Cloudinary

Supercharge your JavaScript with Wasm

Tamas Piros

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Hi 👋 I am **Tamas Piros**

Developer Evangelist
Cloudinary

Director
Full Stack Training

Google Developer Expert
Web Technologies

@tpiros

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Why do programmers leave their job?

Because they don't get a raise

a raise = arrays 😉

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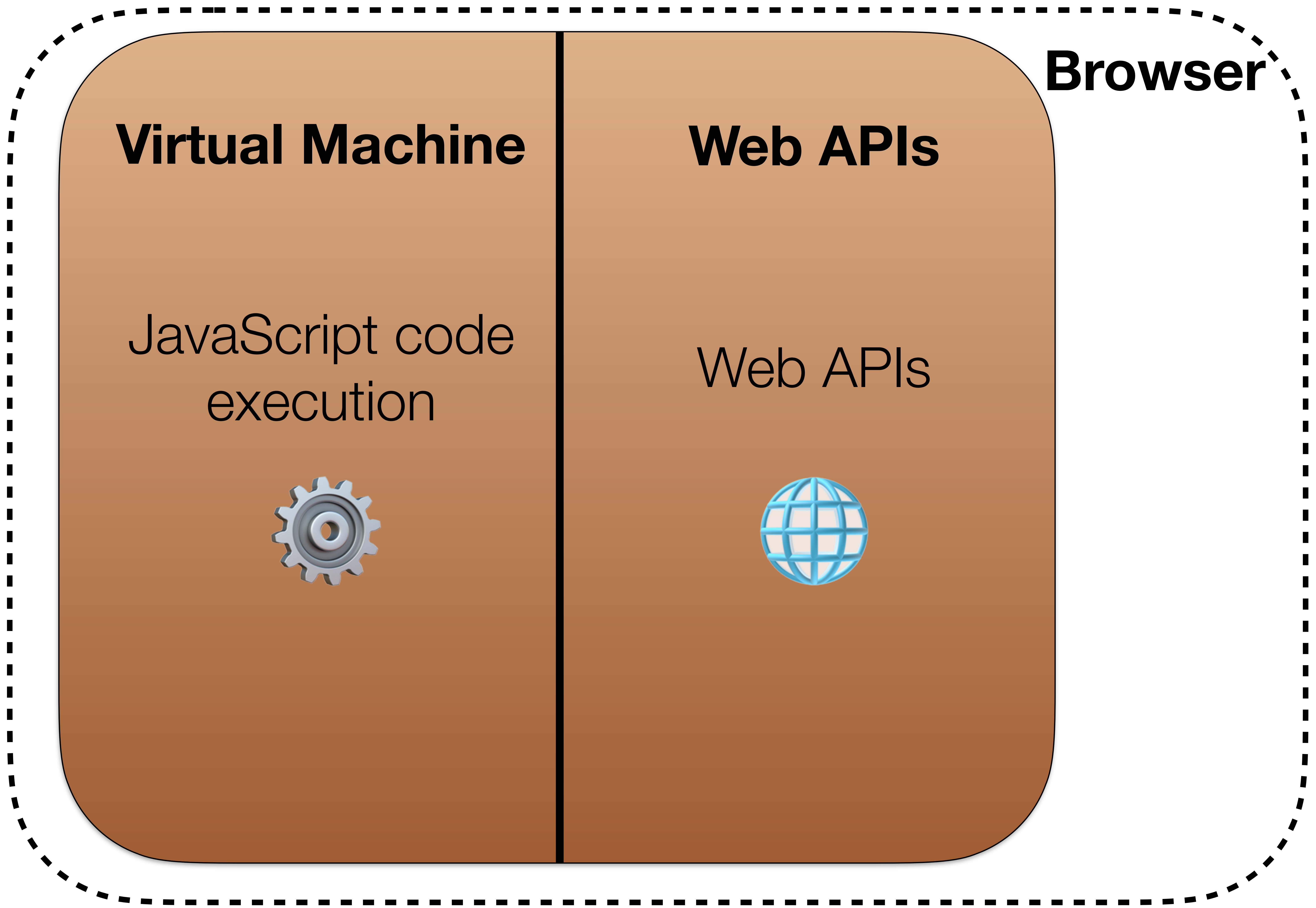
Web Platform (as of 2018)



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The Web is progressing at an incredible pace

JavaScript is great for leveraging the ecosystem

But has its limits

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It’s very difficult to achieve low-level tasks without a performance impact

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WebAssembly was created in 2015*

* asm.js predates WebAssembly (2013) - allowed apps written in C to run as web apps

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Since 2019 (Dec) WebAssembly is a W3C recommendation

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WebAssembly is a low-level assembly-like language with a compact binary format that runs with near-native performance and provides languages such as C/C++ and Rust with a compilation target so that they can run on the web.

https://developer.mozilla.org/en-US/docs/WebAssembly

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Run native apps on the web

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WebAssembly functions can be exposed to JavaScript

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WebAssembly is not here to replace JavaScript.

It’s here to enhance / augment it.

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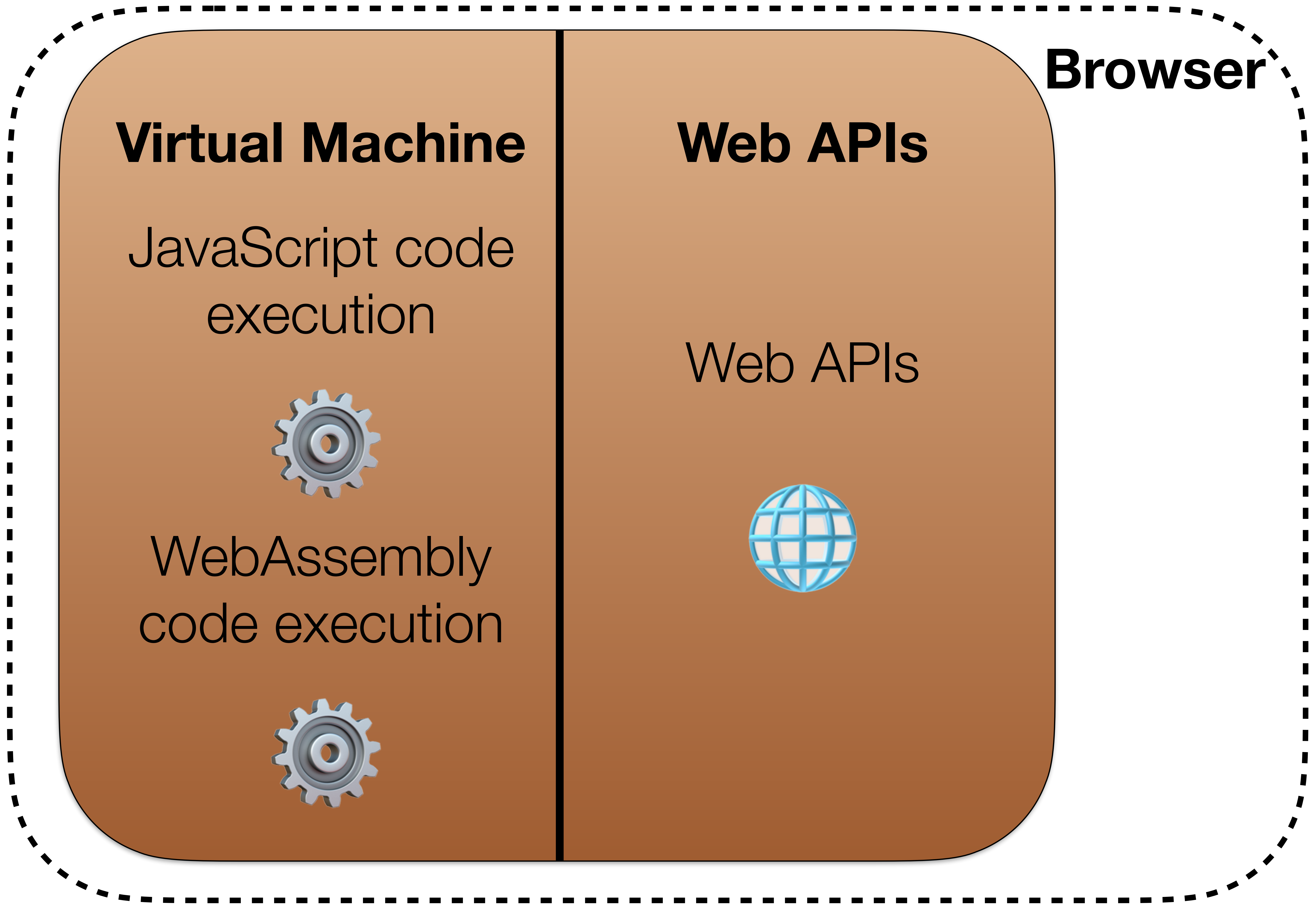
Web Platform (today)



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WebAssembly JavaScript API

Loading module (compiled WebAssembly binary)

Create new memory and table instances

Instance: Module + Memory & Table - just like an ES2015 module

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Process of creating wasm

Write code in C or C++ (or any other LLVM supported languages)

Use Emscripten or use direct compile targets to produce .wasm

Load & consume via JavaScript

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Process of creating wasm

Write code using .NET languages, Java, Ruby or Go

Compile to .wasm

Load & consume via JavaScript

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Languages that compile to .wasm

.Net, C, C++, C#, D, F#, Go, Java, PHP, Python, TypeScript

… and a lot more https://github.com/appcypher/awesome-wasm-langs

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Demo Time 🥳

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Resources

- Emscripten (https://emscripten.org)
- MDN WebAssembly (https://developer.mozilla.org/en-US/docs/WebAssembly)
- Sample Repository (https://github.com/tpiros/wasm-samples)
- Wasm by example (https://wasmbyexample.dev)
- Running Doom via wasm (https://wasm.continuation-labs.com/d3demo/)
- Super Marion via wasm (https://medium.com/@bokuweb17/writing-an-nes-emulator-with-rust-and-webassembly-d64de101c49d)
- Squoosh.app (https://squoosh.app)
  - Case study: https://developers.google.com/web/updates/2019/02/hotpath-with-wasm

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Thank you

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