Intro to Servers & Node.js

CS 390 – Web Application Development

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Outline

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WIWYT – Servers

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- Even static webpages need a server to function!

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- This backend allows us to develop a server that scales effectively, has built-in concurrency, and does not require us to learn a new language.

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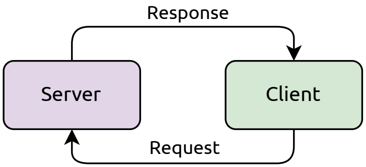
Functionally, servers follow a straightforward lifecycle:



Server Types

There are three server protocols that are useful to know:

1. **HTTP**: Implements the standard client-server protocol for webpage rendering.
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3. **Proxy**: Routes an HTTP request to a specific applications. Can be used to host multiple services on a single sever endpoint.

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Notably, it does not **idle** when unused.

Server v/s Client Side Rendering

A naive approach to render dynamic page content is as follows:

1. Return a template HTML file.
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This is **server-side rendering**. It's much quicker, since it does not rely on multiple processes running synchronously.

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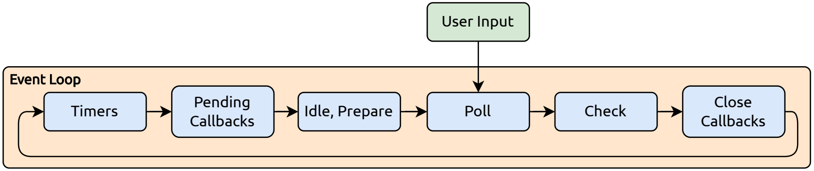
Why Node? Node runs JavaScript, and using the same language for both the front and backend reduces developer overhead.

The Node Event Loop

The node event loop allows Node to efficiently perform **non-blocking I/O operations**. It first processes the provided input script / REPL, and begins running the following event loop:[1]



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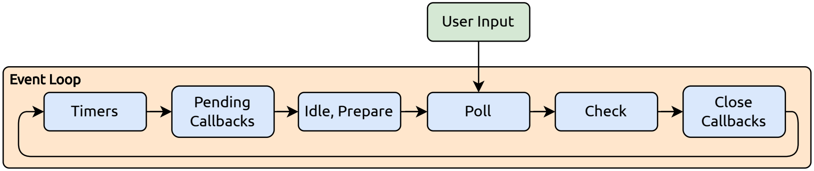

Each of the phases contains it's own callback queue that is either triggered or executed.

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Blocking v/s Non-Blocking Processes

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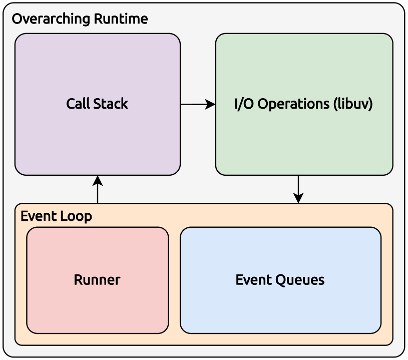

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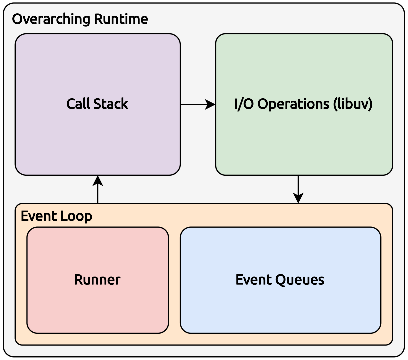

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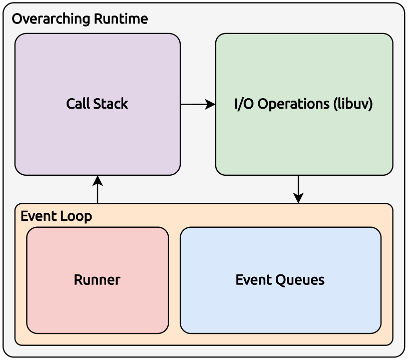

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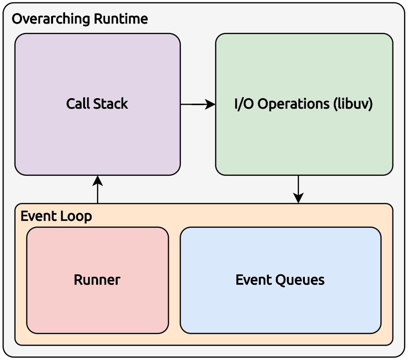

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The objective is to maximize non-blocking asynchronous processes to minimize latency.

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There is also a file-specific `module` object that can be accessed, however is not a part of the global context.

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Building a Simple HTTP Server with Node

If you can view this screen, I am making a mistake.

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Thank you!

Have an awesome rest of your day!

Slides: **`https://cs.purdue.edu/homes/jsetpal/slides/intro-servers-node.pdf`**

If anything's incorrect or unclear, please ping `jsetpal@purdue.edu`
I'll patch it ASAP.