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**JavaScript**  
Conference

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# YOU DON'T KNOW NODE.JS EVENTLOOP

# ***HEY I'M NAIRI \*\_\****

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 **Newsletter author (26K): [t.me/javascript](https://t.me/javascript)**

 **Hosting Podcasts for the Armenian tech community**

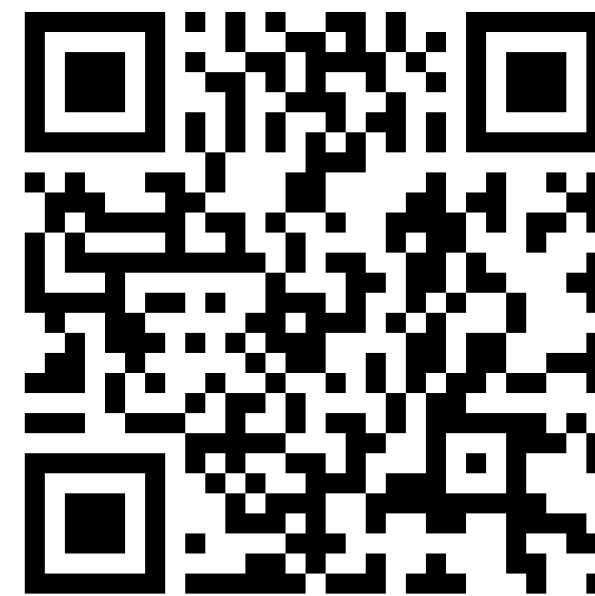
 **Speaker, Conference/Meetup Organizer**

**[nairi.dev](https://nairi.dev)**



**@nairihar**

The story behind this ambitious title



[nairihar.medium.com](https://nairihar.medium.com)

- What is Node.js
- Reactor Pattern
- Node.js Architecture
- Event Queues
- Changes from Node v11
- Unblocking EventLoop using unref()
- CommonJS vs ES modules
- Libuv (thread pool)
- DNS is problematic in Node.js
- Custom Promises
- Bluebird
- Summary
- A challenging interview question
- Translated versions of this article
- ...



Generated using Leonardo AI

# You Don't Know Node.js EventLoop

The Ultimate Guide to Understanding EventLoop in Node.js



nairihar

29 min read · May 27, 2023



1.1K



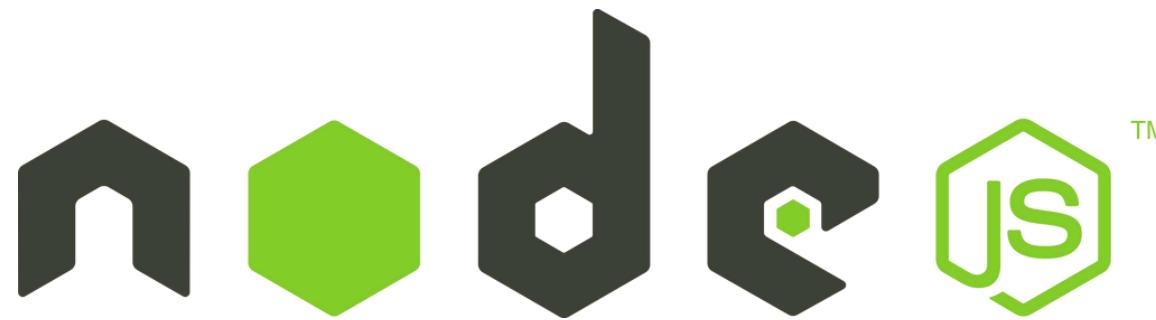
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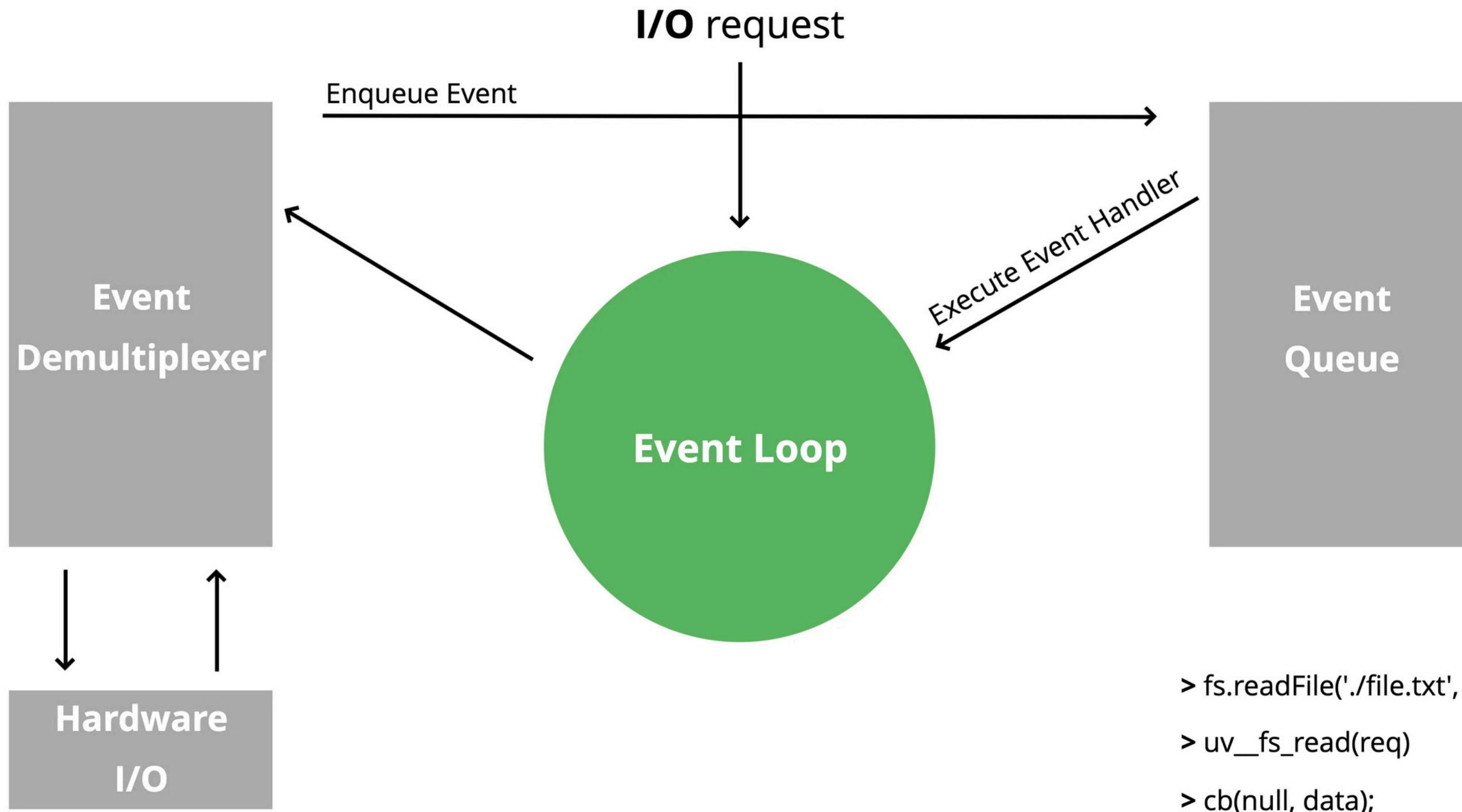
# AGENDA

- EventLoop
- Deep Dive into Libuv
- Macrotasks
- Microtasks
- Threads, worker\_threads
- Custom Promise libs vs native Promise
- ...



Node.js is a JavaScript runtime built on Chrome's V8 JavaScript engine.  
It uses an **event-driven, non-blocking I/O** model that makes it lightweight and efficient.

# Reactor Pattern

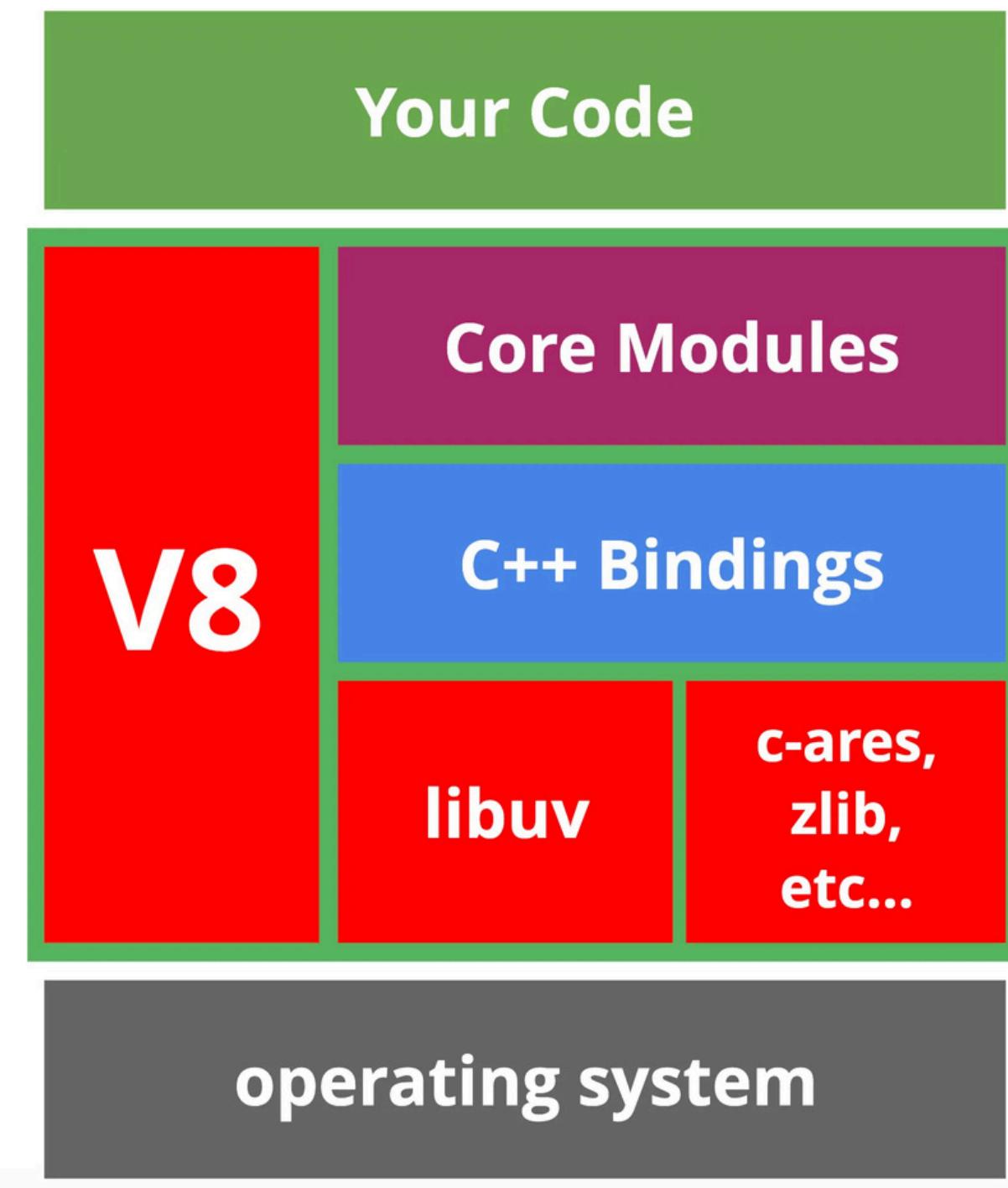




libuv

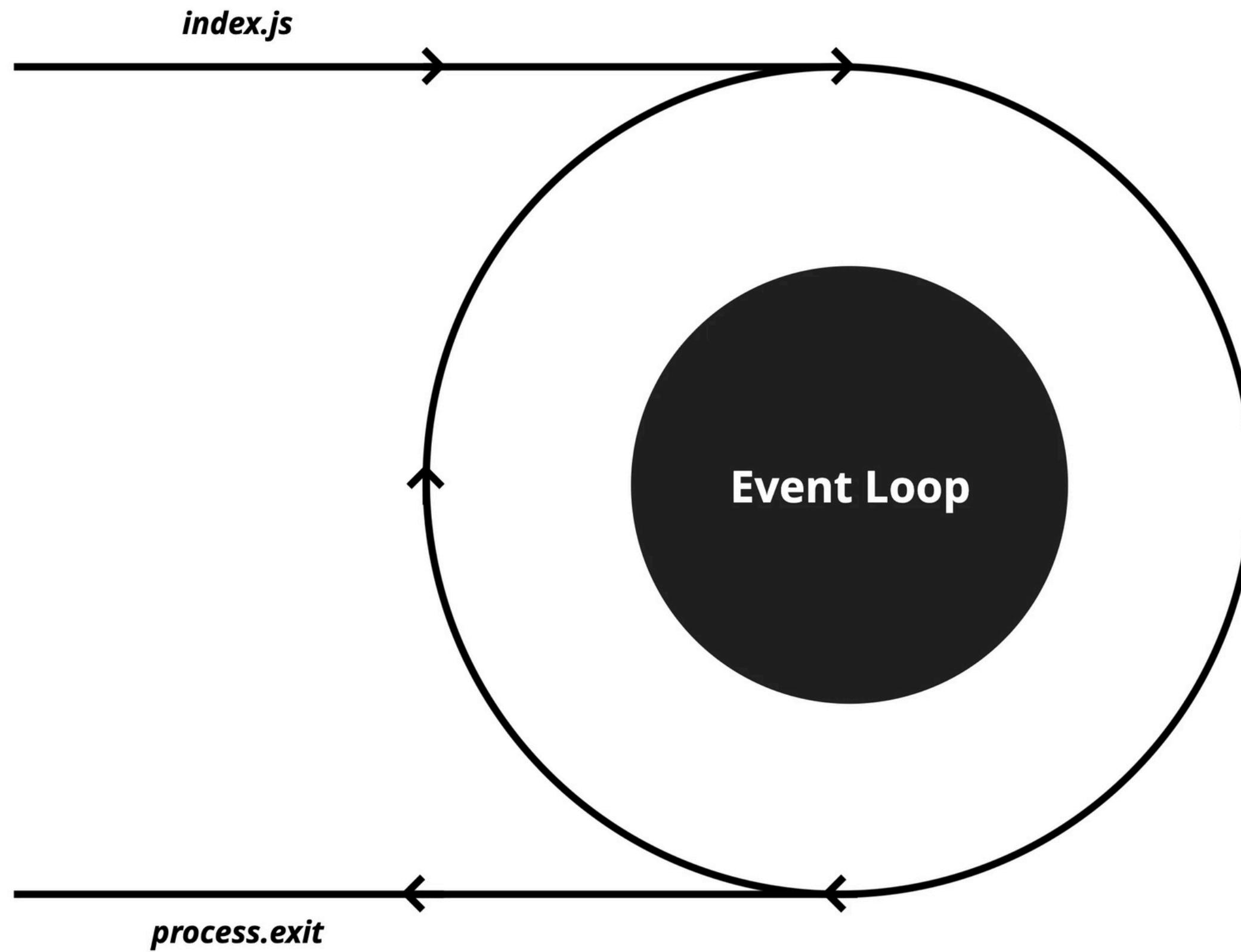
@nairihar

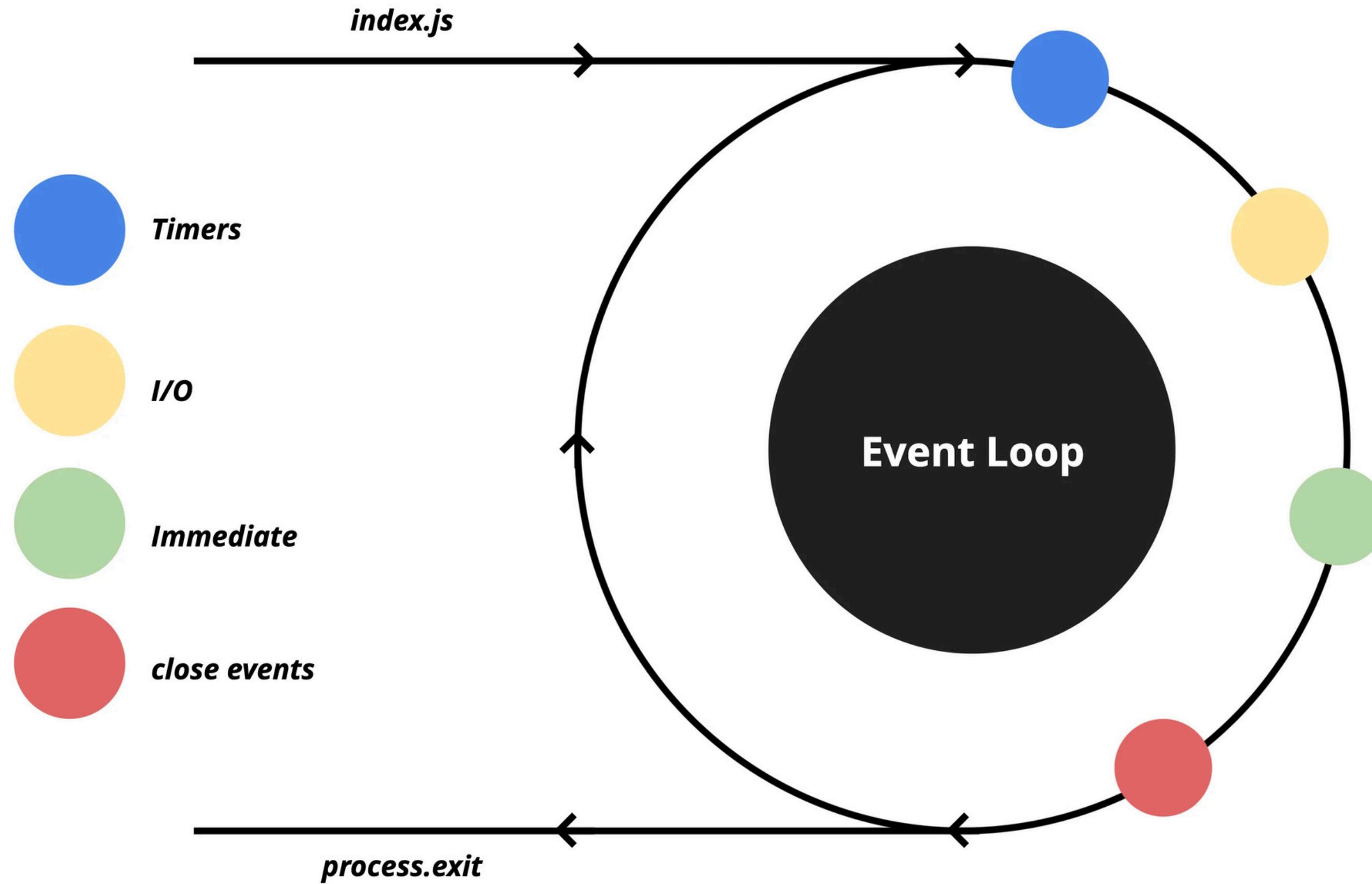
# Node.js architecture

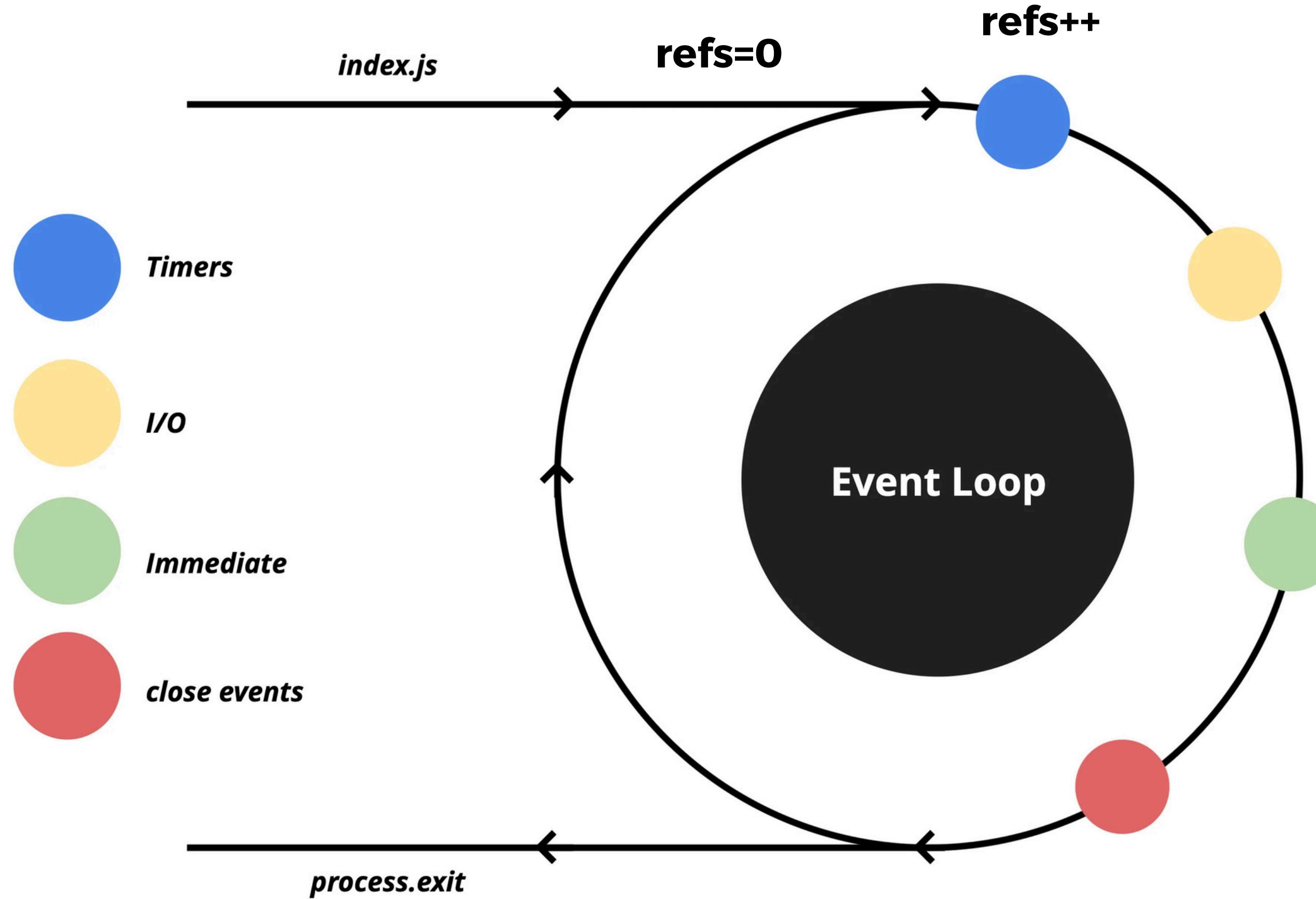


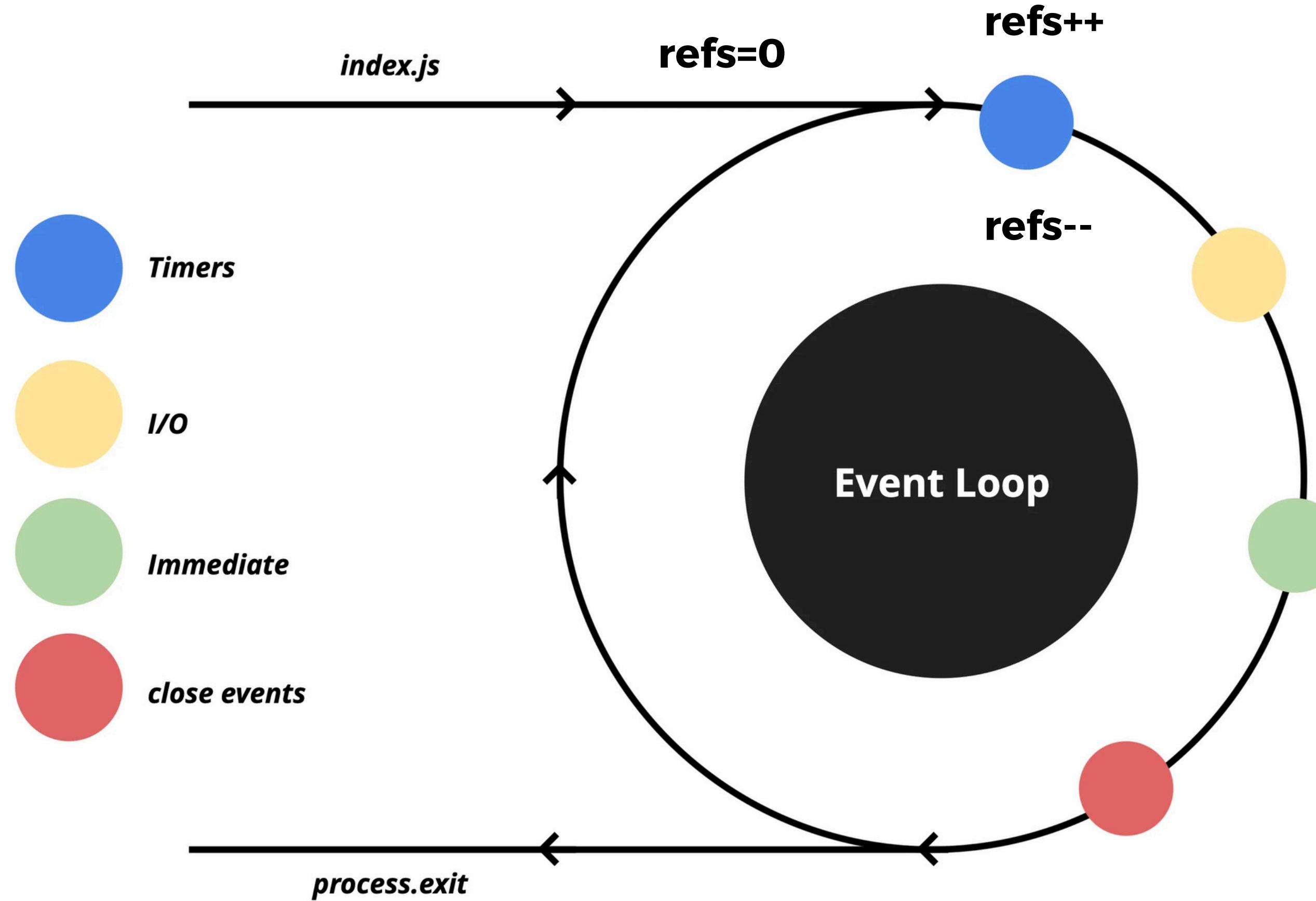
# EventLoop

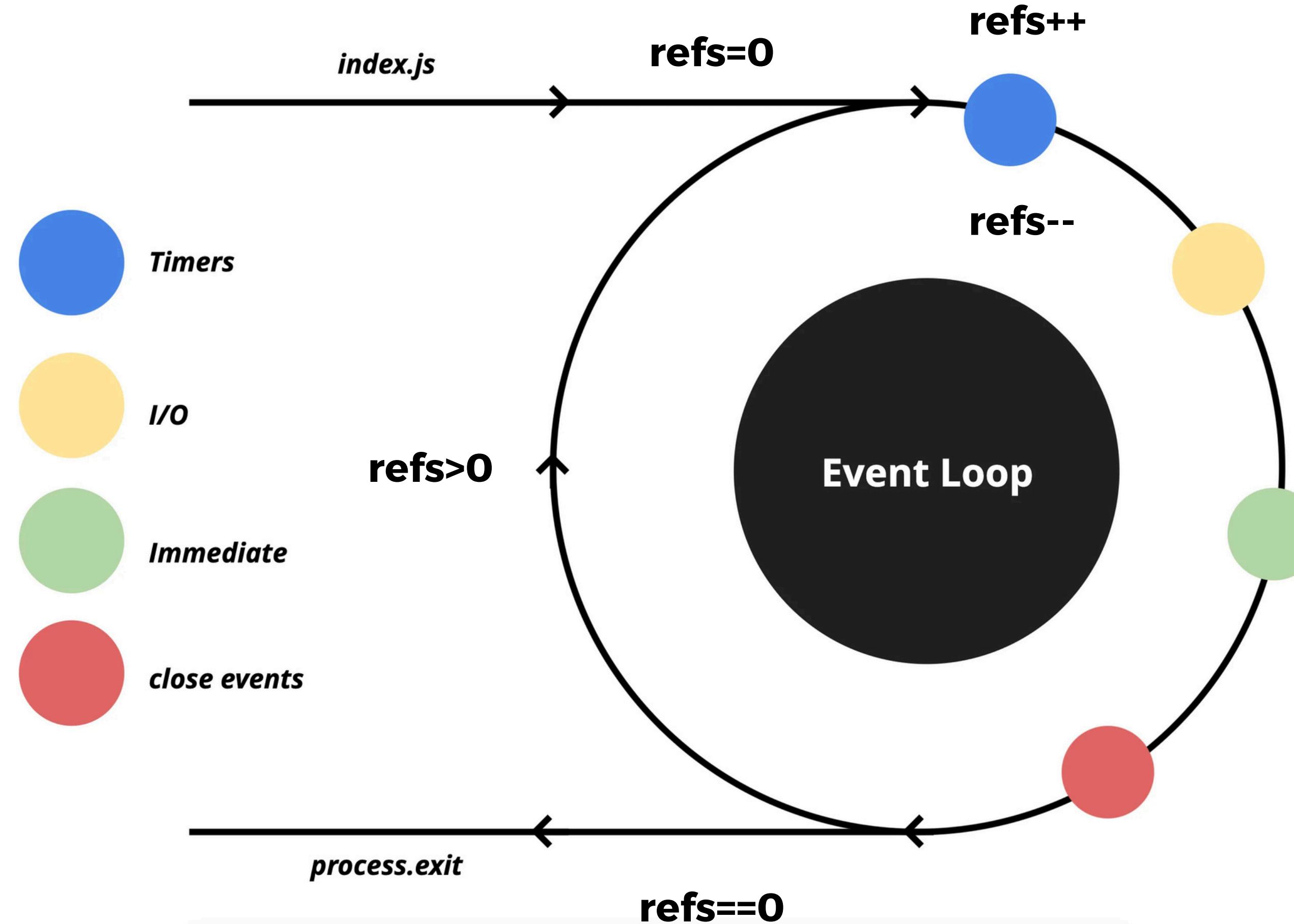
## semi-infinite loop

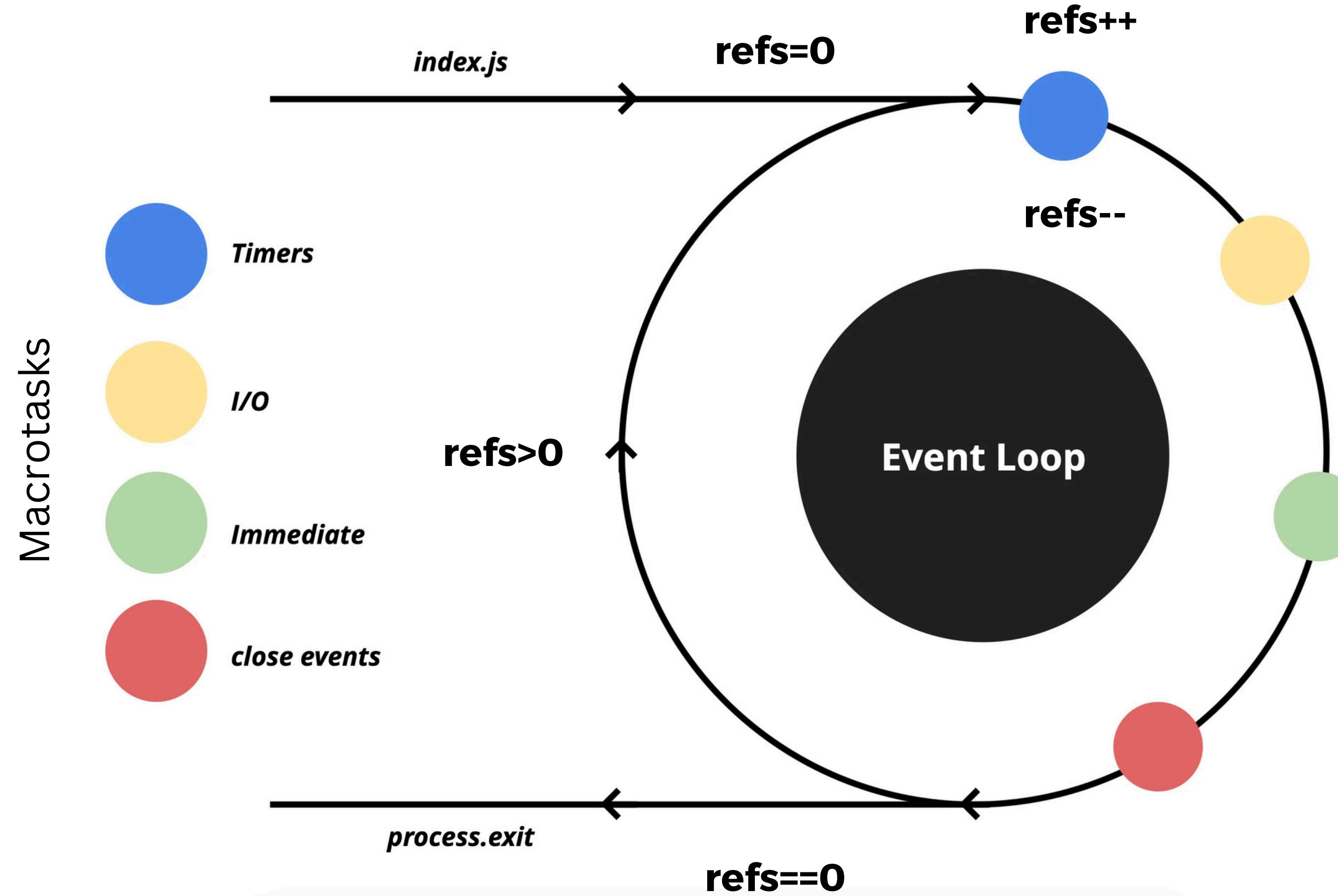


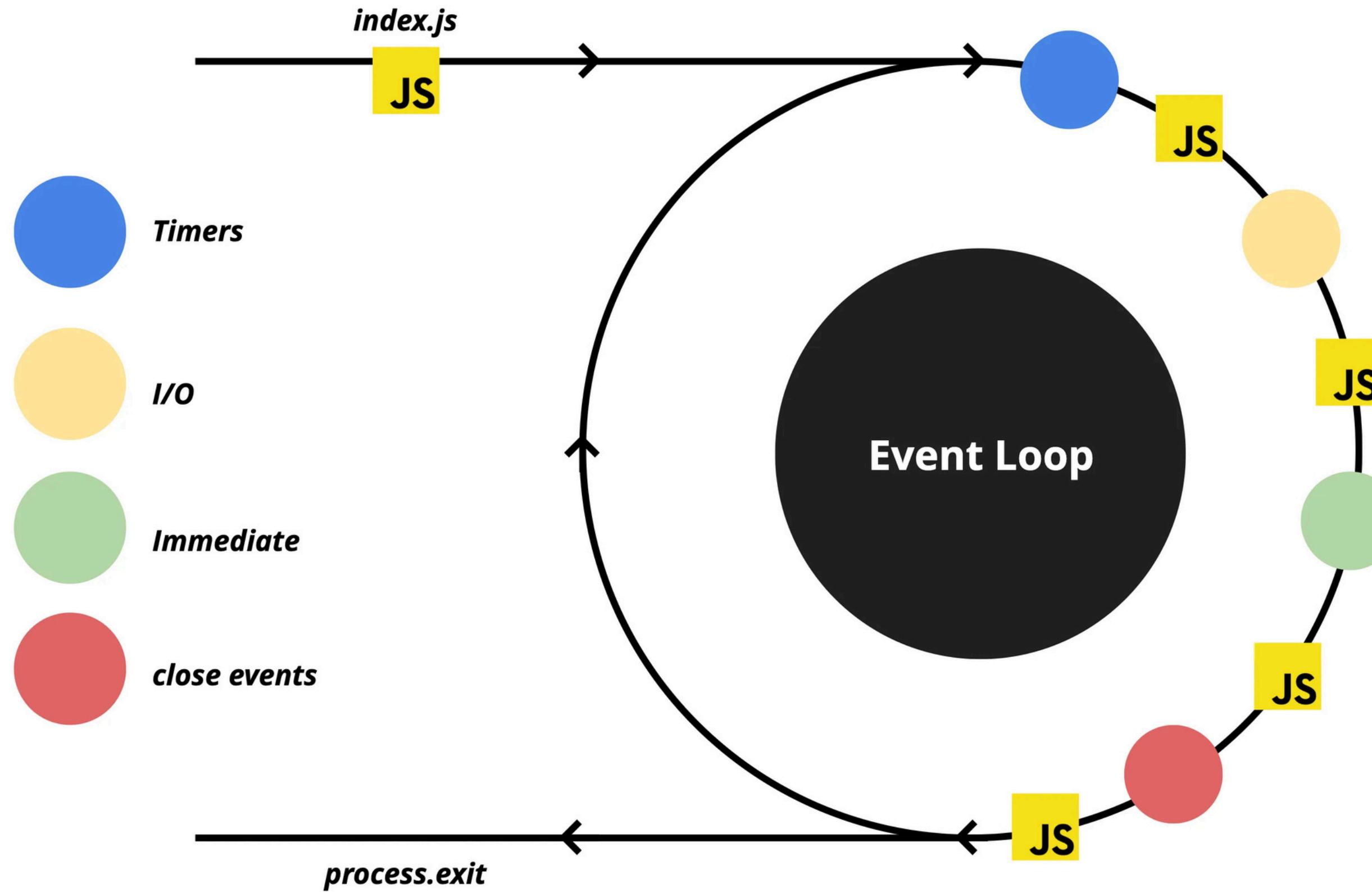


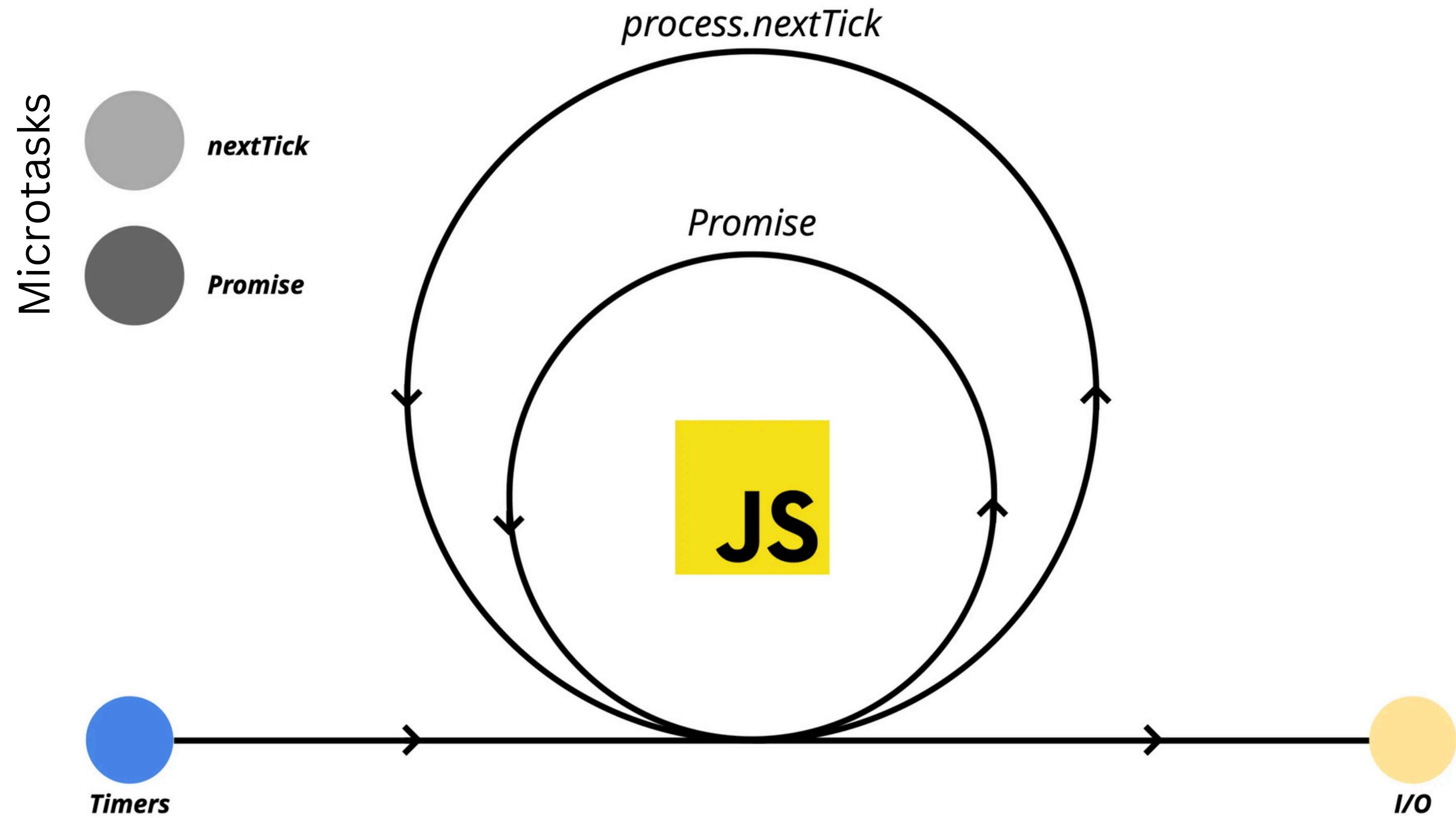


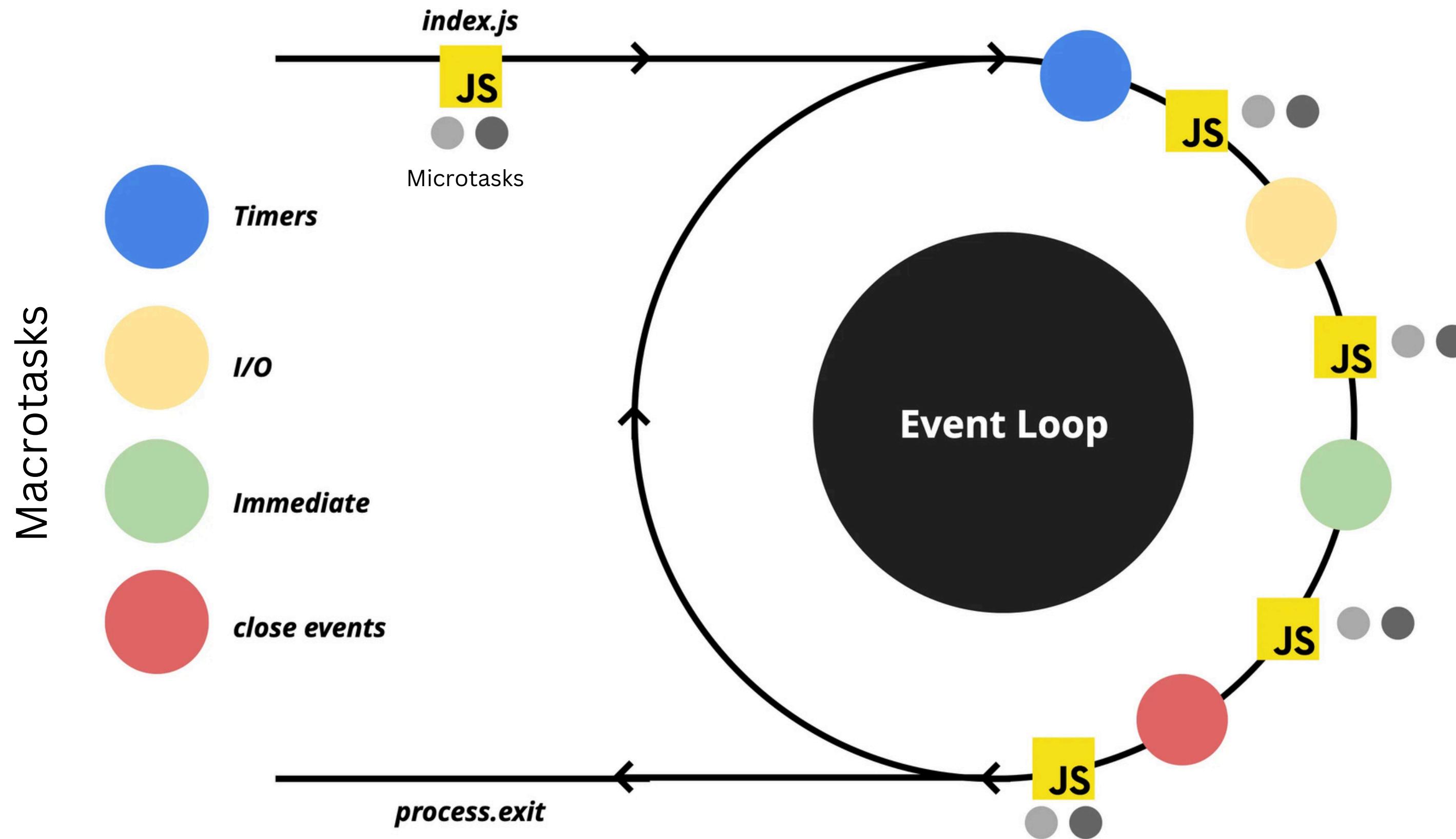




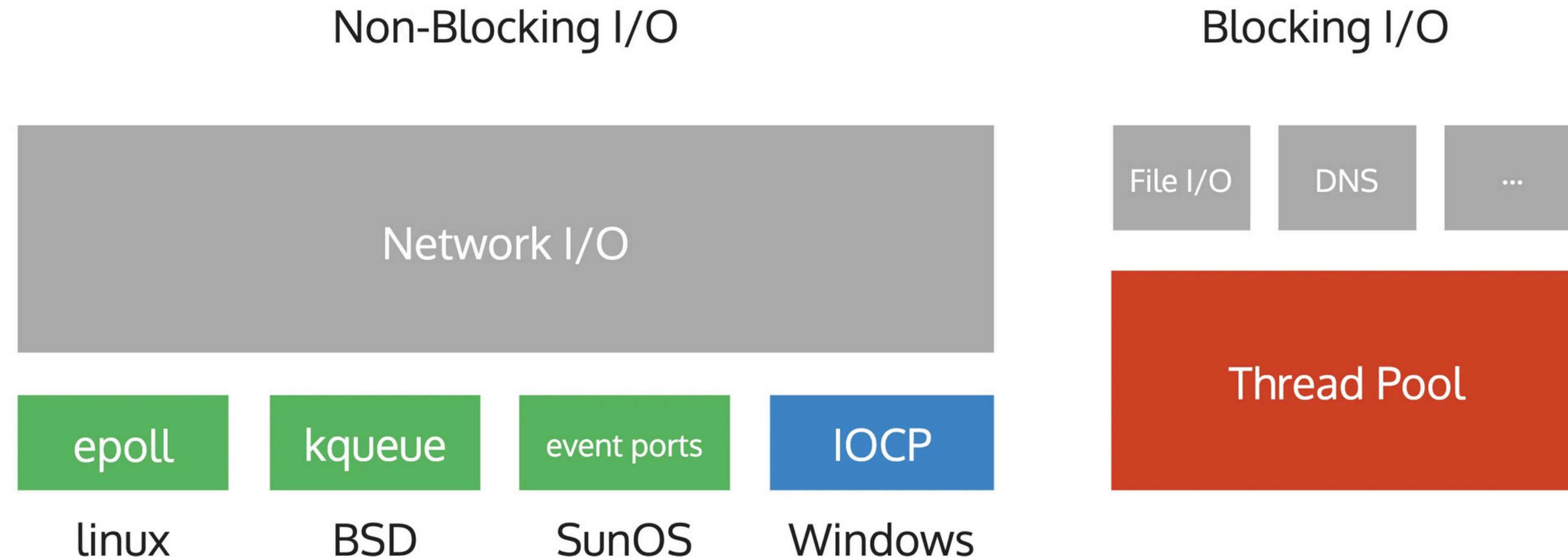








# I/O in Operation systems



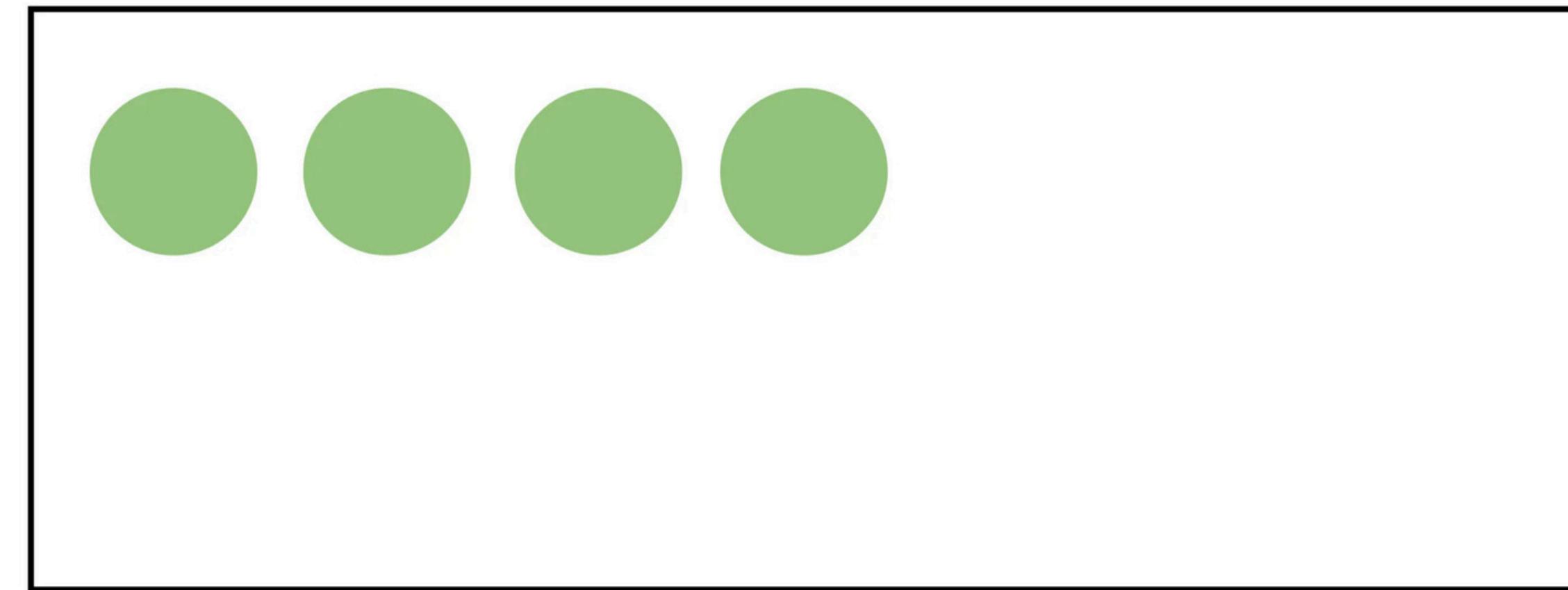
# Thread pool

Blocking I/O

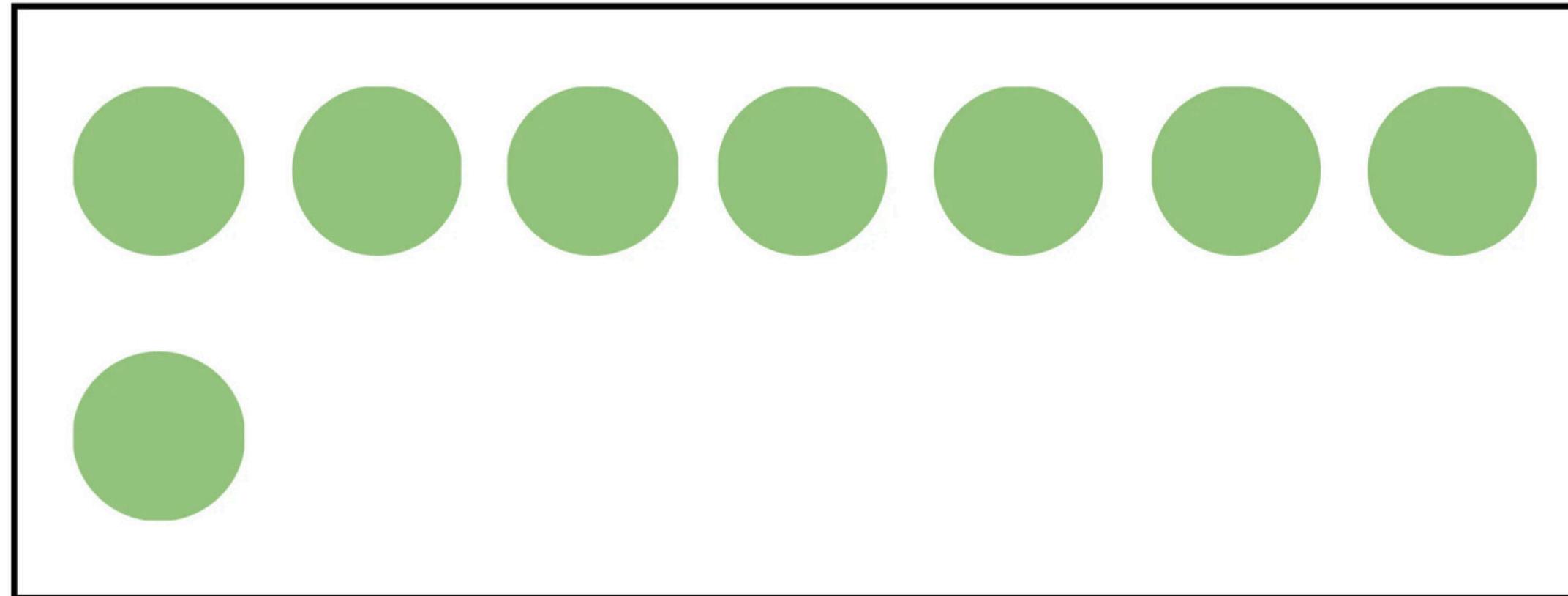
CPU intensive



**libuv**



# Thread pool



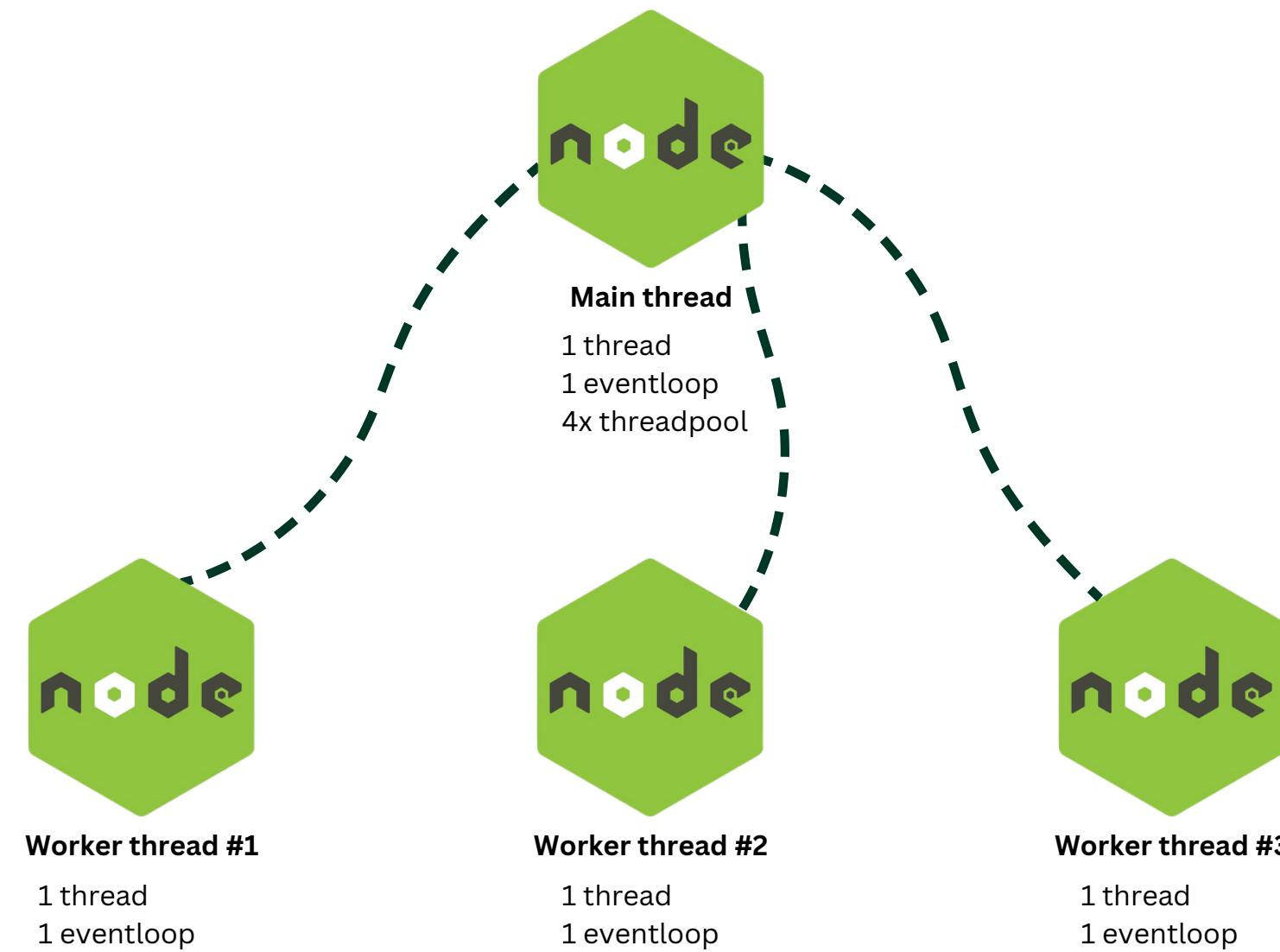
UV\_THREADPOOL\_SIZE=8 (SIZE<=128)

NOW: Up to 1024 threads (after libuv v1.30.0 or node v12.5.0)

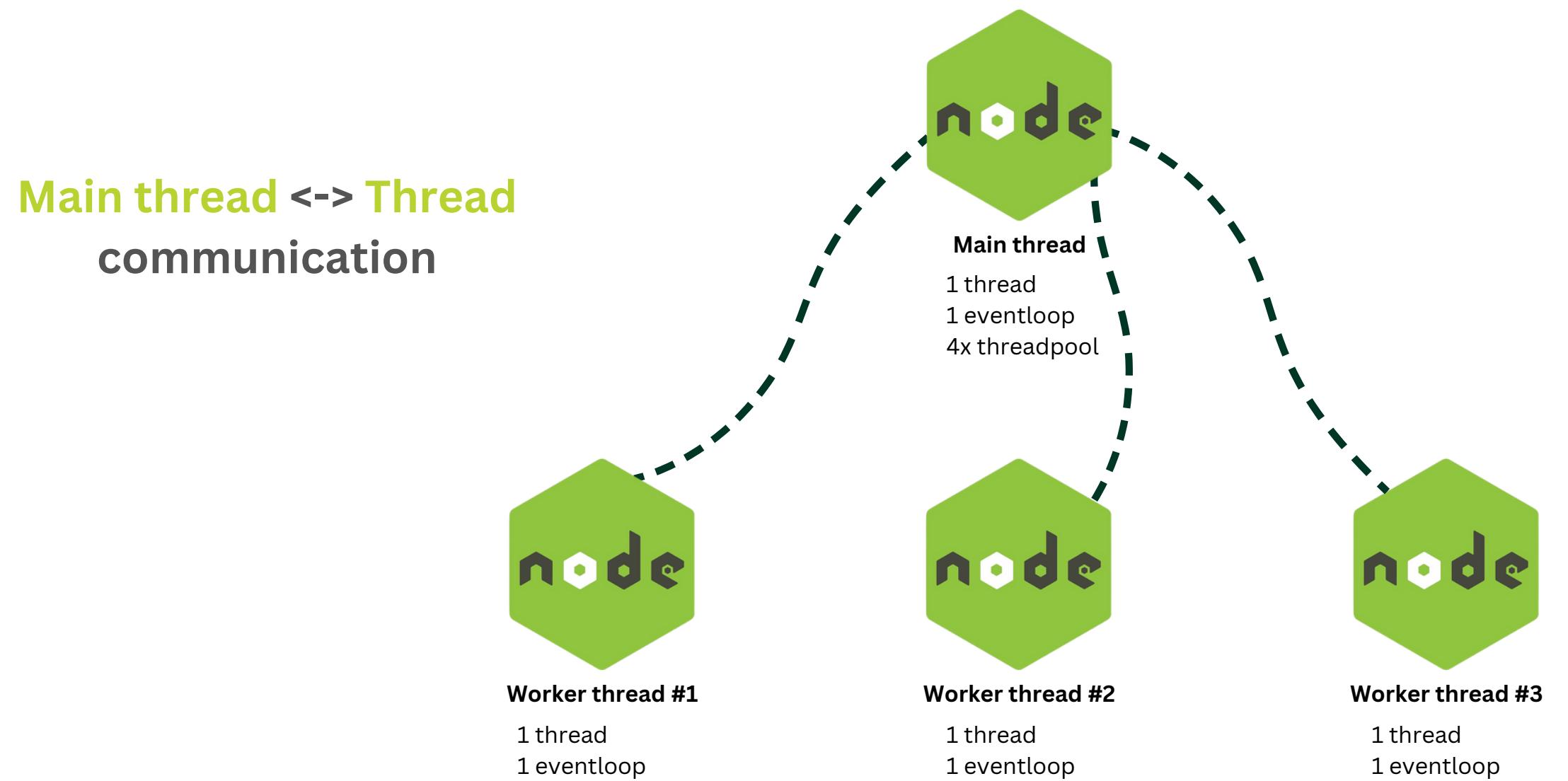
**'worker\_threads'**

**Unlike ThreadPool threads...**

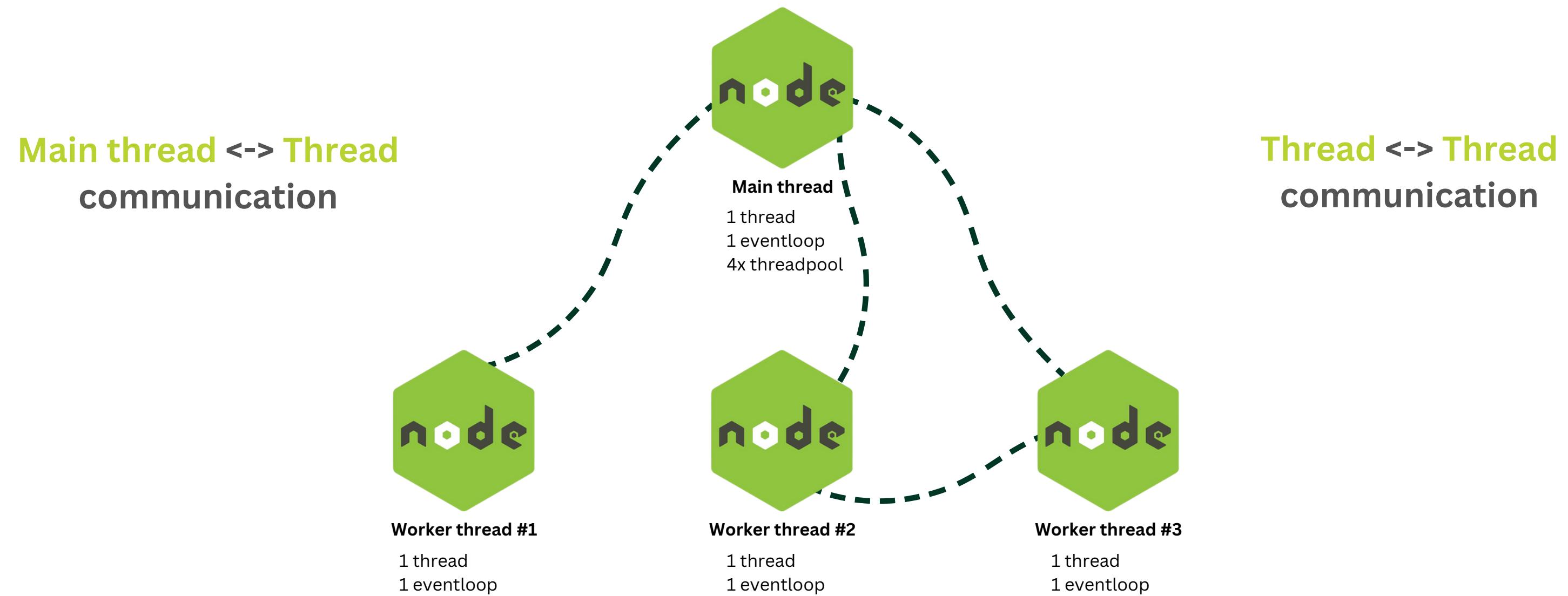
# 'worker\_threads'



# 'worker\_threads'



# 'worker\_threads'

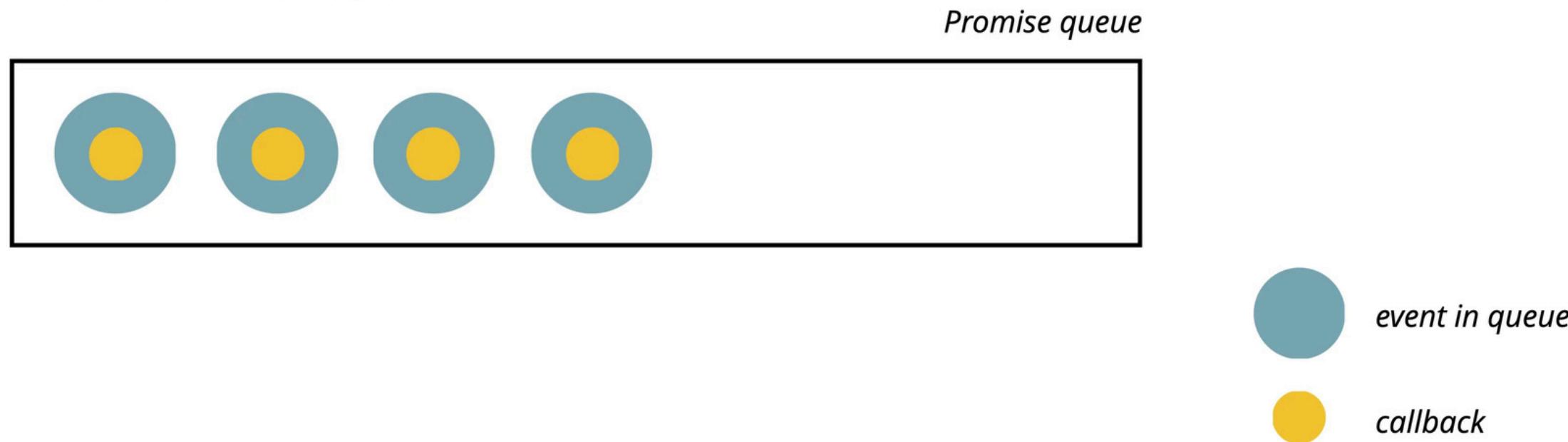


Is the `worker\_thread`  
lightweight?

# Promises

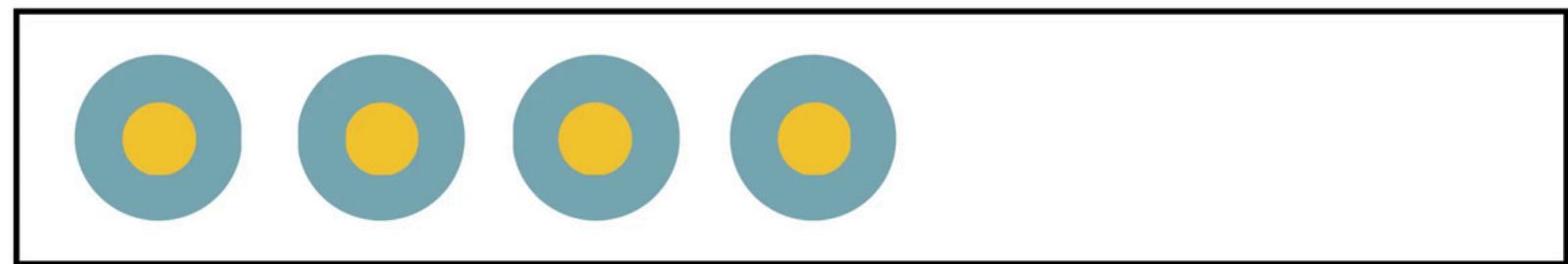
## non native vs native

## Native Promise



## Native Promise

*Promise queue*



*event in queue*



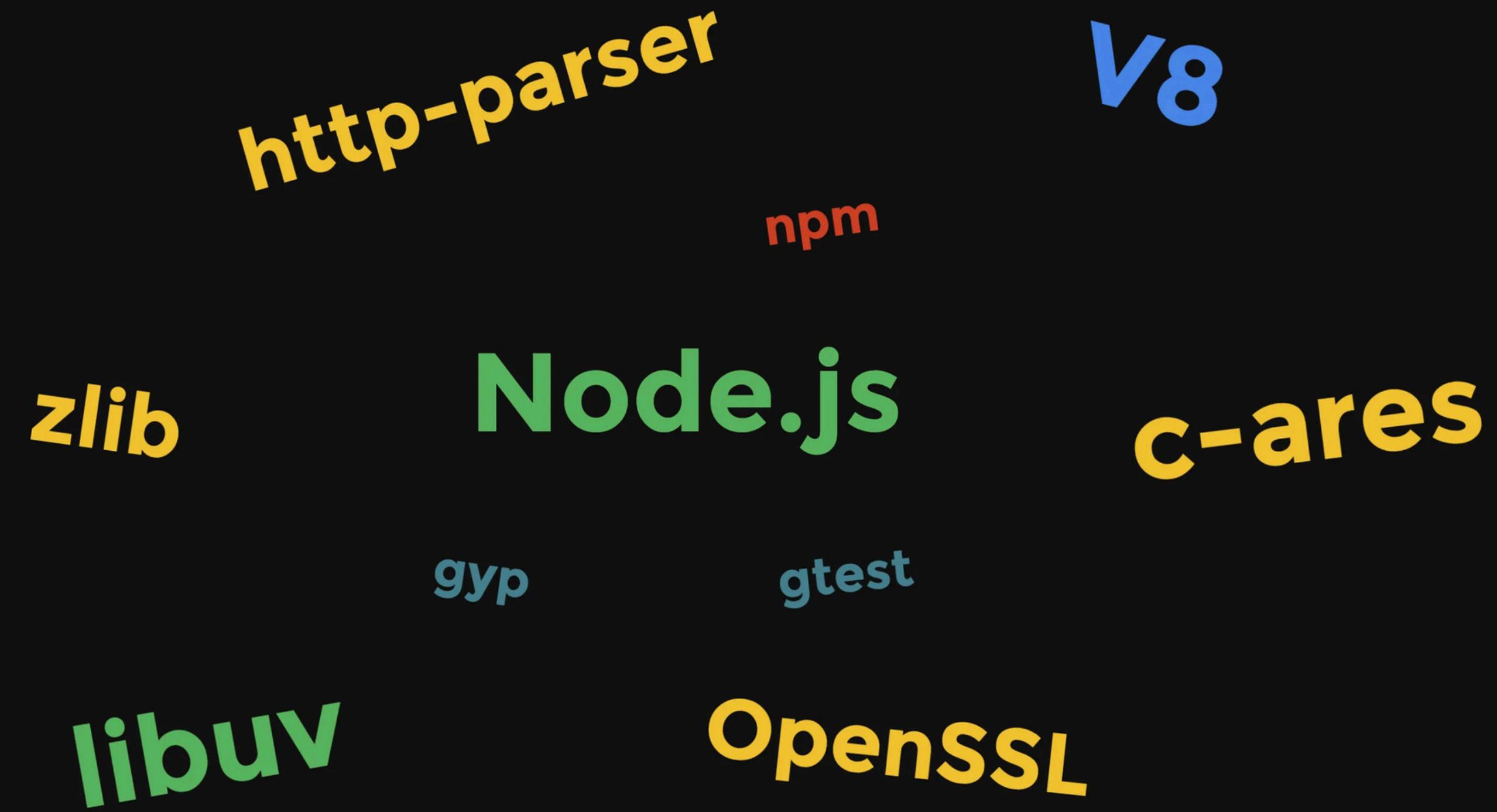
*callback*

## Bluebird

*Immediate queue*



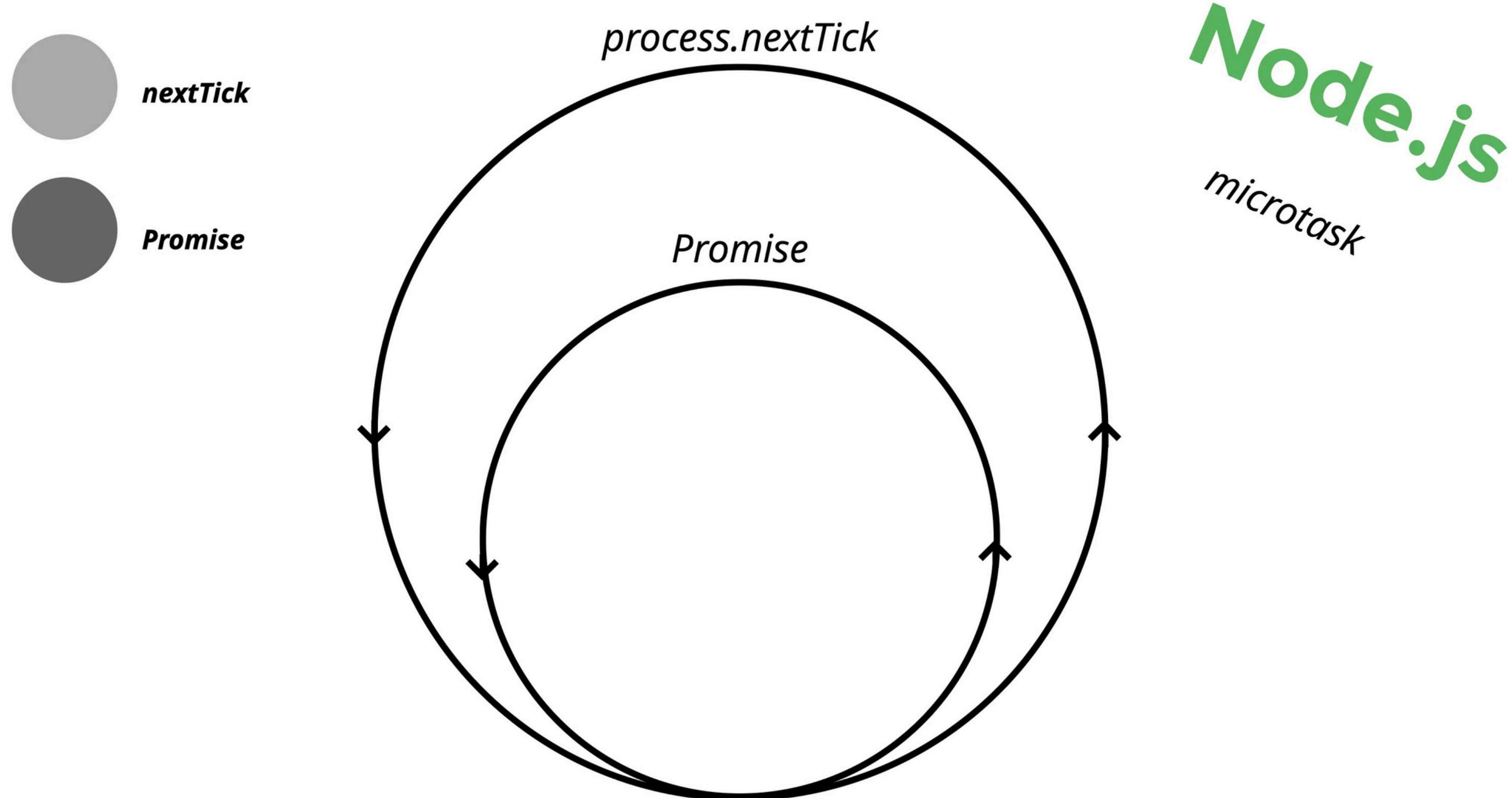
# Summary

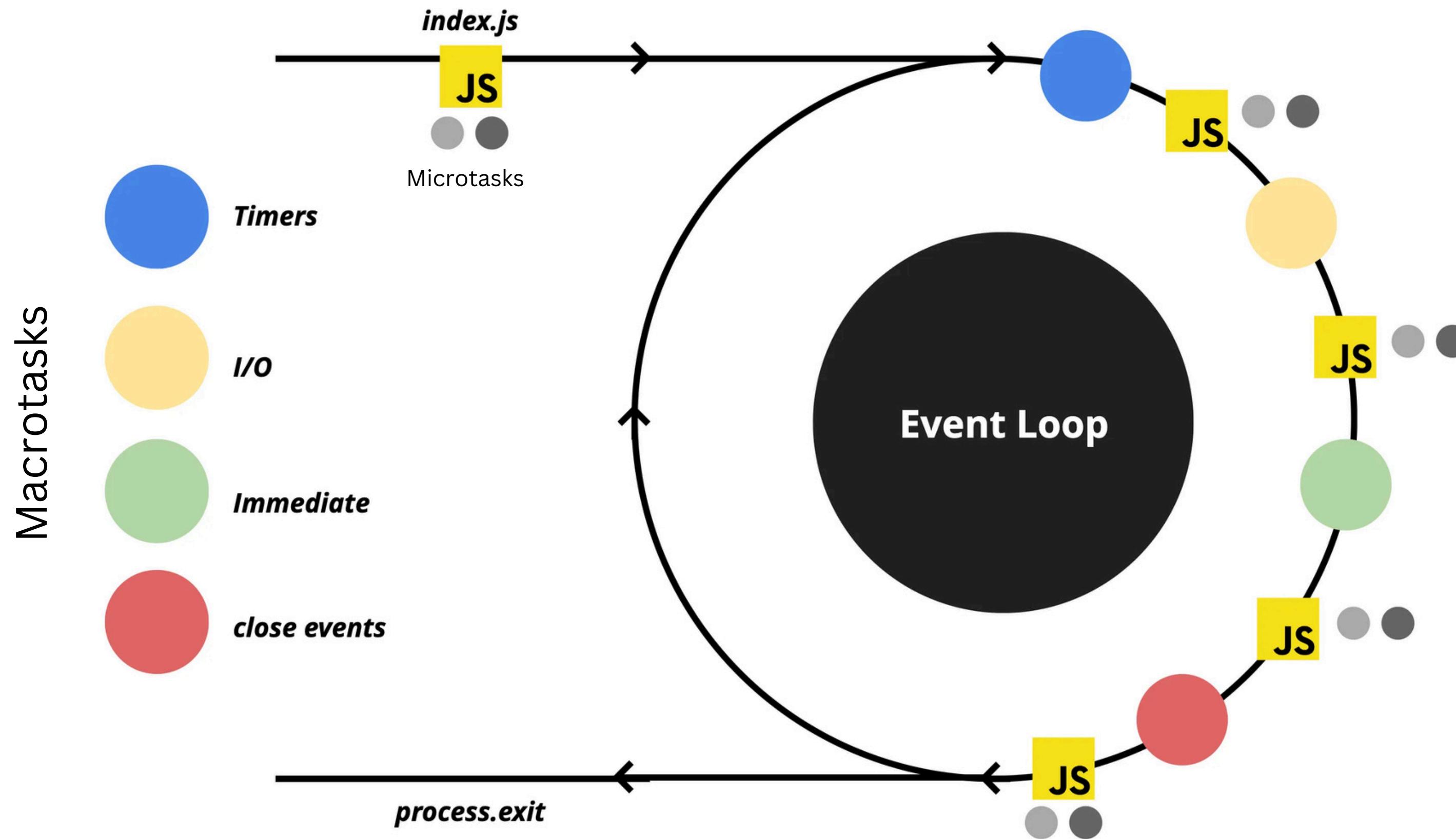


**Queue**  
macrotask

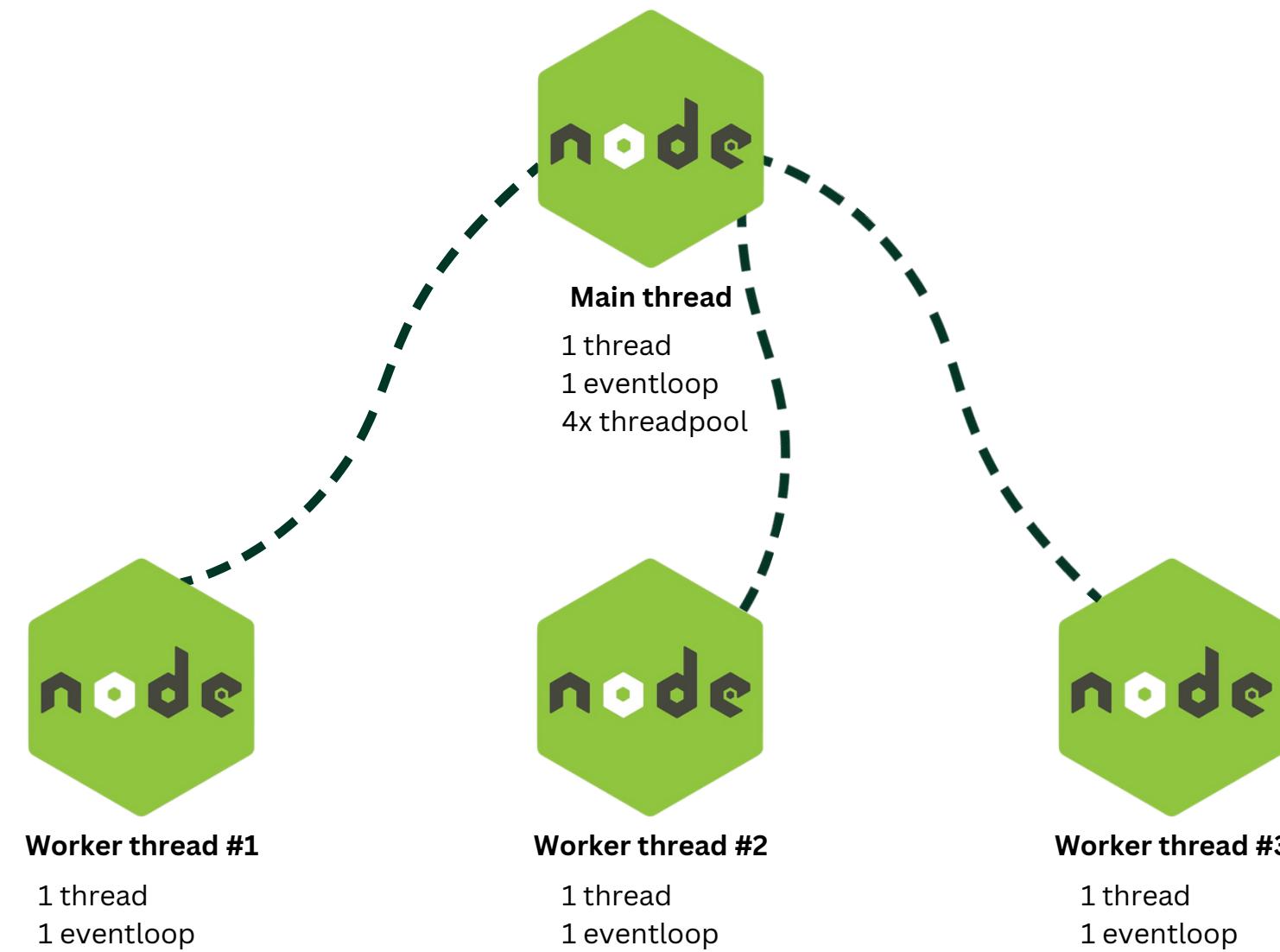


**libuv**





# 'worker\_threads'



# Any questions



# THANK YOU!



Slide and examples (Github)

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