Enarx Annual Review 2024

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Annual Review

- Basic Information
  - Stage: development
  - Maintainer: Richard Zak
- Goals
- Progress
- Events
- Budget
- OpenSSF Best Practices
- Next Steps
- Conclusion

Goals

- Easy deployment of WebAssembly workloads on AMD SEV or Intel SGX
- Application privacy via WebAssembly when workloads are deployed via Drawbridge
- Modular design for future support for ARM CCA, others.

Progress

Enarx has been gradually getting back on the right track post Profian:

Done:

- CI servers received from Redhat, up and running at my house (Richard)
- Steward & Drawbridge moved to Enarx org, donated to LF (relicensed as Apache 2.0)
- Future actions plan drawn up for Enarx
- AMD SNP v10 patches merged in PR#2552
- Updated some dependencies for Enarx, Steward, Drawbridge, Ciborium, Flagset, Sgx, other Enarx-owned crates.
- Removed some abandoned crates and CI actions
- Community: worked with a student (Jacopo from Politecnico di Torino), provided him with advice and hardware access for working with Enarx & Steward

In progress:

- Further dependency updates, including Drawbridge

Events

- RustLab 2023 (presentation by Nick): conference with leading Rust developers in Europe.
- EuroProofNet 2024 (presentation by Richard): conference on formal methods for security. Slides.
- WasmCon 2024 (Richard likely to be part of PC): Linux Foundation conference about Wasm.

Budget

- Operating budget: $0
- CCC funds: Some money will be spent for my trip to Dresden, Germany for the EuroProofNet conference on formal methods for computer security.

OpenSSF Best Practices

- This will begin soon.
- Removed abandoned crates and CI actions from Enarx, Steward, Drawbridge and Enarx-owned crates.

Next steps

1. Relicense Steward, Drawbridge, and Benefice; move to Enarx organization. ✔
2. Bring back Enarx infrastructure (CI: ✔)
3. Maintain a public Steward
4. Maintain a public Drawbridge
5. Maintain Try Enarx
6. Keep interest from the community ✔
7. Keep interest from potential custodian(s)
8. Keep Enarx up-to-date
9. Wait for Wasm to mature (WASI 0.2 released Feb 2024)
10. Wait for market demand for Confidential Computing

Relicense Steward, Drawbridge, and Benefice

- **Steward**: attestation aware Certification Authority.
- **Drawbridge**: repository service for WebAssembly workloads and Enarx.
- **Benefice**: Try Enarx codename

Relicensed from AGPL 3.0 to Apache 2.0

Donated to the Linux Foundation

Bring back Enarx infrastructure

We have 2 Enarx machines being hosted by our leading developer (Richard Zak) for Github Actions:

- Intel SGX2
- AMD SEV-SNP

Substeps:

- Maintain a public Steward instance
- Maintain a public Drawbridge instance
- Maintain “Try Enarx”
- Re-engage with Equinix for public-facing services.

Maintain a public Steward

Steward: attestation aware Certification Authority.

- Create a public Steward at ca.enarx.dev
- Get HSM for use with public Steward
- Figure out how to bootstrap a public Steward from the HSM.
- Doesn't have to have 100% uptime or High Availability, just enough for testing at this point (to be considered "beta", do more if it gains traction).

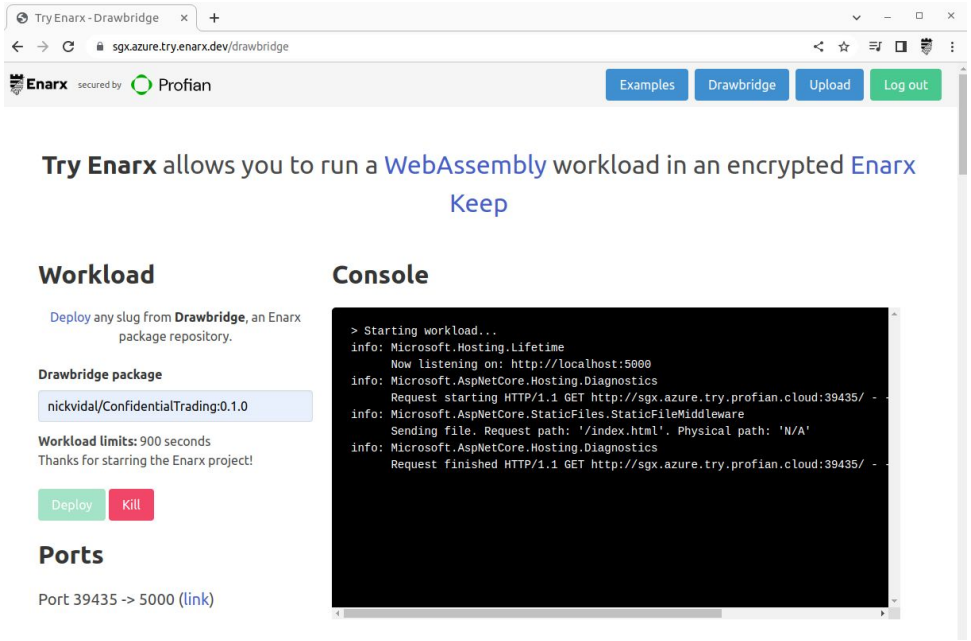
Maintain a public Drawbridge

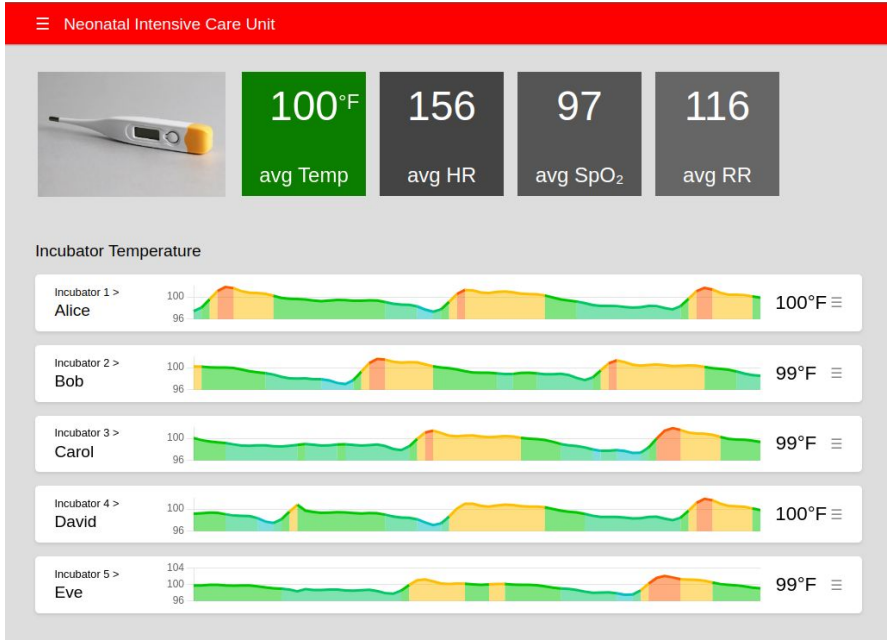
Drawbridge: repository service for WebAssembly workloads and Enarx.

Various code examples in 15 different languages are available here:

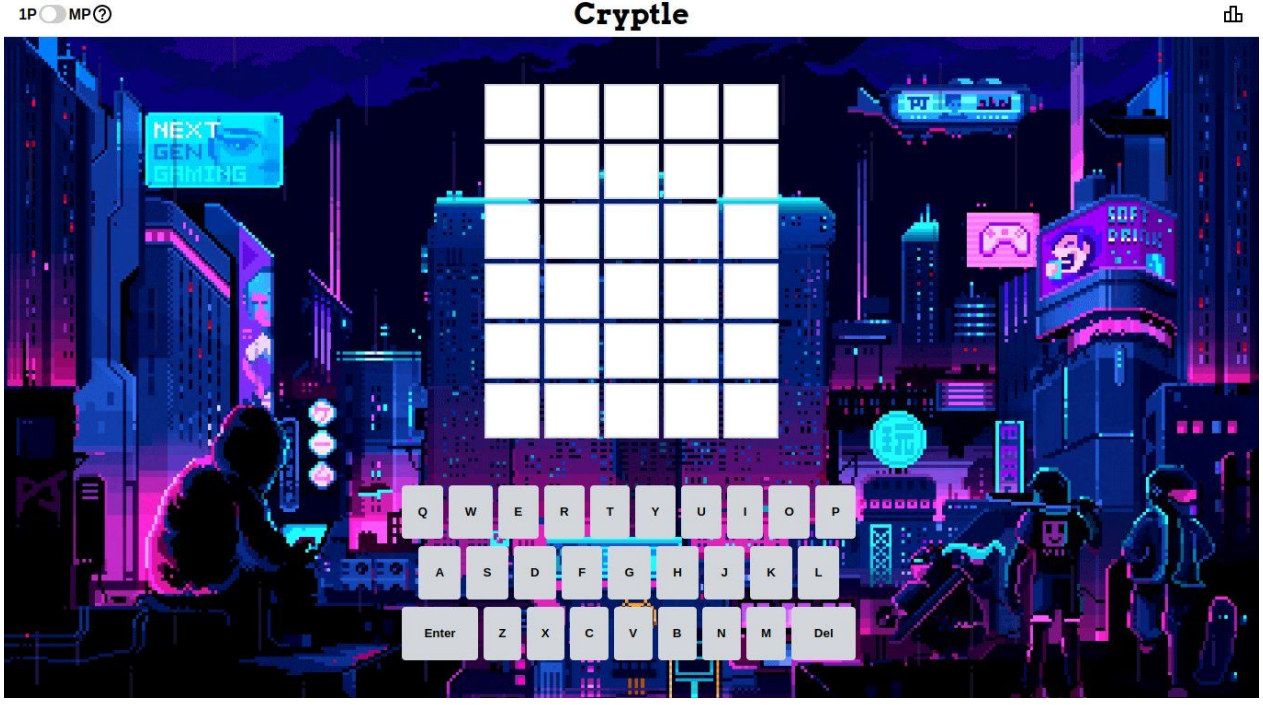
- **Codex**: https://github.com/enarx/codex
- **Cryptle**: https://github.com/enarx/cryptle
- **Chat**: Server / Client
- **Confidential Trading**: https://github.com/enarx/ConfidentialTrading
- **ICU Monitor**: https://github.com/enarx/ICUMonitor
- **Greenhouse Monitor**: https://github.com/enarx/GreenhouseMonitor

Maintain Try Enarx





Maintain Try Enarx



Keep interest from the community

Target audience:

- Rust, Wasm, and CC developers
- Hackers
- Security professionals

Conferences:

- Rust: RustConf, RustLab
- Wasm: WasmCon, Kubecon Wasm Day
- CC: CC Summit

Keep interest from potential custodian(s)

Potential Custodian(s):

- Booz Allen (CC)
- ARM (CC)
- Fermyon (Wasm)
- Cosmonic (Wasm)

Keep Enarx up-to-date

- We need to keep Enarx up-to-date until technologies (Wasm) and market (CC) matures
- Automated updates from crates.io when possible, exceptions:
  - Update code when dependencies have breaking changes
  - Replace dependencies if they become unmaintained
- Collaboration with other groups (Attested TLS)

Wait for Wasm to mature

Standards being led by the Bytecode Alliance:

- Component Model
- WASI 0.2 released Feb 2024

Market adoption driven by:

- VMWare
- Docker
- Fastly
- Fermyon
- Cosmonic

Wait for market demand for Confidential Computing

Standards being led by the Confidential Computing Consortium

Market adoption driven by:

- Hardware: Intel, ARM, AMD, NVIDIA, RISC-V, IBM
- Cloud: Google, Microsoft, Alibaba, IBM Cloud
- Services: Fortanix, Edgeless Systems, Opaque, Anjuna

Conclusion

- Enarx is still very much relevant
- We need to keep the project up-to-date and alive
- We need to maintain Try Enarx, with Steward and Drawbridge as public services
- We need to keep interest from the community
- We need to keep interest from potential custodian(s)
- We need to wait until technologies and market matures
- We might see a tipping point within 1 or 2 years