



Waterford Institute of Technology  
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

# Module: Web App Development 2

## Overview

### Presenters:

Diarmuid O' Connor ([doconnor@wit.ie](mailto:doconnor@wit.ie))

Dr. Frank Walsh ([fwwalsh@wit.ie](mailto:fwwalsh@wit.ie))

### Where:

<https://tutors-design.netlify.com/course/wad2-2020-wit.netlify.com>

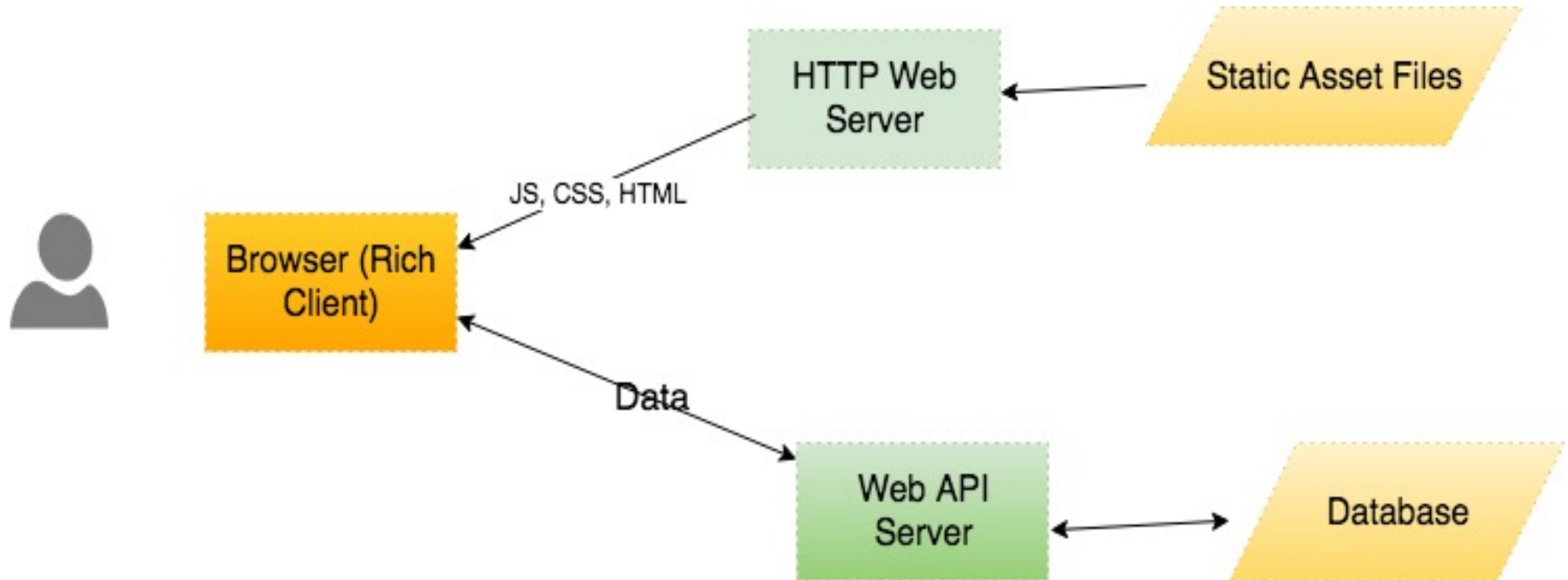
*TL;DR*

**Design and develop modern, secure  
Web apps.**

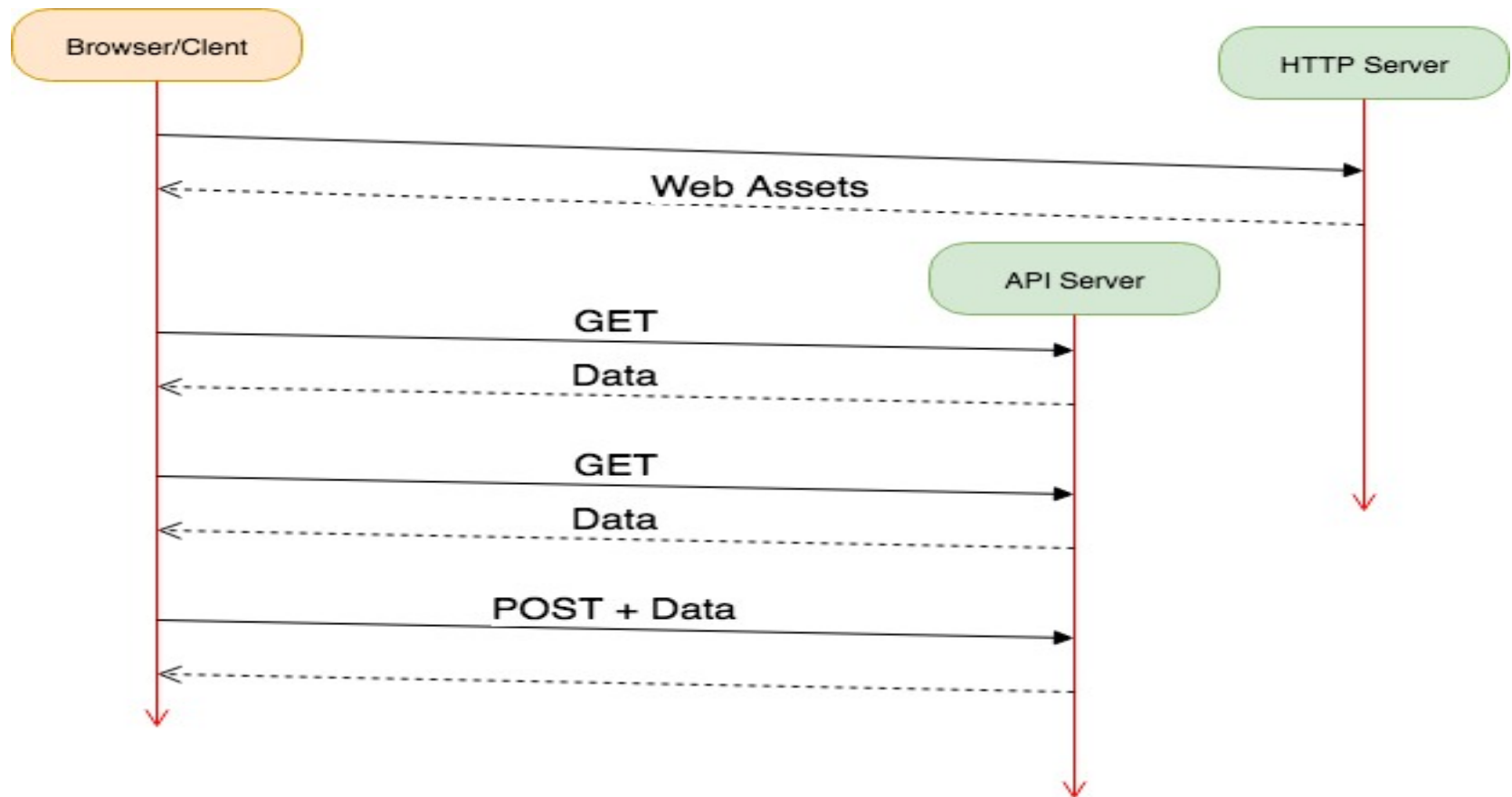
# Agenda

- Context
- This module's focus
- Software installation requirements

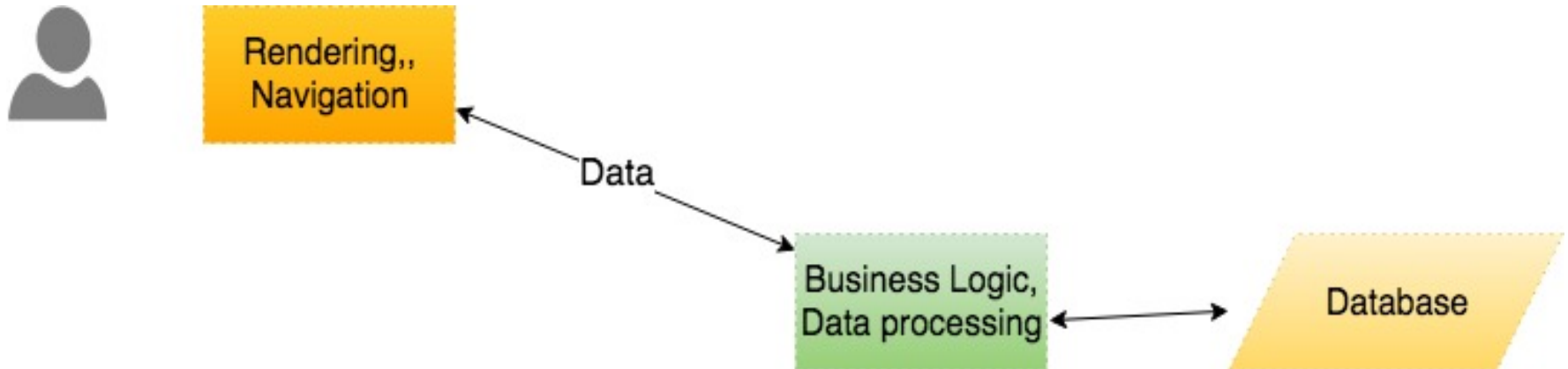
# Modern Web Apps - Architecture



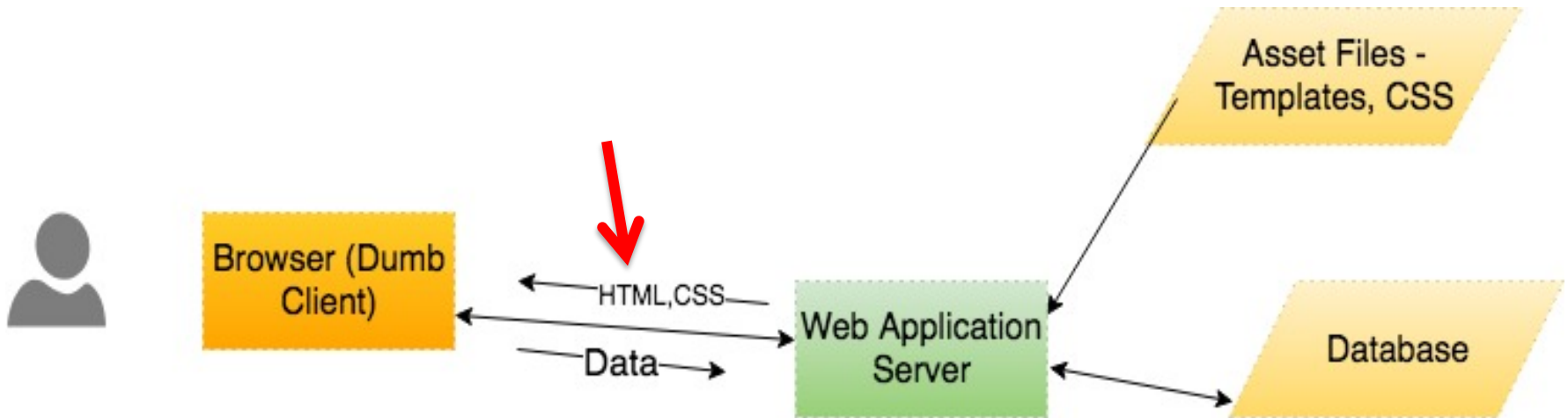
# Modern Web Apps – HTTP Communications flow



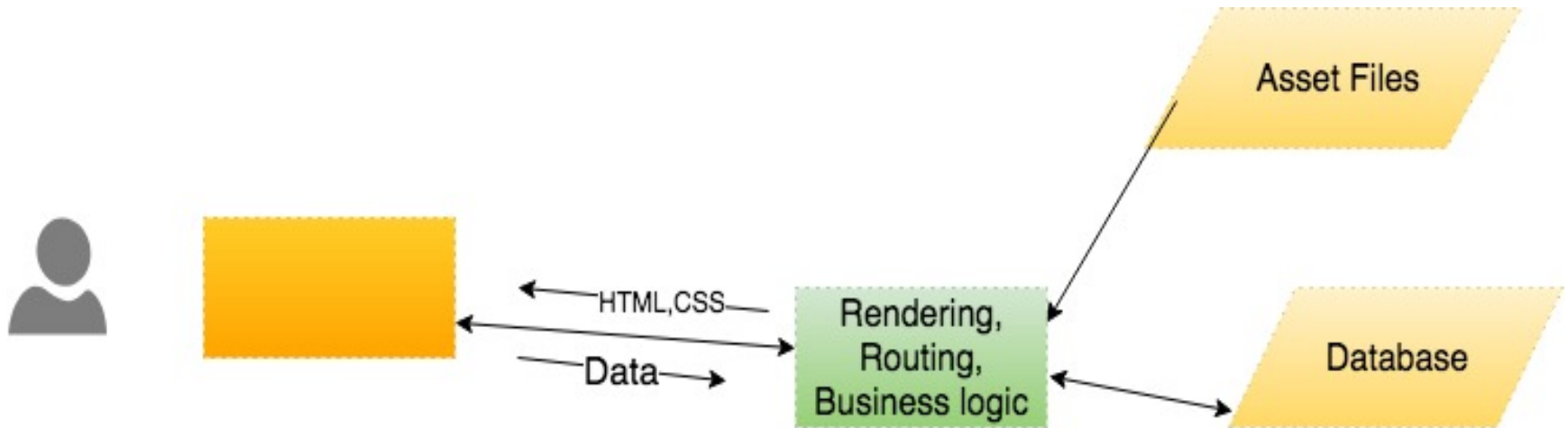
# Modern Web Apps – Sub-system roles



# Traditional Web Apps – Architecture

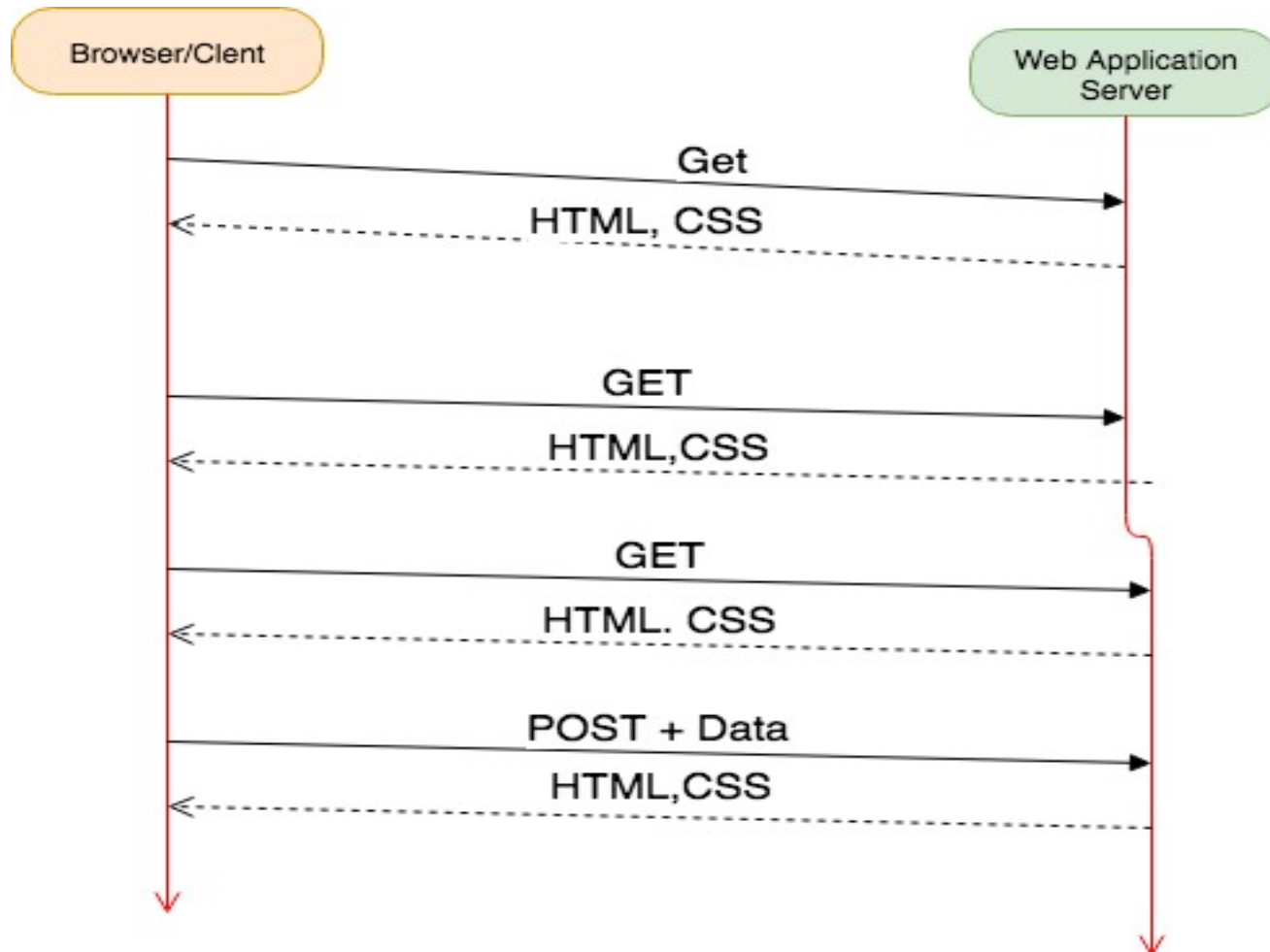


# Traditional Web Apps – Sub-system roles.





# Traditional Web Apps – HTTP Communication flow.



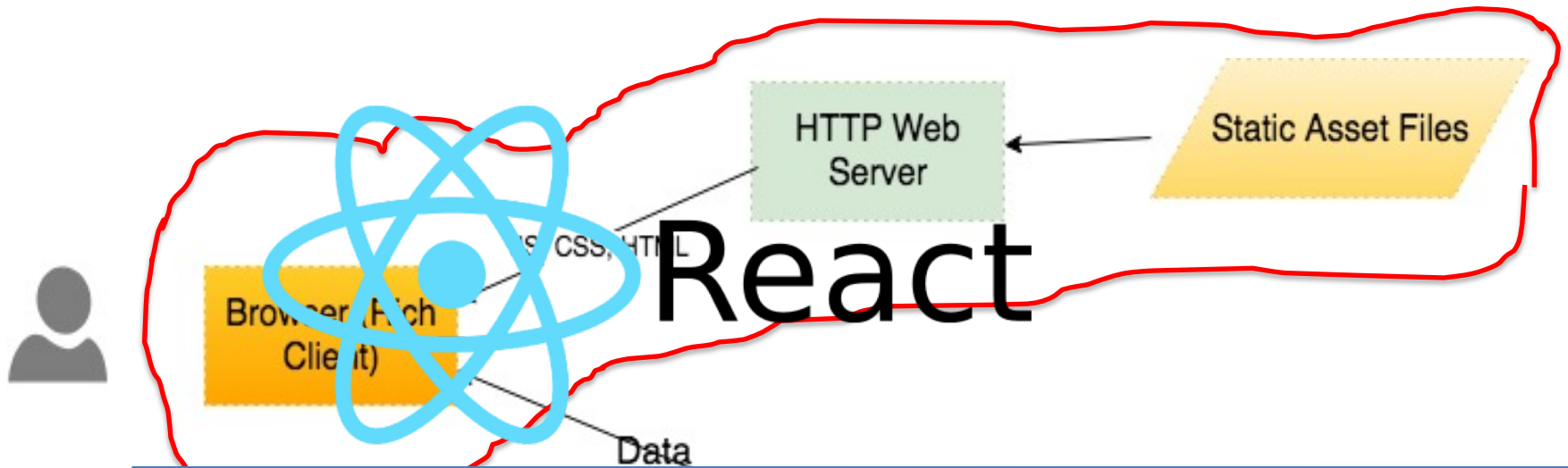
# Modern Web Apps.

1. **Early Examples: Gmail (2004), YouTube (1<sup>st</sup> generation)**
  - **Disadvantage:**
    - **Poor developer experience (DX) – code bloat; poor maintainability; browser inconsistencies.**
    - **Lacked addressability (Key principle of the web).**
2. **Jquery – A cross-platform JavaScript library to simplify the client-side scripting of HTML pages. (2006)**
  - **Adv.: Better developer productivity;**
    - **Reduced code bloat**
    - **Cross-browser**
  - **Disadvantages –**
    - **Lacked Addressability.**
    - **Poor code maintainability (spaghetti code).**
3. **Single Page App (SPA) *frameworks*. (2010 ish)**
  - **Support addressability; Improved DX; Improved maintainability.**

# Agenda

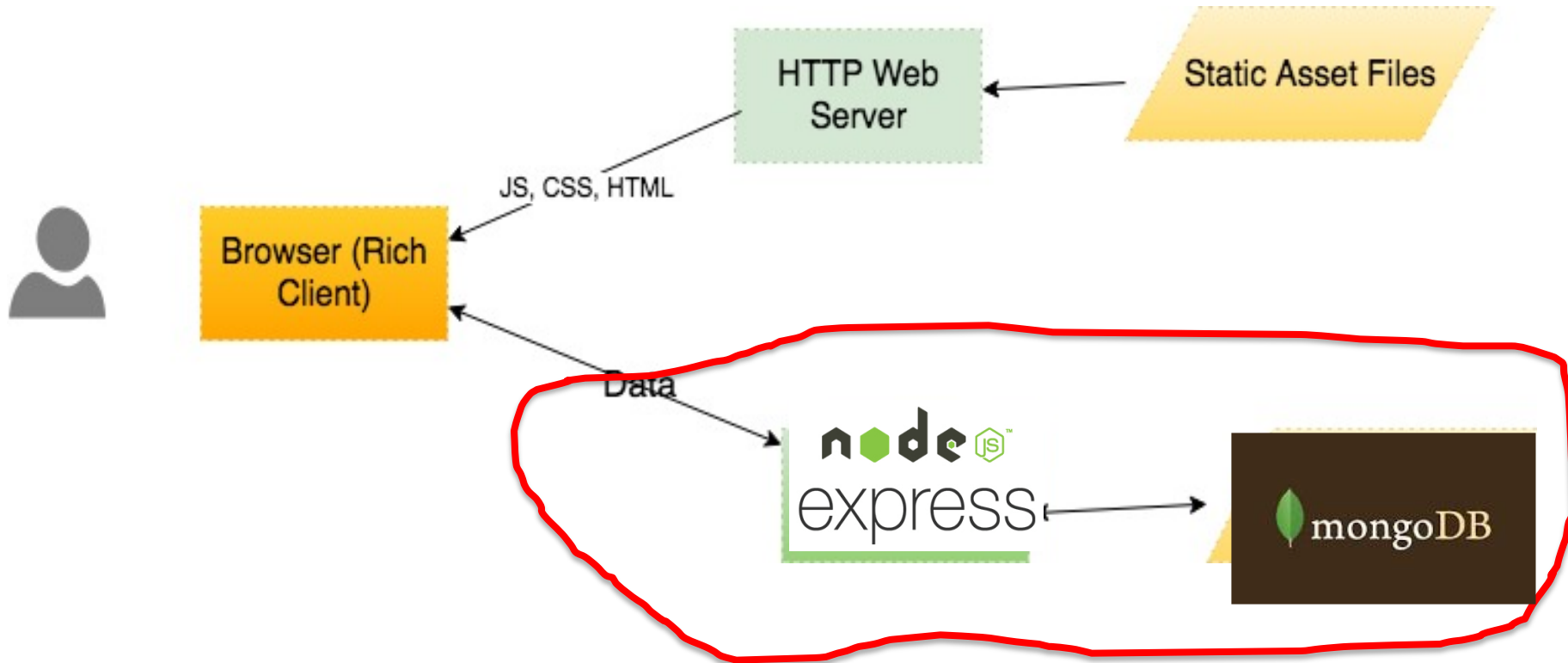
- Context. ☒
- This module's focus

# Modern Web Apps

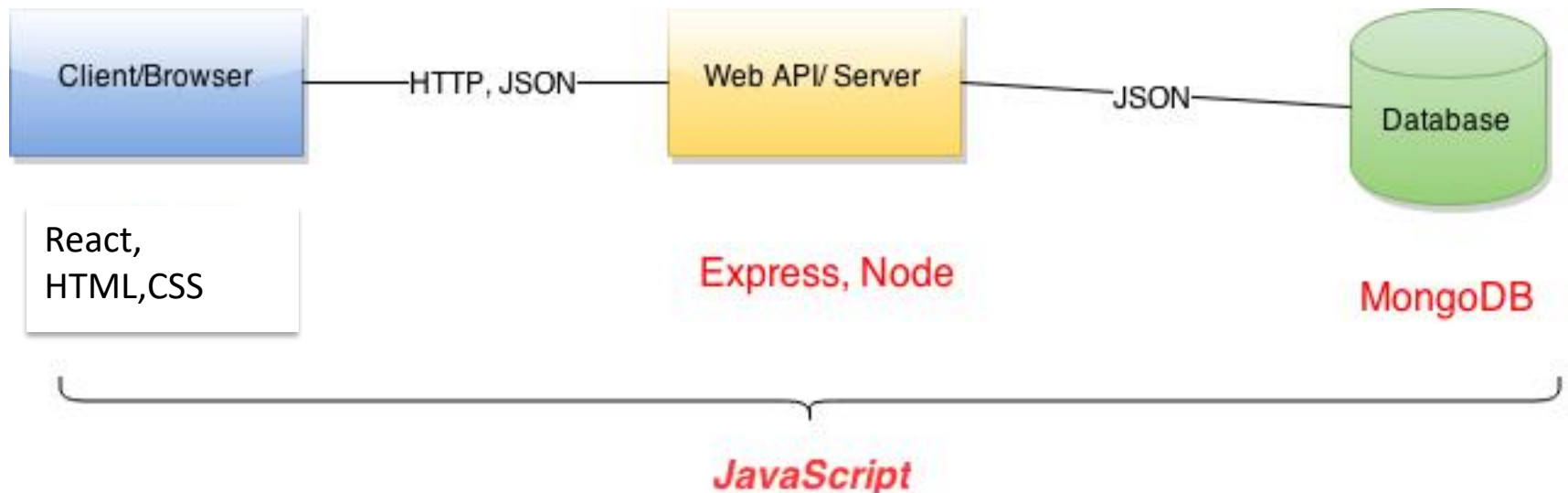


A JavaScript library for building user interfaces

# Modern Web Apps



# Modern Web App architecture.



The **MERN** stack. (Mongo, Express, React, Node)

# Agenda

- Context. ☒
- This module's focus
  - Single Page Apps, using React ☒
  - Web APIs, using Node and MongoDB ☒
- Software Installation Requirements

# Node.js

(A JavaScript runtime platform)

The screenshot shows the Node.js website with a red annotation box containing the text "You must pick this version or slightly lower". A red arrow points from this box to the "12.18.4 LTS" download button. The website header includes the Node.js logo and navigation links: HOME, ABOUT, DOWNLOADS, DOCS, GET INVOLVED, SECURITY, CERTIFICATION, and NEWS. Below the header, it states "Node.js® is a JavaScript runtime built on Chrome's V8 JavaScript engine." There is a "#BlackLivesMatter" banner and a green notification bar that says "New security releases are available". Under the heading "Download for macOS (x64)", there are two green buttons: "12.18.4 LTS Recommended For Most Users" and "14.12.0 Current Latest Features". Below these buttons are links for "Other Downloads", "Changelog", and "API Docs". At the bottom, there is a link to the "Long Term Support (LTS) schedule". The footer includes the OpenJS Foundation logo and copyright information: "© OpenJS Foundation. All Rights Reserved. Portions of this site originally © Joyent."

nodejs.org/en/

node

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Node.js® is a JavaScript runtime built on Chrome's V8 JavaScript engine.

#BlackLivesMatter

New security releases are available

Download for macOS (x64)

**12.18.4 LTS**  
Recommended For Most Users

**14.12.0 Current**  
Latest Features

Other Downloads | Changelog | API Docs    Other Downloads | Changelog | API Docs

Or have a look at the [Long Term Support \(LTS\) schedule](#).

OpenJS Foundation

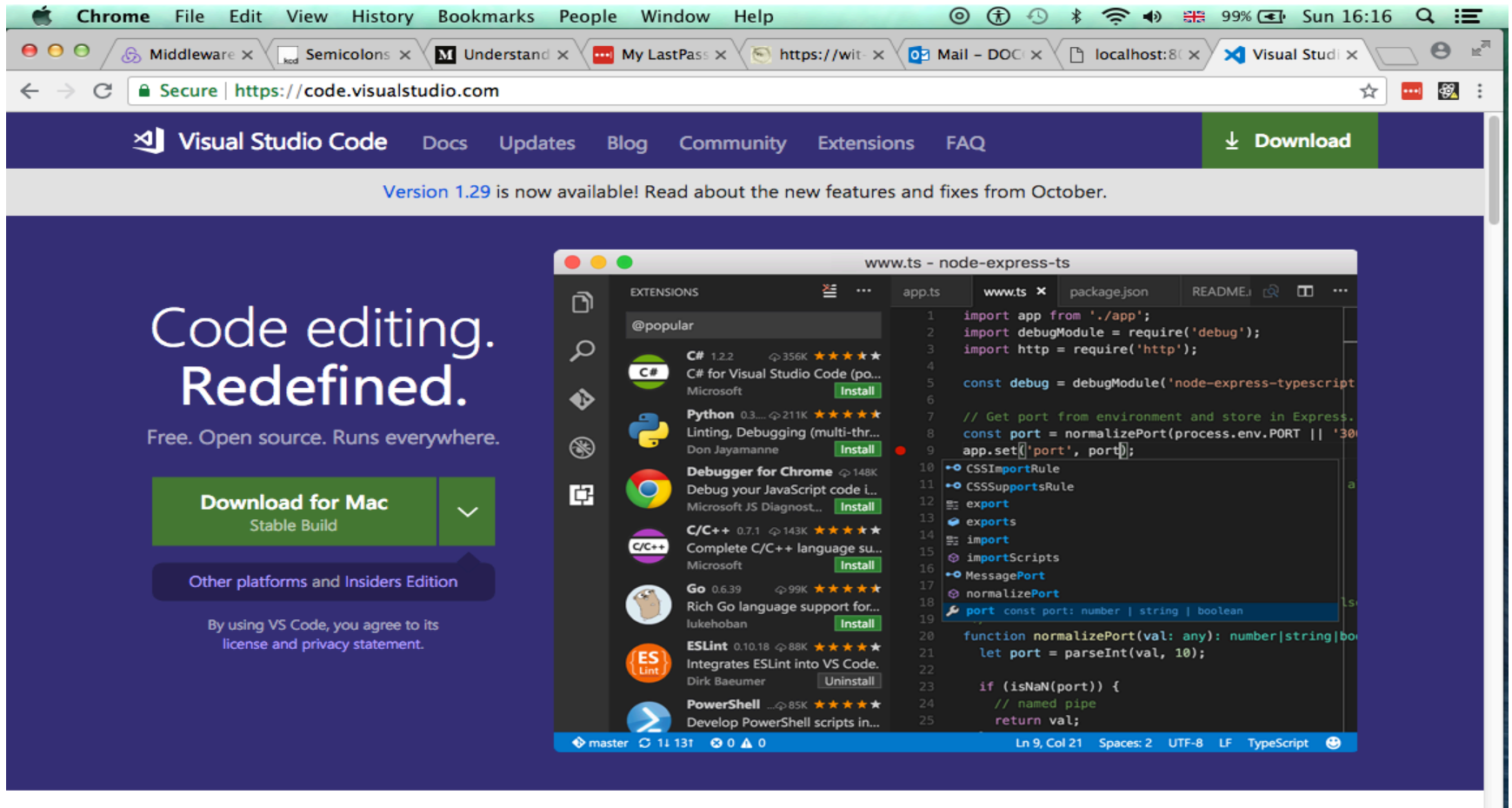
Report Node.js issue | Report website issue | Get Help

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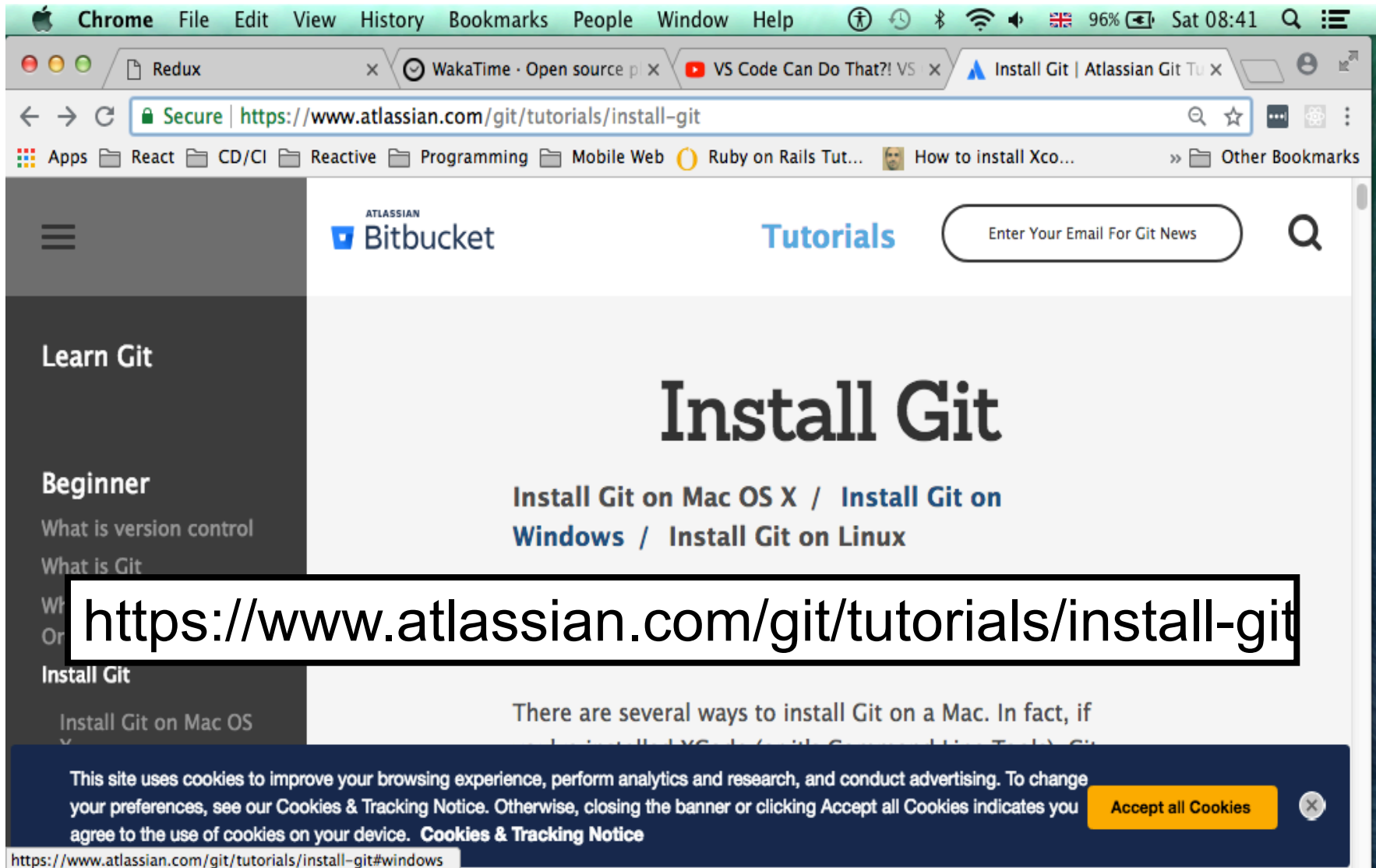


# Text Editor

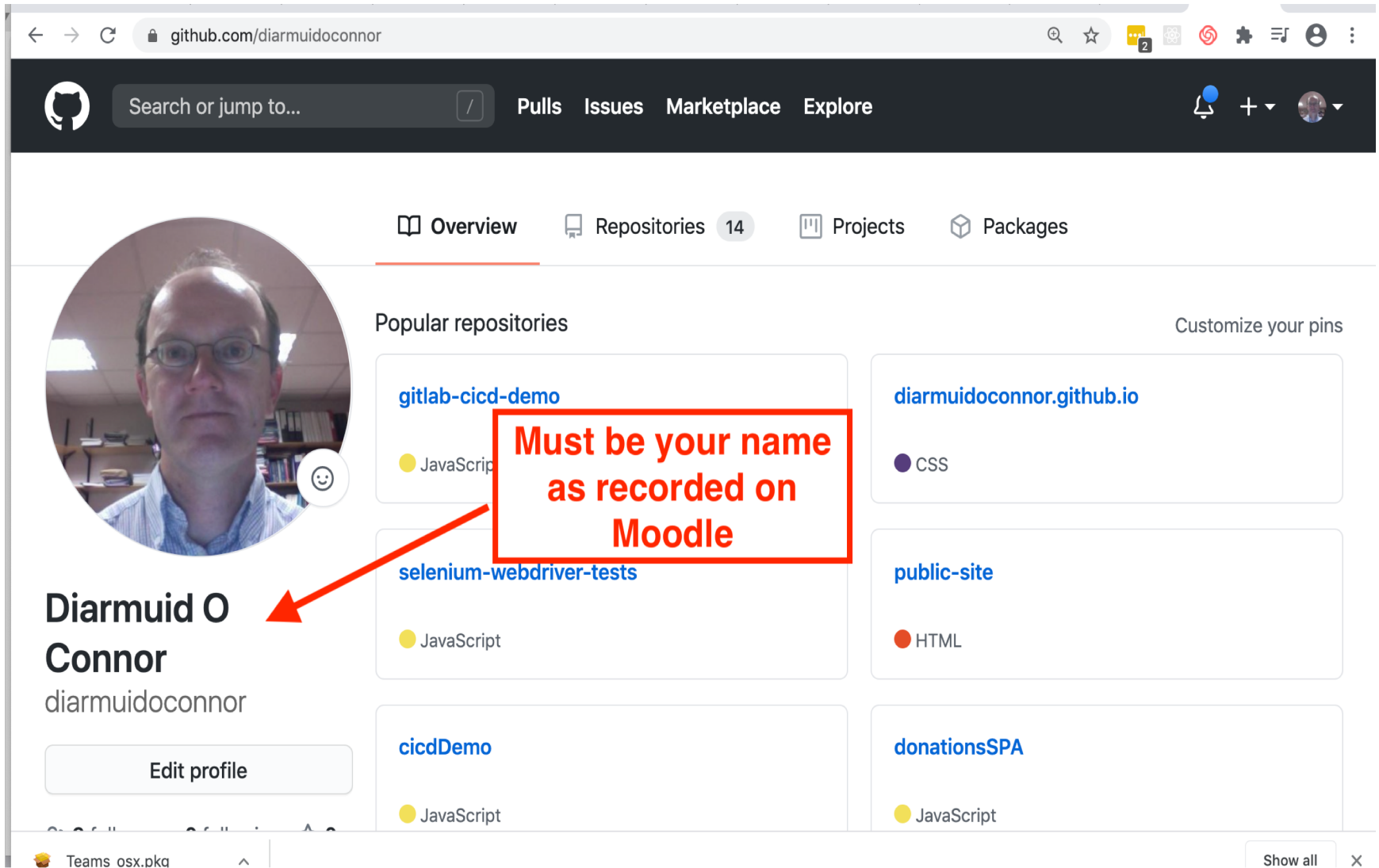
(Not a heavyweight IDE, thankfully)



# Source Control (Git)



# Create a GitHub account



The screenshot shows a web browser at the URL `github.com/diarmuidoconnor`. The GitHub navigation bar is at the top with links for Pulls, Issues, Marketplace, and Explore. The profile header includes a circular profile picture of a man with glasses, the name **Diarmuid O Connor**, the username `diarmuidoconnor`, and an **Edit profile** button. Below the header, the **Overview** tab is selected, showing a section for **Popular repositories**. A red box with the text **Must be your name as recorded on Moodle** is overlaid on the repository list, with a red arrow pointing to the profile name. The repository list includes `gitlab-cicd-demo`, `selenium-webdriver-tests`, `cicdDemo`, `diarmuidoconnor.github.io`, `public-site`, and `donationsSPA`. The browser's taskbar at the bottom shows a Teams icon and the file `osx.pka`.

github.com/diarmuidoconnor

Search or jump to... Pulls Issues Marketplace Explore

Overview Repositories 14 Projects Packages

Popular repositories

Customize your pins

**Diarmuid O Connor**  
diarmuidoconnor  
Edit profile

**Must be your name as recorded on Moodle**

`gitlab-cicd-demo`  
JavaScript

`selenium-webdriver-tests`  
JavaScript

`cicdDemo`  
JavaScript

`diarmuidoconnor.github.io`  
CSS

`public-site`  
HTML

`donationsSPA`  
JavaScript

Teams osx.pka Show all

# Summary.

- **Two models of web apps:**
  - **Traditional – Server Side Rendering (SSR)**
  - **Modern – Client Side Rendering (CSR)**
- **CSR model has evolved:**
  - **Unmaintainable JS codebase to SPA framework based codebase.**
  - **No addressability to addressable.**
- **Server-side:**
  - **From SSR web applications to Web APIs.**
  - **REST style interface.**
- **NoSQL databases.**

