KubeCon | CloudNativeCon

North America 2019

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Introduction to SIG Cluster Lifecycle

Who is this guy?

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Steering Committee Member
Senior Staff Engineer @ VMware
@timothysc

Agenda

- Overview
- Key subprojects
- How you can get involved!

Overview - What is SCL?

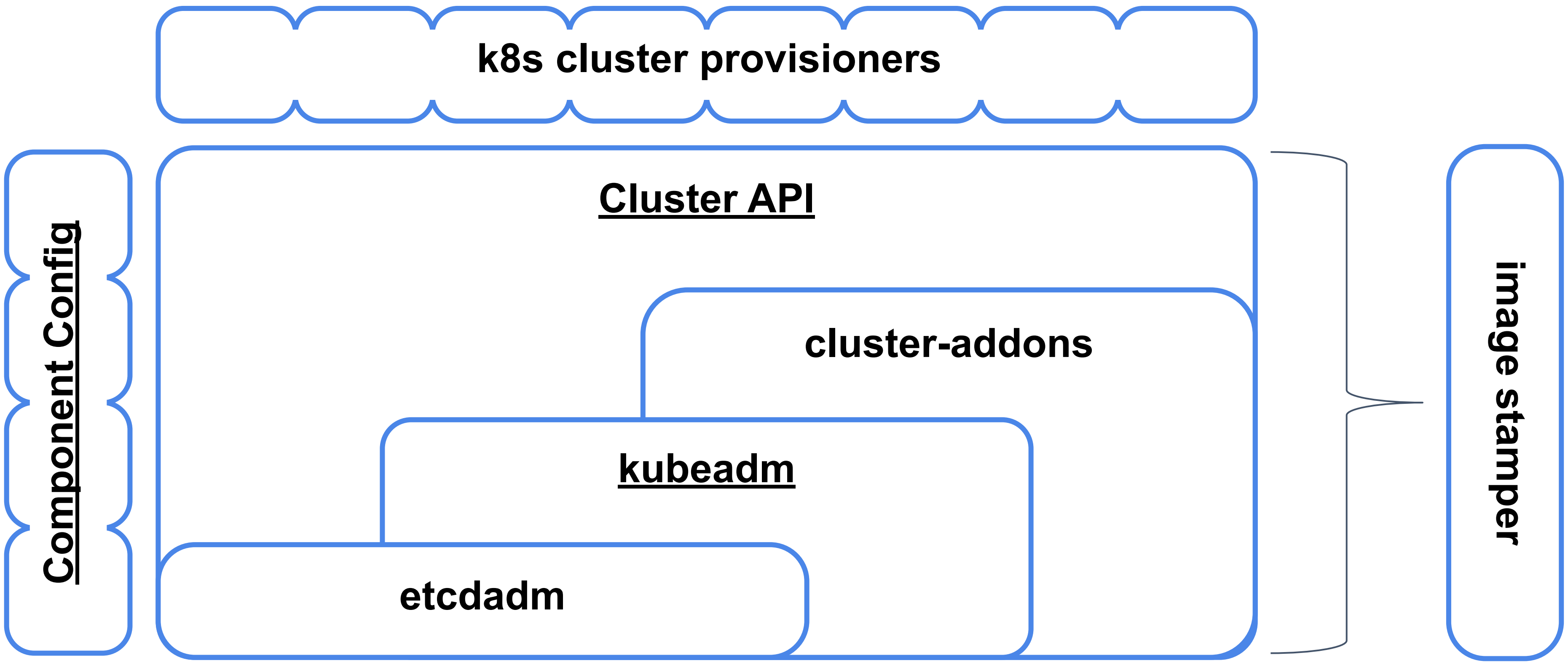
Mission

“SIG Cluster Lifecycle’s objective is to simplify creation, configuration, upgrade, downgrade, and teardown of Kubernetes clusters and their components.”

Vision

- Develop the tooling necessary to build a highly automated meta cloud...
  - Declarative API-driven k8s deployments
    - Make managing clusters as easy as managing pod deployments across all providers
  - Avoid the pitfalls of yesteryear
- Make the 80% use case simple and the 20% use case possible
- Spread the base, commoditize k8s clusters

The Stack

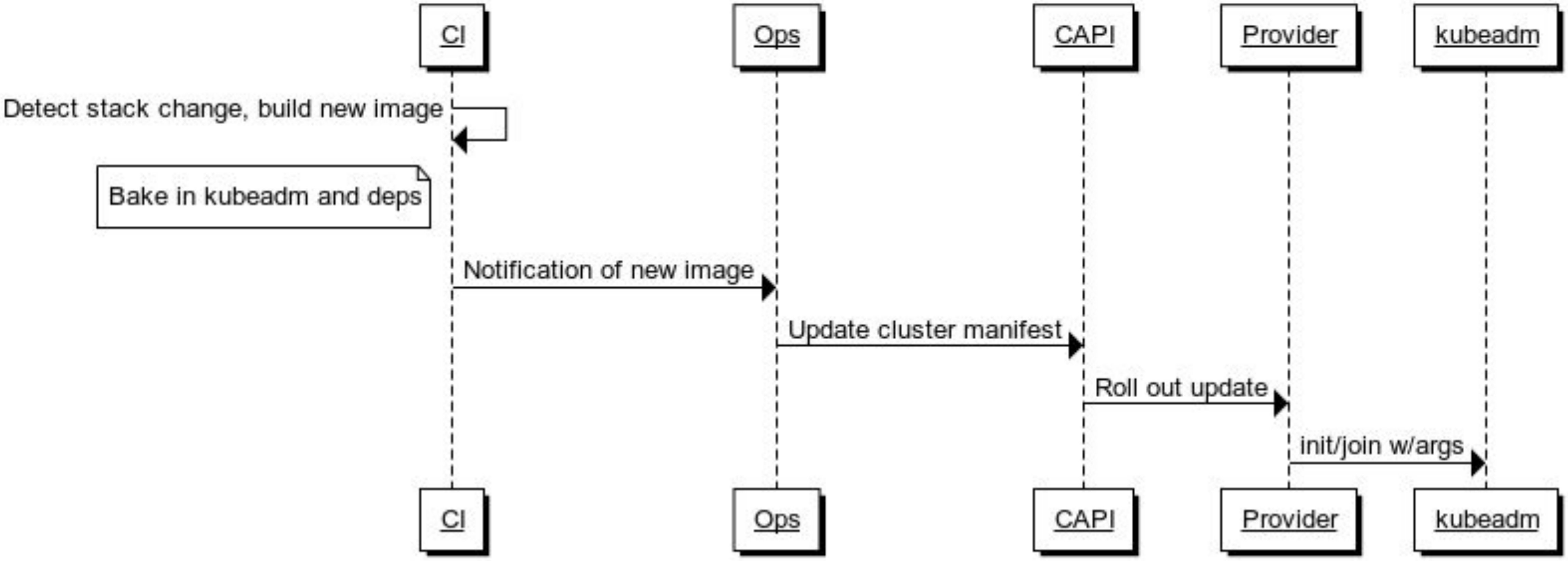

k8s cluster provisioners
Component Config
Cluster API
cluster-addons
kubeadm
etcdadm
image stamper

Unix Philosophy

- Make each program do one thing well
  - Make the boundary lines explicit
  - Set non-goals
    - *~Every computing infrastructure project that initially meets one need well will eventually expand in scope to only meet several needs poorly.*
- Expect the output of every program to become the input to another program.
  - Using them together is the voltron moment.

Voltron Example

Immutable Node Update



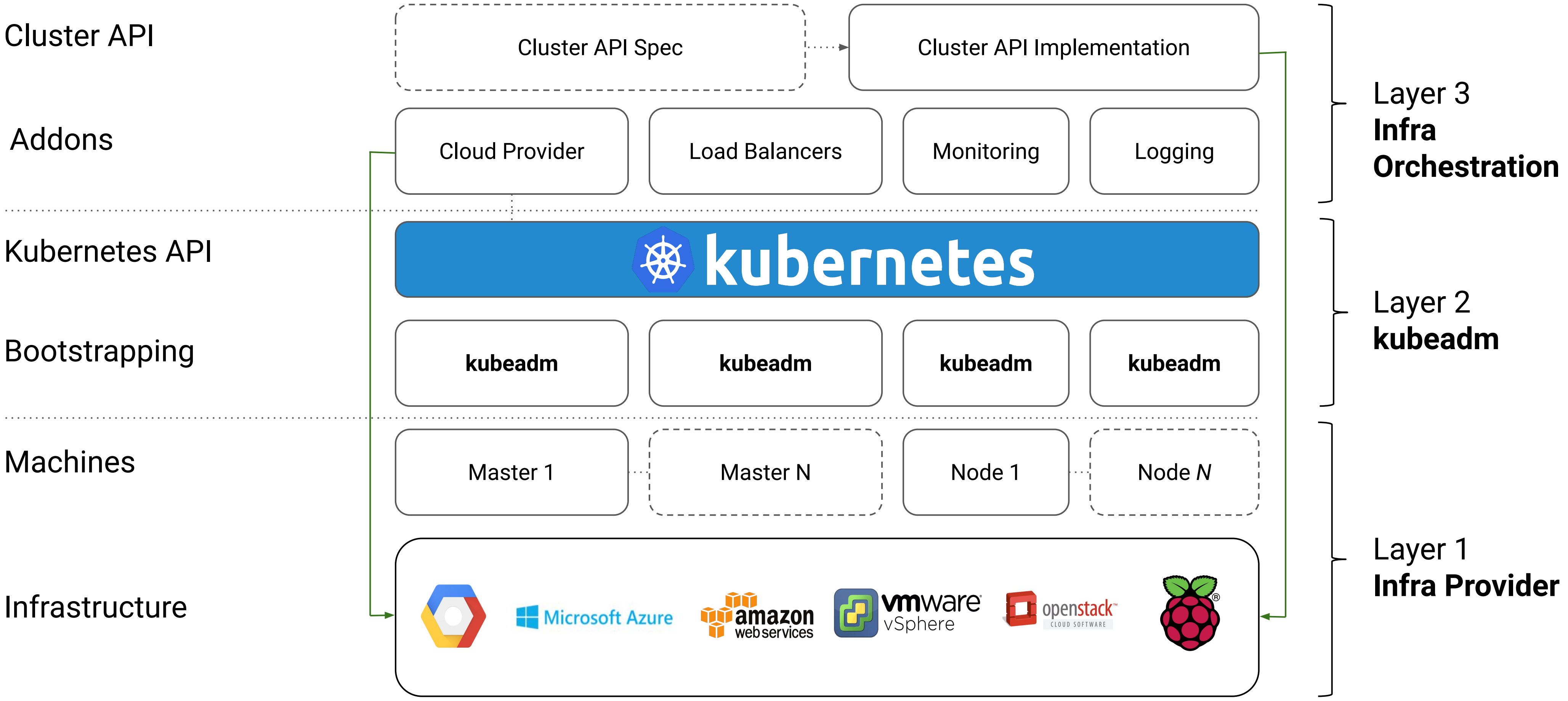
Key Subprojects

Kubeadm

- kubeadm’s task is to set up a **best-practice cluster** for each *minor version*
- The user experience should be *simple*, and the cluster reasonably *secure*
- kubeadm’s scope is limited; intended to be a **building block**
  - Only ever deals with the local filesystem and the Kubernetes API
  - Agnostic to ***how exactly*** the kubelet is run
  - Setting up or favoring a specific CNI network is **out of scope**
- Composable architecture with everything divided into **phases**
  - Allows for **DIY** using other higher order tools as chef/puppet/etc.

Kubeadm

= **The official tool to bootstrap a minimum viable, best-practice Kubernetes cluster**



Kubeadm - Learn More

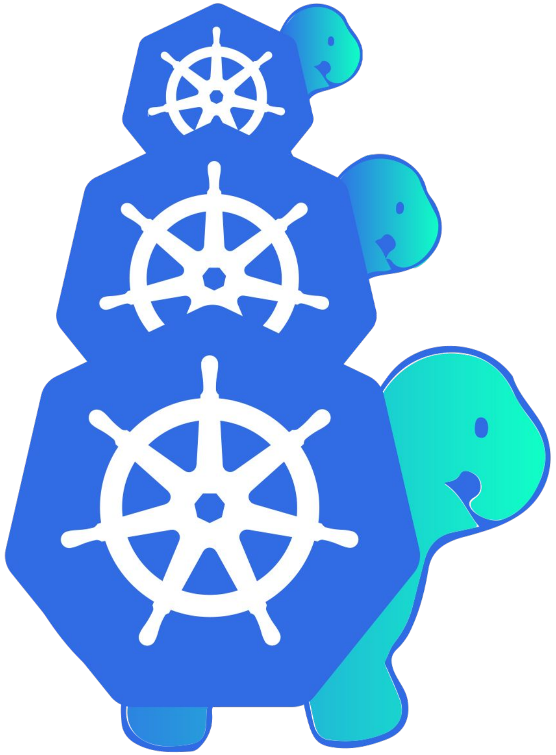
Kubeadm Deep Dive

Thursday 3:20 - 3:55

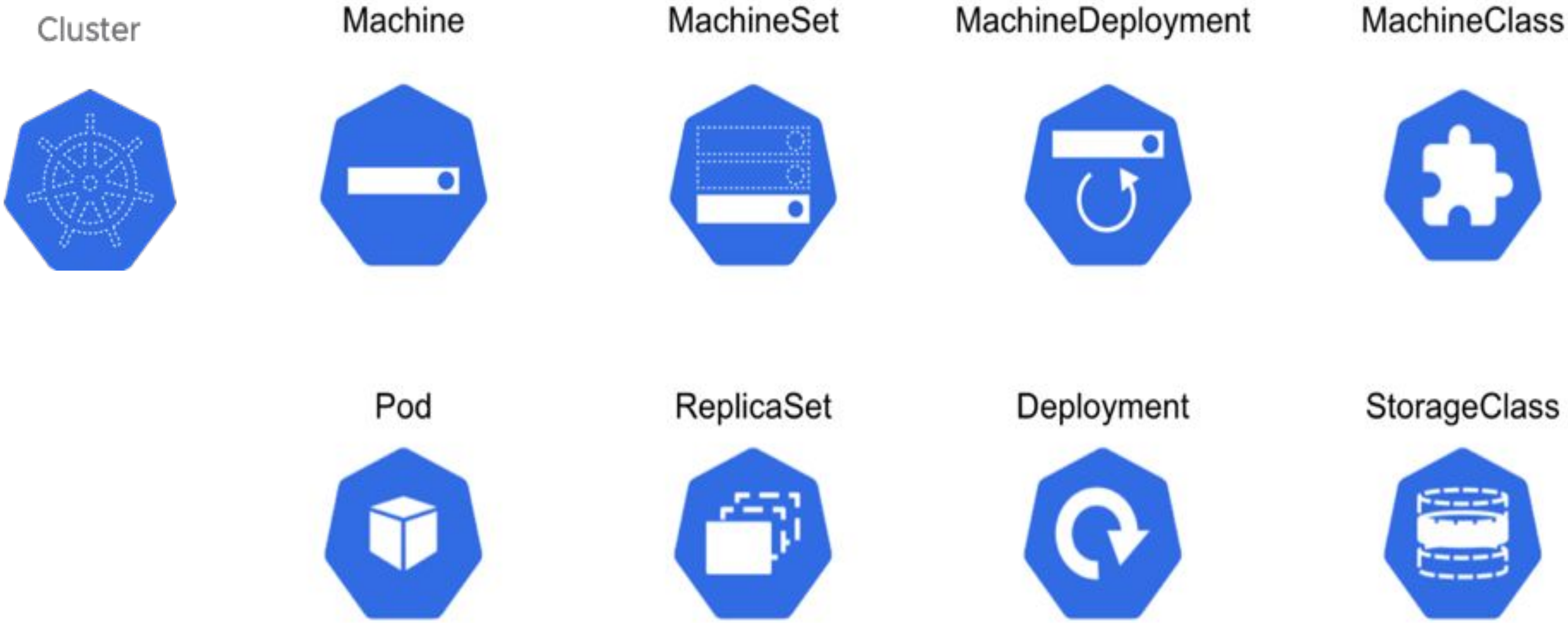
~ Yago, Fabrizio

Cluster API

- It is:
  - A declarative, Kubernetes-style API to cluster creation, configuration, and mgmt
    - Across providers
  - Manages the lifecycle of other associated cluster infra
  - An immutable (node) deployment model
- It is not:
  - A cloud provider abstraction layer
  - A tool that provides in-place upgrades



Cluster API



Cluster

Machine

MachineSet

MachineDeployment

MachineClass

Pod

ReplicaSet

Deployment

StorageClass

Cluster API - Learn More

Cluster API Deep Dive

Thursday 2:25 - 3:00

~ Vince, Ashish

Component Config

- Problem 1: The core Kubernetes components are not consistent in
  - how they are configured
  - how they should be set up
  - what HTTP(S) endpoints they register
  - how they do (delegated) auth

- Problem 2: It’s pretty hard to write a k8s-like component with declarative config

- Solution: Factor common component-related code into a `k8s.io/component-base` toolkit repository. Make it easier to write a non-core component that follows the k8s style

Component Config

- **Maintainability:**

  When $component's flag set grows over 50+ flags, configuring it becomes painful

- **Upgradability:**

  On upgrades, $component still works using versioned config vs. flags

- **Programmability:**

  Configuration expressed as JSON/YAML objects allows for consistent manipulation

- **Possibility:**

  Many types of config simply can't be expressed as simple key-value

- **Declarative:**

  OpenAPI information can easily be exposed / used for doc generation

- See Lucas' talk on this here: Configuring Your Kubernetes Cluster on the Next Level

Component Config - Learn More

Component Standard Deep Dive

Thursday 5:20 - 5:55

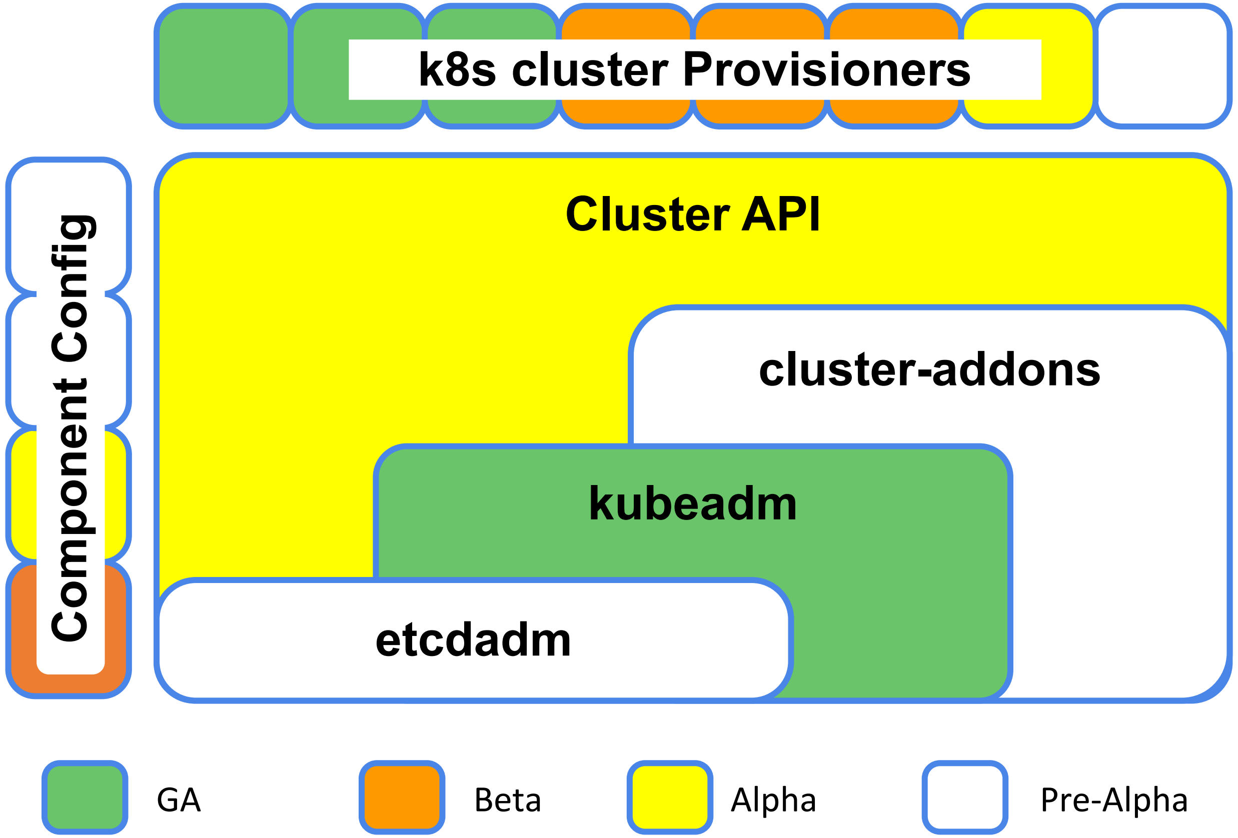
~ Leigh, Michael

Getting Involved

State of tools

We need your help!

There is still a lot of work to do in order to build voltron!



k8s cluster Provisioners

Component Config

Cluster API

cluster-addons

kubeadm

etcdadm

🟩 GA

🟧 Beta

🟨 Alpha

⬜ Pre-Alpha

How you can contribute

- SIG Cluster Lifecycle New Contributor Onboarding
- Navigate to our community page
- Look for “good first issue”, “help wanted” labeled issues in our repositories
  - Docs and testing.
- Attend our zoom meetings, and ask questions
- Introduce yourself on slack
- Attend/Watch new contributor sessions (contribex)
- Chop wood, carry water, **be kind**
  - Everyone `**earns**` their place at the table (social capital)

https://git.k8s.io/community/values.md

Thank You!

Q/A