



## The Internet & the Web

The Internet & the  
Web



The nature of the Internet  
& the web: fundamental  
characteristics

# Agenda

---

Code

The Internet

The Web

# CODE is King (or Queen)

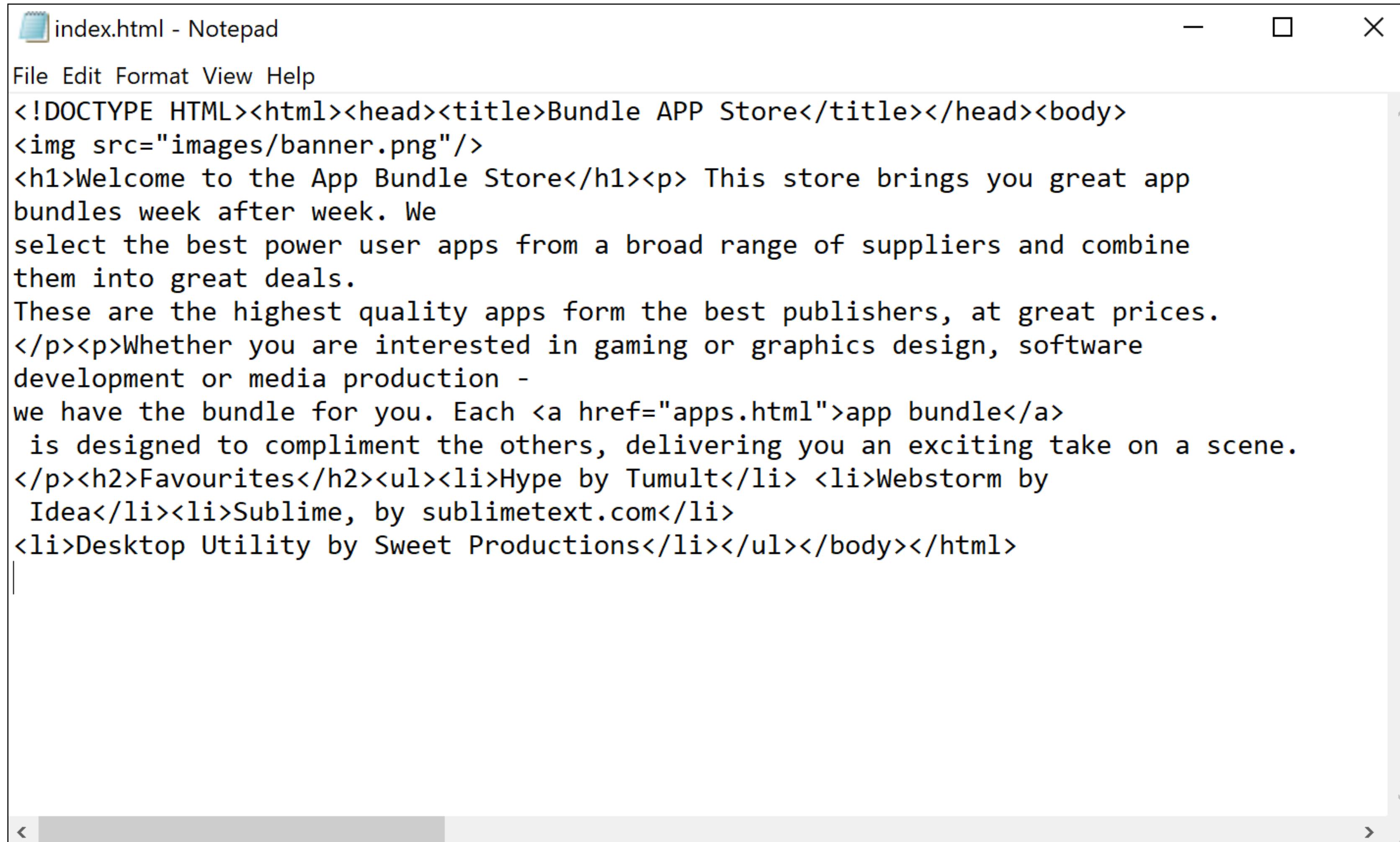
---

- The language of the Web:
  - Hypertext Markup Language - HTML
  - Cascading Style Sheets - CSS
- Build over successive labs a simple web sites from scratch.
- Focus on the structure and meaning of:

CODE *- html, css*



# The Code in a Conventional Editor



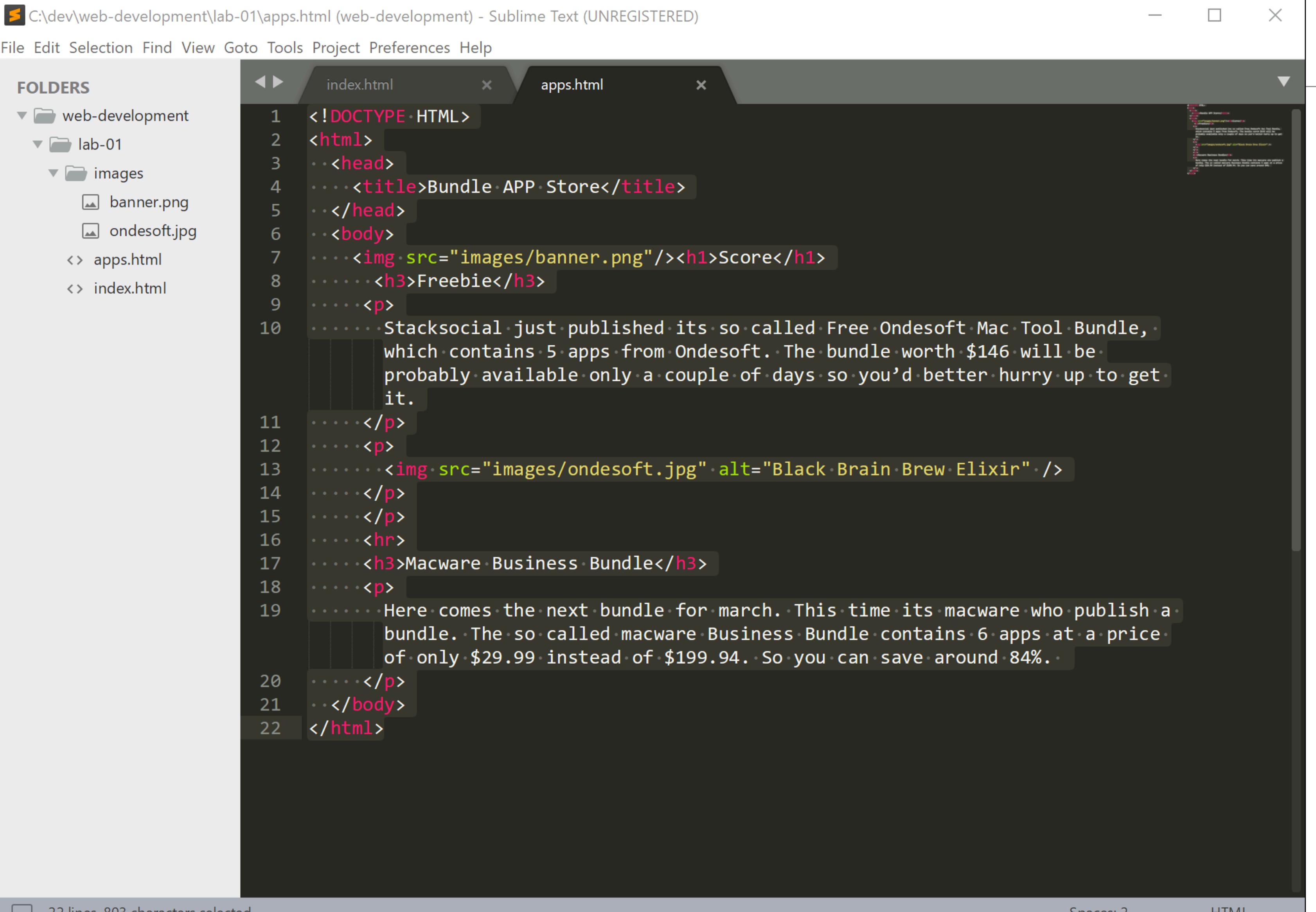
A screenshot of a Windows Notepad window titled "index.html - Notepad". The window contains the following HTML code:

```
<!DOCTYPE HTML><html><head><title>Bundle APP Store</title></head><body>

<h1>Welcome to the App Bundle Store</h1><p> This store brings you great app
bundles week after week. We
select the best power user apps from a broad range of suppliers and combine
them into great deals.
These are the highest quality apps form the best publishers, at great prices.
</p><p>Whether you are interested in gaming or graphics design, software
development or media production -
we have the bundle for you. Each <a href="apps.html">app bundle</a>
is designed to compliment the others, delivering you an exciting take on a scene.
</p><h2>Favourites</h2><ul><li>Hype by Tumult</li> <li>Webstorm by
Idea</li><li>Sublime, by sublimetext.com</li>
<li>Desktop Utility by Sweet Productions</li></ul></body></html>
```

- The actual document text - but poorly structured (indented)

# The Code in a Programmers Editor



The screenshot shows a Sublime Text editor window with two tabs: "index.html" and "apps.html". The "index.html" tab is active, displaying the following HTML code:

```
<!DOCTYPE HTML>
<html>
  <head>
    <title>Bundle APP Store</title>
  </head>
  <body>
    <h1>Score</h1>
    <h3>Freebie</h3>
    <p>
      Stacksocial just published its so called Free Ondesoft Mac Tool Bundle, which contains 5 apps from Ondesoft. The bundle worth $146 will be probably available only a couple of days so you'd better hurry up to get it.
    </p>
    <p>
      
    </p>
    <p>
      <hr>
      <h3>Macware Business Bundle</h3>
      <p>
        Here comes the next bundle for march. This time its macware who publish a bundle. The so called macware Business Bundle contains 6 apps at a price of only $29.99 instead of $199.94. So you can save around 84%.
      </p>
    </p>
  </body>
</html>
```

The code is syntax-highlighted with colors for HTML tags (e.g., pink for tags like `<html>`), attributes (e.g., green for `src="images/banner.png"`), and text content (e.g., grey for the paragraph text). The editor also shows line numbers (1 through 22) and character counts (803 characters selected).

- Same document - pleasingly indented and syntax highlighted

# Agenda

---

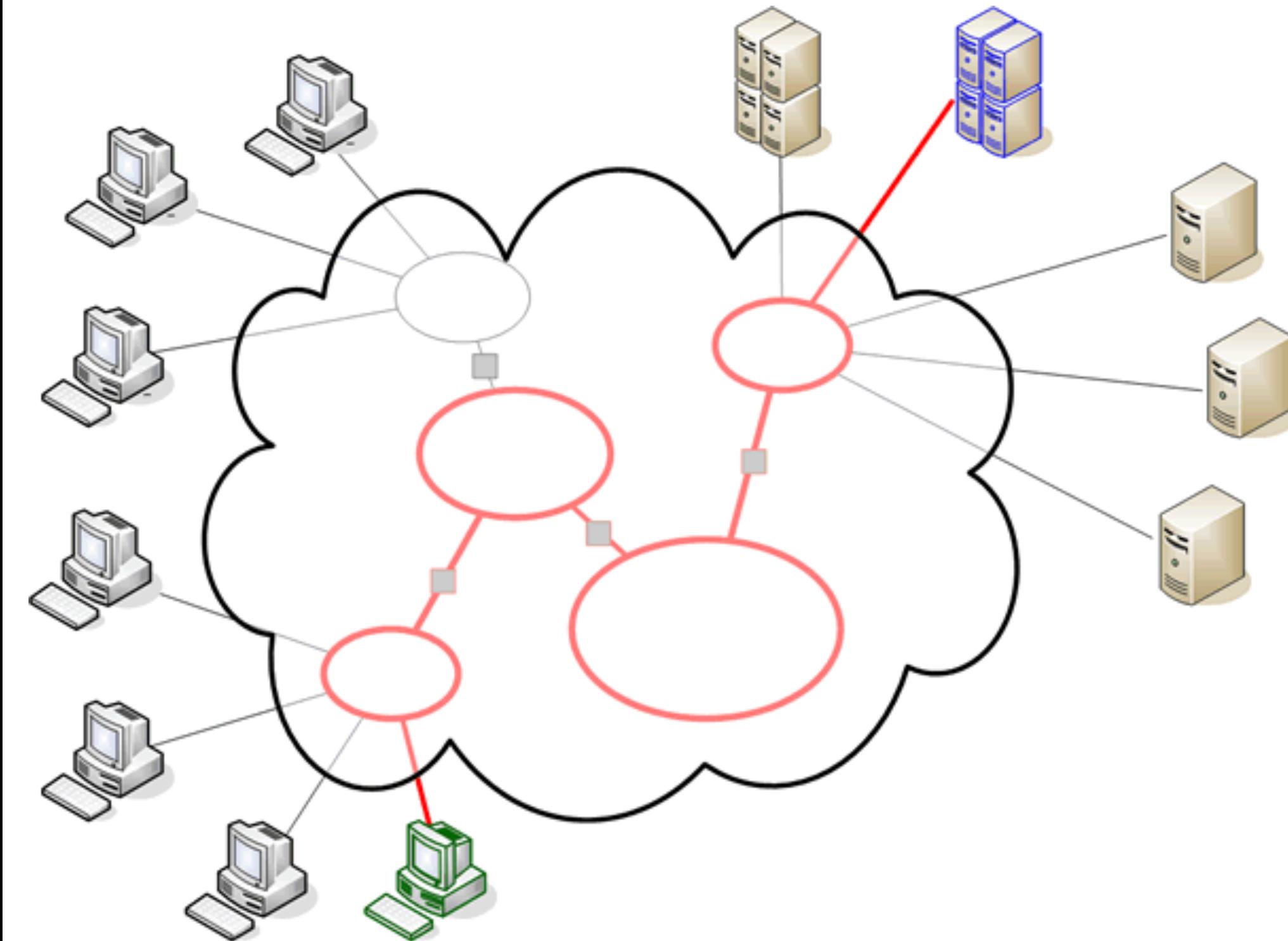
Code

The Internet

The Web

# The Internet

---



# The Internet

---

<http://www.internetlivestats.com/>

---



**4,447,305,259**

Internet Users in the world



**1,742,537,939**

Total number of Websites



**99,044,261,662**

Emails sent [today](#)



**2,650,424,239**

Google searches [today](#)



**2,530,802**

Blog posts written [today](#)



**292,060,286**

Tweets sent [today](#)



**2,726,919,878**

Videos viewed [today](#)  
on YouTube



**31,984,522**

Photos uploaded [today](#)  
on Instagram



**54,399,447**

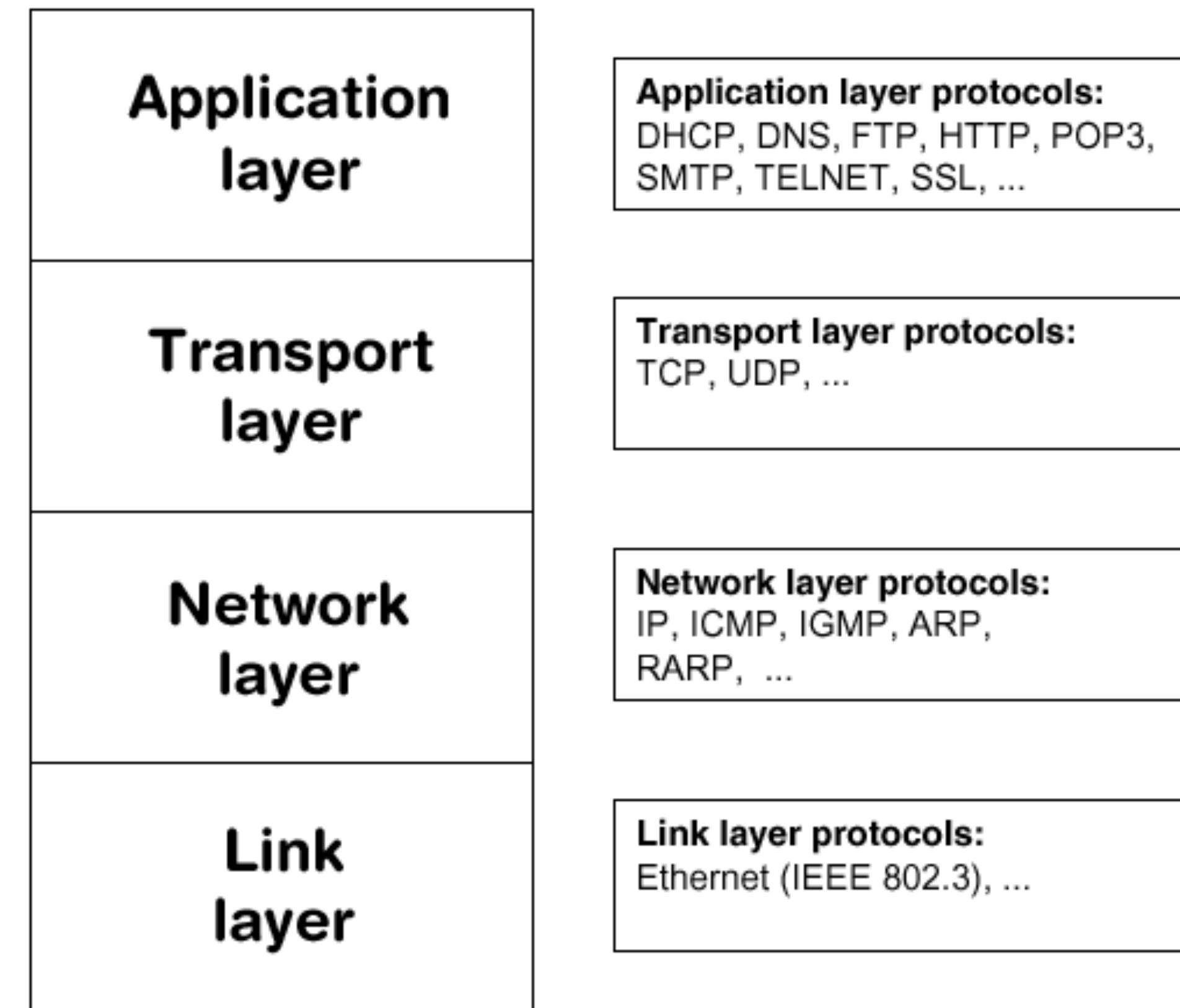
Tumblr posts [today](#)

# Underlying nature of the Internet - Protocols & Standards

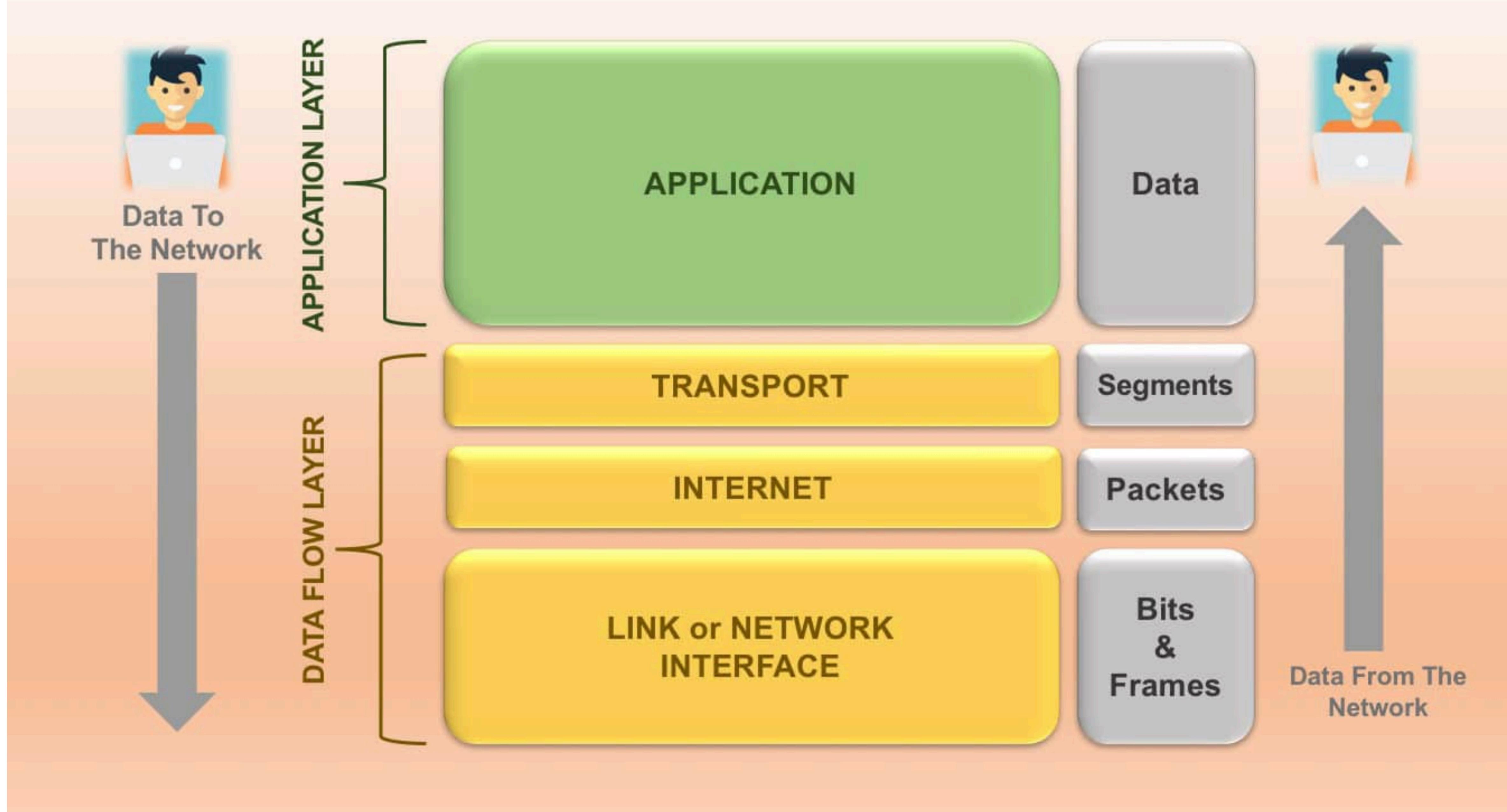
---

“The irony is that in all its various guises -- commerce, research, and surfing -- the Web is already so much a part of our lives that familiarity has clouded our perception of the Web itself.”

[Tim Berners-Lee](#) in  
Weaving the Web



You  
are  
here!  
HTTP



# Agenda

---

Code

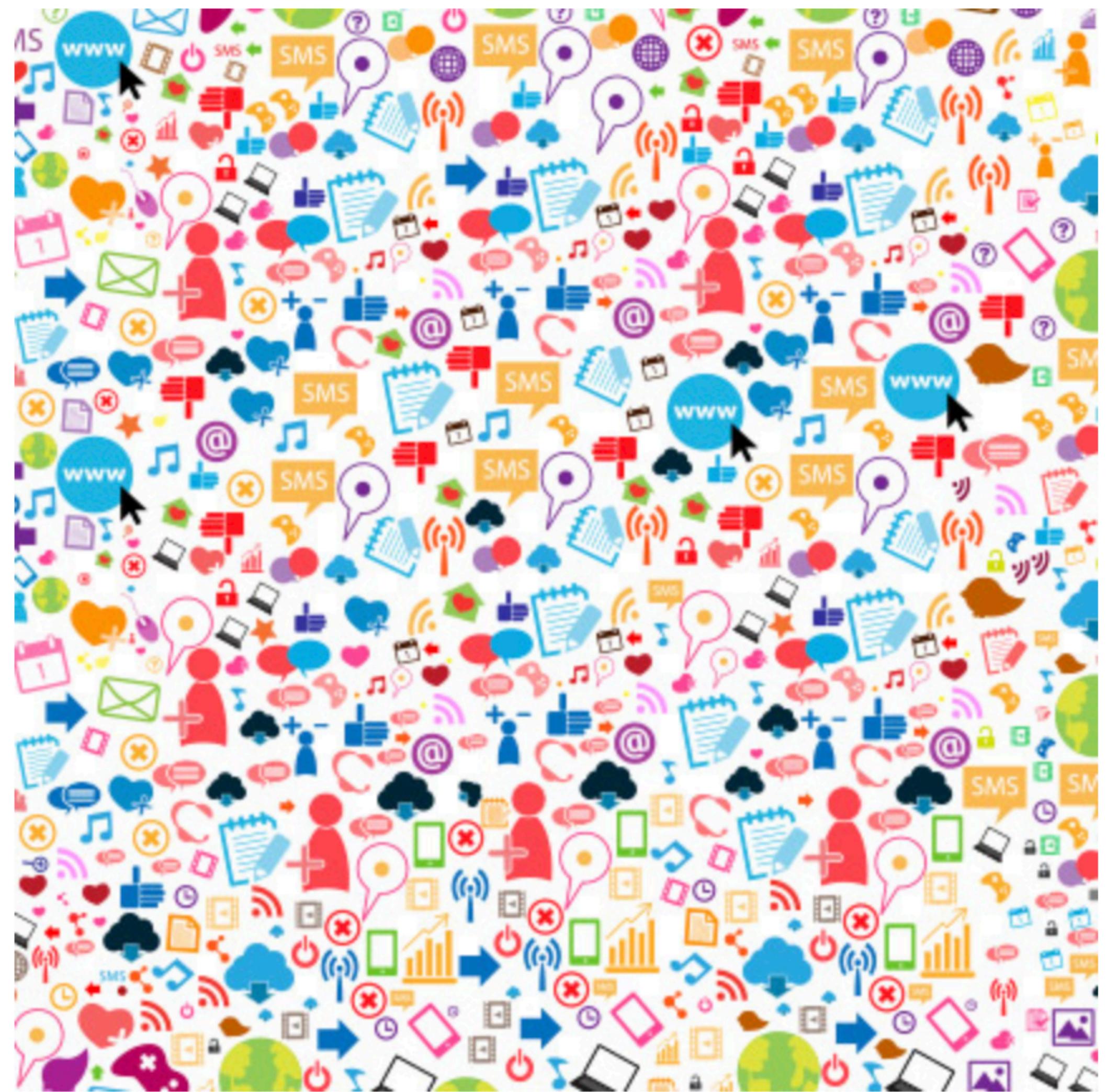
The Internet

The Web

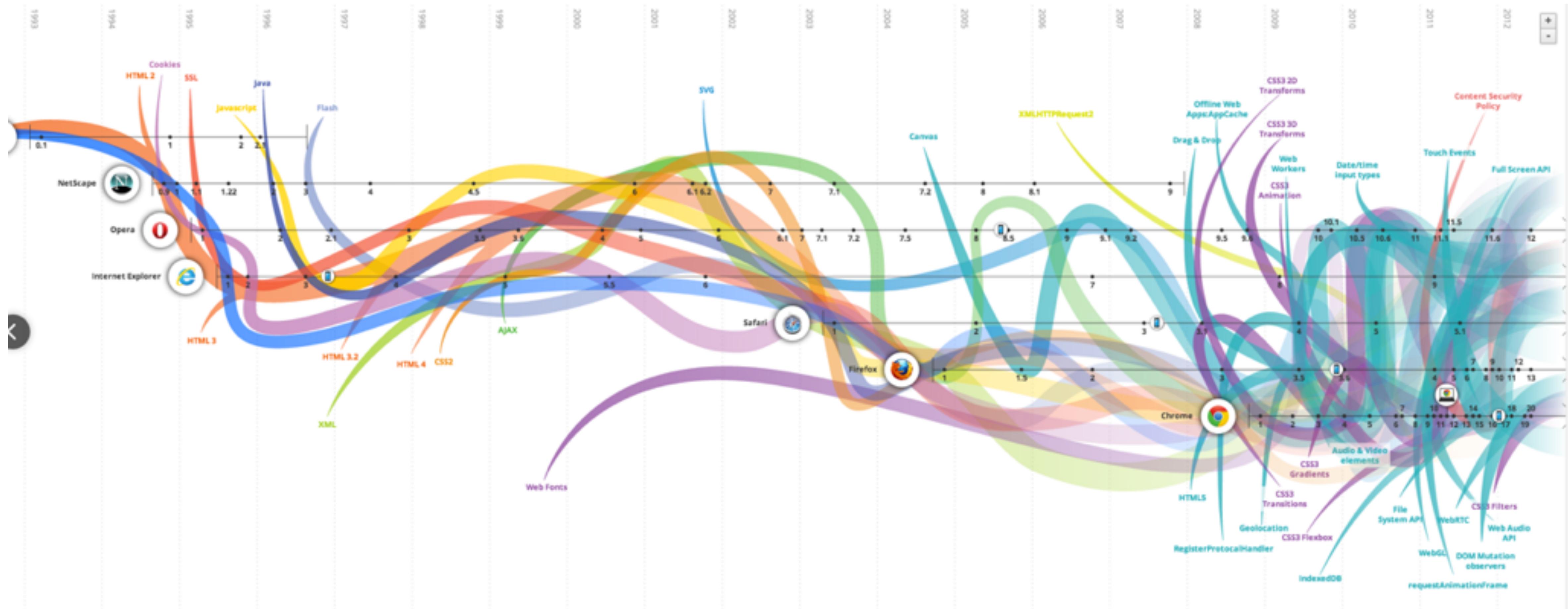
# World Wide Web

---

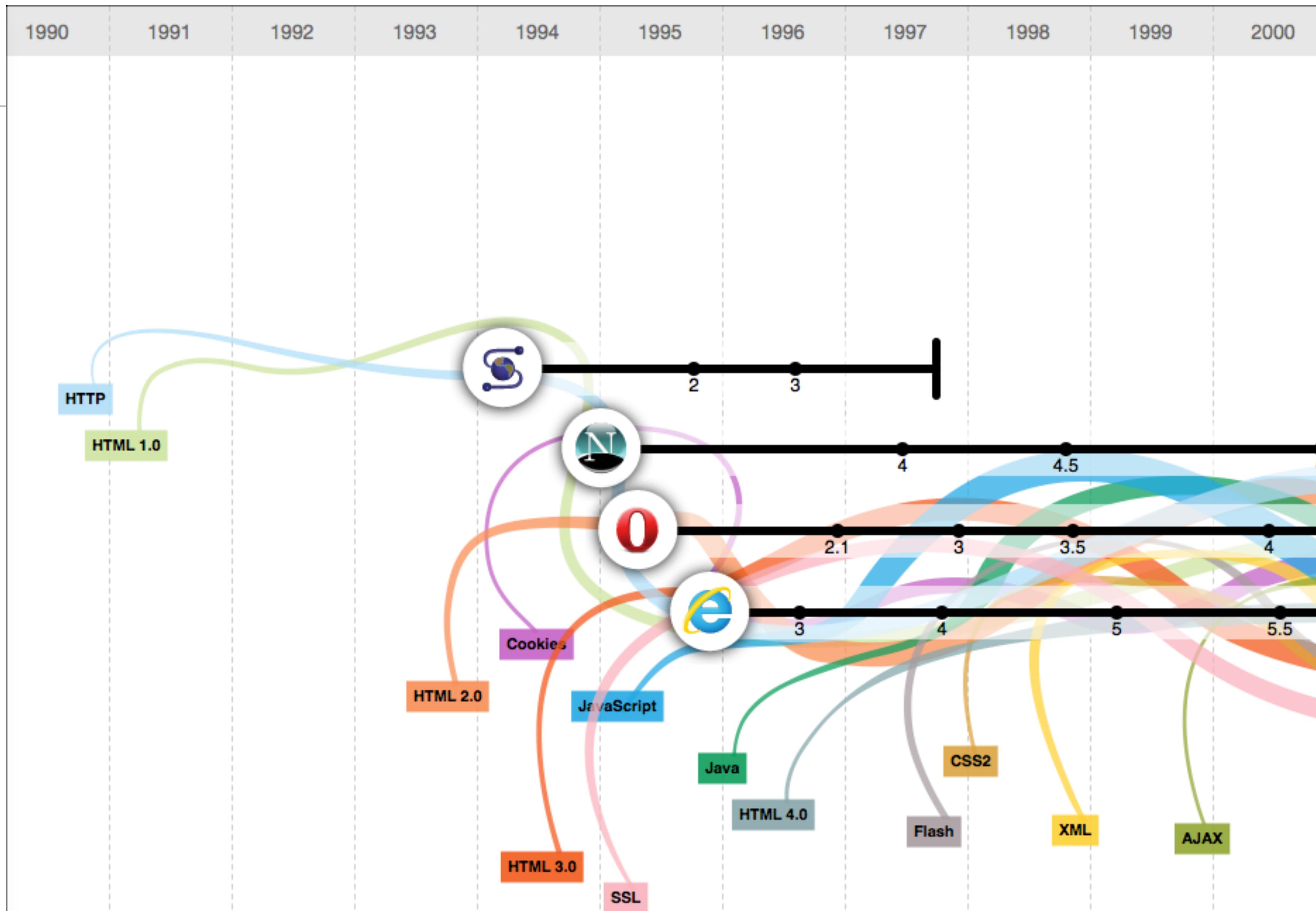
- The world wide web is a huge globally distributed collection of information and data that can be accessed via the internet with the help of http: Hypertext Transfer Protocol
- WWW has made the Internet the most important communication medium of our days.
- Thanks to the simple to use graphical interface – The Web Browser – the WWW provides everyone with simple access to information



# Evolution of the Web - 1990-2012

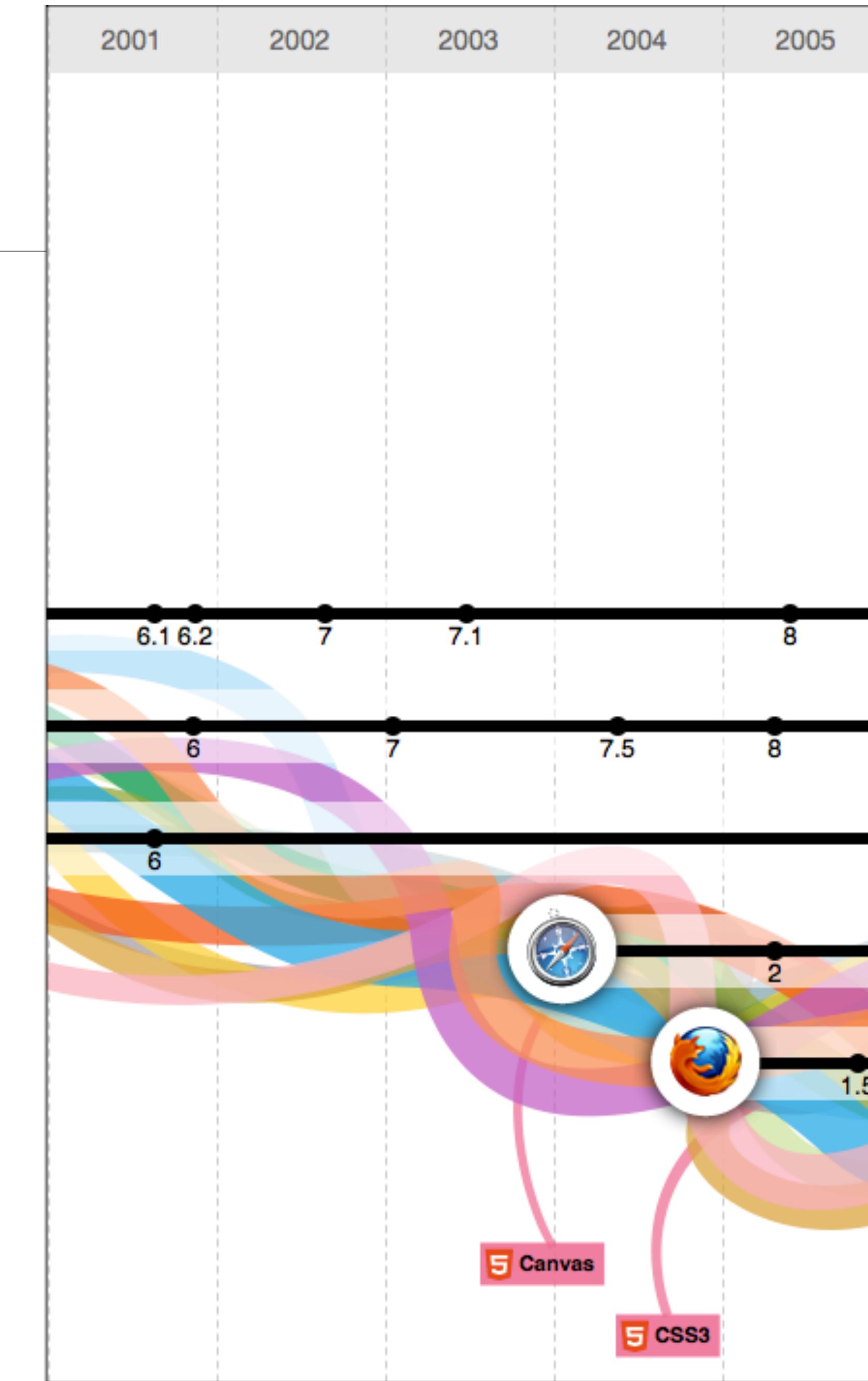
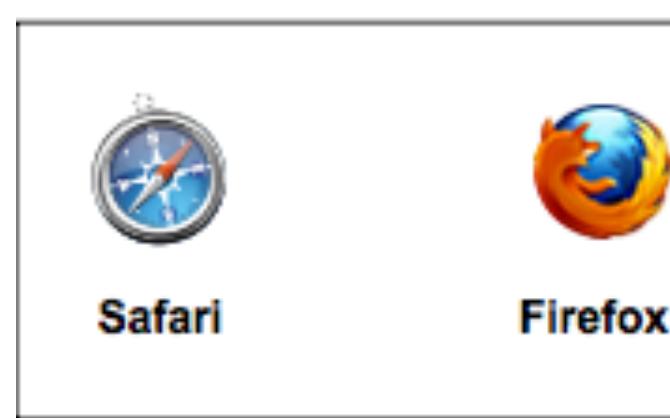


# Evolution of the Web - 1990-2000

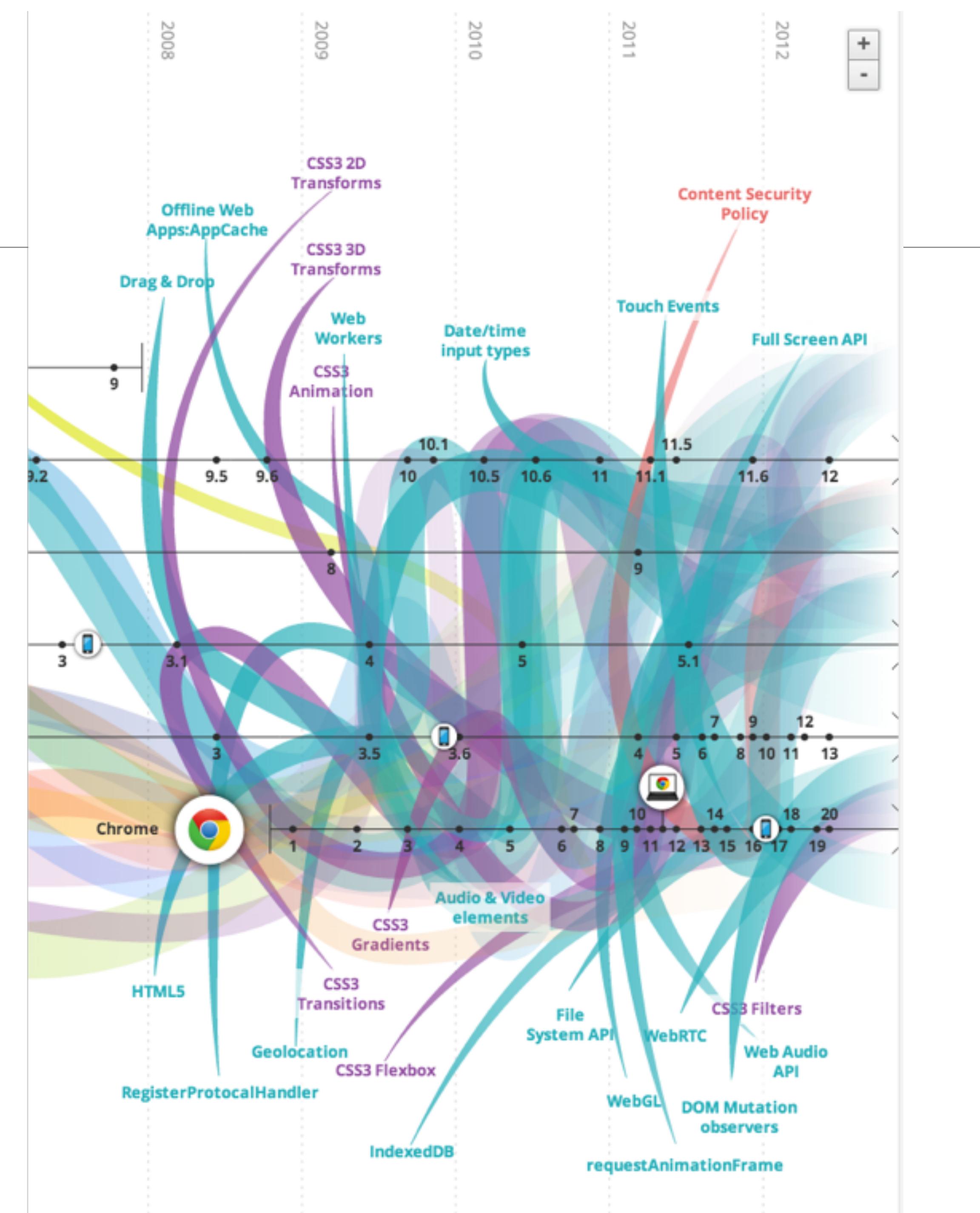
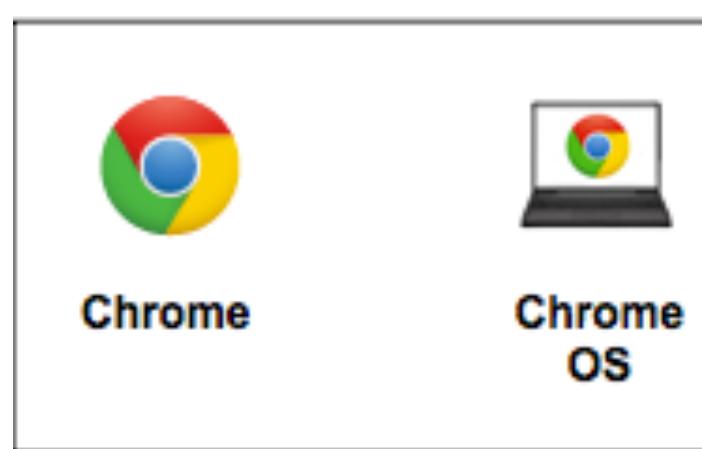


# 2001-2005

---

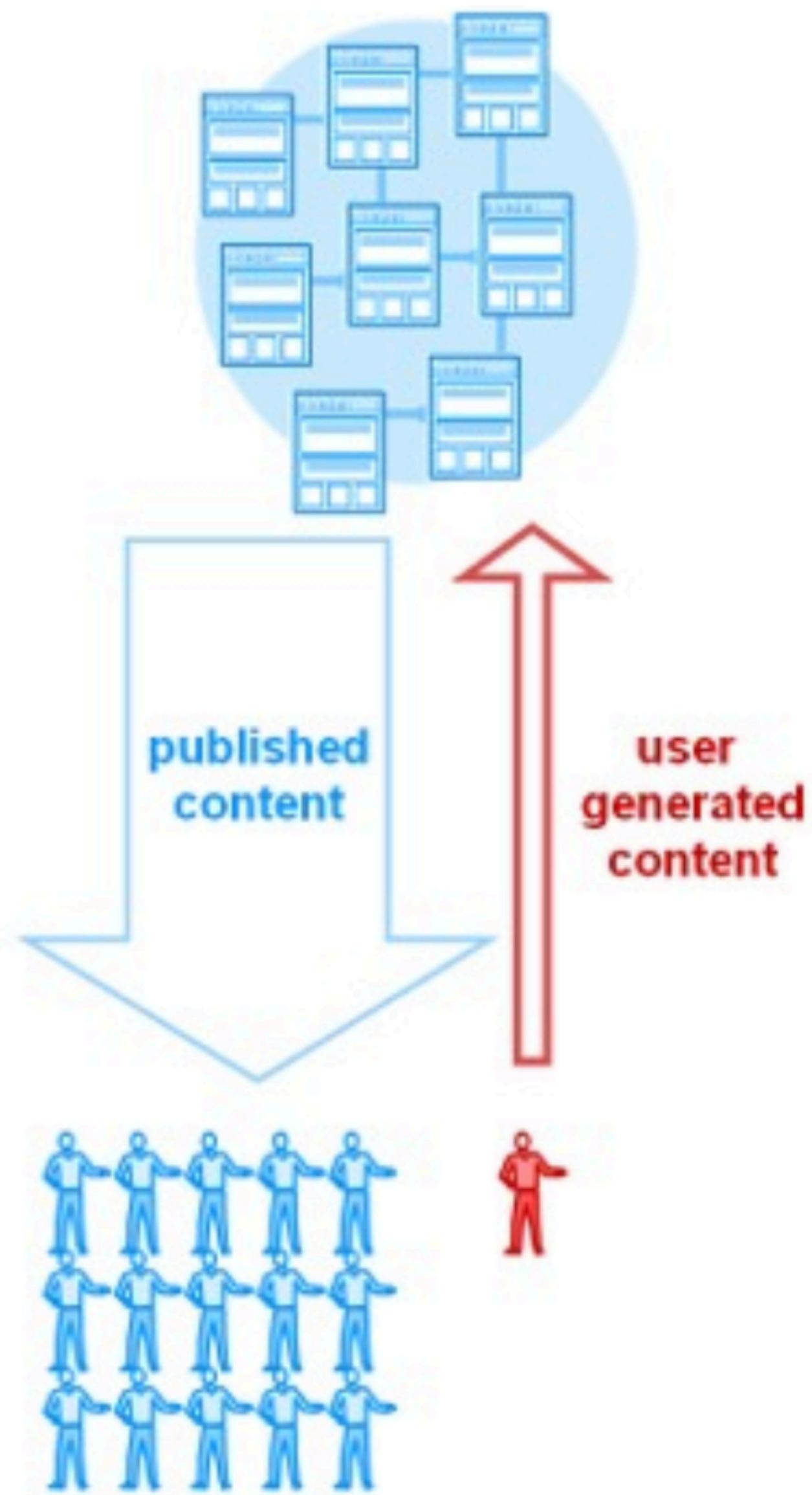


# 2006-2012



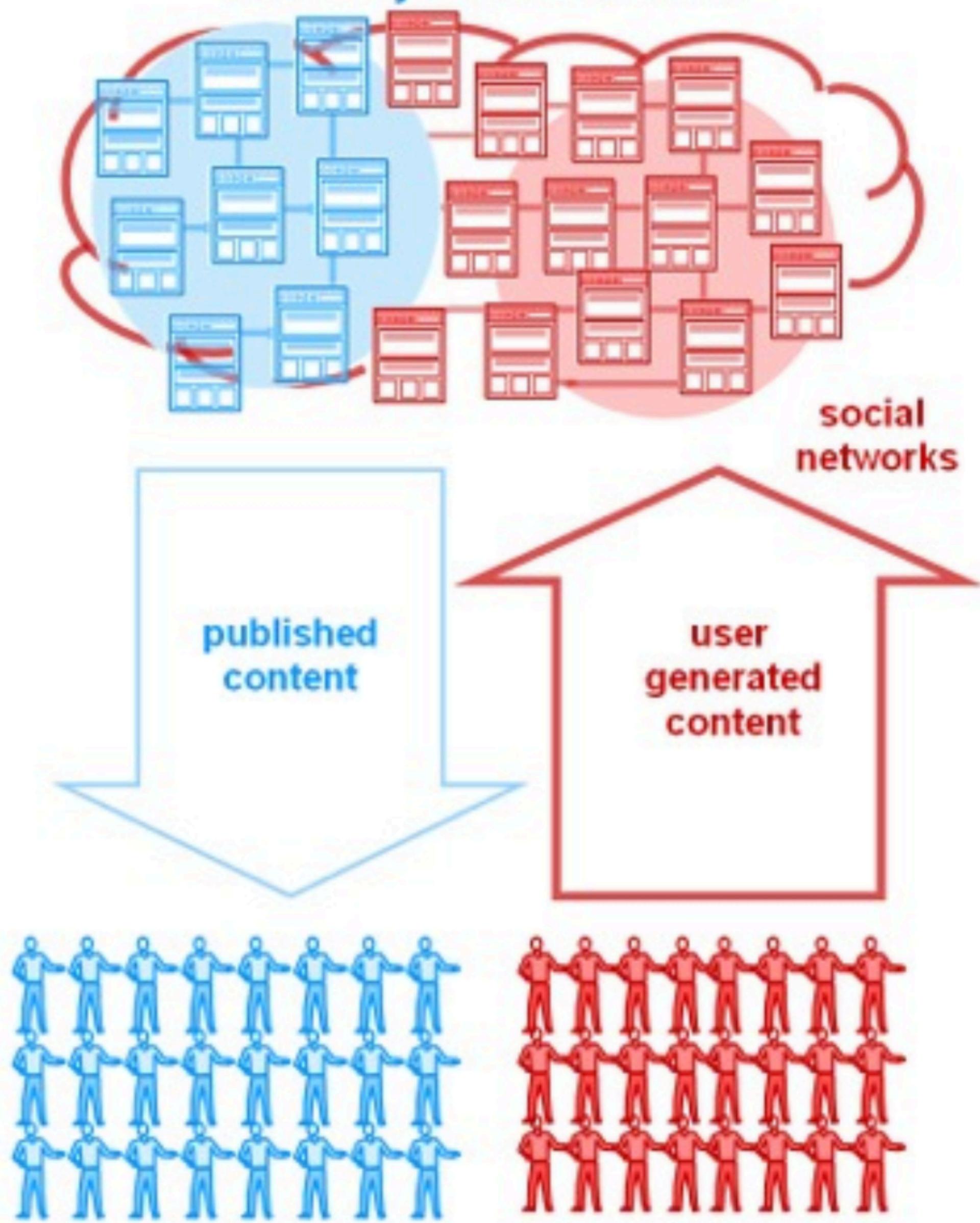
# Web 1.0

'the mostly read-only Web'

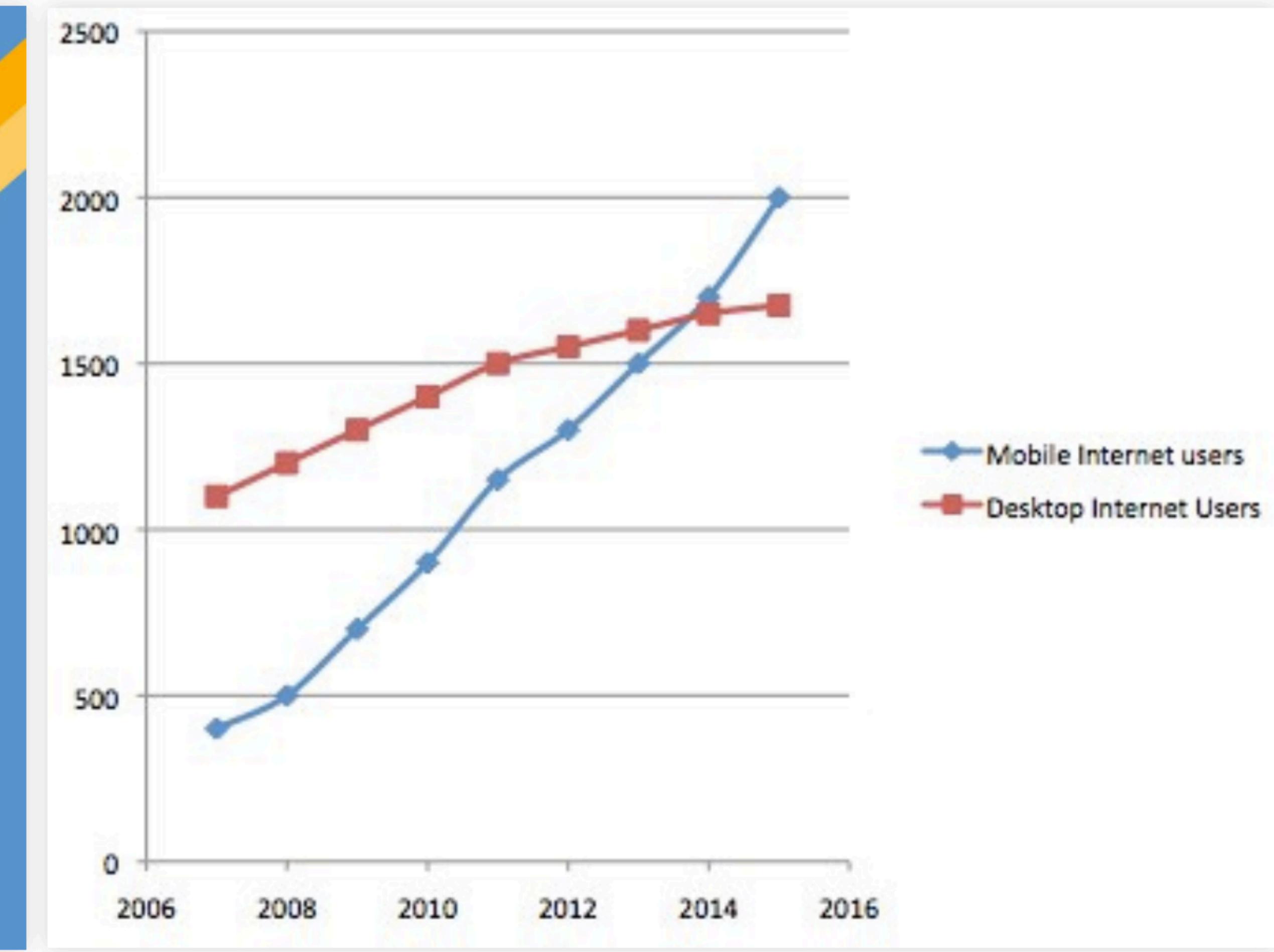


# Web 2.0

'the widely read-write Web'

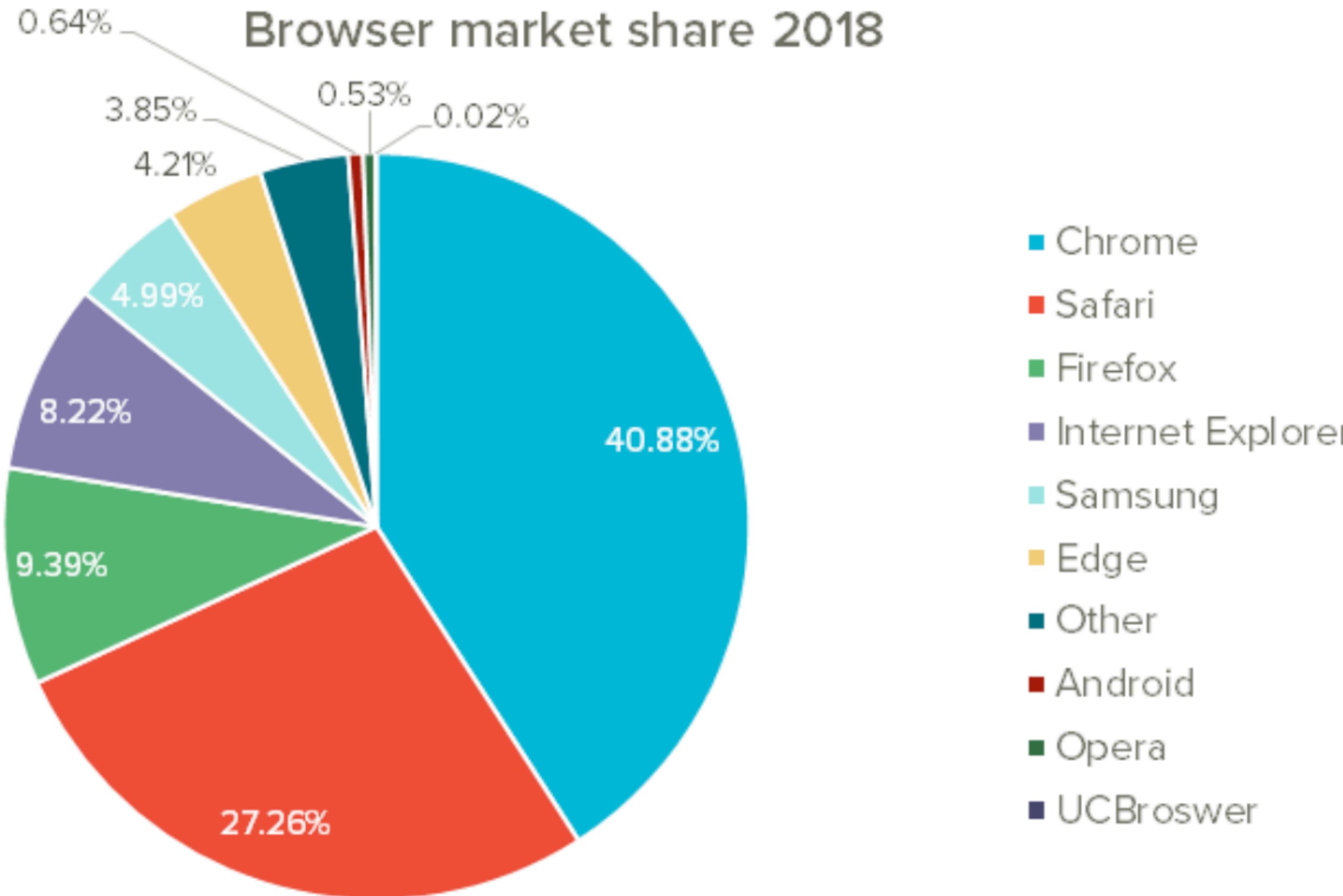


# The Mobile Revolution

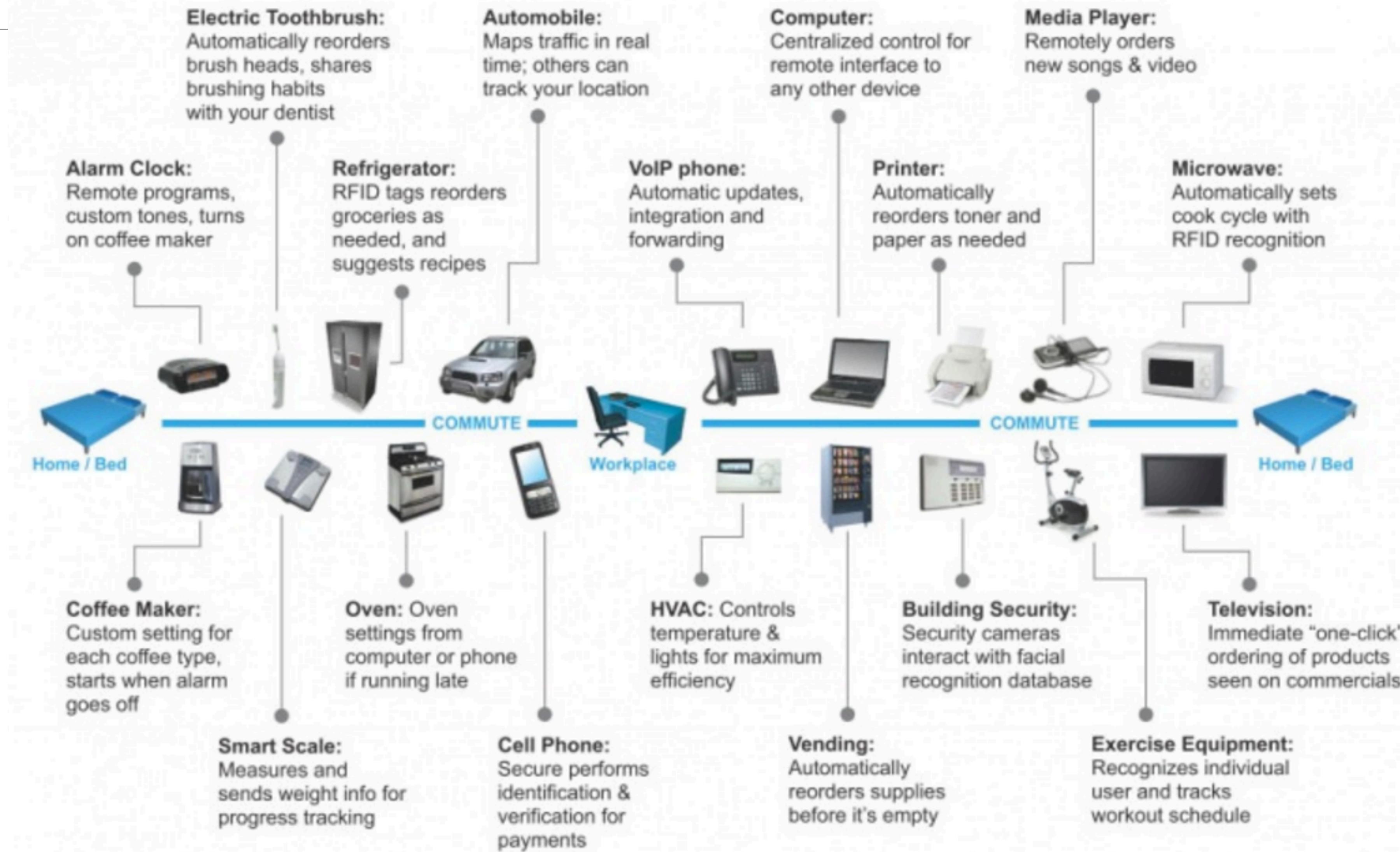


- Mobile usage of the web exceeds desktop usage

# Web Browser Wars

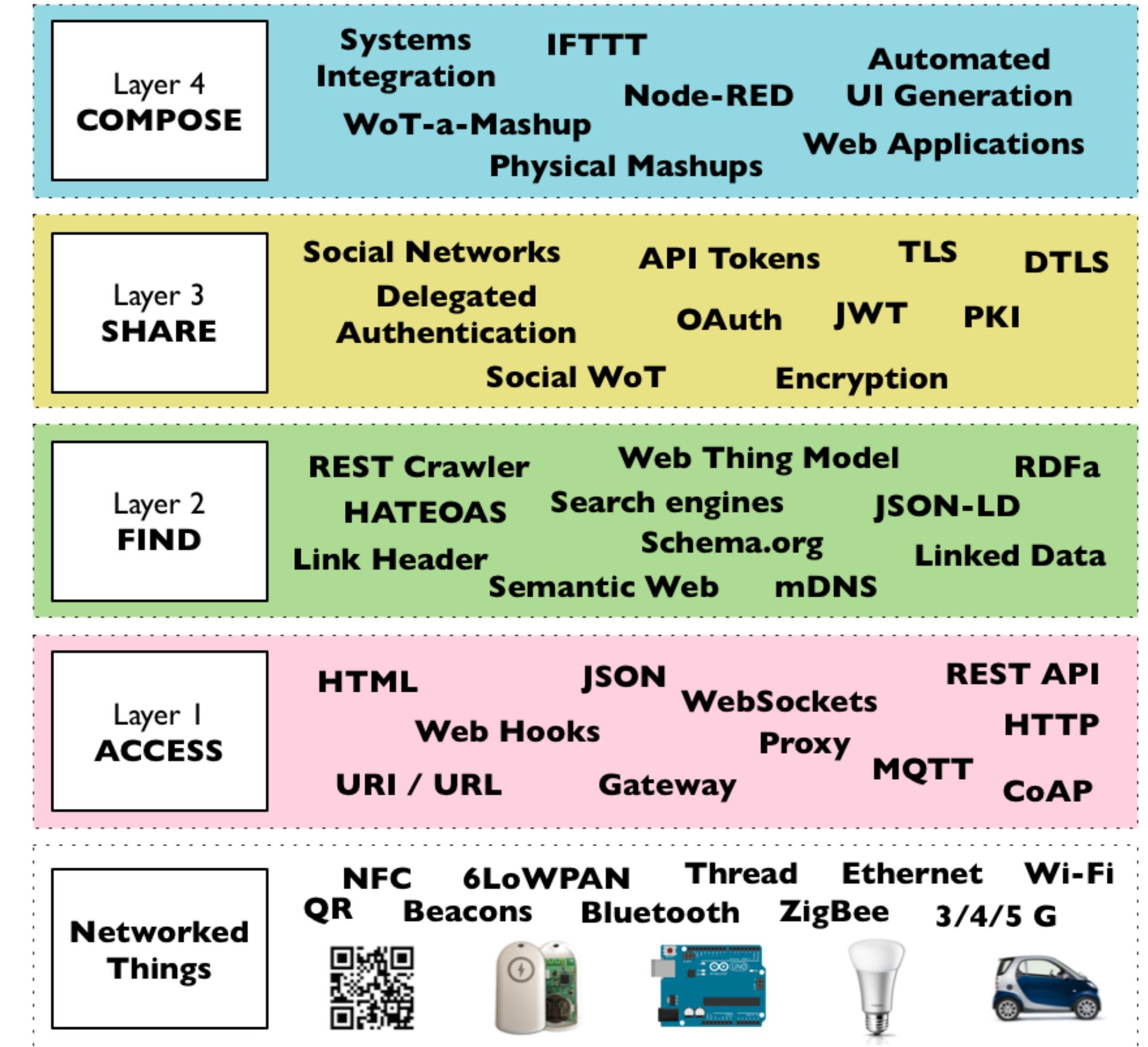


# Devices: Things!



# The Web

- Protocols & Standards
  - Protocol : agreed vocabulary to enable two programs to communicate
  - Standard: an agreed definition of the structure and meaning of a document
- Web Protocol
  - Hyper Text Transfer Protocol - HTTP
- Web Standard
  - Hyper Text Markup Language – HTML
  - Cascading Style Sheets - CSS
- Web Servers and Web Browsers use HTTP to exchange HTML documents

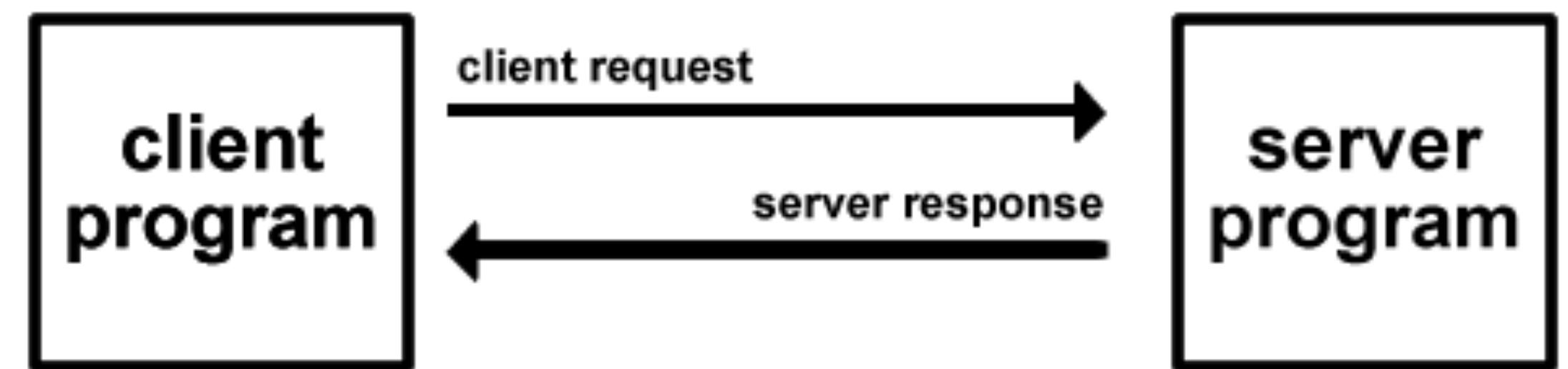


Source: Building the Web of Things: book.webofthings.io  
Creative Commons Attribution 4.0

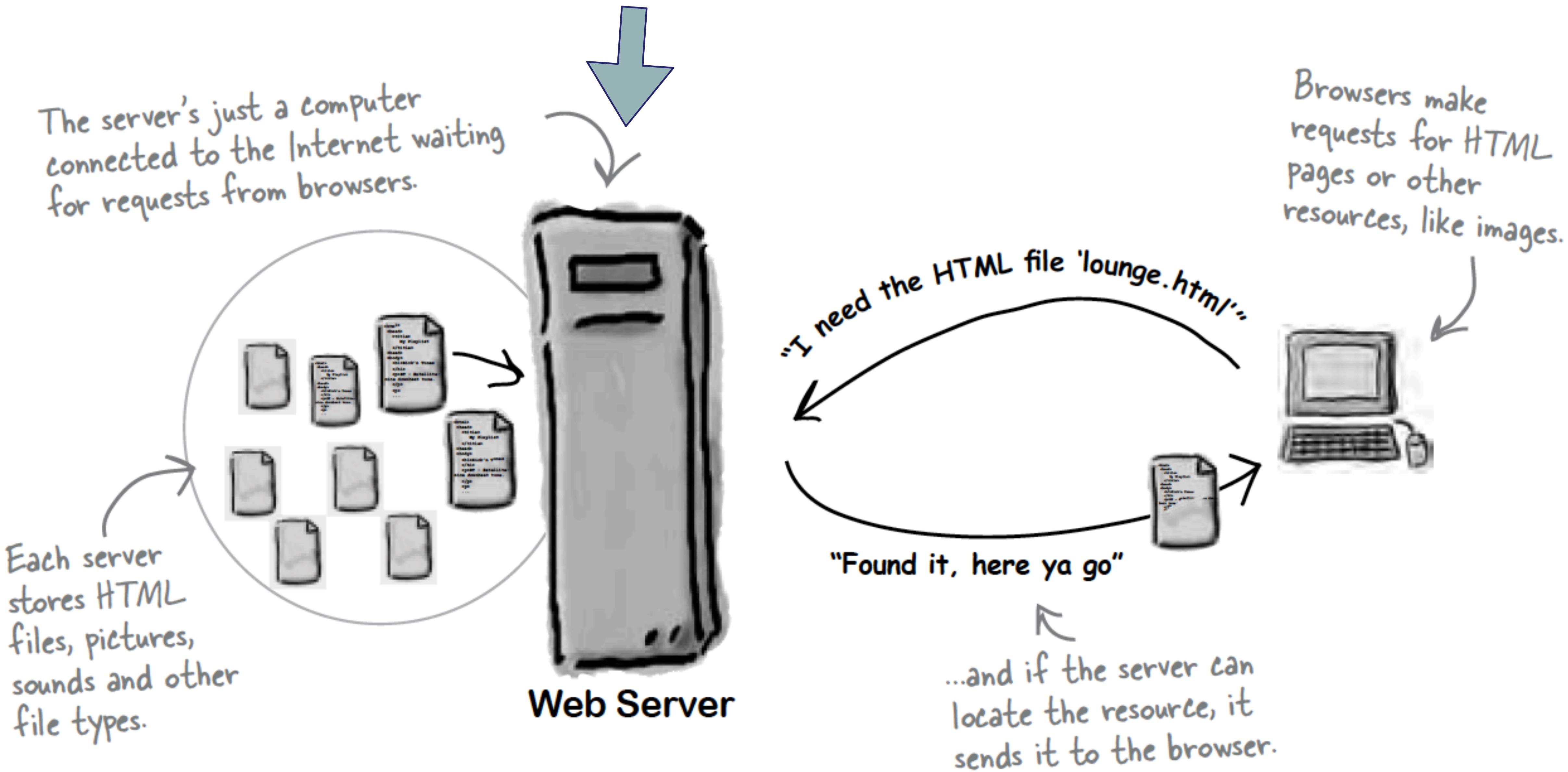
# Clients and Servers

---

- Client/Server Computing:
  - The interaction between two programs when they communicate across a network.
  - A program at one site sends a request to a program at another site and awaits a response.
  - The requesting program is called a client; the program satisfying the request is called the server.



# Role of Server

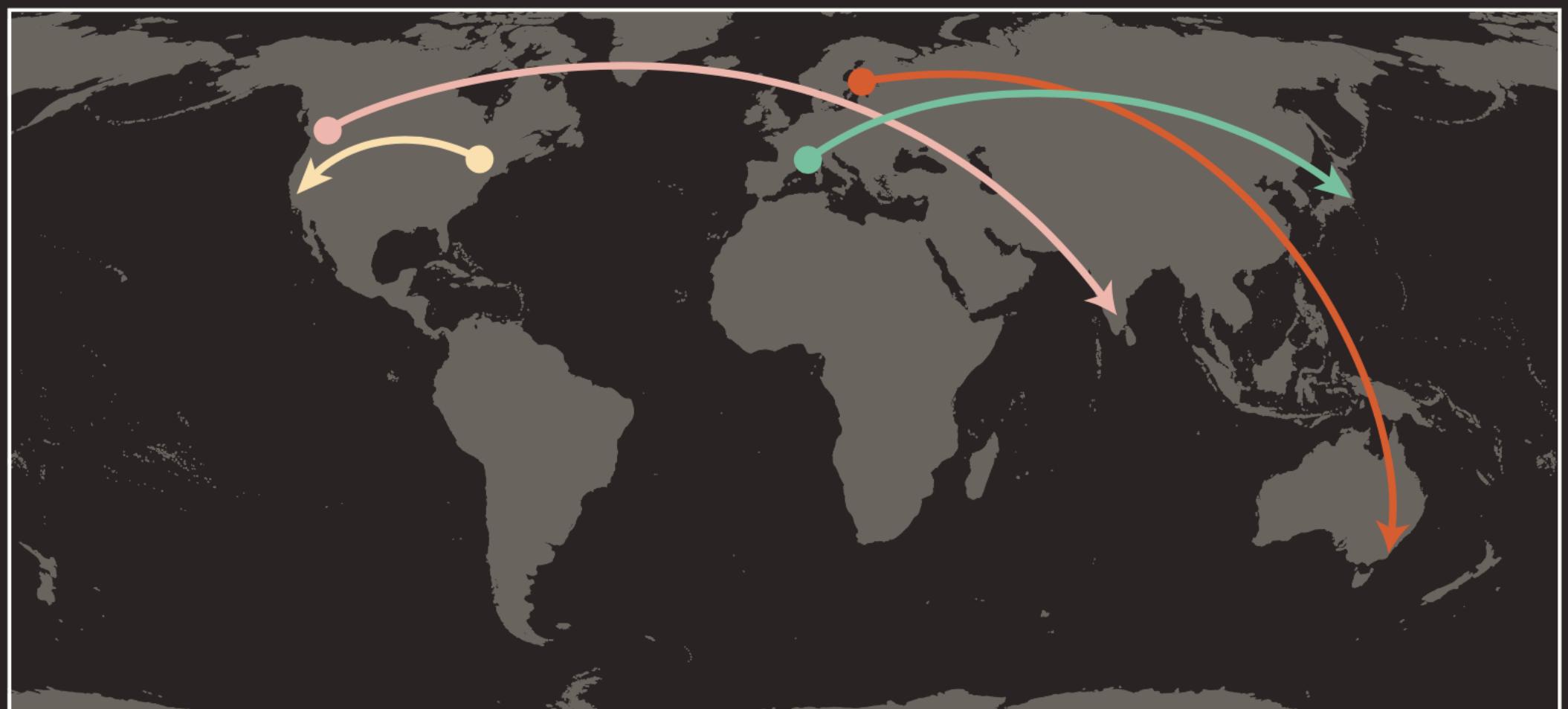


# Role of Client



# HOW THE WEB WORKS

When you visit a website, the web server hosting that site could be anywhere in the world. In order for you to find the location of the web server, your browser will first connect to a Domain Name System (DNS) server.



On this page you can see examples that demonstrate how the web server that hosts the website you are visiting can be anywhere in the world. It is the DNS servers that tell your browser how to find the website.

- A user in Barcelona visits sony.jp in Tokyo
- A user in New York visits google.com in San Francisco
- A user in Stockholm visits qantas.com.au in Sydney
- A user in Vancouver visits airindia.in in Bangalore

On the right you can see what happens when a web user in England wants to view the website of the Louvre art gallery in France which is located at www.louvre.fr. Firstly, the browser in Cambridge contacts a DNS server in London. The DNS server then tells the browser the location of the web server hosting the site in Paris.

1

When you connect to the web, you do so via an Internet Service Provider (ISP). You type a domain name or web address into your browser to visit a site; for example: google.com, bbc.co.uk, microsoft.com.

2

Your computer contacts a network of servers called Domain Name System (DNS) servers. These act like phone books; they tell your computer the IP address associated with the requested domain name. An IP address is a number of up to 12 digits separated by periods / full stops. Every device connected to the web has a unique IP address; it is like the phone number for that computer.

3

The unique number that the DNS server returns to your computer allows your browser to contact the web server that hosts the website you requested. A web server is a computer that is constantly connected to the web, and is set up especially to send web pages to users.

4

The web server then sends the page you requested back to your web browser.

A map of Europe with a red circle highlighting the United Kingdom. Inside the circle, 'Cambridge' and 'LONDON' are labeled. From London, a red arrow points west towards France, where 'PARIS' is labeled. Another red arrow points from Paris back towards the UK, indicating the return path of the web request.