CRI-Containerd

Kubernetes Containerd Integration

dockercon17 EU

CRI-Containerd
Status Update

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CRI-Containerd
Demo

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Docker: Now Powered by Swarm and Kubernetes

1

The best enterprise container security and management

2

The best container development workflow

3

Native Kubernetes integration provides full ecosystem compatibility

4

Industry-standard container runtime

Agenda

Container Runtime Interface (CRI)

CRI & Containerd

CRI-Containerd

Demo

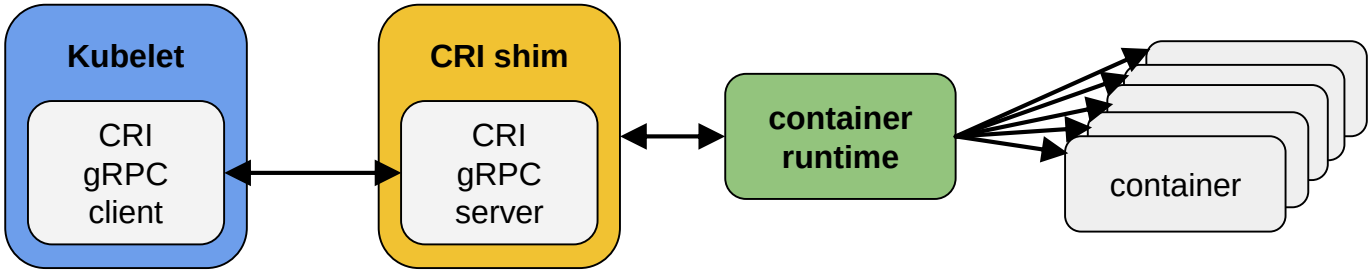
Q & A

Container Runtime Interface (CRI)

Container Runtime Interface

What is Container Runtime Interface - CRI ?

- A gRPC interface and a group of libraries
- Enables Kubernetes to use a wide variety of container runtimes
- Introduced in Kubernetes 1.5



Container Runtime Interface

CRI Runtimes

- cri-containerd: https://github.com/kubernetes-incubator/cri-containerd
- cri-o: https://github.com/kubernetes-incubator/cri-o
- Docker (Upstream): https://github.com/kubernetes/kubernetes/tree/master/pkg/kubelet/dockershim
- frakti: https://github.com/kubernetes/frakti
- rktlet: https://github.com/kubernetes-incubator/rktlet
- virtlet: https://github.com/Mirantis/virtlet

Container Runtime Interface

CRI Tools

- https://github.com/kubernetes-incubator/cri-tools
- critest: CRI Validation Test Suite
- crictl: CRI Command Line Tool

CRI & Containerd

CRI & Containerd

Containerd scope is just right for Kubernetes.

	Containerd Scope (In/Out)	CRI Requirement
Container Lifecycle Management	In	Container Create/Start/Stop/Delete/List/Inspect (✓)
Image Management	In	Pull/List/Inspect (✓)
Networking	Out. Network namespace.	Just enough. (✓)

CRI & Containerd

	Containerd Scope (In/Out)	CRI Requirement
Volumes	Out. Host path mount.	Just enough. (✓)
Persistent Container Logging	Out. STDIO as FIFOs.	Decorate to CRI log format. (✓)
Metrics	In.	Container memory/cpu usage; image filesystem disk/inode usage. (✓)

CRI & Containerd

Other alignments with Kubernetes:

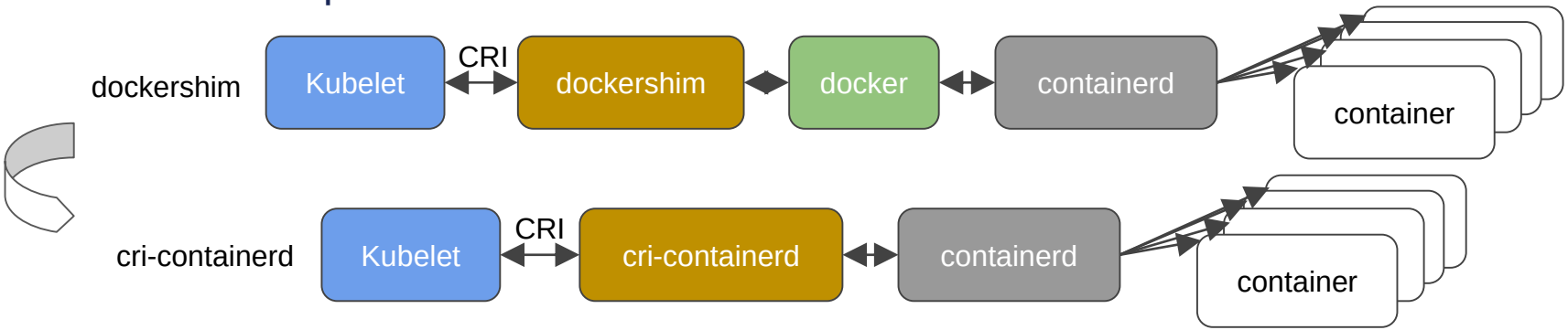
- Decentralized container management - containerd-shim.
  - Live restore.
  - Overhead charge back to pod.
- Decoupled image and container management.
  - Support other image formats (e.g. tarball).
- Support OCI image/runtime spec.
- CNCF project.
- ...

CRI-Containerd

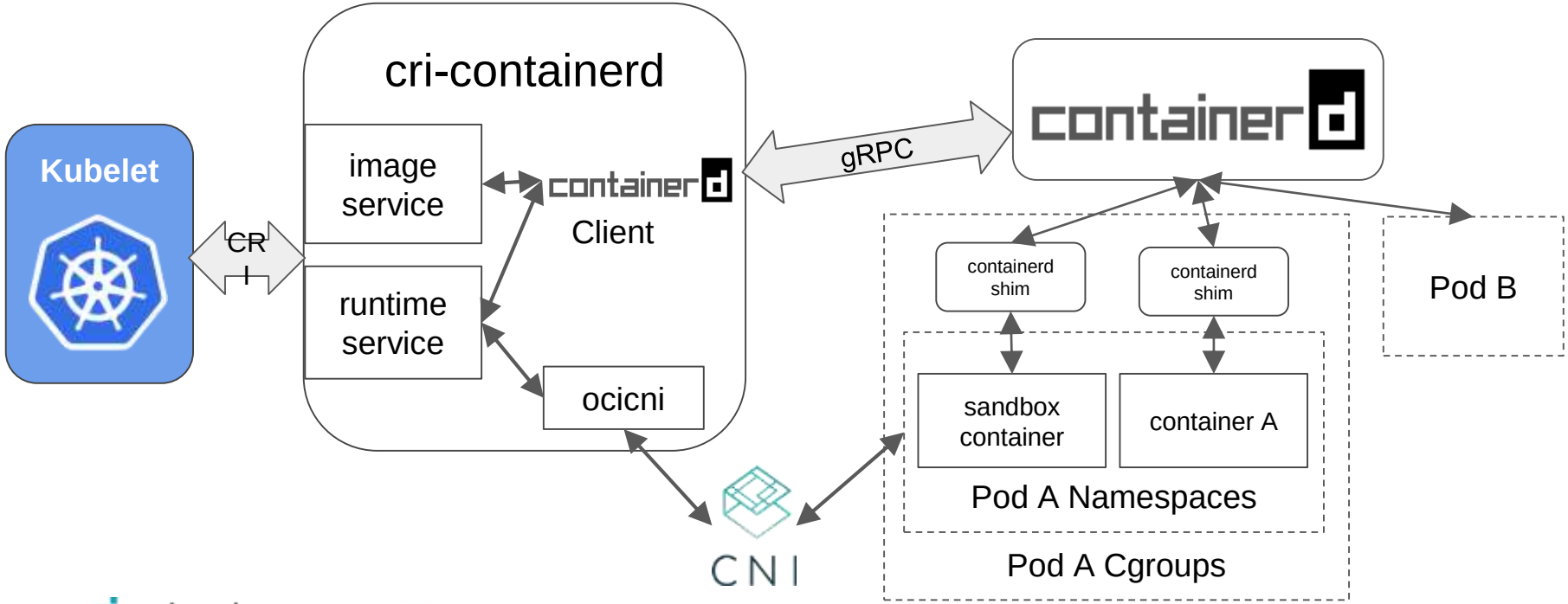
CRI-Containerd

cri-containerd: A CRI implementation for containerd.

- https://github.com/kubernetes-incubator/cri-containerd
- Kubernetes incubator project.
- Started in April 2017.



CRI-Containerd Architecture



CRI-Containerd Status

CRI-Containerd 1.0.0-alpha.0

- Kubernetes 1.7+, Containerd v1.0.0-beta.1, CNI Spec v0.3.1.
- Feature Complete.
- 57/57 CRI validation tests passing.
- 188/188 regular node e2e tests passing.
- Use kubeadm to bring up Kubernetes cri-containerd cluster. (ansible, custom)
- Kubernetes the hard way.
- Contributors from Google, IBM, Docker, ZTE, ZJU etc.

CRI-Containerd Roadmap

Q4: Additional testing, bug fixes and usability.

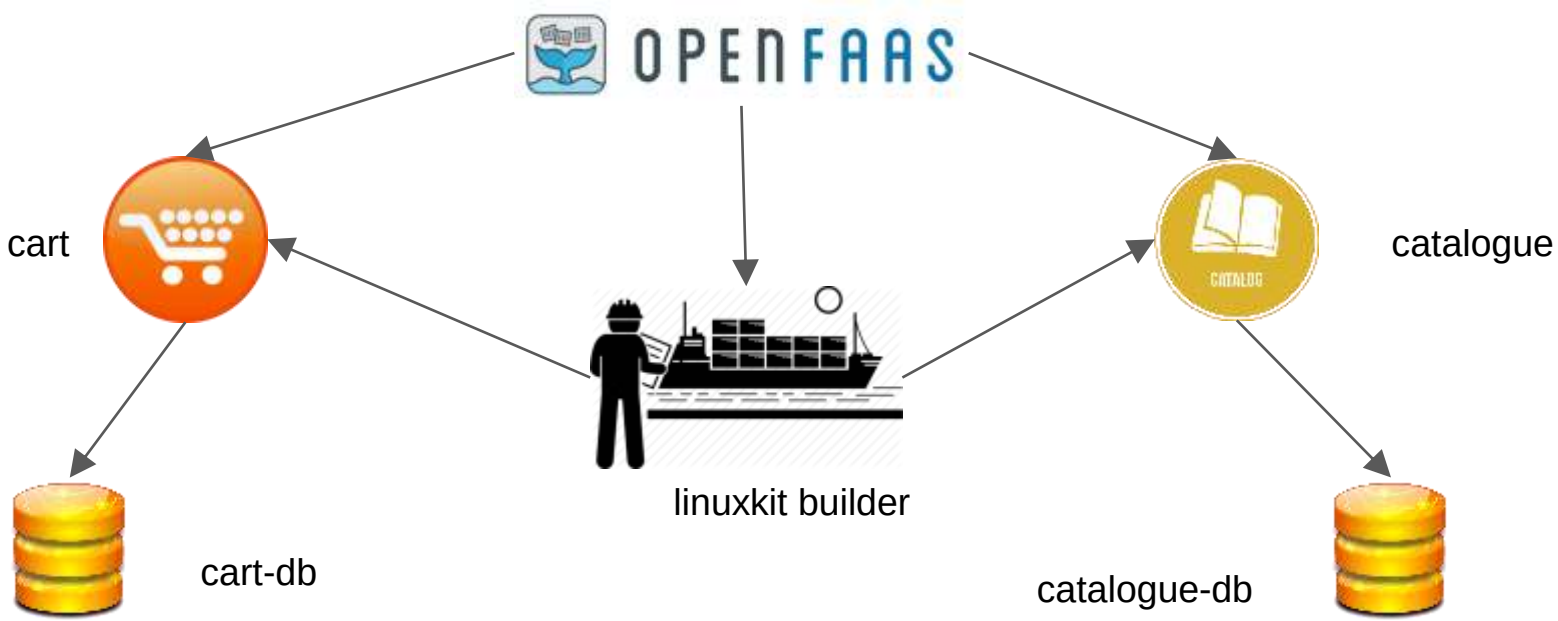
- FULL SET of e2e test in Kubernetes test infrastructure.
- Upstream Kubernetes *kube-up.sh* integration.
- Debug CLI *crictl*.
- 1.0.0-beta.0 by the end of 2017.

Demo

Demo

- Kubernetes cluster with CRI-Containerd and containerd
- Sample micro services deployment
- Serverless

Moby Store


OPENFAAS
cart
catalogue
linuxkit builder
cart-db
catalogue-db

Recap

CRI is the standard way to integrate Container Runtime with Kubernetes.

Containerd matches CRI and Kubernetes' requirement very well.

CRI-Containerd is 1.0.0-alpha.0.

Links

- **Github:** https://github.com/kubernetes-incubator/cri-containerd
- **Slack:** https://kubernetes.slack.com/messages/sig-node
- **Mailing List:** https://groups.google.com/forum/#!forum/kubernetes-sig-node
- **Maintainers:**
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Q&A