Unikernels Are Here

Building, Running and Deploying Unikernels with 1 Command

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Application Workflows

- build
- package
- push
- pull
- unpack
- run
Using VMs & Containers

- run everywhere
- no dependency issues
- isolation
VMs

- overhead
- difficult to create recipes

+ good isolation
+ good resource control
Containers

- isolation issues
- imperfect resource control

+ recipes (Dockerfile)
+ registries (DockerHub)
+ tooling (Docker, Podman)
+ good performance
What We Want

+ good isolation
+ good resource control
+ recipes
+ registries
+ tooling
+ good performance
What We Want
Unikernels / Unikraft: We Are Here

+ good isolation: VMs
+ good resource control: VMs
+ recipes: Dockerfile, Kraftfile
+ registry: Unikraft OCI images
+ tooling: KraftKit
+ good performance: no domain transition, extreme specialization
Before and After

configure kernel

build kernel

run QEMU / Firecracker command line

port application to Unikraft

pull and run prebuilt kernel

single command build

single command run

run native Linux applications (Docker-based)
Before: NGINX on Unikraft

https://asciinema.org/a/635997
After: NGINX on Unikraft (from Registry)

https://asciinema.org/a/635998
After: Python on Unikraft (from Registry)

https://asciinema.org/a/635999
After: Python Example

https://asciinema.org/a/636002
After: Python Flask

https://asciinema.org/a/636003
More

Catalog: https://github.com/unikraft/catalog
Guides: https://unikraft.org/guides
Unikernels Are Here

+ good isolation: VMs
+ good resource control: VMs
+ recipes: Dockerfile, Kraftfile
+ registry: Unikraft OCI images
+ tooling: KraftKit
+ good performance: no domain transition, extreme specialization
Thanks!

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