RUST-VMM

Status Report – 2020

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What is rust-vmm?

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- Virtualization components
- Written in Rust
  - Components = package (Rust Crates)
- Open Source
- [https://github.com/rust-vmm](https://github.com/rust-vmm)
Rust-vmm in Production

- Firecracker
- Cloud Hypervisor
- Alibaba Cloud Sandbox
- Enarx
Rust-vmm in Production

- Firecracker
- Cloud Hypervisor
- Alibaba Cloud Sandbox
- Enarx
- libkrun
- Nydus: Dragonfly Container Image Service
- ...

...
From idea to published crate

Idea → GitHub Issue

Design Discussions

github/rust-vmm/community

Design

Pull Requests

Crate in Dev

Continuous Integration

License

Tests

Documentation

Milestone 0

Empty Crate

Milestone 1

Crate in Dev

Milestone 2

Publish crates.io

Crate = Package

crates.io = Rust Crate Registry
Component Status
Status 2019

Milestone 0
Empty Crate

- vhost
- vm-allocator

Milestone 1
Crate in Dev

- vm-device
- vm-virtio
- linux-loader
- vm-memory

Milestone 2
Publish crates.io

- virtio-bindings
- kvm-bindings
- vmm-sys-util
- vfio-bindings
- kvm-ioctls
Status 2020

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vm-allocator
vhost
vm-device
vm-virtio
linux-loader
vm-memory
virtio-bindings
kvm-bindings
vmm-sys-util
vfio-bindings
kvm-ioctls
Status 2020
Status 2020

Milestone 0
Empty Crate

Milestone 1
Crate in Dev

Milestone 2
Publish crates.io
Status 2020 - New Development

- vfio-ioctls
- vhost-user-backend
- vm-allocator

Milestone 0
- Empty Crate

Milestone 1
- Crate in Dev

Milestone 2
- Publish crates.io

- vhost
- vm-device
- vm-virtio

- linux-loader
- virtio-bindings
- kvm-bindings

- vm-memory
- vmm-sys-util
- vfio-bindings
- kvm-ioctls
Status 2020 - New Development

- vfio(ioctls)
- vhost-user-backend
- vm-allocator

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- vhost
- vm-device
- vm-virtio
- vmm-reference

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- linux-loader
- virtio-bindings
- kvm-bindings

- vm-memory
- vmm-sys-util
- vfio-bindings
- kvm(ioctls)

Milestone 0
Empty Crate

Milestone 1
Crate in Dev

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Publish crates.io
Status 2020 - New Development

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vfio-ioctls  vhost-user-backend  vm-allocator

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vhost  vm-device  vm-virtio  vmm-reference

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event-manager  linux-loader  virtio-bindings  kvm-bindings

vm-superio  vm-memory  vmm-sys-util  vfio-bindings  kvm-ioctls

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Milestone 0
Empty Crate

Milestone 1
Crate in Dev

Milestone 2
Publish crates.io
Investment in Security & Testing

- Performance tests
  - Pipeline for running the tests
  - Benchmarks in: event-manager, linux-loader, vm-memory, vm-virtio
  - Next: infrastructure for nightly runs

- Security
  - Code audit
  - Next: threat model
Security Vulnerabilities

- **vm-memory:**
  - Non-atomic reads & writes
  - [https://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2020-13759](https://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2020-13759)

- **vm-superio:**
  - Serial console may allocate an unbounded amount of memory
  - CVE ID allocation in progress
  - [https://github.com/rust-vmm/vm-superio/issues/17](https://github.com/rust-vmm/vm-superio/issues/17)
Community
Code Contributions

- GitHub API
- Only code contributions :(  
- All rust-vmm components
Start Contributing

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- Find issues
  - Label = “good first issue”
  - Label = “help wanted”
  - Issues without owners
- Slack:
  - rust-vmm_channel
- Email:
  - rust-vmm@lists.opendev.org
Future Investments
Community

- Gather feedback on contribution & consumption model
- Reporting security vulnerabilities
Virtualization Components

- vhost-user-backend
- Virtio
  - Block
  - Network
  - Vsock
- Vcpu Abstractions
- PCI
- VFIO
- Fuzzing for emulation code
Thank you!