

WEB ADVANCED

NODE.JS

WHAT IS A CLIENT?

WHAT IS A SERVER?

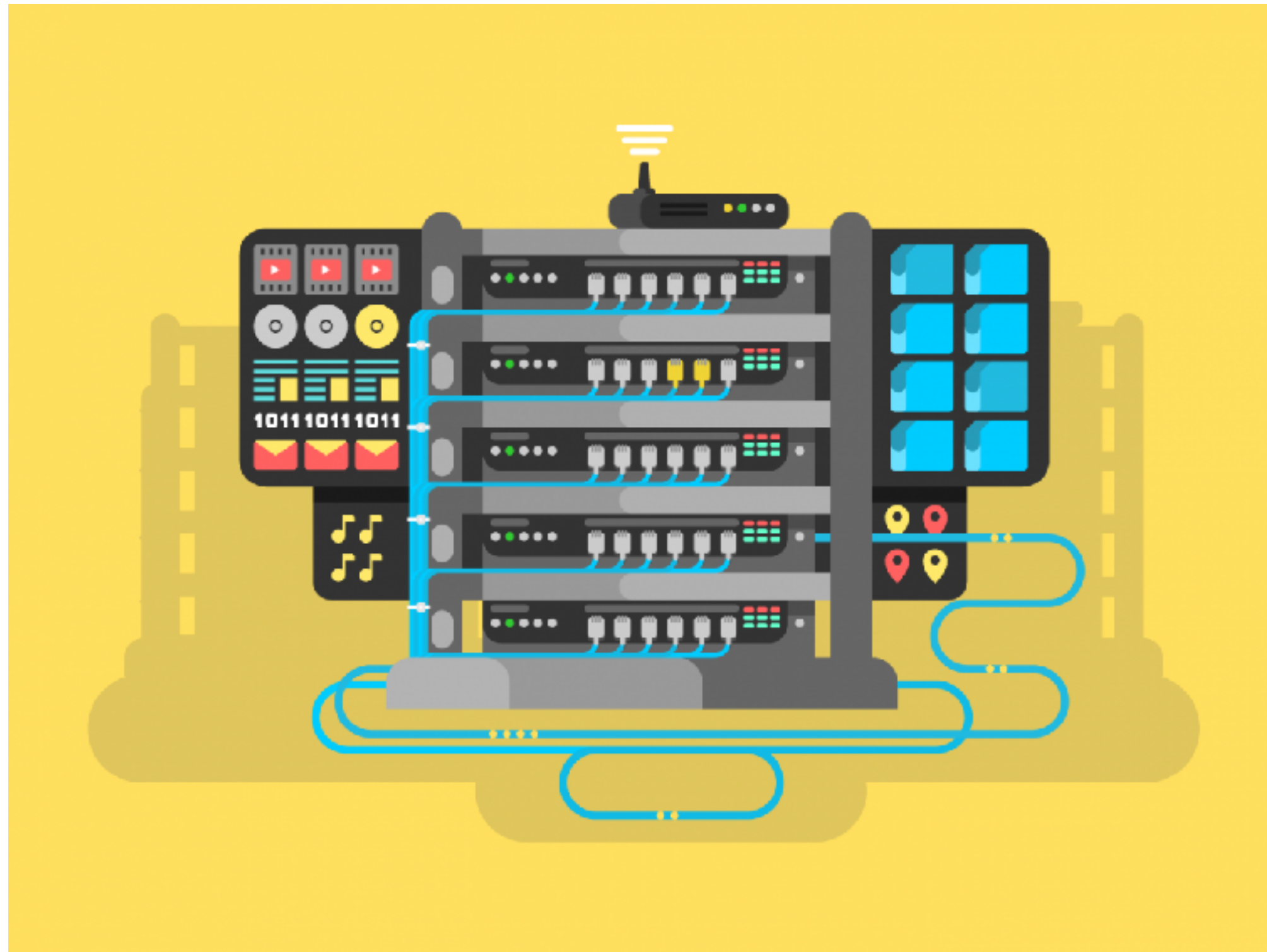


- ▮ The client is the software that runs on the user's computer (your laptop, iPad, smartphone) that is capable of communicating with a server

Timi Ajiboye

WHAT IS A SERVER?

WHAT IS A SERVER?



- “A server, in this context, is a computer that is on the internet”
- “The internet” is just a collection of many many servers; many computers (with no screens attached to them) doing magic and sending the results to your browser for your enjoyment.

Timi Ajiboye

WHAT IS A WEB-SERVER?

The We usually think of a web server as a huge computer somewhere, sending pages back as we type an address on the browser. But it can also simply refer to the software serving the pages.

We can have more than one server running in the same machine (on different ports)

```
$ python -m SimpleHTTPServer 8000
```

```
$ python -m SimpleHTTPServer 3000
```

```
$ python -m SimpleHTTPServer 1234
```

HTTP PROTOCOL?

History

Though implemented by Tim-Berners Lee at CERN, the term *hypertext* was coined by Ted Nelson in his Project Xanadu in 1960.

Specs

- The HTTP takes a REQUEST and sends back a RESPONSE
- The REQUEST usually includes information such as:
 - HTTP methods: GET, POST (+ PUT and DELETE)
 - url
 - User-agent

SO WHAT IS NODE.JS?

Basically, it's a server-side Javascript!

Runs on Google's super powerful V8 JS Engine that compiles the Javascript into low-level code/machine code.

(If you don't know what that means, just understand that it's SUPER FAST.)

WHAT IS PROCEDURAL PROGRAMMING?

NODE.JS IS THE OPPOSITE!

It is 'asynchronous/non-blocking'

It's event-driven

WHAT EXACTLY IS BLOCKING / NON-BLOCKING?

Consider a scenario where we request a backend database for the details of user 1 and user 2 and then print them on the screen/console.

The response to this request takes time, but both of the user data requests can be carried out independently and at the same time.

WHAT EXACTLY IS BLOCKING / NON-BLOCKING?



In the blocking method, user 2's data request is not initiated until user1's data is printed to the screen.

On the other hand, using a non-blocking request, you can initiate a data request for user 2 without waiting for the response to the request for user 1. You can initiate both requests in parallel.

WHAT CAN WE DO WITH NODEJS?

- Build simple to complex web servers and API servers
- Communicate with databases - CRUD files
- Communicate with device's low-level hardware - sound card, GPU, network configurations, etc
 - . Node.js + PComp = IOT!
- Implement websocket protocols
 - . Build an IRC chat bots
 - . Make collaborative drawing tool
- Scrape websites (for data visualization)

WHAT NODE IS NOT:

- A programming language (We write the same exact JS!)
- A web framework

USEFUL INFO

npm (NODE PACKAGE MANAGER) is the package manager for Javascript. It makes it easy for JavaScript developers to share and reuse code.

Express is a framework for building web applications on top of Node.js. It simplifies the server creation process that is already available in Node.

DOWNLOAD NODE

<https://nodejs.org/en/>

START A NEW PROJECT

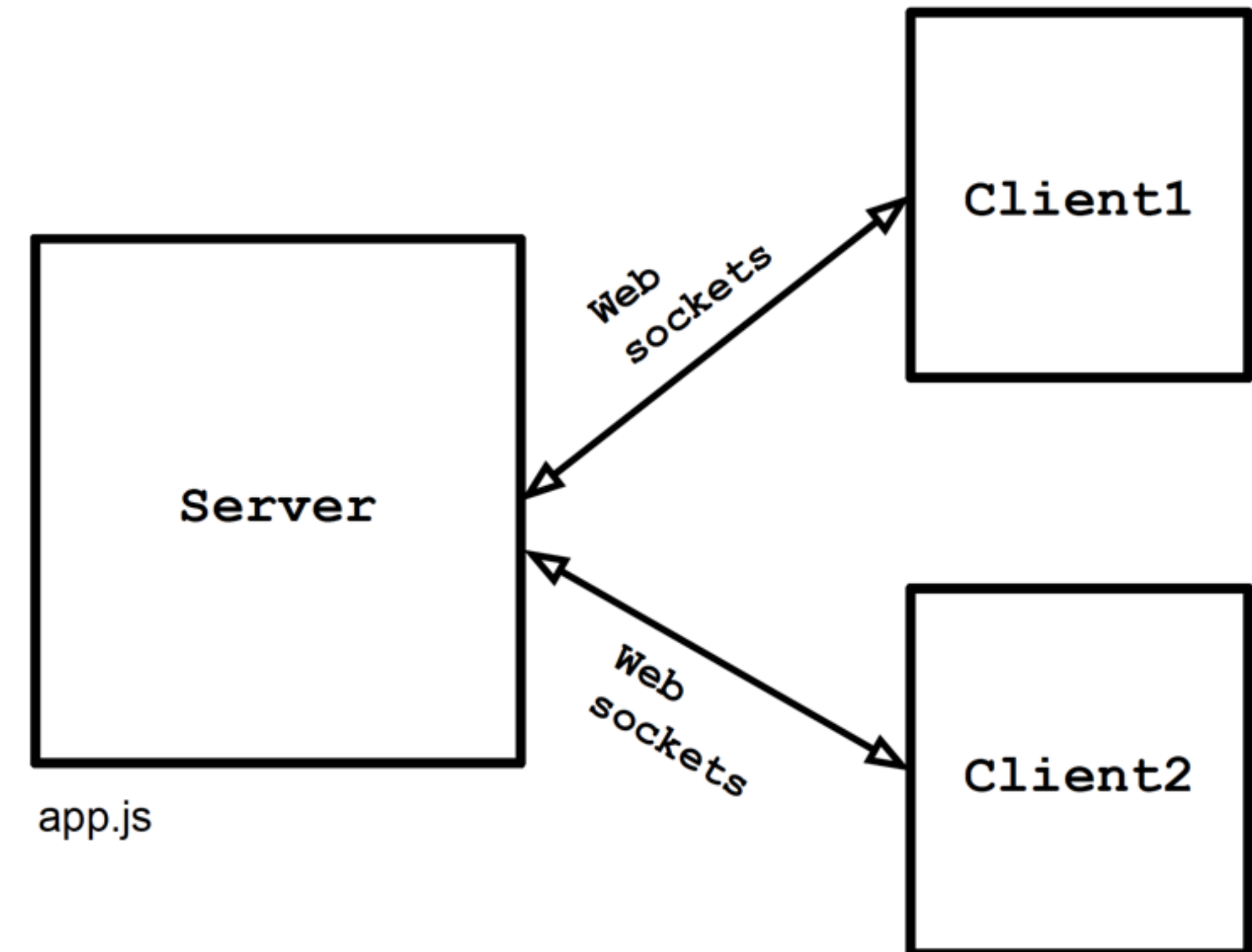
- Create a new folder for your Node project
- Open terminal and:
 - `cd link/to/your/project/folder`
 - `npm init`
 - // Initializes a project, creating a **package.json** file that will store our project information and list its dependencies
 - `npm install some-node-module another-module --save`
 - // You might need "**sudo**" before those npm, depending on your permissions
 - // `--save` is specifying that the modules should be registered as dependencies in you
 - // After this command, you should be able to see a `node_modules` folder

Example: **npm install express —save**

LET'S CODE

SOCKET.IO

Socket.io is one of the most prized libraries by those who develop with Node.js. Why? Because it allows synchronized communication to take place simply within your app, which means real-time communication!



WHAT CAN WE DO WITH SOCKET.IO?

Twitter Bot using News Headlines from API -

<https://twitter.com/TwoHeadlines>

Socket.io Collaborative Drawing Tool -

<http://socketio-intro.herokuapp.com/whiteboard/>

Browser-based multiplayer game -

<http://agar.io>

Data-Visualization with data collected from APIs -

<https://pudding.cool/2017/02/vocabulary/>

Data Visualization with real-time data -

<https://earth.nullschool.net/>

LET'S CODE