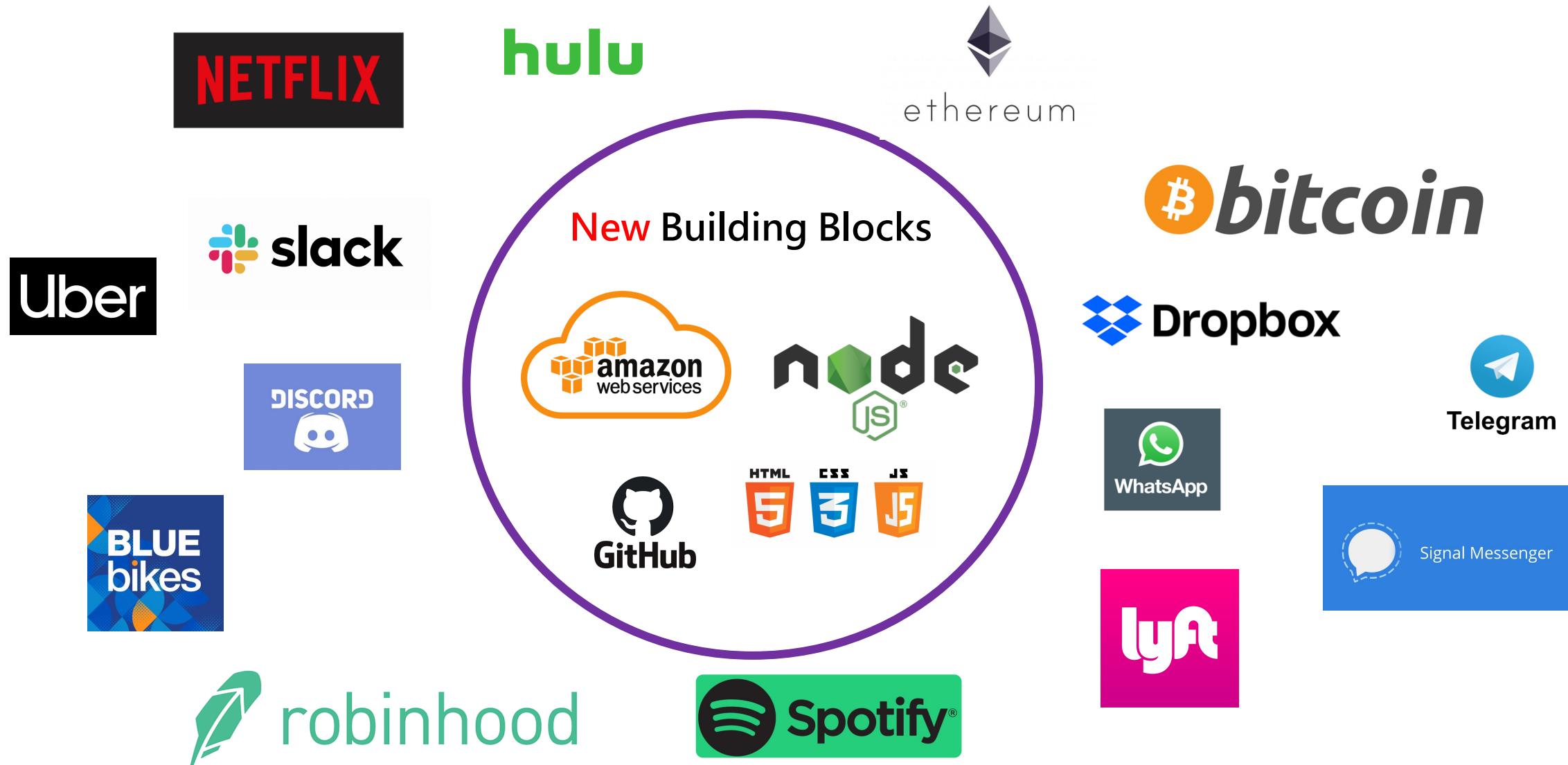


1.125 – Software Engineering and Architecting

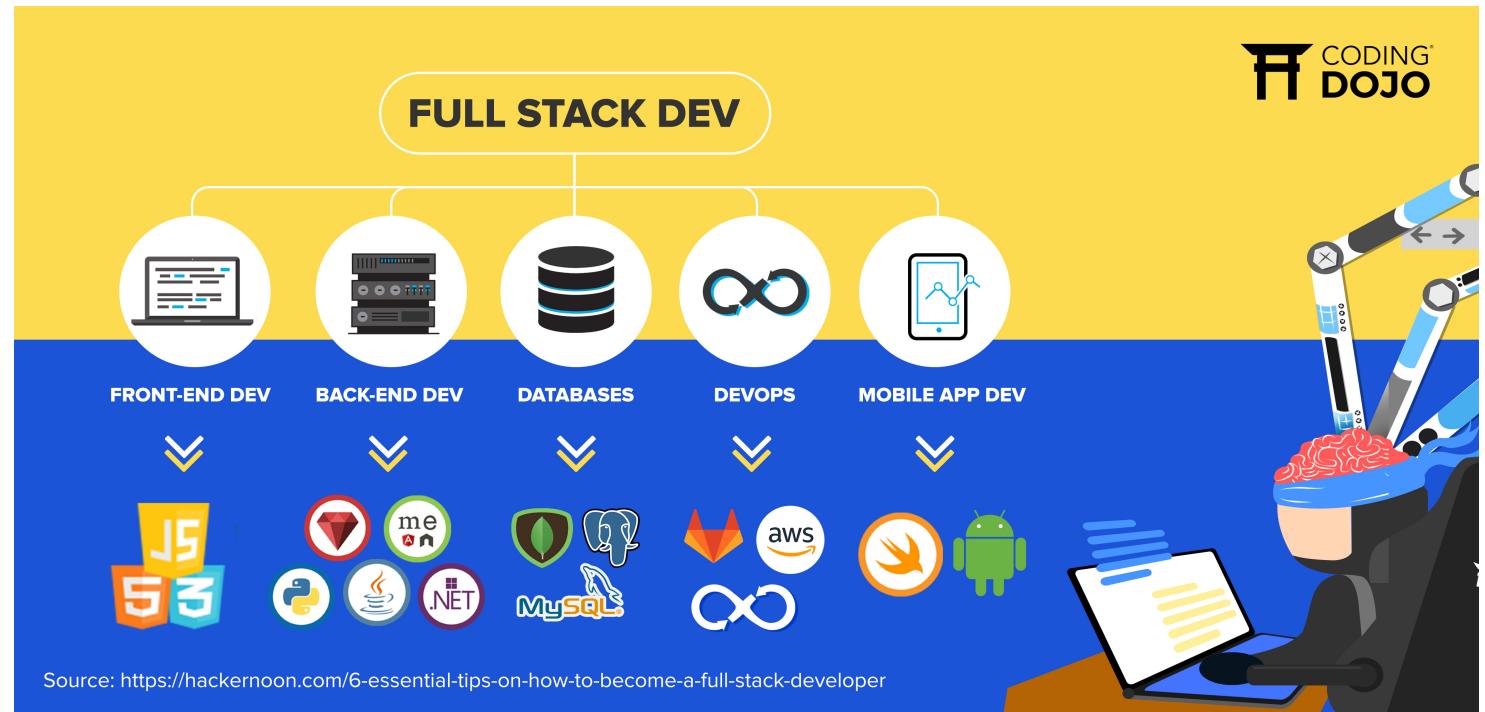
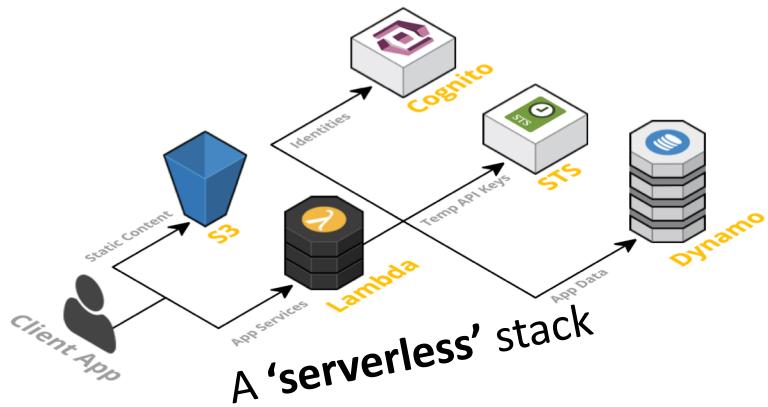
Lecture 1
Course Outline and Introduction to the World Wide Web

The New Web Economy



1.125- Software Engineering and Architecting

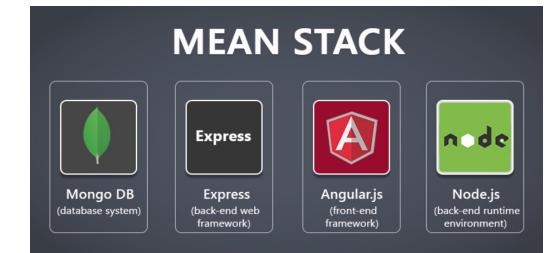
If the internet is “a series of tubes” – Modern software is a “stack of blocks”



LAMP:



MEAN STACK

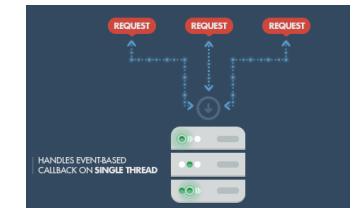


Course Outline

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



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

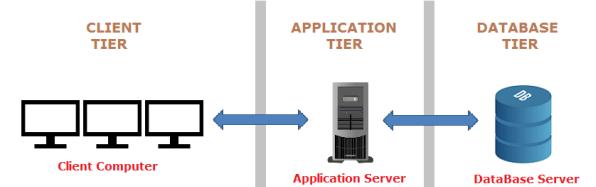


Topic 2: The Back End - [Node/NPM](#)



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/>

1.125

1.125

Software Engineering and Architecting

Tu/Th, 02:30-04:00, Rm 1-390, John R Williams, Abel Sanchez, Sam Raymond

Software architecting and design of software-intensive systems. Targeted at future CTOs who must understand both the business and technical issues involved in architecting global-scale systems. Introduces the Digital Transformation that was started with the World Wide Web and continues with modern advances like Cloud Computing and Blockchain. Cover the use of cloud service APIs, containers, testing and synchronization techniques. Students learn problem solving in an active learning lab setting, completing in-class exercises and weekly assignments leading to a group project in the second half of the course. By the end of the class, students will be able to build practical web/cloud applications and understand the limitations and opportunities of the technology.

Class Information & Logistics

Course Documents

- [Academic Honesty](#)
- [Syllabus](#)

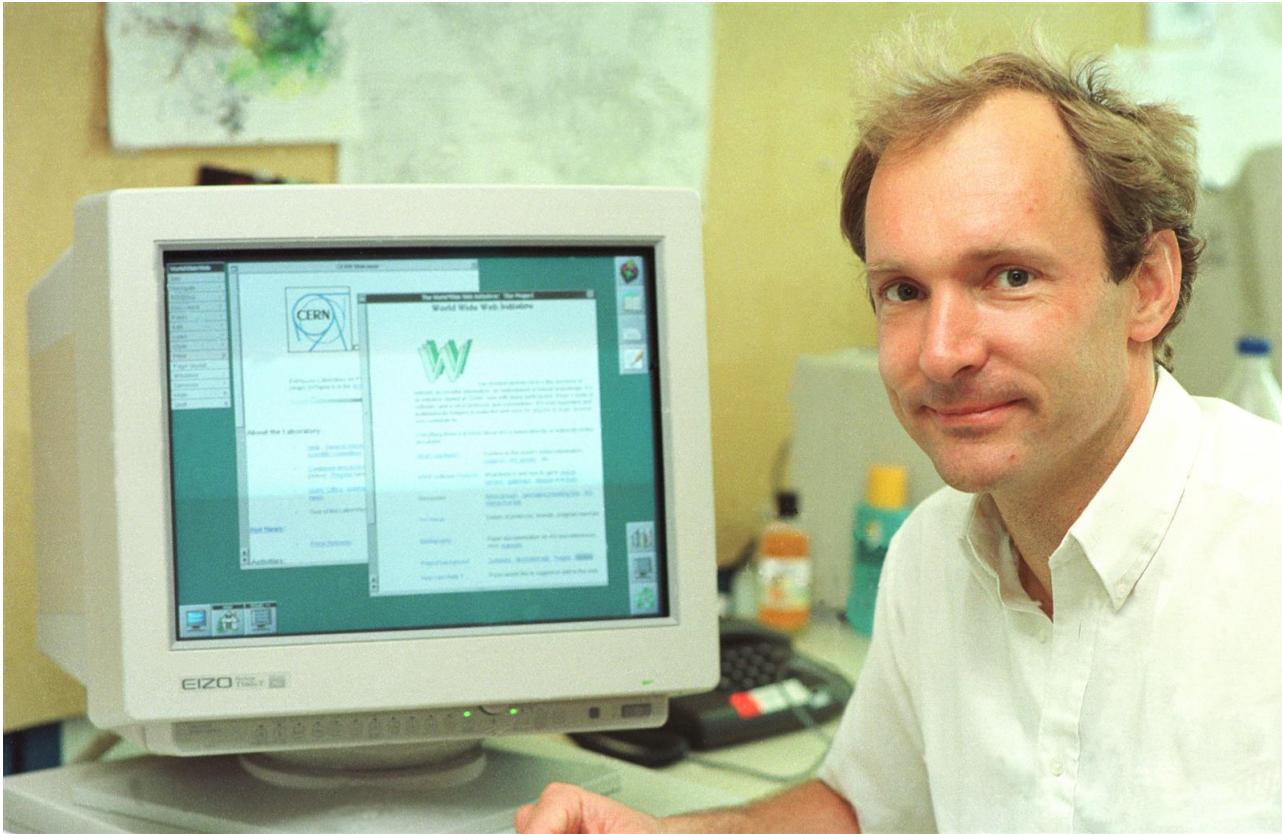
Final Projects

https://onexi.org/projects_standalone.html

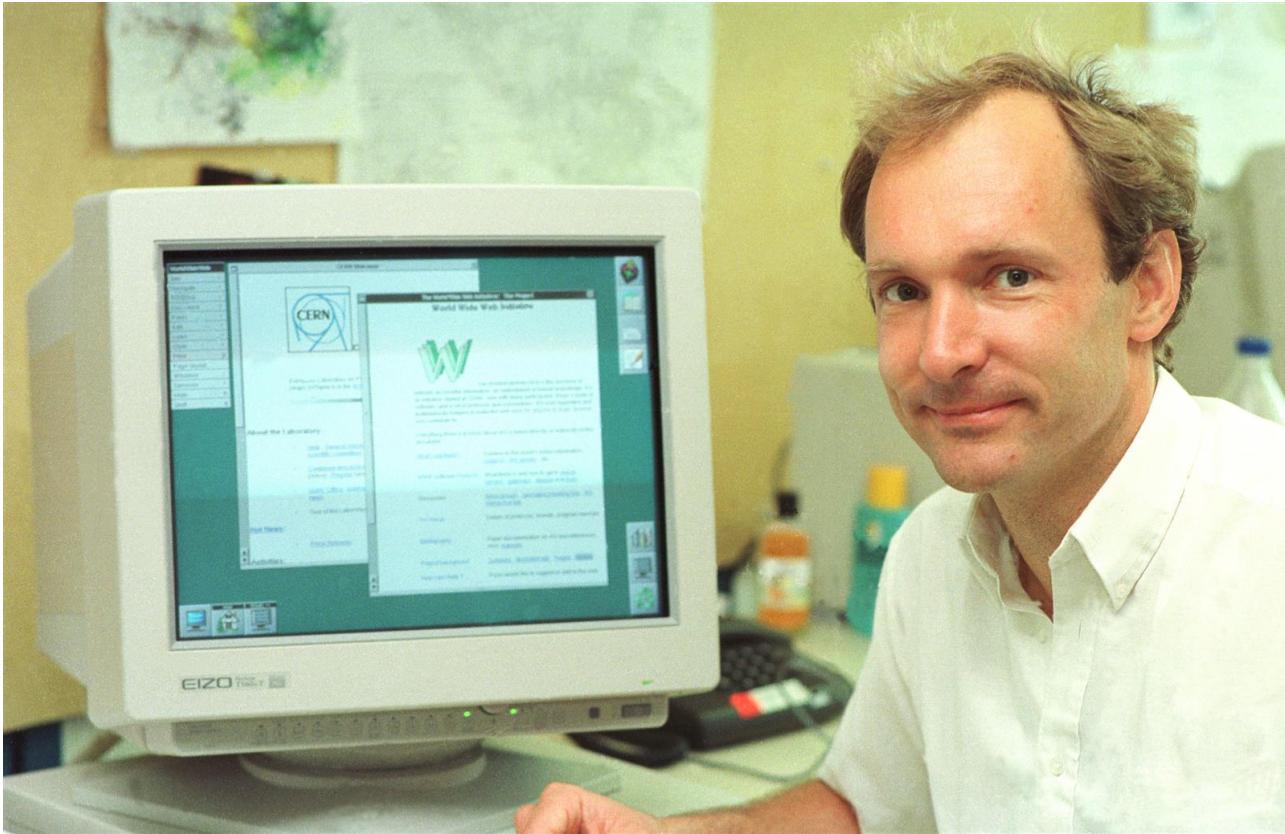
The World Wide Web



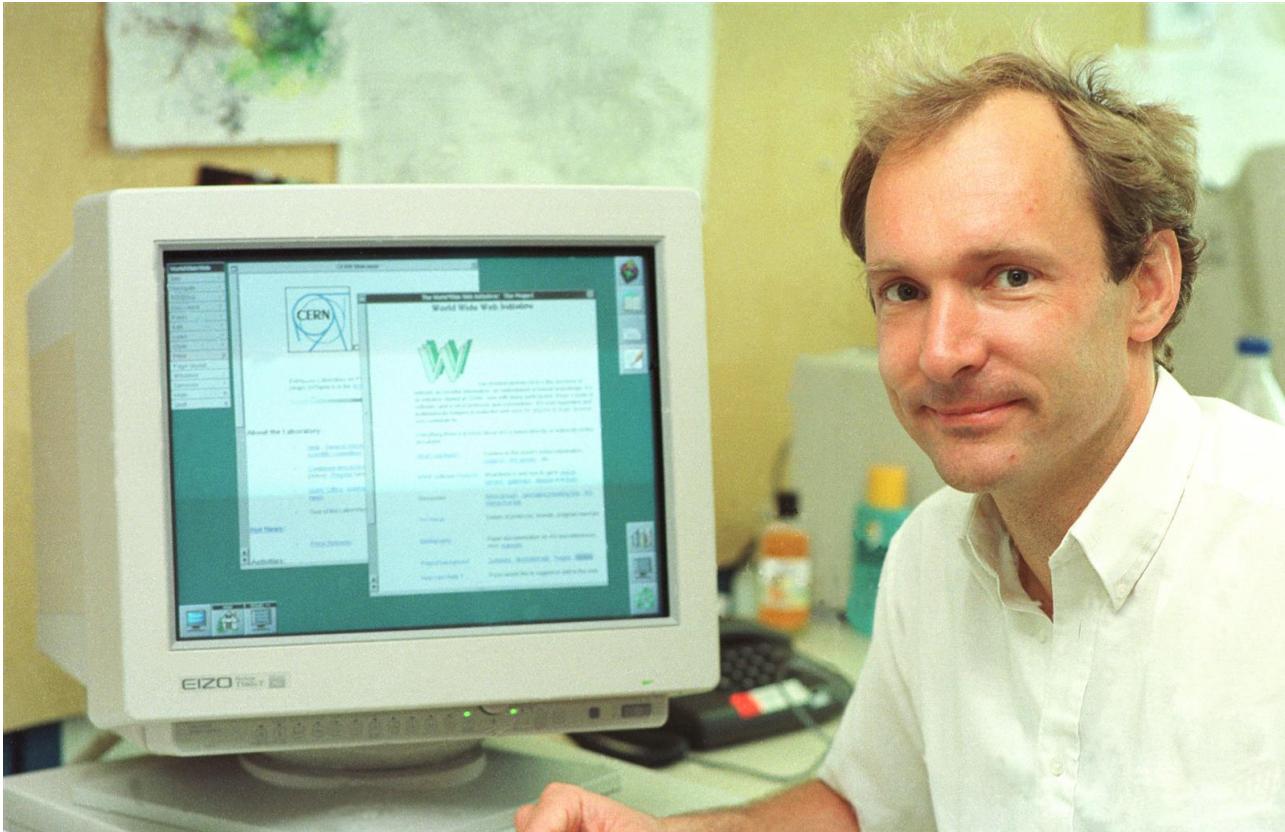
?????????????



Sir Tim Berners-Lee

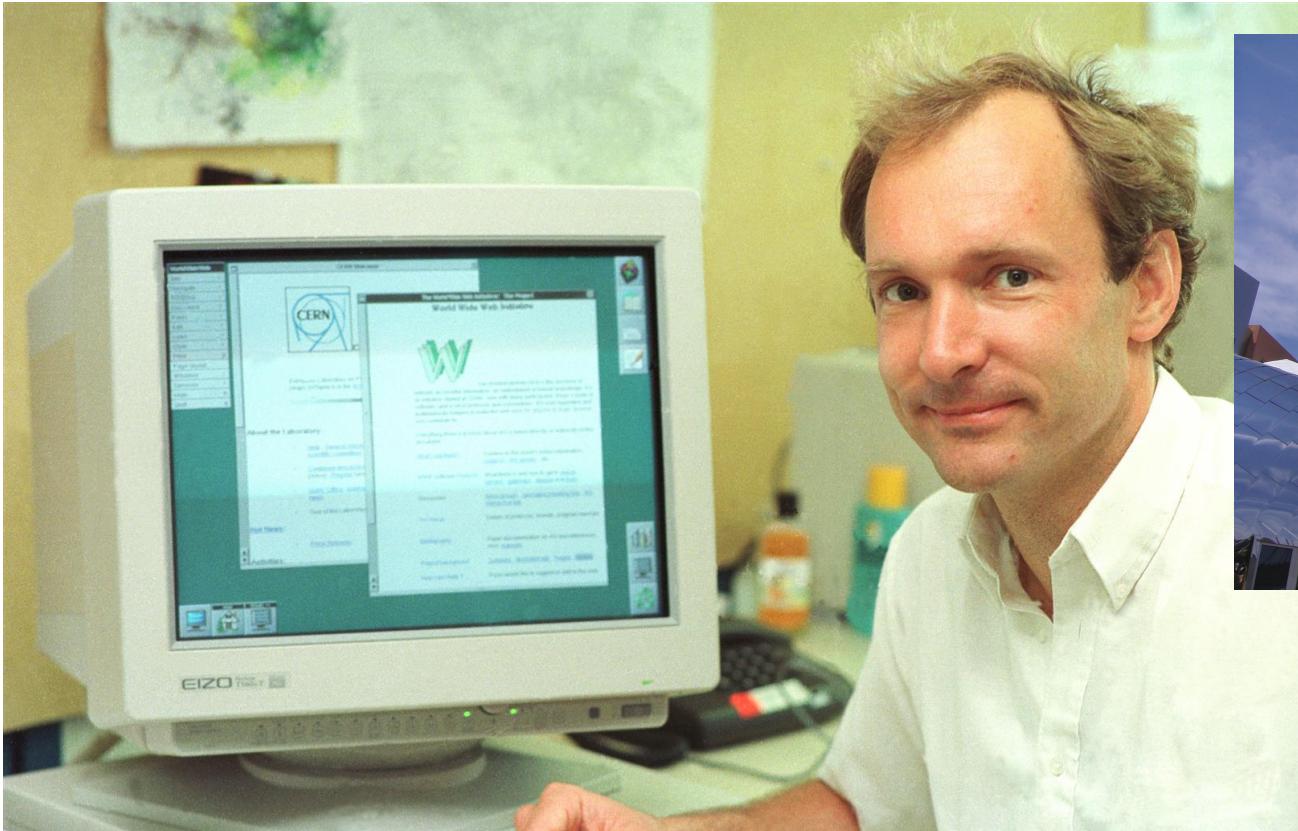


Sir Tim Berners-Lee



...invented the World Wide Web in 1989

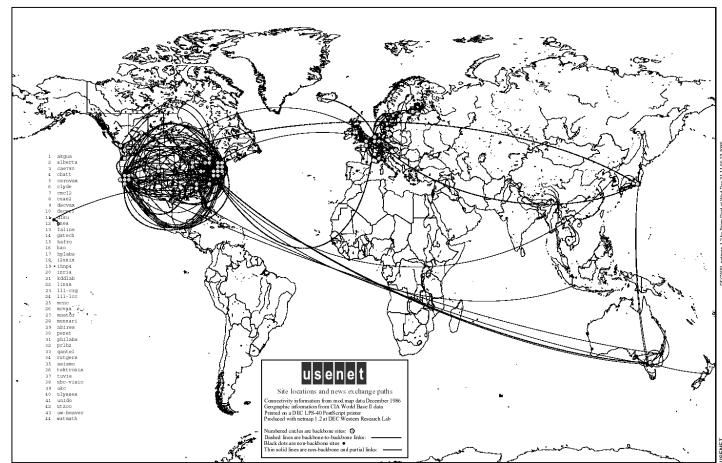
Sir Tim Berners-Lee



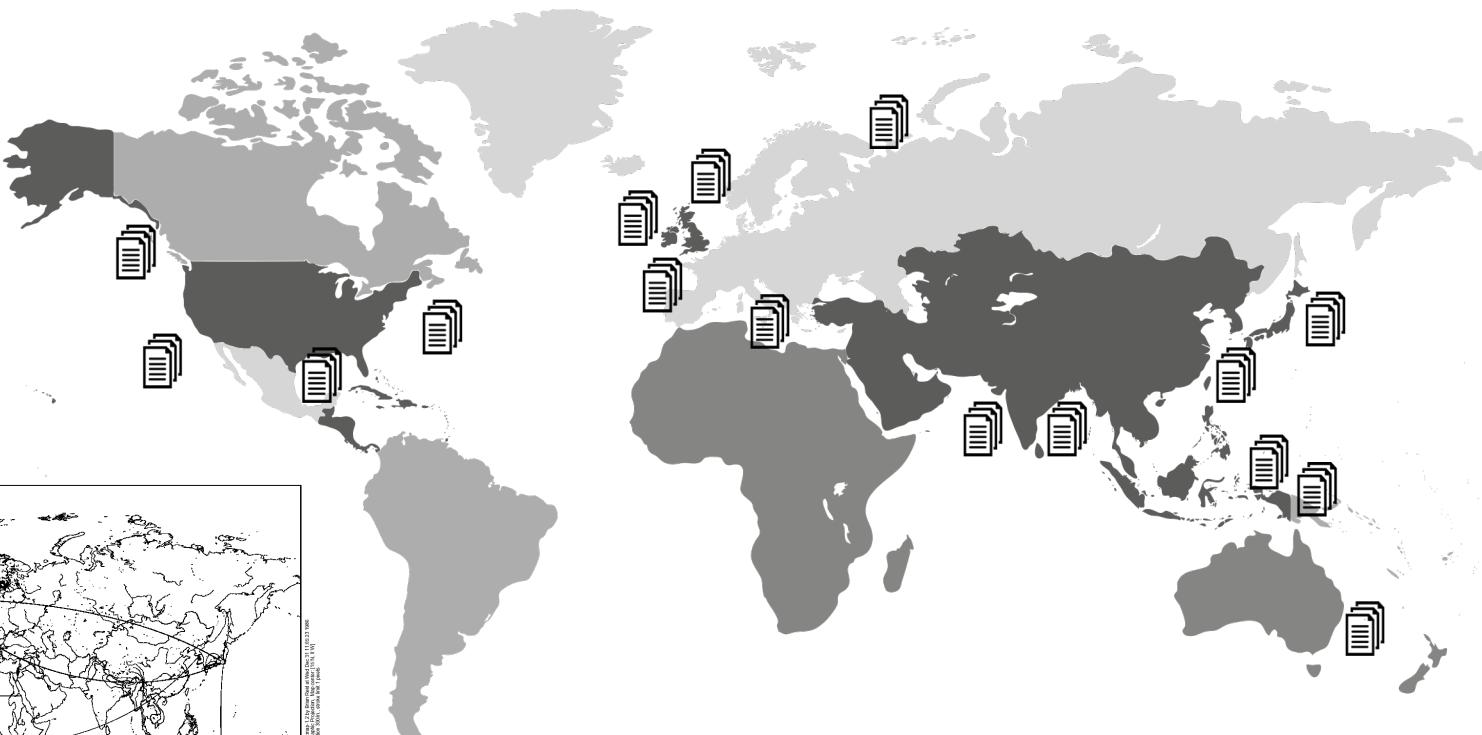
Works Here

...invented the World Wide Web in 1989

The Problem



Internet Connections Existed



But researchers couldn't communicate

The Solution: HyperLinks

CERN DD/OC

Tim Berners-Lee, CERN/DD

Information Management: A Proposal

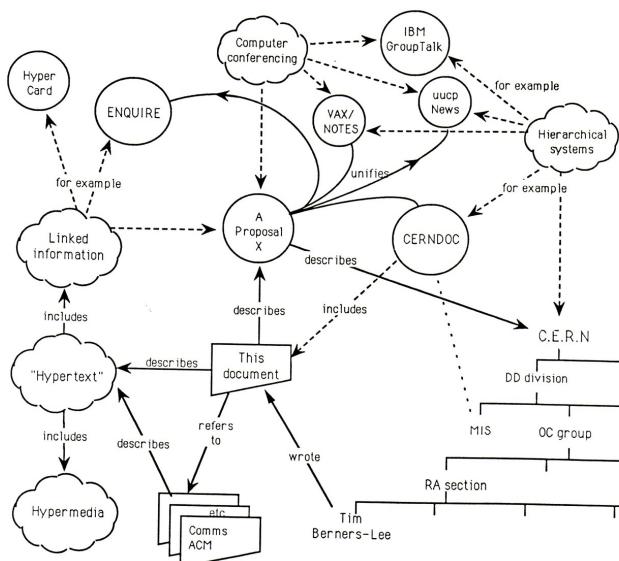
March 1989

Information Management: A Proposal

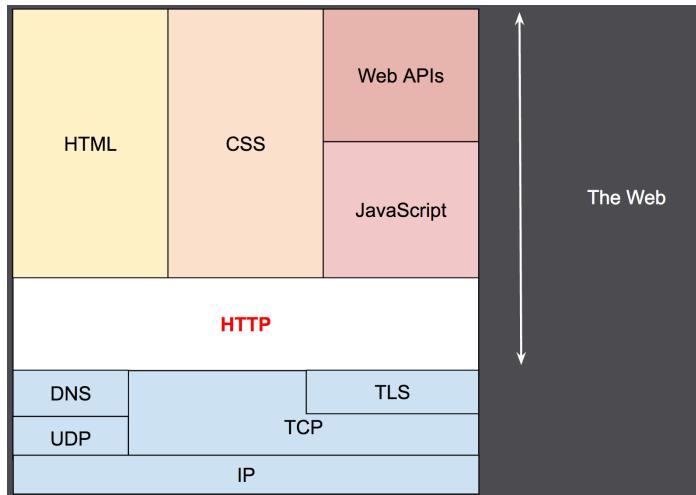
Abstract

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 system.

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



The Solution: HTTP + HTML + Browser



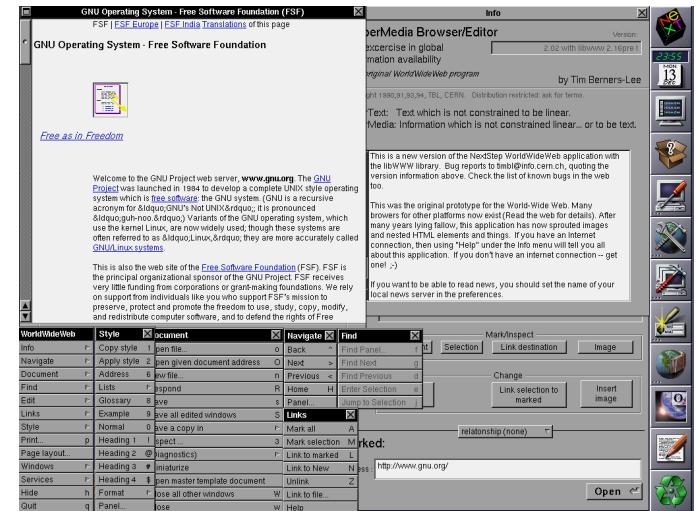
Hyper Text Transfer Protocol - HTTP

```


<nav id="nav" role="navigation">
<ul>
<li><a href="index.html">Home</a></li>
<li><a href="home-events.html">Home Events</a></li>
<li><a href="multi-col-menu.html">Multiple Column Men
<li class="has-children"> <a href="#" class="current">
<ul>
<li><a href="tall-button-header.html">Tall But
<li><a href="image-logo.html">Image Logo</a>
<li class="active"><a href="tall-logo.html">Ta
</ul>
</li>
<li class="has-children"> <a href="#">Carousels</a>
<ul>
<li><a href="variable-width-slider.html">Variab
...<a href="variable-width-slider.html">Testimon

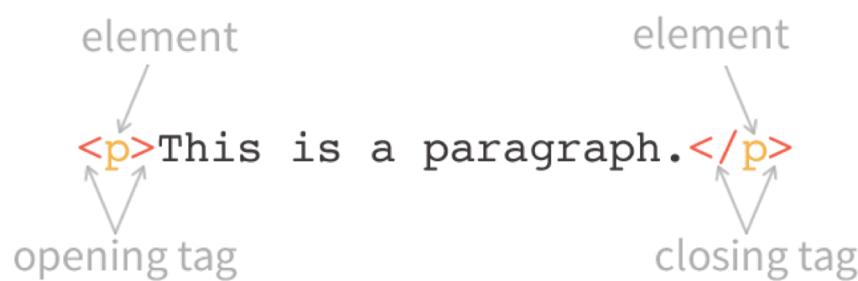

```

Hyper Text Markup Language - HTML



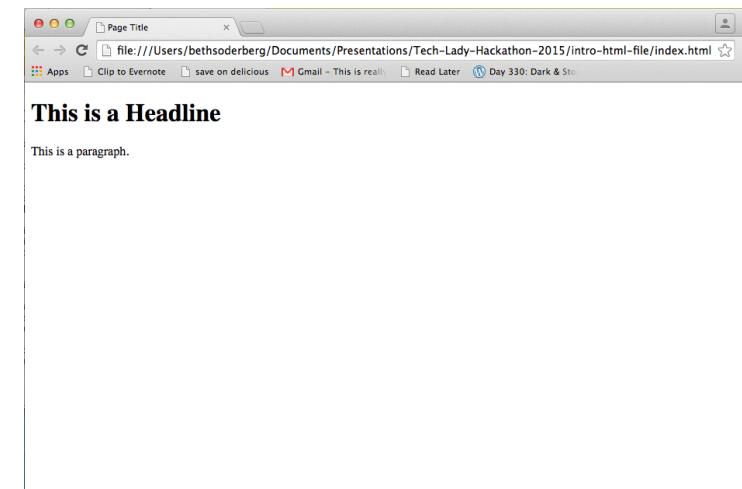
Web Browser

HTML – Hyper Text Markup Language

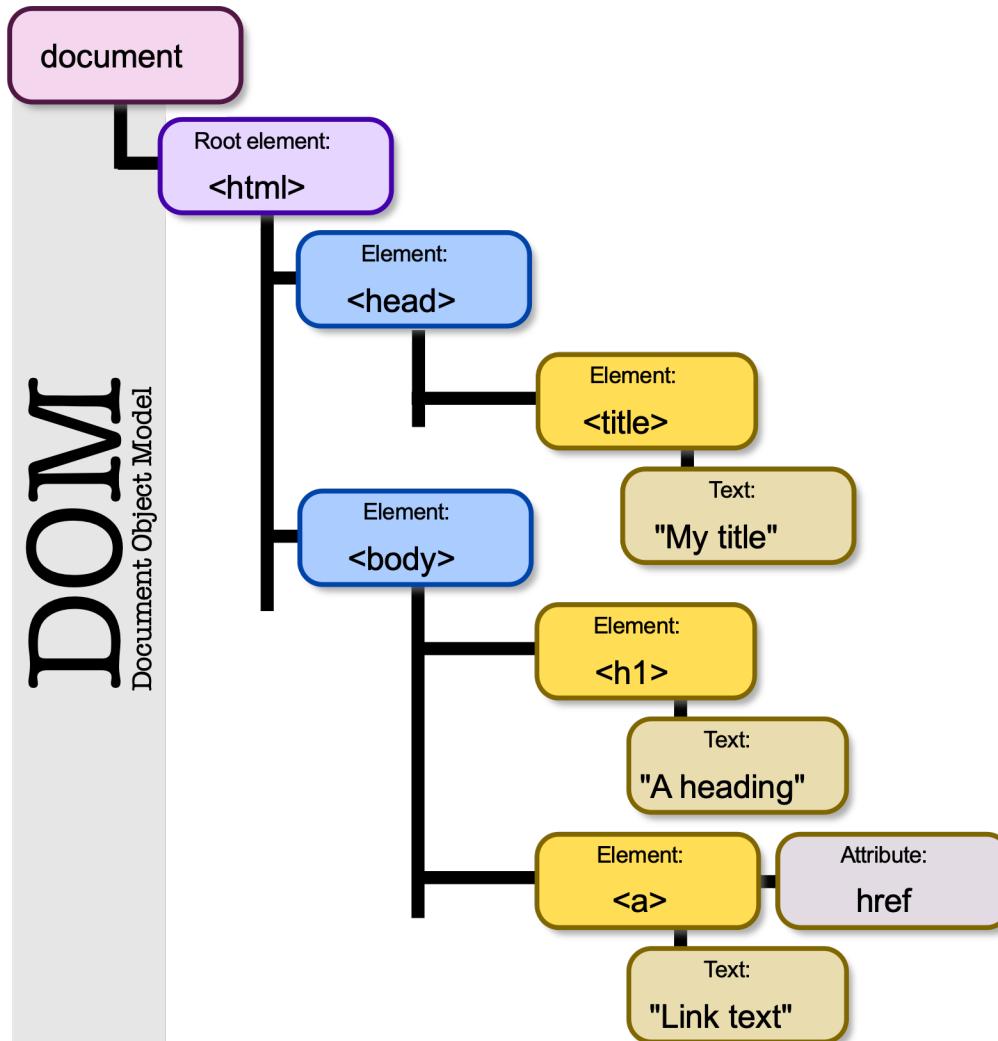


```
<!DOCTYPE html>
<html>
  <head>
    <title>Page Title</title>
  </head>

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



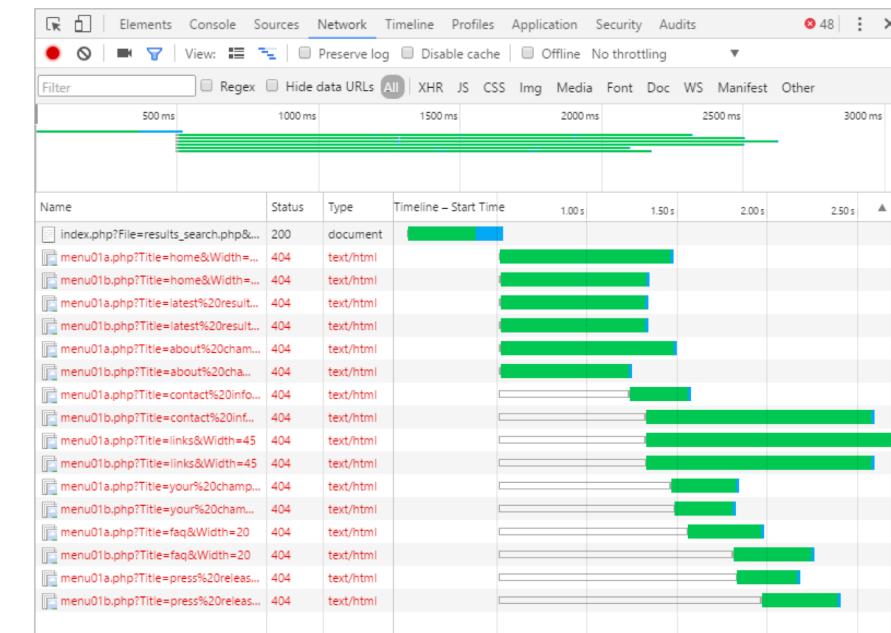
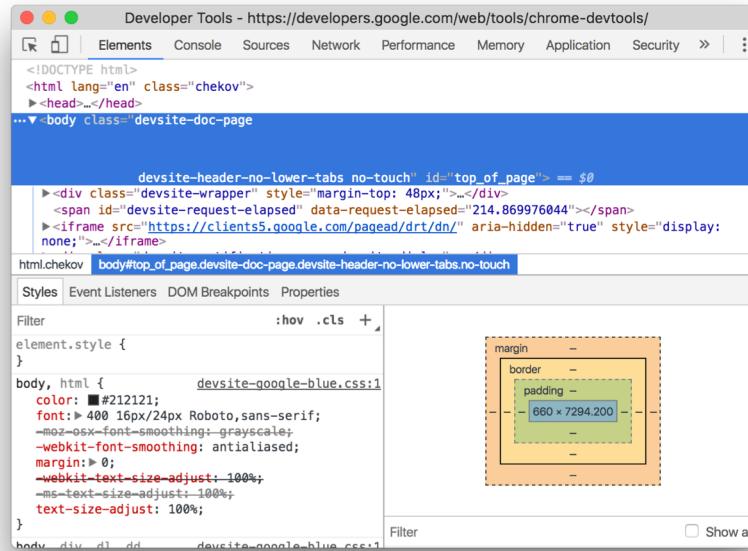
DOM – Document Object Model



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