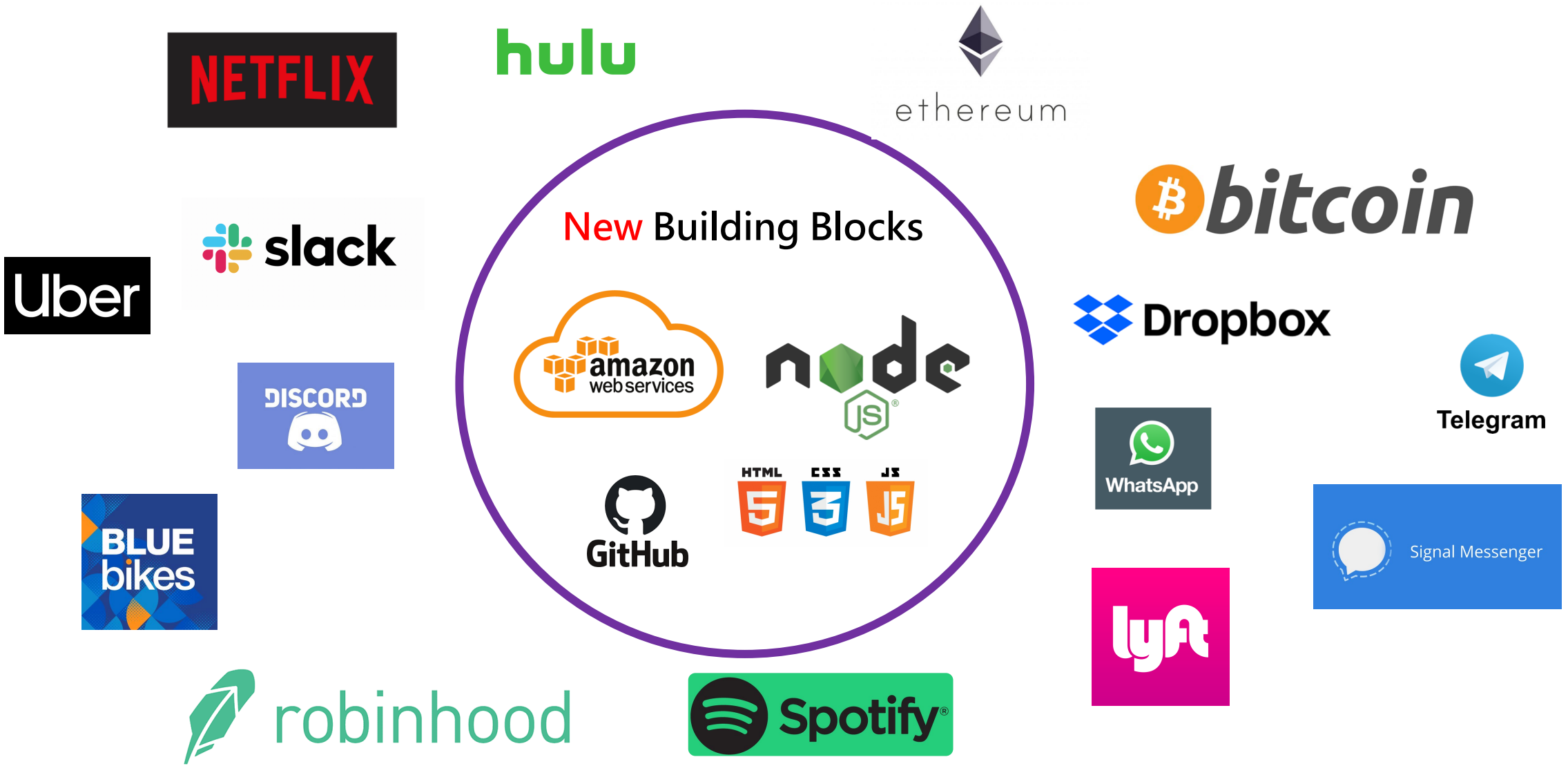
1.125 – Software Engineering and Architecting

Lecture 1

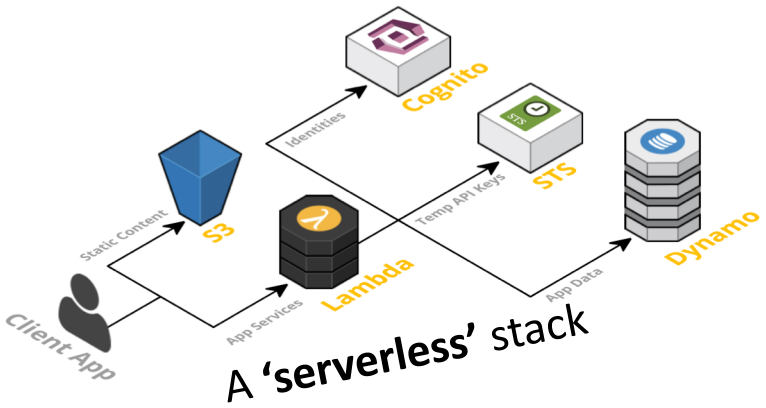
Course Outline and Introduction to the World Wide Web

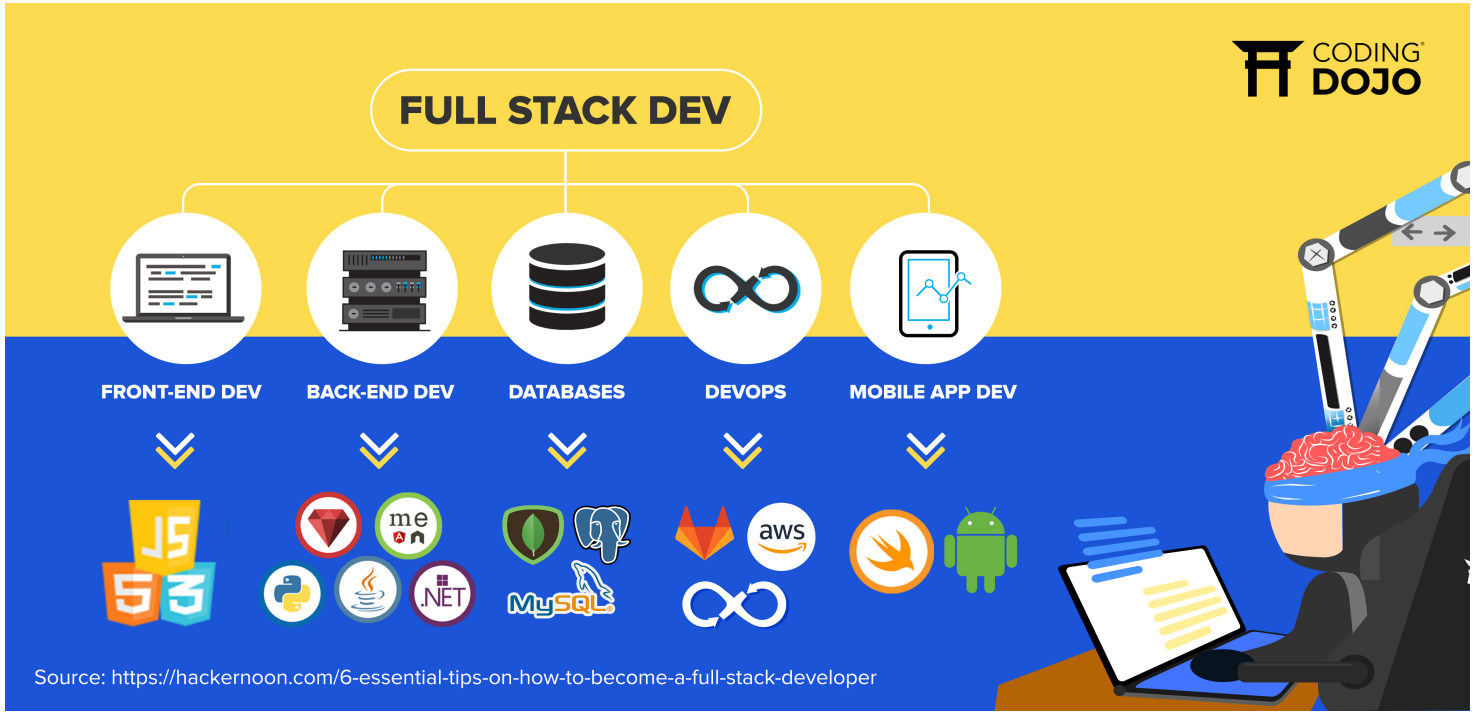
The New Web Economy

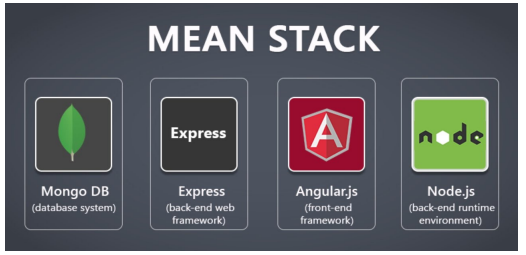


1.125- Software Engineering and Architecting

If the internet is “a series of tubes” – Modern software is a “stack of blocks”







Course Outline

Topic 0 (today): Introduction, Overview, and Set Up

Topic 1: The Front End - JavaScript and Understanding the Web

Topic 2: The Back End - Node/NPM

Topic 3: Open Source and Collaboration – GitHub

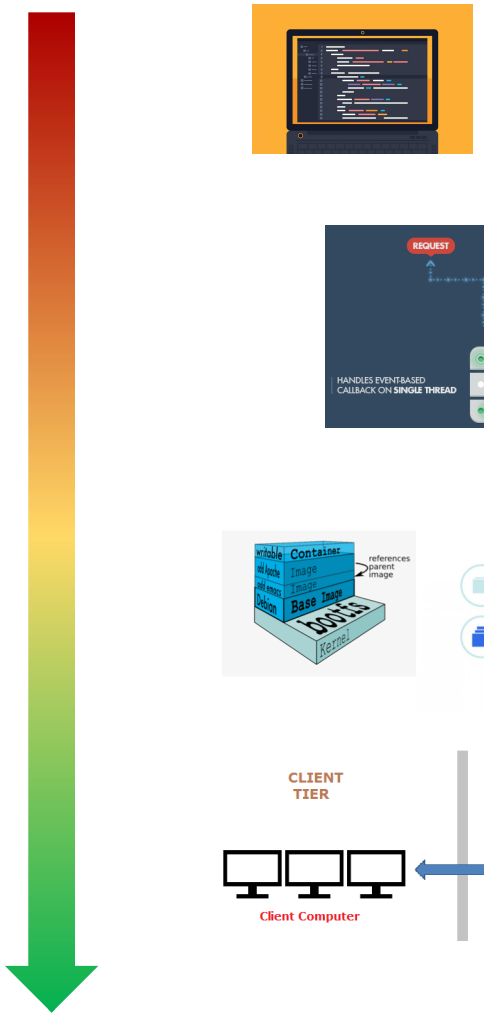
Topic 4: Containers and Portable Code – Docker

Topic 5: Using The Cloud - AWS/Digital Ocean

Topic 6: Connecting to Services – APIs

Topic 7: Special Topic – Blockchain

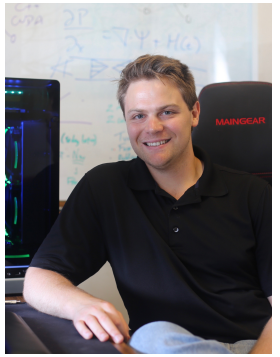
Final Project



Course Staff

Prof. John Williams
jrw@mit.edu

Dr. Abel Sanchez
abel@mit.edu



Sam Raymond
sjr@mit.edu

Our Research:

- Machine Learning
- Cyber Security
- Digital Transformation
- Blockchain
- Online Education
- Resource Exploration
- Numerical Simulation
- Computational Mechanics

Assessment

Homework (30%)

Each class we will be doing in-class work involving coding and interacting with the technologies we'll be studying. Each week you will be required to submit work based on these in-class activities.

Quiz (20%)

We will hold a quiz (date TBD) in class covering some of the fundamentals of what will be necessary to work with the new tools of the web.

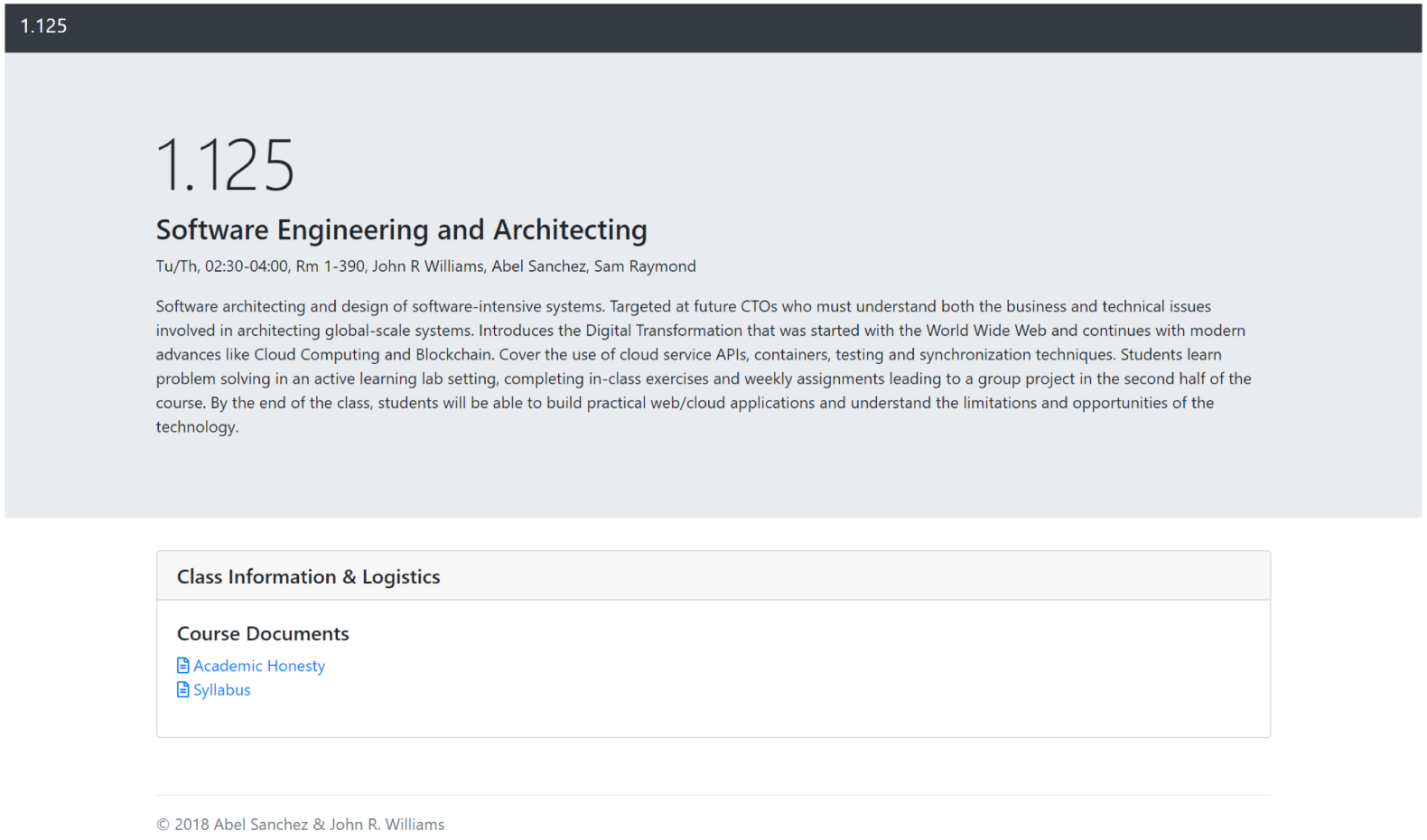
Final Project (50%)

The final part of this course involves a group project where you will take what has been covered (and extra if required) and create a new application.

- Proposal (10%)
- Final Presentation (20%)
- Final Deliverable (20%)

Our Class Website

https://neopoxo.org/



Final Projects

https://onexi.org/projects_standalone.html

The World Wide Web

??????????????


CERN
World Wide Web Initiative
EIZO

Sir Tim Berners-Lee

Sir Tim Berners-Lee

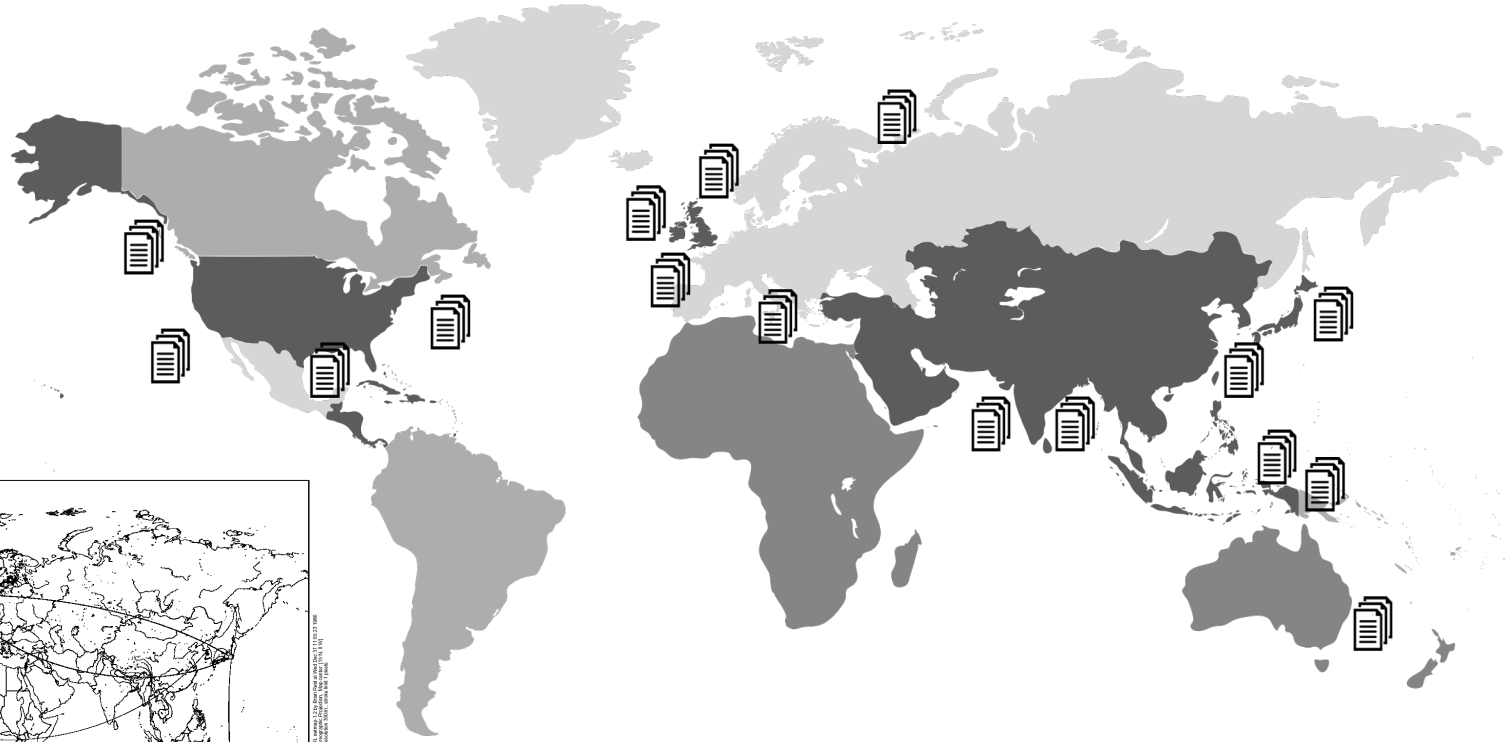
…invented the World Wide Web in 1989

Sir Tim Berners-Lee

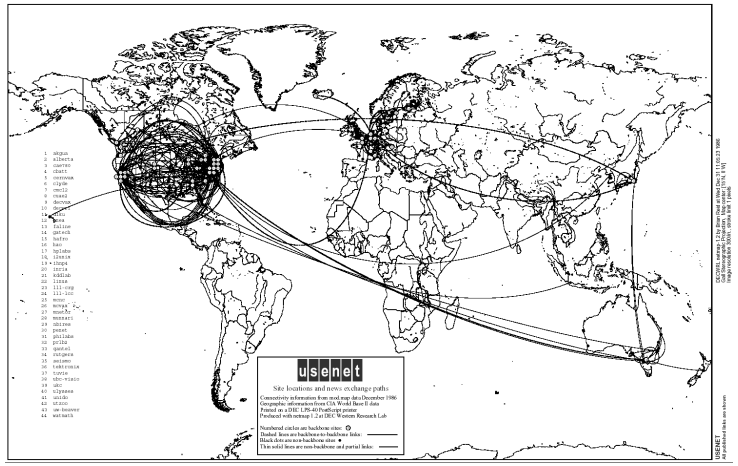
Works Here

…invented the World Wide Web in 1989

The Problem



But researchers couldn’t communicate



Internet Connections Existed

The Solution: HyperLinks

CERN DD/OC

Information Management: A Proposal

Tim Berners-Lee, CERN/DD

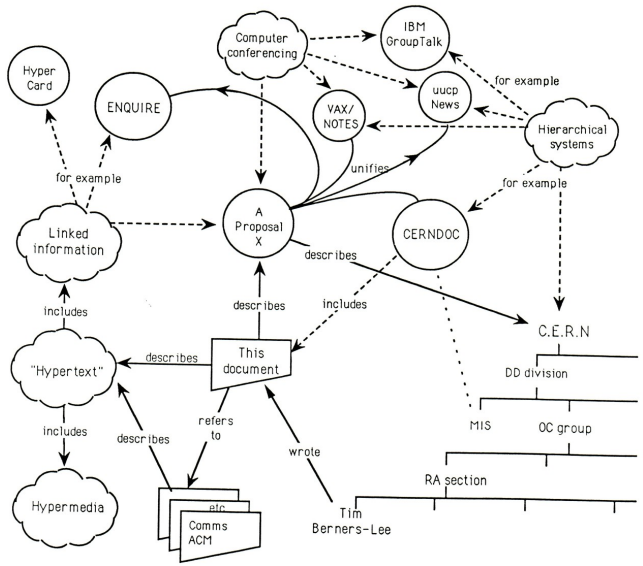
March 1989

Information Management: A Proposal

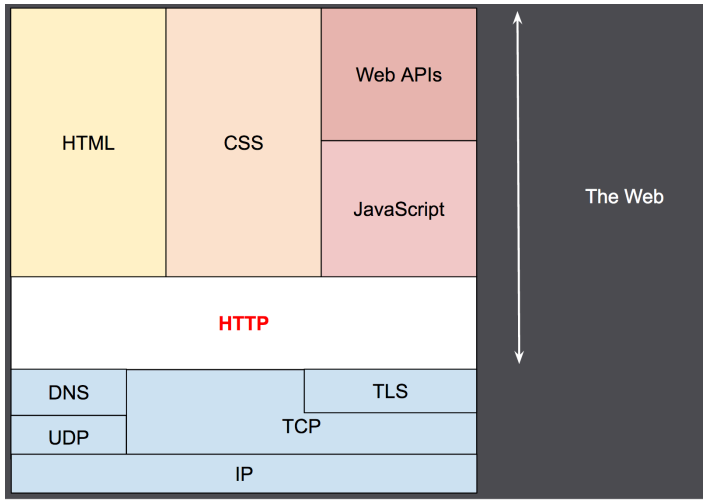
Abstract

This proposal concerns the management of general information about accelerators and experiments at CERN. It discusses the problems of loss of information about complex evolving systems and derives a solution based on a distributed hypertext sytstem.

Keywords: Hypertext, Computer conferencing, Document retrieval, Information management, Project control

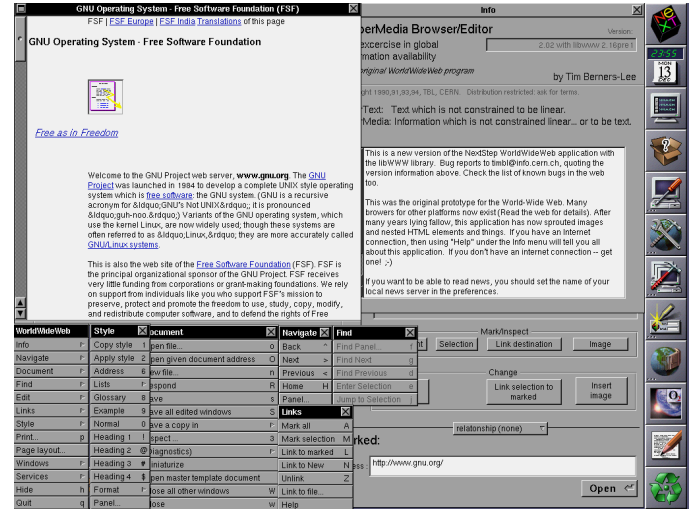


The Solution: HTTP + HTML + Browser



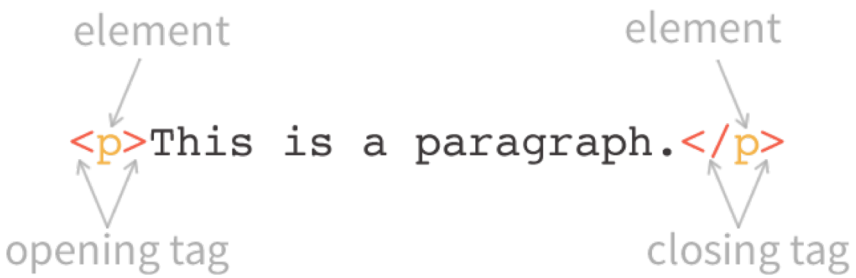
Hyper Text Transfer Protocol - HTTP

Hyper Text Markup Language - HTML



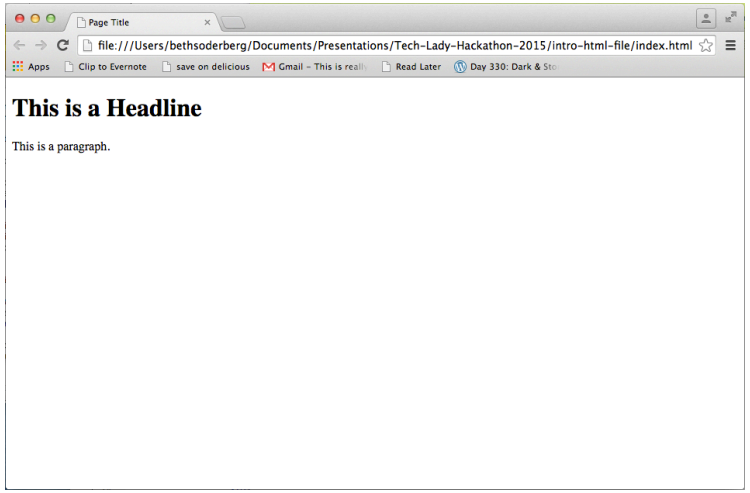
Web Browser

HTML – Hyper Text Markup Language

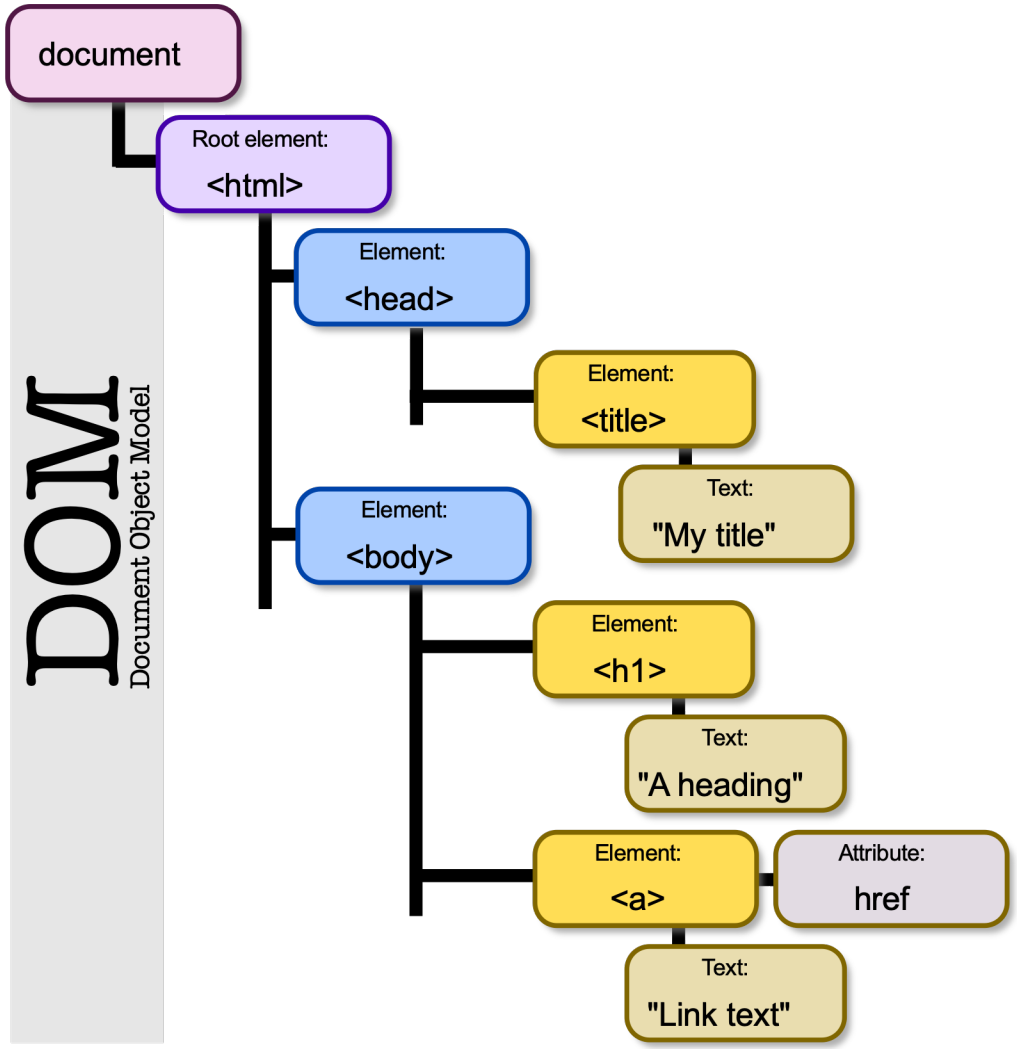



```
<!DOCTYPE html>
<html>
	<head>
		<title>Page Title</title>
	</head>

	<body>
		<h1>Homepage Headline</h1>
		<p>This is a paragraph.</p>
	</body>
</html>
```



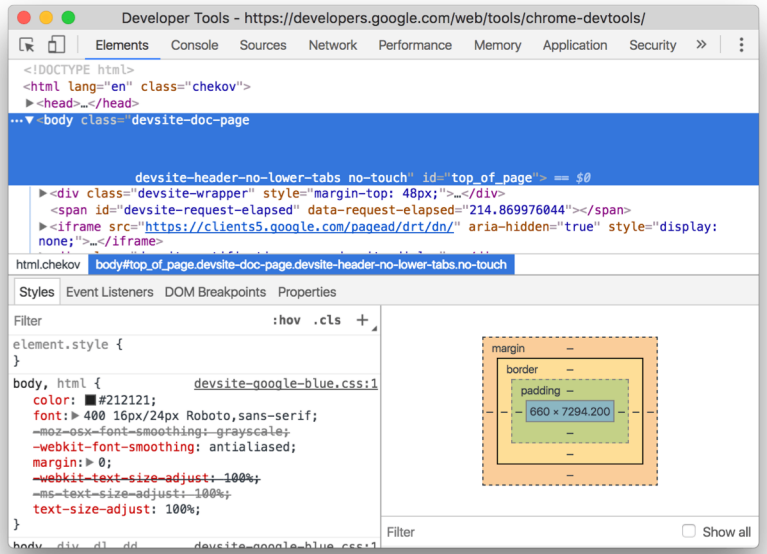
DOM – Document Object Model

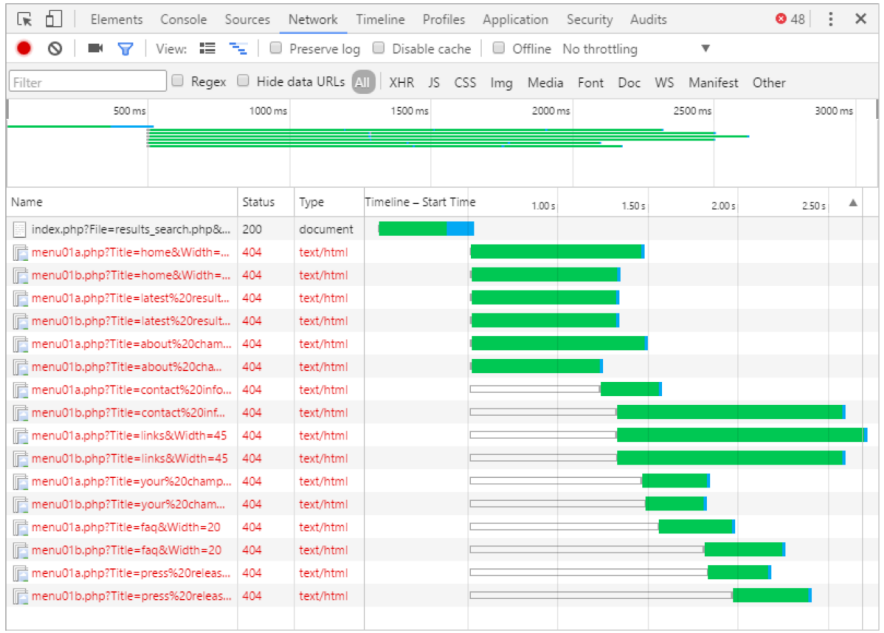


In-Class Activity

HelloWorld.html

The Developer Tools





Homework 0: Getting Setup

So that everyone is working with the same software, this week's homework is to install and set up the following:

VSCode – The recommended code editor

NodeJS – The JavaScript runtime environment

GitHub Account – Where we will be storing/submitting all our work

GitCLI – So we can connect to our GitHub account

Google Chrome – Our Web Browser of choice