



KubeCon



CloudNativeCon

Europe 2018

SIG Cluster Lifecycle Intro

Lucas Käldeström & Justin Santa Barbara

2nd of May, 2018 - KubeCon Copenhagen

Who's on stage?



Lucas Kälström

SIG Cluster Lifecycle co-lead

CNCF Ambassador & CKA

Contractor for Weaveworks

Upper Secondary School Student



Justin Santa Barbara

SIG AWS co-lead

kops creator and co-maintainer

Google

Our Mission

SIG Cluster Lifecycle examines how we should change Kubernetes to make it easier to operate.



What we do

1. Control Plane Installation Management

- *"How do I run the Kubernetes control plane?"*
- Building [kubeadm](#), cleaning up outdated getting started guides and improving docs

2. Control Plane Configuration Management

- *"How do I configure the Kubernetes control plane?"*
- Published guidelines for [Component Configuration](#) and [building a Control Plane API](#)



What we do

3. Simplifying Infrastructure Management

- *“How do I set up my network / machines?”*
- Working on a [Machines API](#) as part of the [Cluster API](#)

4. Addon Management

- *“How do I install things outside the core control plane?”*
- Many different approaches used today; still working on a plan for convergence



What we do

5. Etcd Management

- *“How should we run etcd?”*



Cluster API

- A declarative way to create, configure, and manage a cluster
 - apiVersion: "cluster.k8s.io/v1alpha1"
 - kind: Cluster, Machine, MachineSet, MachineDeployment
- Cluster: General cluster configuration (e.g. networking)
- Machine: A single physical or virtual machine
- MachineSet / MachineDeployment



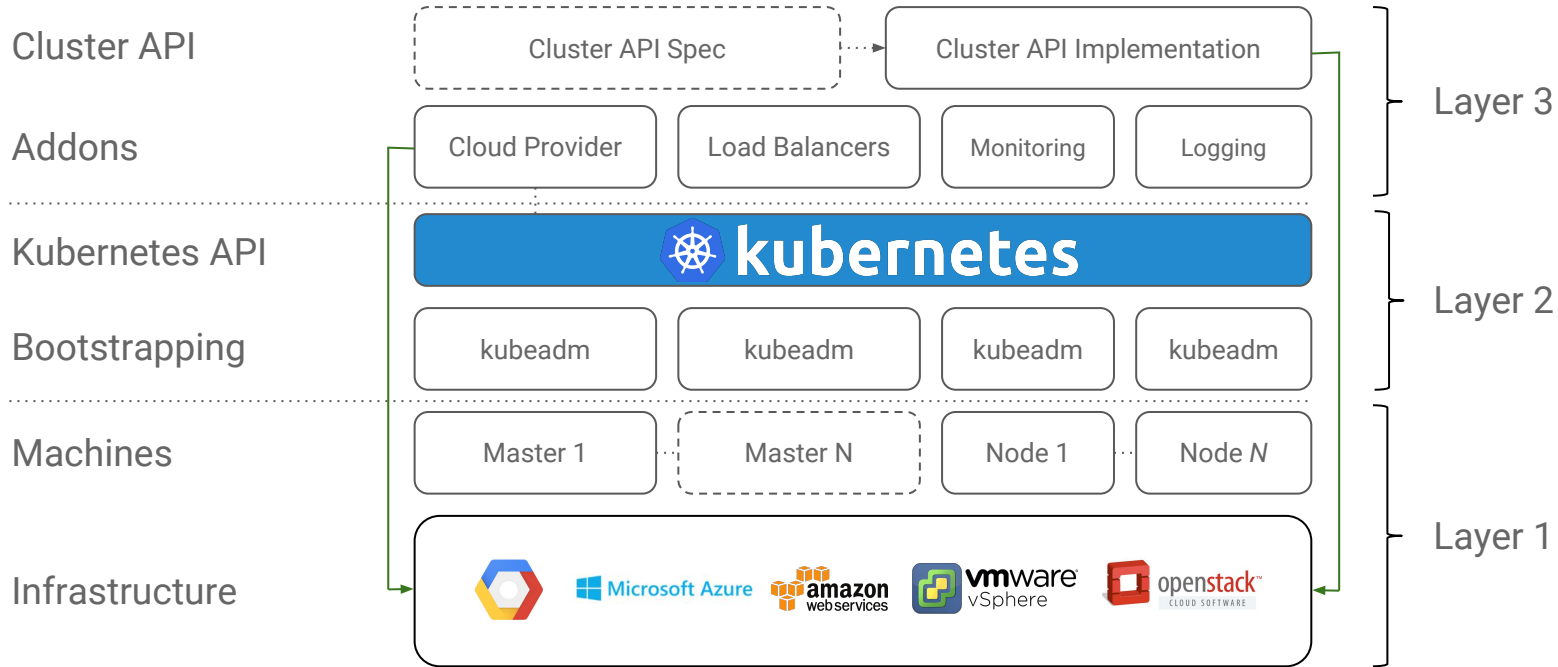
Cluster API

- Controllers will reconcile desired vs. actual state
 - These could run inside or outside the cluster
- Cloud Providers will implement support for their IaaS
 - GCE, AWS, Azure, DigitalOcean, Terraform and Docker Machine, etc.
- Port existing tools to target Cluster API
 - Cluster upgrades, auto repair, cluster autoscaler
 - kops and ... ?



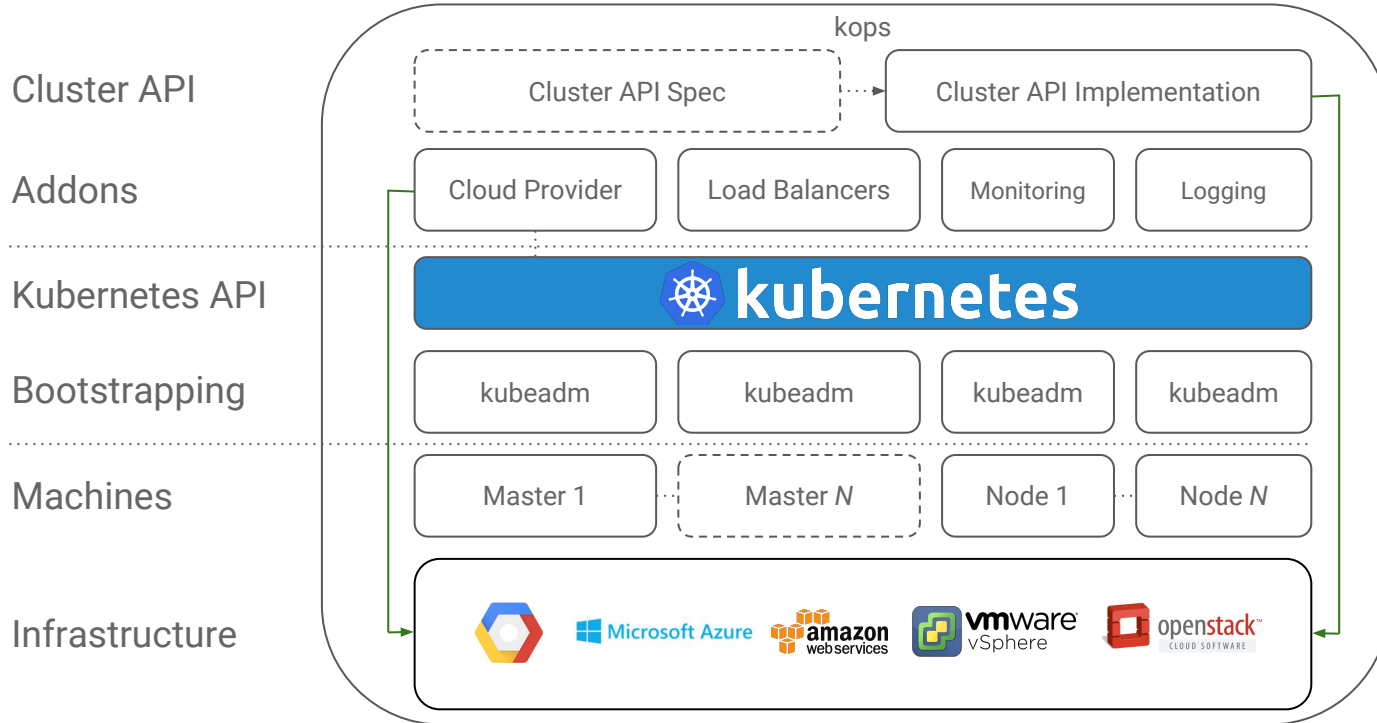
What is kubeadm and why should I care?

= A tool that sets up a minimum viable, best-practice Kubernetes cluster



kubeadm vs kops

Two different projects, two different scopes



Key design takeaways

- 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**

Audience: build-your-first-own-cluster users & higher-level tools like *kops* & *kubicorn*



Recent accomplishments

- kubeadm v1.10
 - Support for advanced auditing, etcd TLS-encryption, update to etcd 3.2, CoreDNS beta support
- kops v1.9
 - 1.9 support, bugfixes, improved GCE support, etcd roadmap & backups
- An alpha Cluster API and prototype implementation
 - Initial spec and GCE implementation



What is kops

- Easy but opinionated way to build clusters on AWS & GCE

```
kops create cluster cluster.example.com --master-nodes 3 --zones us-east-1b
```

```
kops update cluster cluster.example.com --yes
```

```
kubectl get nodes
```

- (support coming for DO, Alibaba, OpenStack & more)



kops roadmap

- kops combines everything into one bundle
- Working on extracting components / becoming more modular
 - Cluster / Machines API
 - Add-on manager
 - Etcd-manager
 - kops



Some of the 2018 roadmap for our SIG

- Productionize tools currently under development
 - kubeadm to General Availability (GA)
 - Beta or higher Cluster API and implementations
 - Component Configuration for all critical system components
- Better documentation
 - Recommended cluster parameters
 - Highly Available cluster deployments
 - External dependencies
 - Create a tool-less starting from scratch installation guide



How can you contribute to our SIG?

[Contributing to SIG Cluster Lifecycle documentation](#)

We're working on growing the contributor/reviewers pool; scaling the SIG

We have both kops (bi-weekly) and kubeadm (weekly) Office Hours

Attend our meetings / be around on Slack

Look at our [backlog of prioritized kubeadm issues](#)

Look at the kops [code](#) and help us with the [roadmap](#)



KubeCon talks from our SIG

- [What Does “Production Ready” Really Mean for a Kubernetes Cluster?](#)
 - By Lucas Käldestrom
Date: Friday, May 4 • 11:55 - 12:30
- [SIG Cluster Lifecycle: kubeadm Deep Dive](#)
 - By Timothy St. Clair, Alexander Kanevskiy and Luke Marsden
Date: Friday, May 4 • 14:45 - 15:20
- [kops Intro](#)
 - By Justin Santa Barbara
Date: Friday, May 4 • 14:45 - 15:20



What now?

Follow the [SIG Cluster Lifecycle YouTube playlist](#)

Check out the [meeting notes](#) for our weekly SIG meetings in Zoom

Join [#sig-cluster-lifecycle](#), [#kubeadm](#), [#cluster-api](#), [#kops-dev](#), [#kops-users](#)

Prep for and take the [Certified Kubernetes Administrator](#) exam

Read the two latest SIG updates on the Kubernetes blog in [January](#) and [August](#)

Check out the [kubeadm setup guide](#), [reference doc](#) and [design doc](#)

Read how you can [get involved](#) and improve kubeadm!

Try out [kops](#) and join our [office hours](#)



Thank you!

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