



Immutable Infrastructure in the Age of Kubernetes

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Who am I?

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Previously co-founder and CTO at Ansible, acquired by Red Hat in 2015. Extensive infrastructure and automation experience.

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A photograph of several large, weathered concrete bridge pillars standing in a flat, open field under a hazy sky. The pillars are made of vertical concrete panels with visible joints and some surface wear. The ground is dry and dusty. The overall tone is muted and industrial.

What is Immutable Infrastructure?

The background of the slide is a photograph of a large, weathered concrete pillar, likely part of a bridge or overpass, standing in a flat, open field under a hazy sky. The pillar is made of vertical concrete segments with visible joints and some surface wear. The ground is covered in dry, brownish grass and dirt. The overall tone is muted and industrial.

What is Immutable Infrastructure?

A system that does not change once it has been deployed.

Characteristics of Immutable Systems

Benefits

- Configuration drift eliminated
- Consistency between dev, test, and prod improved
- Rollbacks, A/B testing, staged updates made easier

Downsides

- Maintaining the “golden image” is difficult
- OS and app may stay tightly coupled

A little bit of history...



A Red Hat project, est. 2006¹. Did not quite catch on.

Declarative config management took over from there.
(Ansible/Puppet/Chef)

A little bit of history...



AWS EC2 and other virtualization platforms popularized the use of “Golden Images”

Somewhat difficult to build, tedious to update.

App and OS closely linked.

A little bit of history...



Packer and other image build and lifecycle tools made golden images easier to deal with.

Containers and Docker began to decouple the OS and the app.

A little bit of history...

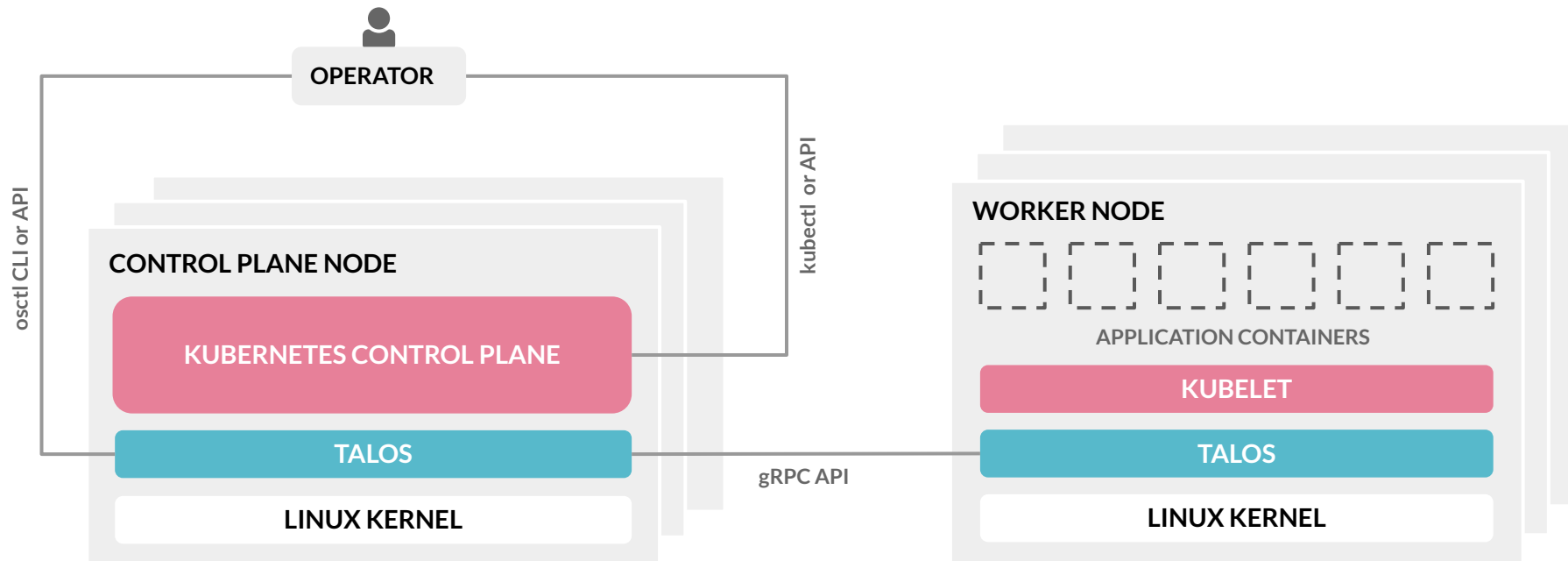


Kubernetes helped manage the where and how of containers.

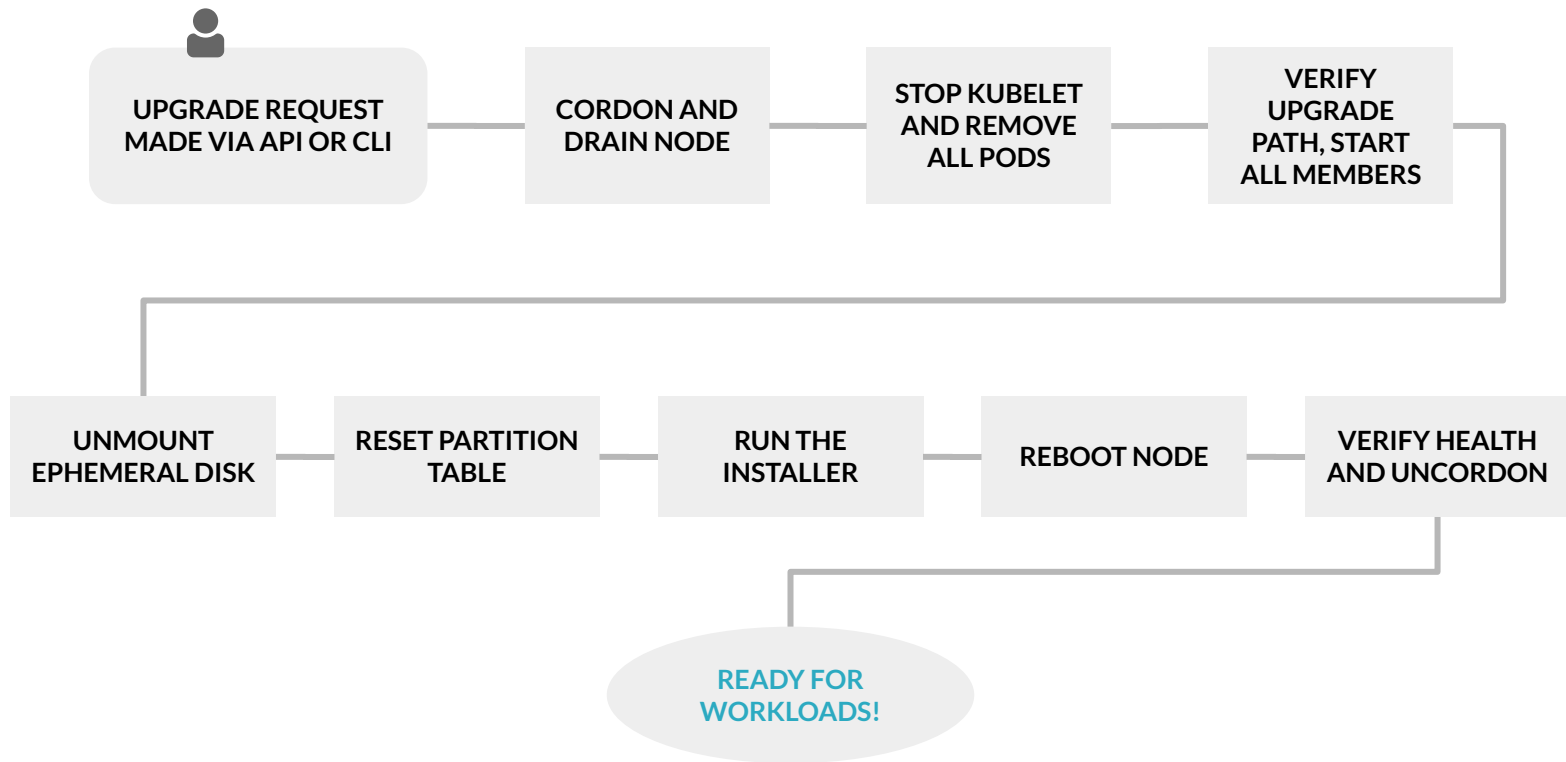
Decoupling of OS and app continued.

Immutable Infrastructure for Kubernetes Hosts

What's Talos?



Upgrading Immutable Kubernetes with Talos



Want to learn more?

Chat With Us on Slack

<https://slack.dev.talos-systems.io/>

Get the Source Code

<https://www.github.com/talos-systems/talos/>

Read the Docs

<https://www.talos.dev/>

