



COMP 125:

Basics of Computer Organization

Week 03, Lecture 05



Agenda

1. Review
2. Discussion
3. Web Browsers
4. Javascript
5. P5

In Review: That was a lot.

1. Ancient computers were calculators
2. Industrial revolution pushed the technology (binary -- looms)
3. WWII forced the mathematicians and engineers into the same room
4. Tech races in the early cold war era meant more and better machines
5. Corporate needs ruled the 80s and 90s
6. WWW : 1990
7. From 1940 to 2000, went from:
 - a. Massive machines
 - b. Mainframes and terminals, supercomputers
 - c. PCs and workstations, supercomputers
 - d. PCs, supercomputers, and browser-based computing
8. Internet:
 - a. Started as data transfer for scientists
 - b. Expanded to commerce (ISPs, DNS)
 - c. Expanded with the WWW (servers, clients, websites like pages of a book)
 - d. Now, dynamic and interactive!

In Review: That was a lot. Discuss!

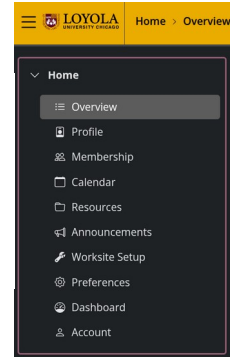
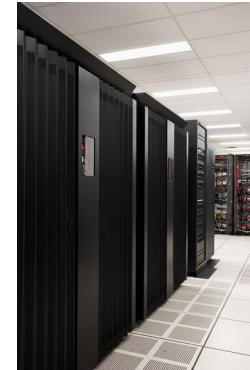
1. What were ancient computers?
 - a. Calculators - business devices
2. What technological advancement made it possible for computers to get both smaller and faster?
 - a. Transistors! Went from vacuum tubes (size of pinkie finger) to transistors, then smaller and smaller until 1,000 of them can fit across a red blood cell
3. Examples of computers in the last 100 years?
 - a. Purpose-built rooms, mainframes, supercomputers, PCs
4. What was the original purpose of the internet?
 - a. Data transfer across continents
5. What changed between ARPANET/NSFNET and the WWW?
 - a. Went from simple data transfer to display of pages
6. How has the web changed in terms of interactivity?
 - a. Used to simply get and give data to/from server - now, the server sends code to the browser to run interactively

Attendance

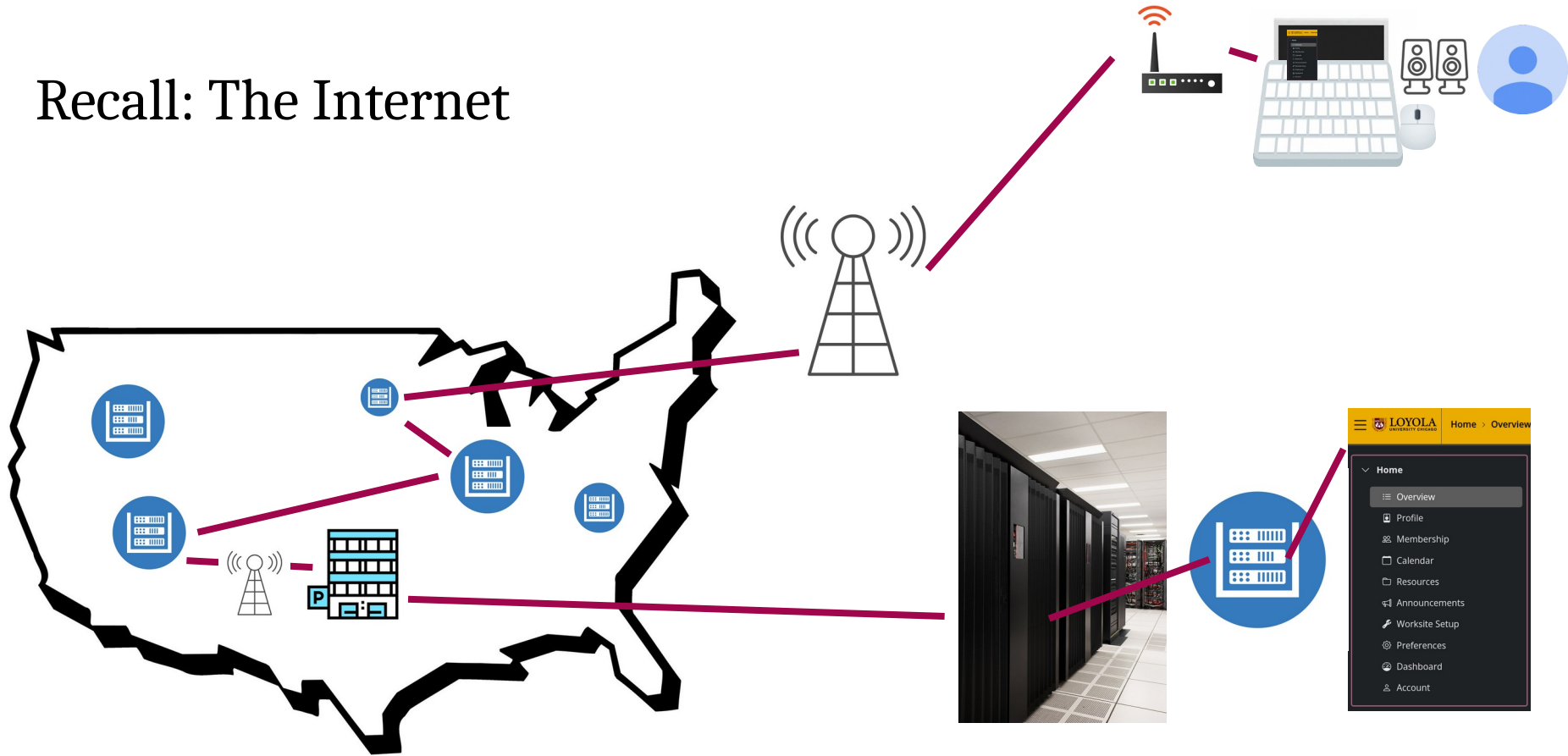
Recall: The Internet

- Communication at a distance
- Routing like mail addresses
- Send information as “packets”
- DNS acts like navigators on a map
- ISPs are like toll entries to the roads
- Changing interaction
 - Before: not-interactive, simply information transport
 - Now: server sends parts of its code for the client to run and interact with in the browser

Recall: The Internet



Recall: The Internet



Web Browsers

Why do we care?

- In general: Everything is web-based
- In specific: We will be using [P5.js](#) in a web browser!

Web Browsers

What is a browser?

- Lets you get around (navigation)
- Sends commands to grab data from servers
- Security
- Identity
- Cookies (memory)



Web Browsers

Where does the code that makes a website inside a browser “live”?



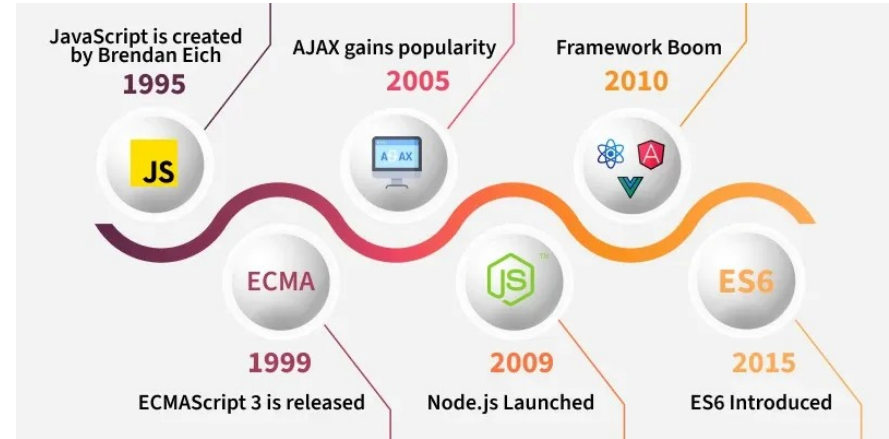
Javascript - The History

Why do we care?

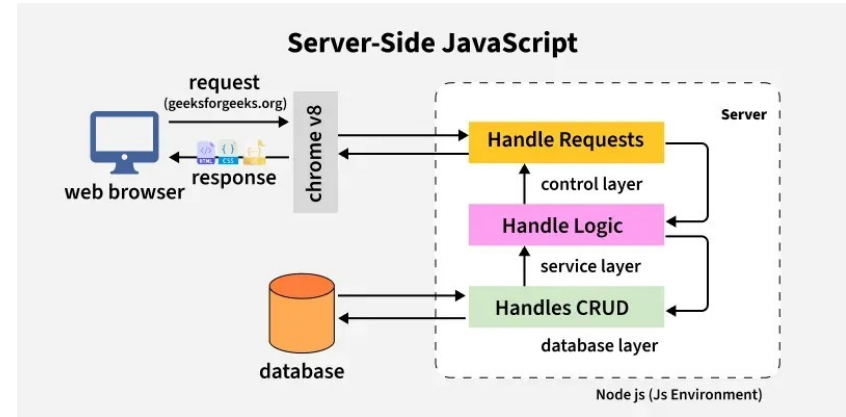
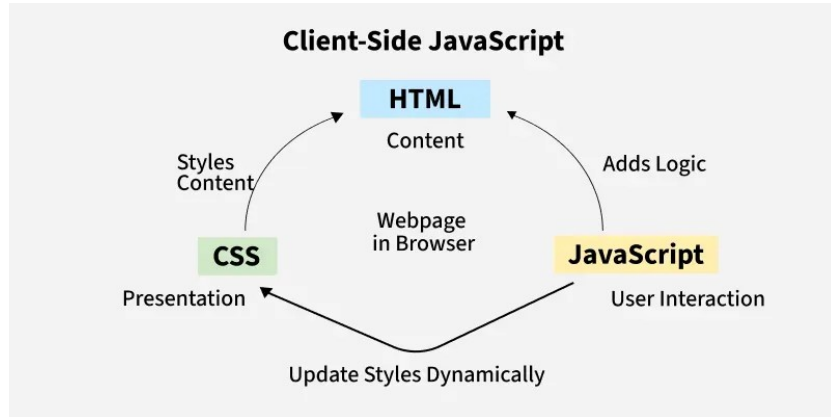
Context!

Javascript - The History

- Interactivity and standardization
- Google Chrome - 2008 (V8)
- ECMAScript 6 (2015)
 - Basically an entirely new language
 - (backwards-compatible)
- Server:
 - Programmers build inside a framework
 - Put their code on servers attached to a domain on the internet
- Client:
 - Visits a domain using their browser
 - Server and browser communicate code and interactive elements



Javascript



P5.js - History

Why do we care?

Context!

P5.js - History

- Processing:
 - 2000
 - Language meant to abstract Java (*not* JavaScript)
 - Visual, meant for artists
- Processing.js
 - 2007
 - *Translator* -- takes Processing code, turns it into JavaScript
- P5.js
 - 2013
 - Re-implementation of Processing *in* JavaScript

P5.js

Benefits:

- Browser (system-agnostic)
- Visual
- Beginner-friendly
- Can “speak” back to JavaScript for full functionality

Downsides:

- Not actually a full language
- Not scalable or general-purpose

P5 - How it Works

Editor:

- Like a word editor, but for code
- We use the web-based one for P5
- Makes JavaScript code, inserts it, and runs it!

Web Browsers, JavaScript, and P5.js

Review:

- Client/server
- JavaScript = Interactivity
- P5.js = JavaScript library