

Rust Without Fear

The Microsoft Journey

Rust Moravia Meetup

October 2025

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Victor Ciura
~~Principal Engineer~~
Rambling Idiot
Rust Tooling @ Microsoft

About me



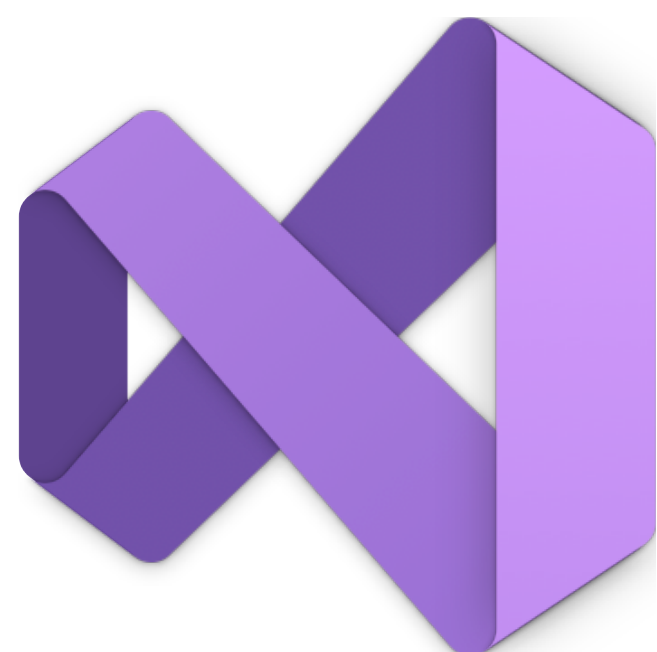
Advanced Installer



Clang Power Tools



Oxidizer SDK



Visual C++



Rust Tooling
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Disclaimer

I'm just an engineer, with some opinions on stuff...



Touch Points

- How it started - original incubations
- How it's going - current projects
- Developer sentiment 🌟 😊 😞 😞 🤕
- Current challenges
- Areas of investment
- Future challenges

How it started...

OSS hidden crabs



COG saving experiments

Under the radar projects

Utilities/CLI



Hackathon projects

But Why Rust?



How it's going

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My team's mission (in [DevDiv](#)) is to pave the path for Rust @ Microsoft
and make our [tooling](#) the gold standard for Rust devs
-- just like we did with C++, C#, TypeScript

C#  **Rust**  **C++**

They need to play nice together... for a looong time!

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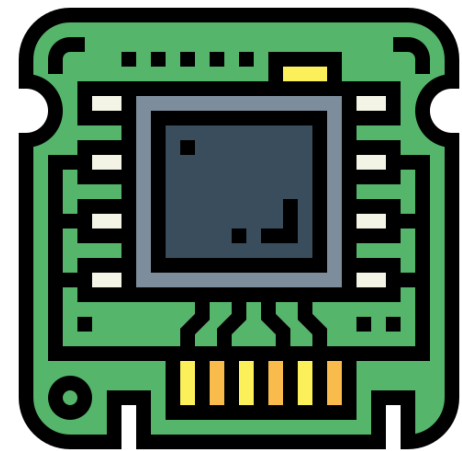
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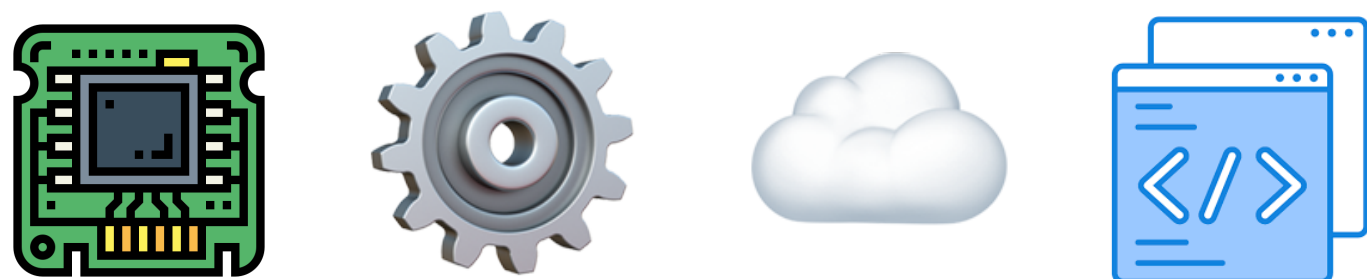
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- Standardizing on **Rust** and other **memory safe languages**
- Contribute 💰 to support the work of the **Rust Foundation** & core **OSS** projects
- Assist developers making the *transition* from C, C++, C# to Rust
 - Investing in Rust **developer tooling**
 - Streamlining **interop** for **hybrid** projects

Extreme **range** of operation




Rust @Microsoft

- Project Mu
- Pluton security processor
- SymCrypt (C++ ➡ Rust) + [rustls](#)
- Azure Integrated HSM
- Azure Boost Agents
- Open VMM / Open HCL
- Hyper-V
- [Azure SDK for Rust](#)
- Azure Data Explorer
- Drasi
- MIMIR
- Caliptra - Hardware Root of Trust
- Hyperlight / WASM
- ... 🤔



TBD:

-  [Windows](#) core components
-  [Microservices](#)

Rusty Windows

Rust already in the **Windows** kernel (since 2023)

```
C:\Windows\System32>dir win32k*
Volume in drive C has no label.
Volume Serial Number is E60B-9A9E

Directory of C:\Windows\System32

04/15/2023  09:50 PM                708,608 win32k.sys
04/15/2023  09:49 PM            3,424,256 win32kbase.sys
04/15/2023  09:49 PM            110,592 win32kbase_rs.sys
04/15/2023  09:50 PM            4,194,304 win32kfull.sys
04/15/2023  09:49 PM             40,960 win32kfull_rs.sys
04/15/2023  09:49 PM             69,632 win32kns.sys
04/15/2023  09:49 PM             98,304 win32ksgd.sys
               7 File(s)            8,646,656 bytes
               0 Dir(s)  116,366,049,280 bytes free
```

_rs = Rust!

Rusty Windows

Ported **Windows 11** core components from C++ to **Rust**

- DirectWrite
- GDI
- ... 🤔

Win32k GDI REGION

Prepare for Windows 11

Windows 11 enterprise feature control

What's new in Windows 11, version 24H2

What's new in Windows 11, version 23H2

Rust in the Windows kernel

There's a new implementation of [GDI region](#) in `win32kbase_rs.sys`. Since Rust offers advantages in reliability and security over traditional programs written in C/C++, you'll continue to see more use of it in the kernel.

2 primary developer

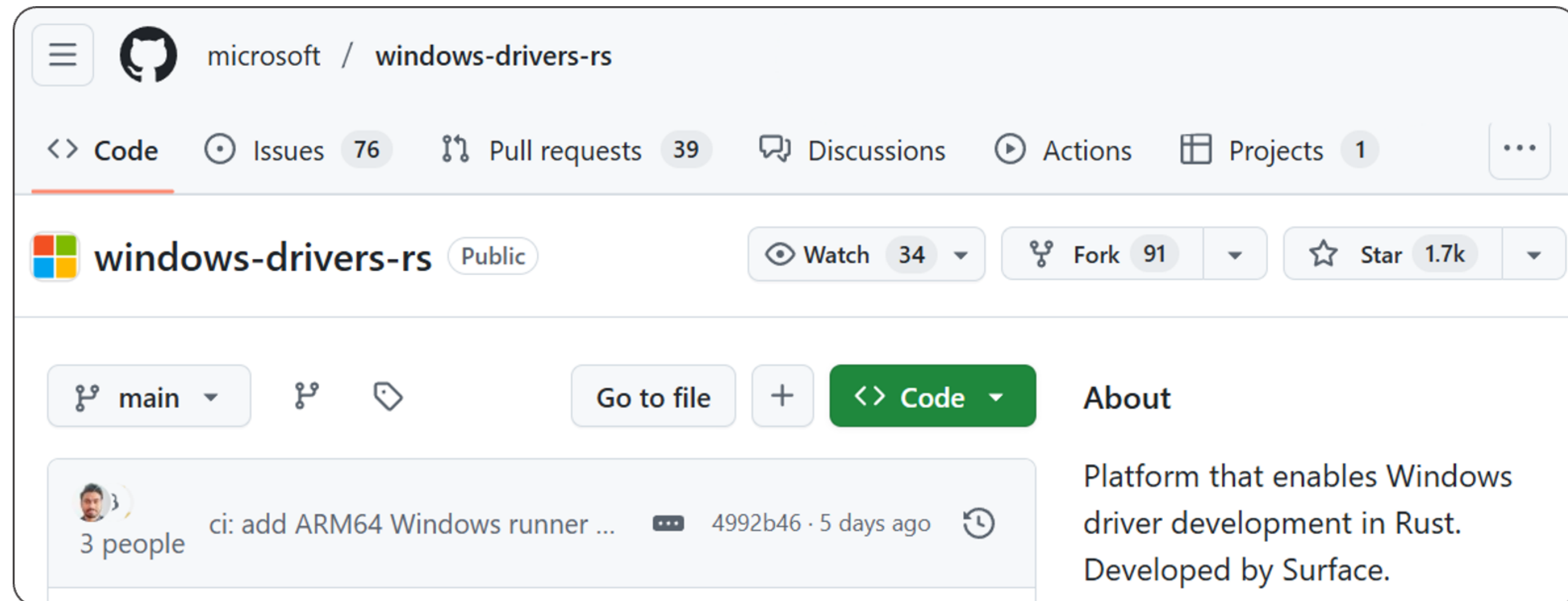
3 months

6 KLOC not including test

Driver SDK for Rust

Enable Windows **driver development** in Rust

 **Surface** Hid Mini Driver is now written in Rust - based on this framework



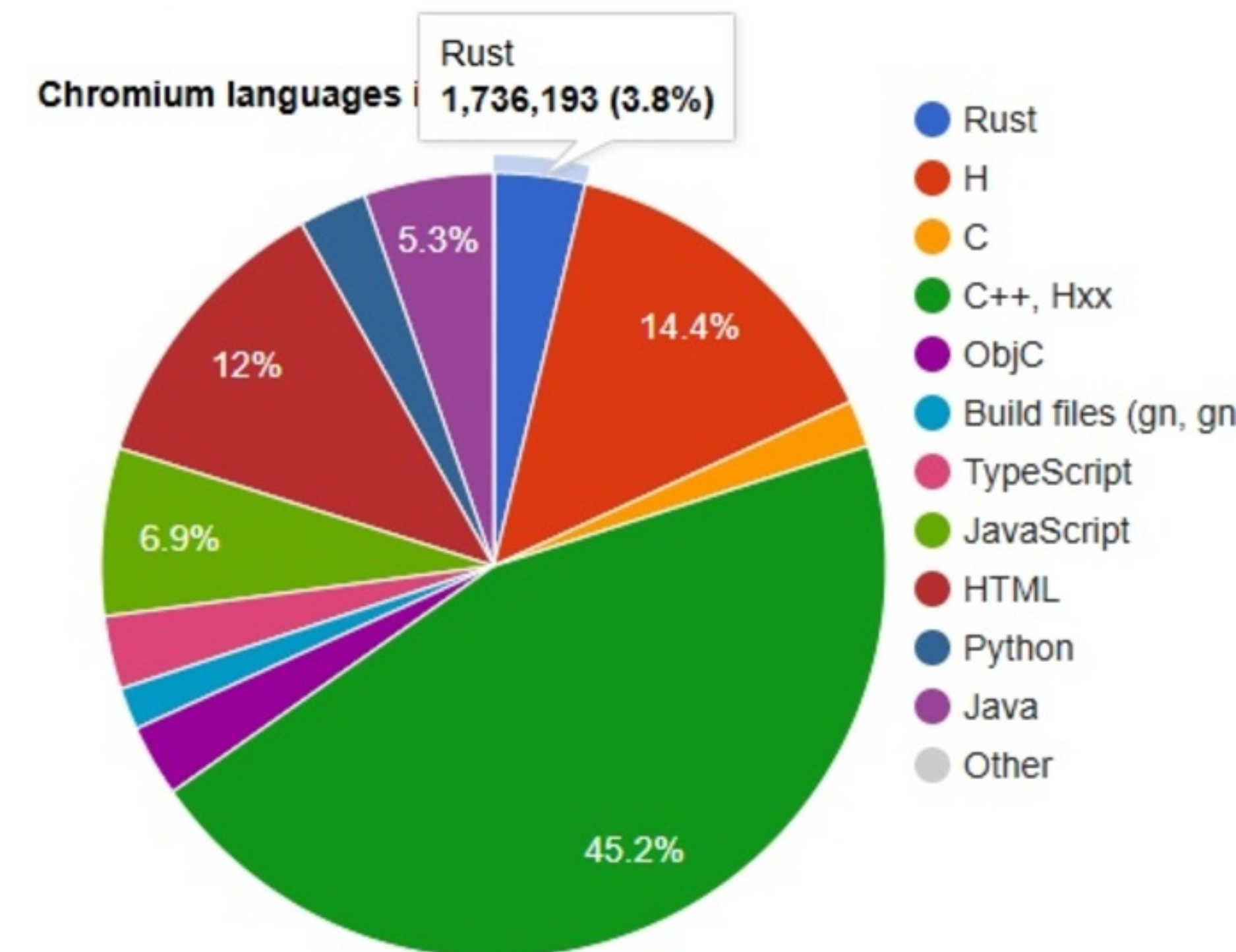
Rust @ Edge

- Many new components
- Security tokens
- Password strength manager
- New Check&Sum hash algorithm
- ...



Languages distribution in Chromium

chromium/chromium repository statistics on Sep 2025



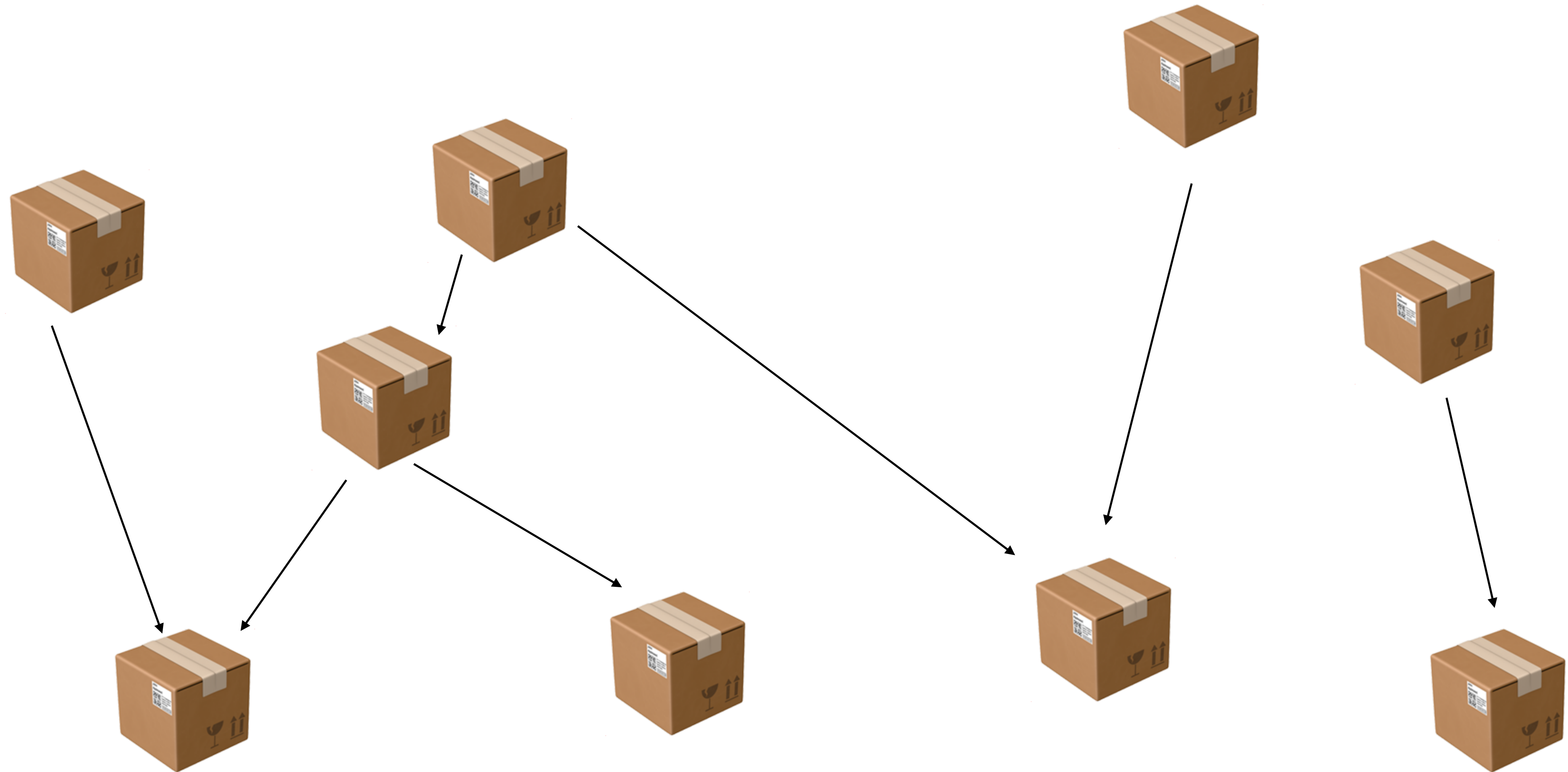
More oxidation  efforts in progress...

TBD 

Ecosystem

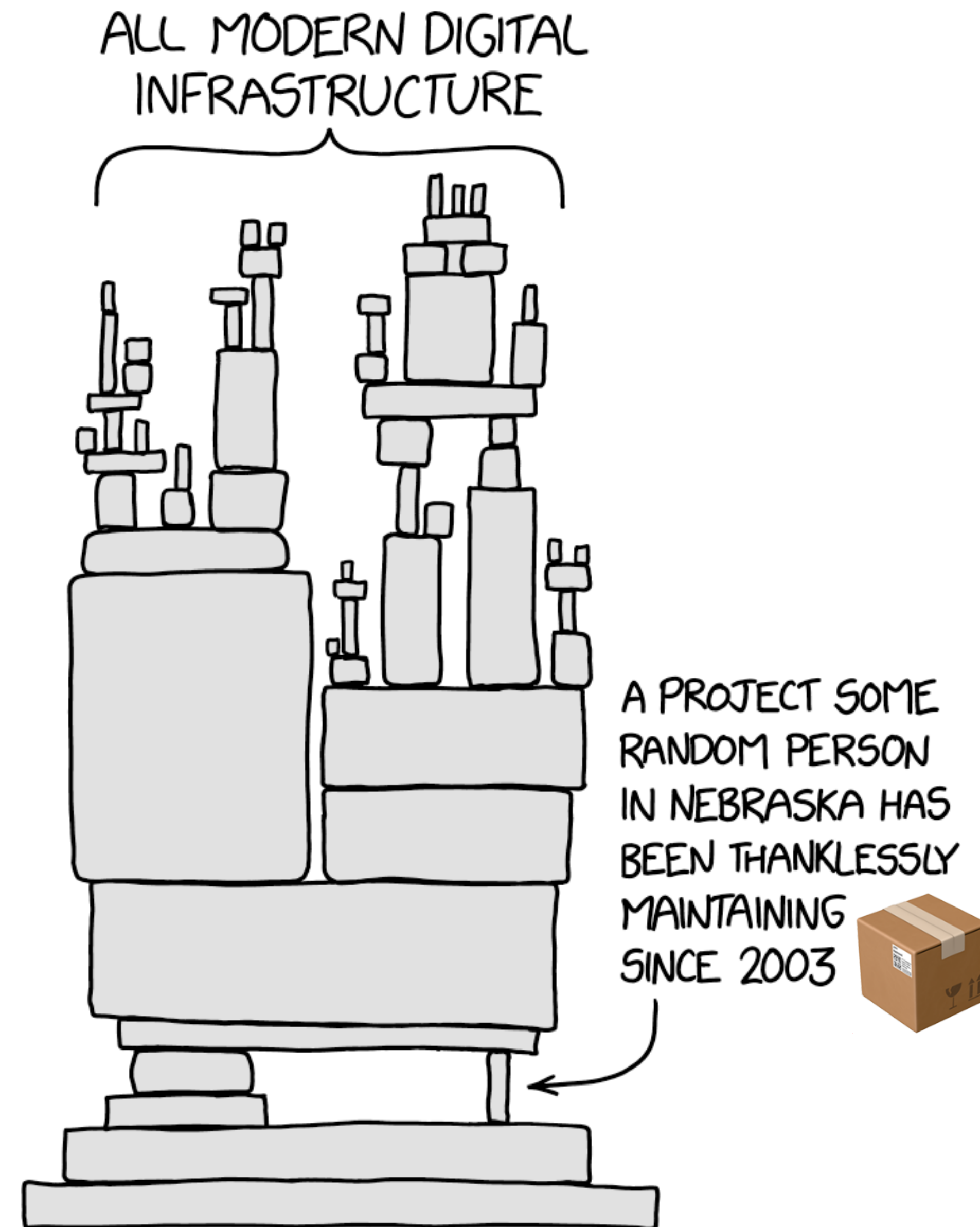
Enterprise-grade tooling

Crate Registry

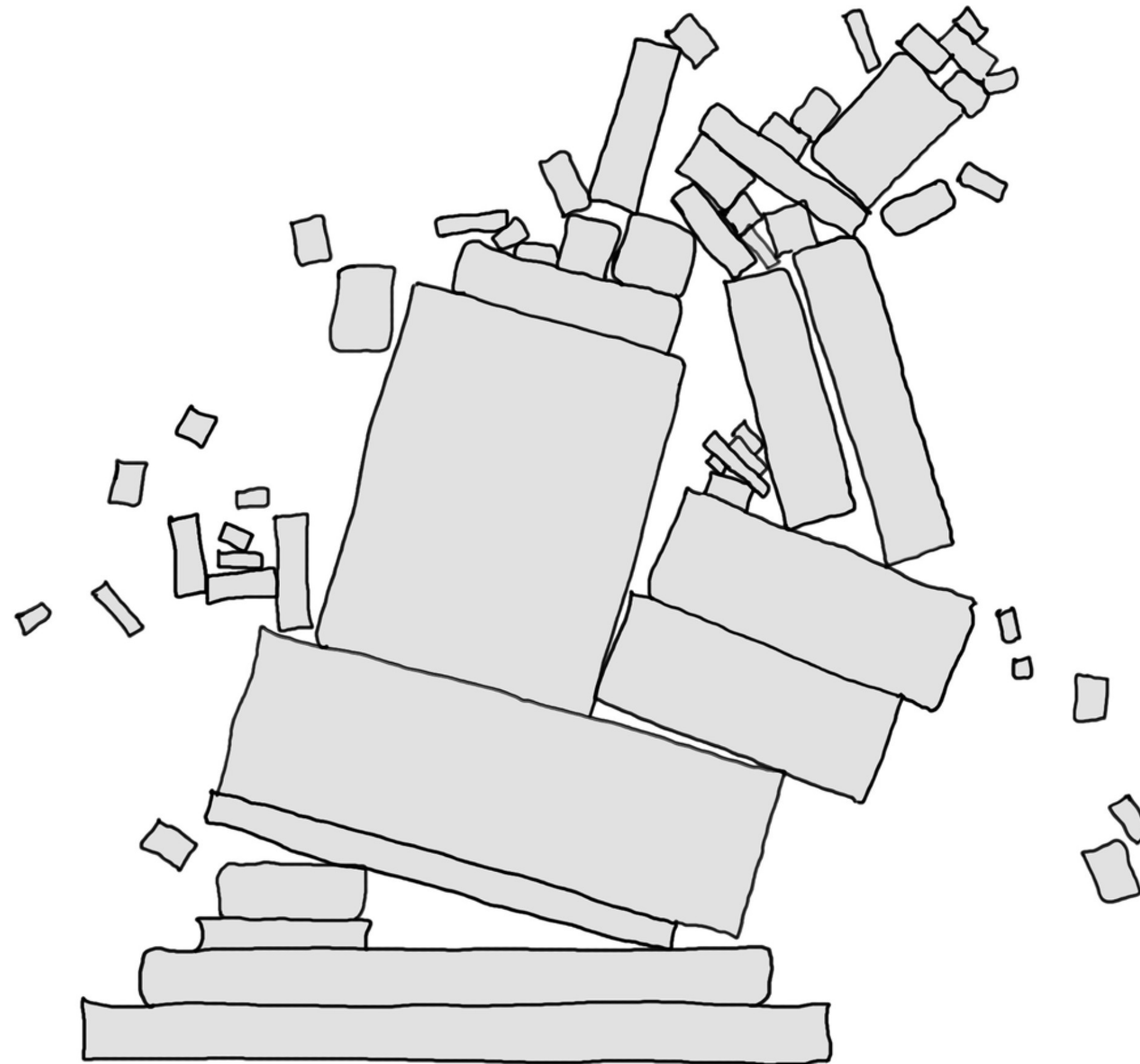


Amazing & thriving ecosystem!

Crate Registry



Crate Registry



Rust Crate Review System

A system that records **guidance** from enterprise developers on using Rust crates, both **public** and **internal** ones

- What crates should my project use, or not use?
- How should I **evaluate** public crates? (and record the evaluation)
- What are the **preferred crates** for particular purposes?
- How to keep a rigorous **SBOM** posture for the project?

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- A **unified**, **unbiased**, highly **automatable** crate **scoring system** used throughout all teams/projects in the company



Crate security in 2025 - Adam Harvey

youtube.com/watch?v=GXkvX9A9xME

Private Crate Publishing

- Publishing to internal ADO feeds
- Discoverability
- Central documentation ("docs.rs")
- Consuming 1P crates
- Challenges of org silos and micro-repositories
- Crossing permission boundaries



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Learn by doing: **Exploration** → **Flighting** → **Production**

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- Performance targets, POGO, etc.
- Costs of maintaining a hybrid C++/Rust codebase?



Ergonomic & efficient
interop ... at scale

Rust / C++ interoperability

 Choose... ~~none~~ some?

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- Easily **automated**
- Hybrid **build systems** (cargo  MSBuild, CMake, bazel, buck2...)



Duck-Tape Chronicles

Rust/C++ Interop



Rust/C++ Interop:

Carcinization or Intelligent Design?

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- FFI is tough to do safely even in Rust
- Some features we rely on not being stabilized

ONE DOES NOT SIMPLY

REWRITE IN RUST

makeameme.org

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But we still do it!

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Rust Without Fear

The Microsoft Journey

Rust Moravia Meetup

October 2025

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