Web Development Basics

Dwinelle 229

Slides & Workshop: bit.ly/splashwebdev

About Me

- First-year undergraduate student at UC Berkeley
- Bioengineering & Intended Business Major
- (3+) Years of experience in web development
  - Self-taught web developer
  - Developed web-related applications for nonprofits, local & international businesses, tech startups, real estate agents

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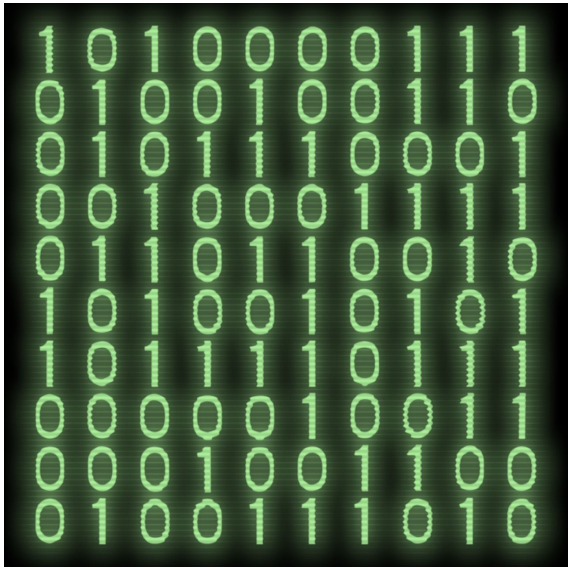
Agenda

- **Understanding the Internet: 11:10 am to 11:40 am**
- Websites, Webpages: 11:45 am to 12:15 pm
- Questions, Workshop: 12:20 pm to 12:50 pm

“The internet is an utility with which connected devices can communicate information by creating data (input) and receiving data (output) from a variety of sources.

The Internet: What is Information?

With computer science lens: information is anything which can be converted into **“computer language”** and is able to be *electromagnetically* **transmitted** through copper wiring and/or signal waves to a desired audience.



The Internet: The Need for Mass Communication

Problem: How do you send and receive **large quantities of information** from a **wide range** of people across **large distance**?

Solution: Build a **network of devices** which can all communicate with each other, **pulling data** from and **adding data** to designated servers

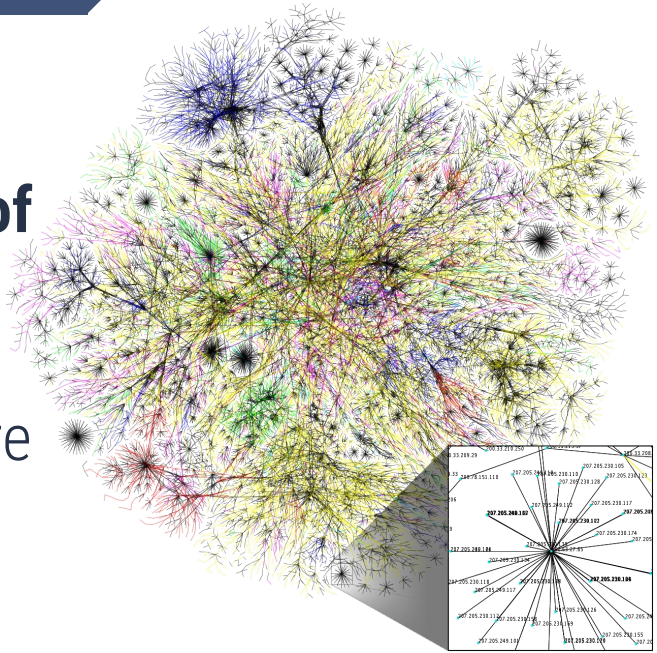
Source: http://www.sciencefocus.com/qa/how-many-terabytes-data-are-internet

The Internet: History & Evolution

- **ARPANET** – A way for the US army to communicate over large distances
- Built from **interconnected systems** of computers connected by **cable**
- Local networks expanded into globalized network (**www**), aided by **server** companies (Google started as a server company)
- Relied on **standardized protocols** to transmit information

The Internet: The Modern Webspace

- WiFi is a wireless method of communication which relies on **packets of electromagnetic waves** to be sent and received across extreme distances.
- Data carried by electromagnetic waves are **interpreted by signal receptors** in your computer (WiFi modules) and **displayed** based on your computer settings.



Source: https://en.wikipedia.org/wiki/History_of_the_Internet#

The Internet: Summary

- The internet is a medium for information to be communicated.
- This information has to follow **specific syntax and protocols** in order to be read by your computer
- Information is added to and stored on servers and then sent to and received by your computer

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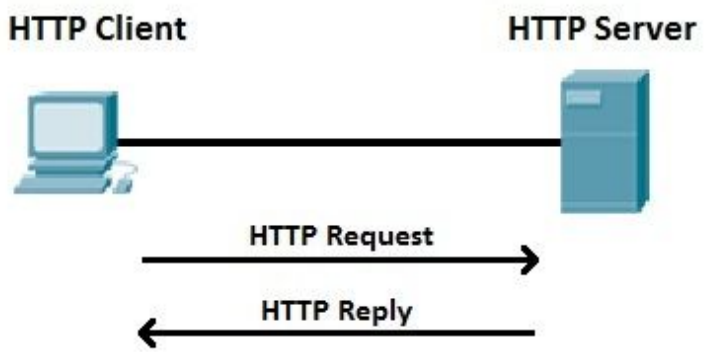
“Essentially, every website is just a bunch of files you download to your computer from a [ISP] server (which is connected to all other public servers). These files are then interpreted and displayed by your browser of choice.

Websites: Information, Language, Protocol

- Standard websites are just **packets of information**
- In order for the packets to be read as intended, the syntax (markup) of the website has to be standardized
- **HTTP**: Hypertext Transfer **Protocol**
- **HTML**: Hypertext Markup **Language**



Source: http://study-ccna.com/

Websites: What are they made of?

Most common frameworks & languages:

- **HTML**: Raw content in a web page
- **CSS** (cascading style sheet): Color, decorations, shapes, etc.
- **JavaScript**: Fancy animations, web applications, advertisements

Source: https://www.zoho.com/sites/features.html

Website: Public, Private, Local

- Public: Files uploaded to (a) **publicly accessible server**(s) (public nameserver, public DNS)
- Private: Files uploaded to (a) publicly accessible server(s) but **hidden behind certain mechanisms** (passwords, IP block, etc.) [**Darknet**]
- Local: Files located within a **private server or computer**, which can still be interpreted and displayed on your browser

Websites: SEO, SSL, E-commerce

- SEO (Search Engine Optimization) is used by websites to gain visibility in search engines.
  - SEO often takes the form of creating backlinks and keyword analysis.
- SSL (Secure Sockets Layer) is used to encrypt connections to the website as to provide an extra layer of security.
  - SSL is useful in preventing fraud, especially for e-commerce interactions

Website: Summary

- Your computer **sends a request** for a specific website.
- Your request is processed by your ISP (internet service provider) and **your computer downloads a bunch of files** (through a lot of electromagnetic packets).
- These files are then **parsed and displayed** by your web browser.

Questions & Workshop

Tutorial: bit.ly/splashwebdev

Web Development Languages: HTML (.html files)

HTML relies on tags to describe content

Exercise 1:

- Create an .html file ($ touch “index.html”)
- View the file with your browser ($ open “index.html”)

<html>

<h1>Hello World!**</h1>**

</html>

- Next step: <h1 style=”color:red”> ’...’ </h1>

Web Development Languages: CSS (.css files)

CSS is used to enhance HTML pages and can be referenced directly from the HTML page.

Exercise 2:

- Create a “style.css” file to enhance “Hello World”
- Link “style.css” to the “index.html” page

Web Development: Next Steps

- Learn more web development languages & frameworks (ie. JavaScript, Wordpress, PHP)
- Upload website files to a publicly accessible server (ie. GoDaddy, A2hosting)
- Implement version control and backups (ie. Git, Github, Bitbucket)

Web Development: Resources

Coding Tutorials:

- Free Code Camp: https://www.freecodecamp.org/
- Codeacademy: https://www.codecademy.com/

Server management tutorials:

- Digital Ocean (personal server): https://digitalocean.com
- Domain & DNS management: https://namecheap.com

Sample websites & template: https://html5up.net

Questions? Email me at nathanwong@berkeley.edu