



Waterford Institute of Technology  
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

# Module: Web App Development 2

## Overview

### Presenters:

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Dr. Frank Walsh (fwwalsh@wit.ie)

### Where:

<https://tutors-svelte.netlify.app/#/course/wad2-2021-wit.netlify.app>

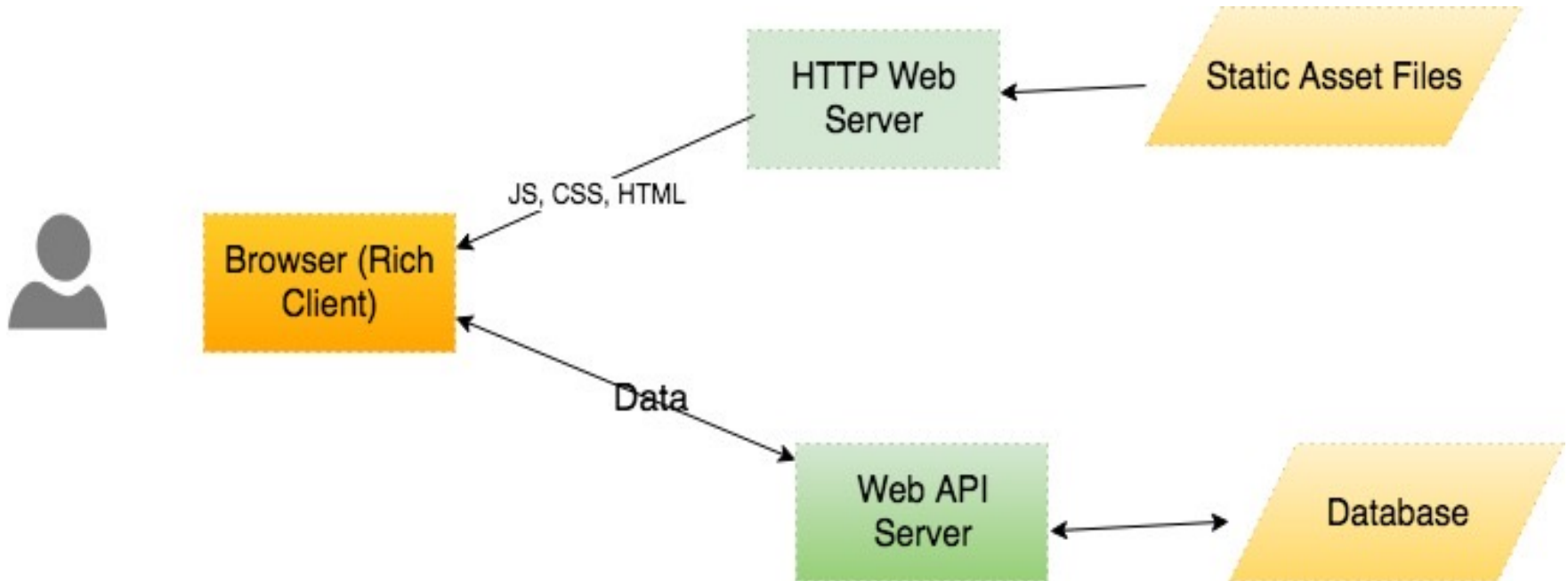
*TL;DR*

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

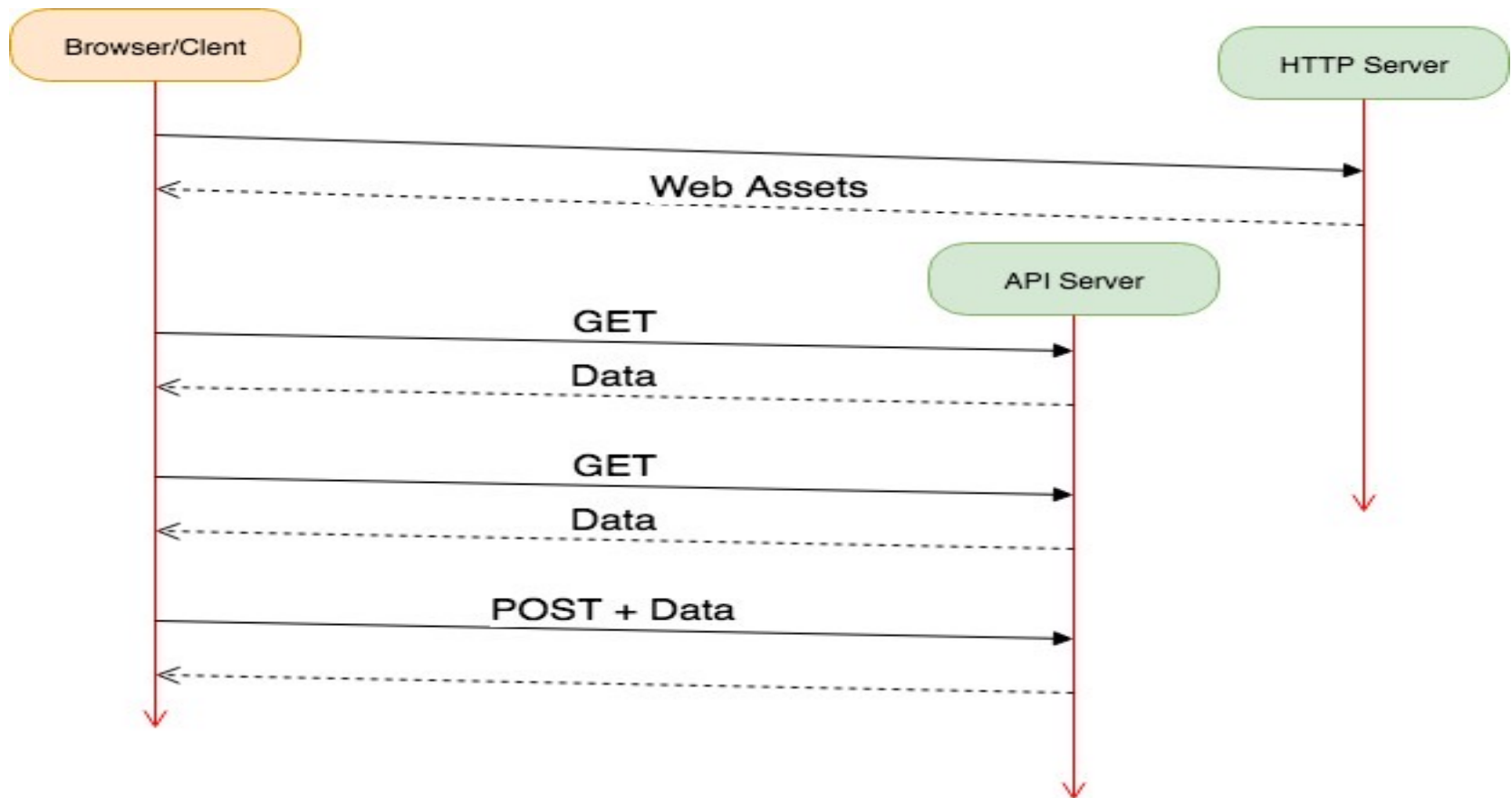
# Agenda

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

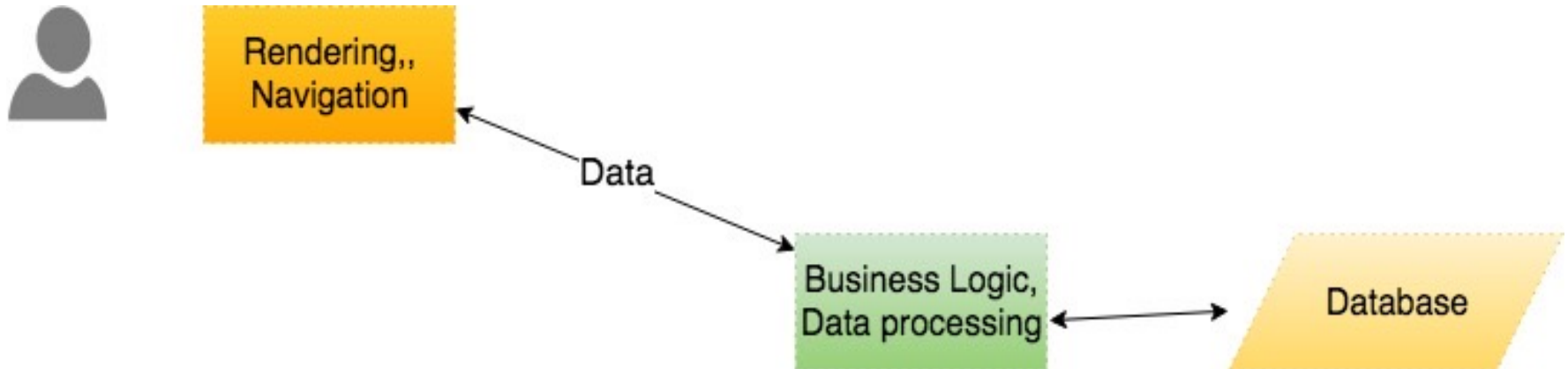
# Modern Web Apps - Architecture



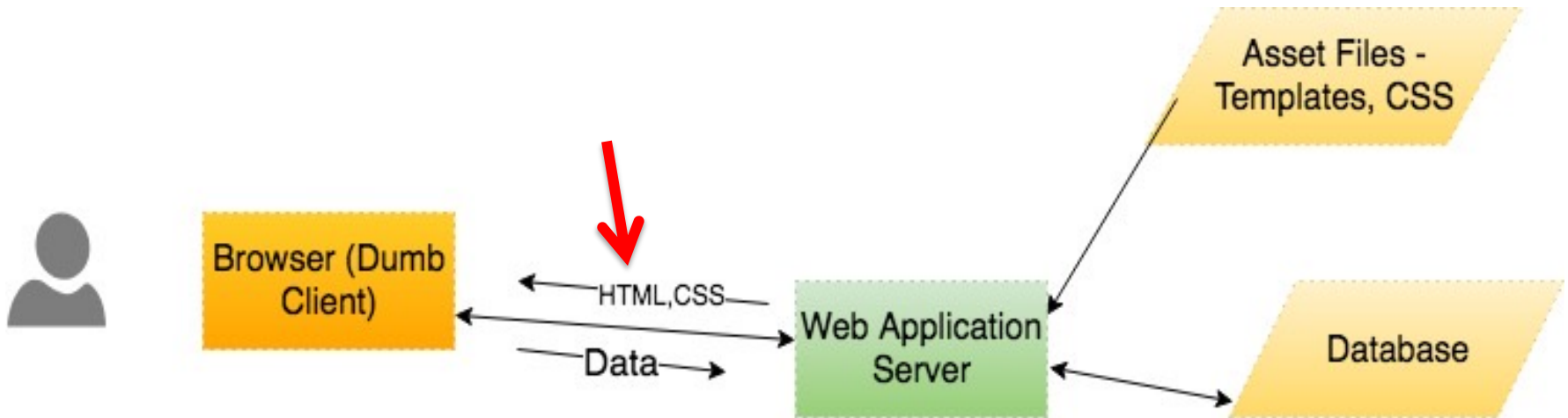
# Modern Web Apps – HTTP Communications flow



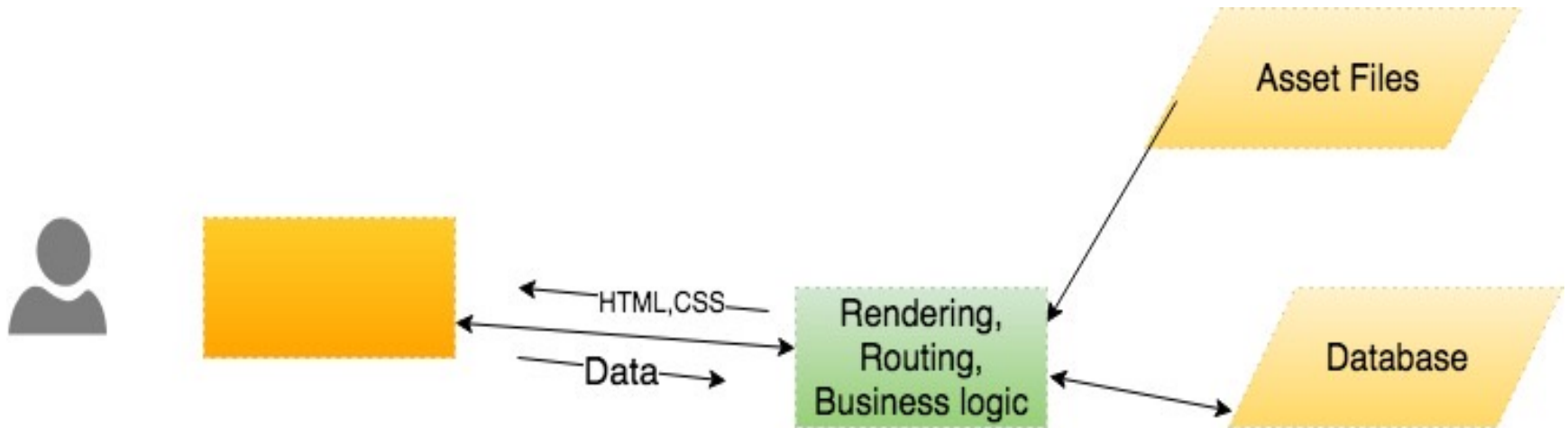
# Modern Web Apps – Sub-system roles



# Traditional Web Apps – Architecture

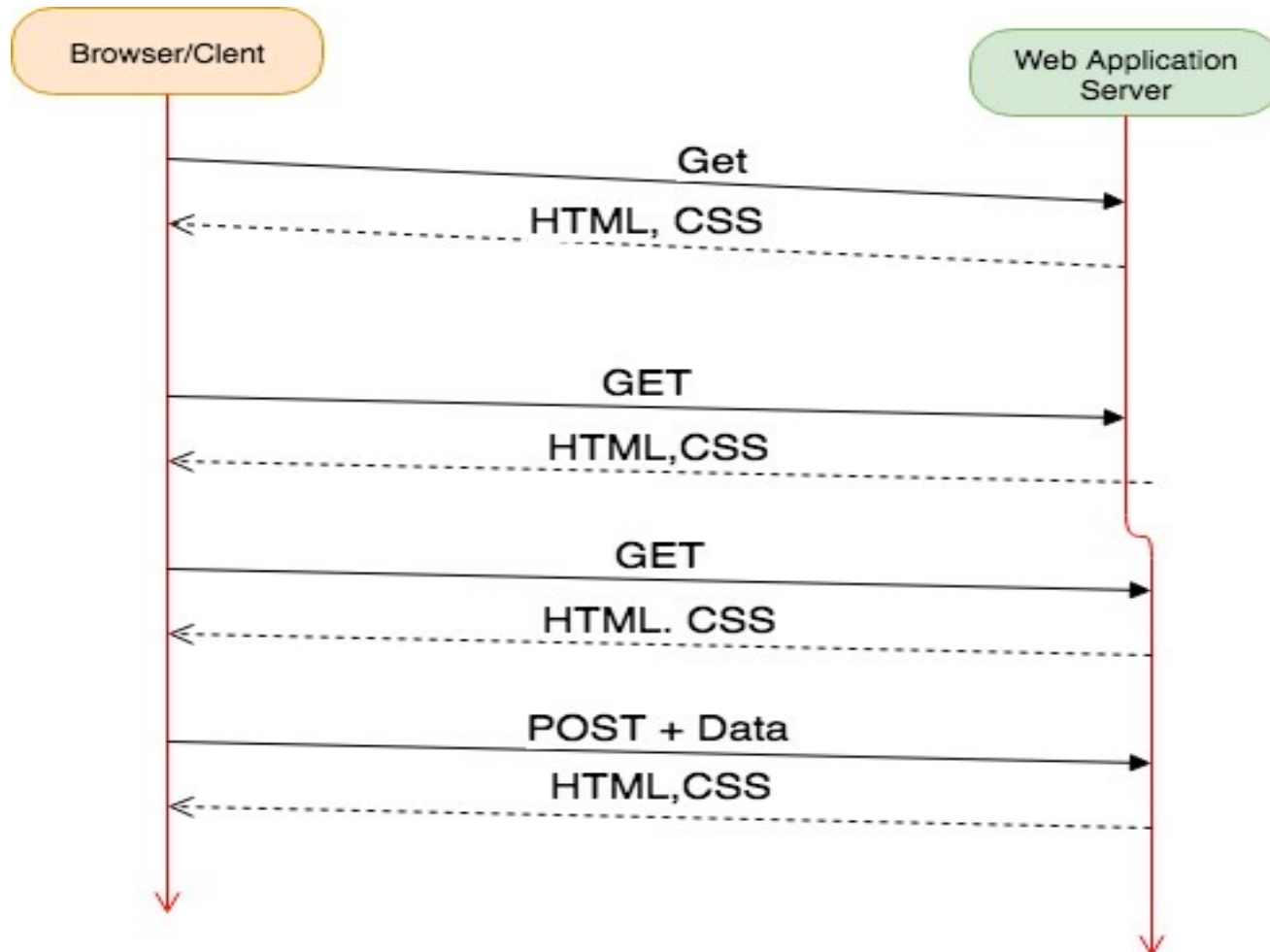


# Traditional Web Apps – Sub-system roles.





# Traditional Web Apps – HTTP Communication flow.



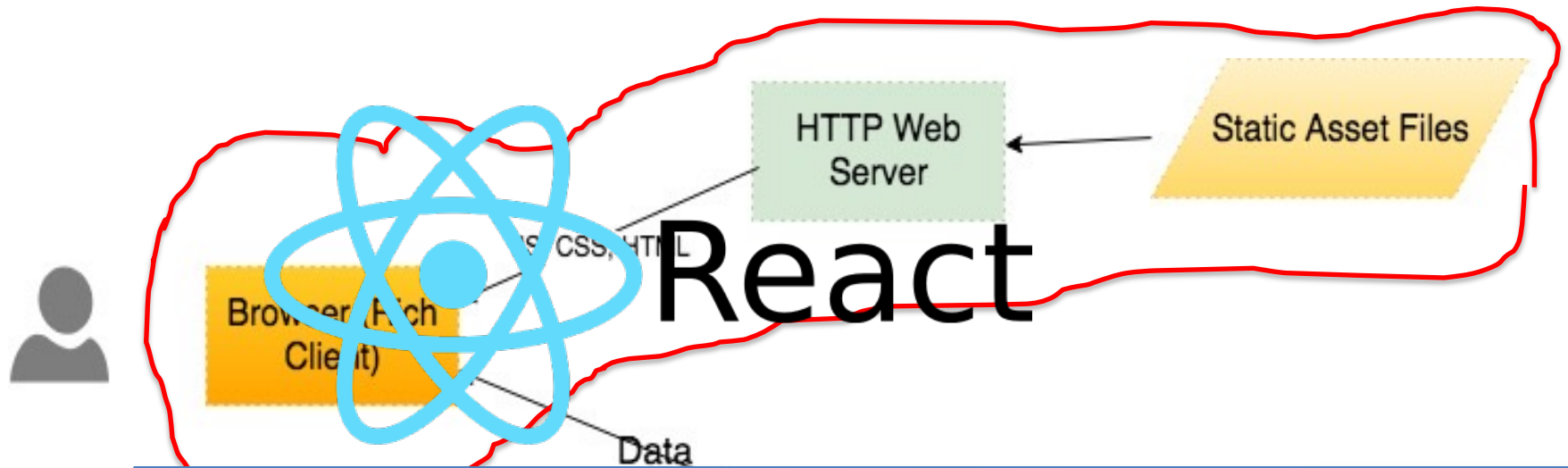
# Modern Web Apps.

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

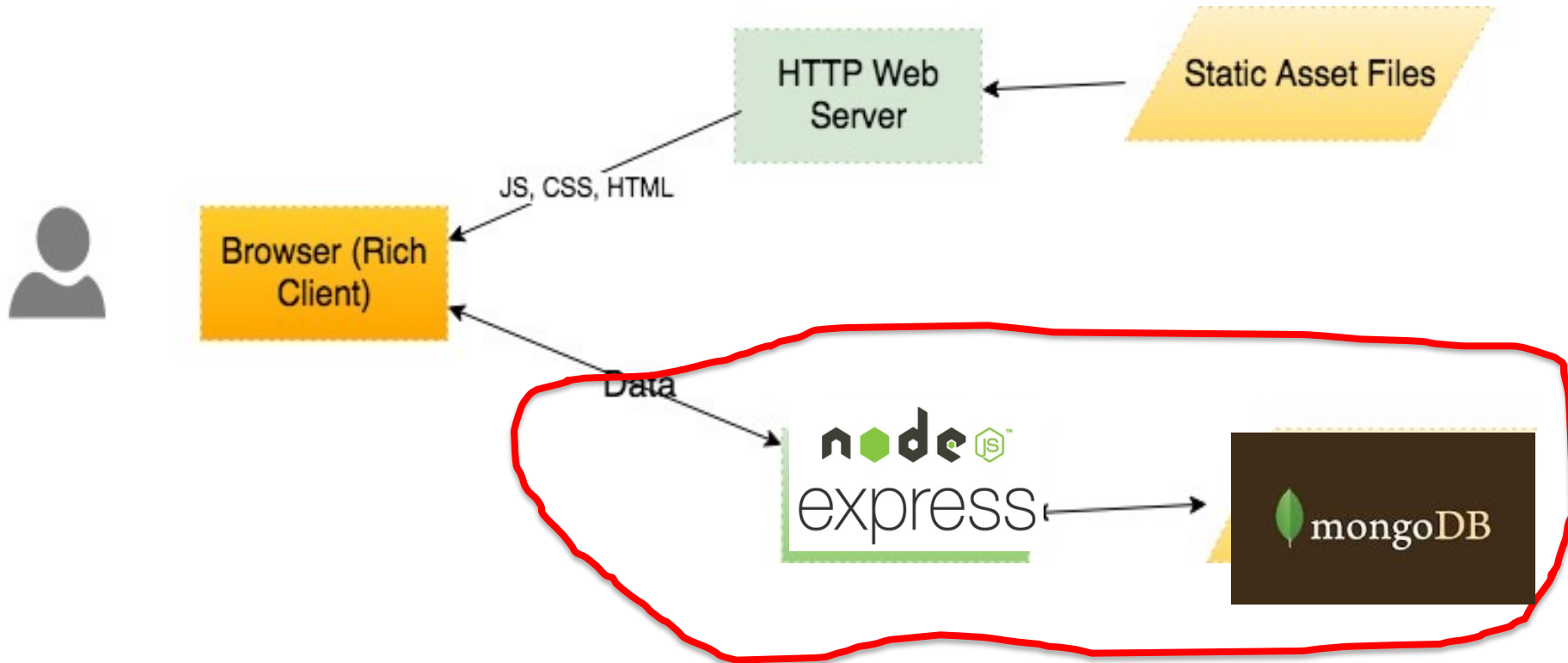
- Context. ☒
- This module's focus

# Modern Web Apps

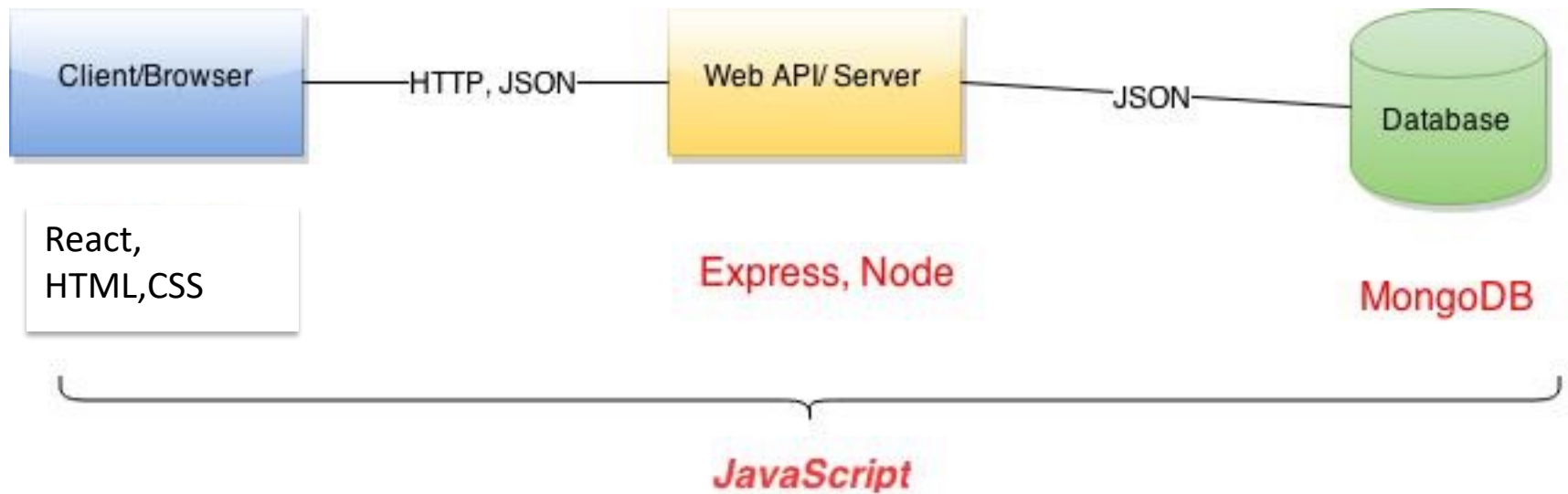


A JavaScript library for building user interfaces

# 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)

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Managing backend re X Operating Lambda: D X My LastPass Vault X JavaScript Live: Serve X Node.js X

nodejs.org/en/

node

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Node.js® is a JavaScript runtime built on [Chrome's V8 JavaScript engine](#).

**You must pick this version or slightly lower**

Download for macOS (x64)

**16.17.0 LTS**  
Recommended For Most Users

**18.8.0 Current**  
Latest Features

[Other Downloads](#) | [Changelog](#) | [API Docs](#) [Other Downloads](#) | [Changelog](#) | [API Docs](#)

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

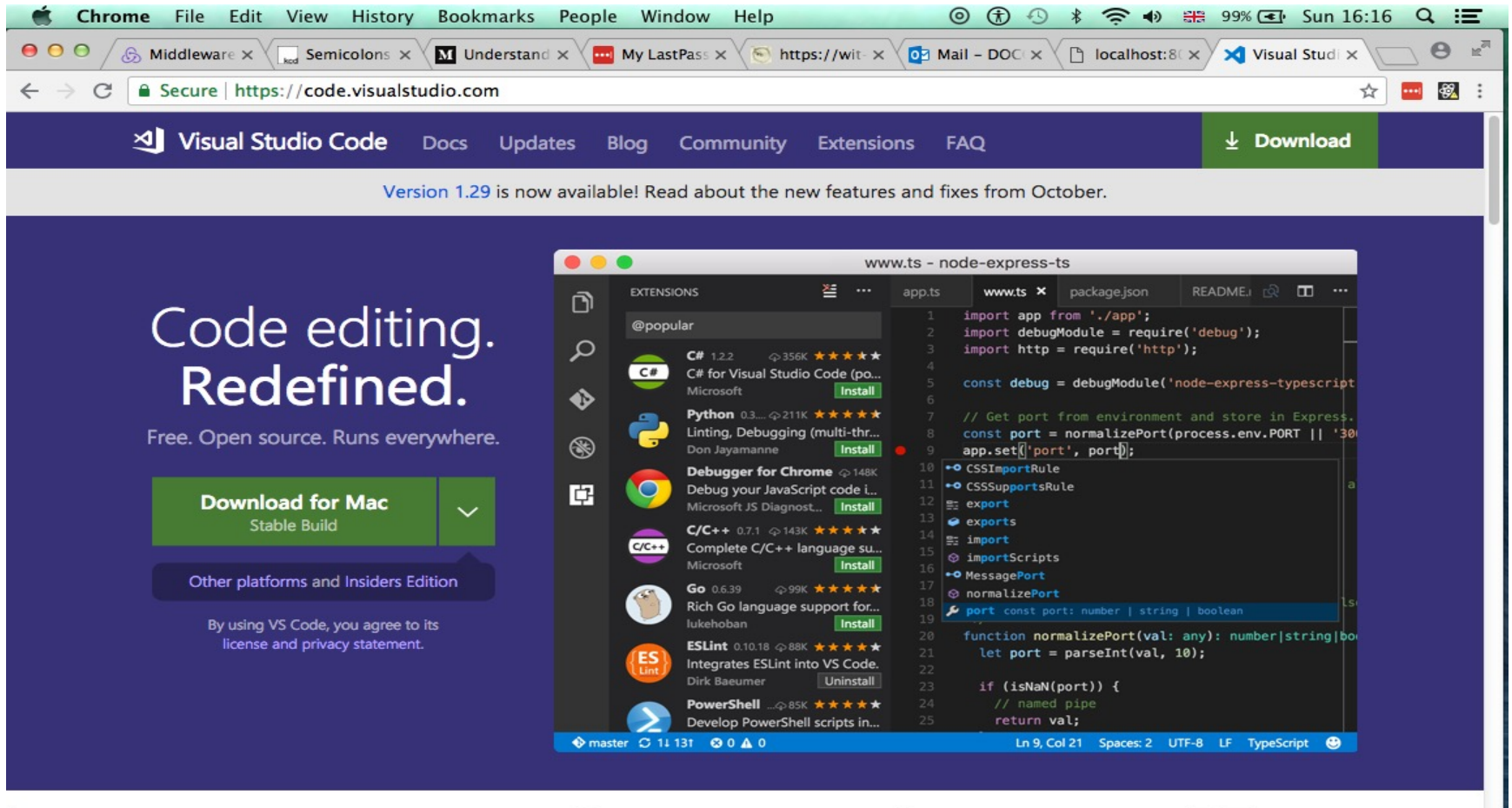
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# Text Editor

(Not a heavyweight IDE, thankfully)



# Source Control (Git)

The screenshot shows a web browser window with the URL <https://www.atlassian.com/git/tutorials/install-git>. The page is titled "Install Git" and features a sidebar with navigation links: "Learn Git", "Beginner", "What is version control", "What is Git", "What is a repository", "What is a commit", "What is a branch", "What is a pull request", "What is a merge", "What is a fork", "What is a clone", "What is a push", "What is a pull", "What is a fetch", "What is a checkout", "What is a revert", "What is a reset", "What is a stash", "What is a cherry-pick", "What is a rebase", "What is a merge conflict", "What is a merge commit", "What is a merge pull request", "What is a merge branch", "What is a merge commit", "What is a merge pull request", "What is a merge branch". The main content area displays the title "Install Git" and a list of links: "Install Git on Mac OS X / Install Git on Windows / Install Git on Linux". A text box at the bottom of the page contains the URL <https://www.atlassian.com/git/tutorials/install-git>. A cookie banner is visible at the bottom of the page.

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Secure | <https://www.atlassian.com/git/tutorials/install-git>

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## Learn Git

### Beginner

- What is version control
- What is Git
- What is a repository
- What is a commit
- What is a branch
- What is a pull request
- What is a merge
- What is a fork
- What is a clone
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- What is a stash
- What is a cherry-pick
- What is a rebase
- What is a merge conflict
- What is a merge commit
- What is a merge pull request
- What is a merge branch

# Install Git

Install Git on Mac OS X / [Install Git on Windows](#) / [Install Git on Linux](#)

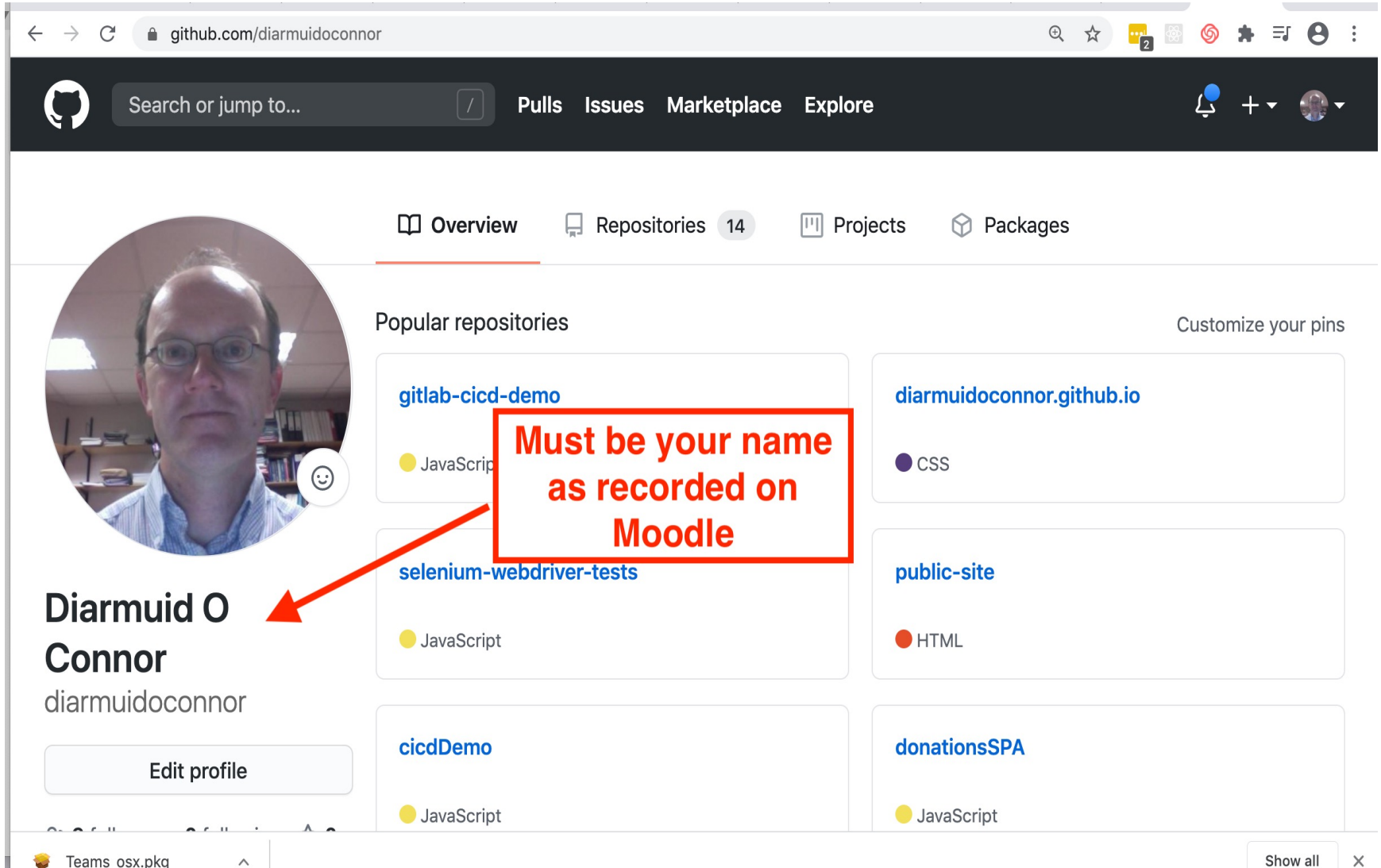
There are several ways to install Git on a Mac. In fact, if

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[Accept all Cookies](https://www.atlassian.com/git/tutorials/install-git#windows)

<https://www.atlassian.com/git/tutorials/install-git#windows>

# 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 positioned over the repository list, with a red arrow pointing from it 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.**

# Assessment.

- **100% continuous assessment.**
  - **20% lab work.**
    - 2 submissions.
  - **80% - 2 projects:**
    - 1. React SPA (40%)**
    - 2. (Integrated) Web API (40%)**
      - Build on top of lab work.
    - May be subject to small changes.

