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Urunc: The New Kid In The Block Of Sandboxed Container Runtimes

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The challenge

urunc: The runc of unikernels & single application kernels

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CNCF Sandbox Project

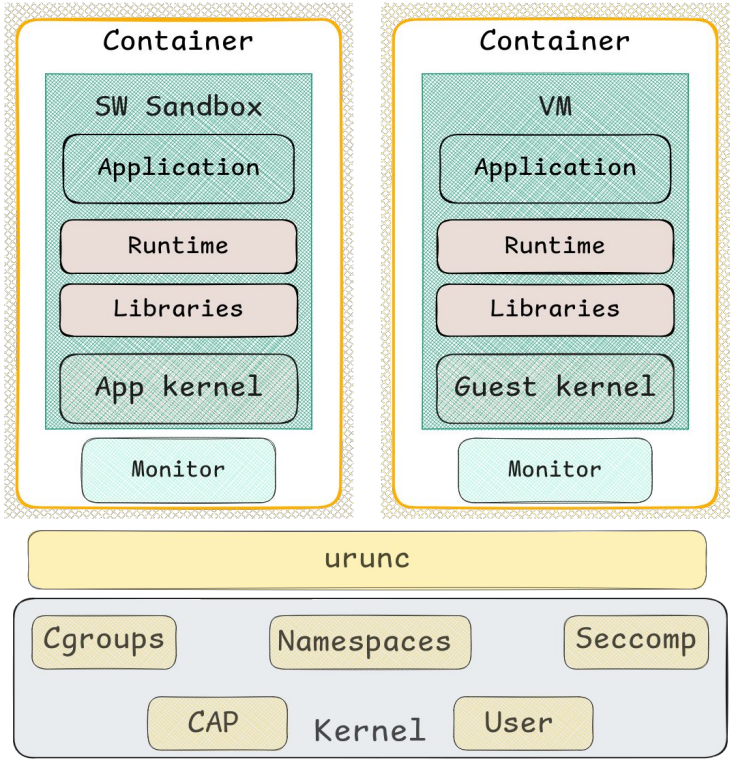
- CRI-compatible runtime written from scratch
- Seamless integration with container ecosystem tools

Unikernels and single app kernels

- One sandbox per container
- Treats monitor as the primary container process

Various Sandboxing technologies

- Supports SW-based & HW-assisted sandboxes
- Extensible and customizable architecture



urunc integration with Kubernetes

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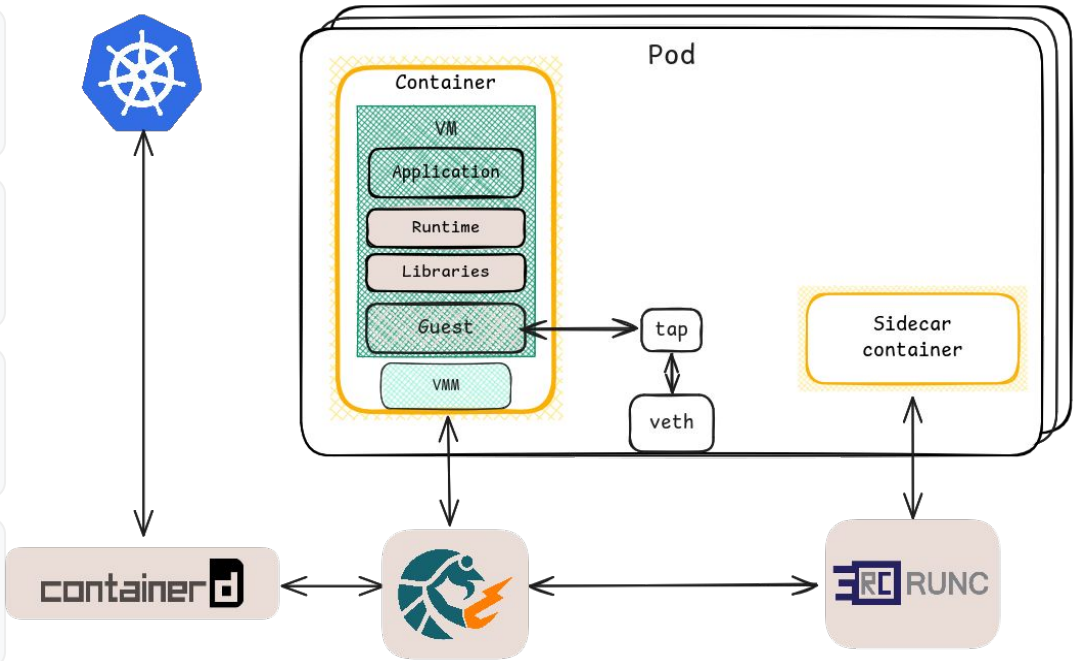
Pod and Sidecar containers
Spawn sidecar containers as normal containers

Untrusted user containers
Intra-pod isolation of sidecar and user containers

Monitor execution environment
Containerize the monitor process and setup network / storage for sandbox

Sandbox Execution
Applications run securely inside isolated sandboxes.



Evaluation

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Cold Boot Overhead (Serverless)

Runc (Baseline)	1.134 Sec
Gvisor	99%
Kata-containers VMM dependent	98 - 102%
urunc Guest/Monitor dependent	16 - 28%

Max Pods (RPi5 8GB)

Runc (Baseline)	467
Gvisor	170
Kata-containers VMM dependent	20 - 32
urunc Guest/Monitor dependent	130 - 430

Use cases

Microservices & Serverless

- Strong isolation, yet lightweight sandboxes
- Safely run untrusted workloads at high scale

Resource Constrained Devices

- Minimal footprint and low overhead
- Isolated deployments on edge devices

AI Agent Sandboxing

- Fine-grained isolation for AI agent tasks
- Low-latency AI agent tasks execution

CI/CD Environments

- Fast ephemeral sandboxes for testing code
- Support for Non-Linux execution environments

Get in touch!

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Where to find us

Visit our kiosk on **Wednesday**

Time: 10:00 - 13:30
Kiosk #: P-24B

Join the Community

Next: **Wednesday 01 April**

Usually the last Wednesday of every month.

Resources

Github Repository:
https://github.com/urunc-dev/urunc

Website & Docs:
https://urunc.io

CNCF Slack:
Join the #urunc channel