

CHAPITRE 1

Introduction to Internet

Dr. Amir Djouama

Associate Professor / ENSIA

amir.djouama@ensia.edu.dz

AGENDA

What is the Internet

The World Wide Web (WWW)

Internet Technologies

WHAT IS THE INTERNET?

The "Internet" was derived from the concept of internetting "**inter**connecting **net**works" which was first used in October 1972

Military origin

A global computer network consisting of a set of national, regional and private networks (Network of Networks) that are linked by the TCP/IP communication protocol and that cooperate to provide a single interface to their users.

Today synonymous with the WWW (World Wide Web)

A BIT OF HISTORY

1971: Birth of ARPAnet

- Secure network for the US military.

1973: Appearance of TCP/IP

1983: Use of ARPAnet as a research network

- The technical basis (TCP/IP) will be introduced internationally in the following years.

1989: Internet emerges as 'THE' search network

1993: Explosion of the Internet following the popularity of the WWW (appearance of the first browser)

1990's: Breakthrough of Intranet/Internet solutions in commerce (Intranet is a closed TCP/IP network). Examples like Amazon / Google ...

2000's: Mobile era (2000s to present): The rise of smartphones and mobile devices led to an explosion of Internet use.

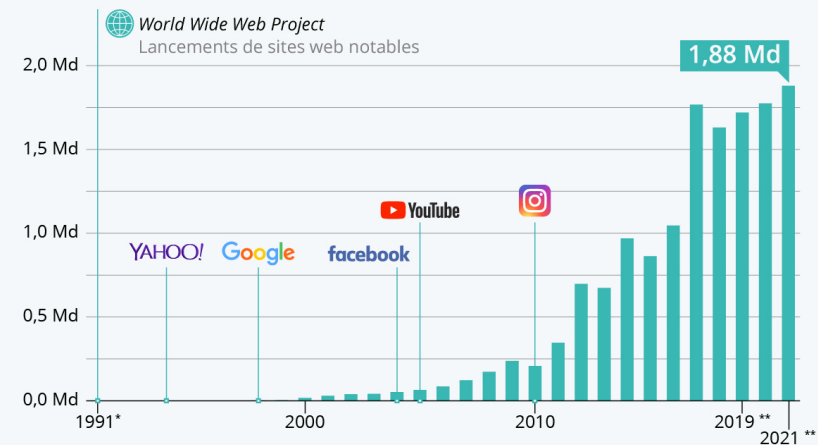
Future developments: The Internet is continuing to evolve, with the increasing use of cloud computing, artificial intelligence, and the Internet of Things (IoT).

- The Internet is becoming more integrated into our daily lives, and it is expected to play an even larger role in the future, transforming industries and shaping the way we live and work. (Generated by chatGPT)

INTERNET WEBSITES

Combien y a-t-il de sites Internet ?

Nombre de sites Internet en ligne de 1991 à 2021



* En date du 1er août 1991.

** Dernières données disponibles 2019 : 28 octobre, 2020 : 2 juin, 2021 : 6 août.

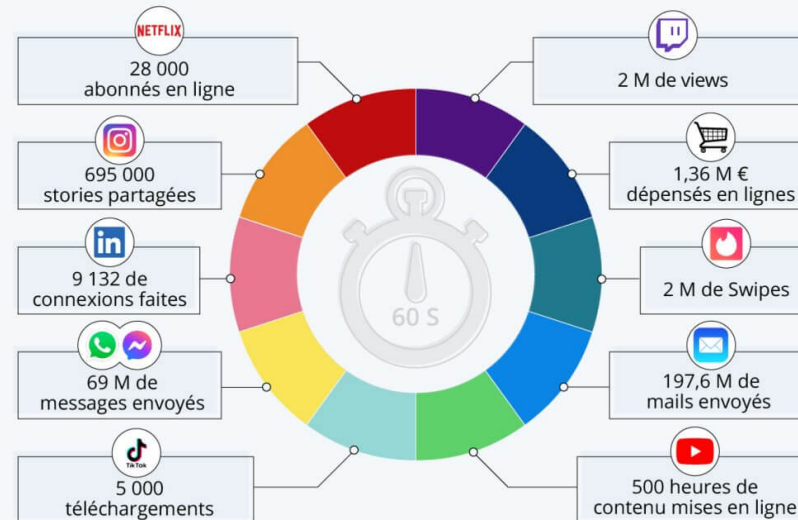
Source : Internet Live Stats



ONE MINUTE IN INTERNET

Une minute sur Internet en 2021

Estimation de l'activité et des données générées sur Internet en l'espace d'une minute



Source : Lori Lewis via AllAccess



THE WORLD WILD WEB OR WEB

Creation: The World Wide Web was created in 1989 by Sir Tim Berners-Lee, a computer scientist at the European Organization for Nuclear Research (CERN).

- He envisioned a system for sharing information over the Internet, which he called the World Wide Web.
- "I just took the principle of hypertext and linked it to the principle of TCP and DNS and then - boom! -that was the World Wide Web!"

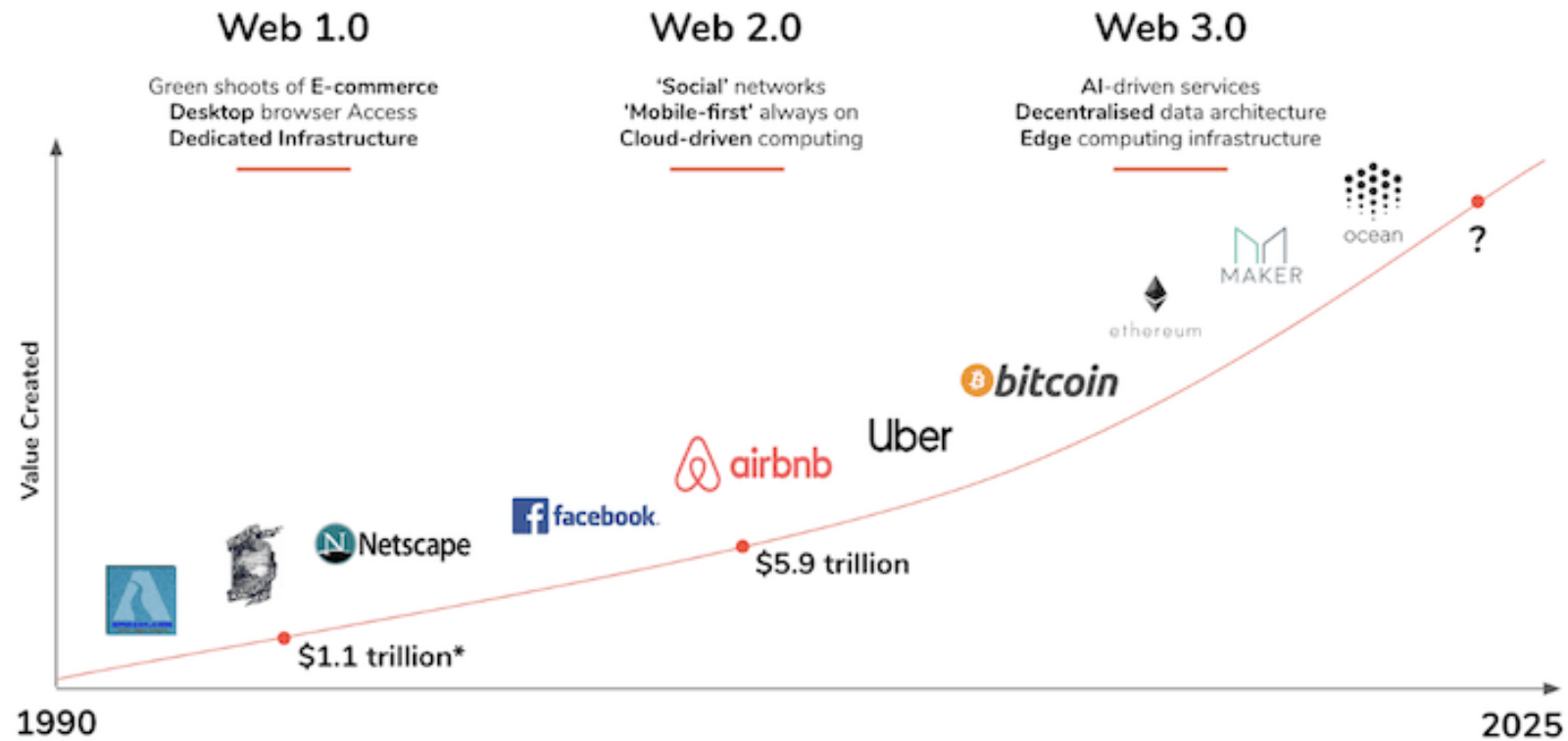
Functionality: The World Wide Web is a system of interlinked hypertext documents that can be accessed through the Internet.

- It allows users to access and share information, multimedia, and applications through a web browser, such as Google Chrome, Mozilla Firefox, or Safari.

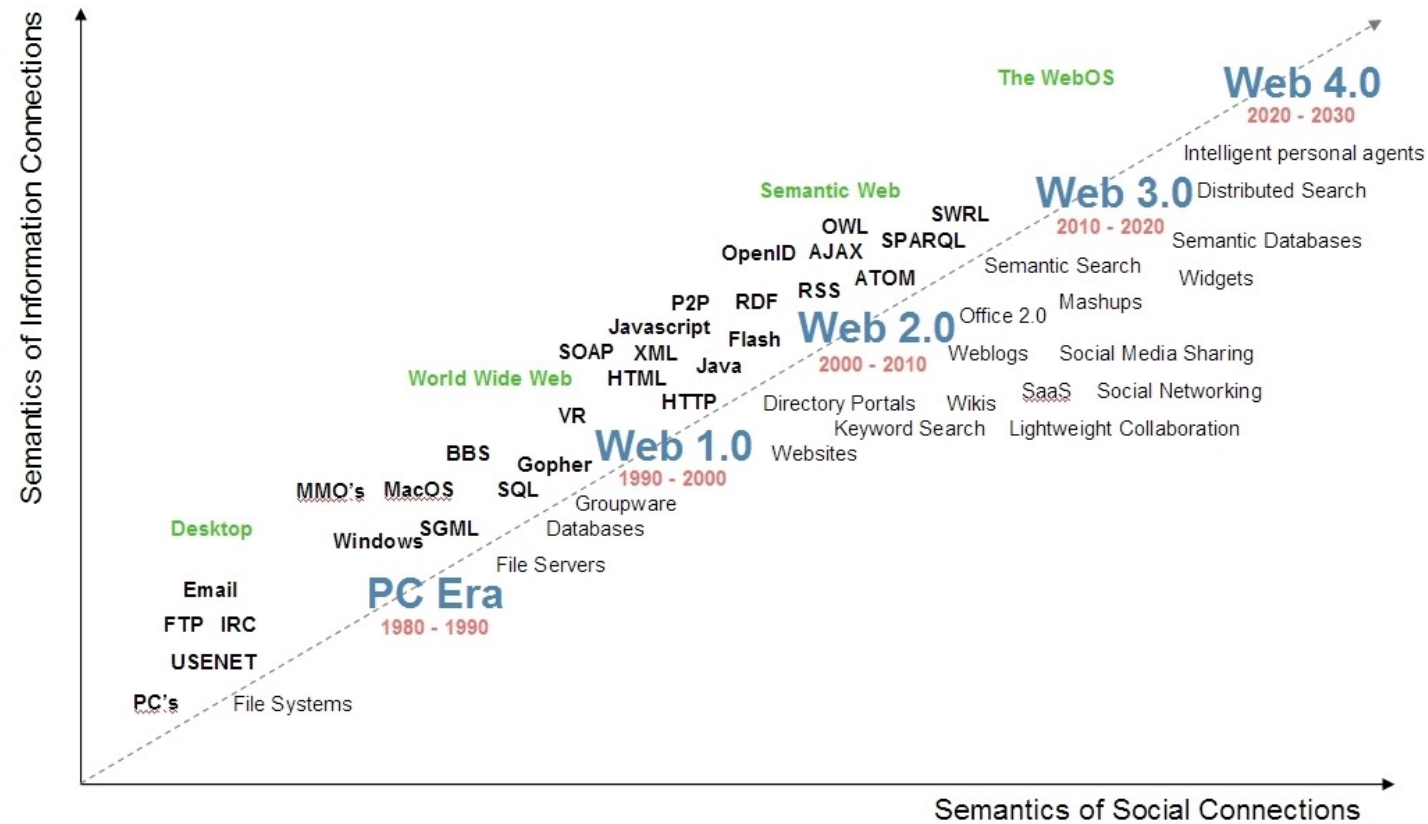
Impact: The World Wide Web has had a profound impact on society and the world.

- It has revolutionized the way we communicate, access information, and conduct business, and it has transformed the global economy.
- The World Wide Web has become an essential part of our daily lives, and its influence and impact will continue to grow in the future.

WEB EVOLUTION



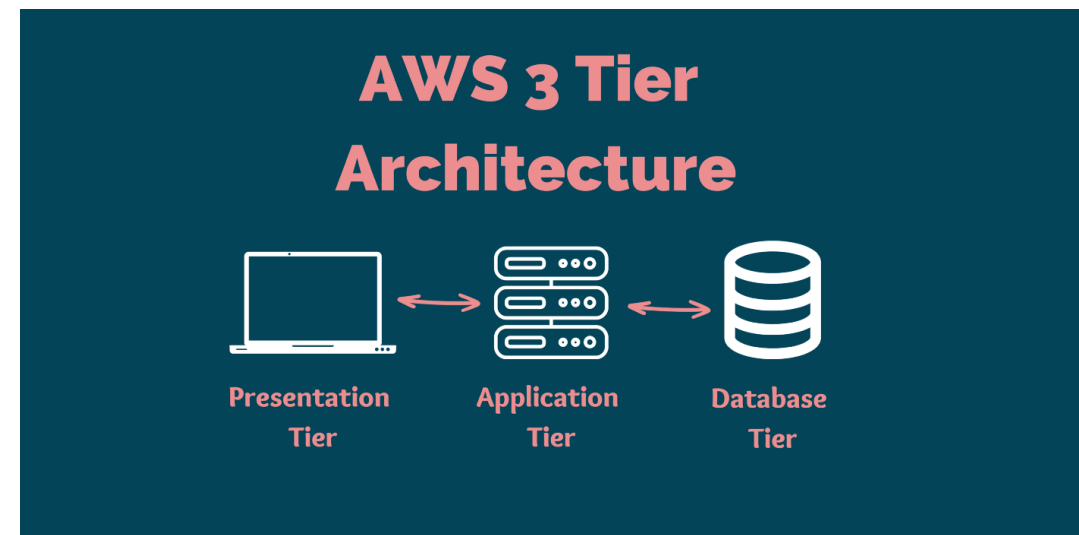
WEB EVOLUTION



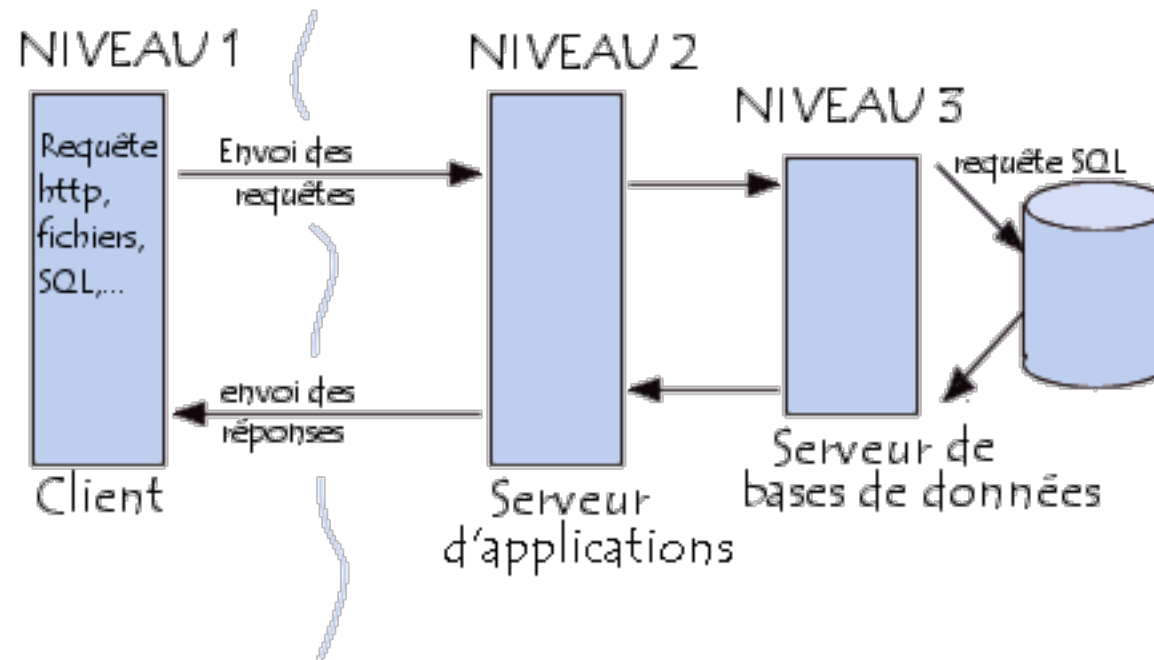
LET'S TALK ABOUT THE TECHNICAL SIDE

The HyperText Transfer Protocol (HTTP)

It is used to transmit pages in HTML format to the browser



THREE-TIER ARCHITECTURE



SERVER SIDE

HTTP

- Hyper Text Transfert Protocol

IP address

- To identify machine (server ?)

DNS

- Domain Name System

Port

- Identify protocol in a machine

URL

URL

`http://host.company.com:80/a/b/c.html?user=Alice&year=2008#p2`

- Scheme (`http:`): identifies protocol used to fetch the content.
- Host name (`host.company.com`): name of a machine to connect to.
- Server's port number (`80`): allows multiple servers to run on the same machine.
- Hierarchical portion (`/a/b/c.html`): used by server to find content.
- Query parameters (`?user=Omar&year=2003`): provides additional parameters
- Fragment (`#p2`): Have browser scroll page to fragment (html: `p2` is anchor tag)
 - Used on the browser only; not sent to the server.

URL SCHEMES

http: is the most common scheme; it means use the HTTP protocol

https: is similar to http: except that it uses SSL encryption

file: means read a file from the local disk

websocket: means create a TCP connection

mailto: means open an email program composing a message

There are many (~350) other schemes: <https://www.iana.org/assignments/uri-schemes/>

URL: HIERARCHICAL PORTION (/A/B/C.HTML)

Passed to the web server for interpretation. Early web servers:

- Path name for a static HTML file.
- Path name of a program that will generate the HTML content (e.g., foo.php).

Web server programmed with **routing** information

- Map hierarchical position to function to be performed and possibly the function's parameters

Application Programming Interface (API) design, Example:

- /user/create
- /user/list
- /user/0x23490
- /user/0x23433
- /user/delete/0x23433

QUERY PARAMETERS (E.G. ?USER=OMAR&YEAR=2003)

Traditionally has been to provide parameters to operation:

- <http://www.company.com/showOrder.php?order=4621047>

For modern apps has implications of when the browser switches pages

LET'S SEE THE APACHE SERVER

Nginx

Apache Tomcat

Node.js

Lighttpd

Cherokee

Microsoft IIS

Appweb

Hiawatha