

# Know Thy Node

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**The Coding Bootcamp**

# Project Week

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# Instructor's Feedback

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**Seriously, mind-blown.**

# A Little Perspective

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***Last time I said this you barely knew  
what a “div” was.***

## Next Steps...

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### Close out your projects well!

- Create README's for your code on GitHub
- Use a custom domain URL
- Create default, working “test cases”
- Consider writing a blog article / video that builds from scratch
- Fork / Star other people's code

***And seriously.***

***Put the GitHub code on your LinkedIn profiles***

# The Mystery of “Backend”

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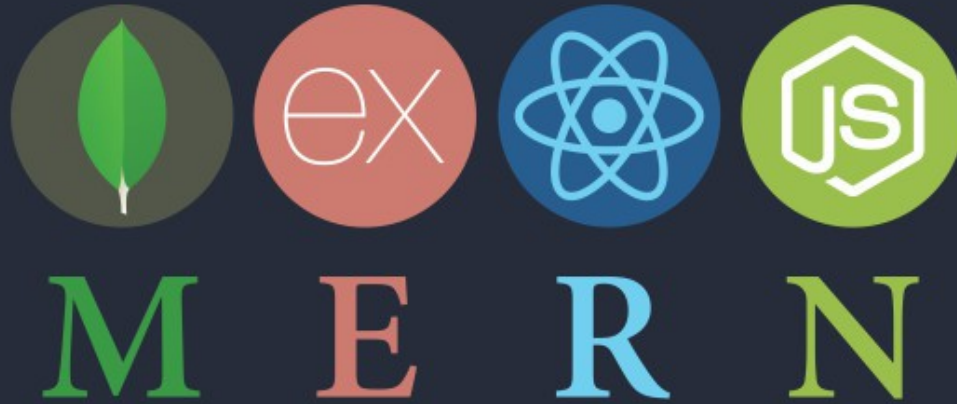
# FOCUS!

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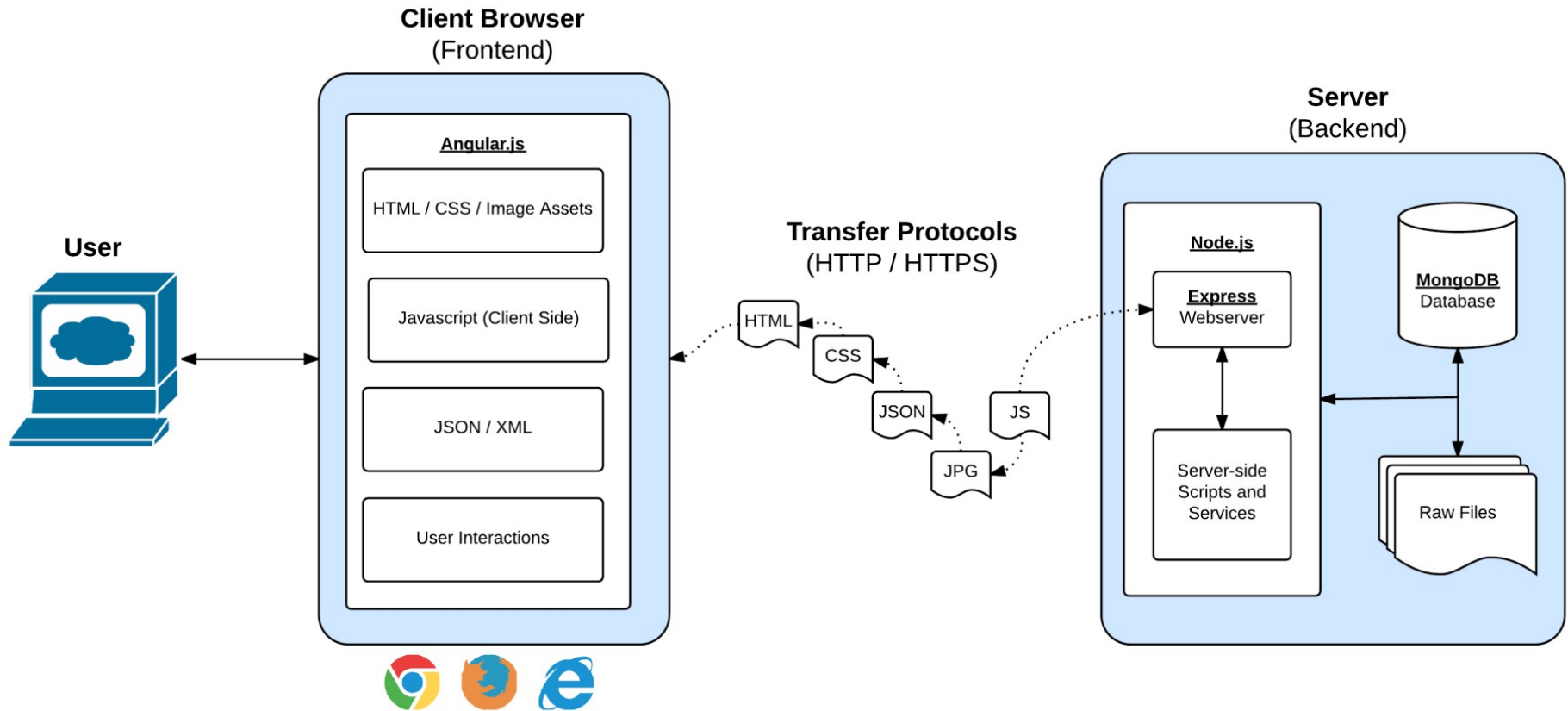
***This next stuff is important!***

# Full-Stack Deve





# Full-Stack



- In modern **web applications** there is a constant back-and-forth communication between the visuals displayed on the user's browser (**frontend**) and the data and logic stored on the server (**backend**).

# The “Magic” of YouTube

The screenshot shows the YouTube homepage in a web browser. The address bar displays <https://www.youtube.com>. The YouTube logo is in the top left, and navigation buttons for 'Upload' and 'Sign in' are in the top right. A search bar in the center contains the text 'how to be awesome', which has triggered a dropdown menu of suggestions: 'how to be awesome', 'how to be awesome at everything', 'how to be awesome in school', 'how to be awesome at skateboarding', 'how to be awesome at agario', 'how to be awesome at basketball', 'how to be awesome at soccer', 'how to be awesome in middle school', 'how to be awesome kid president', and 'how to be awesome in minecraft'. Below the search bar, the 'TODAY Recommendations' section features three video thumbnails: Brad Pitt and Angelina Jolie (8:53), the 'Pretty Woman' cast reunion (8:10), and Amy Schumer (27:13). Each video includes its title, channel name, and view count. The 'Popular Videos - Movies & Walt Disney by #Movies' section at the bottom shows three more thumbnails: '24 Historical Inaccuracies in Disney Movies' (7:23), '10 Hidden Details In Disney Movies' (5:58), and 'Walt Disney Movies 2015 - Animation Movies 2015 English...' (1:15:26).

how to be awesome

- how to be awesome
- how to be awesome at everything
- how to be awesome in school
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- how to be awesome at soccer
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**TODAY Recommendations**

**Angelina Jolie, Brad Pitt Discuss Marriage, New Film, Cancer Fig...**  
TODAY ✓  
2,091,579 views • 2 months ago

**'Pretty Woman' Cast Reunites 25 Years Later | TODAY**  
TODAY ✓  
1,491,399 views • 9 months ago

**Amy Schumer On Body Image, Kardashians, Style (Full...**  
TODAY ✓  
556,855 views • 3 months ago

**Subscribe** 131K

**Popular Videos - Movies & Walt Disney by #Movies**

**24 Historical Inaccuracies in Disney Movies - mental\_floss Li...**  
Mental Floss ✓  
142,518 views • 3 days ago

**10 Hidden Details In Disney Movies**  
Screen Rant ✓  
11,553,738 views • 5 months ago

**Walt Disney Movies 2015 - Animation Movies 2015 English...**  
Geroy Donothe  
186,964 views • 4 months ago

# Key Question

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***Examples of “Server-Side” Code?***

# Server-Side Code in Action!

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- API that parse URL parameters to provide selective JSONs
- Firebase methods that provide a timestamp back to users
- Clicking an invoice that provides a PDF report
- Image processing software that takes an image applies a filter, then saves the new version
- Google providing “results” relevant to your searches on other sites.

# Critical Question

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***What is a “server”?***

# Definition of “Server”

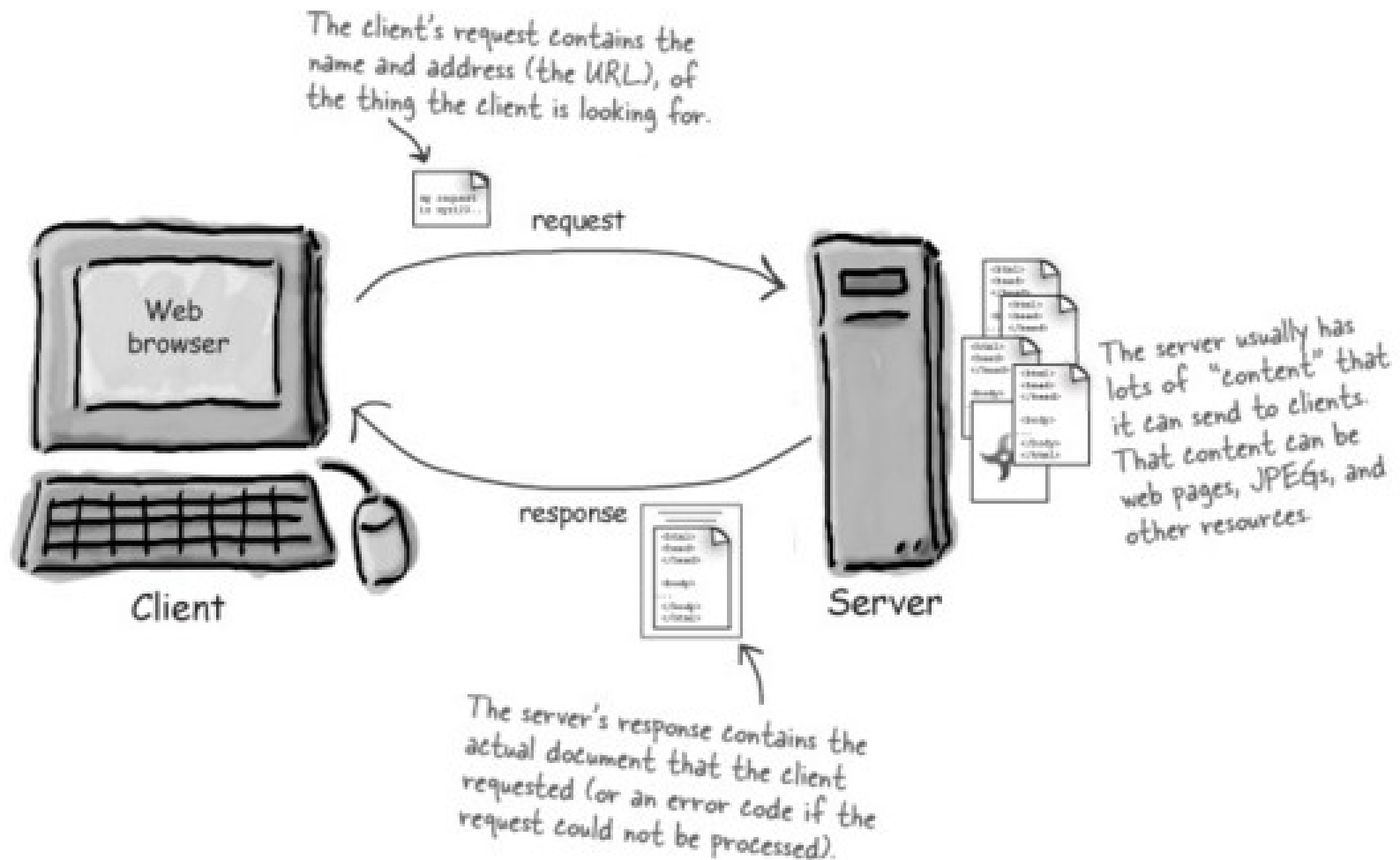
**A web server takes a client request and gives something back**

“A web browser lets a user request a resource. The web server gets the request, finds the resource, and returns something to the user. Sometimes the resource is an *HTML* page. Sometimes it's a picture. Or a sound file. Or even a PDF document. Doesn't matter--the client asks for the thing (resource) [or action] and the server sends it back.”

“... When we say "server", we mean either the physical (hardware) or the web server application (software) [that actually runs the server commands]”

*Kathy Sierra, Author of Head First Servlets and JSP*

# Server Definition



# Definition of “Web Client”

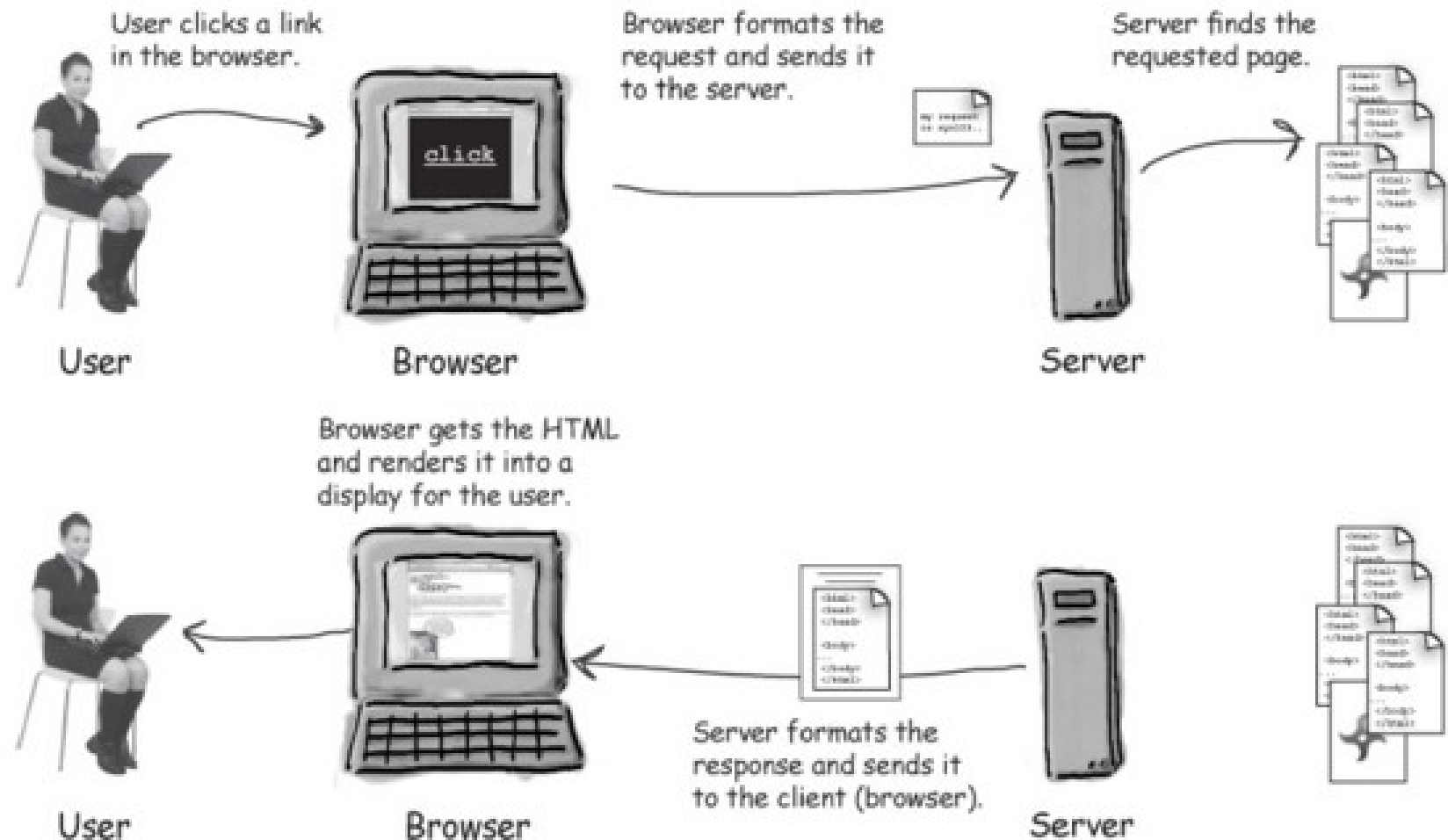
**Web client lets the user request something on the server and then shows the result (response) of the server.**

When we talk about client, though, we usually mean both (or either) the human user and the browser application. The browser is the piece of the software that knows how to communicate with the server. The browser's other big job is interpreting the HTML code [sent by the server] and rendering the web page to the user.

*Kathy Sierra, Author of Head First Servlets and JSP*



# Web Client Definition



# > YOUR TURN!!

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## Assignment

Talk to the person next to you and re-explain to one another the following terms:

- Server
- Web Client
- Request
- Response

# Aight. Relax.

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***Yay!***

***You made it through the ultra important stuff!***



***You can go back to Facebook now***  
*(But.... Not really, the next stuff is still important)*

# Node.JS

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# Key Question

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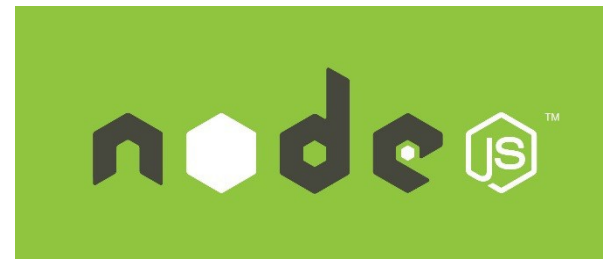
***So what is NodeJS?***

# Definition of “NodeJS”

Node.js is an open-source, cross-platform JavaScript runtime environment designed to be run outside of browsers.

It is a general utility that can be used for a variety of purposes including asset compilation, scripting, monitoring, and **most notably as the basis for web servers**

*Our made-up definition of Node. Yay for sounding intelligent!*



## > YOUR TURN!!

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### Assignment

Take a few moments to research 5 companies that actively use NodeJS in production.

# Why Use NodeJS as a Server?

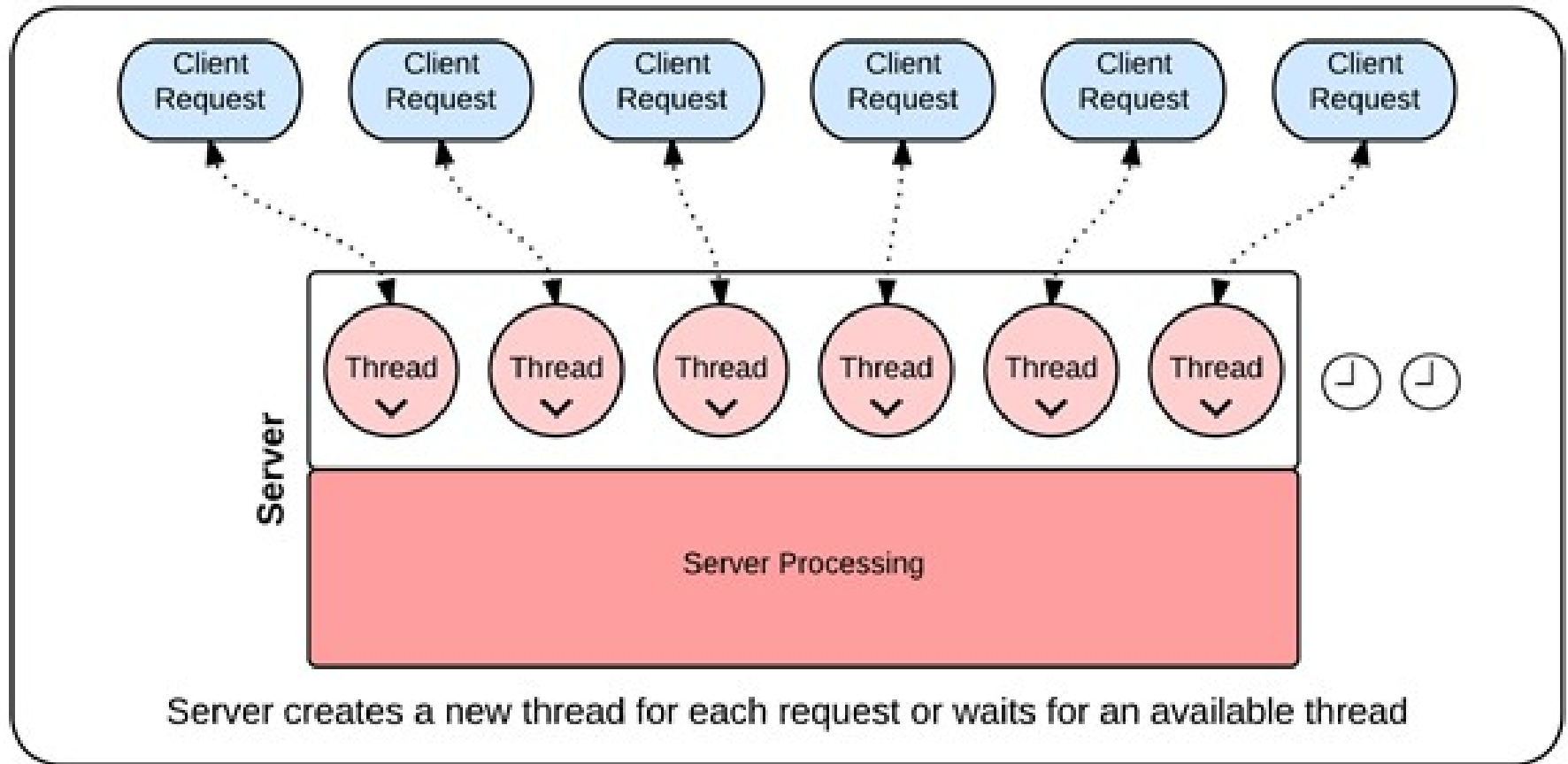
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- **It re-uses Javascript** – meaning a front-end Javascript developer can also build an entire server themselves
- **It's easily extendable.** Numerous plugins exist to expand the capabilities of Node
- **Fast-implementation**, which allows for the creation of an entire working server with only a few lines of code.
- **Single-Threaded Asynchronous Model** – meaning it can handle multiple requests simultaneously and not get bottlenecked.



# Synchronous

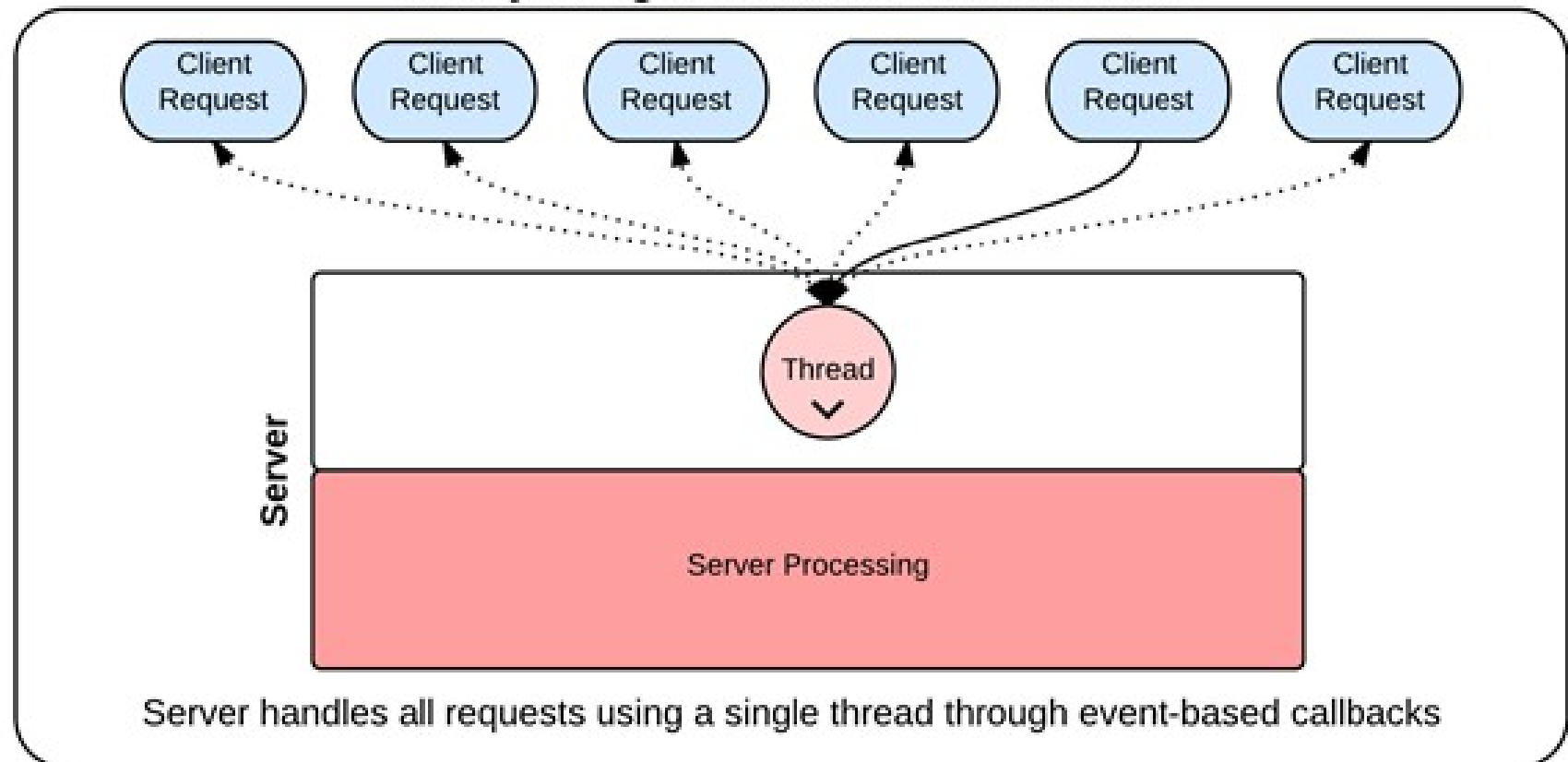
## Traditional Multi-threaded Server Model



***In traditional synchronous threading, each request requires its own thread. No other request can pass through that thread until complete. Since there is a limited pool of threads, this can create bottlenecks.***

# Asynchronous Threading (Node Way)

## Node.js Single-Threaded Server Model



***In Node-based asynchronous threading, a single thread is used throughout. Each request is “put to the side” using callbacks and responded to when ready. Because of this, there is no limit on the number of requests that can be responded to and there is no bottleneck.***

# Coding Time!

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# Homework!

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