Introduction to the Web

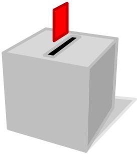
MPRI 2.26.2: Web Data Management

Antoine Amarilli

POLL: World Wide Web creation

The Web was invented...

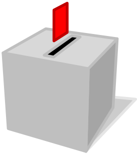
- **A**: About at the same as the Internet
- **B**: 2 years after the Internet
- **C**: 5 years after the Internet
- **D**: More than 5 years after the Internet



POLL: World Wide Web creation

The Web was invented...

- **A**: About at the same as the Internet
- **B**: 2 years after the Internet
- **C**: 5 years after the Internet
- **D**: **More than 5 years after the Internet**



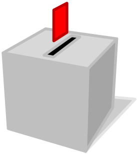
The old days

1969	ARPANET (ancestor of the Internet)
1974	TCP
1990	The World Wide Web, HTTP, HTML
1994	Yahoo! was founded
1995	Amazon.com, Ebay, AltaVista are founded
1998	Google are founded
2001	Wikipedia is created

POLL: Number of Internet domains

How many domain names exist on the Internet?

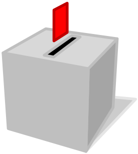
- **A**: 3 million
- **B**: 30 million
- **C**: 300 million
- **D**: 3 billion



POLL: Number of Internet domains

How many domain names exist on the Internet?

- **A**: 3 million
- **B**: 30 million
- **C**: **300 million**
- **D**: 3 billion



Statistics

- Around 370 million domains, including 150 million in `.com`[1]
- 64% of content in English and 3% in French[2]
- Google knows over one trillion (10^{12}) of unique URLs[3] and possibly hundreds of trillions
  - → The same content can live in many different URLs
  - → Parts of the Web are not indexable: the hidden Web or deep Web

[1] https://www.verisign.com/en_US/domain-names/dnib/index.xhtml

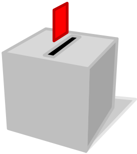
[2] https://w3techs.com/technologies/overview/content_language/all

[3] https://googleblog.blogspot.fr/2008/07/we-knew-web-was-big.html

POLL: Internet users

Which proportion of the world population is using the Internet

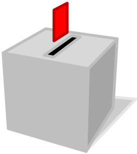
- **A**: Less than 1/3
- **B**: Between 1/3 and 1/2
- **C**: Between 1/2 and 2/3
- **D**: More than 2/3



POLL: Internet users

Which proportion of the world population is using the Internet

- **A**: Less than 1/3
- **B**: Between 1/3 and 1/2
- **C**: **Between 1/2 and 2/3**
- **D**: More than 2/3



Users

- 65% of the world population uses the Internet
    - Gender imbalance: 63% of women and 69% of men
    - Age imbalance: 75% of people with ages 15–24
- The connectivity exists, however:
    - 95% of the world population have access to a mobile network
    - 88% have access to 4G

Source : ITU `https://www.itu.int/itu-d/reports/statistics/facts-figures-2022/`

Table of Contents

Introduction

Web browsers

Other Web clients

Historical web browsers

Mosaic First common graphical browser, 1993–1997

Netscape Released in 1994, based on Mosaic

Internet Explorer Released in 1995, provided with Windows 95

- IE 6 released in 2001 and reaches 80% market share

Firefox Released in 2002 from Netscape

- Attacked IE 6's monopoly

Current Web browsers (desktop)

IE IE 7 released in 2006, replaced by Microsoft Edge

Firefox Still actively developed

Safari Released in 2003, default Web browser on Mac OS X

Opera Released in 1996, proprietary (niche)

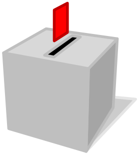
Chrome Released in 2008 by Google, with an open-source version (Chromium)

To check rendering on old browsers, use `browserstack.com`

POLL: Web Browser Market share (1/3)

Which is the most common Web browser nowadays?

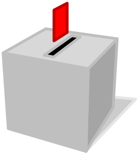
- **A**: Internet Explorer / Edge
- **B**: Mozilla Firefox
- **C**: Google Chrome
- **D**: Apple Safari



POLL: Web Browser Market share (1/3)

Which is the most common Web browser nowadays?

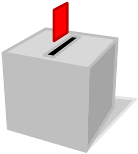
- **A**: Internet Explorer / Edge
- **B**: Mozilla Firefox
- **C**: **Google Chrome**
- **D**: Apple Safari



POLL: Web Browser Market share (2/3)

What is its main competitor?

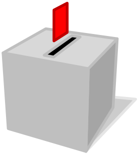
- **A**: Internet Explorer / Edge
- **B**: Mozilla Firefox
- **C**: Apple Safari
- **D**: A more obscure browser?



POLL: Web Browser Market share (2/3)

What is its main competitor?

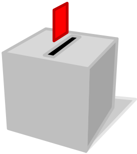
- **A**: Internet Explorer / Edge
- **B**: Mozilla Firefox
- **C**: **Apple Safari**
- **D**: A more obscure browser?



POLL: Web Browser Market share (3/3)

What is the market share of the main challenger (Safari)?

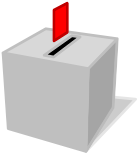
- **A**: 10%
- **B**: 20%
- **C**: 30%
- **D**: 40%



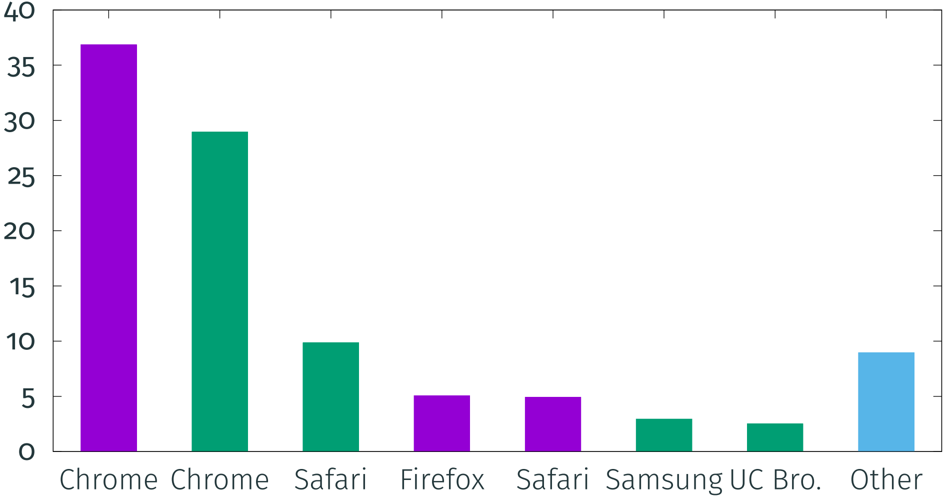
POLL: Web Browser Market share (3/3)

What is the market share of the main challenger (Safari)?

- **A**: 10%
- **B**: **20%**
- **C**: 30%
- **D**: 40%

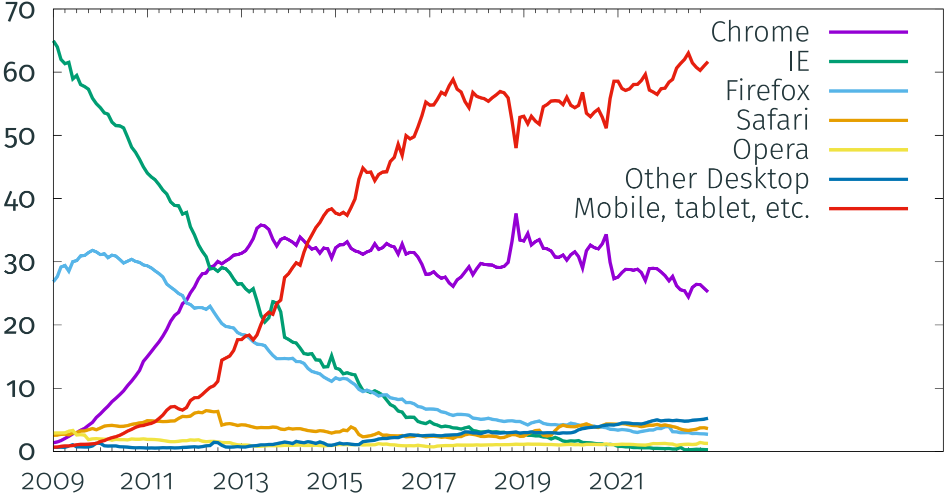


Recent market share



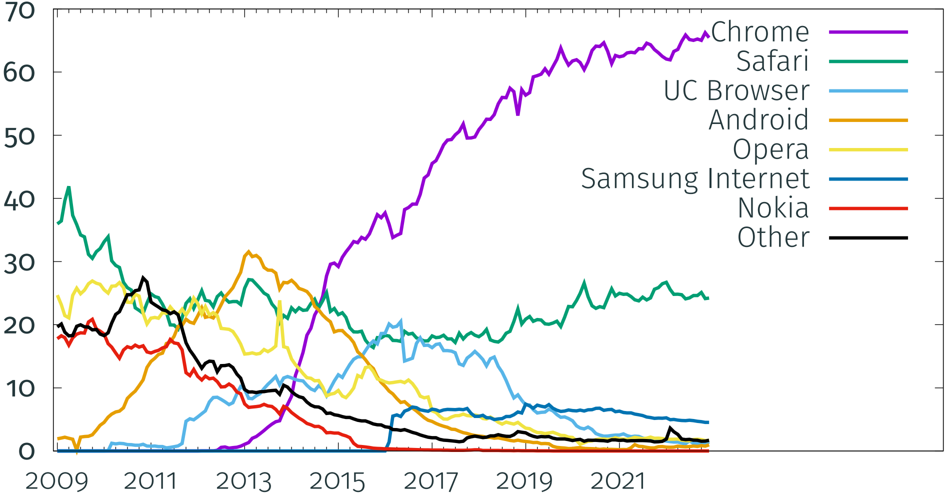
Source: `gs.statcounter.com` (November 2021)

Evolution



Source: `gs.statcounter.com`

Evolution (mobile)



Source: `gs.statcounter.com`

Rendering engine

Firefox Gecko, and (work-in-progress) Servo, using Rust

Safari WebKit engine

Chrome Blink (fork of Webkit, in April 2013)

IE Originally Trident, then EdgeHTML, Chromium since January 2020

Opera Originally Presto, then Blink

Others Dillo, KHTML, and other old/minimalistic engines

Summary and perspectives

- Webkit/Blink and Chrome/Chromium are **dominant**
- Main contenders: **Safari** (especially on mobile) and **Firefox**
- Blink is **open-source** but **controlled by Google**
- Different **browsers** using this rendering engine
  - Some **minimalistic**, e.g., `uzbl`
  - Some **new browsers** using Blink: Vivaldi, Brave

New topics about Web browsers (1)

- Ecosystem of extensions: Chrome Web Store, Mozilla Store, signing

[4] https://www.statista.com/topics/3201/ad-blocking/

New topics about Web browsers (1)

- Ecosystem of **extensions**: Chrome Web Store, Mozilla Store, signing
- **Ad blocking** (in the US, 47% of desktop and 34% of mobile users[4]), counter*-measures
  - **uBlock Origin** extension, based on **Easylist** `https://easylist.to/easylist/easylist.txt`
  - More generally, **JavaScript blockers**, e.g., uMatrix, NoScript, etc.

[4] `https://www.statista.com/topics/3201/ad-blocking/`

New topics about Web browsers (2)

- Filtering out bots: robots exclusion standard, CAPTCHAs
    - reCAPTCHA: now volunteer work for Google

New topics about Web browsers (2)

- Filtering out bots: robots exclusion standard, CAPTCHAs
    - reCAPTCHA: now volunteer work for Google
- Security: site isolation, one process/site
    - Available in Chrome, experimental in Firefox (Project Fission)

New topics about Web browsers (2)

- Filtering out **bots**: robots exclusion standard, CAPTCHAs
  - **reCAPTCHA**: now volunteer work for Google
- **Security**: site isolation, one process/site
  - Available in Chrome, experimental in Firefox (Project Fission)
- Web browser **fingerprinting** `https://panopticlick.eff.org/`

New topics about Web browsers (2)

- Filtering out bots: robots exclusion standard, CAPTCHAs
    - reCAPTCHA: now volunteer work for Google
- Security: site isolation, one process/site
    - Available in Chrome, experimental in Firefox (Project Fission)
- Web browser fingerprinting `https://panopticlick.eff.org/`
- In-browser cryptocurrency mining (cryptojacking)

New topics about Web browsers (2)

- Filtering out bots: robots exclusion standard, CAPTCHAs
    - reCAPTCHA: now volunteer work for Google
- Security: site isolation, one process/site
    - Available in Chrome, experimental in Firefox (Project Fission)
- Web browser fingerprinting `https://panopticlick.eff.org/`
- In-browser cryptocurrency mining (cryptojacking)
- Tor and Tor hidden services

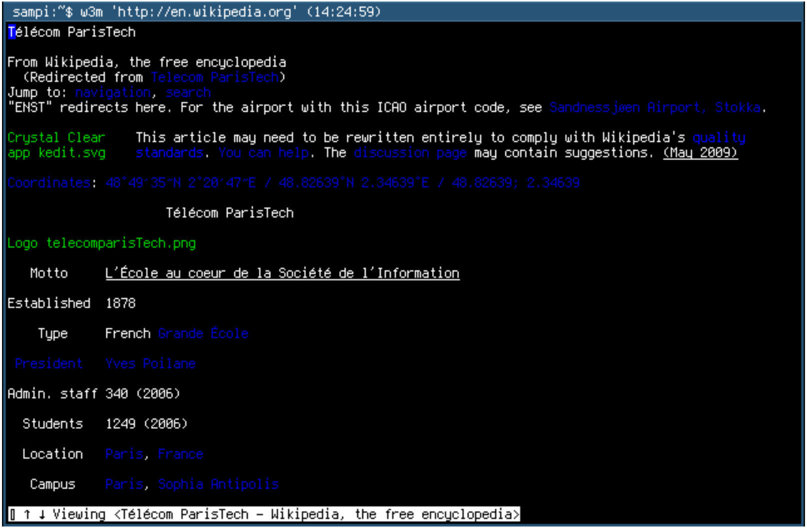
Table of Contents

Introduction

Web browsers

Other Web clients

Textual Web browsers



```
sampi:~$ w3m 'http://en.wikipedia.org' (14:24:59)
Télécom ParisTech

From Wikipedia, the free encyclopedia
  (Redirected from Telecom ParisTech)
Jump to: navigation, search
"ENST" redirects here. For the airport with this ICAO airport code, see Sandnessjøen Airport, Stokka.

Crystal Clear    This article may need to be rewritten entirely to comply with Wikipedia's quality
app kedit.svg    standards. You can help. The discussion page may contain suggestions. (May 2009)

Coordinates: 48°49′35″N 2°20′47″E / 48.82639°N 2.34639°E / 48.82639; 2.34639

                     Télécom ParisTech

Logo telecomparisTech.png

   Motto     L’École au coeur de la Société de l’Information

Established  1878

    Type     French Grande École

 President   Yves Poilane

Admin. staff 340 (2006)

  Students   1249 (2006)

  Location   Paris, France

   Campus    Paris, Sophia Antipolis

▯ ↑ ↓ Viewing <Télécom ParisTech - Wikipedia, the free encyclopedia>
```

- lynx (still maintained), w3m, elinks
- Also: screen readers for visually impaired users

Robots

Many automated programs on the Web:

- Search engine crawlers: see class on Web crawling
- RSS readers and aggregators
- Email harvesters (spammers)
- API consumers

Credits

- Course material inspired by course notes by Pierre Senellart