

The Internet & Web

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Computer Networks

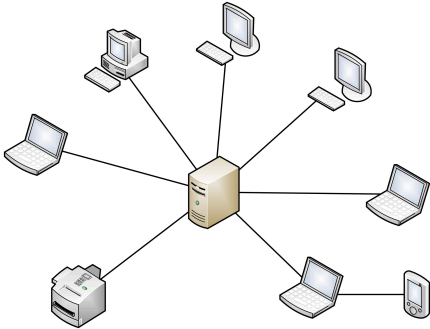
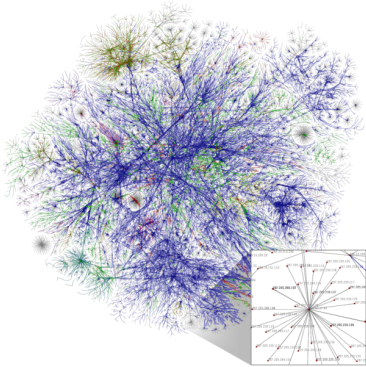
A **computer network** is a collection of computers that can transfer data between each other.

In a basic **client-server** network:

- Computers are connected via a central **server**.
- Each computer connected to the server is a **client**.

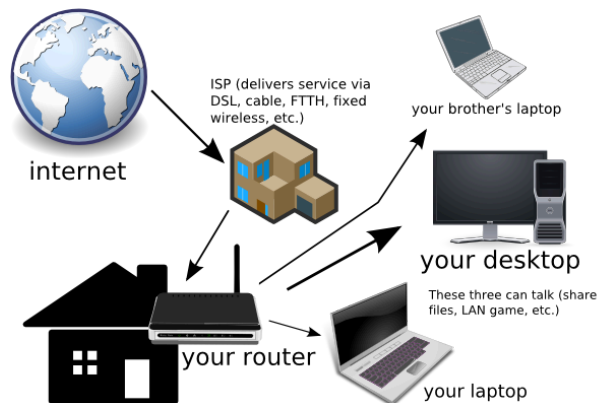
The Internet

- Networks are linked together to create **internetworks, or internets**.
- One of the first internetworks was ARPANET, which went online in 1969.
- The globally connected internetwork is called **the Internet** (with a capital 'I')

Client-server network diagram	The Internet connections visualization
	

ISP's & home networks

- Consumers connect to the internet through an **Internet Service Provider (ISP)**.
 - For example: Comcast or Verizon
 - An ISP forms a **wide-area network (WAN)**
- Many homes now have a **local-area network (LAN)**.
 - A **modem** connects the LAN to an ISP.
 - A **router** directs Internet traffic to and from devices on the LAN.

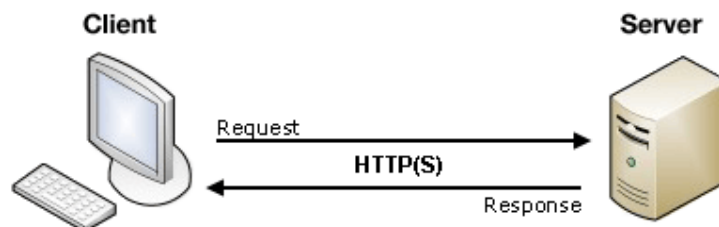


The WWW

- 'The web' refers to the **World Wide Web (WWW)**
- The WWW went online in 1991.
- Components of the WWW:
 - **Web servers**
 - **Hypertext Transfer Protocol (HTTP)**
 - **Hypertext Markup Language (HTML)**
 - **Web browsers.**




Web Servers and HTTP

- When you attempt to access content on the WWW,
 - your computer (**client**) sends a request over the Internet to a **server** for the website.
 - The server then sends back a **response** with the data you requested.



HTML and Web Browsers

- **Hypertext markup language (HTML)** is the language that specifies the contents of a web page.
- The **web browser** processes HTML and other files and displays the formatted web page.

HTML File	Browser	Formatted Web Page
 <pre><!DOCTYPE html> <html> <!-- created 2010-01-01 --> <head> <title>sample</title> </head> <body> <p>Voluptatem accusantium totam rem aperiam.</p> </body> </html></pre>		

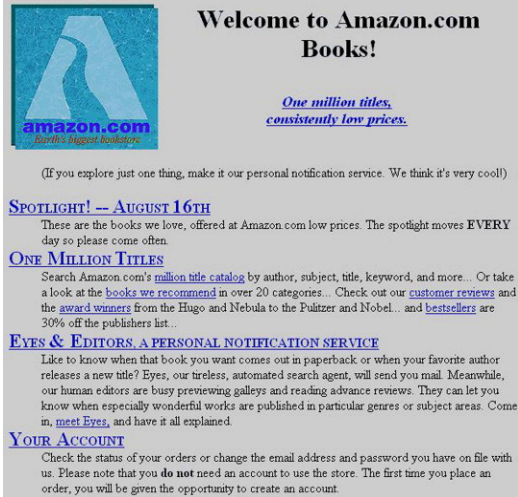

Evolution of the Web

The Static Web

- Prior to ~2000, the internet mostly consisted of **static content**.
 - Content is the same for each user.
 - User cannot interact with or change the content.
 - Content consists mostly of images and links.

The Dynamic Web (Web 2.0)

- Around the year 2000, much of the Web was shifting towards **dynamic content**.
- User can log in for a customizable, personal experience.
 - Amazon product suggestions, facebook profile, etc.
- User can modify or contribute content.
 - Wikipedia, youTube
- Content is interactive, graphical, etc.
 - The Evolution of the Web

Static content	Dynamic content
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The Mobile Web & Ubicomp

- With the increased adoption of Internet connected **smartphones and tablets**, the Web went mobile.
- **Ubiquitous computing (Ubicomp)** refers to the concept of computing everywhere and in many forms.



Emergent & future technologies

- The "semantic web"
 - using metadata to provide extra information about web content
 - #hashtags are a form of semantic tagging
- The "internet of things"
 - connecting other items to the web: cars, household appliances, clothing, etc.
- Virtual / augmented reality
 - e.g. oculus rift, google glass.
 - VR / AR technologies provide new ways to interact with the web and with each other via. the web.
- Artificially intelligent (AI) agents
 - entities which can act autonomously on your behalf.
 - AI agents will be able to observe the world and will have 'senses,' such as vision (image recognition), hearing (audio / natural language processing), and more.