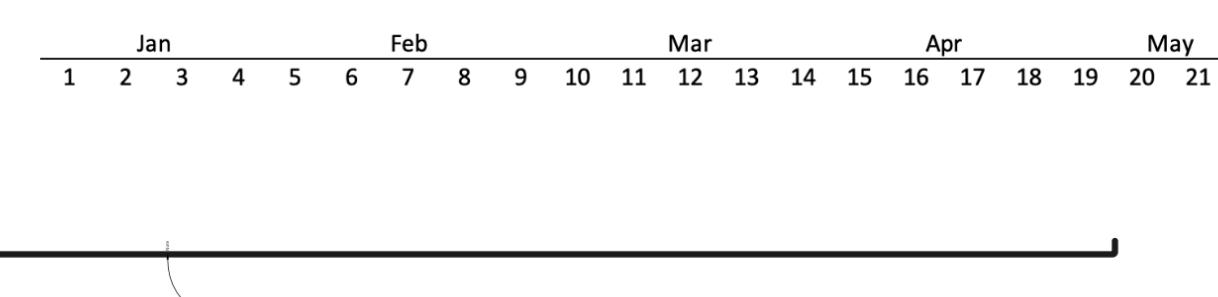
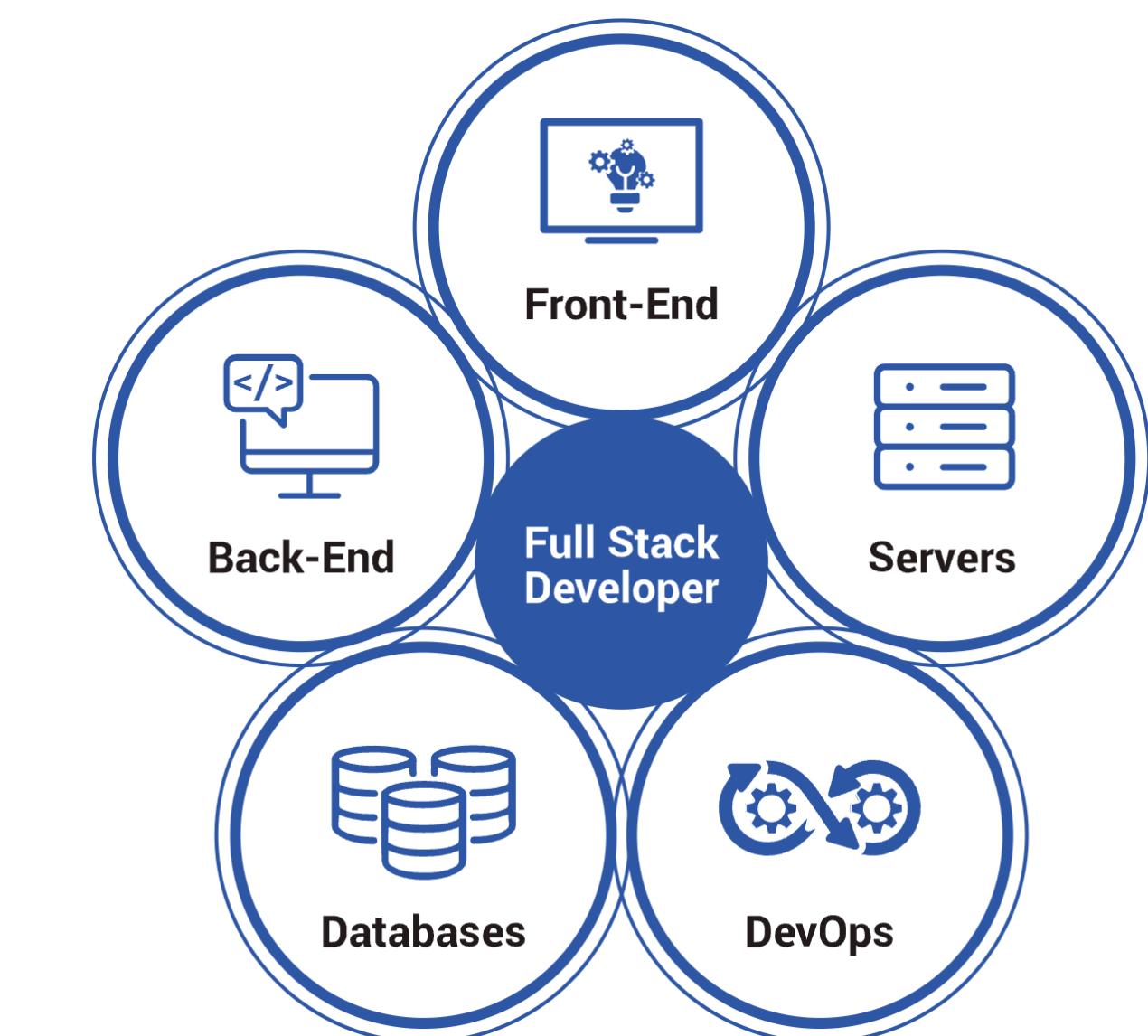
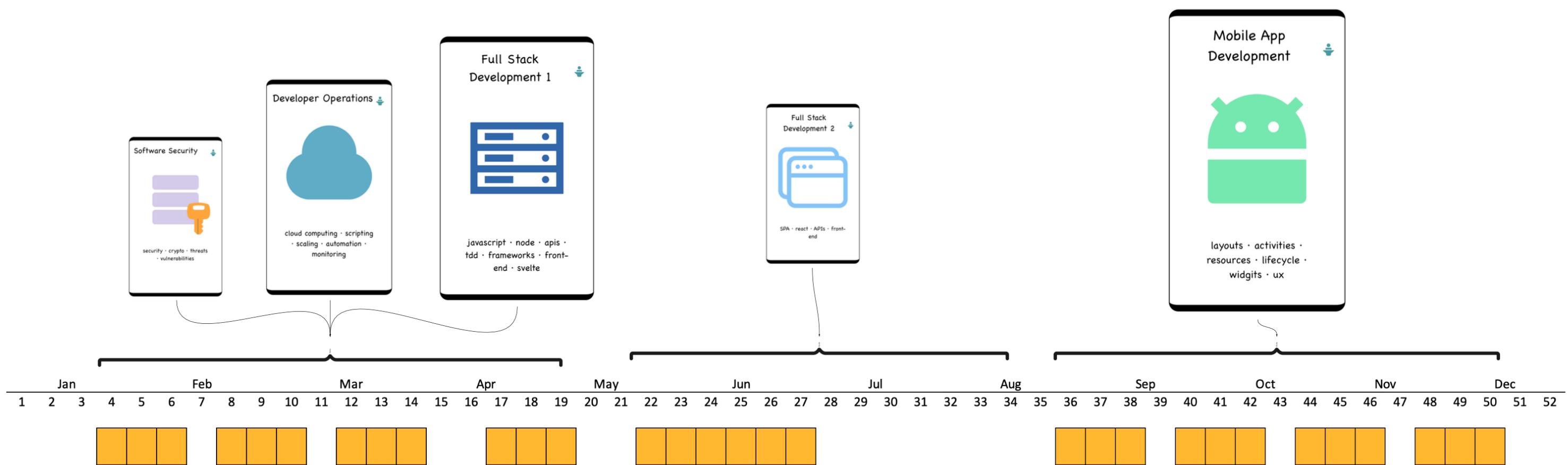
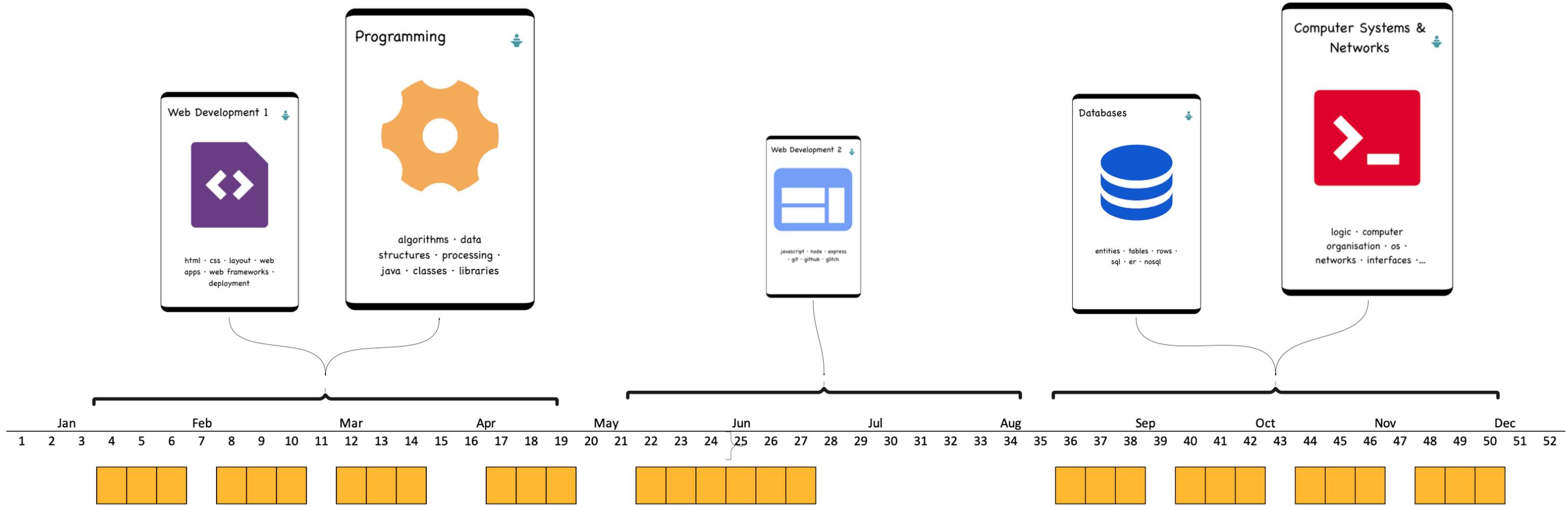


The Internet & the Web



The nature of the Internet &
the web: fundamental
characteristics



Agenda

Code

The Internet

The Web

CODE is the FOCUS

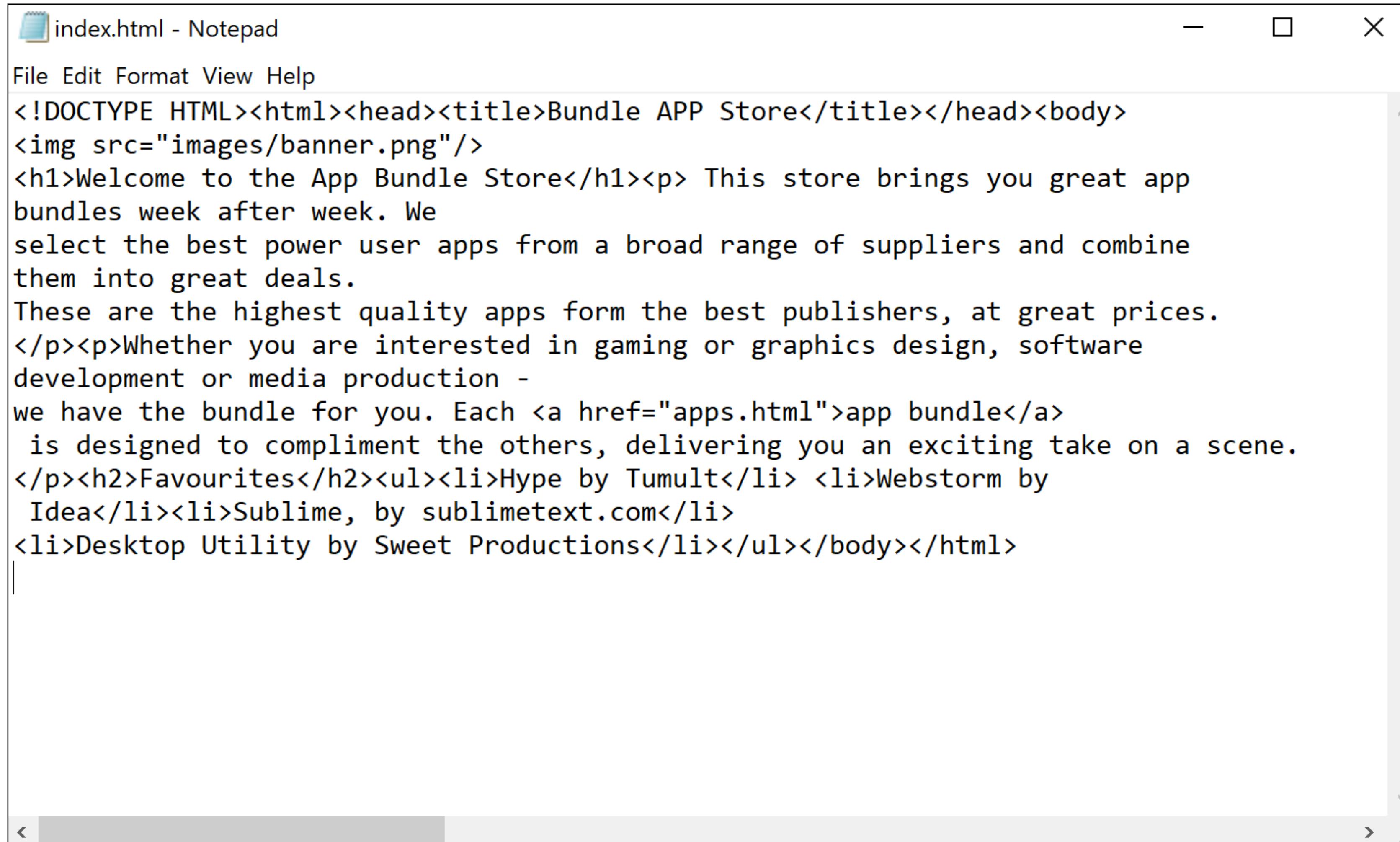
- The language of the Web:
 - Hypertext Markup Language - HTML
 - Cascading Style Sheets - CSS
- Build over successive labs a simple web sites from scratch.
- Focus on the structure and meaning of:

CODE *- html, css*



```
<html>
<head id="html_head">
  <title>website</title>
  <script type="text/javascript">
    pageNow = new Date();
  </script>
```

The Code in a Conventional Editor



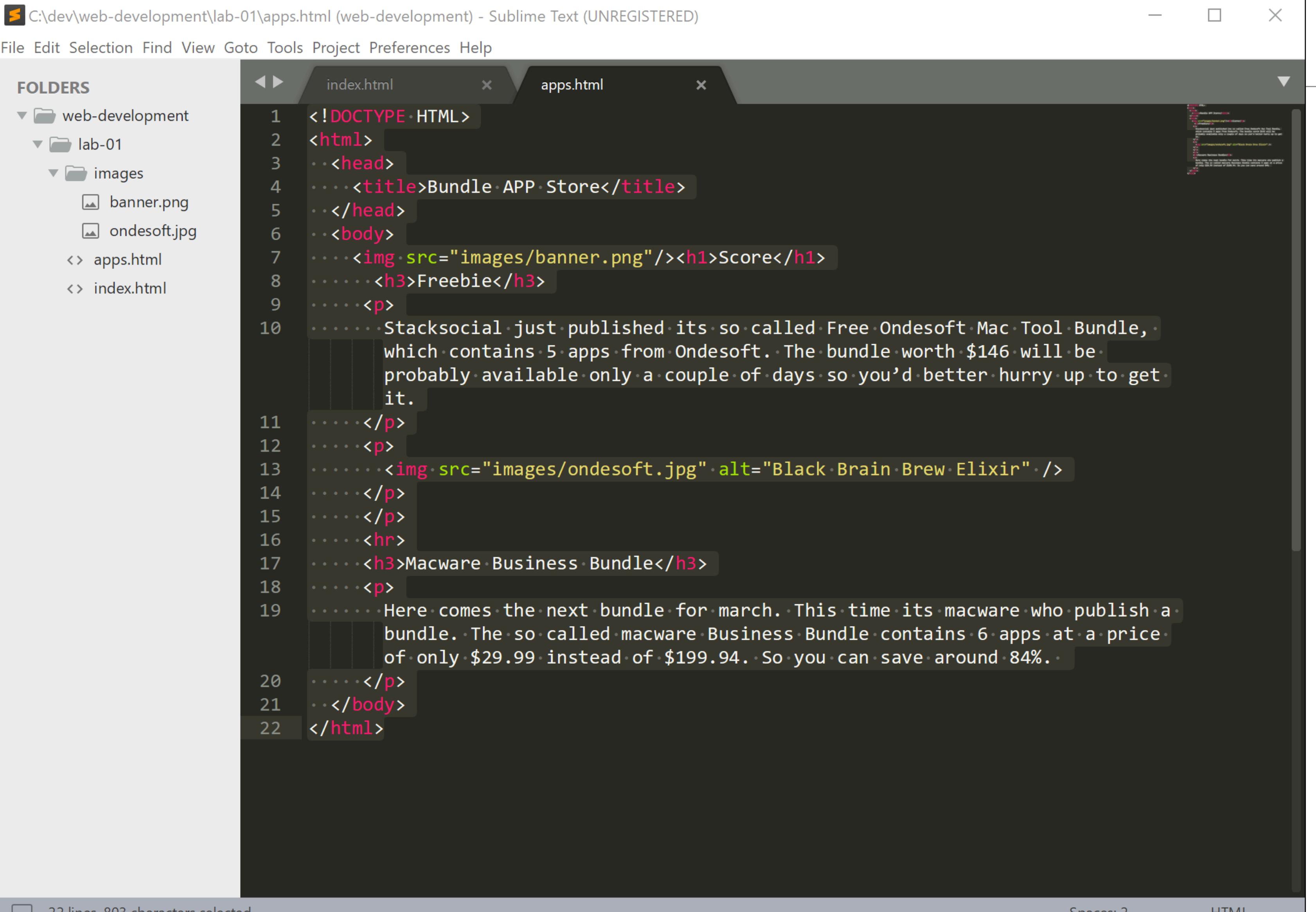
A screenshot of a Windows Notepad window titled "index.html - Notepad". The window contains the following HTML code:

```
<!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



A screenshot of the Sublime Text code editor interface. The title bar shows "C:\dev\web-development\lab-01\apps.html (web-development) - Sublime Text (UNREGISTERED)". The menu bar includes File, Edit, Selection, Find, View, Goto, Tools, Project, Preferences, and Help. On the left is a sidebar titled "FOLDERS" showing the project structure: "web-development" contains "lab-01", which contains "images" (with files "banner.png" and "ondesoft.jpg") and "apps.html" and "index.html". The main editor area displays the contents of "apps.html". The code is as follows:

```
1 <!DOCTYPE HTML>
2 <html>
3   <head>
4     <title>Bundle APP Store</title>
5   </head>
6   <body>
7     <h1>Score</h1>
8     <h3>Freebie</h3>
9     <p>
10       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.
11   </p>
12   <p>
13     
14   </p>
15   <p>
16   <hr>
17   <h3>Macware Business Bundle</h3>
18   <p>
19     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%.
20   </p>
21   </body>
22 </html>
```

The status bar at the bottom indicates "22 lines, 803 characters selected" and "Spaces: 2 HTML".

- Same document - pleasingly indented and syntax highlighted

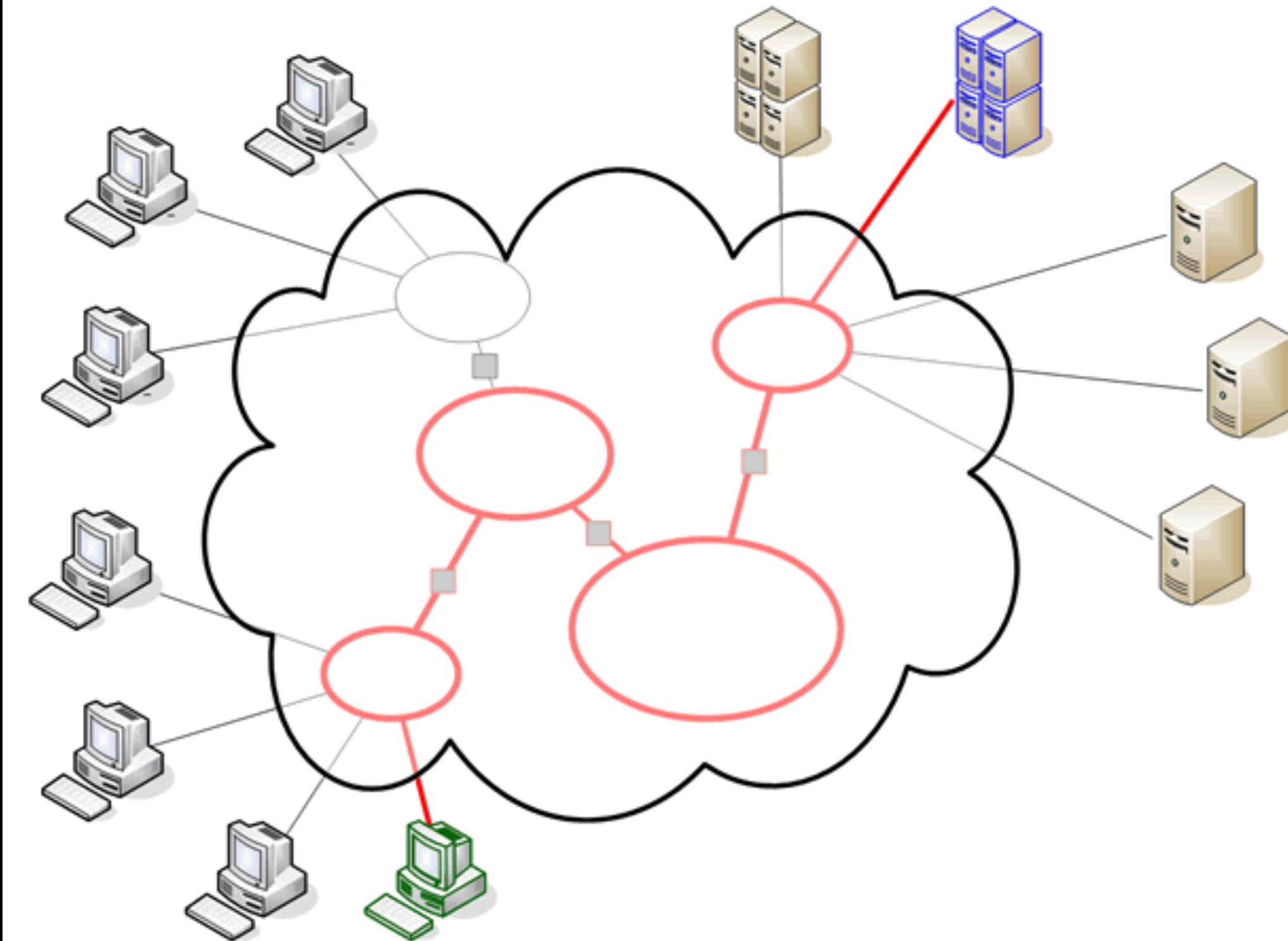
Agenda

Code

The Internet

The Web

The Internet



The Internet

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



4,801,463,884

Internet Users in the world



1,830,490,529

Total number of Websites



145,240,016,552

Emails sent **today**



4,157,854,579

Google searches **today**



4,001,704

Blog posts written **today**



435,137,516

Tweets sent **today**



4,103,371,297

Videos viewed **today**
on YouTube



48,843,983

Photos uploaded **today**
on Instagram



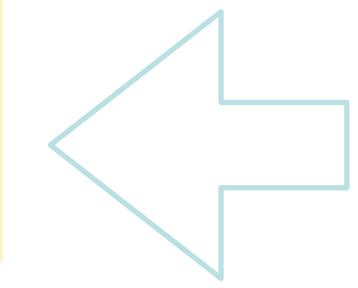
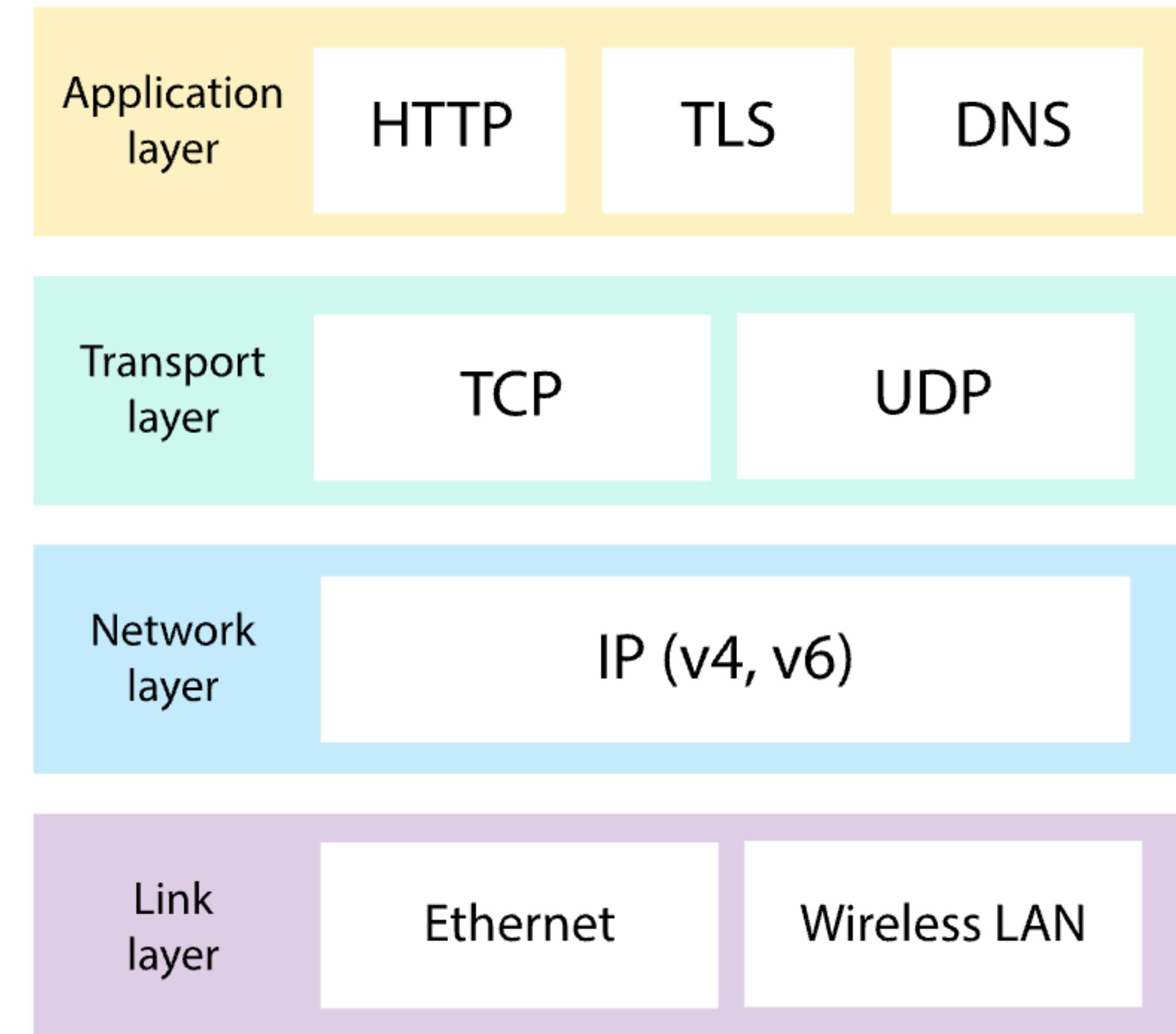
85,258,425

Tumblr posts **today**

Underlying nature of the Internet - Protocols & Standards

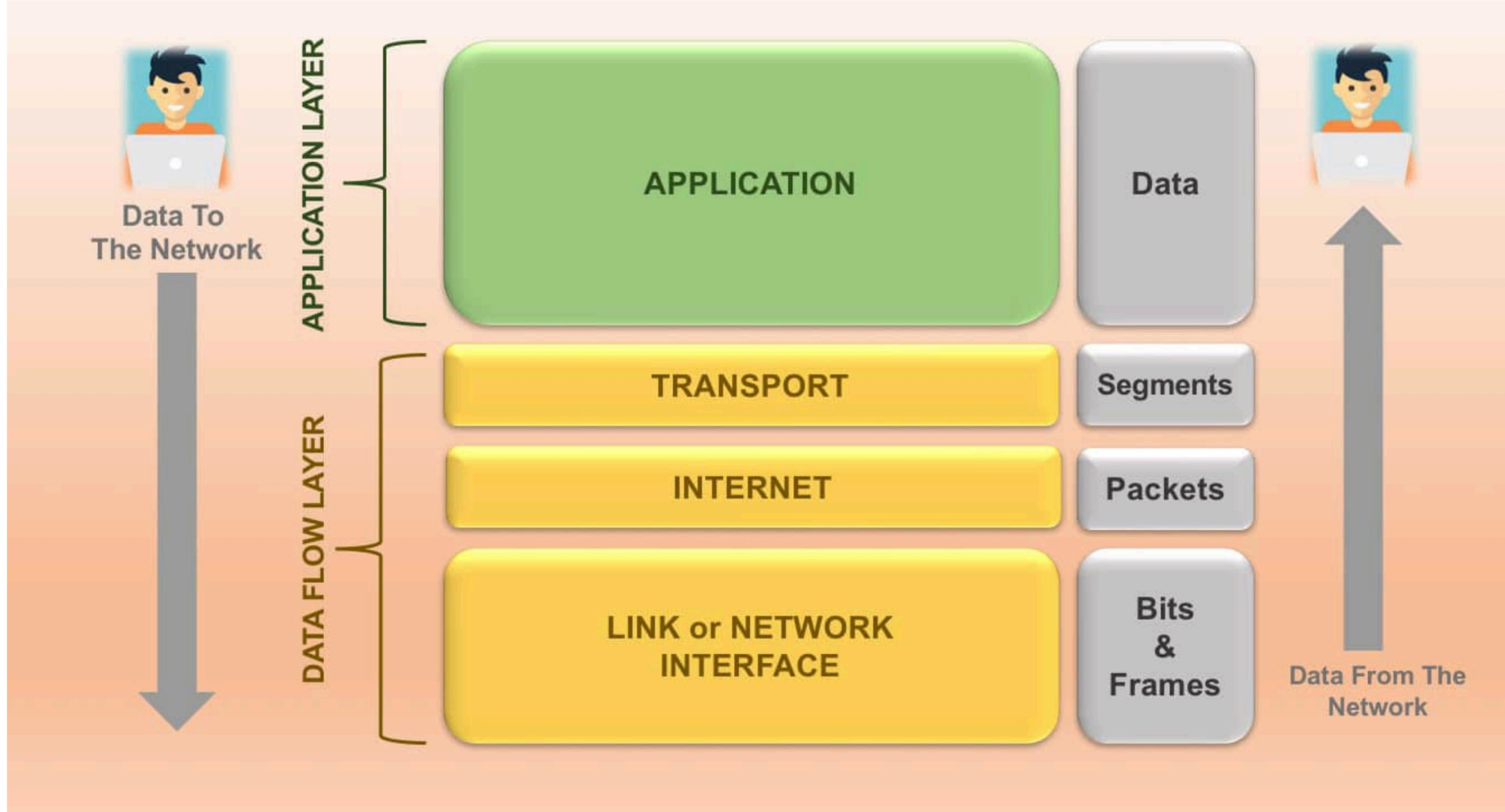
“The irony is that in all its various guises -- commerce, research, and surfing -- the Web is already so much a part of our lives that familiarity has clouded our perception of the Web itself.”

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



You
are
here!
HTTP

*Internet
Technologies*



Agenda

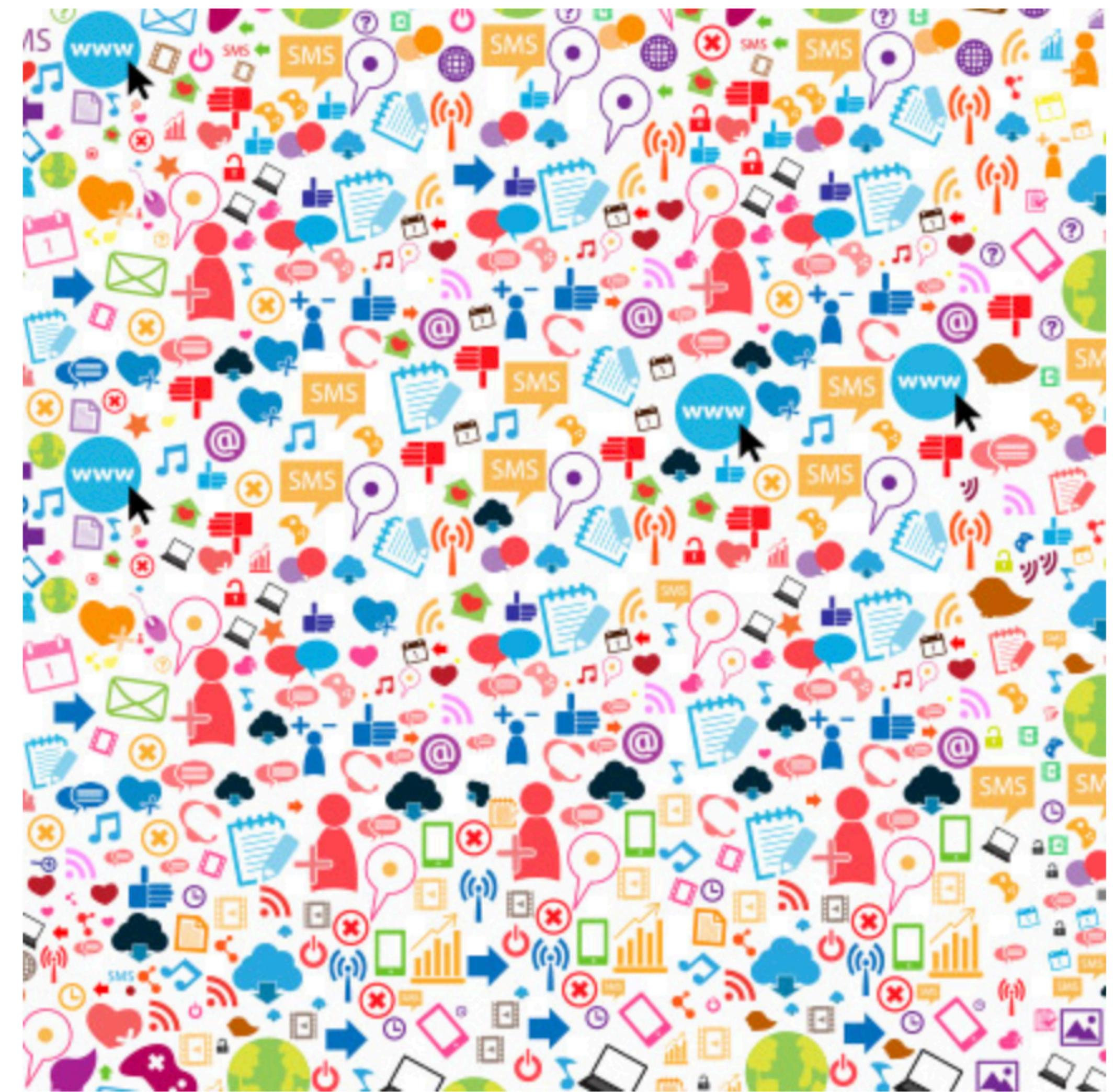
Code

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





**Did you think that the
World Wide Web and the
Internet are the same?**

Think again!

Here is the difference.

INTERNET

It is a series of computer networks that allows multiple devices to connect and communicate with each other globally

WORLD WIDE WEB

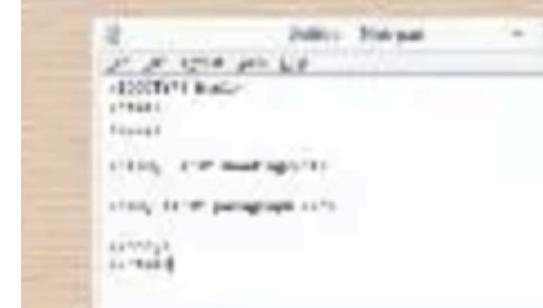
It is a layer on the internet that uses different protocols

The Evolution of the World Wide Web

THREE PROTOCOLS OF THE WORLD WIDE WEB

1. HTML

It is the language in which web pages are written



2. HTTP

The most common protocol developed specifically for the World Wide Web

http://

3. URL

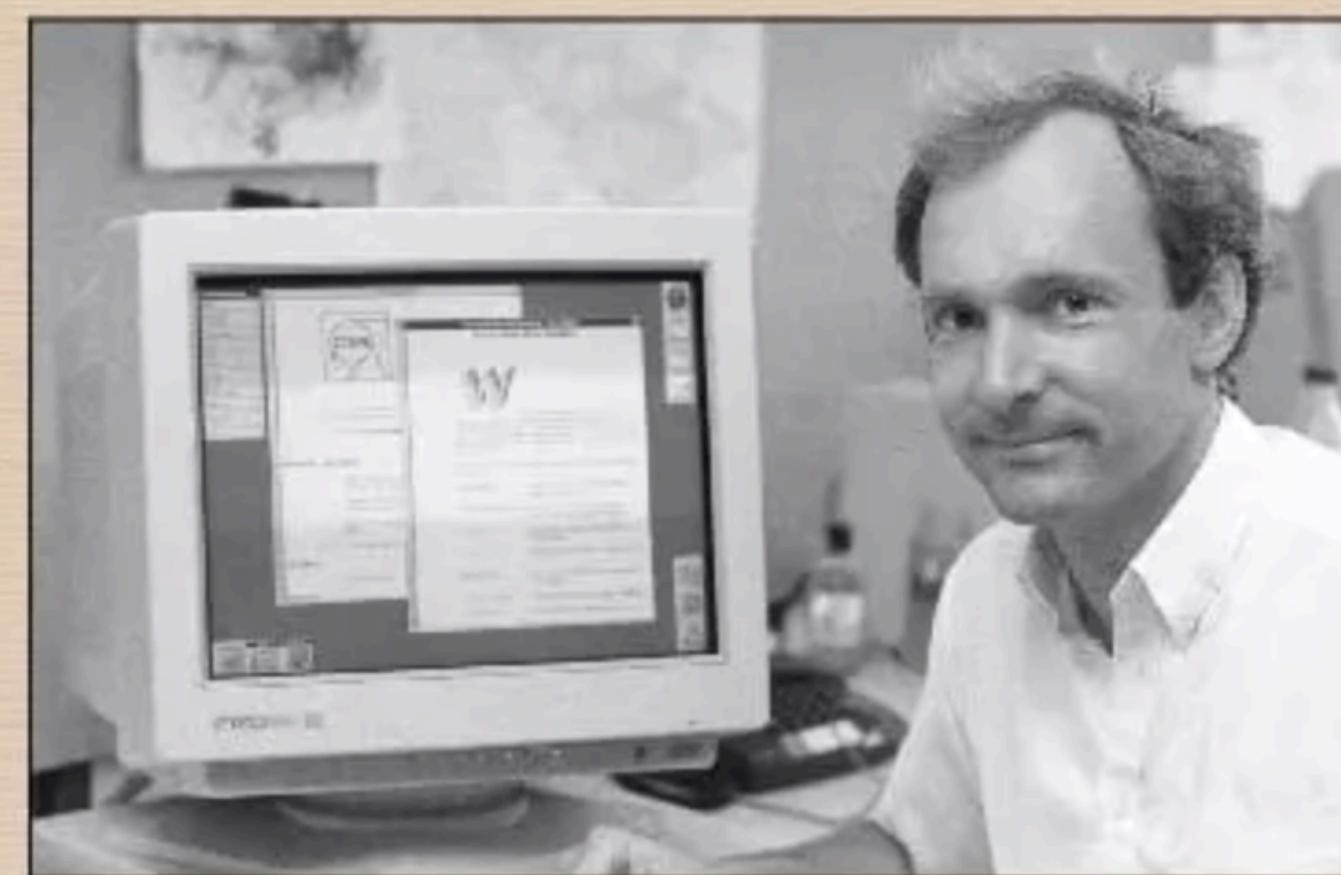
Uniform Resource Locator is the address that indicates where a given document resides on the web

Now that we are well versed with the basics, let's move forward and learn about the evolution of the World Wide Web



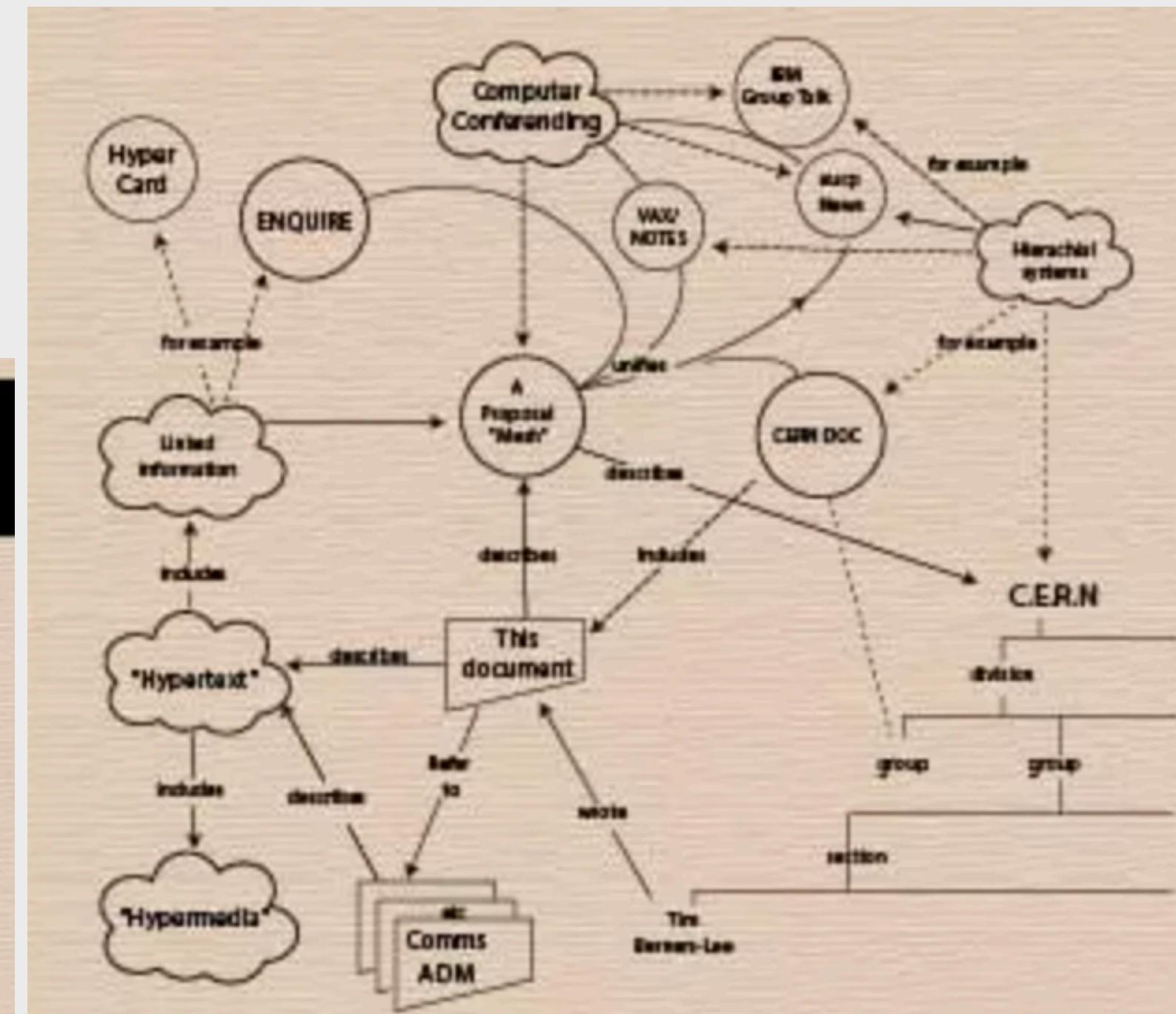
Grazitti Interactive®

Marketing for Digital Natives



1980

The real vision and execution happened in the 1980s



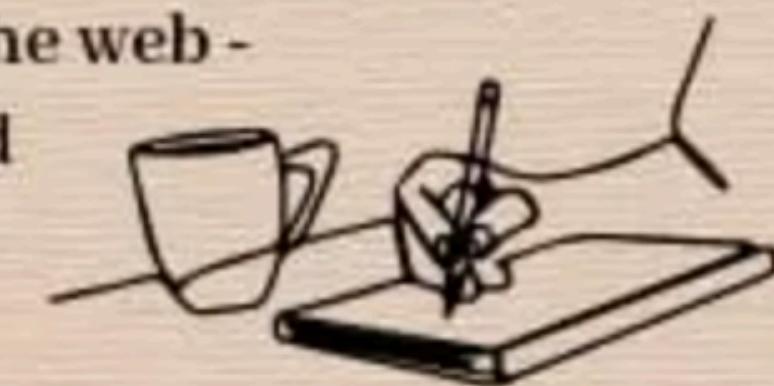
By the end of 1990, Tim joined forces with a physicist Robert Cailliau and rewrote the original proposal

Tim Berners Lee started working on a project called 'Enquire'

Enquire was just a database of people and software who worked at the same place as Lee

By 1989, Tim drafted a document titled 'Information Management:A Proposal', that shared his vision of the World Wide Web

Tim developed the three major components of the web - HTTP, HTML and the world's first web browser

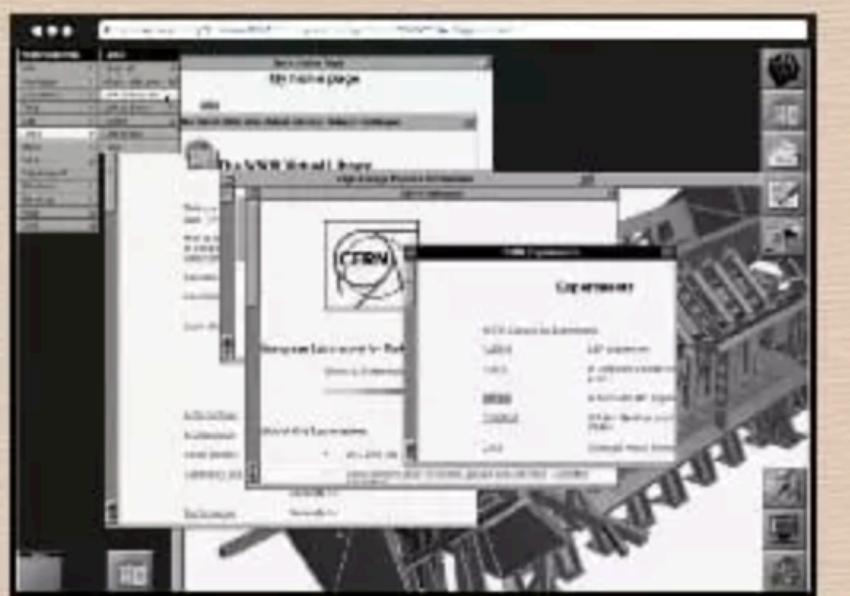


1990-1995

Taking Baby Steps

The birth of web browsers

Tim created the **world's first web browser** called WorldWideWeb for NeXT computer by 1990 and introduced it to his colleagues at **CERN** in 1991.



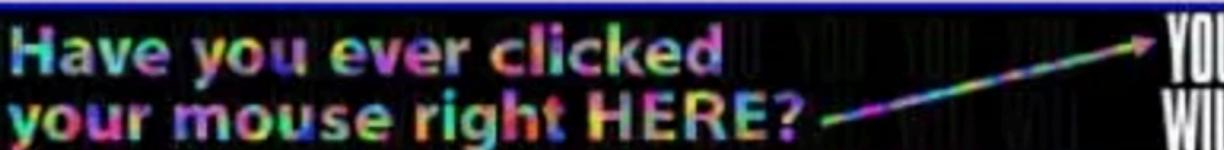
World's first website



the website is still accessible today.

<https://www.w3.org/History/19921103-hypertext/hypertext/WWW/TheProject.html>

1994



AT&T released the first banner ad online in October

January

YAHOO!

Jerry Yang and David Filo registered the Yahoo! Domain

April

Netscape

Jim Clark and Marc Andreessen co-founded Netscape

October

W3C

Berners Lee founded World Wide Web Consortium (W3C) to develop protocols and guidelines to ensure the growth of the internet

New web browsers were also released during this period.

Each web browser brought new improvements.

Let's take a look at some of them

BROWSERS

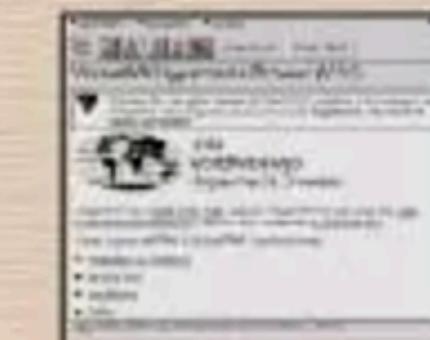
1992

February



Line Mode Browser

March



Viola WWW Browser

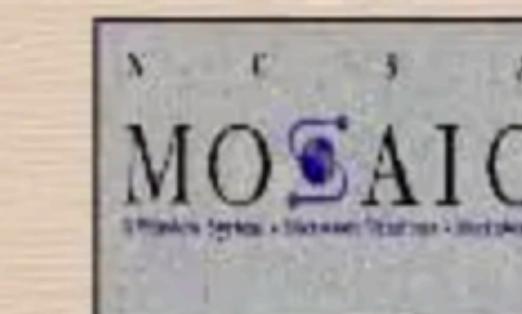
1993

June



Cello Browser

January



Mosaic Browser

1995

April

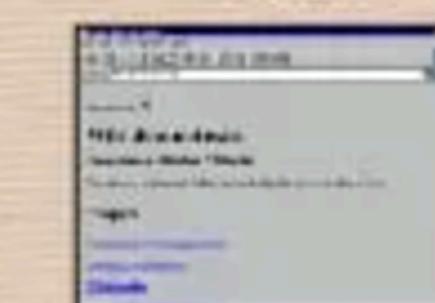


Netscape Navigator 1.1

August



Opera 1.0



Internet Explorer 1.0

Total Internet Users till 1994 – 44.4 Million

1995-2000

World Wide Web becomes mainstream attraction

Enter JavaScript and CSS!



First announced in August 1995 as code name 'Mocha'

Its addition to the World Wide Web was not fully supported by many including Robert Cailliau.

He described it as 'the most horrible kluge – (a software or hardware configuration that, while inelegant, inefficient, clumsy, or patched together, succeeds in solving a specific problem or performing a particular task.) in the history of computing'

N It came as an addition in Netscape Navigator 2

Even with users having reservations about it, JavaScript paved the way for a more dynamic and interactive web

After JavaScript, CSS brought style and look of the web



September
AuctionWeb (now known as eBay) was launched

1995

CSS1 was introduced



January
World's first meme Baby Cha Cha became a viral trend and spread via email

1996

It became an official recommendation of W3C



June
Peep-to-Peer file sharing became popular with Napster's release that peaked close to 80 million users



September
WiFi was introduced to the public by the Institute of Electrical and Electronics Engineers

1998

September
A research project in 1996 was incorporated into a private company named Google



1999

June
Google – still a startup at the time receives a 25 million equity funding

August
Blogger was launched as a blogging platform



March
Internet Explorer 5 was the first web browser to support CSS1 specification

2000

Total number of internet users till 2000

412.8 million

The Rise and Fall of the Dot Com Bubble

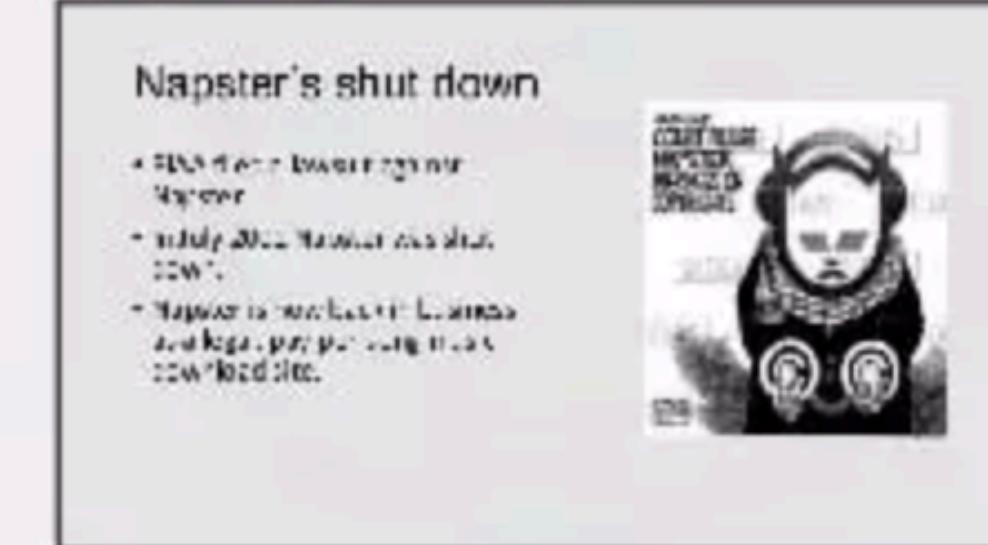
2000-2005

The dot com bubble at a glance

- The business changed its focus towards the web
- Investors threw money in any idea related to the web and stock prices soared
- This boom marked the commercial growth of the World Wide Web
- Investors overlooked business fundamentals and relied on advancements in technology
- The dot com bubble burst between 2000-2001

July

Recording companies like A&M Records filed a lawsuit against Napster and the service was shut down



The after effect

Only 49% dot com businesses founded since 1996 were operational by March 2000

2000 

Google launched AdWords (now Google Ads) to compete with GoTo.com



2000

Recession in Japan triggered the 'dot com bubble' to burst and stocks were sold off

2001

January

Wikipedia was launched by Jimmy Wales and Larry Sanger



● 2001- 2005

● All Social Media websites



2001

October

Adrian Scott founded ryze.com a predecessor to LinkedIn – as a new generation social networking platform



2002

March

Friendster, another social networking platform was launched



September

Phoenix (now Firefox) beta version was released by the Mozilla Organization



2003

May

WordPress and LinkedIn were launched



August

Myspace was launched and became one of the largest social networking platforms

Race to become the best social network begins

2004

February



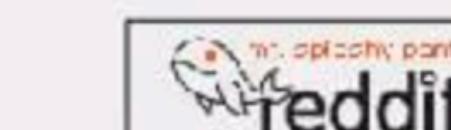
Facebook was launched with limited access to students in the US and Canada until 2006

2005



February

Former PayPal employees launched YouTube



June

Reddit was launched by Steve Huffman and Alexis Ohanian after meeting with Paul Graham

Total number of internet users till 2005

1.02 Billion



World Wide Web goes mobile (2005-2010)

2006

March

Twitter was founded in March but was made available to the public in July



May

Pirate Bay's servers were raided and taken over by Swedish Police



2007

June

World's first iPhone was launched and revolutionized mobile web



August

Hashtags '#' became a thing



November

Facebook ads was introduced to allow brands to target users based on demographics



2008

July

iOS App Store was launched with 500 apps initially



September

The first version of Google Android OS was released



October

Android Market (now Play Store) was launched

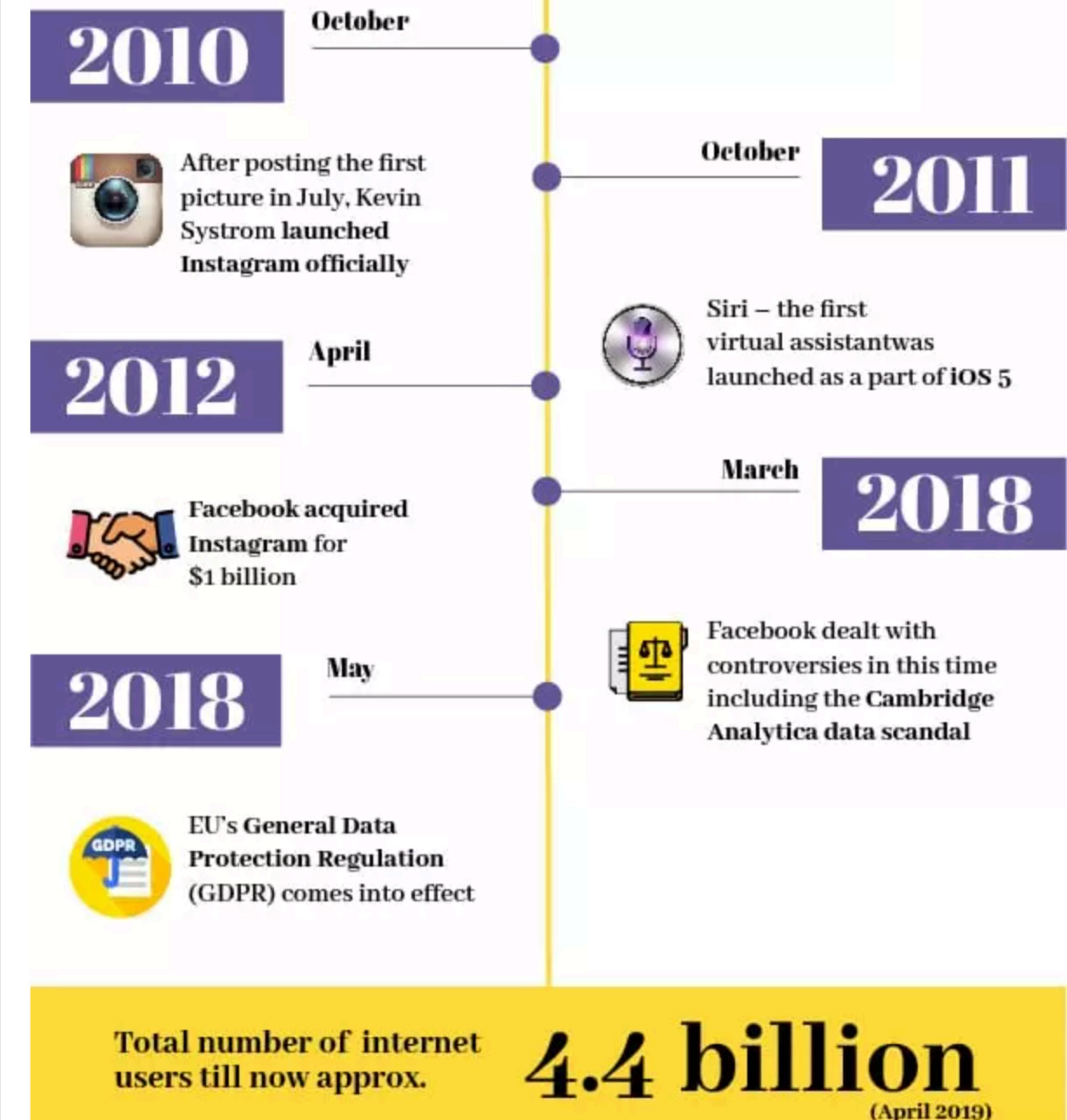


Total number of internet users till 2010

1.9 Billion

Paradigm Shift

2010 – Present

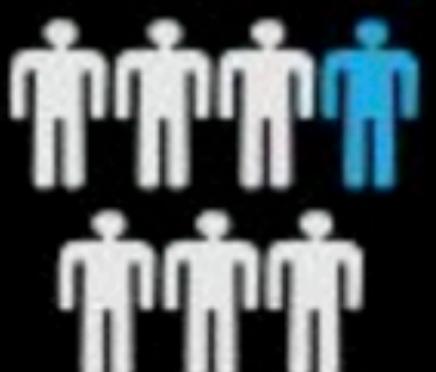


Web 1.0

100,000 websites
(read-only Web)



published content
↔ user-generated content



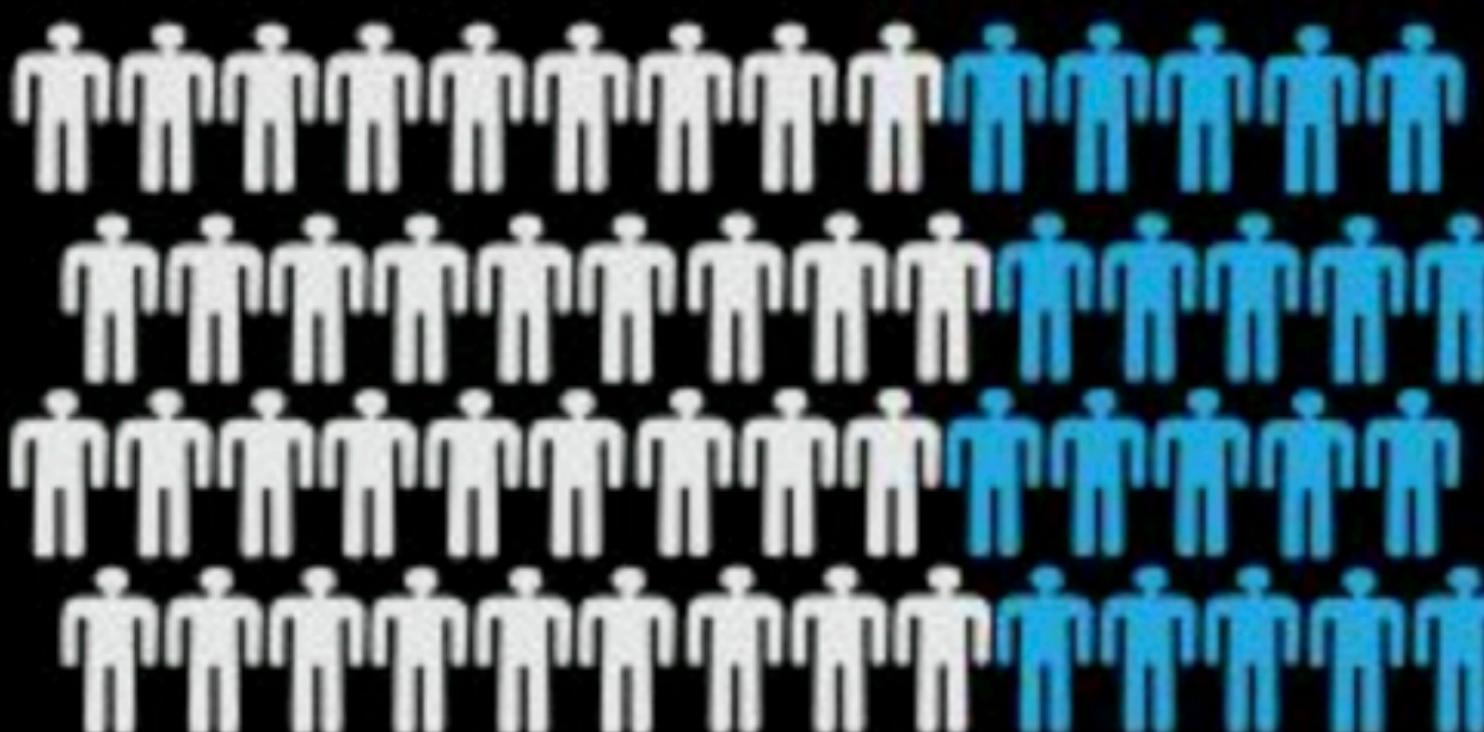
50,000,000 users

Web 2.0

100,000,000 websites
(read-write Web)



published content
↔ user-generated content



1,000,000,000 users

Web 3.0

1,000,000,000 websites
(read-write Web)



published content
↔ user-generated content

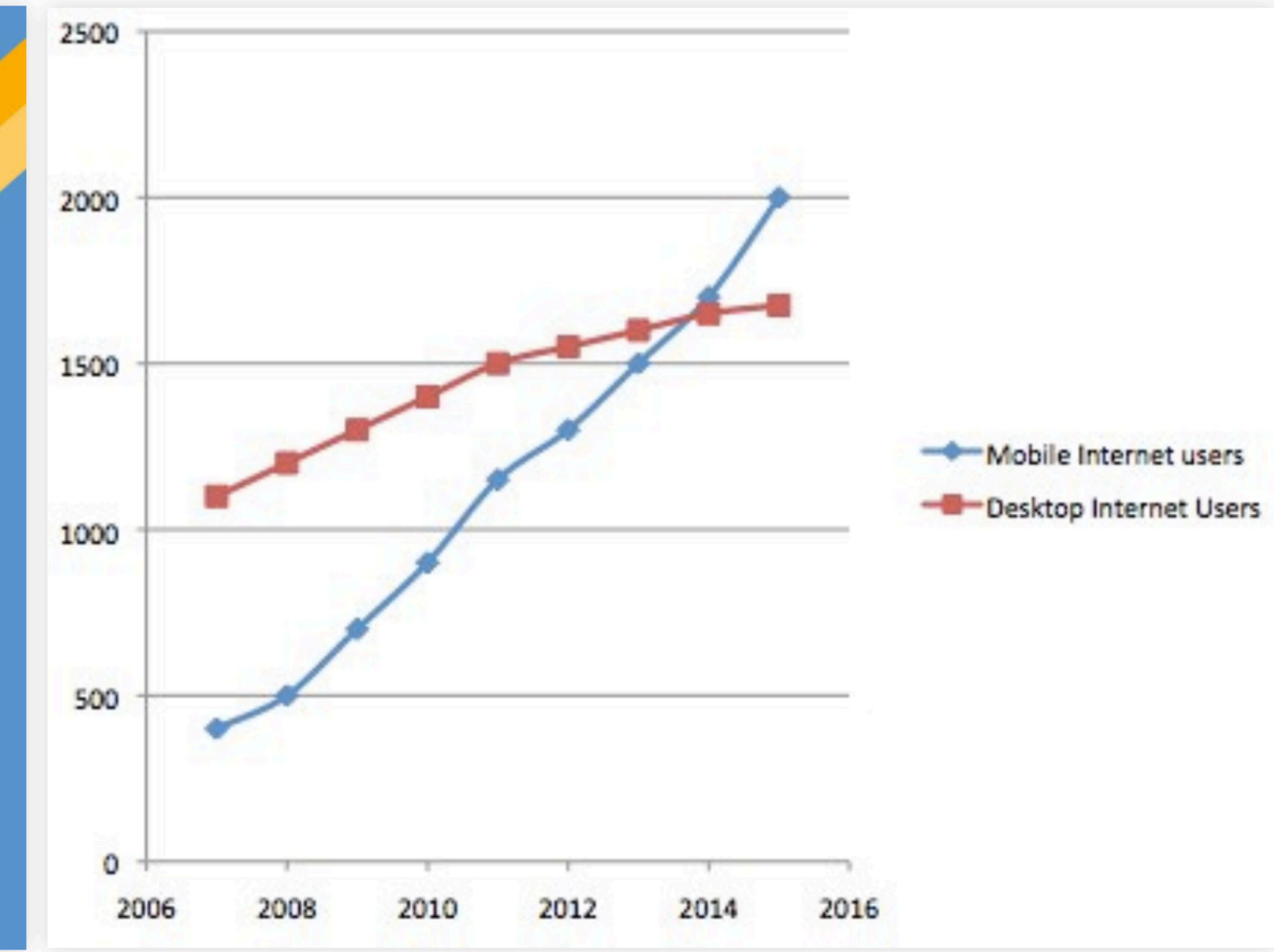


2,500,000,000 users

Alternative Web 3

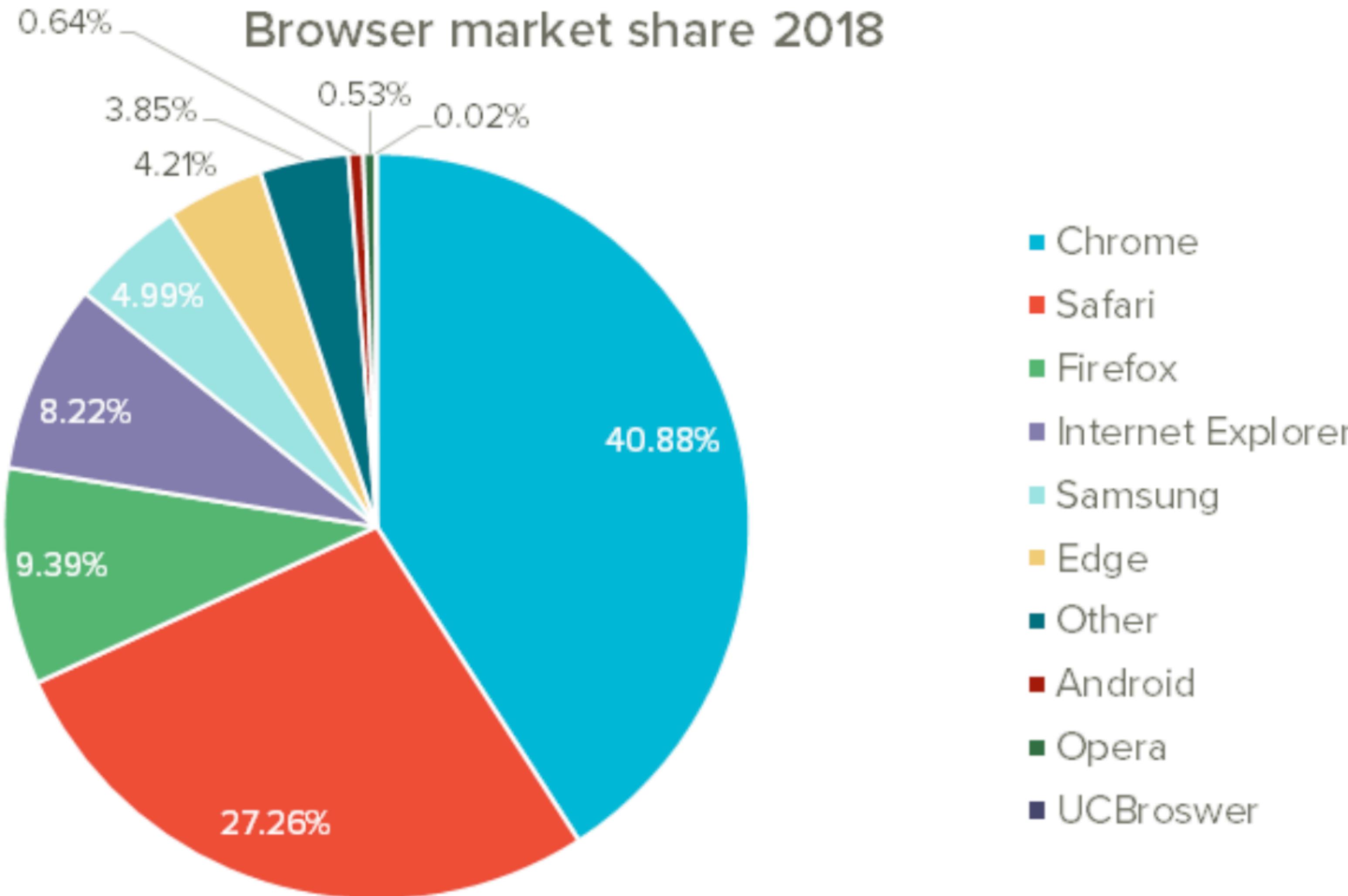


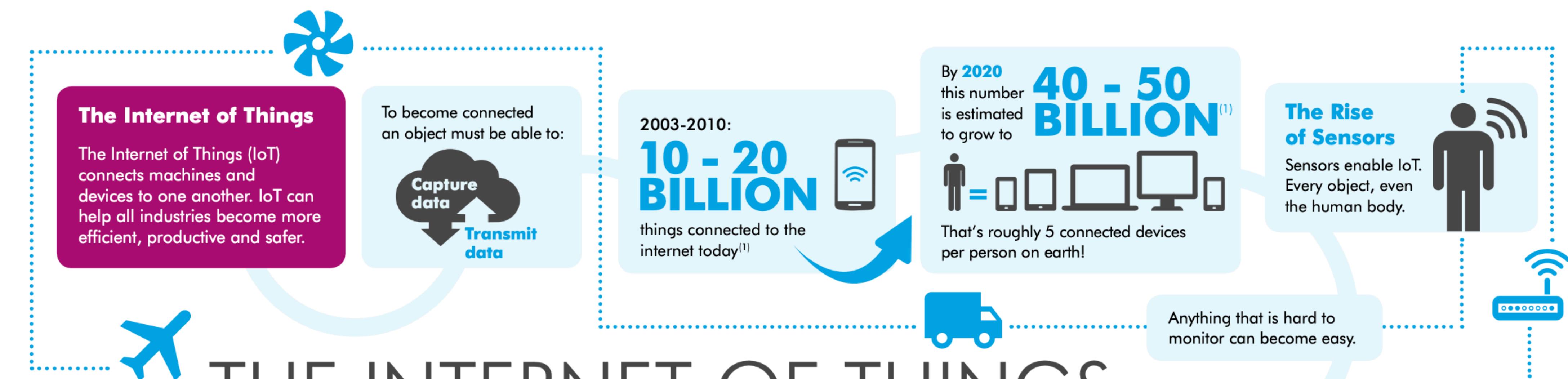
The Mobile Revolution



- Mobile usage of the web exceeds desktop usage

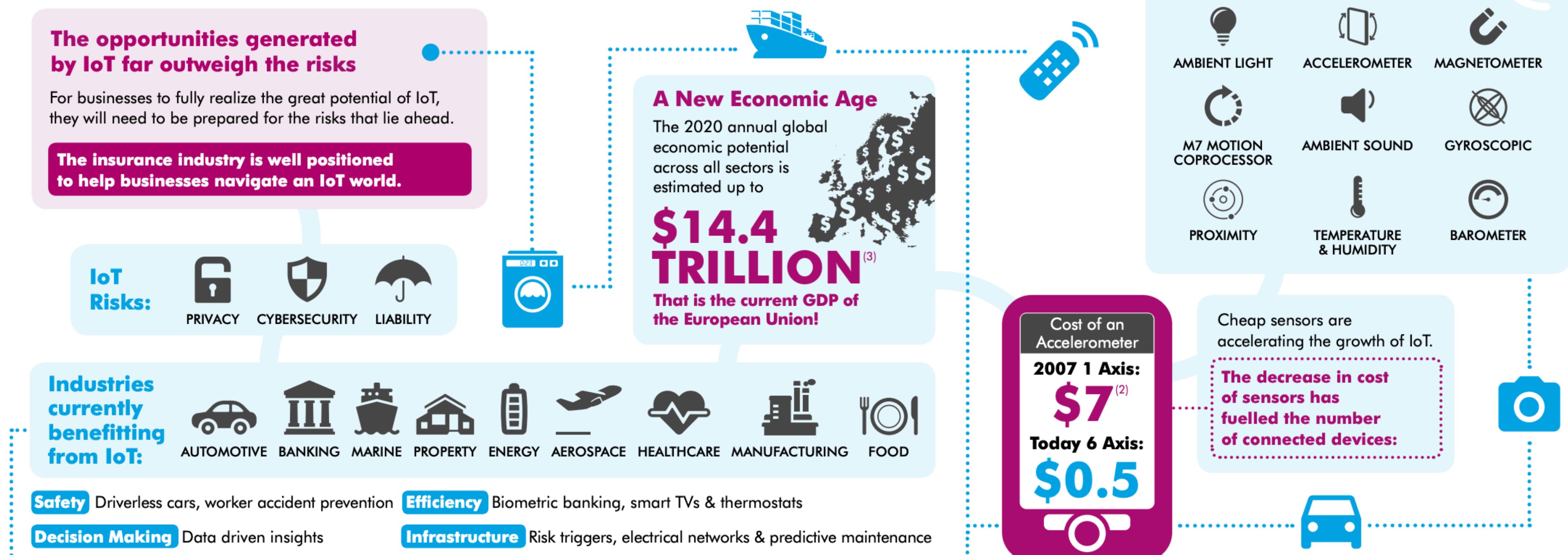
Web Browser Wars





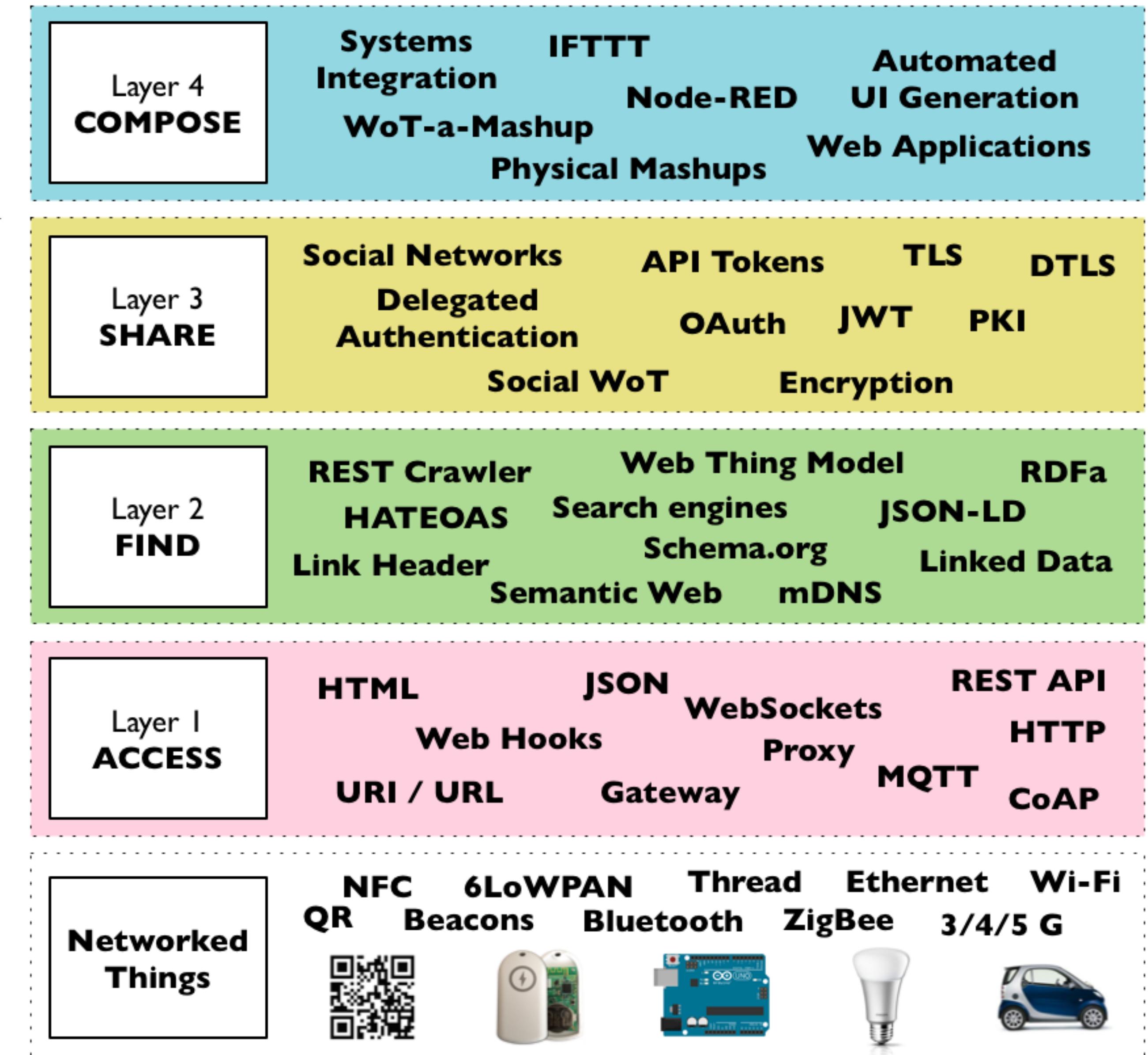
THE INTERNET OF THINGS

EVOLUTION OR REVOLUTION?



The Web

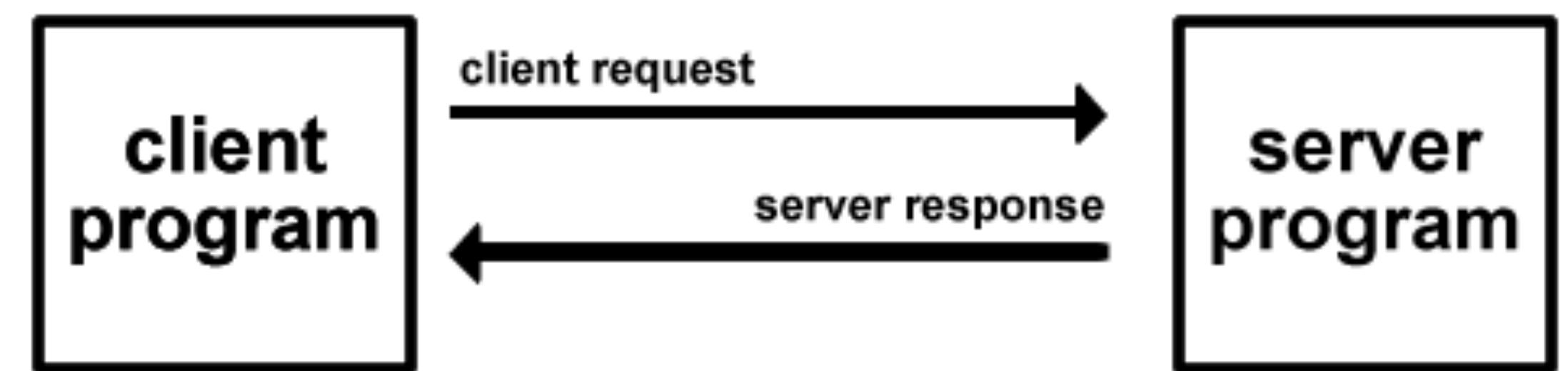
- Protocols & Standards
 - Protocol : agreed vocabulary to enable two programs to communicate
 - Standard: an agreed definition of the structure and meaning of a document
- Web Protocol
 - Hyper Text Transfer Protocol - HTTP
- Web Standard
 - Hyper Text Markup Language – HTML
 - Cascading Style Sheets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



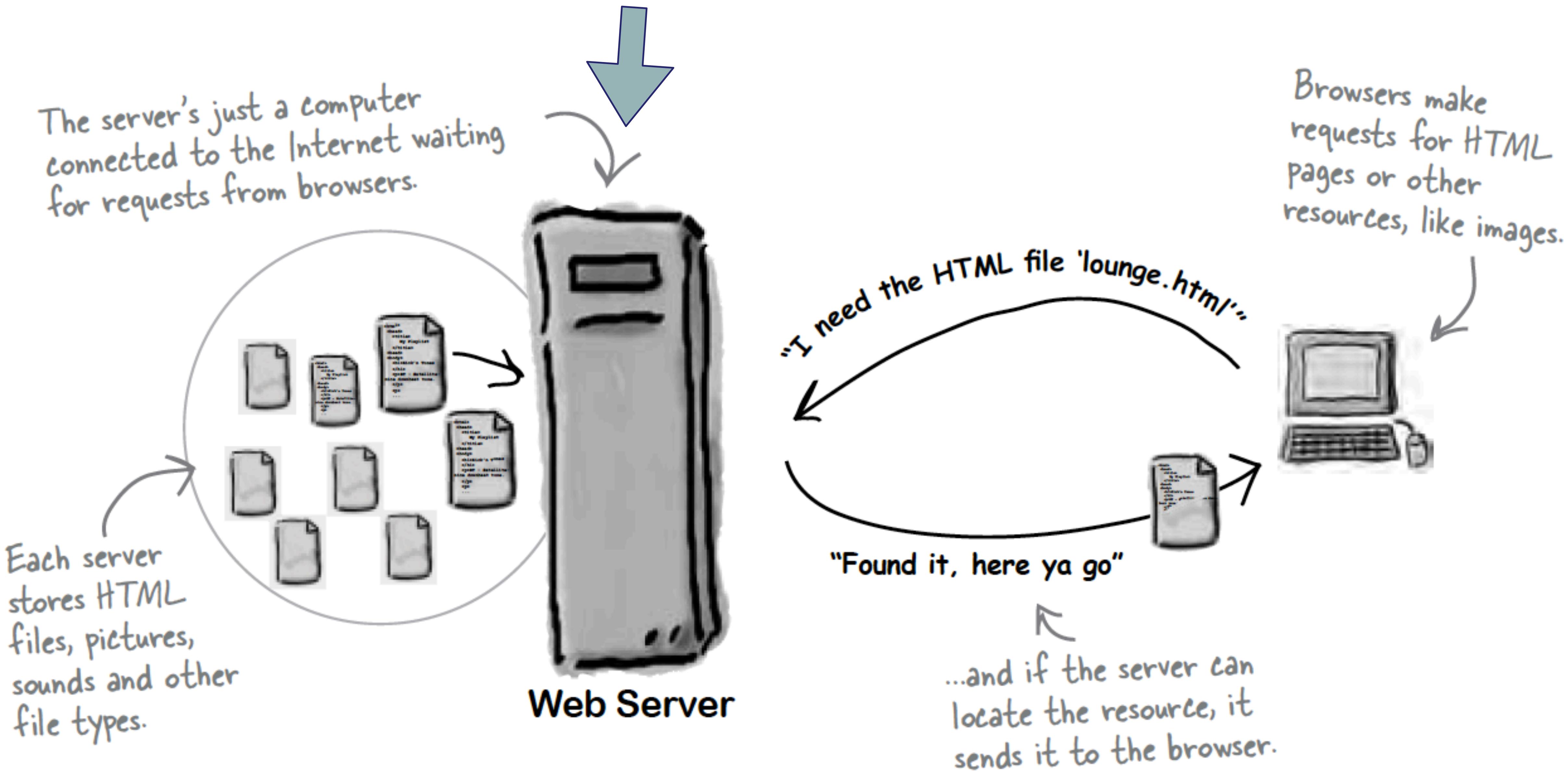
Source: Building the Web of Things: book.webofthings.io
Creative Commons Attribution 4.0

Clients and Servers

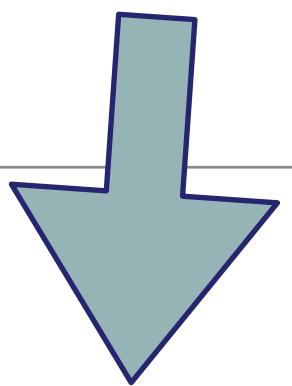
- Client/Server Computing:
 - The interaction between two programs when they communicate across a network.
 - A program at one site sends a request to a program at another site and awaits a response.
 - The requesting program is called a client; the program satisfying the request is called the server.



Role of Server

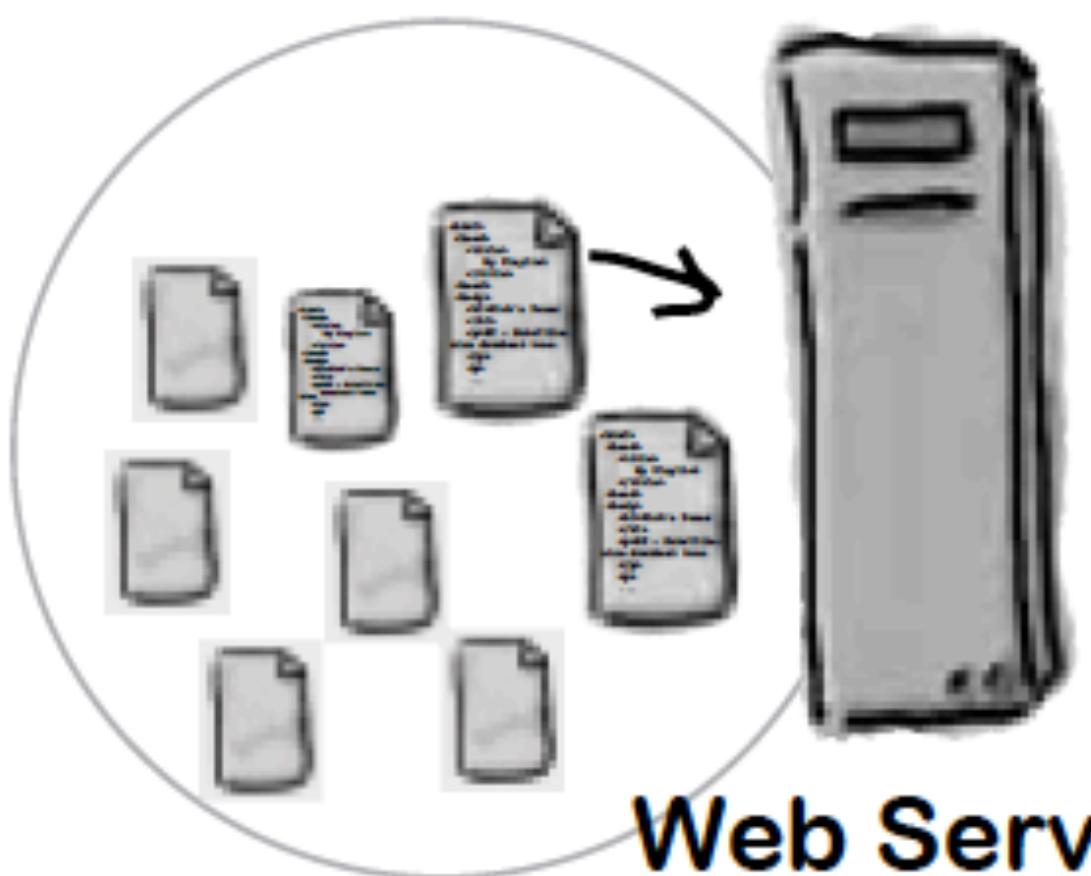
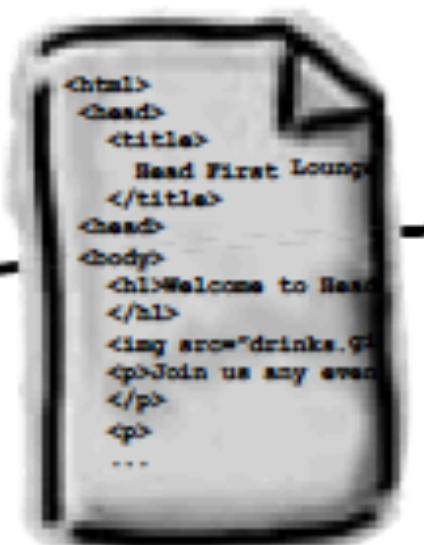


Role of Client



...and the browser displays
the HTML page.

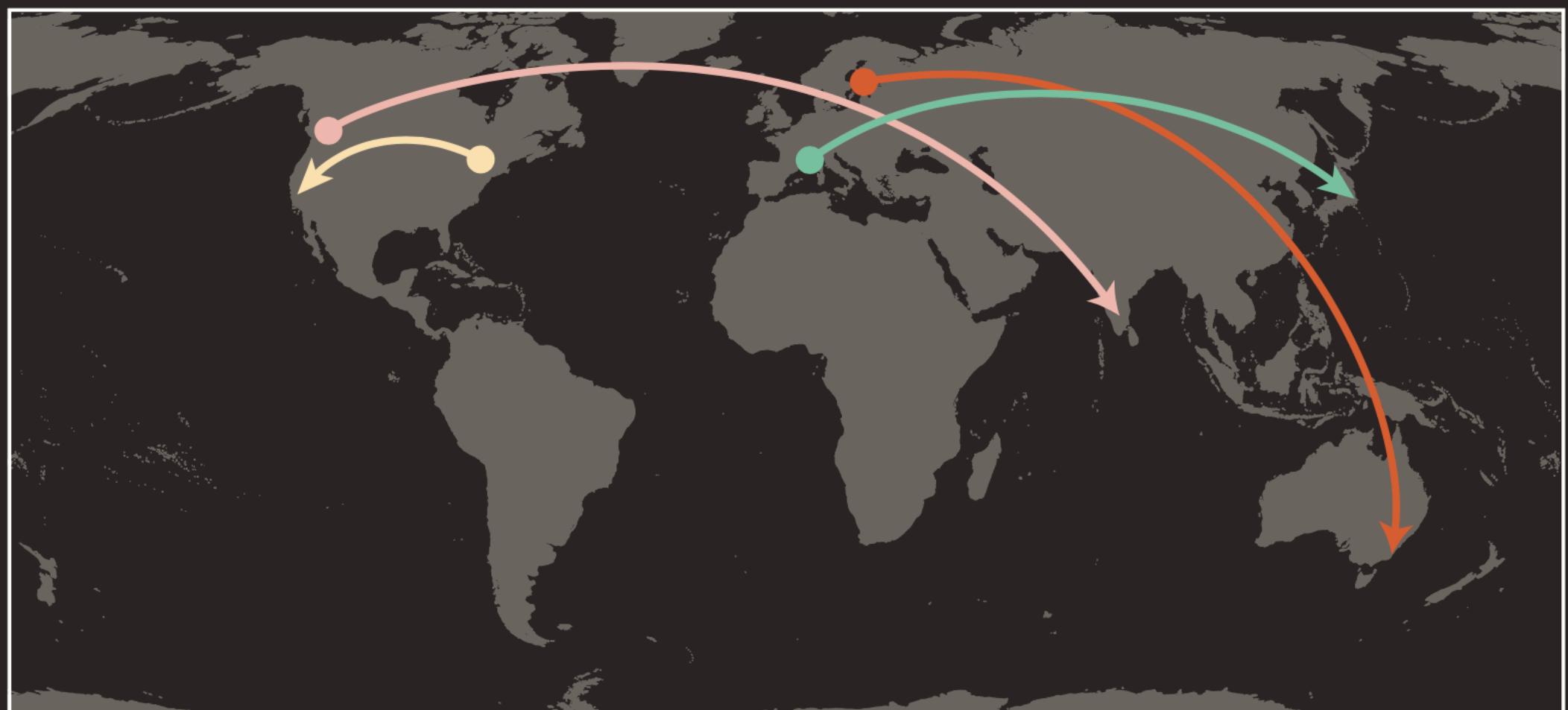
The browser
retrieves the page...



The server "serves up"
Web pages and sends
them to the browser.

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.



The Internet & the Web



The nature of the Internet &
the web: fundamental
characteristics