Emerging container technologies

Talos Linux

one (immutable) OS to rule them all

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What is Talos Linux?

Talos is built for running Kubernetes

- Minimal
- Immutable
- Secure
- gRPC API w/ mTLS

Designed for Kubernetes

- Do one thing, and do it very, very well
- There is only *the cluster*
- Self-healing
- Replace misbehaving parts
- Noflake (né cattle) computing FTW

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Not based on X distro

- Not Yet Another Linux Distribution (YALD)
- 2nd generation container optimised OS
- Userspace rewrite from scratch in GoLang
- Published as a signed and versioned image
- machined replaces systemd (PID 1)

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Minimal

- Built from scratch
- No shell
- No SSH
- No GNU utilities
- Only 80MB, 12 executables (as of v1.7.0)!

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Immutable

- Runs from SquashFS
- Image delivery through single and versioned files
- Reproducible builds
- Highly controlled write points

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Secure

- Signed images
- No passwords
- Encrypted and authenticated networking
- Short lived certificates
- Enforced Kubernetes PKI

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Ephemeral

- Read only
- Replicated
- Reconstructable

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Declarative

- No scripting
- No procedural steps
- No imperative configuration

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Distributed

- High available dataplane
- Ad-hoc etcd cluster (w/o sacrificing security)
- Workloads intended to be distributed
- Preventing SPoFs

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Where to run Talos Linux?

- Bare metal
- Virtualised
- Cloud
- Local
- Single board

Demo

Creating clusters

- Cloud cluster on OpenStack
- Local cluster on Podman

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Configuration

```
% talosctl gen secrets

% talosctl gen config openstack \
> https://k8s.talos.rlnc.eu:6443 --with-secrets secrets.yaml

% ls -1 *.yaml
controlplane.yaml
secrets.yaml
worker.yaml
```

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Virtual machines

```
% openstack server create controlplane-0 \
> --flavor gXcd.small --image talos-1.6.6 --user-data controlplane.yaml

% openstack server create worker-0 \
> --flavor gXcd.small --image talos-1.6.6 --user-data worker.yaml
```

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