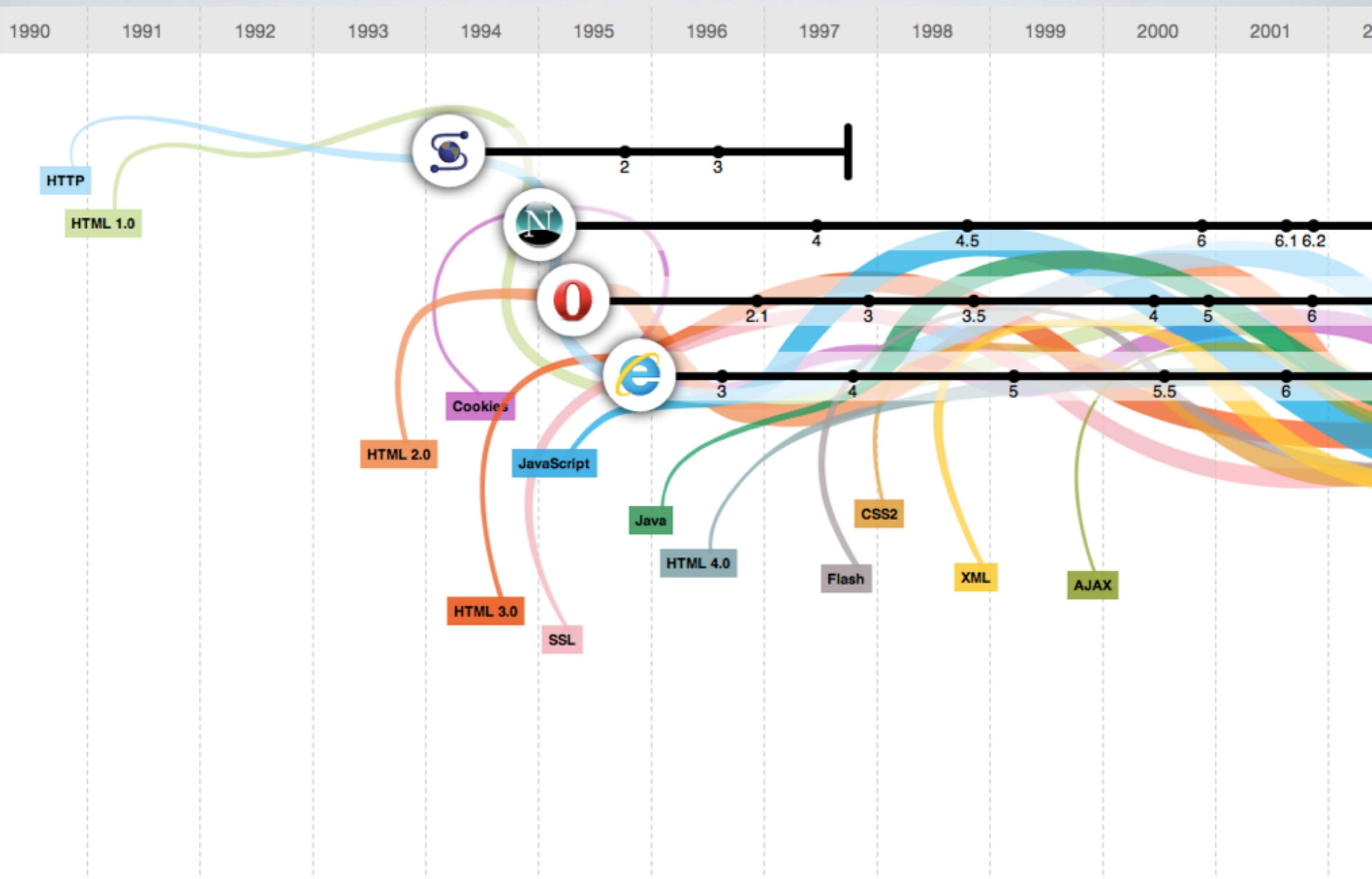


JS

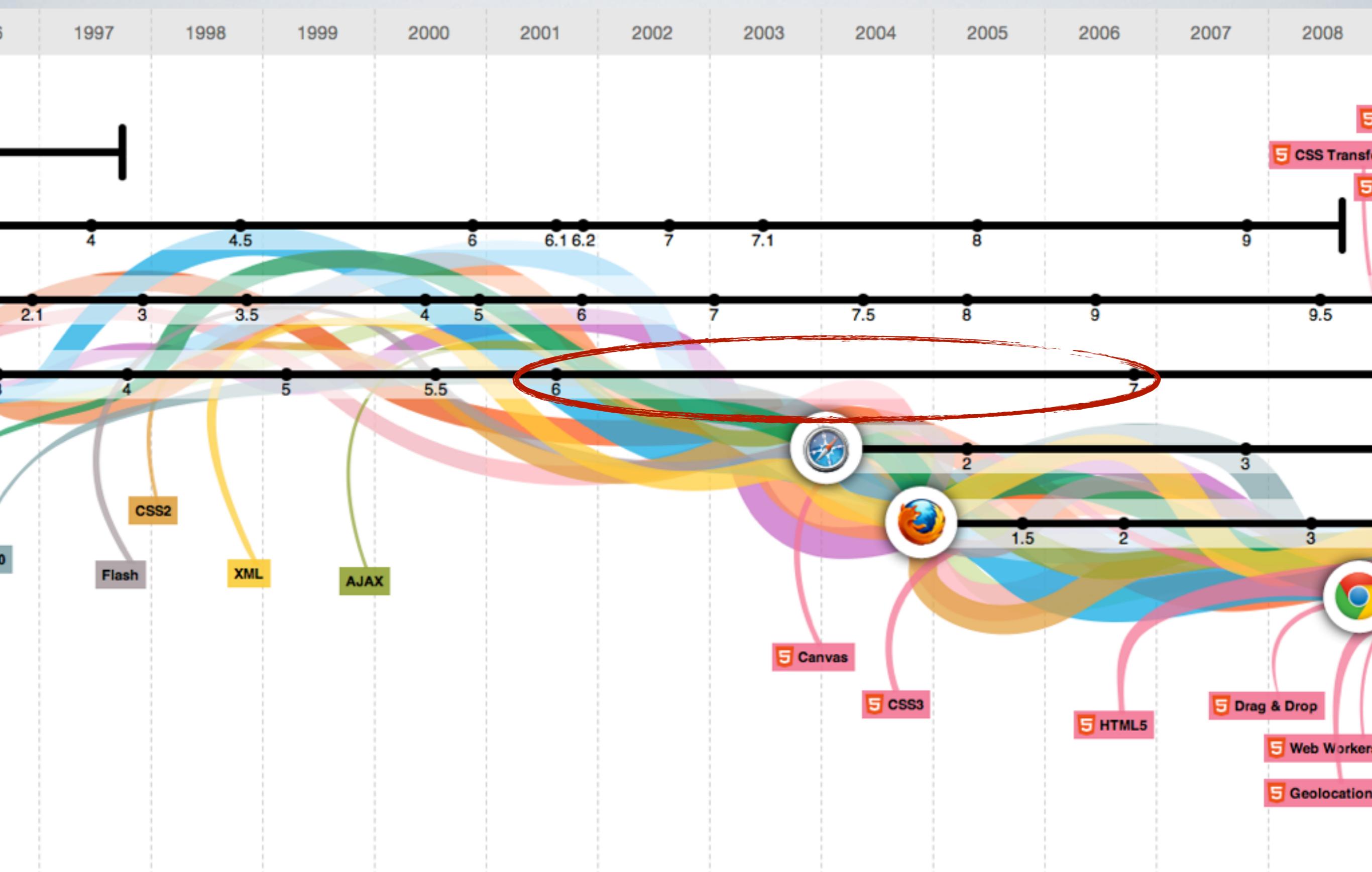


JS

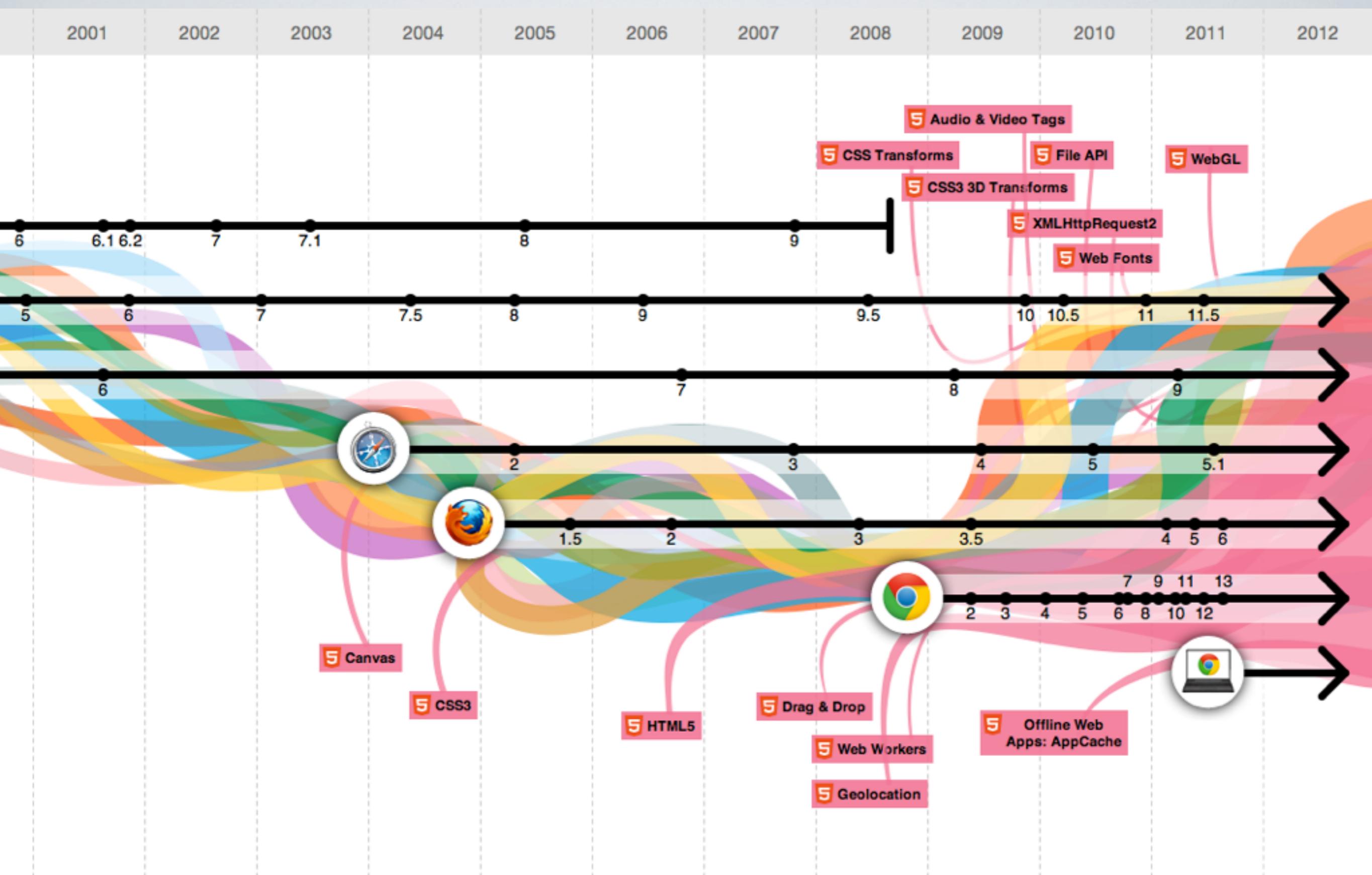
Evolution of the Web



Evolution of the Web



Evolution of the Web

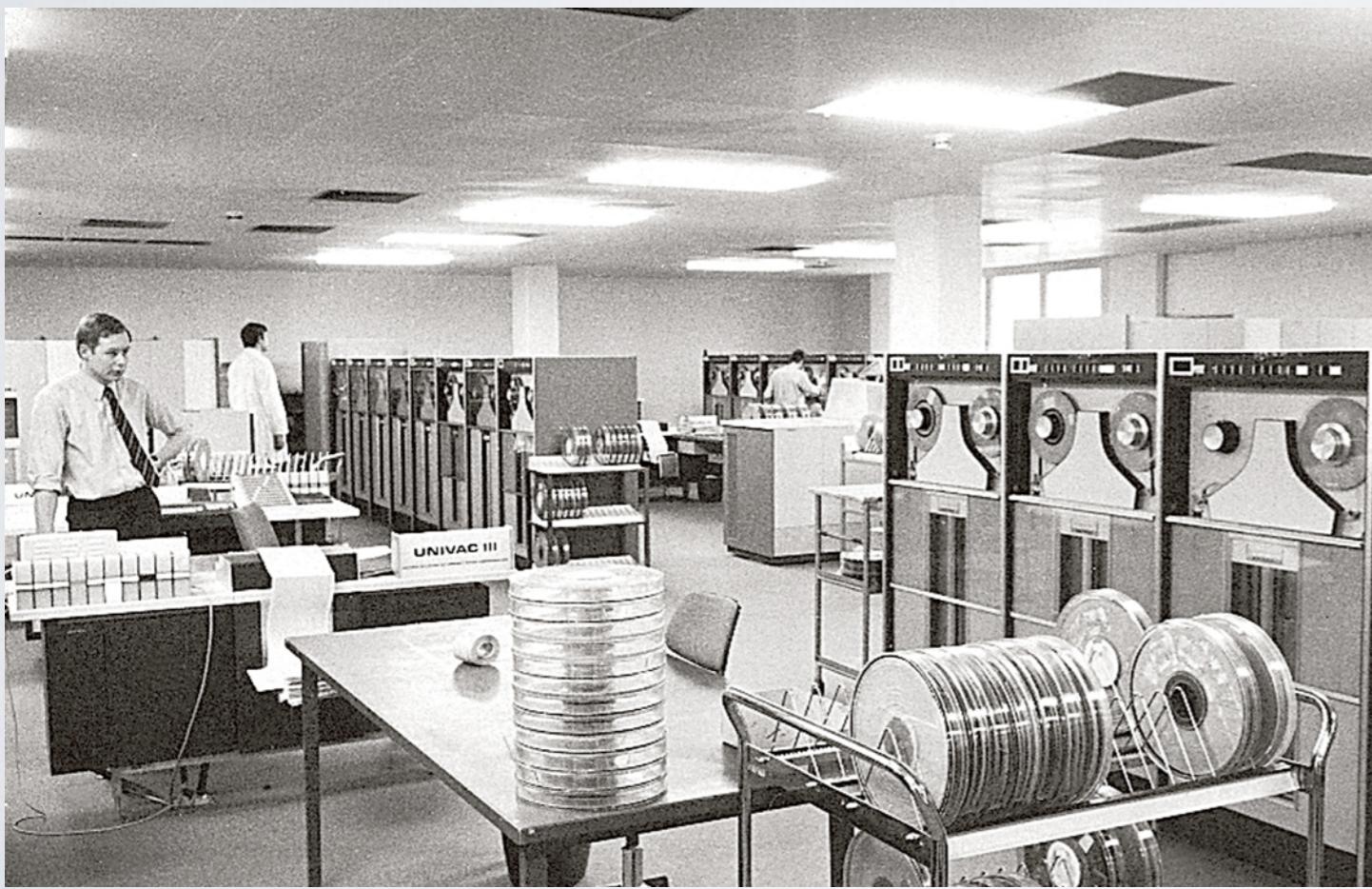


INTERNET EXPLORER

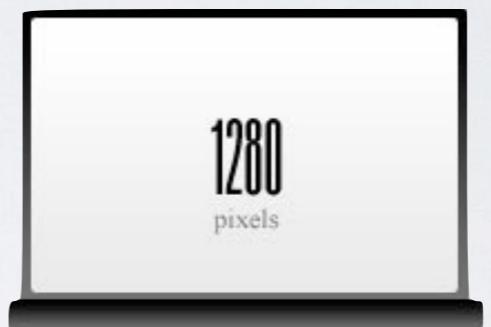
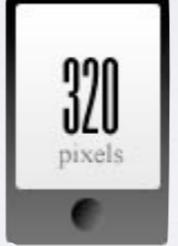
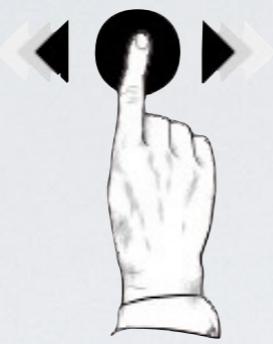


The number one browser for
downloading a better browser

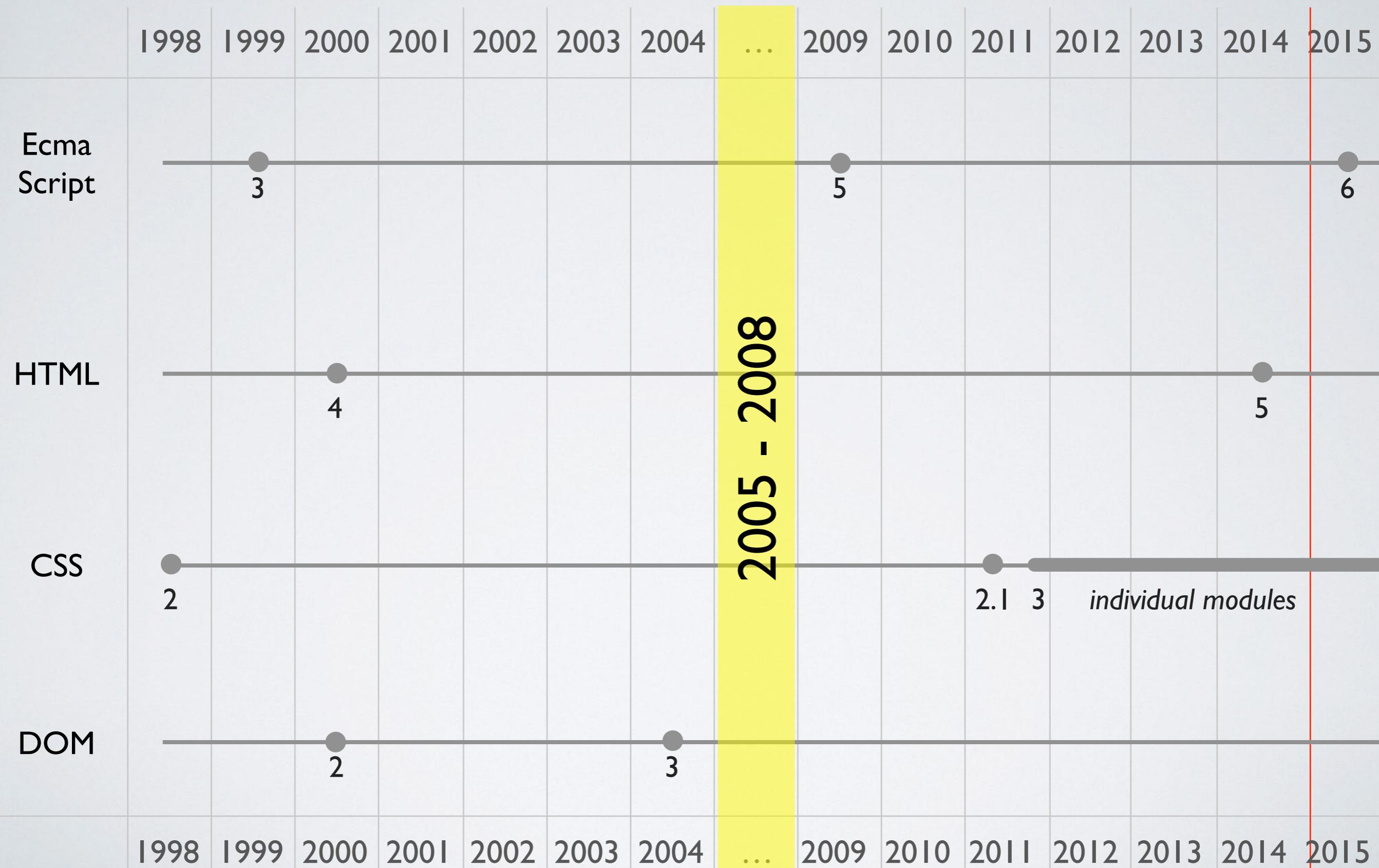
FORMFAKTOR







OPEN WEB STANDARDS



I've seen the
FUTURE
It's in my
BROWSER

HTML



W3C

18.01.2011

"HTML is the new HTML5"

Web Hypertext Application Technology Working Group



20.01.2011



HTML5
SEMANTICS



OFFLINE &
STORAGE



DEVICE
ACCESS



CONNECTIVITY



MULTIMEDIA



3D, GRAPHICS,
EFFECTS

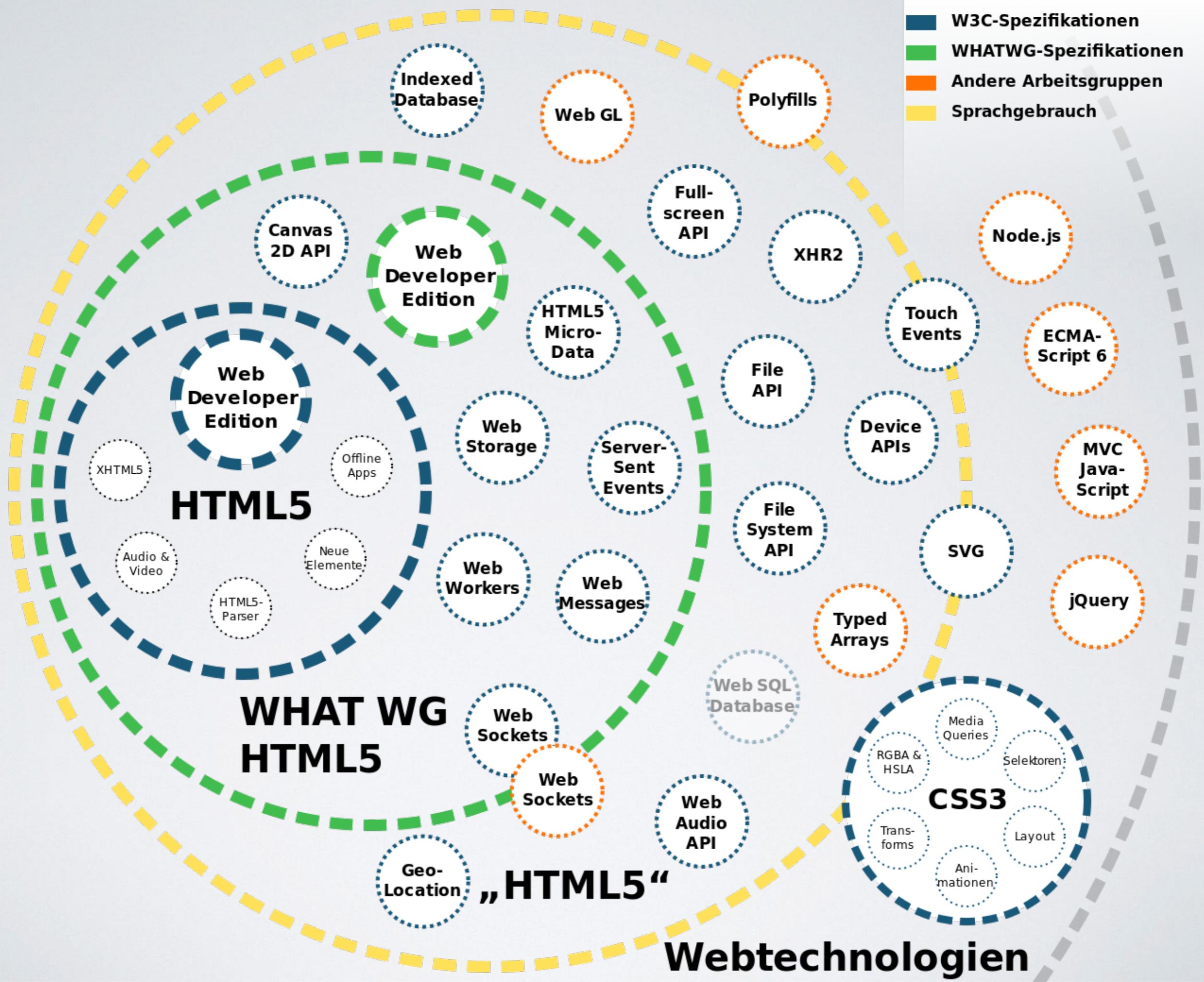


PERFORMANCE &
INTEGRATION



CSS3
STYLING

- W3C-Spezifikationen
- WHATWG-Spezifikationen
- Andere Arbeitsgruppen
- Sprachgebrauch



HTML



CSS



JS



diveintohtml5.info

DIVE INTO HTML5

BY

MARK PILGRIM

WITH CONTRIBUTIONS FROM THE COMMUNITY

CC-BY



ive Into HTML5 elaborates on a hand-picked selection of features from the [HTML5](#) specification and other fine standards. We encourage you to [buy the printed work](#) — Mark Pilgrim's artfully titled “HTML5: Up & Running” — published on paper by O'Reilly, under the Google Press imprint. Your kind and sincere [feedback](#) is always welcome, and this work shall remain online under the [CC-BY-3.0 license](#).

Mozilla Foundation developer.mozilla.org/de/ Anmelden mit mozilla ▾

MDN MOZILLA DEVELOPER NETWORK BEREICHE WEB-PLATTFORM WERKZEUGE DEMOS VERBINDELN

Geteiltes Wissen für das offene Web

Die Dokumentation durchsuchen

WEB-PLATTFORM

- [Web APIs & DOM](#)
- [HTML & HTML5](#)
- [CSS & CSS3](#)
- [JavaScript](#)
- [mehr...](#)

BEREICHE

- [Firefox](#)
- [Firefox OS](#)
- [Firefox Marketplace](#)
- [App-Zentrum](#)
- [Add-ons](#)

ENTWICKLER-WERKZEUGE

- [Firefox-OS-App-Manager](#)
- [Seiteninspektor](#)
- [JavaScript-Debugger](#)
- [Web-Konsole](#)
- [mehr...](#)

VERBINDELN

Erhalten Sie Nachrichten über Web-Technologien von Mozilla, holen Sie sich Hilfe von anderen Entwicklern und mehr!

Erfahren Sie mehr und registrieren Sie sich!

Lernen Sie Web-Entwicklung →

Holen Sie sich den Browser für Entwickler wie Sie →

Entwickeln Sie Open Web Apps →

Hacks Blog Lesen Sie mehr auf [hacks.mozilla.org](#) →

MITMACHEN

[Easier in-app payments with fxpay](#)
For developers building web applications on Firefox OS or Firefox Desktop, supporting payments is easy with Mozilla's fxpay.

caniuse.com

About News February 21, 2015 - Latest support data update Compare browsers Index

Can I use

?

Settings

Detected your country as "Germany". Would you like to import usage data for that country?

Import No thanks

CSS

- ::selection CSS pseudo-element
- :placeholder-shown CSS pseudo-class
- @font-face Web fonts
- Blending of HTML/SVG elements
- calc() as CSS unit value
- 2.1 selectors
- background-attachment
- background-blend-mode
- background-position edge offsets
- box-decoration-break
- clip-path property
- Counters
- currentColor value
- Device Adaptation
- Exclusions Level 1
- Feature Queries
- Filter Effects
- font-size-adjust
- font-stretch
- Generated content for pseudo-elements
- Gradients
- Grid Layout
- Hyphenation
- inline-block
- Masks
- min/max-width/height

HTML5

- Audio element
- Autofocus attribute
- Canvas (basic support)
- Canvas blend modes
- classList (DOMTokenList)
- Color input type
- contenteditable attribute (basic support)
- Custom Elements
- Custom protocol handling
- Datalist element
- dataset & data-* attributes
- Date and time input types
- Details & Summary elements
- Dialog element
- Download attribute
- Drag and Drop
- Form validation
- getElementsByClassName
- hidden attribute
- HTML Imports
- HTML5 form features
- input placeholder attribute
- Minimum length attribute for input fields
- Multiple file selection
- New semantic elements
- Number input type

SVG

- Inline SVG in HTML5
- SVG (basic support)
- SVG effects for HTML
- SVG favicons
- SVG filters
- SVG fonts
- SVG fragment identifiers
- SVG in CSS backgrounds
- SVG in HTML img element
- SVG SMIL animation
- All SVG features

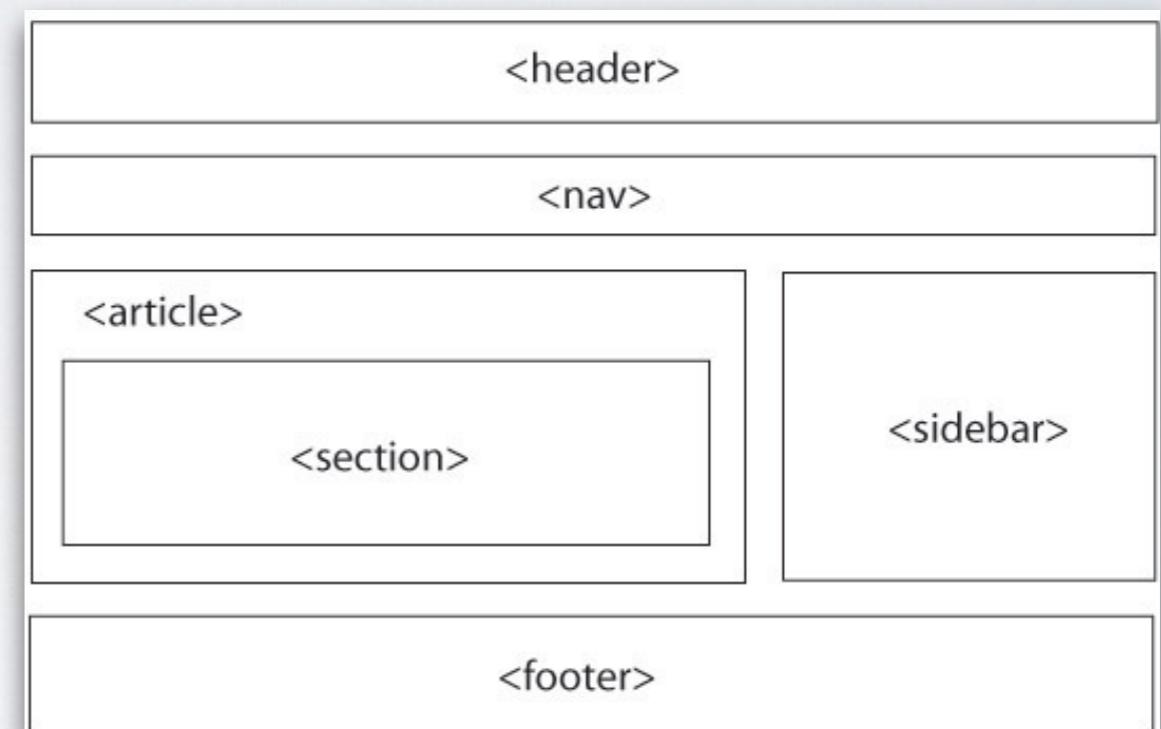
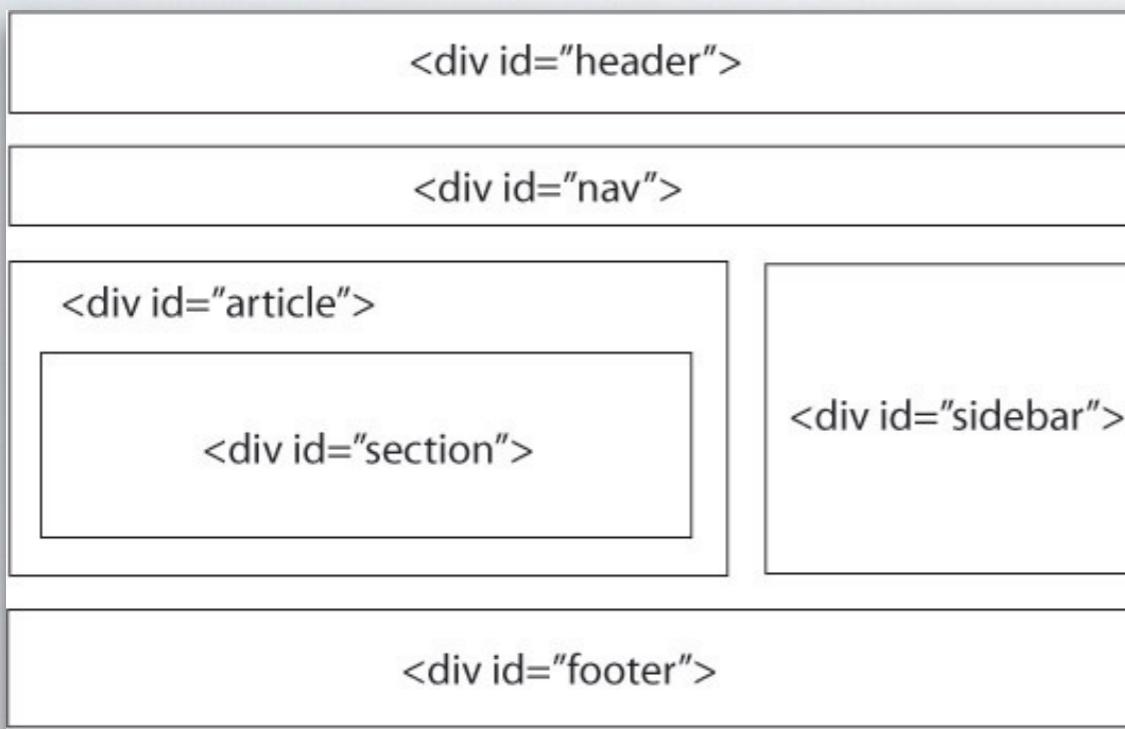
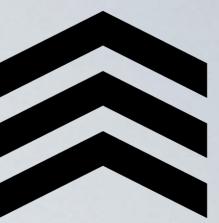
JS API

- Ambient Light API
- Base64 encoding and decoding
- Battery Status API
- Blob constructing
- Blob URLs
- BroadcastChannel
- Channel messaging
- Clipboard API
- Cross-document messaging
- Cross-Origin Resource Sharing
- crypto.getRandomValues()
- CSS Font Loading



Semantics
“Giving meaning to the structure”
W3C

HTML5: Semantics



HTML5: Semantics / Input Fields



color
date
datetime
datetime-local
email
month
number
range
search
tel
time
url
week

```
<input type="date" name="bday">  
  
<input type="datetime-local" name="bdaytime">  
  
<input type="email" name="email">  
  
<input type="url" name="sitename">  
  
<input type="number" name="quantity" min="1" max="5">  
  
<input type="range" min="0" max="10" step="2" value="6">
```



HTML5: Semantics / Micro Data



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fon: +49 (0)69 34877347 | mail: mail@bettervest.de
Impressum | AGBs | Datenschutzerklärung

```
<address>
  <div itemscope itemtype="http://schema.org/Organization">
    <span itemprop="name">bettervest GmbH</span> |
    <span itemprop="address" itemscope itemtype="http://schema.org/PostalAddress">
      <span itemprop="streetAddress">Schweizer Straße 28</span> |
      <span itemprop="postalCode">60594</span>
      <span itemprop="addressLocality">Frankfurt</span>
    </span> <br />
    fon: <span itemprop="telephone">+49 (0)69 34877347</span> |
    mail: <span itemprop="email"><a href="mailto:mail@bettervest.de">mail@bettervest.de</a></span>
  </div>
</address>

<time itemprop="date" datetime="2010-07-18">next week</time>
```

schema.org



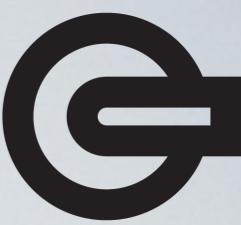
Offline & Storage



Warum sind Cookies schlecht?

- Größe: max 4kb (IE safe!)
- Werden bei JEDEM Request mitgeschickt (incl. AJAX)
- Grausame API

HTML5: Offline & Storage / LocalStorage SessionStorage



```
// Store  
localStorage.setItem("lastname", "Smith");  
// Retrieve  
document.getElementById("result").innerHTML = localStorage.getItem("lastname");
```

5 - 10mb

IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
		31						
		36						
		37						
		38						
8	31	39					4.1	
9	35	40	7				4.3	
10	36	41	7.1		7.1		4.4	
11	37	42	8	27	8.3	8	40	41
TP	38	43		28				
	39	44		29				
	40	45						

HTML5: Offline & Storage / WebSQL



Beware. This specification is no longer in active maintenance and the Web Applications Working Group does not intend to maintain it further.

IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
		31						
		36						
		37						
		38						
8	31	39					4.1	
9	35	40	7				4.3	
10	36	41	7.1		7.1		4.4	
11	37	42	8	27	8.3	8	40	41
TP	38	43		28				
	39	44		29				
	40	45						

HTML5: Offline & Storage / IndexedDB



```
// Öffnen unserer Datenbank
var request = window.indexedDB.open("MeineTestdatenbank");

// Erstelle ein ObjectStore für diese Datenbank
var objectStore = db.createObjectStore("name", { keyPath: "myKey" });

// Speichern...
objectStore.add({ id: "123", name: "Test User"});

// Lesen
var request = objectStore.get("123");
request.onerror = function(event) {
    // Handle errors!
};

request.onsuccess = function(event) {
    // Do something with the request.result!
};
```



IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
		31						
		36						
		37						
		38						
8	31	39					4.1	
9	35	40	7				4.3	
10	36	41	7.1		7.1		4.4	
11	37	42	8	27	8.3	8	40	41
TP	38	43		28				
	39	44		29				
	40	45						

HTML5: Offline & Storage / Cache Manifest

- Wird im <head> eingebunden:

```
<html manifest="/cache.manifest">
```

- MUSS:** MIME type: text/cache-manifest
- Wenn SSL/TLS, alles von same origin
- Besteht aus folgenden Abschnitten
 - CACHE: zu cachen
 - NETWORK: Nur falls online, nicht gecacht
 - FALLBACK: Ersetze mit, falls nicht im Cache
- Ist wie eine Seuche...
- Schwer zu sagen wie viel Speicher

CACHE MANIFEST

CACHE:

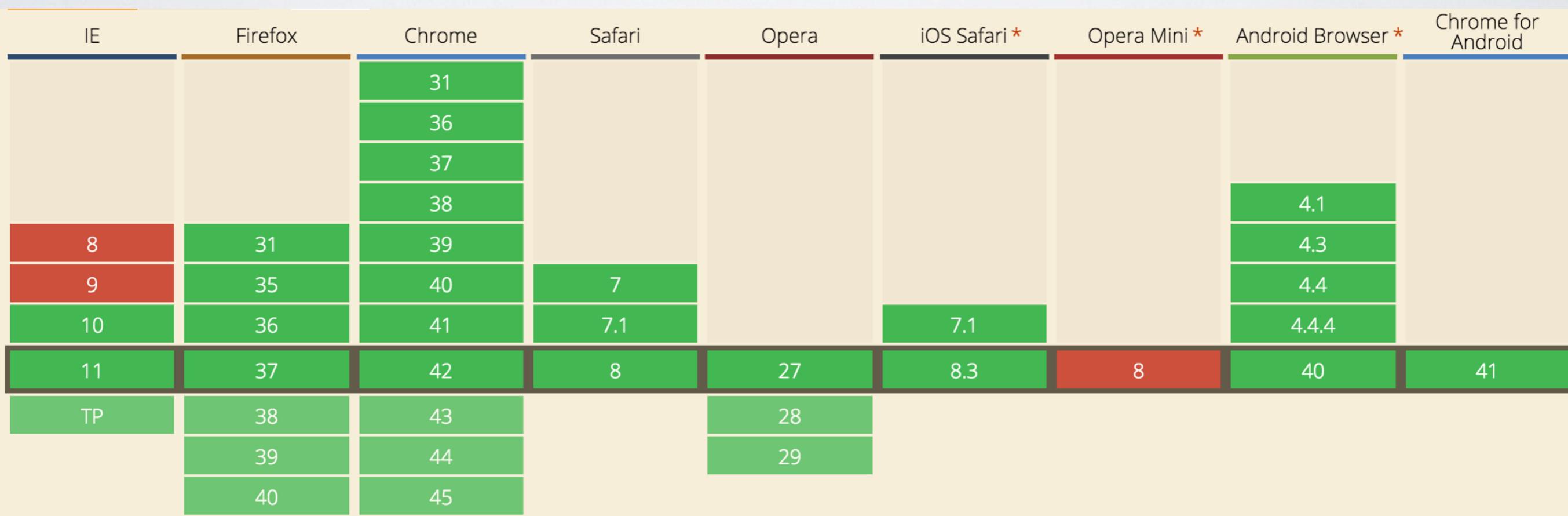
logo.jpg
styles.css
main.js
offline.html

NETWORK:

online.html

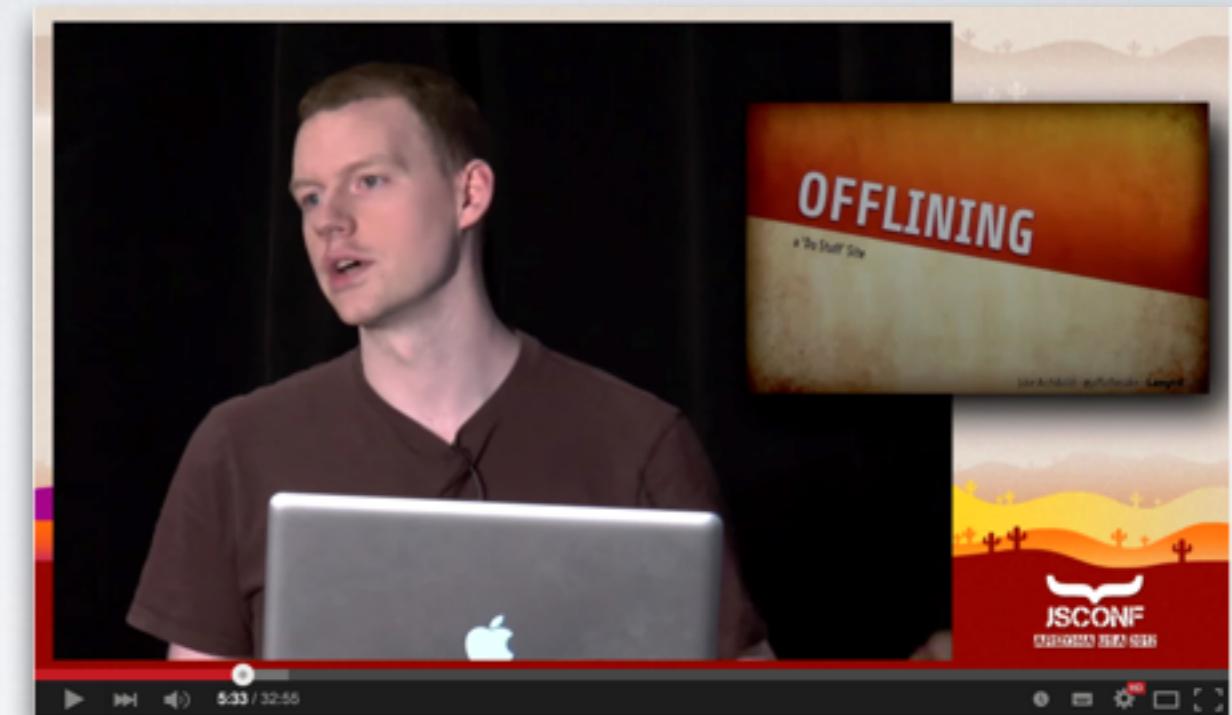
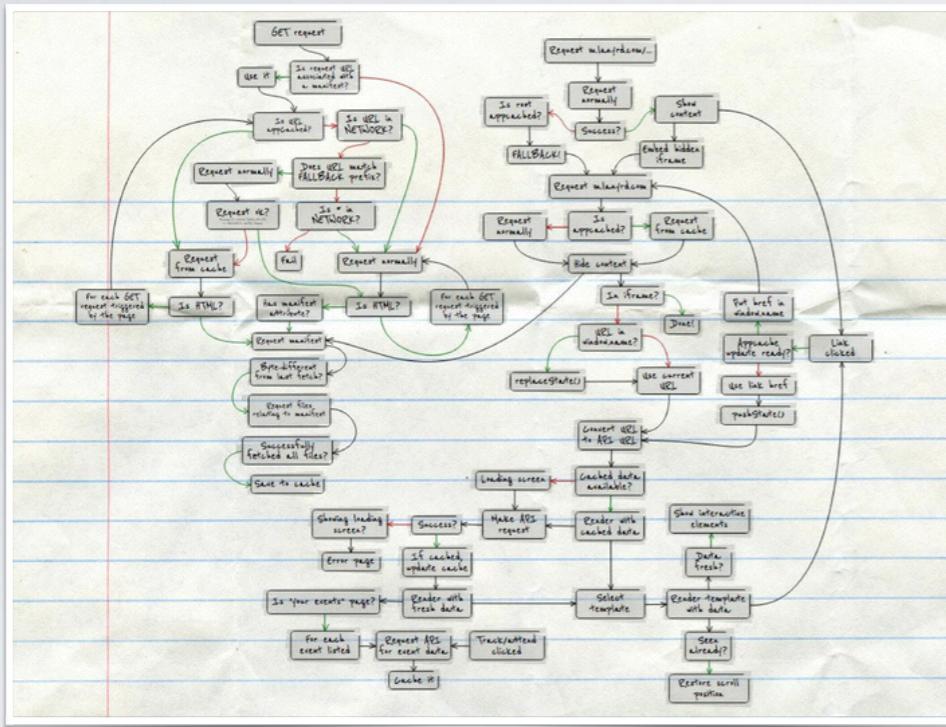
FALLBACK:

images/imageNotFound.gif



HTML5: Offline & Storage / Cache Manifest

...is a douchebag



<http://y2u.be/cR-TP6jOSQM>

Application Cache is a Douchebag

by [JAKE ARCHIBALD](#) May 08, 2012

<http://alistapart.com/article/application-cache-is-a-douchebag>



Multimedia

HTML5: Multimedia / Audio

```
<audio controls>
```

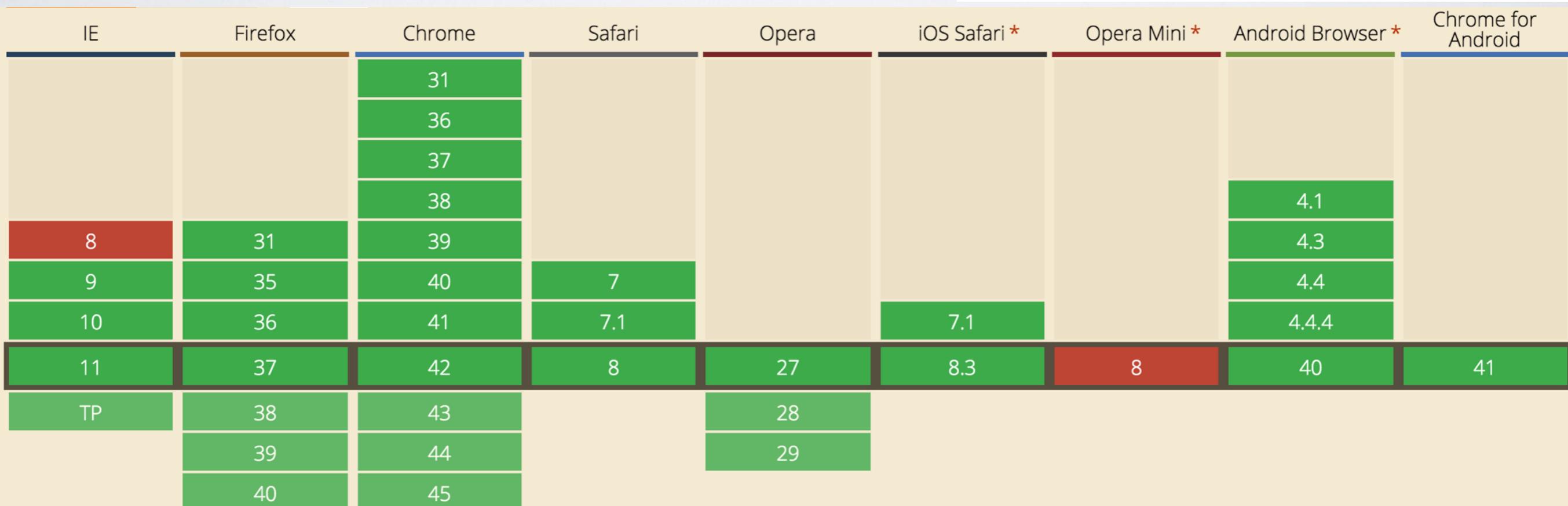
```
  <source src="vincent.mp3" type="audio/mpeg"/>
```

```
  <source src="vincent.ogg" type="audio/ogg"/>
```

```
</audio>
```

```
var a = document.getElementsByTagName("audio")[0];
a.play();
a.pause();
```

Browser	MP3	Wav	Ogg
IE	YES	NO	NO
Chrome	YES	YES	YES
Firefox	YES	YES	YES
Safari	YES	YES	NO

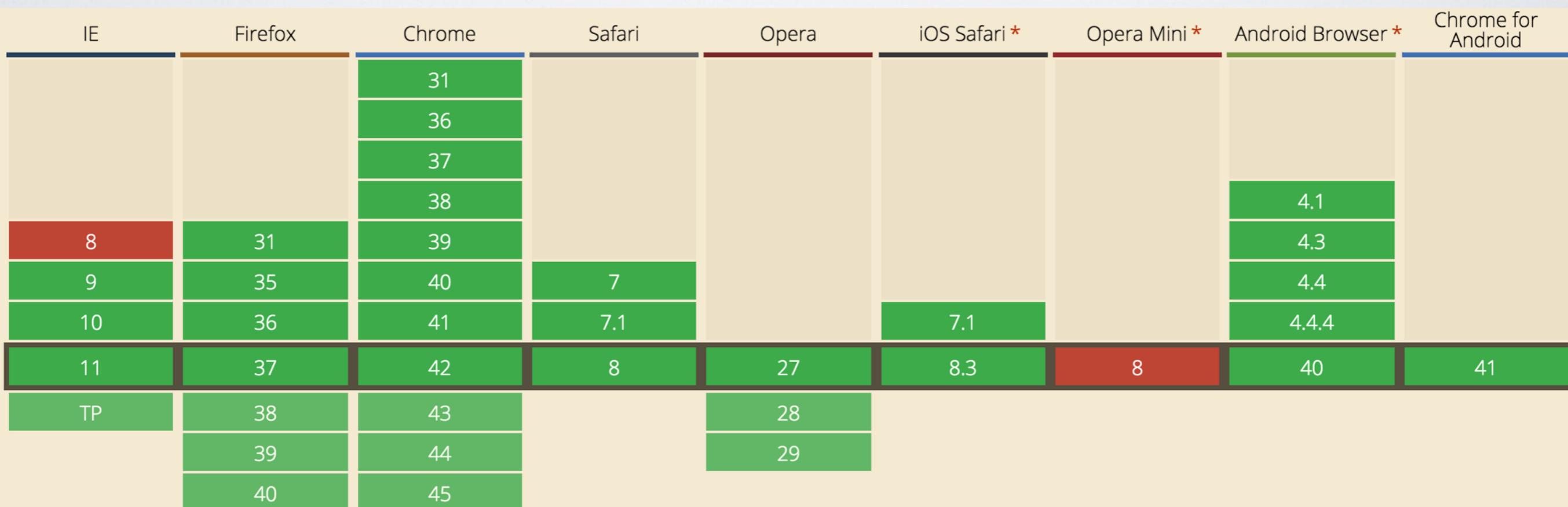


HTML5: Multimedia / Video

```
<video id="video" controls="controls" poster="/video/poster.jpg">
  <source src="/video/video.m4v" type="video/mp4" />
  <source src="/video/video.webm" type="video/webm" />
  <source src="/video/video.ogv" type="video/ogg" />
</video>
```

```
var v = document.getElementsByTagName("video")[0];
v.play();
v.pause();
```

Browser	MP4	WebM	Ogg
IE	YES	NO	NO
Chrome	YES	YES	YES
Firefox	YES	YES	YES
Safari	YES	NO	NO



 **bettervest**
nachhaltig · effizient · rentabel

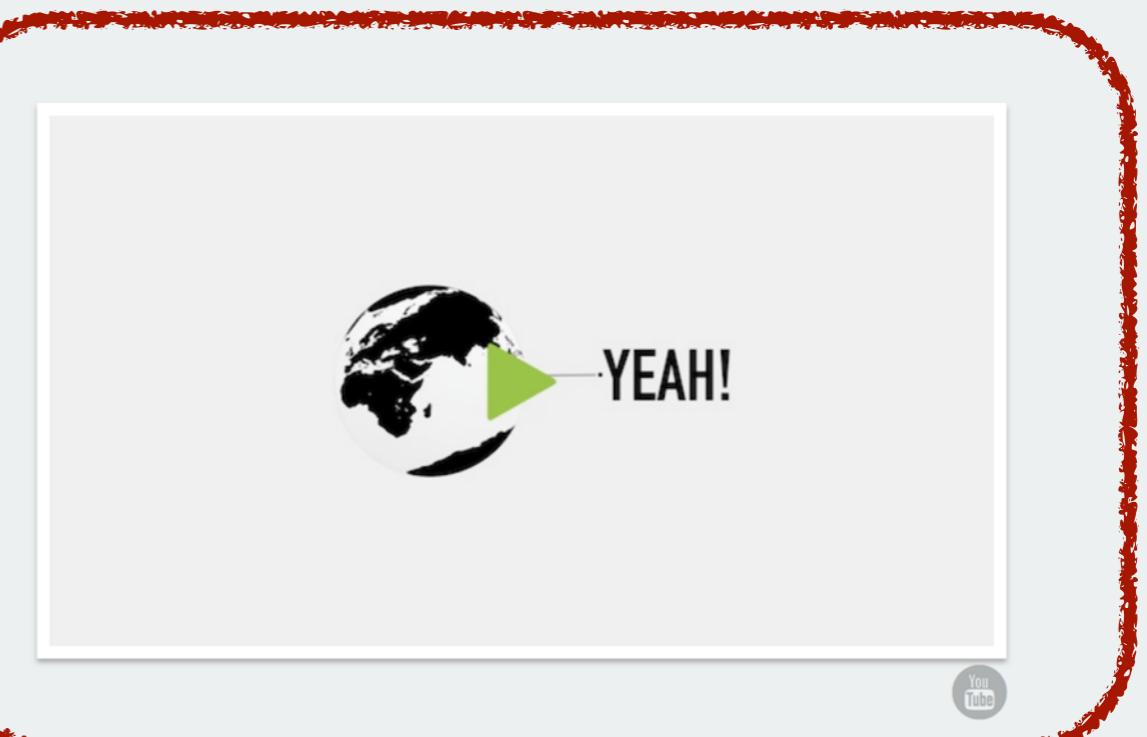
E-Mail Adresse Passwort

Start Projekte FAQs Über uns Blog Kontakt

**Clever investieren.
Die Welt retten.**

Auf bettervest investierst du in eine energieeffiziente Zukunft - und alle profitieren.

Die erste Crowdinvesting-Plattform, auf der du in Energieeffizienzprojekte von Unternehmen, Sozialträgern, Vereinen und Kommunen investieren kannst und dafür an den erzielten Einsparungen beteiligt wirst.



YouTube



kraftkontor GbR - Frankfurter PresseClub e.V.

BHKW

endet in 37 Tagen 10 Stunden ⏱

-  6.5% Rendite
-  31.2t CO₂ Einsparung
-  7 Jahre Laufzeit
-  30% effizienter
-  79,950€ benötigt

HTML5: Multimedia / Web Audio API

...Musik erzeugen!

JAN MONSCHKE: USING THE WEB FOR MUSIC PRODUCTION AND FOR LIVE PERFORMANCES



Jan Monschke: Using the web for music production and for live performances | JSConf EU 2014

0:00 / 22:14

Slides Transcript

Subscribe: YouTube 999+



The introduction of the Web Audio API has enriched the web landscape enormously. It gives game developers the ability to add precisely timed, high performant sound effects and to create realistic spatialized sound landscapes. For many web developers it is the first time they encounter audio programming which leads to many interesting experiments when the world of web and audio collide. Traditional web developers start to become really interested into audio programming and educate themselves on the topic of synthesizers and audio effects.

However, currently there are only few applications that try to create audio production or audio performance environments in the browser. In this talk I want to show how the Web Audio API can be used to create a desktop-like production environment similar to Garageband. Furthermore, I will do a live

<http://y2u.be/cqtBpCqgOgM>

IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
		31						
		36						
		37						
		38						
8	31	39						
9	35	40	7					
10	36	41	7.1		7.1			
11	37	42	8	27	8.3	8	40	41
TP	38	43		28				
	39	44		29				
	40	45						

Samples Book

Web Audio API

Audio Tag

Illustrates the use of MediaElementAudioSourceNode to wrap the audio tag.

Crossfade

Equal-power crossfading to mix between two tracks.

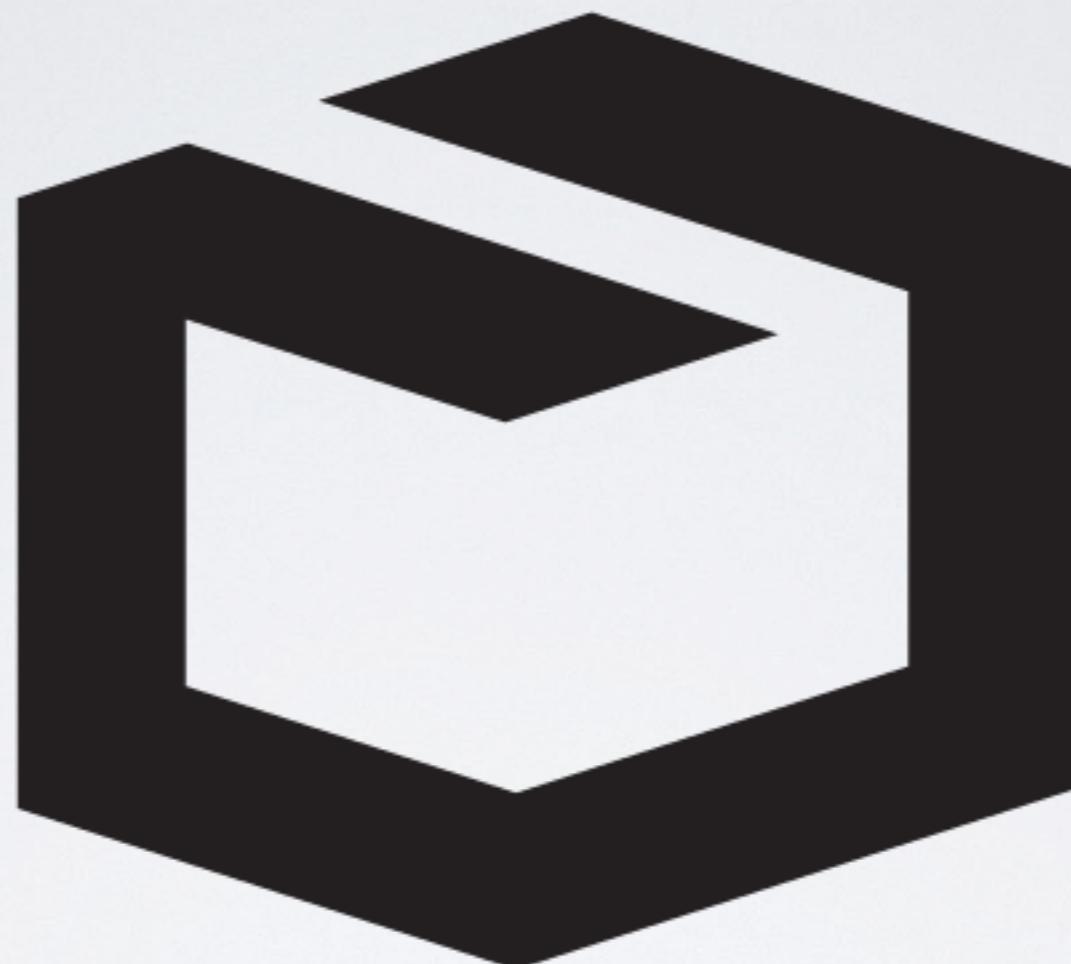
Crossfading Playlist

Automatic crossfading between songs (as in a playlist).

Filter

Apply a simple low pass filter to a sound. Lets you tweak frequency and Q values.

Metering



3D, Graphics, Effects

HTML5: SVG Scalable Vector Graphics

Vektor-Grafiken im XML-Format

```
<svg width="100" height="100">  
  <circle cx="50" cy="50" r="40" stroke="green" stroke-width="4" fill="yellow" />  
</svg>
```

Können animiert werden! Zugriff über DOM.
“retina” geeignet :-)



IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
		31						
		36						
		37						
		38						
8	31	39						
2	9	35	40	7				
2	10	36	41	7.1		7.1		
2	11	37	42	8	27	8.3	8	40
2	TP	38	43		28			42
		39	44		29			
		40	45					

HTML5: Canvas

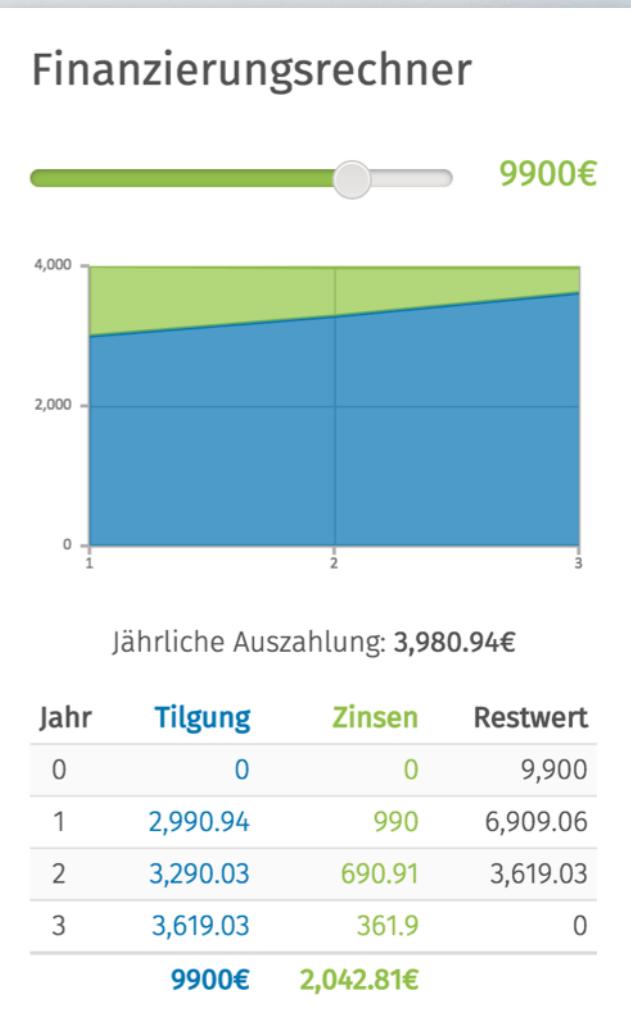
Bitmaps

Erstmals von Apple für die OS X Widgets in Webkit eingebaut.

```
<canvas id="myCanvas" width="200" height="100" style="border:1px solid #000000;">  
</canvas>
```

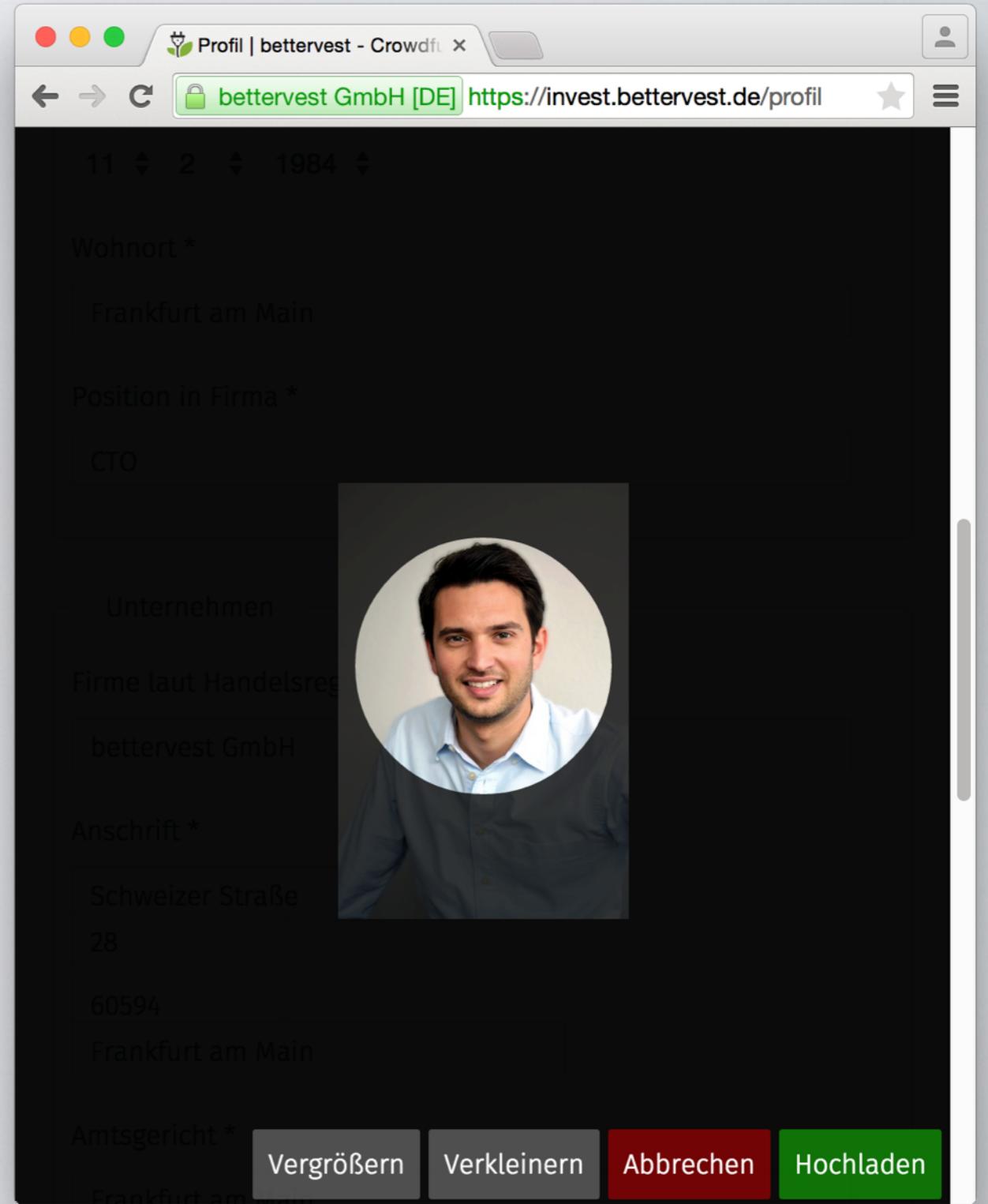
```
<script>  
    var c = document.getElementById("myCanvas");  
    var ctx = c.getContext("2d");  
    ctx.fillStyle = "#FF0000";  
    ctx.fillRect(0,0,150,75);  
</script>
```

Muss jedes mal neu gerendert werden.



IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
		31					4.1	
		36					4.3	
		37					4.4	
		38					4.4.4	
8	31	39						
9	35	40	7					
10	36	41	7.1		7.1			
11	37	42	8	27	8.3	8	40	41
TP	38	43		28				
	39	44		29				
	40	45						

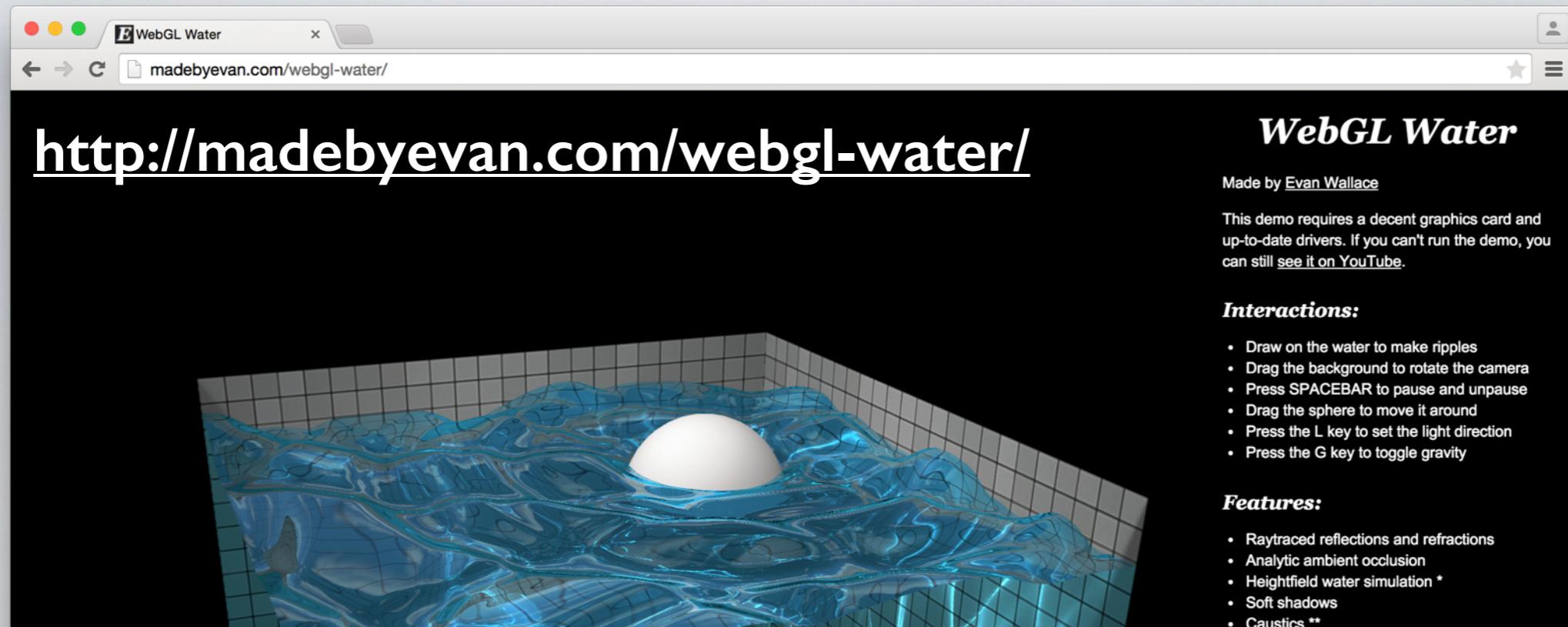
HTML5: Canvas Bitmaps manipulation



Auslesen:

`ctx.getImageData()`

HTML5: 3D WebGL



<http://madebyevan.com/webgl-water/>

WebGL Water

Made by Evan Wallace

This demo requires a decent graphics card and up-to-date drivers. If you can't run the demo, you can still [see it on YouTube](#).

Interactions:

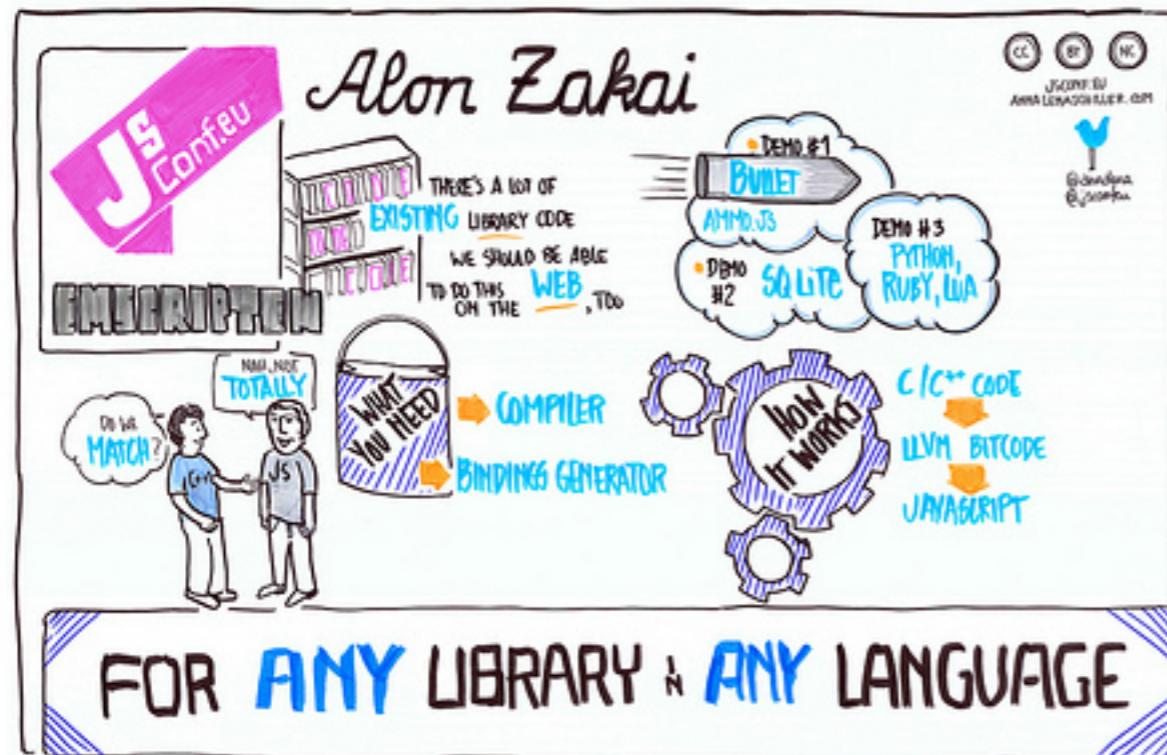
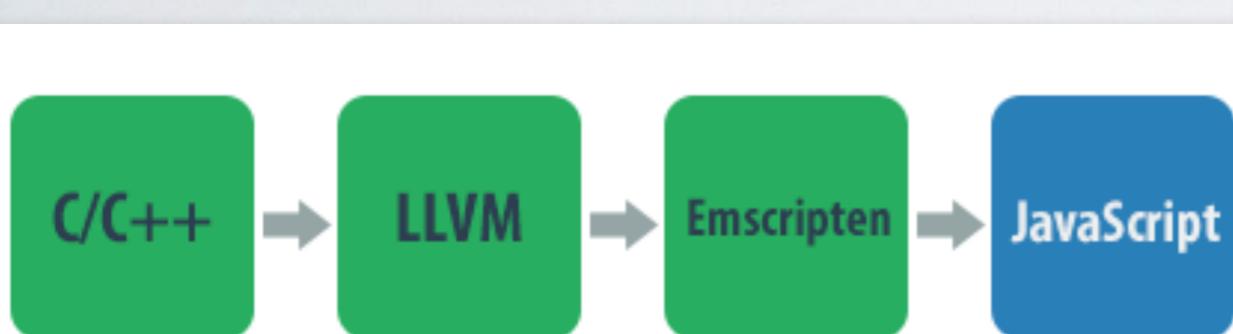
- Draw on the water to make ripples
- Drag the background to rotate the camera
- Press SPACEBAR to pause and unpause
- Drag the sphere to move it around
- Press the L key to set the light direction
- Press the G key to toggle gravity

Features:

- Raytraced reflections and refractions
- Analytic ambient occlusion
- Heightfield water simulation *
- Soft shadows
- Caustics **

IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
		1 31						4.1
		36						4.3
		37						4.4
		38						4.4.4
8	31	39						
9	35	40	1 7					
10	36	41	1 7.1			7.1		
11	37	42	8	27	8.3	8	40	41
TP	38	43		28				
	39	44		29				
	40	45						

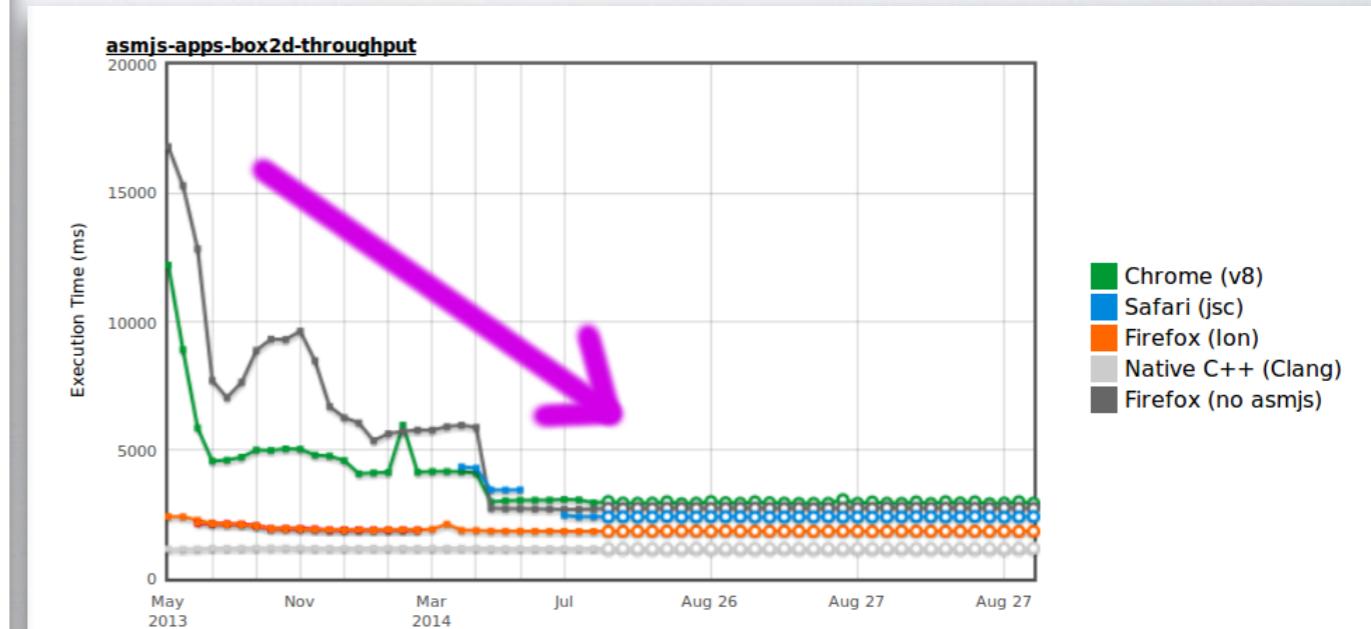
HTML5: 3D WebGL



In fact, the **game industry** has been an **early adopter** of compiling C++ to JavaScript, using Emscripten:

Unity, Unigine, Minko, Torque 2D, Unreal, Nebula3, Cocos2D-X, Godot, etc.

Overall, performance is around **50-67%** of native speed, and still improving









Device Access

HTML5: Device Access

Planned for initial release of B2G

Unless otherwise noted, APIs listed in the table below were available in Firefox OS v1.0.1 or will be available in v1.1.

API	Description	Standardization	Availability	See also
WebTelephony	Allow placing and answering phone calls as well as build in-call UI.	W3C ED (SysApps)	D A B	bug 674726 , Security
Vibration API	Control device vibration for things like haptic feedback in games. Not intended to solve things like vibration for notification.	W3C REC (Device APIs)	D A B	bug 679966 , Security
WebSMS	Send/receive SMS messages as well as manage messages stored on device.	W3C ED (SysApps)	D A B	bug 674725 , Security
Idle API	Get notifications when user is idle.	Needs plan	D A B	bug 715041 , Security
Screen Orientation	Get notification when screen orientation changes as well as control which screen orientation a page/app wants.	W3C WD (WebApps)	D A B	bug 720794 , bug 740188 , bug 673922 , Security
Settings API	Set system-wide configurations that are saved permanently on the device.	Future?	D A B	bug 678695 , Security
Power Management API	Turn on/off screen, cpu, device power, etc. Listen and inspect resource lock events.	Future?	D A B	bug 705444 , Security , bug 1017232 , implement for Android
Mobile Connection API	Expose signal strength, operator, etc for GSM and other mobile connections. This does not cover WiFi.	Future?	D A B	bug 729173 , Security , bug 1017233 , implementation on Android
TCP Socket API	Low-level TCP socket API. Will also include SSL support.	W3C ED (SysApps)	D A B	bug 733573 , bug 892833 , Security
Geolocation API	Access to the end user's location.	W3C REC	D A B	Security
WiFi Information API	Privileged API to get a list of available WiFi networks. Also get signal strength and name of currently connected network, etc.	Future?	D A B	Security , bug 1017234 , Android implementation bug
Device Storage API	Add/Read/Modify files stored on a central location on the device. For example the "pictures" folder on modern desktop platforms or the photo storage in mobile devices.	Needs plan	D A B	bug 717103 , Security
Contacts API	Add/Read/Modify the device contacts address book.	W3C ED (SysApps)	D A B	bug 674720 , bug 857730 for Android, Security
Mouse Lock	Lock access to mouse and get access to movement deltas rather than coordinates.	W3C CR	D A B	bug 633602



HTML5: Device Access PhoneGap / Cordova



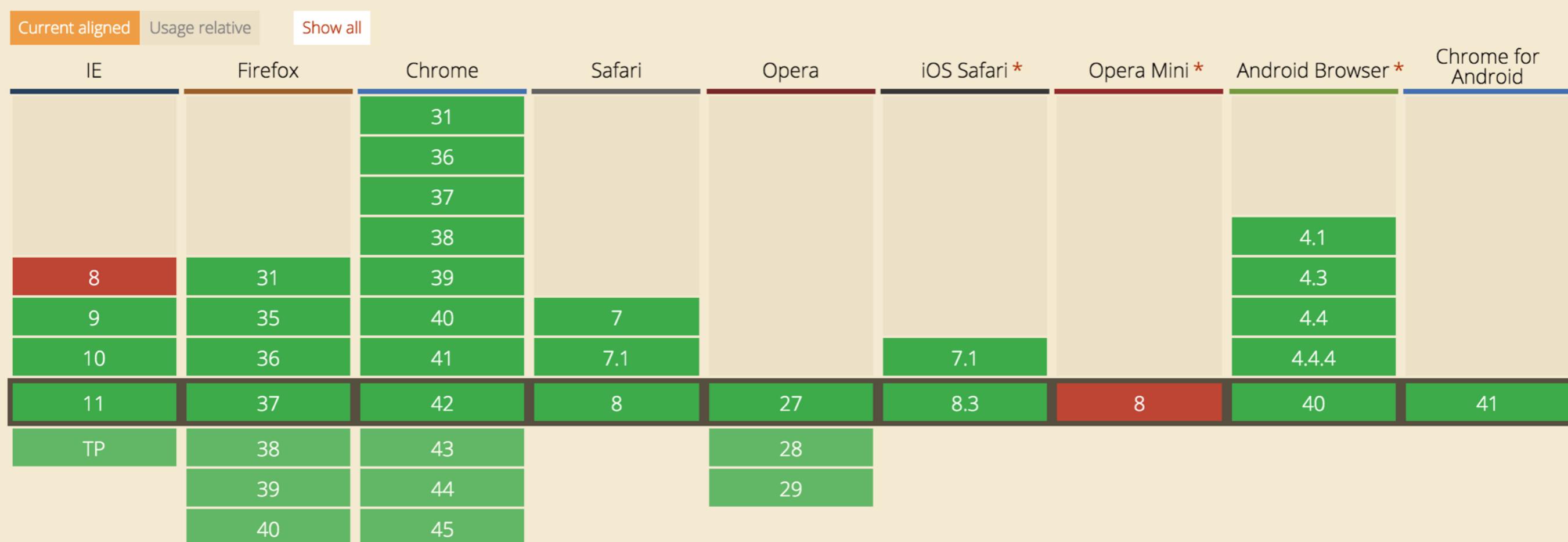
PhoneGap

HTML5: Device Access / Geolocation

```
1 <script>
2   var x = document.getElementById("demo");
3   function getLocation() {
4     if (navigator.geolocation) {
5       navigator.geolocation.getCurrentPosition(showPosition);
6     } else {
7       x.innerHTML = "Geolocation is not supported by this browser.";
8     }
9   }
10  function showPosition(position) {
11    x.innerHTML = "Latitude: " + position.coords.latitude +
12    "<br>Longitude: " + position.coords.longitude;
13  }
14 </script>
```

Geolocation  - CR Global 91.72% + 0.01% = 91.74%

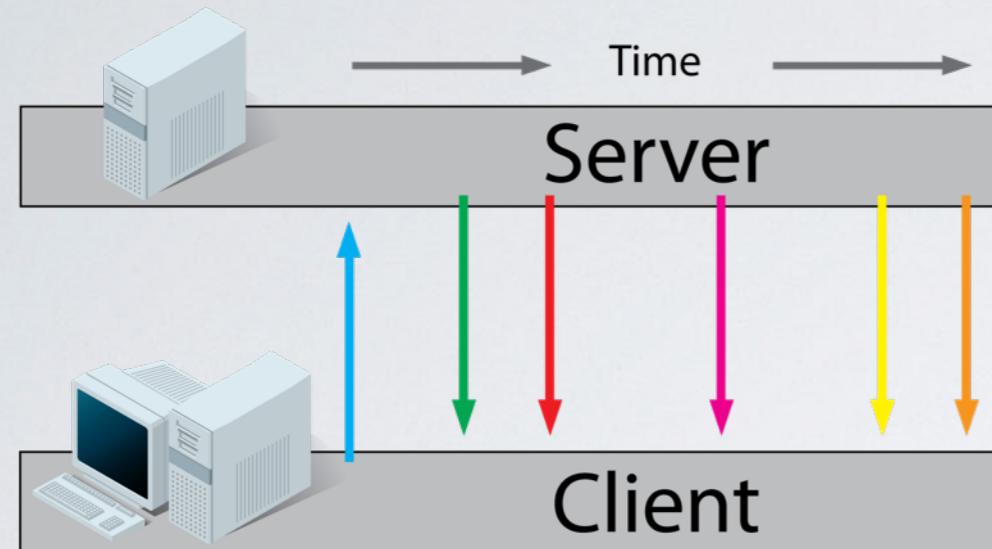
Method of informing a website of the user's geographical location



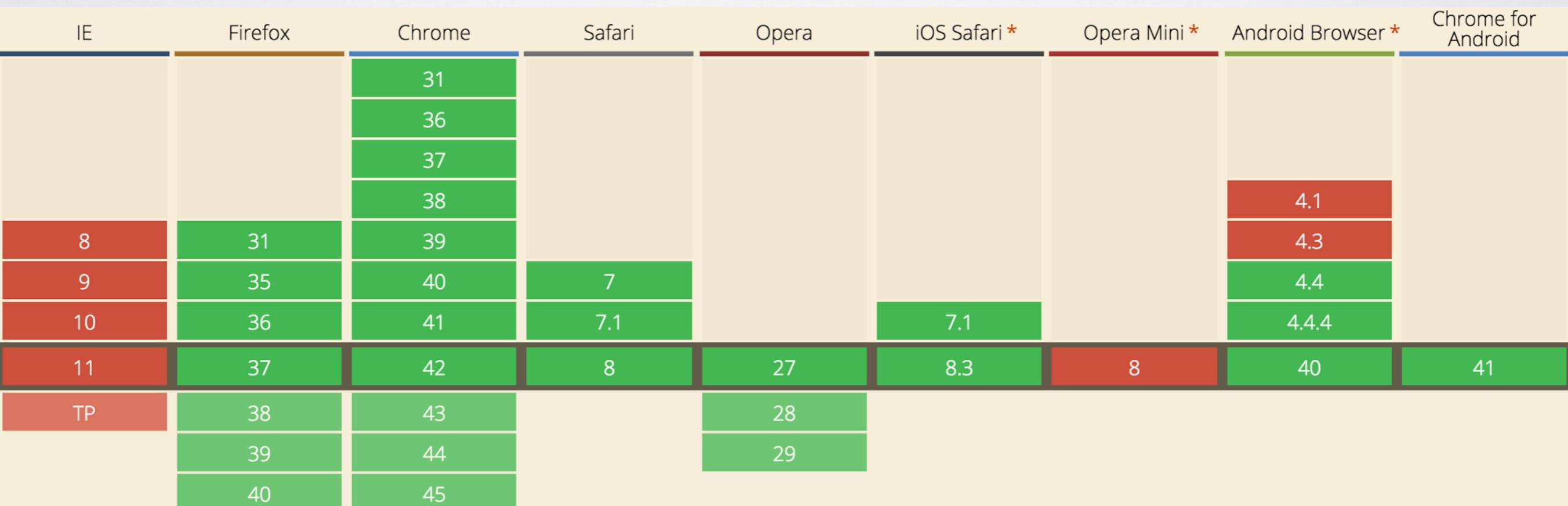


Connectivity

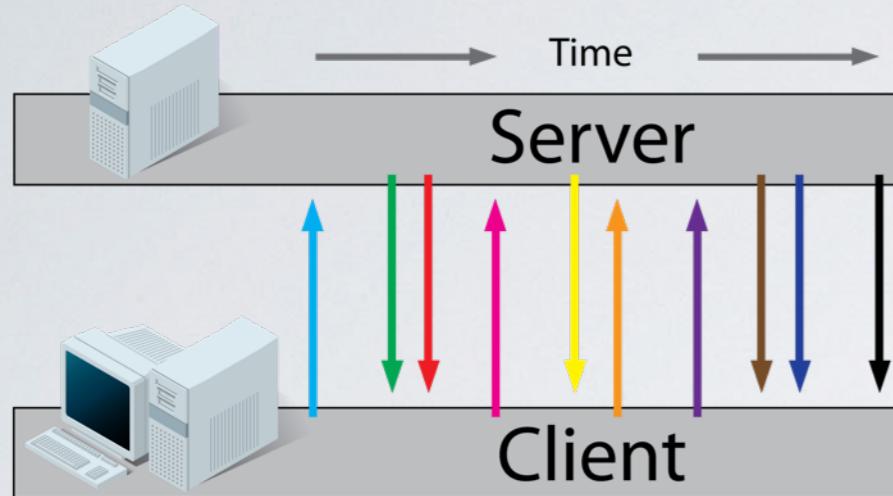
HTML5: Connectivity / Server Sent Events (SSE)



```
var evtSource = new EventSource("ssedemo.php");
evtSource.addEventListener("ping", function(e) {
  alert("ping event!");
});
```



HTML5: Connectivity / WebSockets



```
var connection = new WebSocket('ws://html5rocks.websocket.org/echo', ['soap', 'xmpp']);
// Sending String
connection.send('your message');

// Sending canvas ImageData as ArrayBuffer
var img = canvas_context.getImageData(0, 0, 400, 320);
var binary = new Uint8Array(img.data.length);
for (var i = 0; i < img.data.length; i++) {
  binary[i] = img.data[i];
}
connection.send(binary.buffer);

// Sending file as Blob
var file = document.querySelector('input[type="file"]').files[0];
connection.send(file);
```



socket.io

IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
		31						
		36						
		37						
		38						
8	31	39					4.1	
9	35	40	7				4.3	
10	36	41	7.1		7.1		4.4	
11	37	42	8	27	8.3	8	4.4.4	41
TP	38	43		28				
	39	44		29				
	40	45						

HTML5: Connectivity / WebRTC

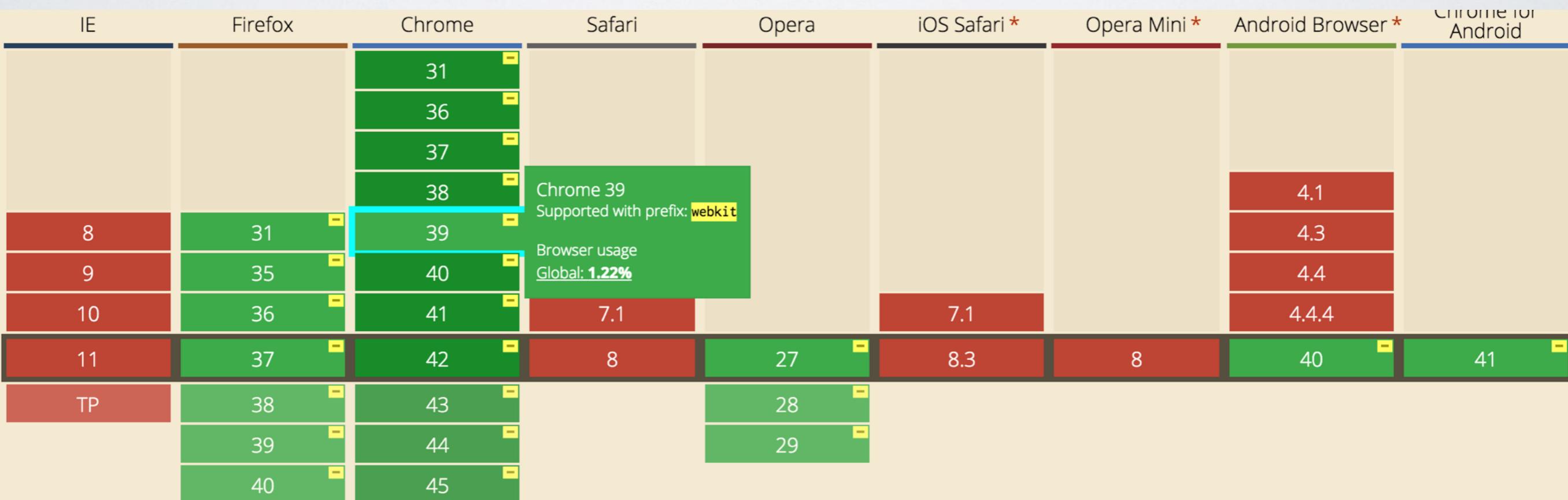
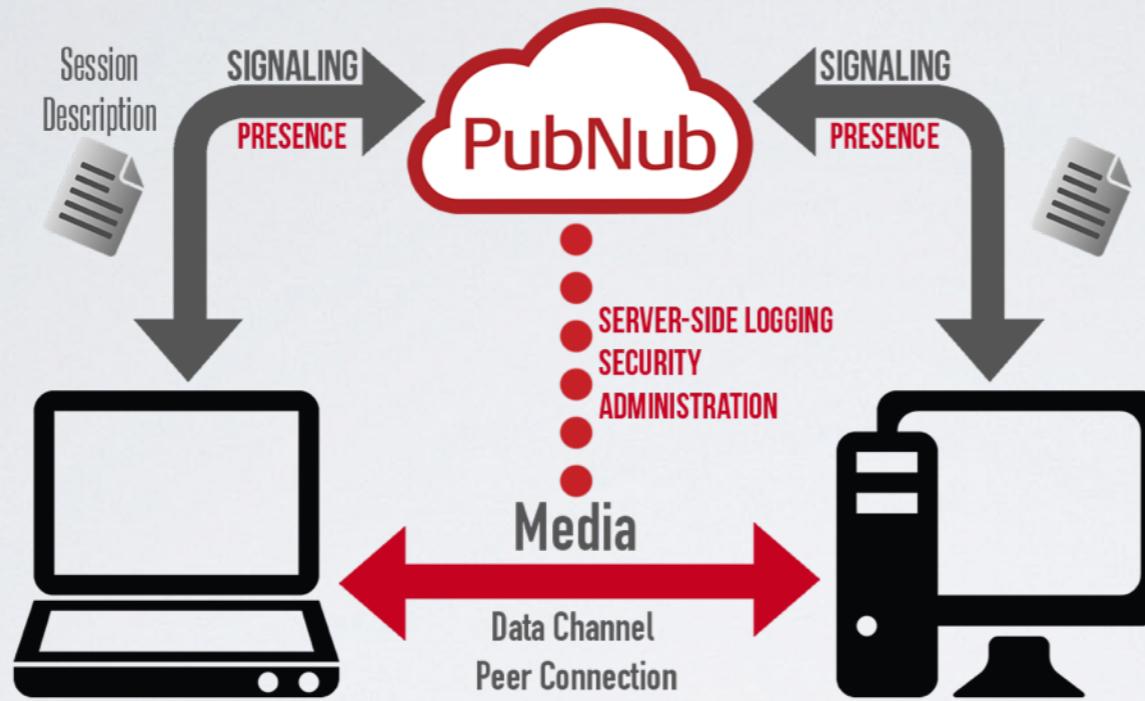
Real Time Communication



↔
WebRTC



Audio and Video Communication in the browser

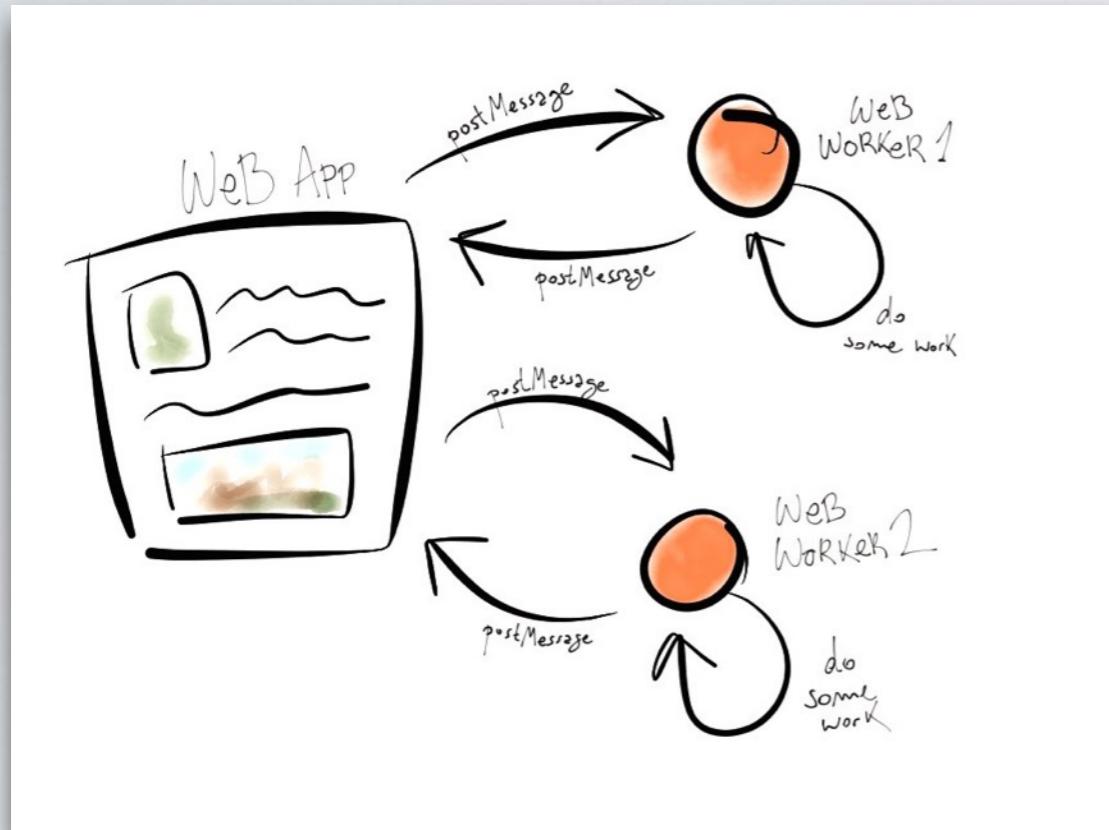




Performance & Integration

HTML5: Performance & Integration

Real Time Communication



```
<script>
  // main.js
  var myWorker = new Worker("worker.js");
  myWorker.postMessage([first.value,second.value]);

  myWorker.onmessage = function(e) {
    result.textContent = e.data;
    console.log('Message received from worker');
  }
</script>

<script>
  // worker.js
  onmessage = function(e) {
    console.log('Message received from main script');
    var workerResult = 'Result: ' + (e.data[0] * e.data[1]);
    console.log('Posting message back to main script');
    postMessage(workerResult);
  }
</script>
```

IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
8	31	31					4.1	
9	35	39	40	7			4.3	
10	36	41	38	7.1		7.1	4.4	
11	37	42	40	8	27	8.3	4.4.4	41
TP	38	43			28		40	
	39	44			29			
	40	45						

HTML5: Performance & Integration



PERFORMANCE & INTEGRATION

[Web Workers](#)

Allows delegation of JavaScript evaluation to background threads, allowing these activities to prevent slowing down interactive events.

[XMLHttpRequest Level 2](#)

Allows fetching asynchronously some parts of the page, allowing it to display dynamic content, varying according to the time and user actions. This is the technology behind [Ajax](#).

[JIT-compiling JavaScript engines](#)

The new generation of JavaScript engines is much more powerful, leading to greater performance.

[History API](#)

Allows the manipulation of the browser history. This is especially useful for pages loading interactively new information.

[The contentEditable attribute: transform your website to a wiki!](#)

HTML5 has standardized the contentEditable attribute. Learn more about this feature.

[Drag and drop](#)

The HTML5 drag and drop API allows support for dragging and dropping items within and between web sites. This also provides a simpler API for use by extensions and Mozilla-based applications.

[Focus management in HTML](#)

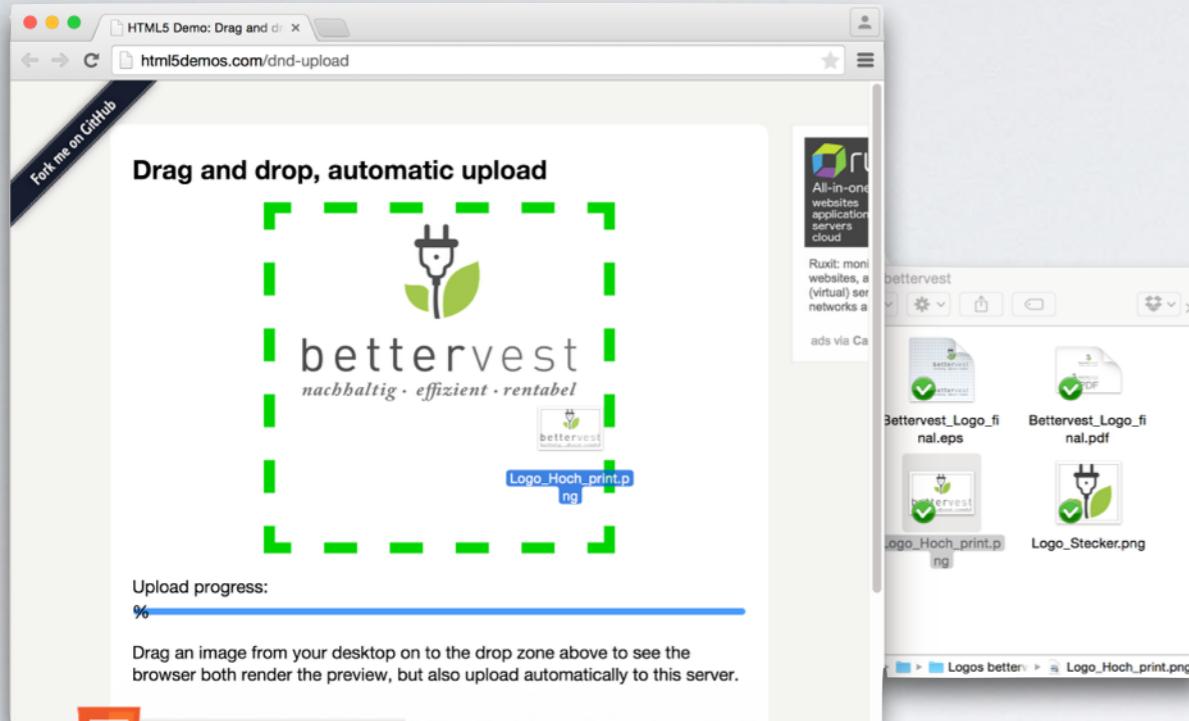
The new HTML5 activeElement and hasFocus attributes are supported.

[Web-based protocol handlers](#)

You can now register web applications as protocol handlers using the `navigator.registerProtocolHandler()` method.

HTML5: Performance & Integration

Drag&Drop and File Access



<http://html5demos.com/dnd-upload>

Drag and Drop

IE	Firefox	Chrome	Safari	Opera	iOS Safari*	Opera Mini*	Android Browser*	Chrome for Android
		31						
		36						
		37						
		38						
8	31	39						
9	35	40	7					
10	36	41	7.1					
11	37	42	8	27	7.1	8.3	8	40
TP	38	43			28			
	39	44			29			
	40	45						

File API

IE	Firefox	Chrome	Safari	Opera	iOS Safari*	Opera Mini*	Android Browser*	Chrome for Android
		31						
		36						
		37						
		38						
8	31	39						
9	35	40	7					
10	36	41	7.1					
11	37	42	8	27	7.1	8.3	8	40
TP	38	43			28			
	39	44			29			
	40	45						

FileReader API

IE	Firefox	Chrome	Safari	Opera	iOS Safari*	Opera Mini*	Android Browser*	Chrome for Android
		31						
		36						
		37						
		38						
8	31	39						
9	35	40	7					
10	36	41	7.1					
11	37	42	8	27	7.1	8.3	8	40
TP	38	43			28			
	39	44			29			
	40	45						

<http://html5doctor.com/drag-and-drop-to-server/>



CSS3 Styling

CSS



CSS3:

Web fonts
Web fonts

IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
		31					4.1	
		36					4.3	
		37					4.4	
		38					4.4.4	
8	31	39						
9	35	40	7					
10	36	41	7.1		7.1			
11	37	42	8	27	8.3	8	40	41
TP	38	43			28			
	39	44			29			
	40	45						

```

1  <!-- copyright 2002 favore.net - your favorite service provider -->
2  <HTML>
3  <head>
4  <title>Ferien am Lago di Bolsena</title>
5  <STYLE TYPE="text/css">
6  <!-- /* $WEFT -- Created by: favore on 02.04.2002 -- */
7  @font-face {
8    font-family: AmbienteDB;
9    font-style: normal;
10   font-weight: 700;
11   src: url(AMBIENT1.eot);
12 }
13 @font-face {
14   font-family: AmbienteDB;
15   font-style: normal;
16   font-weight: normal;
17   src: url(AMBIENT1.eot);
18 }
19 -->
20 </STYLE>
21

```

IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
		31					4.1	
		36					4.3	
		37					4.4	
		38					4.4.4	
8	31	39						
9	35	40	7					
10	36	41	7.1		7.1			
11	37	42	8	27	8.3	8	40	41
TP	38	43			28			
	39	44			29			
	40	45						

CSS Transitions on GPU



IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
		31					4.1	
		36					4.3	
		37					4.4	
		38					4.4.4	
8	31	39						
9	35	40	7					
10	36	41	7.1		7.1			
11	37	42	8	27	8.3	8	40	41
TP	38	43			28			
	39	44			29			
	40	45						

CSS3 3D Transforms



HTML5: CSS3 Media Queries

```
@media all and (min-width: 400px) and (max-width:767px){

  .hero{
    background: none !important;

    .title{
      max-width: 90% !important;
    }
  }

  @media (max-width: 730px){

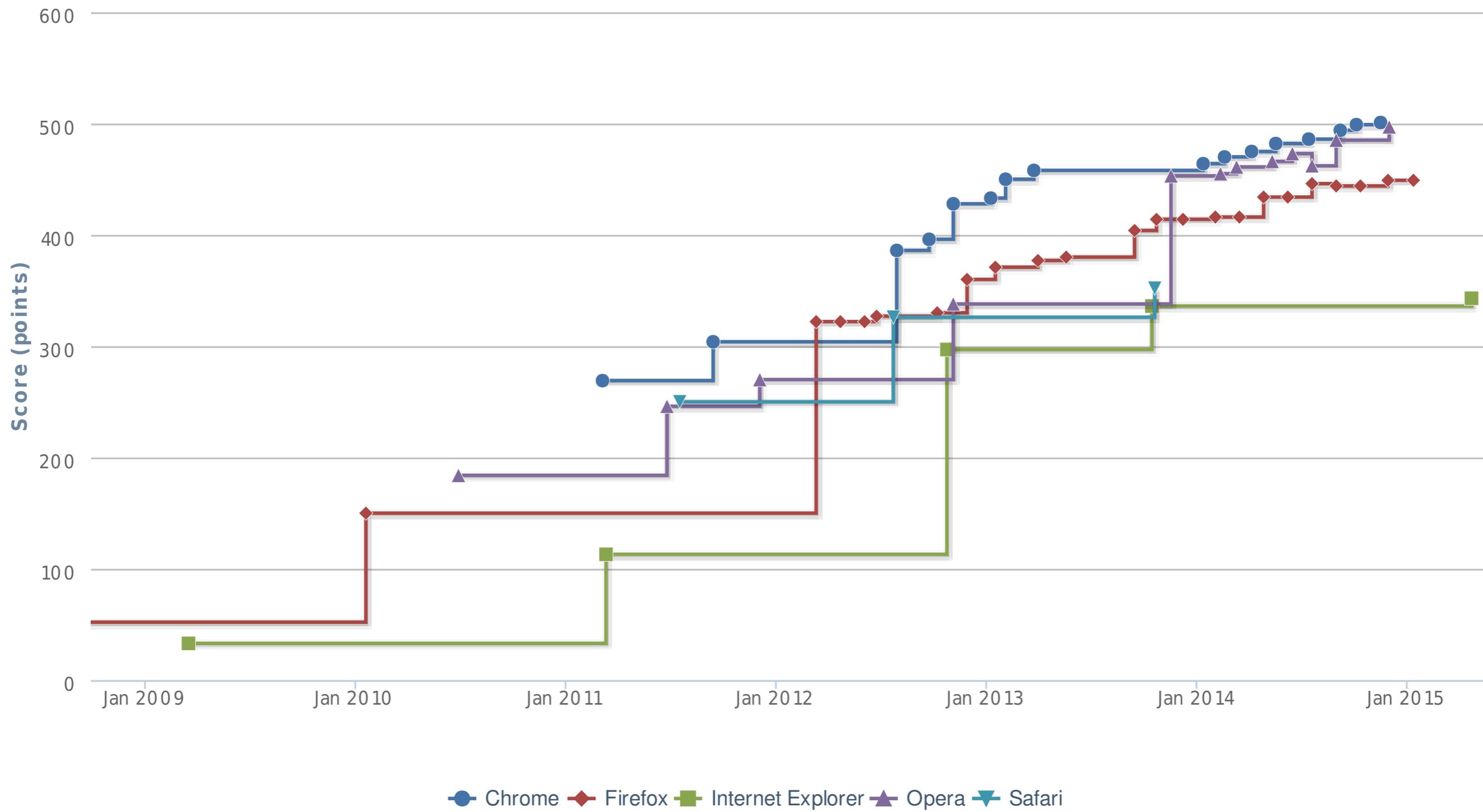
    aside{
      position: relative;
    }
  }
}
```



IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
		31					4.1	
		36					4.3	
		37					4.4	
8	31	38						
9	35	39						
10	36	41	7			7.1		
11	37	42	7.1	8	27	8.3	8	40
TP	38	43			28			
	39	44			29			
	40	45						

HTML5: Wo stehen wir heute?

HTML5test.com score over the years



JS



JAVASCRIPT



JAVASCRIPT

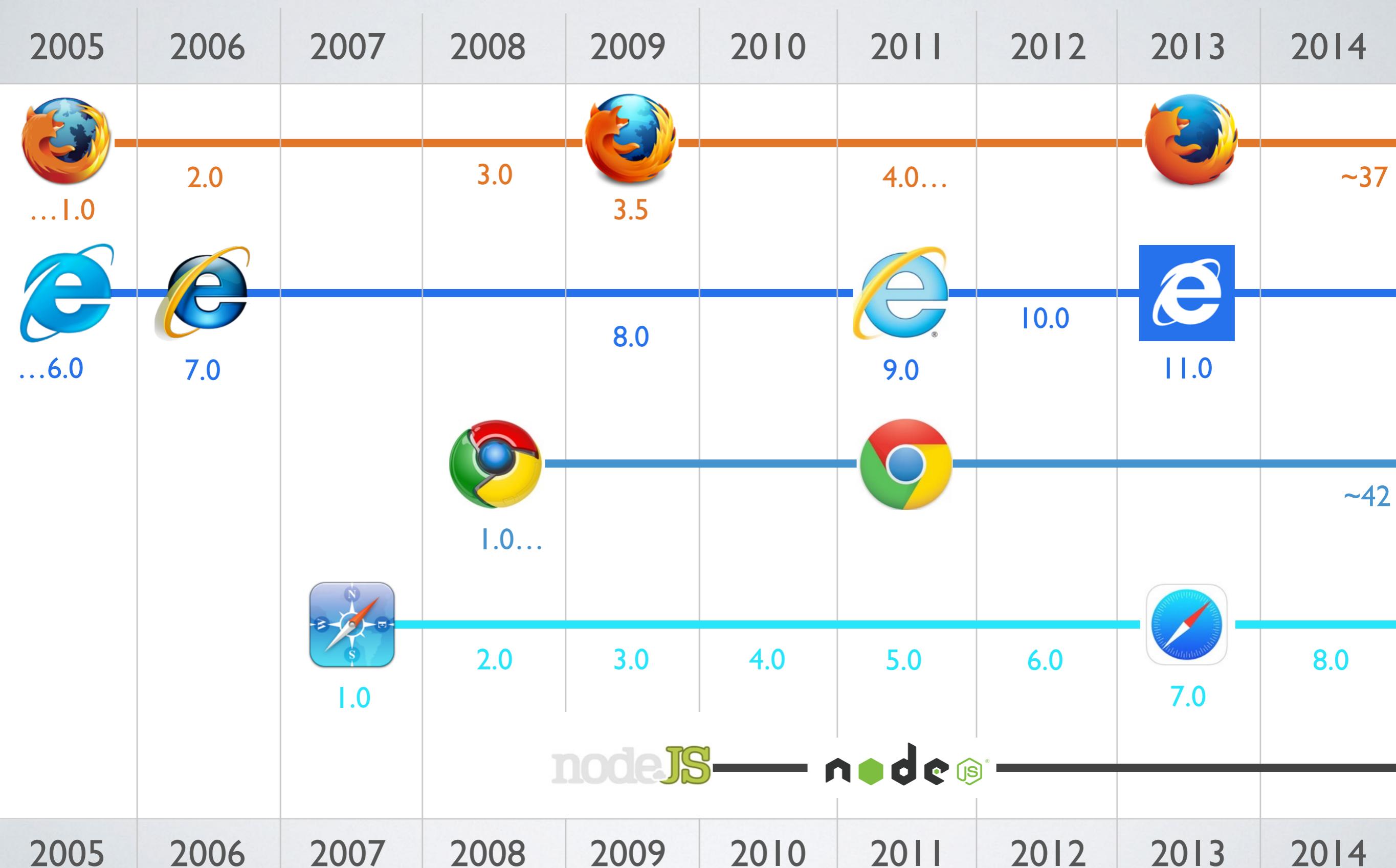
- Brendan Eich, 1995, Netscape
- ECMAScript 5 / 6 
- schwach typisiert, dynamisch
- meistverbreitete Sprache der Welt
- extrem flexibel: Multi-Paradigmen-Sprach
- als nodeJS / io.js auf dem Server
- **HTML5 basiert auf JavaScript!**



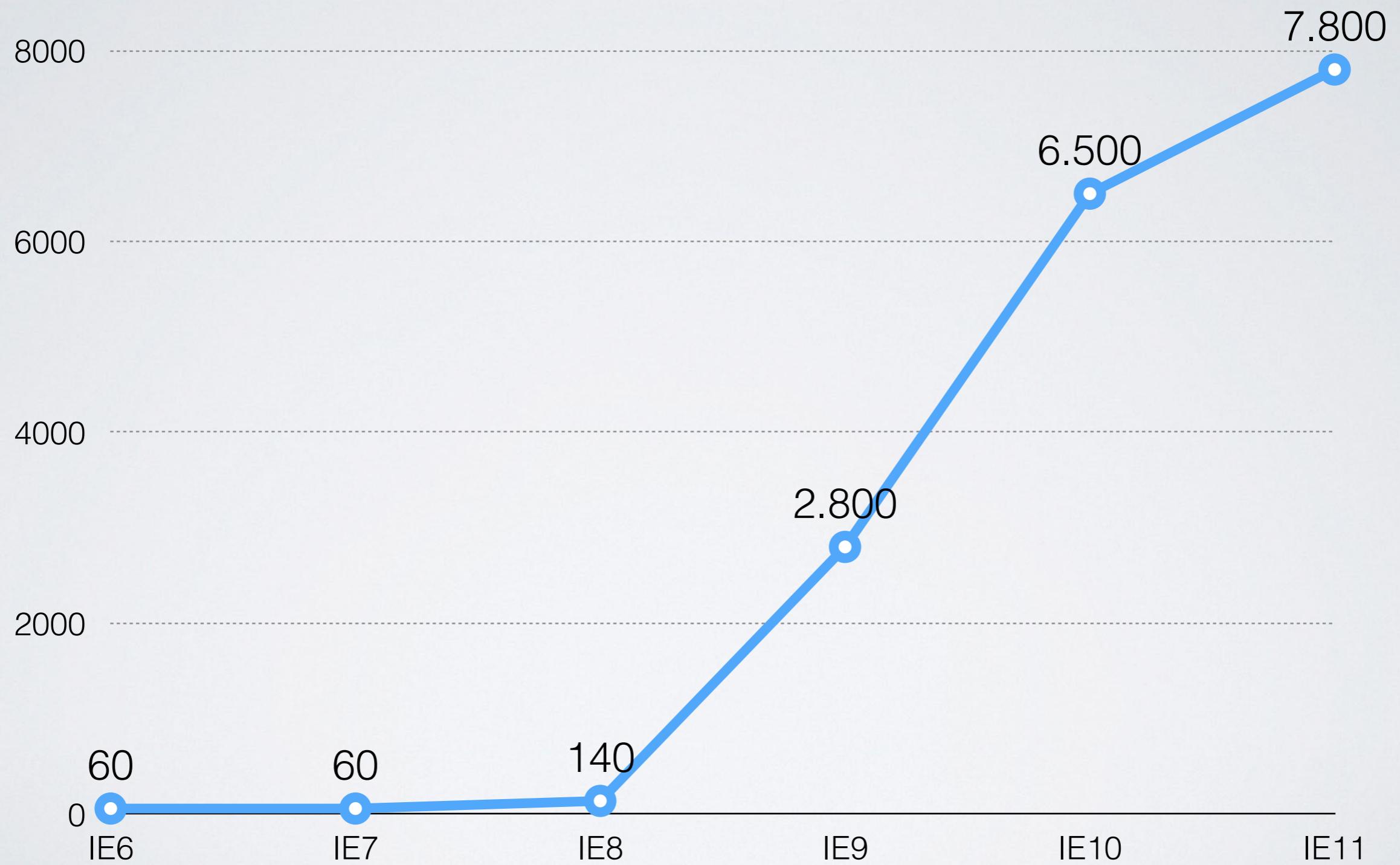


JavaScript is required.

JAVASCRIPT RUNTIMES



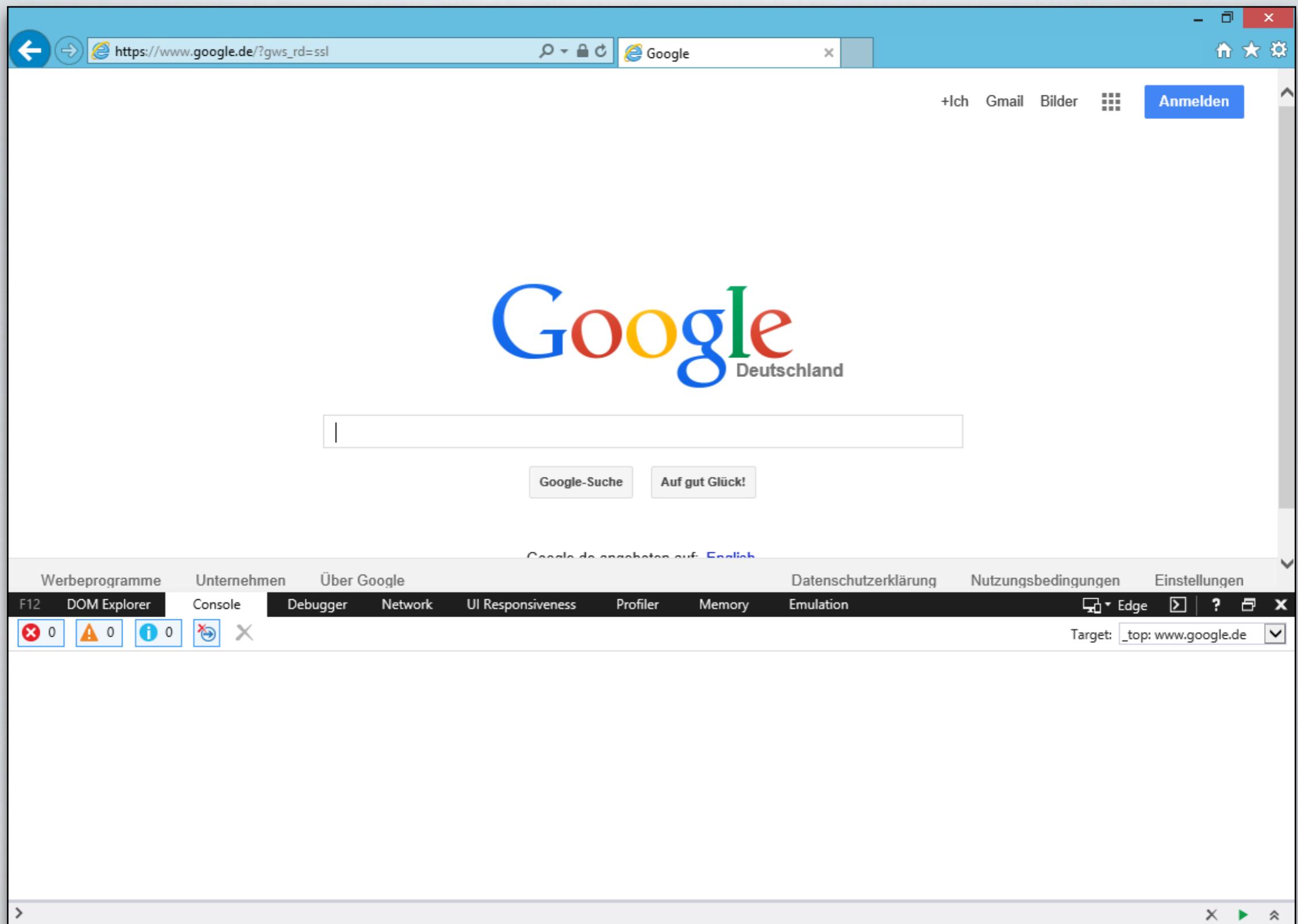
JAVASCRIPT PERFORMANCE



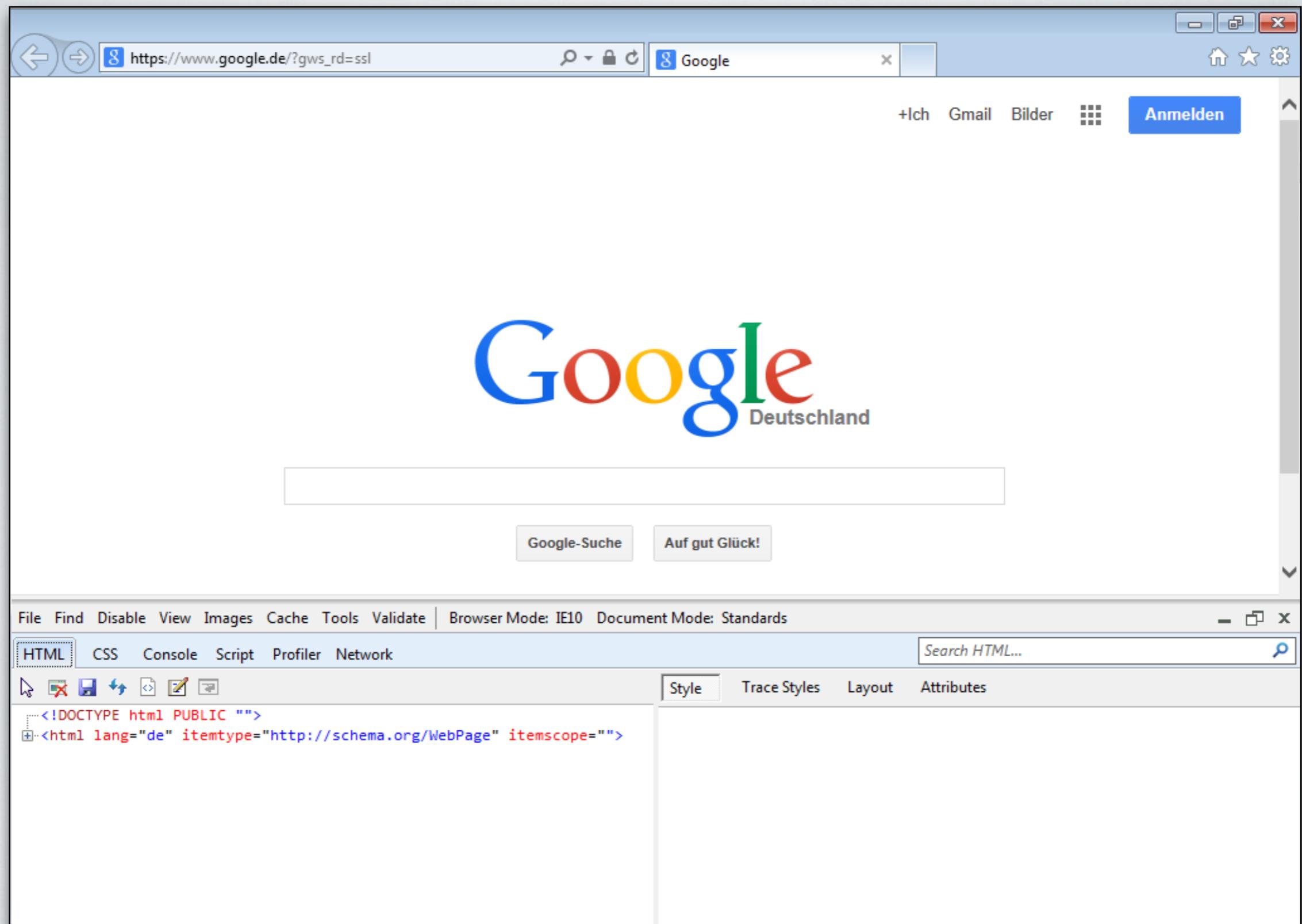
AreWeFastYet.com ?



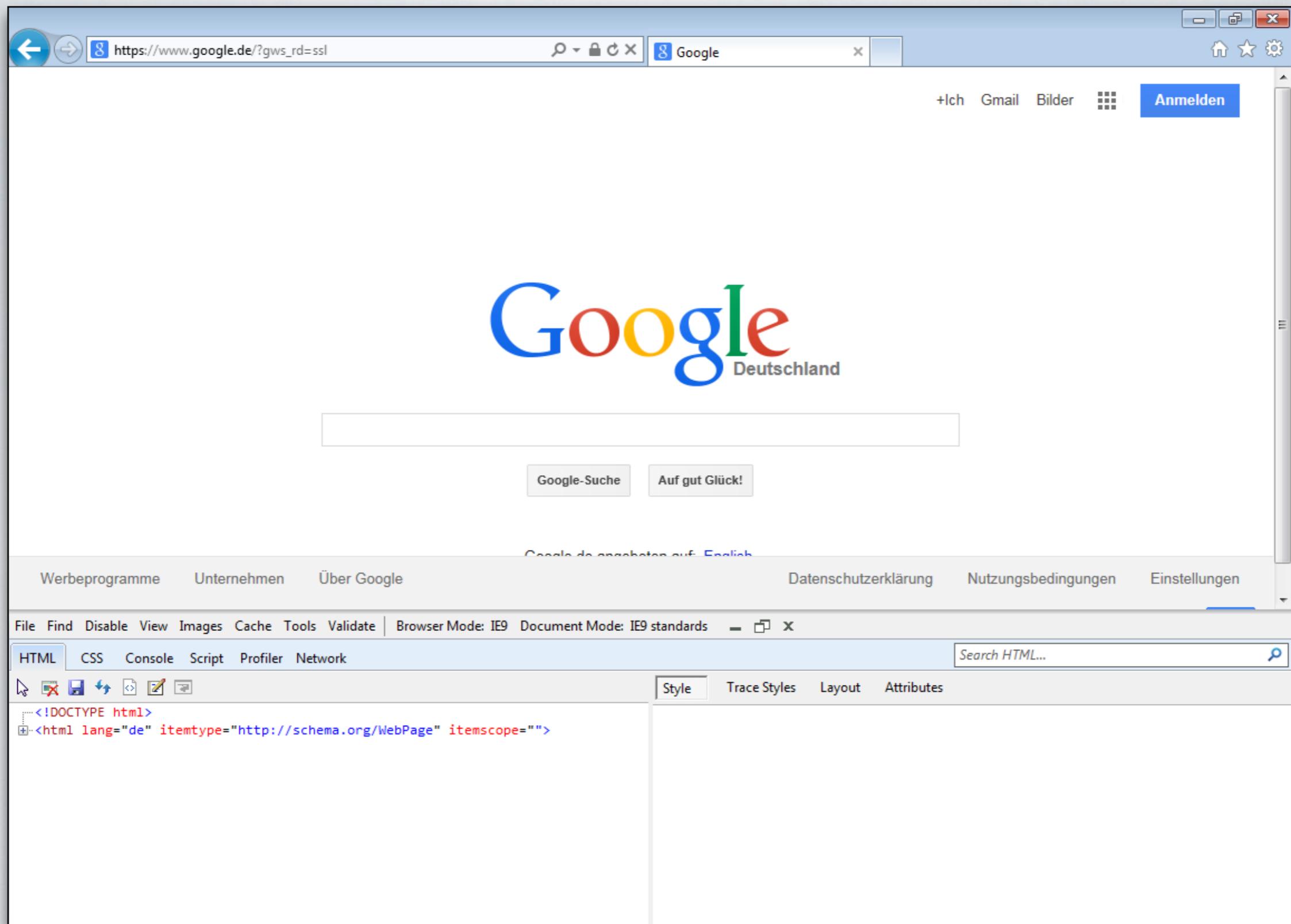
IE ||



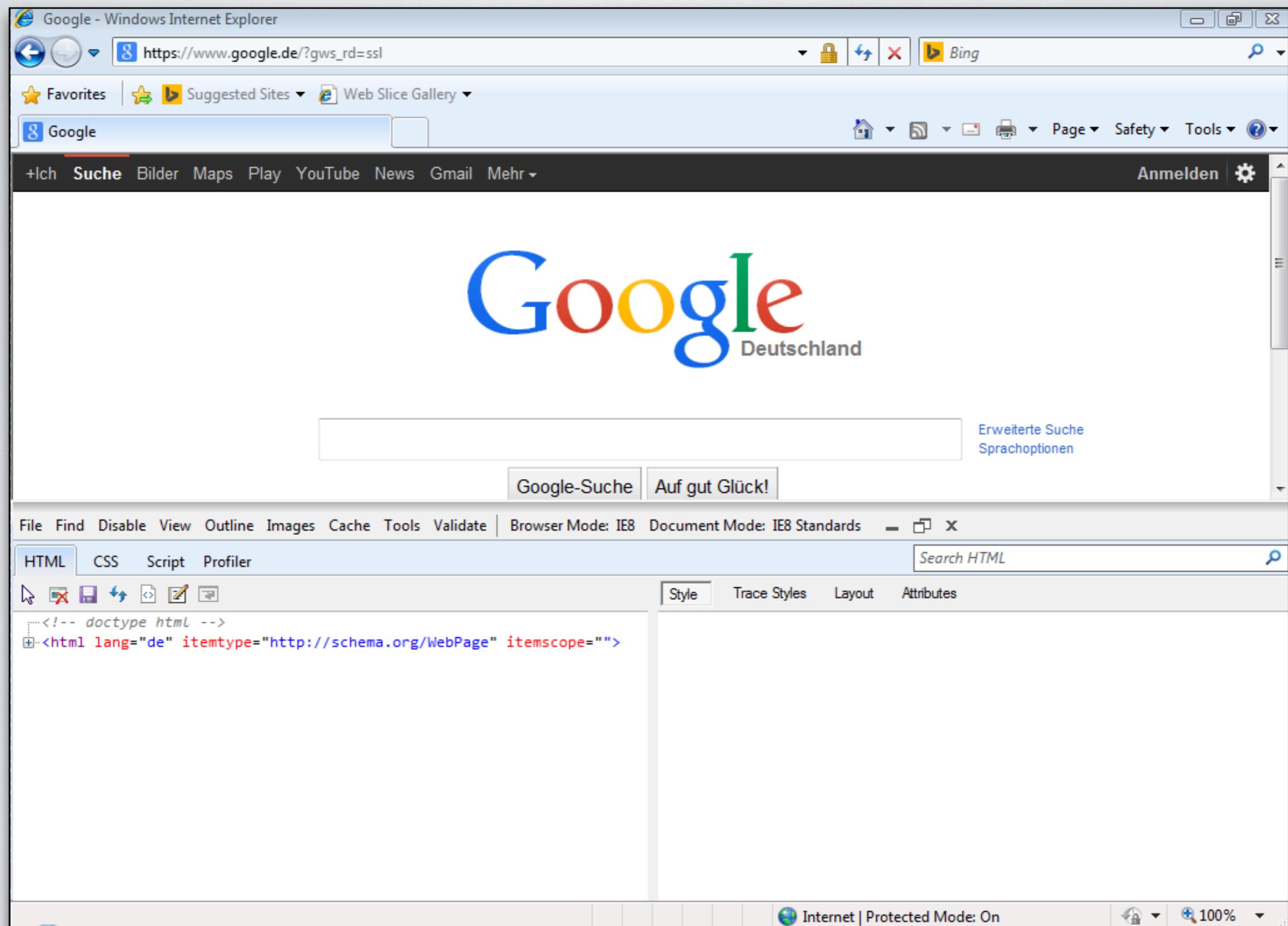
IE 10



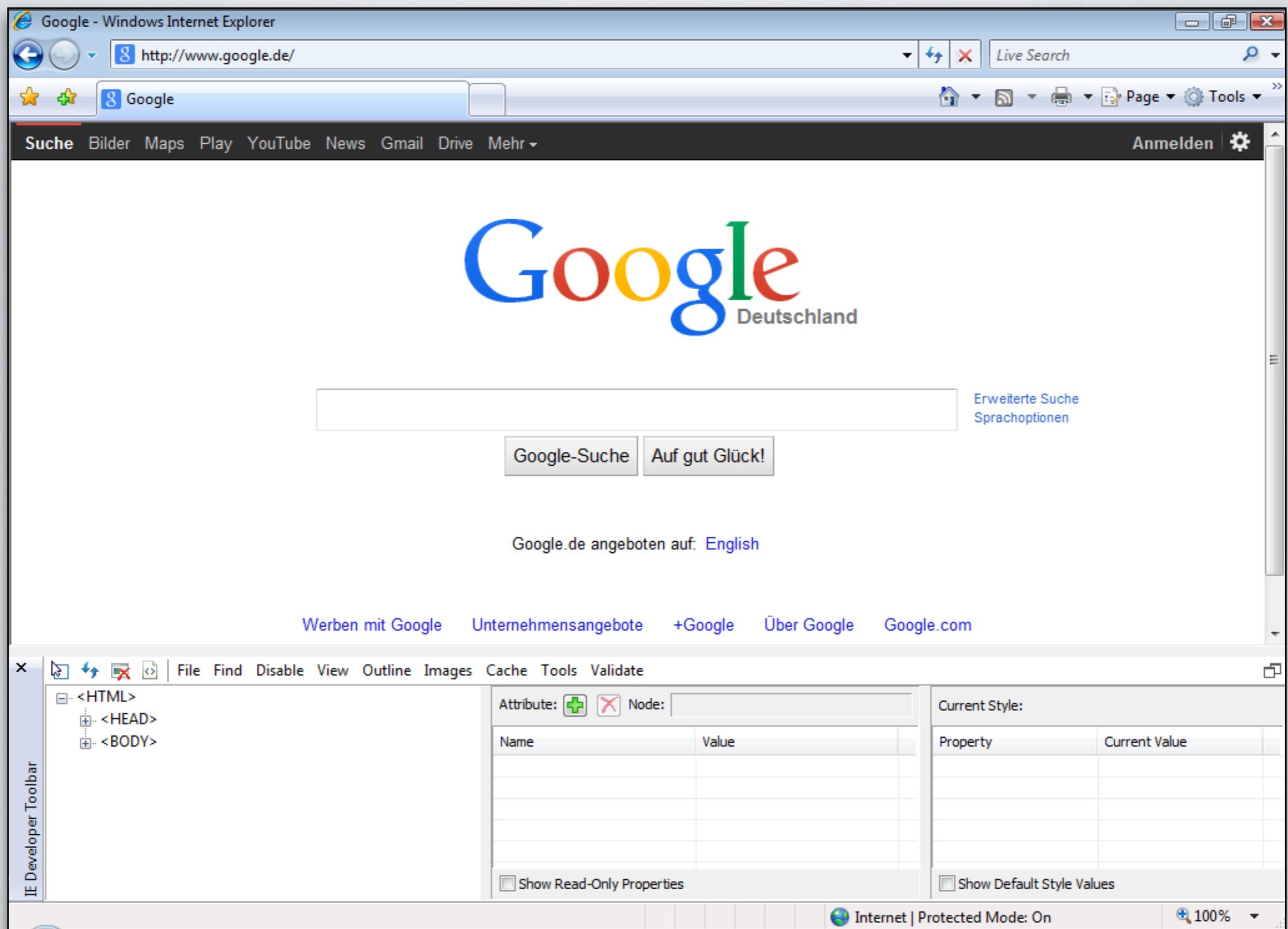
IE 9



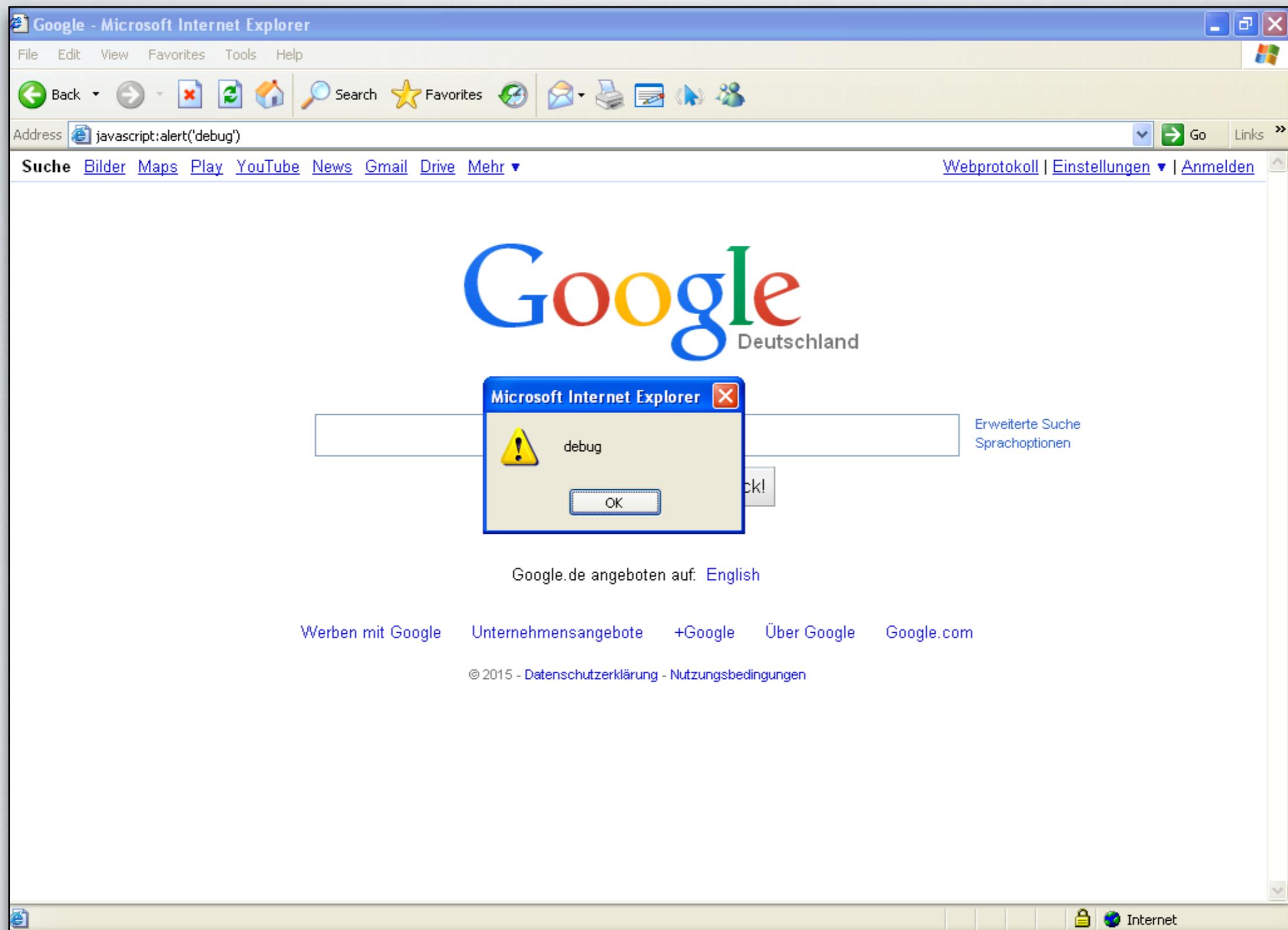
IE 8



IE 7



IE 6



JAVASCRIPT TOOLS

...

2009

2010

2011

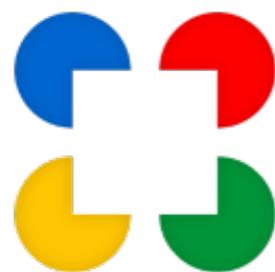
2012

2013

2014



2002



...

2009

2010

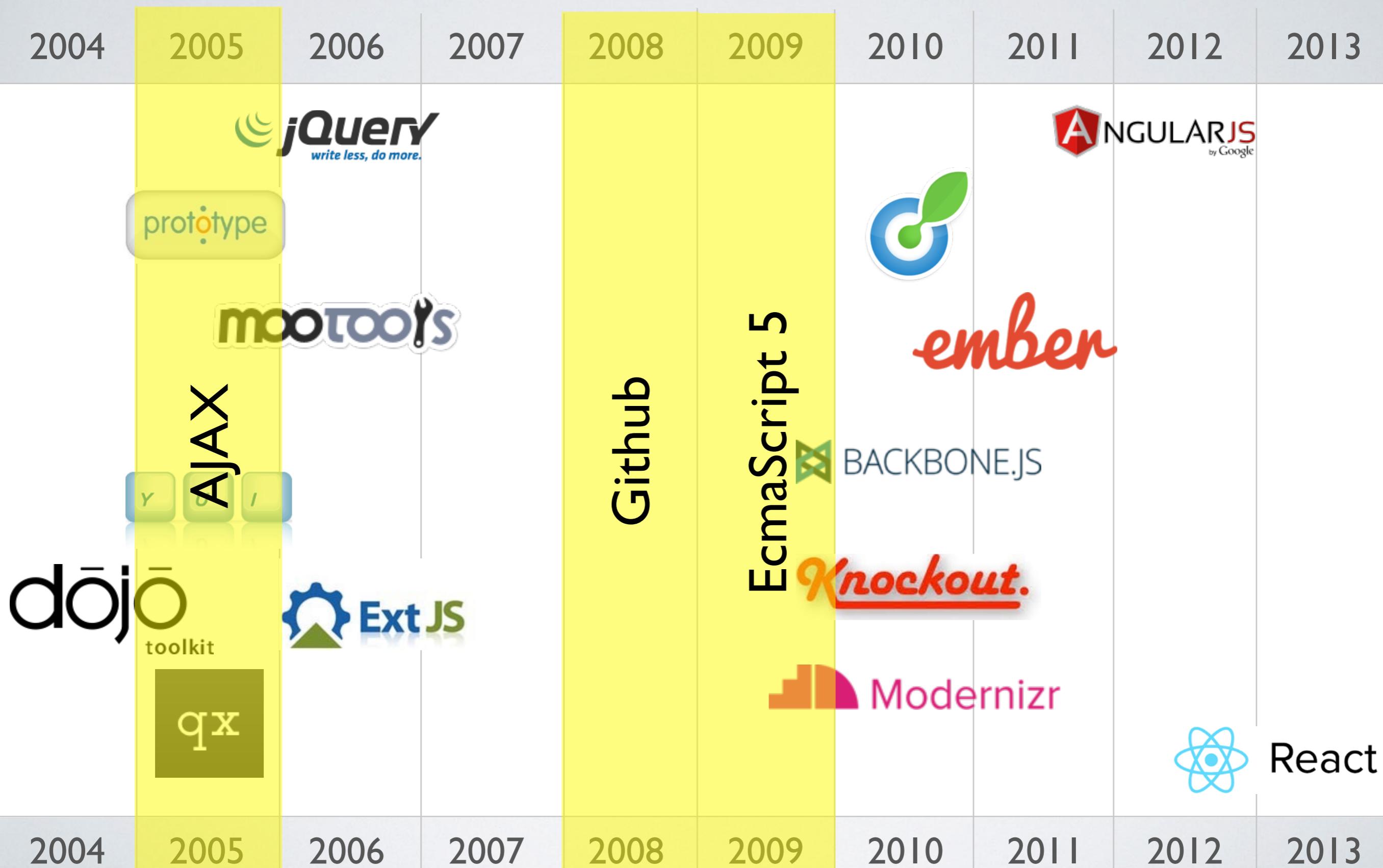
2011

2012

2013

2014

JAVASCRIPT FRAMEWORKS



AUSBlick

WEB COMPONENTS & SHADOW DOM

Start | bettervest - Crowdful

bettervest GmbH [DE] https://invest.bettervest.de/

Elements Network Sources Timeline

```
<section class="details ajaxload">...</section>
<div id="home">
  <div class="stage">
    <div class="container">
      <div class="row-fluid">
        ::before
        <div class="span5">...</div>
        <div class="span6 offset1">
          <div class="frame videoframe">
            
            <video id="video" poster="video/poster.jpg" preload="none" controls style="display: inline;">
              #shadow-root (user-agent)
              <div pseudo="-webkit-media-controls">
                <div pseudo="-webkit-media-controls-overlay-enclosure">...</div>
                <div pseudo="-webkit-media-controls-enclosure">
                  <div pseudo="-webkit-media-controls-panel">
                    <input type="button" pseudo="-webkit-media-controls-play-button">
                  </div>
                </div>
              </div>
            </video>
          </div>
        </div>
      </div>
    </div>
  </div>
</div>
```

Shadow DOM

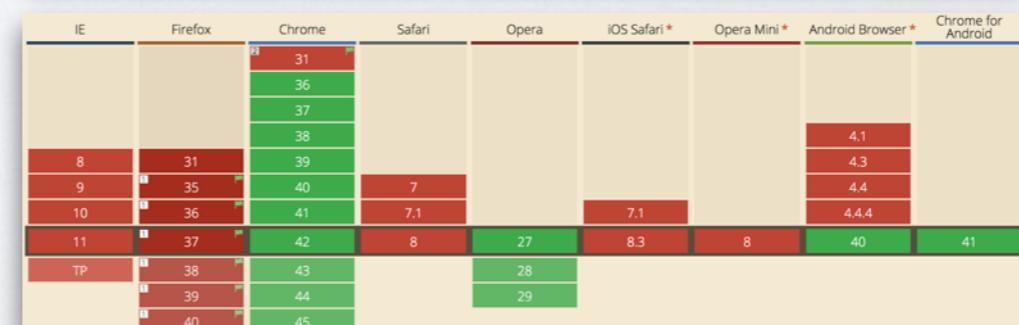
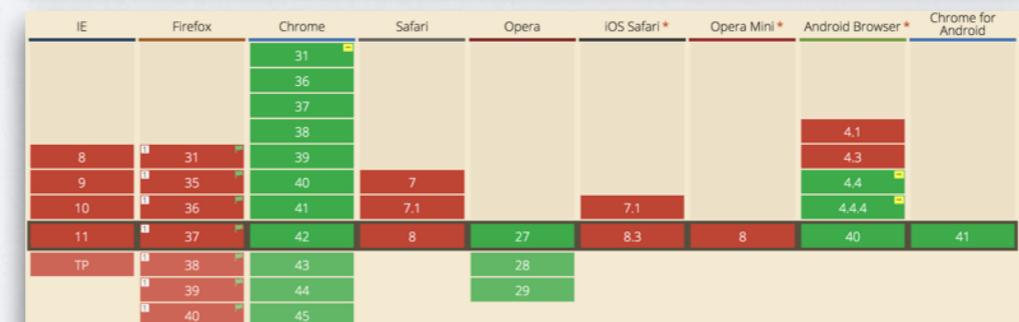
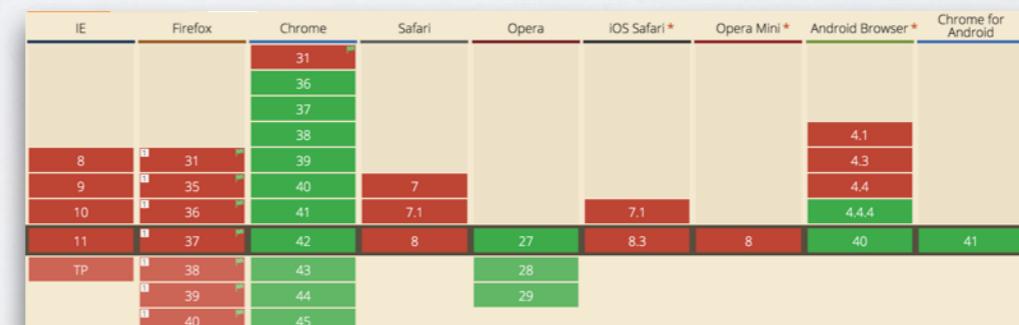
WebComponents



```
<link rel="import" href="google-map-plugin.html">

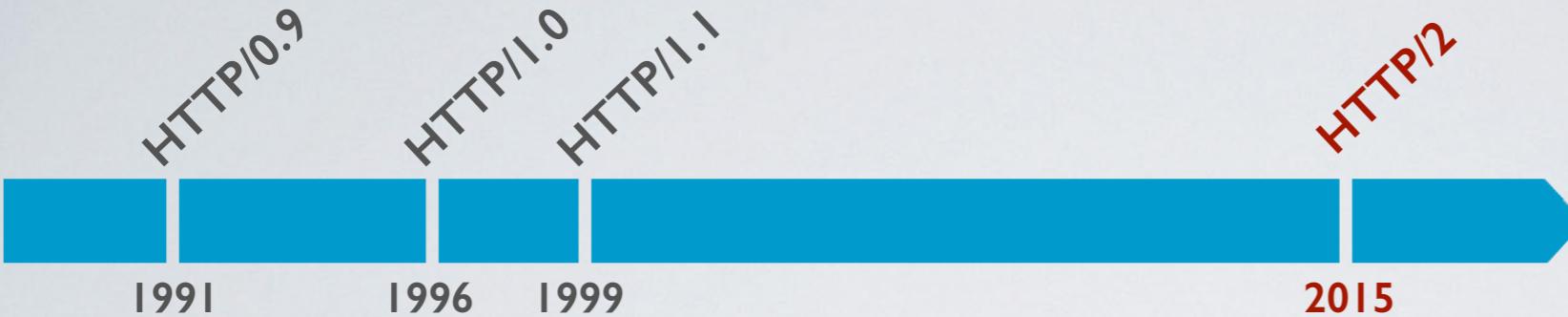
<google-map
  latitude="-52.033"
  longitude="8.533"
  zoom="8"
  type="roadmap"></google-map>
```

- Custom Elements
- HTML Imports
- Template
- Shadow DOM



Specification	Status
Custom Elements	Working Draft
WHATWG HTML Living Standard	Living Standard
The definition of 'template element' in that specification.	
HTML5	Recommendation
The definition of 'template element' in that specification.	
Shadow DOM	Working Draft
HTML Imports	Editor's Draft
CSS Scoping Module Level 1	Working Draft

... ONE MORE THING
HTTP/2



Wednesday, 18 February 2015

HTTP/2 is Done

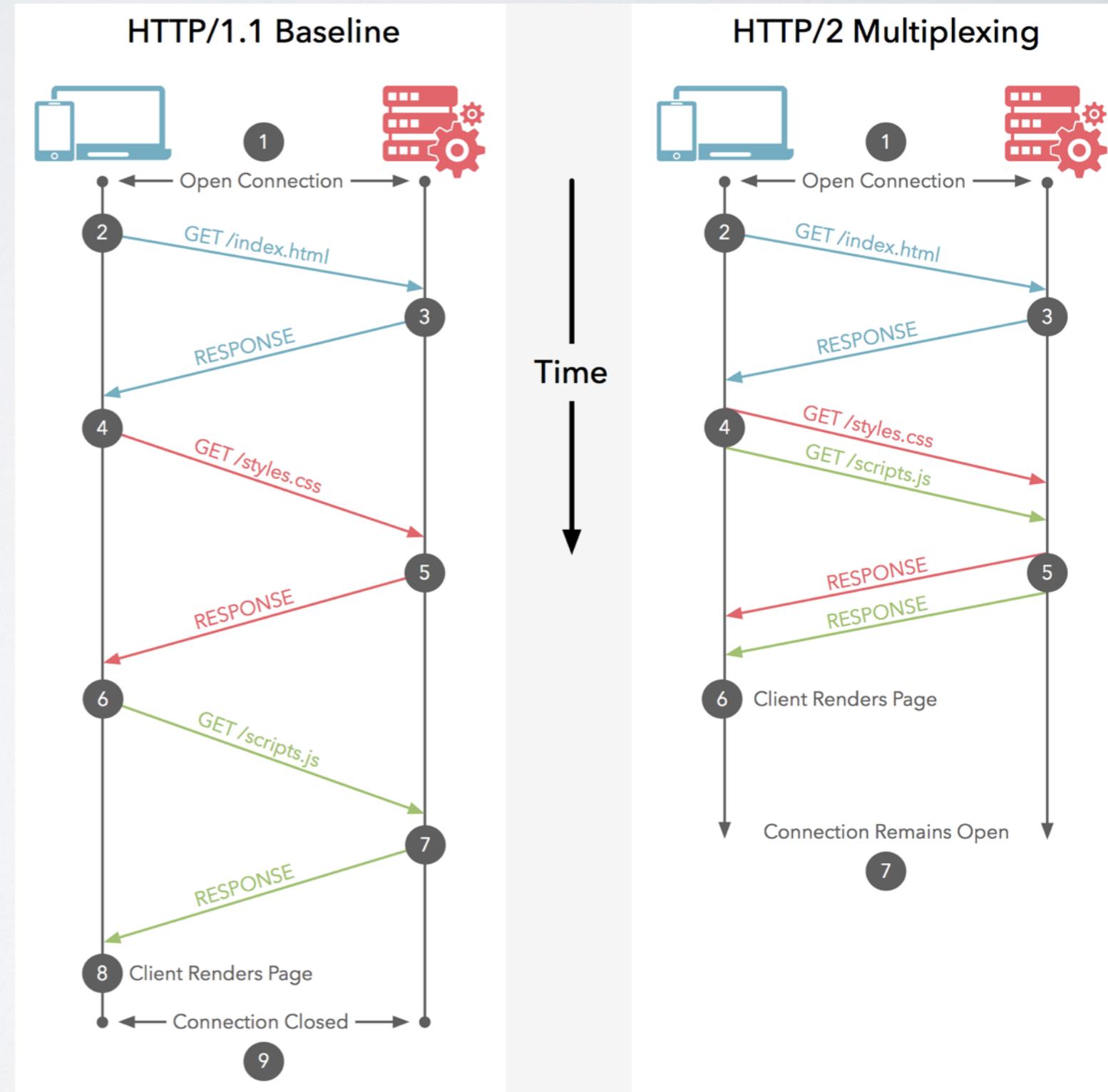
The IESG has formally approved the [HTTP/2](#) and [HPACK](#) specifications, and they're on their way to the [RFC Editor](#), where they'll soon be assigned RFC numbers, go through some editorial processes, and be published.

<https://www.mnot.net/blog/2015/02/18/http2>

Wichtige neue Möglichkeiten sind

- die Möglichkeit des Zusammenfassens mehrerer Anfragen,
- weitergehende Datenkompressionsmöglichkeiten,
- die binär kodierte Übertragung von Inhalten und
- Server-initiierte Datenübertragungen (push-Verfahren)

IE	Firefox	Chrome	Safari	iOS Safari*	Android Browser*	Chrome for Android
		31			4.1	
		36			4.3	
		37			4.4	
		38			4.4.4	
8	31	39	7	7.1	40	41
9	35	40				
10	36	41	7.1	7.1		
11	37	42	8	8.3		
TP	38	43				
		39	44			
		40	45			





LET'S GET STARTED...

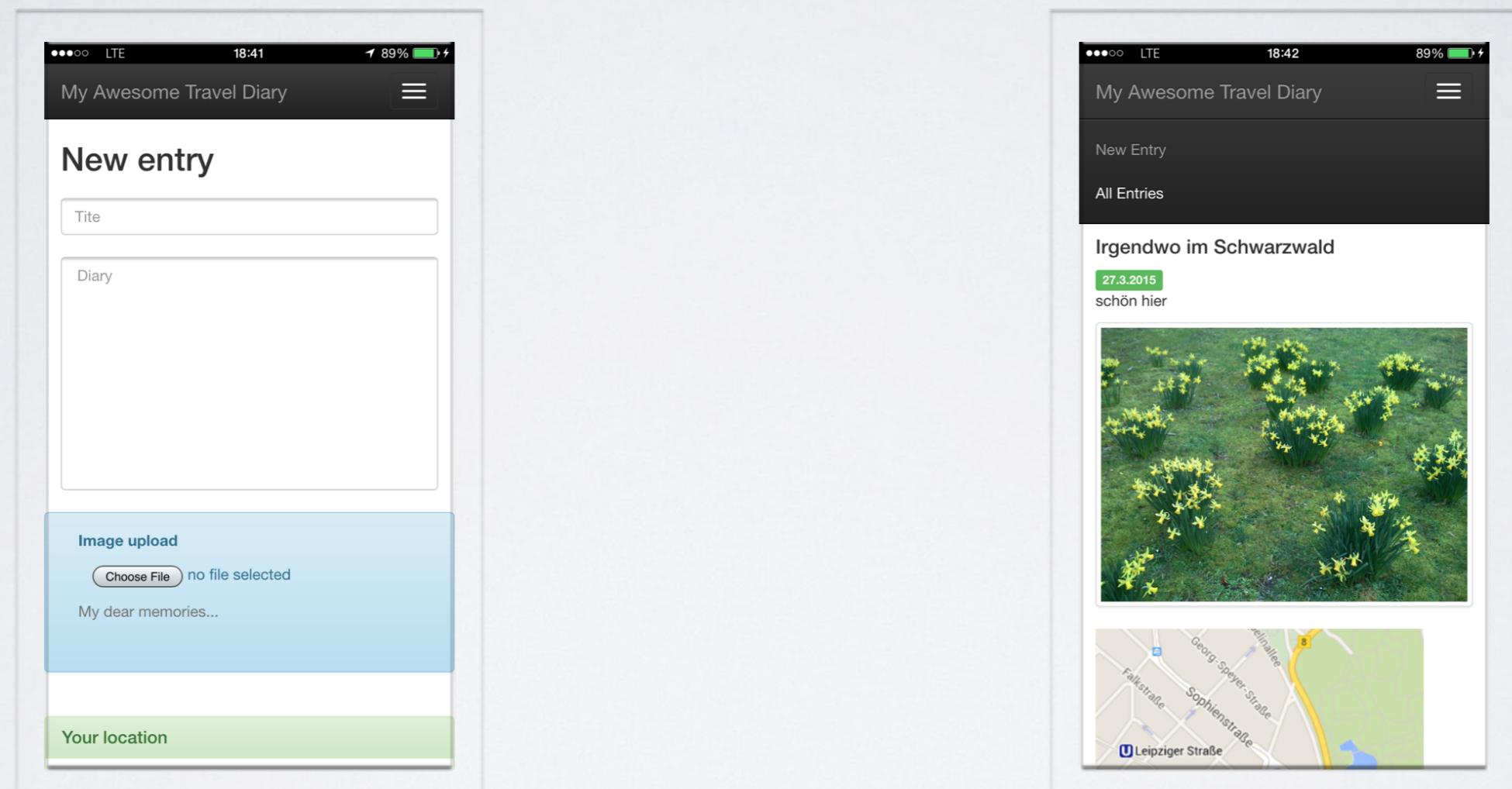
HANDS ON

— MY TRAVEL DIARY —

PT 2:
JavaScript & HTML5 API

HANDS ON

— MY TRAVEL DIARY —



<https://bettervest.de/demo/traveldiary/>

<https://github.com/terehov/nextlevelweb1>

VIELEN DANK.