Ramón Huidobro
@hola_soy_milk

WebAssembly en el Servidor

¡Ha llegado la época post-contenedor!

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¡Ha llegado* la época post-contenedor*!

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¿Contenedores? 

¿WebAssembly? 

@hola_soy_milk

¿Yo? 

@hola_soy_milk

Soy Ramón.

(él)

De Chile, en Austria

Developer Advocate @ Suborbital

Consultante DevRel

Instructor de Desarrollo

Mozilla tech speaker

Mentor de Carrera Tech

Live Streamer

Ponente de keynote

¡A aprender qué es WebAssembly y por qué su futuro en el servidor es emocionante!

Unas preguntitas...

- ¿Qué?
- ¿Por qué?
- ¿Cómo?
- ¿Cuándo?
- ¿Dónde?

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¿Qué es WebAssembly (Wasm)?

WEBASSEMBLY

Overview | Getting Started | Specs | Future features | Community | FAQ

WebAssembly 1.0 has shipped in 4 major browser engines.  Learn more

WebAssembly (abbreviated *Wasm*) is a binary instruction format for a stack-based virtual machine. Wasm is designed as a portable compilation target for programming languages, enabling deployment on the web for client and server applications.

https://webassembly.org/

Wasm no es un lenguaje de programación

Wasm no es un framework de front-end

Wasm es un formato de código binario (bytecode)

Wasm es un objeto de compilador

¿Qúe?

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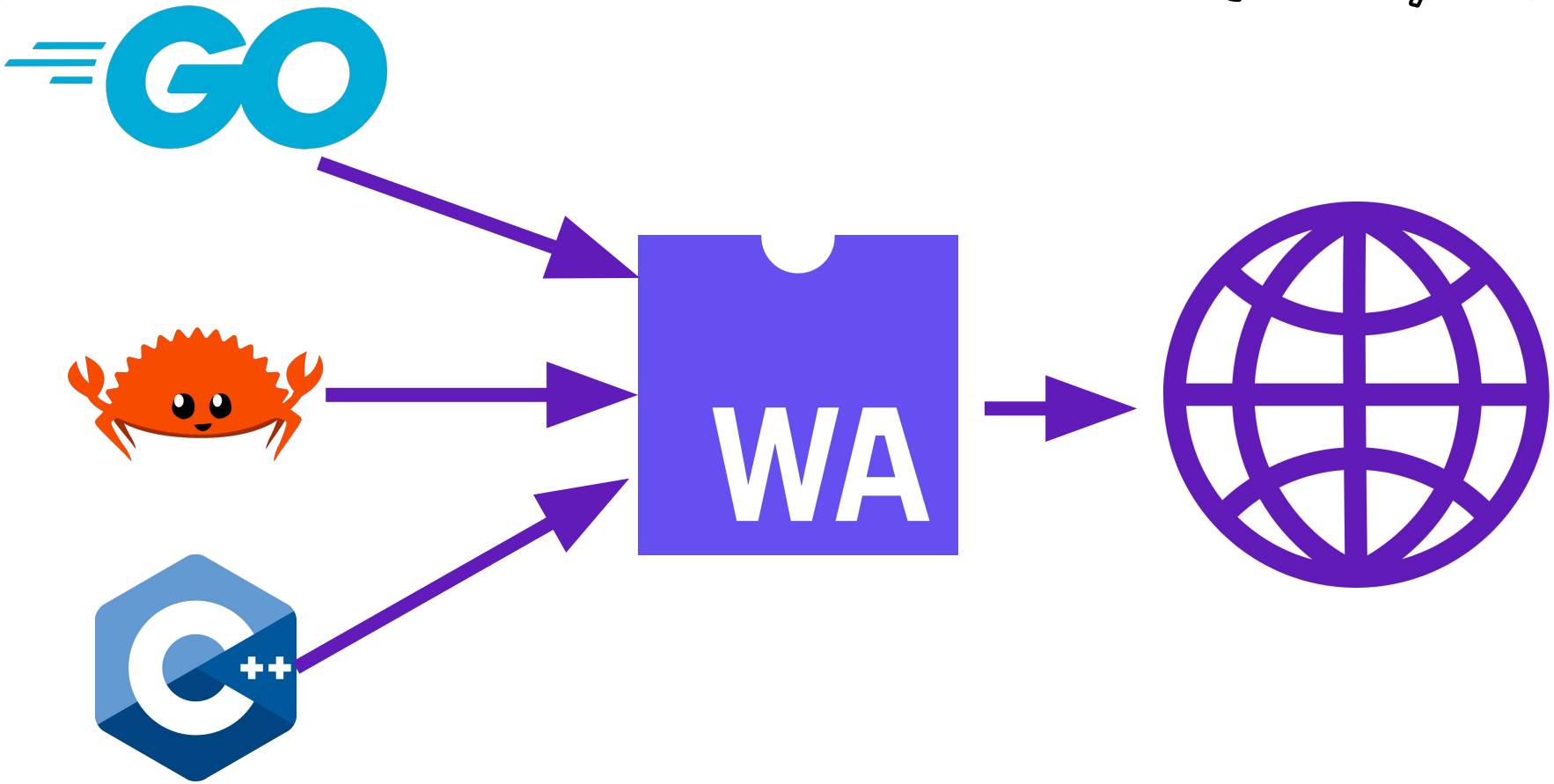
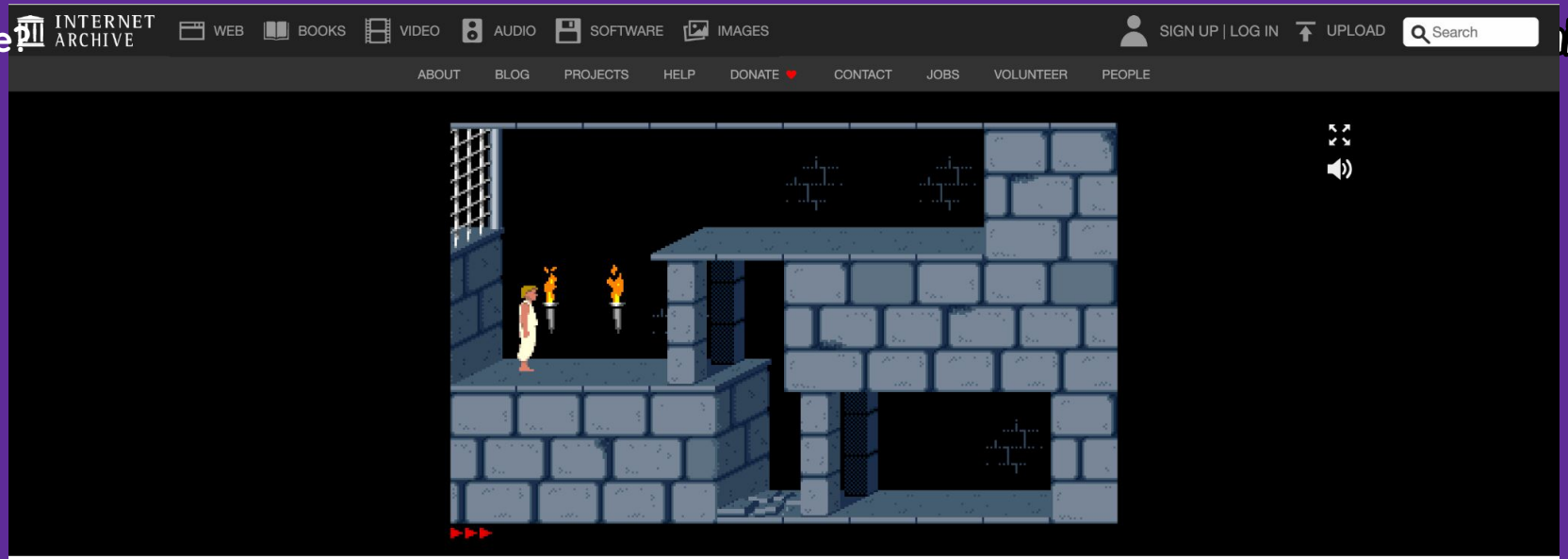


¿Qué?



https://archive.org/details/msdos_Prince_of_Persia_1990

¿Qúe?

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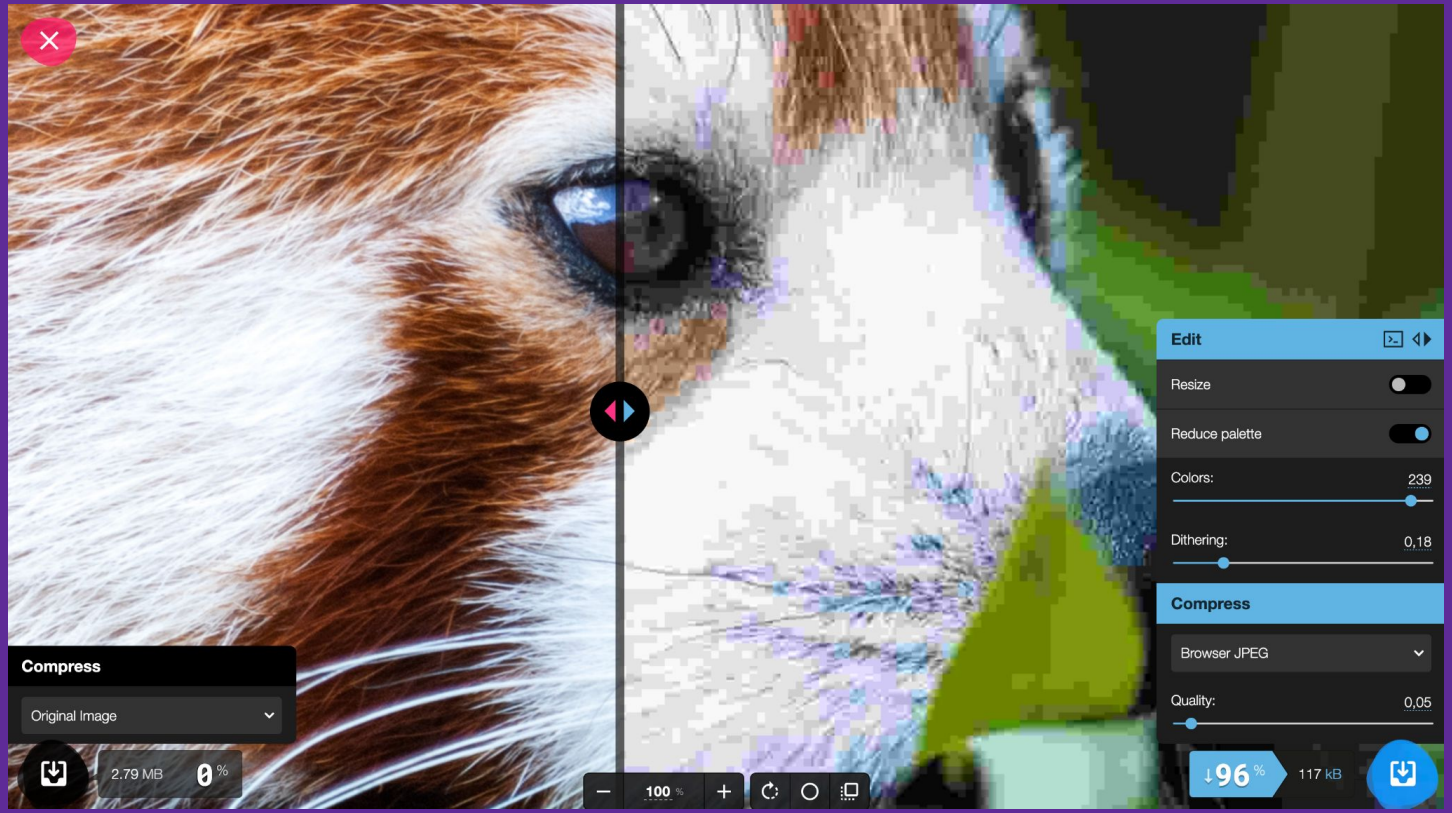

https://squoosh.app/

¿Qúe?

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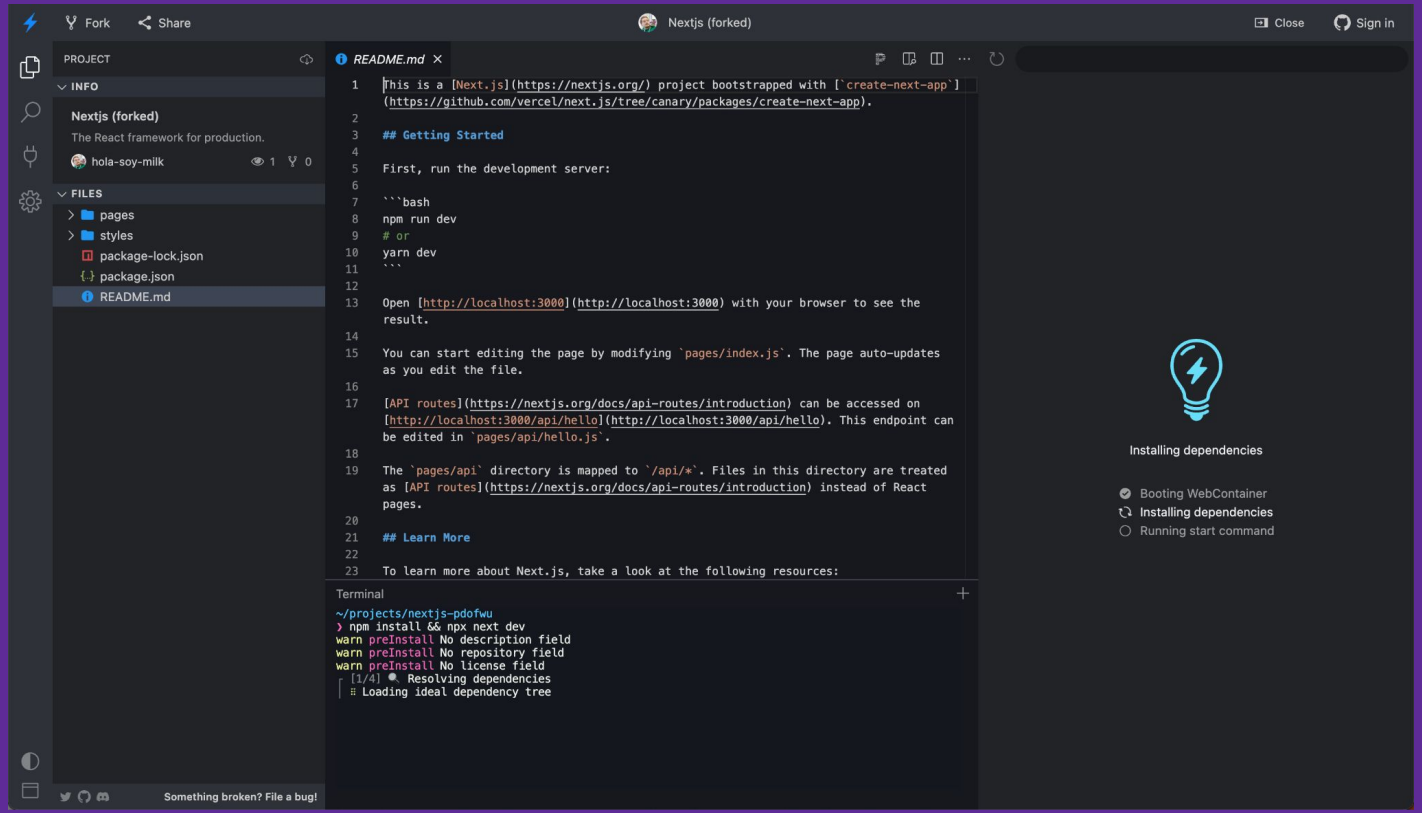


https://stackblitz.com

lab.allotropia.de/wasm/

example_larger.odt - LibreOfficeDev Writer 7.4 [d9b2f82b09d89ea918e6d1555d860426fd153c71]

File Edit View Insert Format Styles Table Form Tools Window Help

What is LibreOffice?

Do more – easily, quickly

LibreOffice is a powerful office suite; its clean interface and powerful tools let you unleash your creativity and grow your productivity. LibreOffice embeds several applications that make it the most powerful Free & Open Source Office suite on the market: Writer, the word processor, Calc, the spreadsheet application, Impress, the presentation engine, Draw, our drawing and flowcharting application, Base, our database and database frontend, and Math for editing mathematics.

Finally, documents that look good

Your documents will look professional and clean, regardless of their purpose: a letter, a master thesis, a brochure, financial reports, marketing presentations, technical drawings and diagrams.

Use documents of all kinds

LibreOffice is compatible with many document formats such as Microsoft® Word, Excel, PowerPoint and Publisher. But LibreOffice goes further by enabling you to use a modern open standard, the OpenDocument Format (ODF).

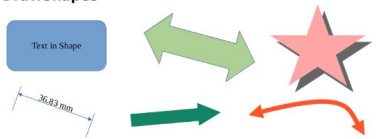
Free as in Freedom, now and forever

LibreOffice is Free and Open Source Software. Its development is open to new talent and new ideas. Our software is tested and used daily by a large and devoted user community; you, too, can get involved and influence its future development.

Table

A	B	C	D	E	F
I					
II					
III					
IV					

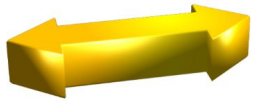
DrawShapes



Textframe

He heard quiet steps behind him. That didn't bode well. Who could be following him this late at night and in this deadbeat part of town? And at this particular moment, just after he pulled off the big time and was making off with the greenbacks. Was there another crook who'd had the same idea, and was now watching him and waiting for a chance to grab the fruit of his labor? Or did the steps behind him mean that one of many law officers in town was on to him and just waiting to pounce and snap those cuffs on his wrists?

3DShape



Textbox

The quick brown Fox Jumps over the lazy Dog

https://lab.allotropia.de/wasm/

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Ya bueno pero esto solo se trata del navegador.

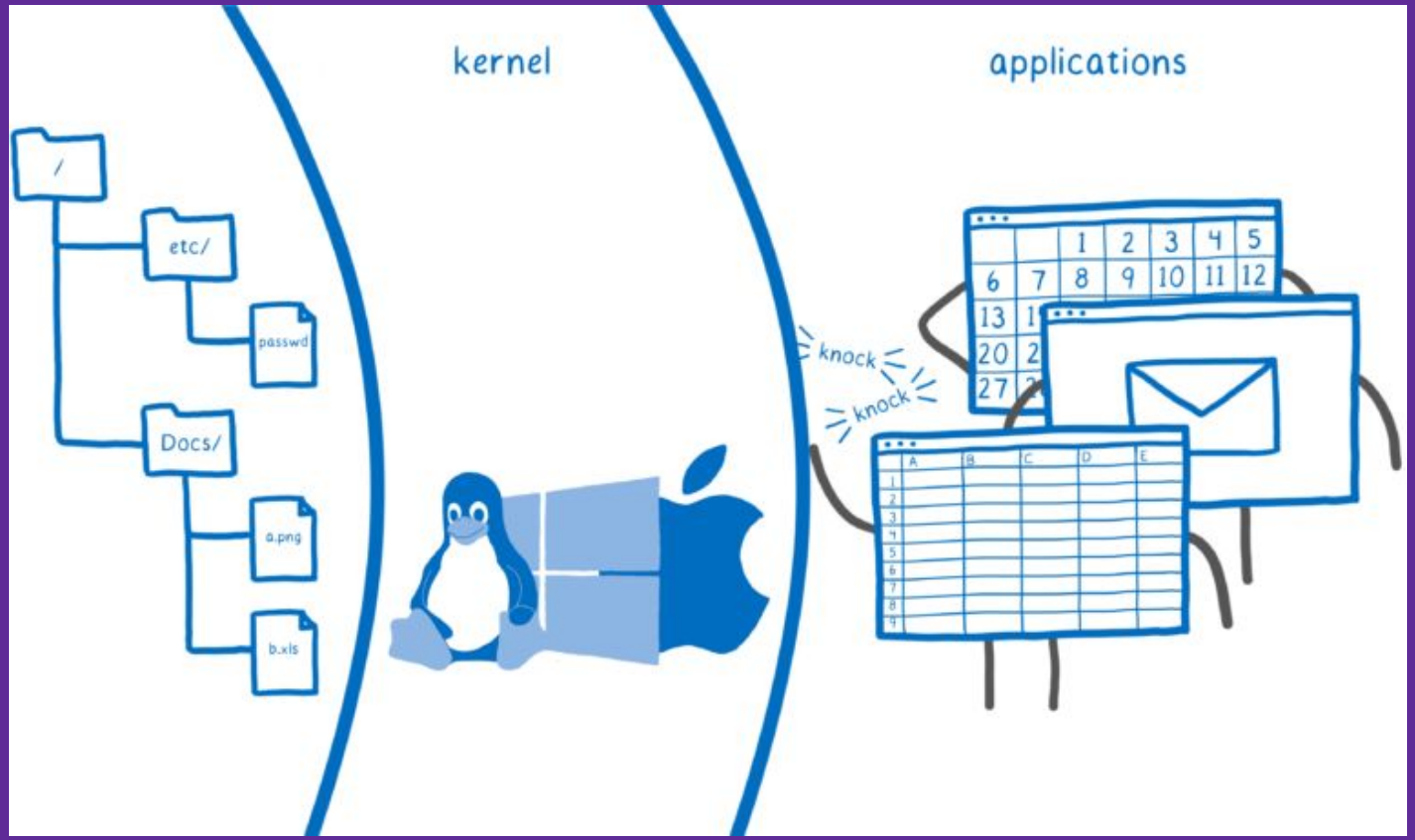
¿Que tiene que ver con Wasm en el servidor?

¿Wasm no anda en cualquier parte, ¿o sí?

Es aquí donde entra WASI

Es aquí donde entra WASI

Web**A**ssembly,
ahora con
Interfaz de **S**istema!



https://hacks.mozilla.org/2019/03/standardizing-wasi-a-webassembly-system-interface/

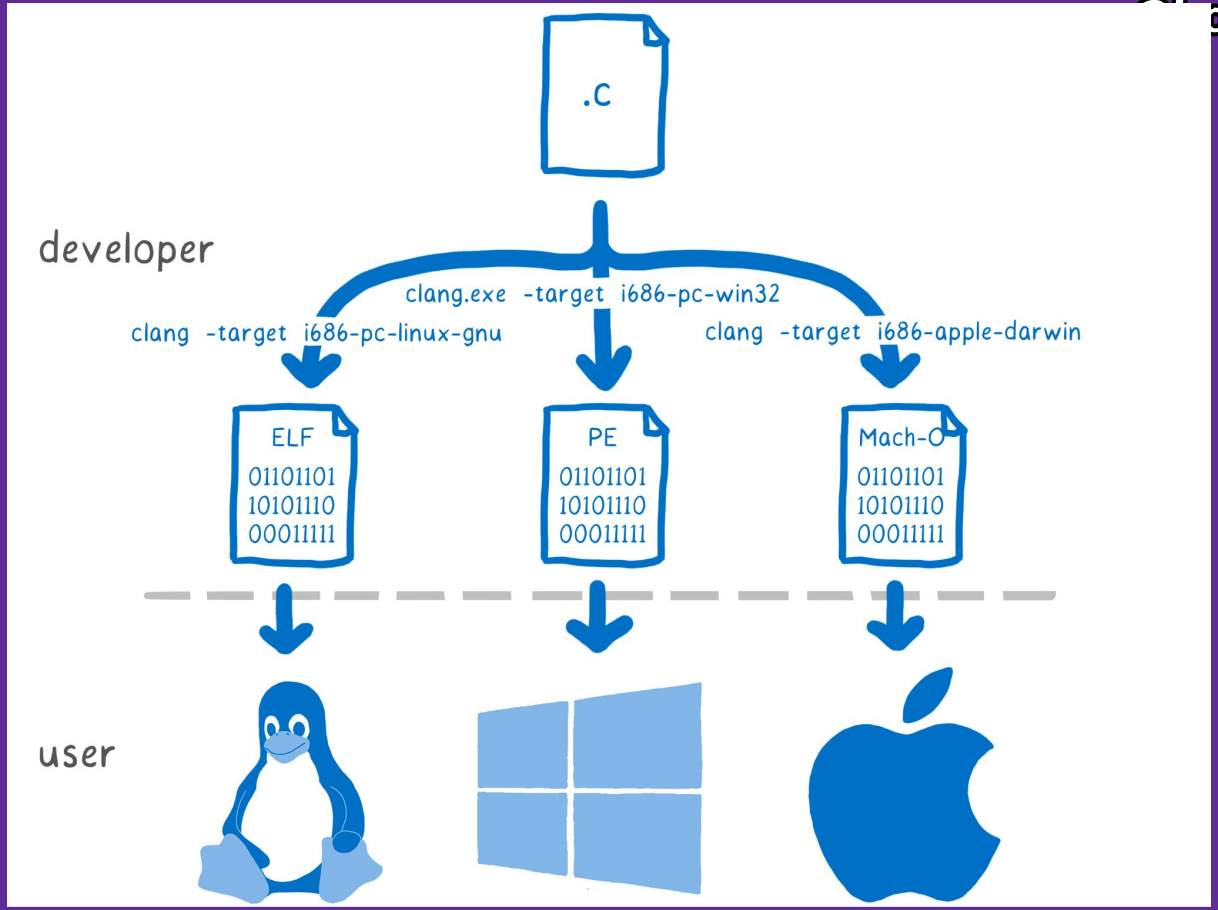
WASI es similar a este concepto de un kernel

Sin embargo, no reemplaza el sistema operativo

It's an API designed by the Wasmtime project that provides access to several operating-system-like features, including files and filesystems, Berkeley sockets, clocks, and random numbers...

https://github.com/bytecodealliance/wasmtime/blob/main/docs/WASI-intro.md

¿Qúe?



https://hacks.mozilla.org/2017/02/creating-and-working-with-webassembly-modules/

¿Qúe?

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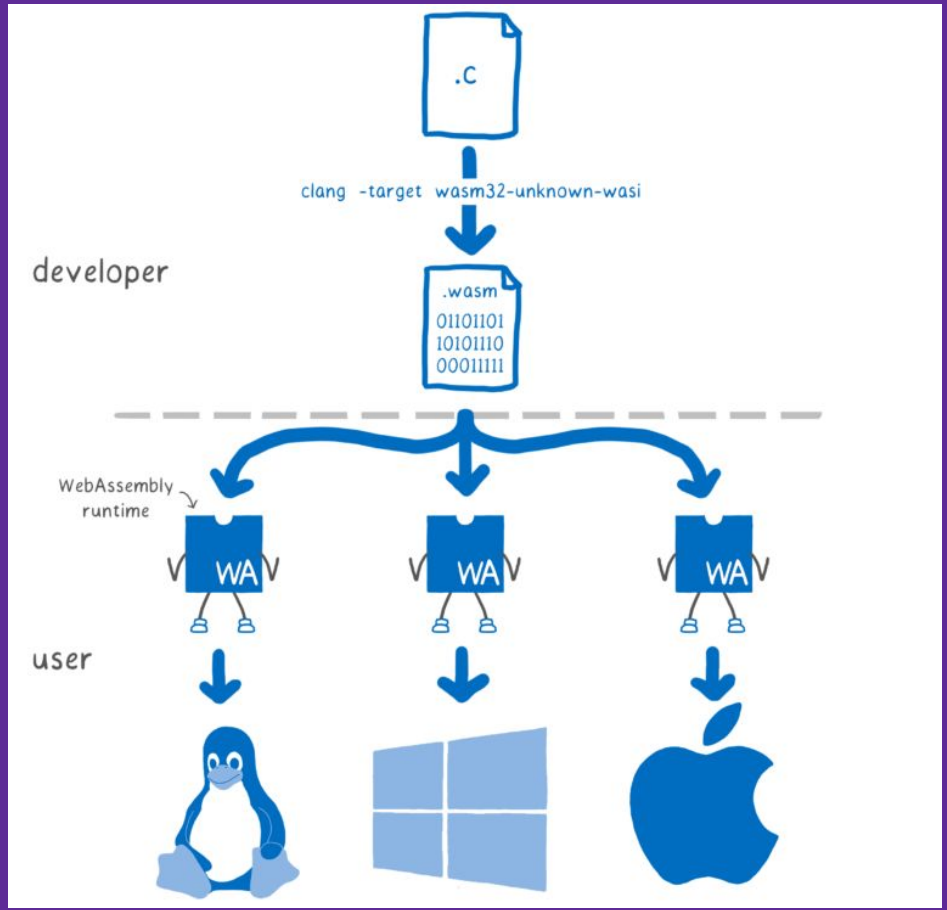

https://hacks.mozilla.org/2017/02/creating-and-working-with-webassembly-modules/

¿Qúe?

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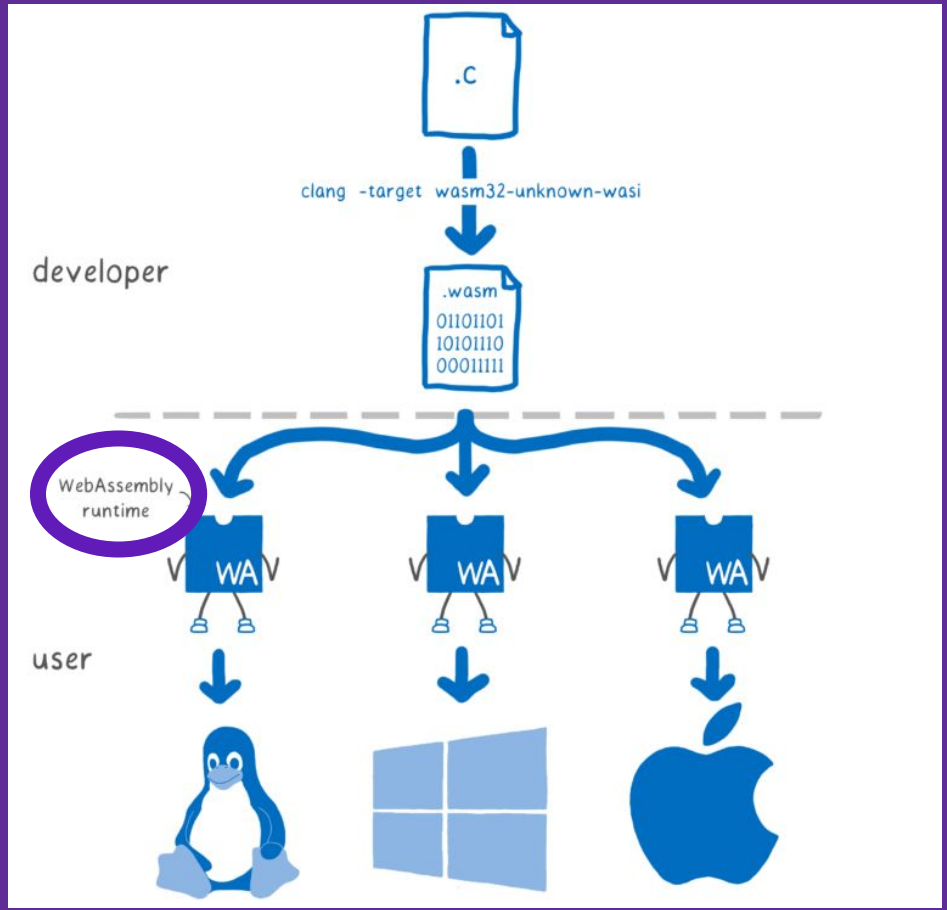
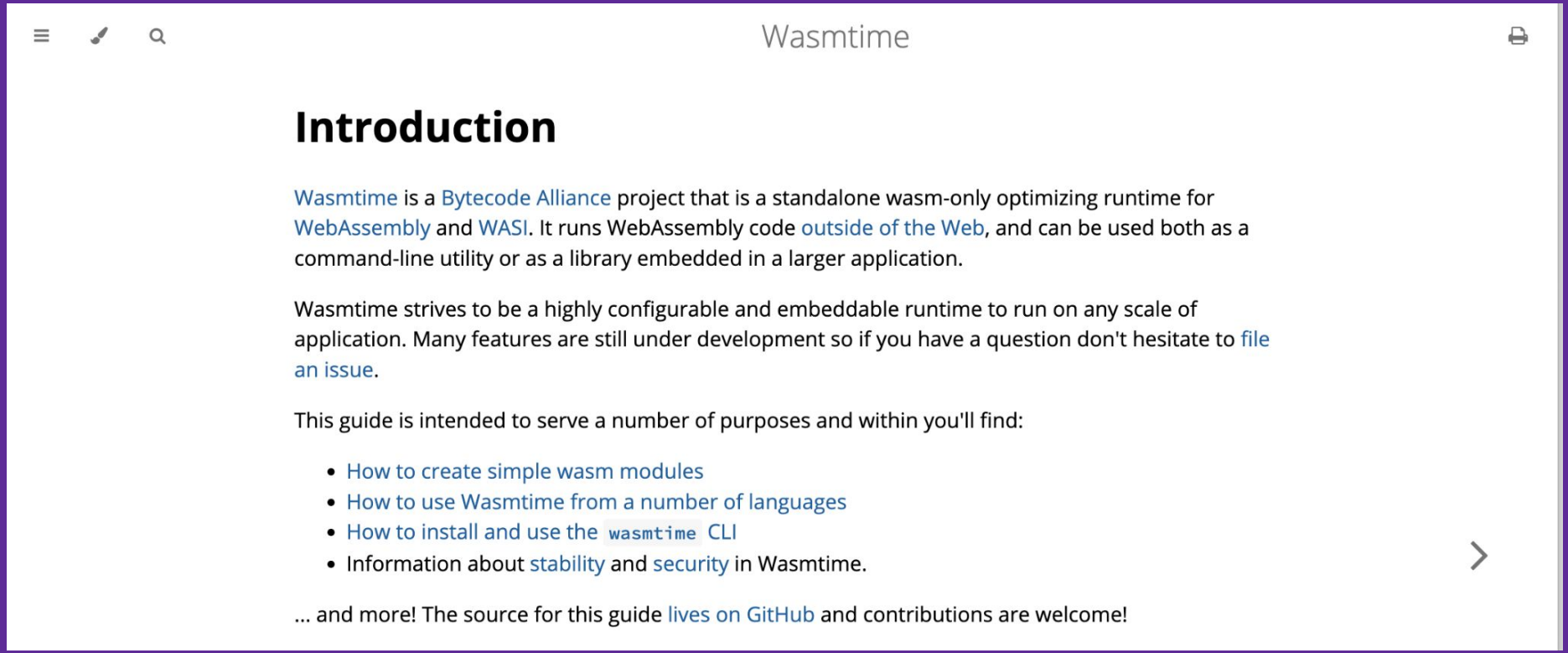


https://hacks.mozilla.org/2017/02/creating-and-working-with-webassembly-modules/

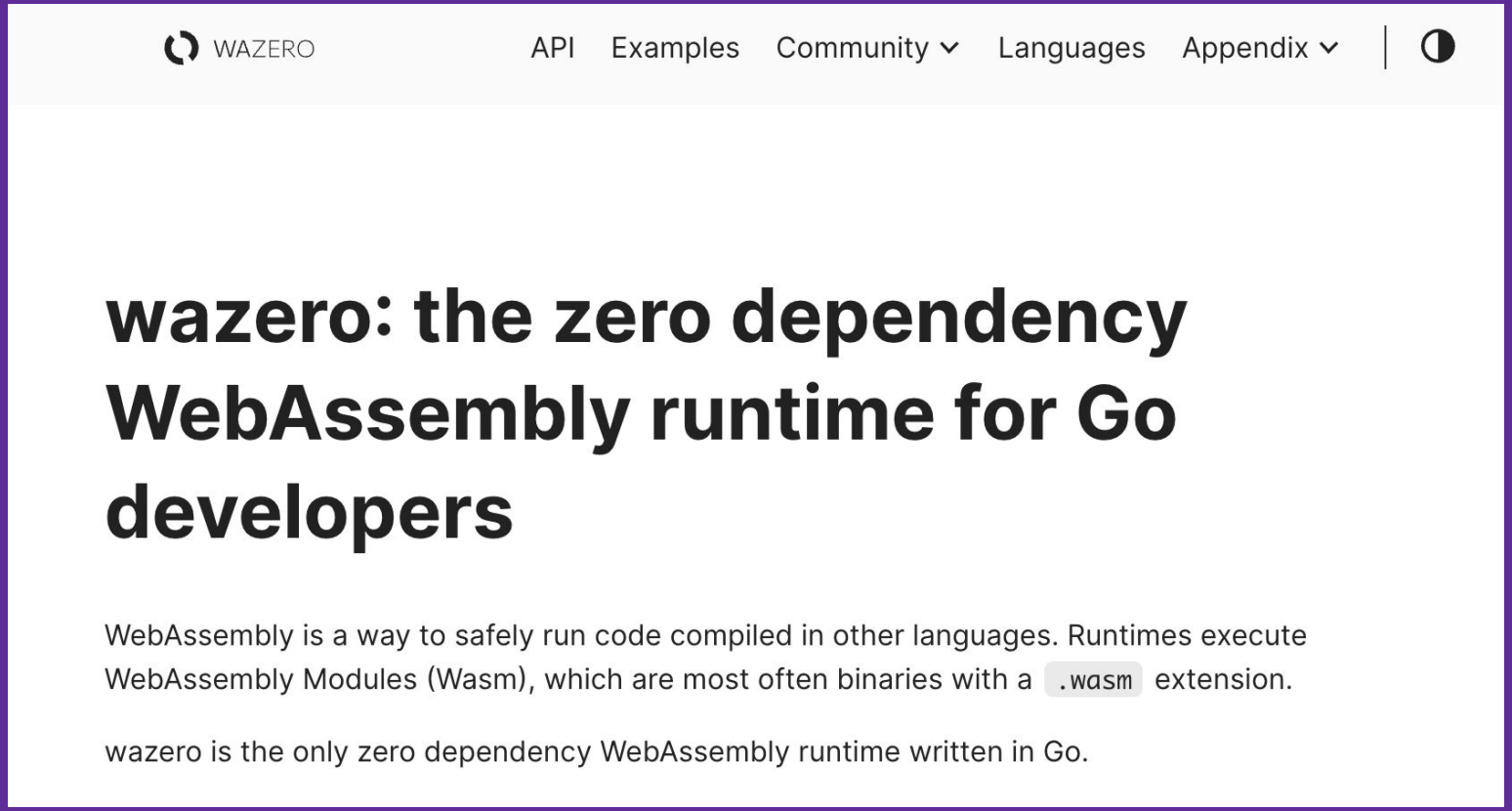


https://docs.wasmtime.dev/

Wasm3

Wasm3 is the fastest WebAssembly interpreter, and the most universal runtime.
It's packaged into a `WebAssembly` package, so you can finally run `WebAssembly` on `WebAssembly` 😆

https://wapm.io/vshymanskyy/wasm3



https://wazero.io/

`wasmi` - WebAssembly (Wasm) Interpreter

`wasmi` is an efficient WebAssembly interpreter with low-overhead and support for embedded environment such as WebAssembly itself.

At Parity we are using `wasmi` in Substrate as the execution engine for our WebAssembly based smart contracts. Furthermore we run `wasmi` within the Substrate runtime which is a WebAssembly environment itself and driven via Wasmtime at the time of this writing. As such `wasmi`'s implementation requires a high degree of correctness and Wasm specification conformance.

Since `wasmi` is relatively lightweight compared to other Wasm virtual machines such as Wasmtime it is also a decent option for initial prototyping.

https://github.com/paritytech/wasmi

Welcome to the Wasmer Documentation! 👋

Wasmer is an open-source runtime for executing WebAssembly on the Server.

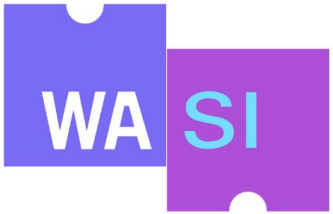
Wasmer

> Wasmer mission is make all software universally available

For an overview of WebAssembly, and what WebAssembly is, take a look here.

> ⓘ You can find the source code of the docs here: github.com/wasmerio/docs.wasmer.io
>
> Any page can be easily edited, just by clicking on the **Edit on Github** link at the top right

https://wasmer.io/



Examinar... Ningún archivo seleccionado.

This is a simple Web polyfill demo of WASI, a portable system interface for WebAssembly, allowing simple WASI programs that print to stout to be run in a browser. See wasi.dev for more information on using WASI.

https://wasi.dev/polyfill/

¿Qúe?

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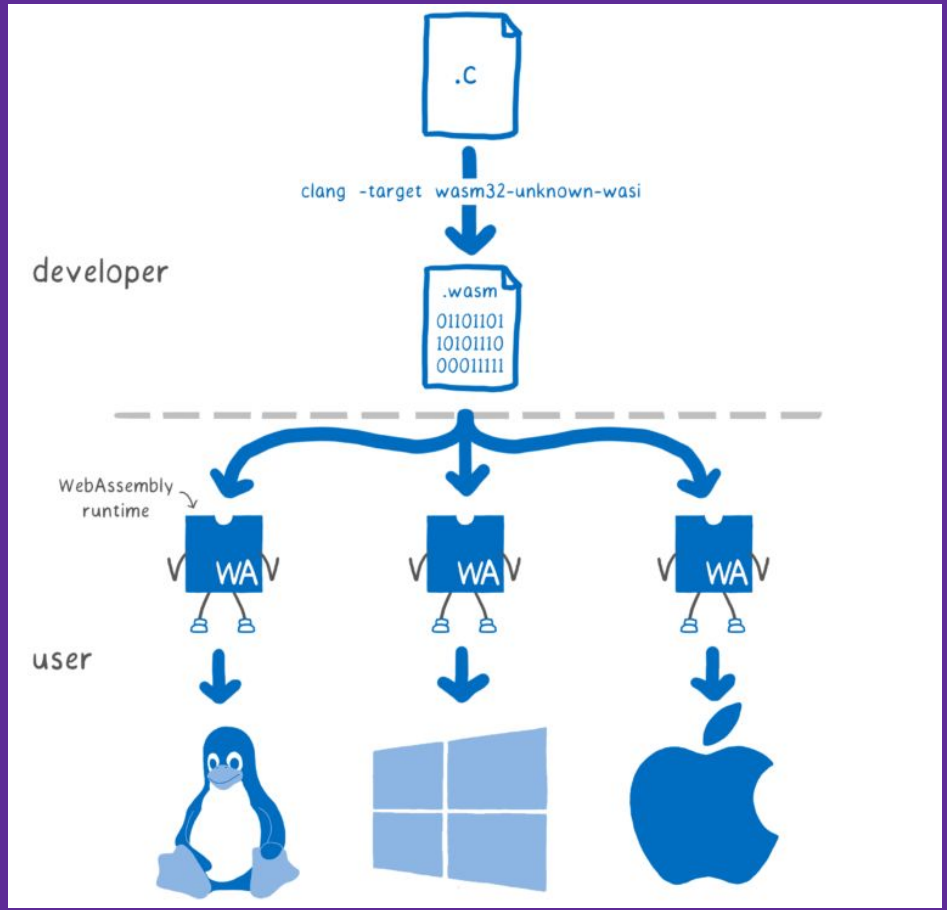


https://hacks.mozilla.org/2017/02/creating-and-working-with-webassembly-modules/

¿Qúe?

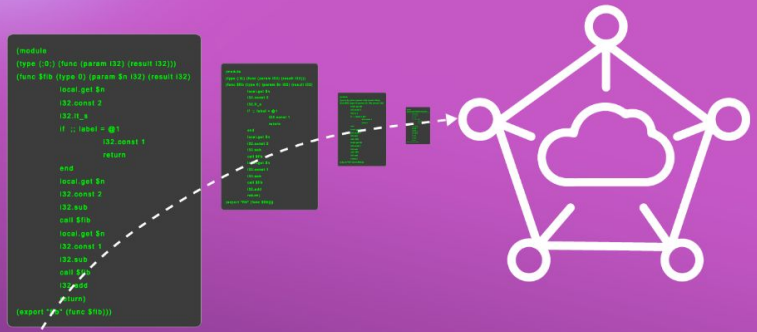
WasmEdgeRuntime Docs Community GitHub

WasmEdge

Bring the cloud-native and serverless application paradigms to Edge Computing.

Get Started Github

```
(module
(type (;0;) (func (param i32) (result i32)))
(func $fib (type 0) (param $n i32) (result i32)
        local.get $n
        i32.const 2
        i32.lt_s
        if  ;; label = @1
                i32.const 1
                return
        end
        local.get $n
        i32.const 2
        i32.sub
        call $fib
        local.get $n
        i32.const 1
        i32.sub
        call $fib
```



WasmEdge is a lightweight, high-performance, and extensible WebAssembly runtime for cloud native, edge, and decentralized applications.

https://wasmedge.org/

O hasta en un contenedor 🤯

Lectura adicional (inglés)

- https://developer.mozilla.org/en-US/docs/WebAssembly
- https://hacks.mozilla.org/2017/02/a-cartoon-intro-to-webassembly/
- https://github.com/bytecodealliance/wasmtime/blob/main/docs/WASI-overview.md
- https://hacks.mozilla.org/2019/03/standardizing-wasi-a-webassembly-system-interface/

Unas preguntitas...

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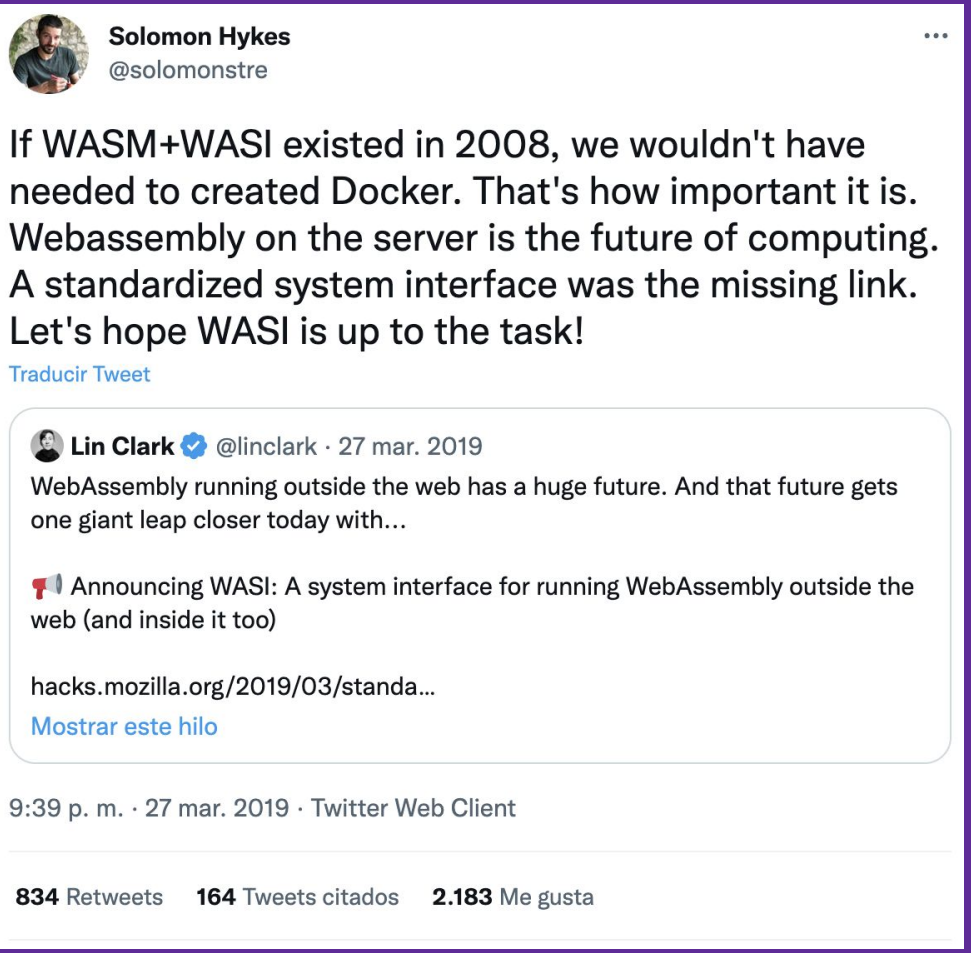
- ¿Qué es Wasm?
- ¿Por qué?
- ¿Cómo?
- ¿Cuándo?
- ¿Dónde?

¿Por qué ejecutar Wasm en el servidor?

¿Por qué?

@hola_soy_milk



Solomon Hykes
@solomonstre

If WASM+WASI existed in 2008, we wouldn't have needed to created Docker. That's how important it is. Webassembly on the server is the future of computing. A standardized system interface was the missing link. Let's hope WASI is up to the task!

Traducir Tweet

Lin Clark @linclark · 27 mar. 2019

WebAssembly running outside the web has a huge future. And that future gets one giant leap closer today with...

📢 Announcing WASI: A system interface for running WebAssembly outside the web (and inside it too)

hacks.mozilla.org/2019/03/standa...

Mostrar este hilo

9:39 p. m. · 27 mar. 2019 · Twitter Web Client

834 Retweets **164** Tweets citados **2.183** Me gusta

https://twitter.com/solomonstre/status/1111004913222324225

¡Trae un diseño “capacity-based security”!

¡Es políglota!

Los componentes se compilan con tipos, son pequeños y gestionables!

¡Super alta velocidad!

¿Por qué?

@hola_soy_milk

First: why are folks putting wasm in production?

obvious reasons:

- Language-independence
- Open, formally-defined, portable standard
- Strong sandbox-based security

- Running the same CLI tools the same way
- Running the same containers the same way

now with wasm!

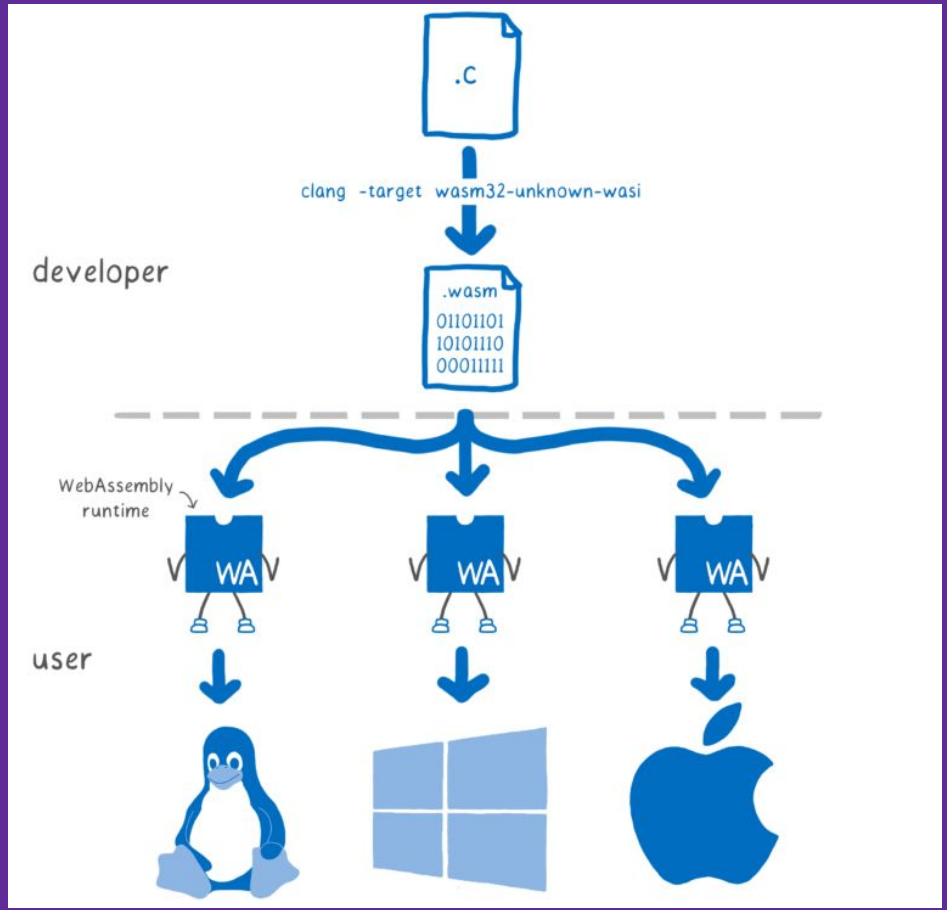
- Next step "smaller" in the progression: VM → CI → WA
- "Serverless" execution: ultra-fast cold start, ephemeral

CLOUD NATIVE Wasm DAY NORTH AMERICA

https://www.youtube.com/watch?v=phodPLY8zNE

¿Por qué?

@hola_soy_milk



https://hacks.mozilla.org/2017/02/creating-and-working-with-webassembly-modules/

¿Por qué?

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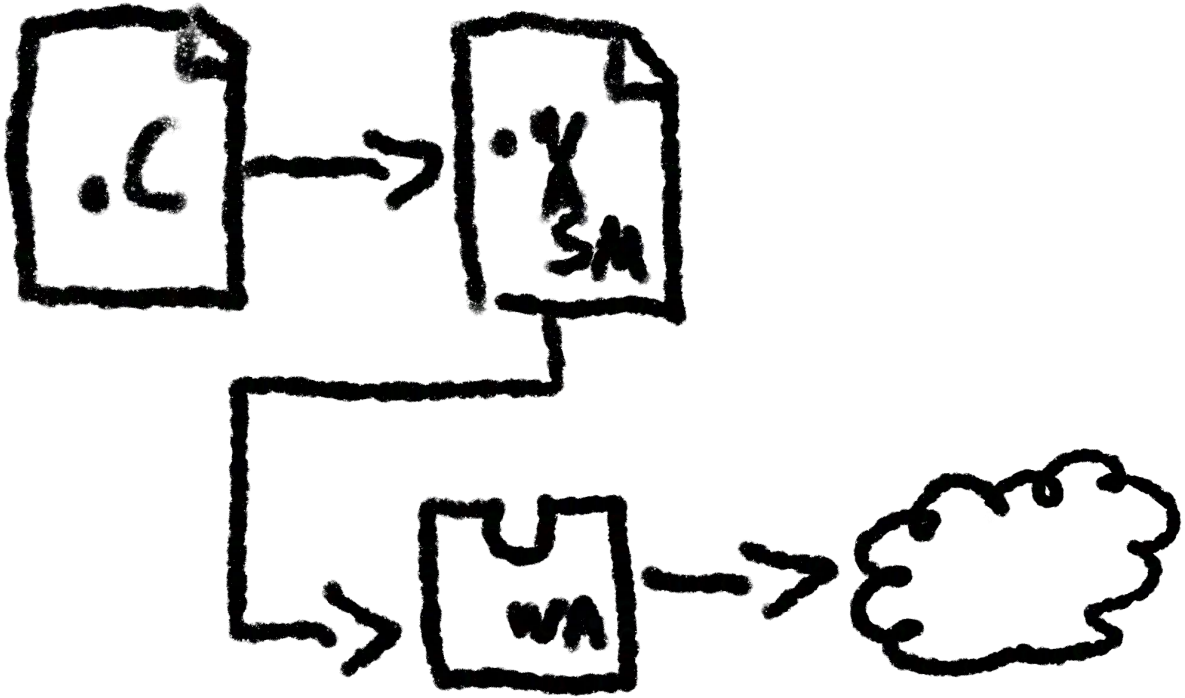

Los componentes se adjuntan a los recursos del sistema al echarse a andar

¿Qué implica esto para el desarrollo de software?

Podemos codear sin preocuparnos de...

Gestionar servidores

Podemos codear sin preocuparnos de...

Tiempo de arranque y cierre

Podemos codear sin preocuparnos de...

Escabilidad

Podemos codear sin preocuparnos de...

Debilidades de seguridad

Lectura Adicional

- https://www.secondstate.io/articles/why-webassembly-server/
- https://wasmedge.org/book/en/use_cases/server_side_render.html
- https://www.wasm.builders/thomastaylor312/why-webassembly-belongs-outside-the-browser-331a

Unas preguntitas...

- ¿Qué es Wasm?
- ¿Por qué ejecutar Wasm?
- ¿Cómo?
- ¿Cuándo?
- ¿Dónde?

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¿Cómo se está usando Wasm en el servidor?

Functions-as-a-Service (Faas)

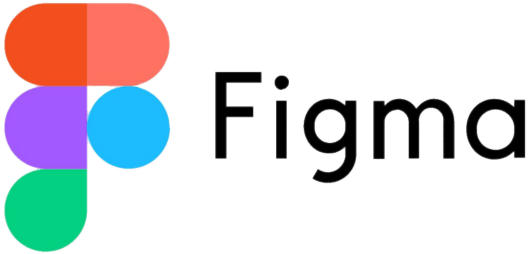
fastly

SECOND STATE

CLOUDFLARE

Edge Computing / Microservices

Extensibilidad



Blockchain

Embedido

Akri

Lectura adicional (inglés)

- https://shopify.engineering/shopify-webassembly
- https://blog.suborbital.dev/webassembly-extensibility-today-and-tomorrow
- https://www.wasm.builders/aryank21/why-wasm-is-the-perfect-runtime-for-server-side-applications-1b9p

Unas preguntitas...

@hola_soy_milk

- ¿Qué es Wasm?
- ¿Por qué ejecutar Wasm?
- ¿Cómo se está usando Wasm?
- ¿Cuándo?
- ¿Dónde?

@hola_soy_milk

¿Cuándo podemos reemplazar los contenedores con Wasm?

¿Cuándo?

@hola_soy_milk

Solomon Hykes
@solomonstre

“So will wasm replace Docker?” No, but imagine a future where Docker runs linux containers, windows containers and wasm containers side by side. Over time wasm might become the most popular container type. Docker will love them all equally, and run it all :)

Traducir Tweet

> **Solomon Hykes** @solomonstre · 27 mar. 2019
> If WASM+WASI existed in 2008, we wouldn't have needed to created Docker. That's how important it is. Webassembly on the server is the future of computing. A standardized system interface was the missing link. Let's hope WASI is up to the task! twitter.com/linclark/statu…
> Mostrar este hilo

4:50 a. m. · 28 mar. 2019 · Twitter Web App

56 Retweets **5** Tweets citados **165** Me gusta

https://twitter.com/solomonstre/status/1111113329647325185

Los contenedores no reemplazaron completamente los VMs...

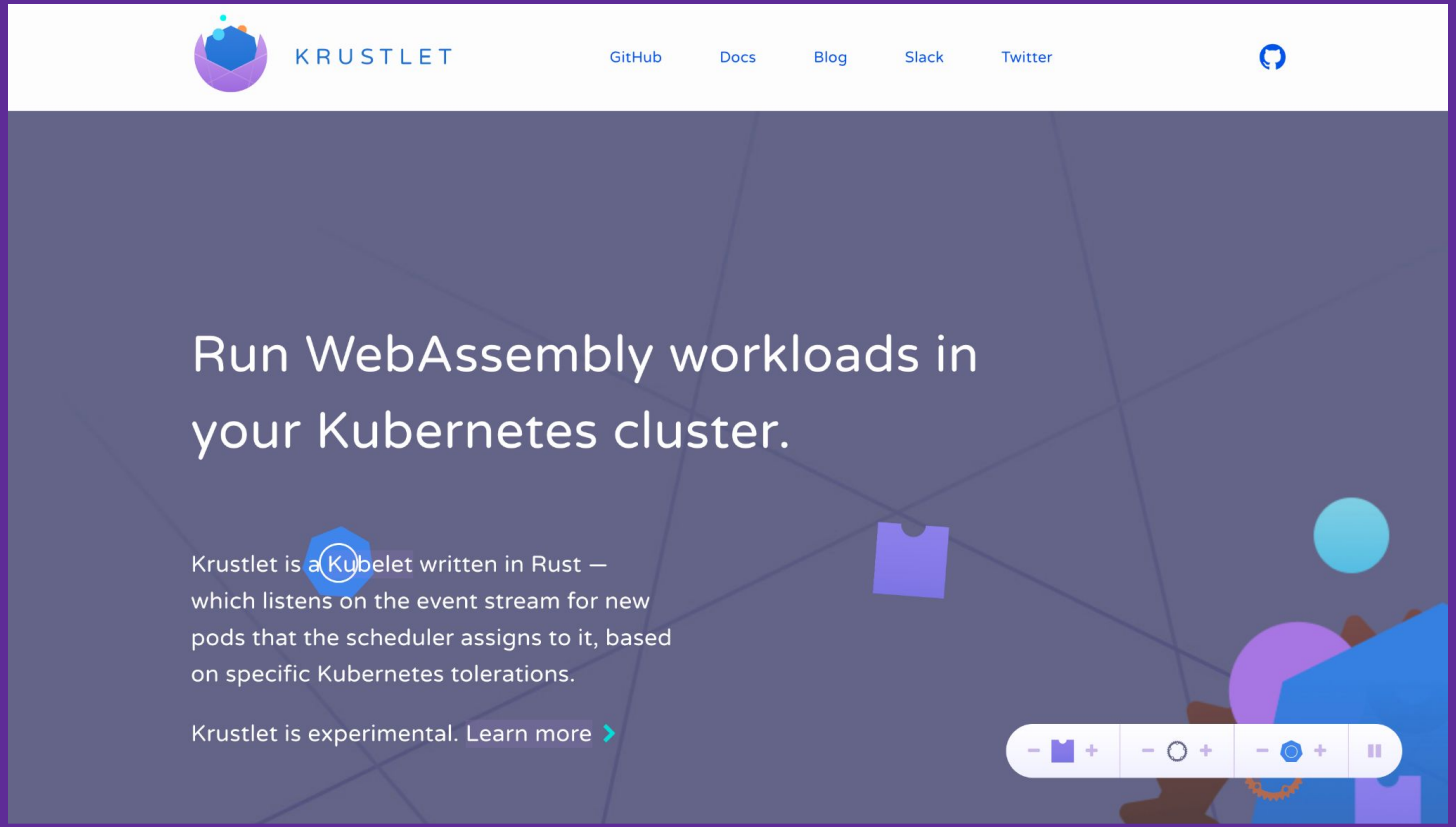
... Reemplazaron los VMs en situaciones no ideales donde se usaban VMs

Wasm no reemplazará los contenedores...

... Reemplazarán los contenedores en situaciones no ideales donde se usan contenedores

¿Cuándo?

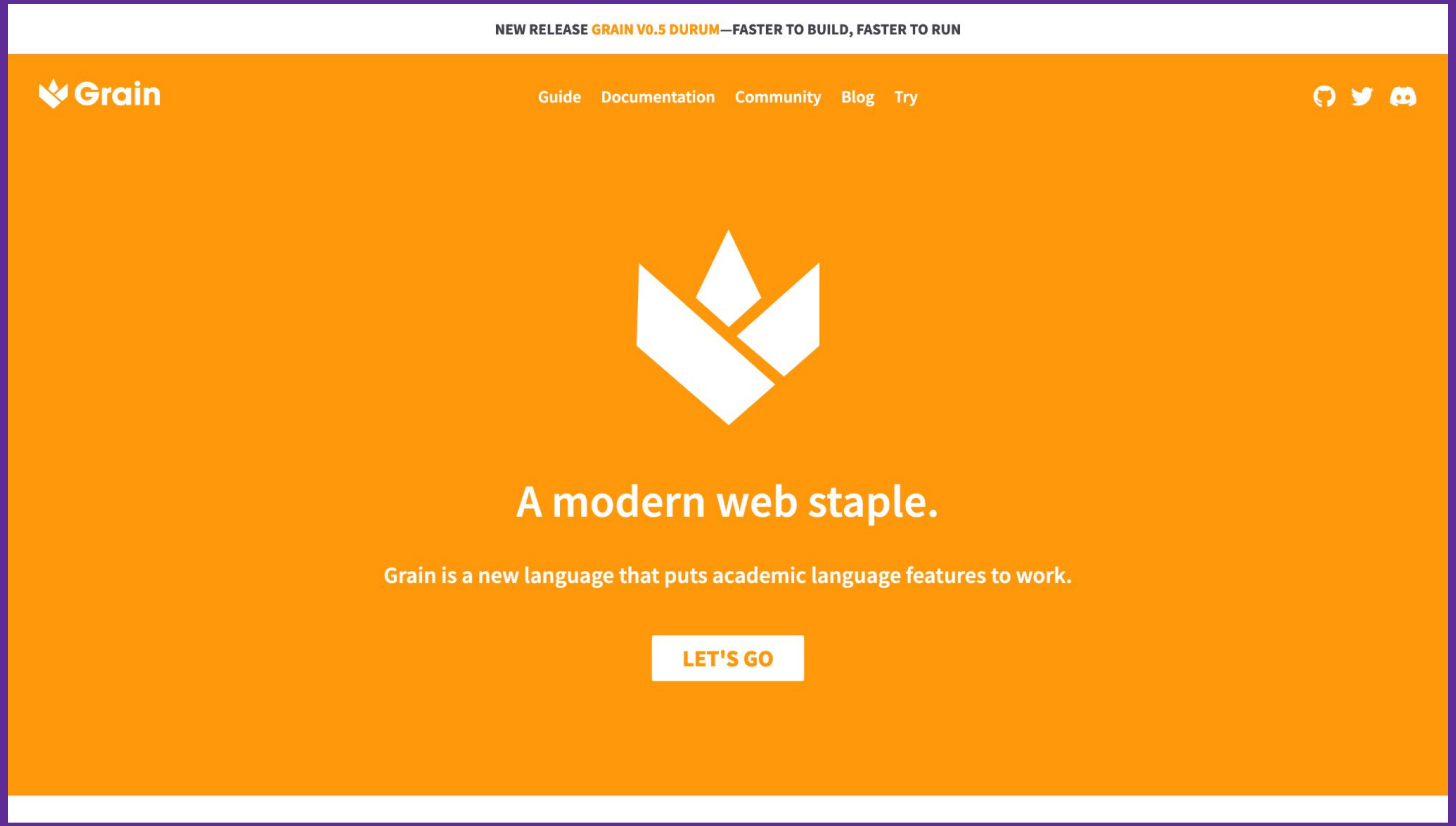
@hola_soy_milk



https://krustlet.dev

¿Cuándo?

@hola_soy_milk



https://grain-lang.org/

Oye y hay más:

- Component Model

Oye y hay más:

- Component Model
- wasi-nn

Oye y hay más:

- Component Model
- wasi-nn
- Garbage Collection

Oye y hay más:

- Component Model
- wasi-nn
- Garbage Collection
- Multihilo

¿Quién quiere Wasm con Docker? 🙋

¿Cuándo?

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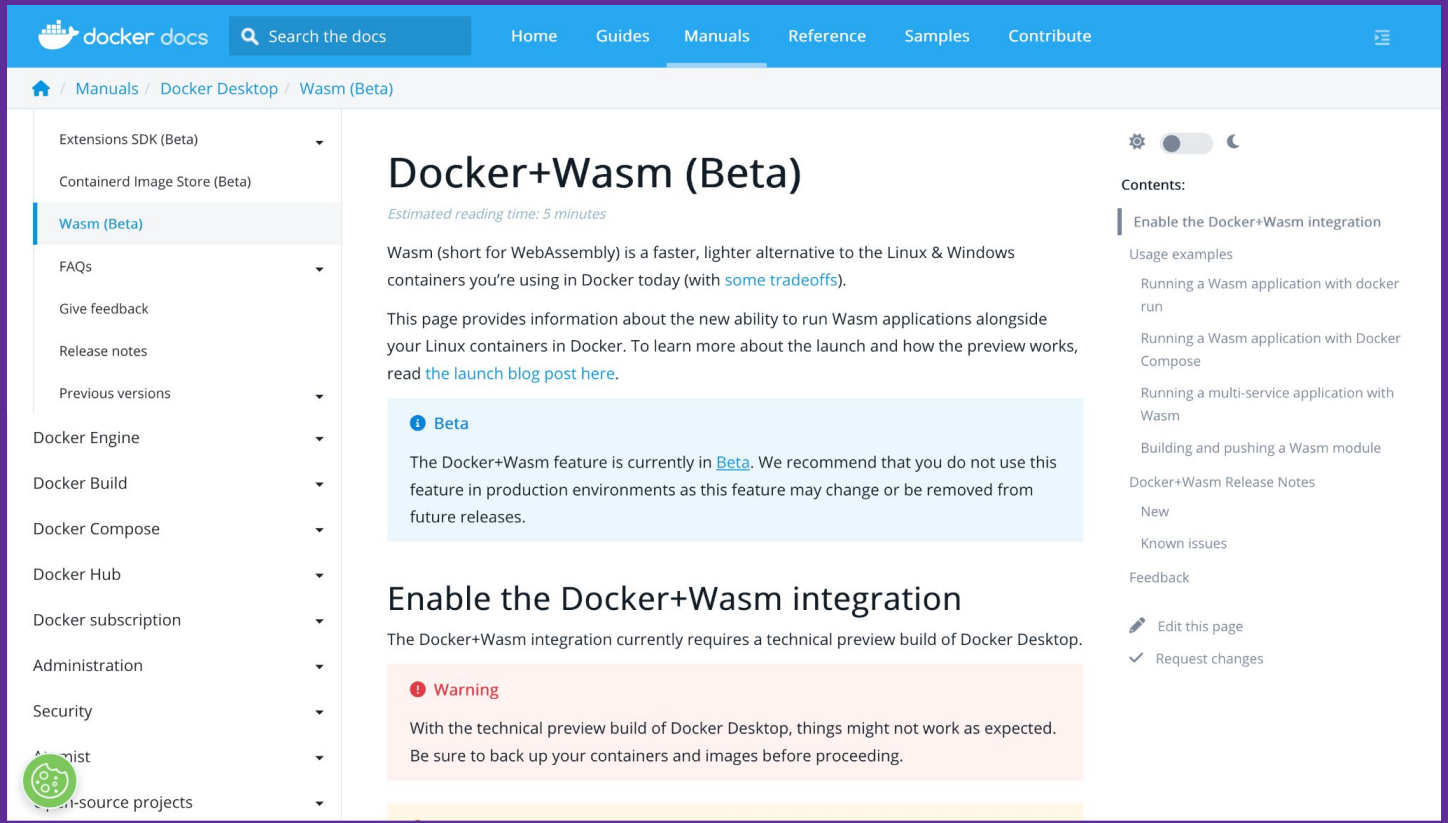
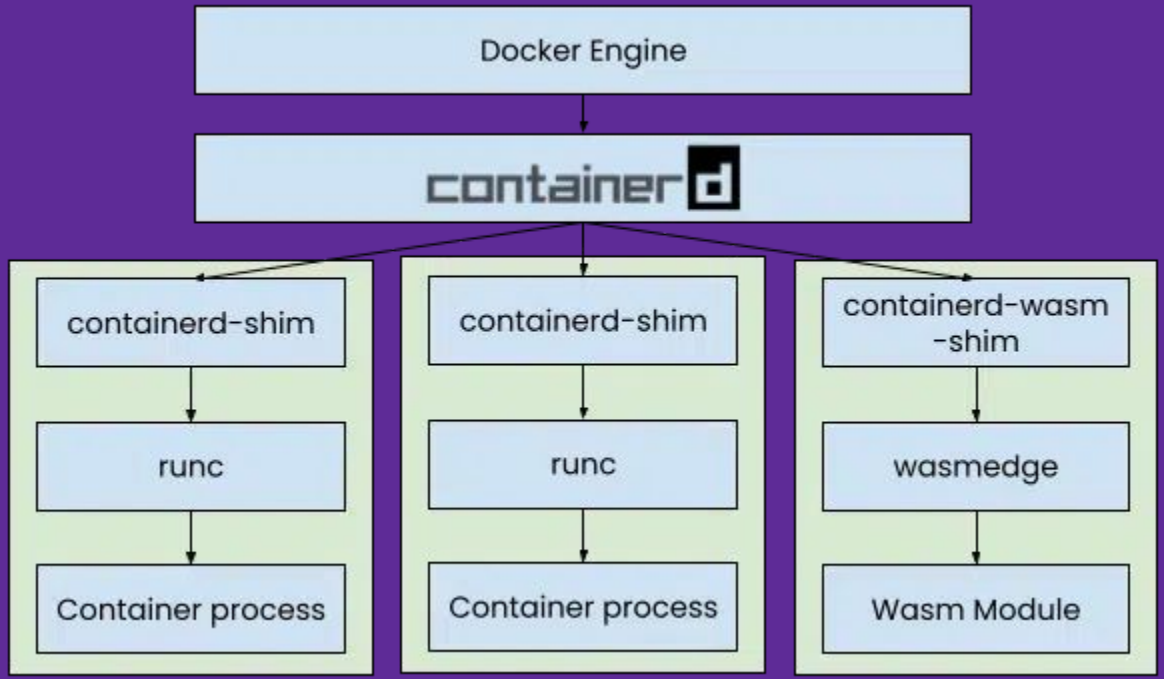


https://docs.docker.com/desktop/wasm/



https://www.docker.com/blog/docker-wasm-technical-preview/

Mucho de lo que les estoy mostrando es nuevo y WIP...

¡El futuro se ve brillante!

Lectura adicional (inglés)

- https://www.fermyon.com/blog/webassembly-vs-containers
- https://www.youtube.com/watch?v=phodPLY8zNE

Unas preguntitas...

- ¿Qué es Wasm?
- ¿Por qué ejecutar Wasm?
- ¿Cómo se está usando Wasm?
- ¿Cuándo se viene?
- ¿Dónde?

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¿Dónde encontramos a la gente colaborando en Wasm?

Where?

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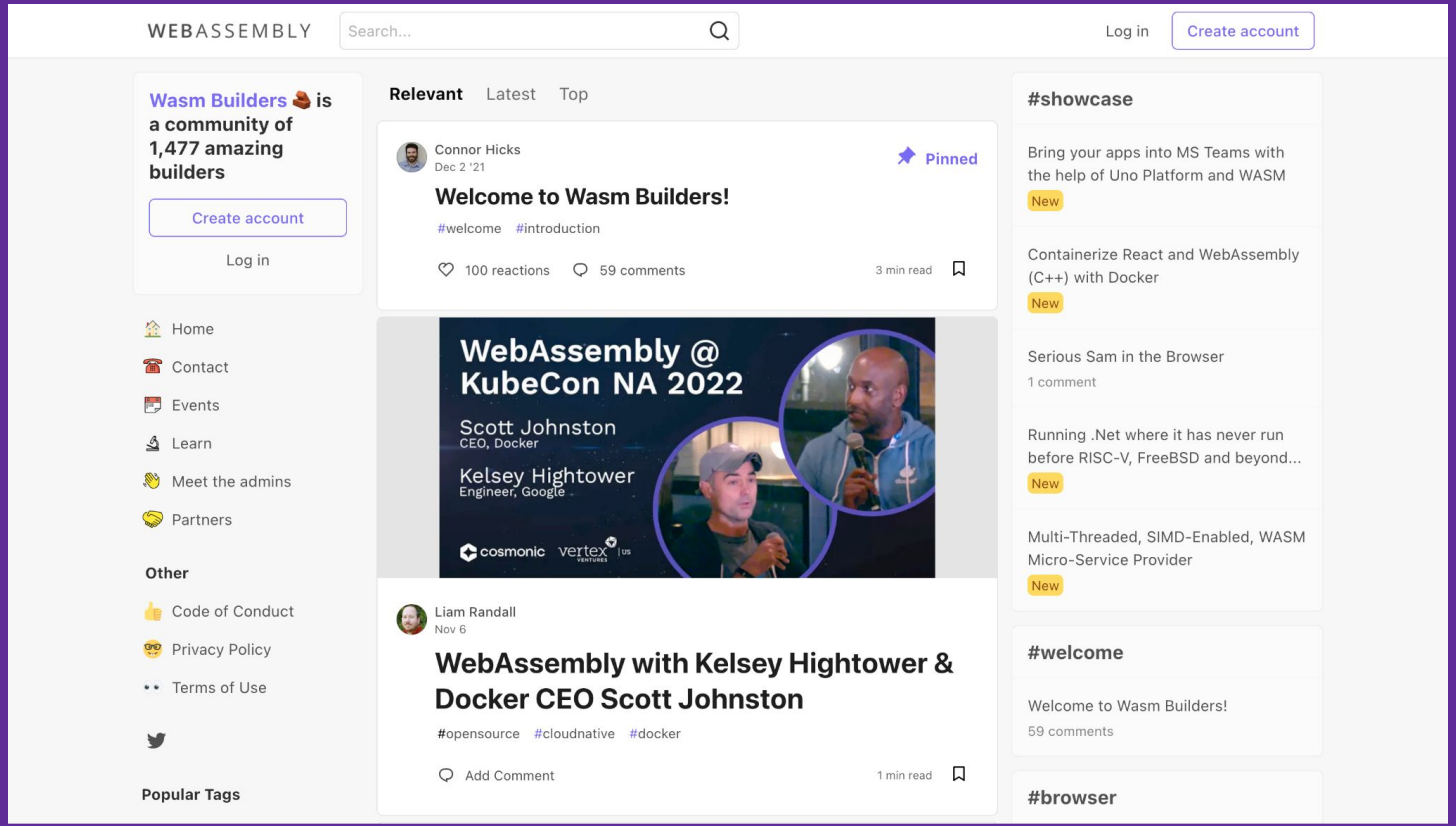


https://www.wasm.builders/

Where?

@hola_soy_milk

https://bytecodealliance.org/

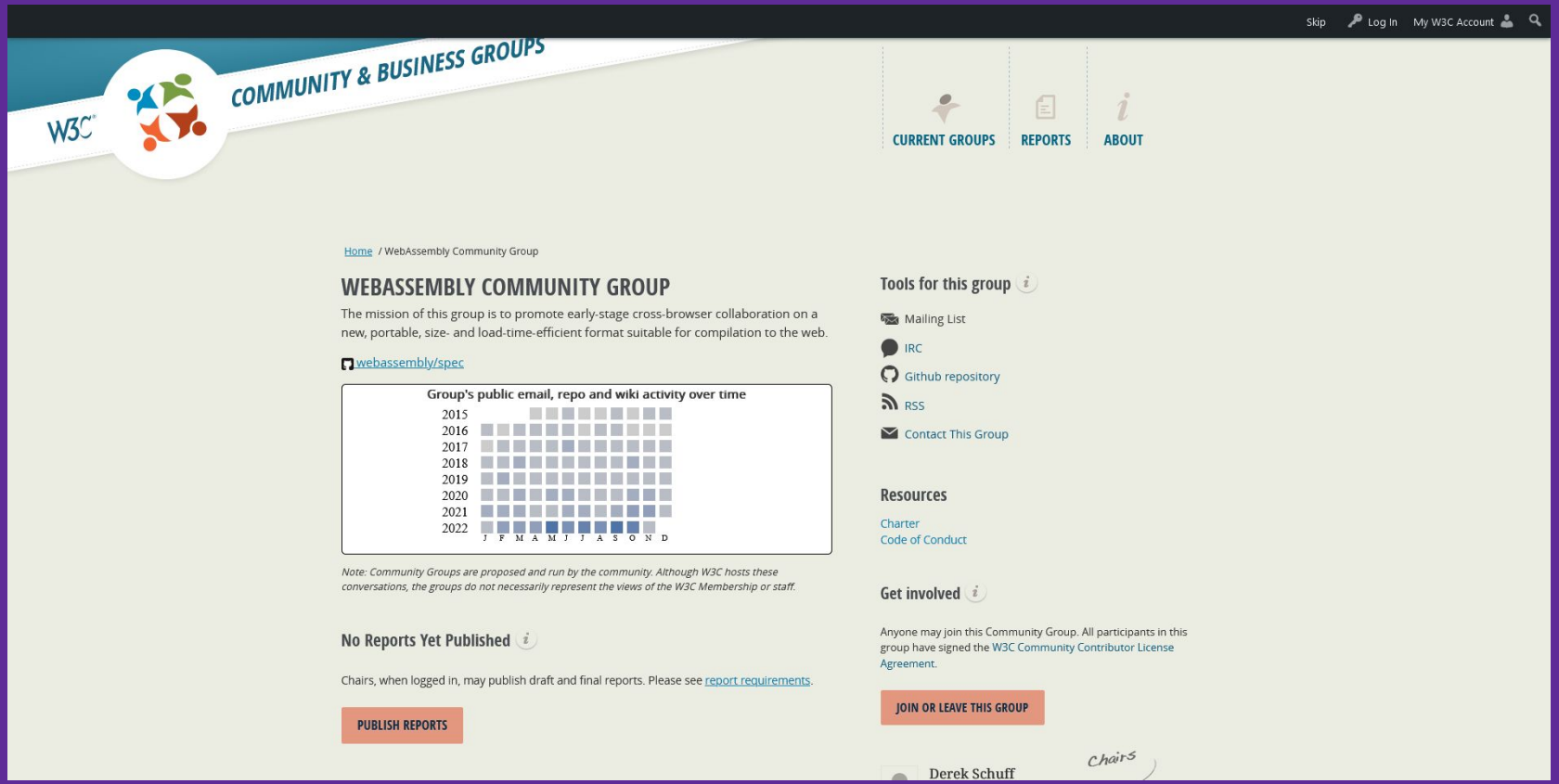
Members

WUOUN 物盾安全
万物互联 安全有盾

https://bytecodealliance.org/

Where?

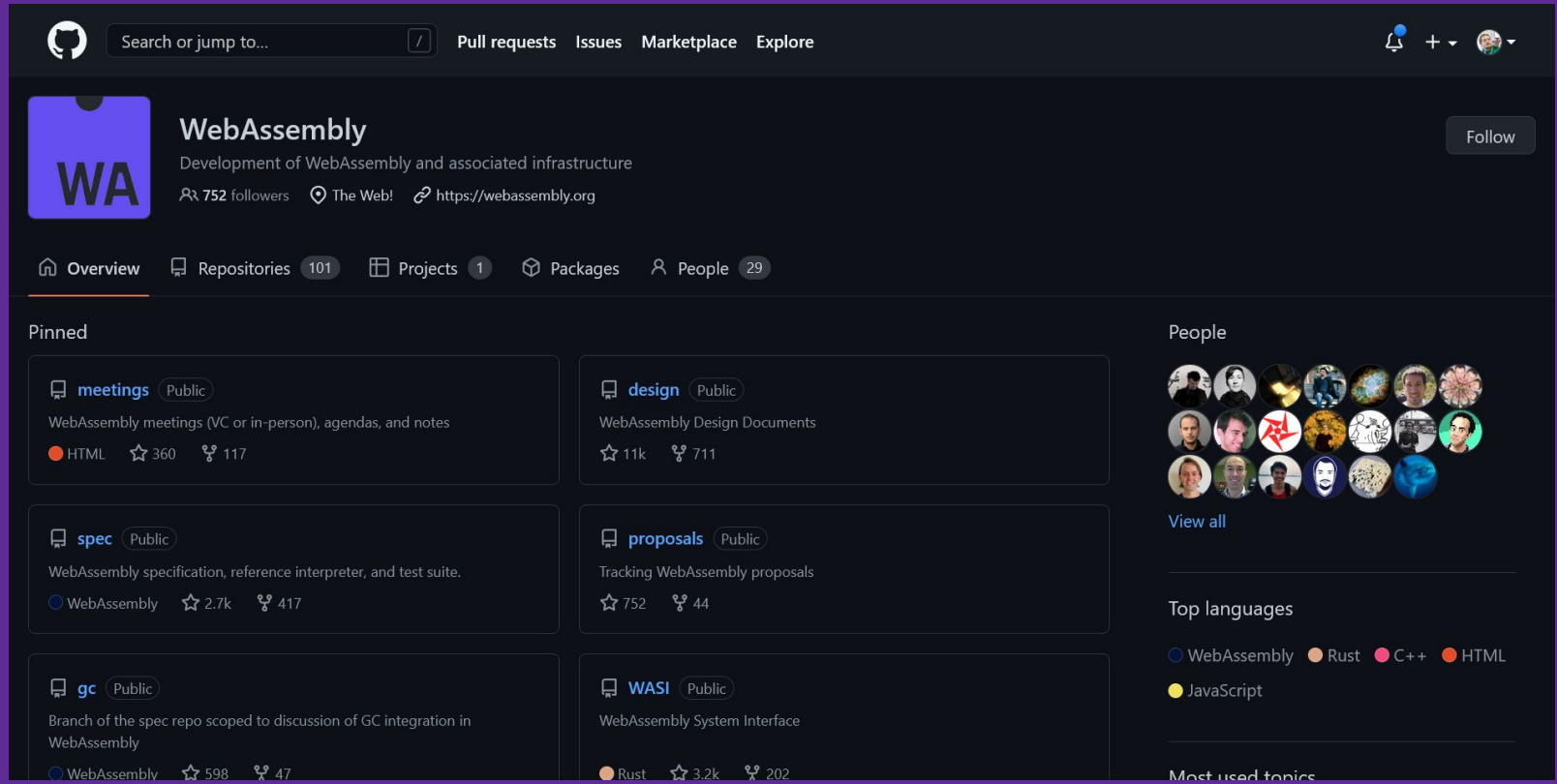
@hola_soy_milk



https://www.w3.org/community/webassembly/

Where?

@hola_soy_milk



https://github.com/WebAssembly

Dale, hemos aprendido...

- Lo que es Wasm
- Por qué usar Wasm
- Cómo se está usando Wasm
- Cuándo se viene
- Dónde se está avanzando

@hola_soy_milk

https://ramonh.dev/wasm-en-el-servidor.pdf

¡Mil Gracias!

¡Tengo stickers!

Ramón Huidobro

@hola_soy_milk