Intro: SIG Cluster Lifecycle

Agenda

An overview of SIG Cluster Lifecycle

- Who?
- What?
- Why?
- Where, When, and How?

Who?

Who are we?

Timothy St. Clair
SIG Cluster Lifecycle co-lead
Steering Committee Member
Staff Engineer @Heptio/VMWare
@timothysc

Robert Bailey
SIG Cluster Lifecycle co-lead
Founding member of GKE
Staff Software Engineer @Google
@roberthbailey

Who are we?

- 569 members on mailing list
- 20+ companies represented during SIG meetings (over the last 3 months)
- 5 continents with contributors
- 1214 contributors with 9438 "contributions" in the 1.12 to 1.13 release cycle
- 15 SIG sponsored subprojects

https://k8s.devstats.cncf.io/d/13/developer-activity-counts-by-repository-group?orgId=1&var-period_name=v1.12.0%20-%20v1.13.0&var-metric=contributions&var-repogroup_name=SIG%20Cluster%20Lifecycle

Who are we?

Subprojects

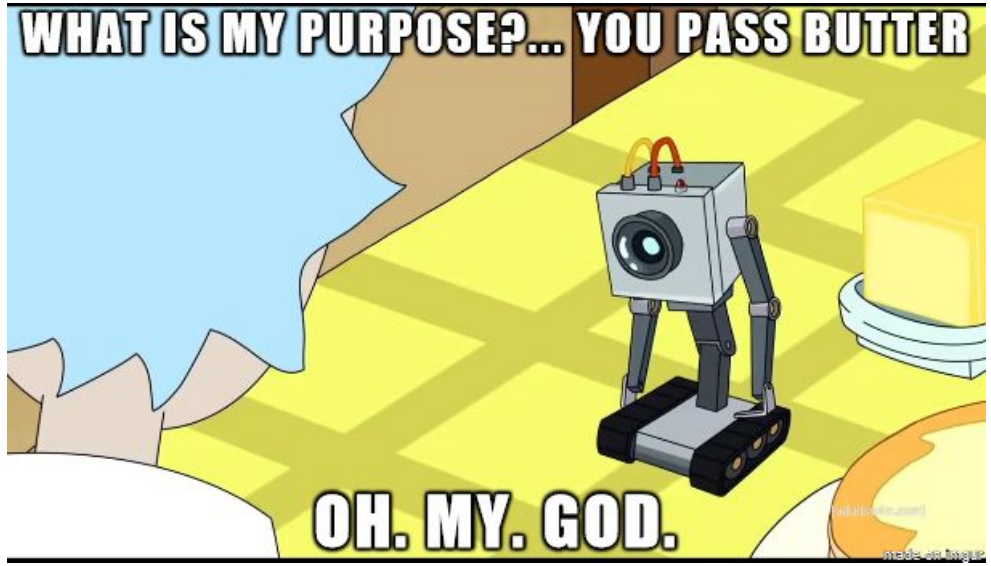
- *bootkube*
- *cluster-api*
- *cluster-api-provider-aws*
- *cluster-api-provider-digitalocean*
- *cluster-api-provider-gcp*
- *cluster-api-provider-openstack*
- *kops*
- *kube-aws*
- *kube-deploy*
- *kube-up*
- *kubeadm-dind-cluster*
- *kubernetes-anywhere*
- *kubespray*
- *minikube*

https://github.com/kubernetes/community/tree/master/sig-cluster-lifecycle#subprojects

What?

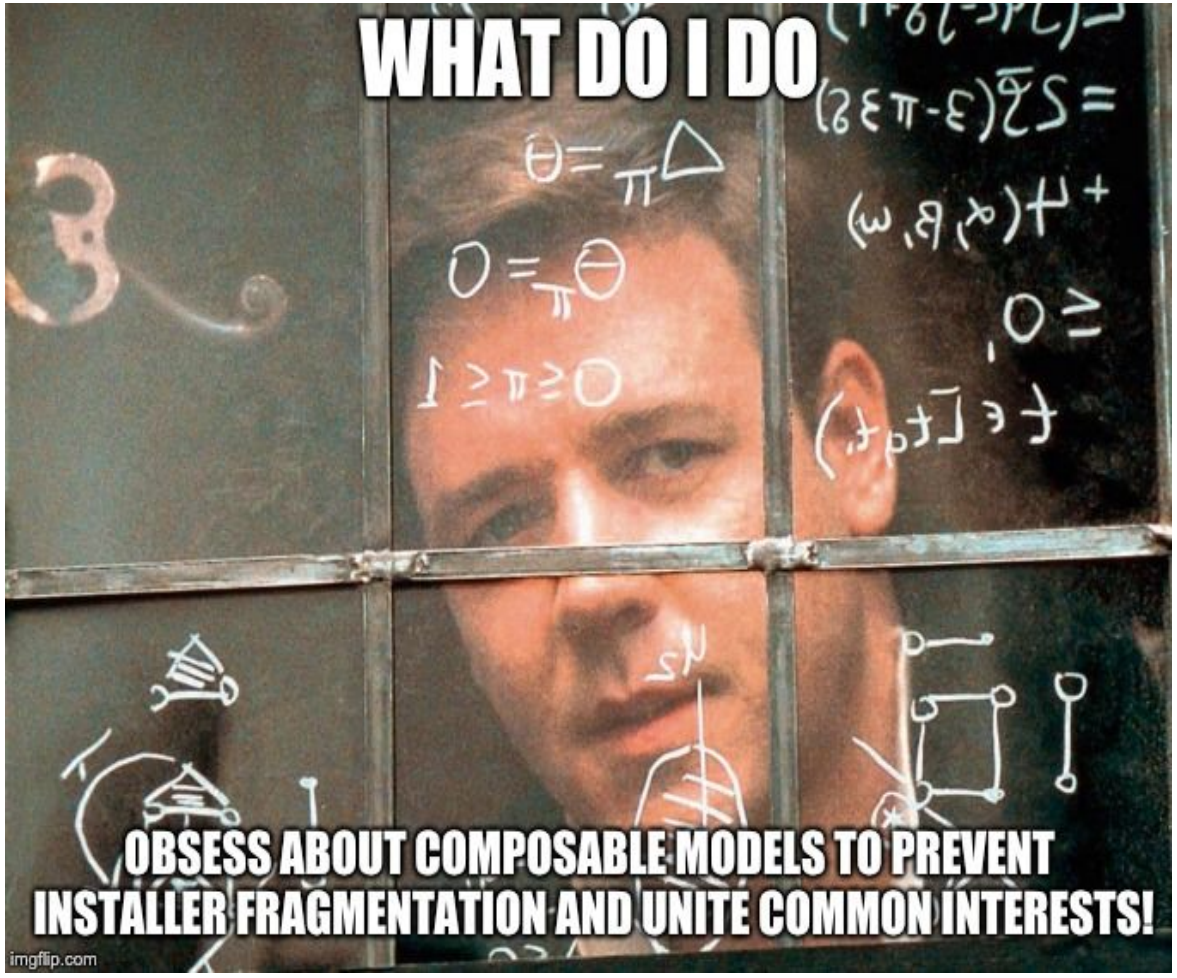
What is our mission?

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



https://github.com/kubernetes/community/blob/master/sig-cluster-lifecycle/charter.md

What we think vs. really do?



What do we *really* 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   - Building kubeadm, cleaning up outdated getting started guides, and improving docs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?"*
   - Driving a standard for configuring Kubernetes components (KEP)

What do we *really* do?

3. Simplifying Infrastructure Management
   - *“How do I set up my network / machines?”*
   - Working on a Machines API as part of the Cluster Management API (KEP)

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
   - Investigating usage of Cluster Bundle

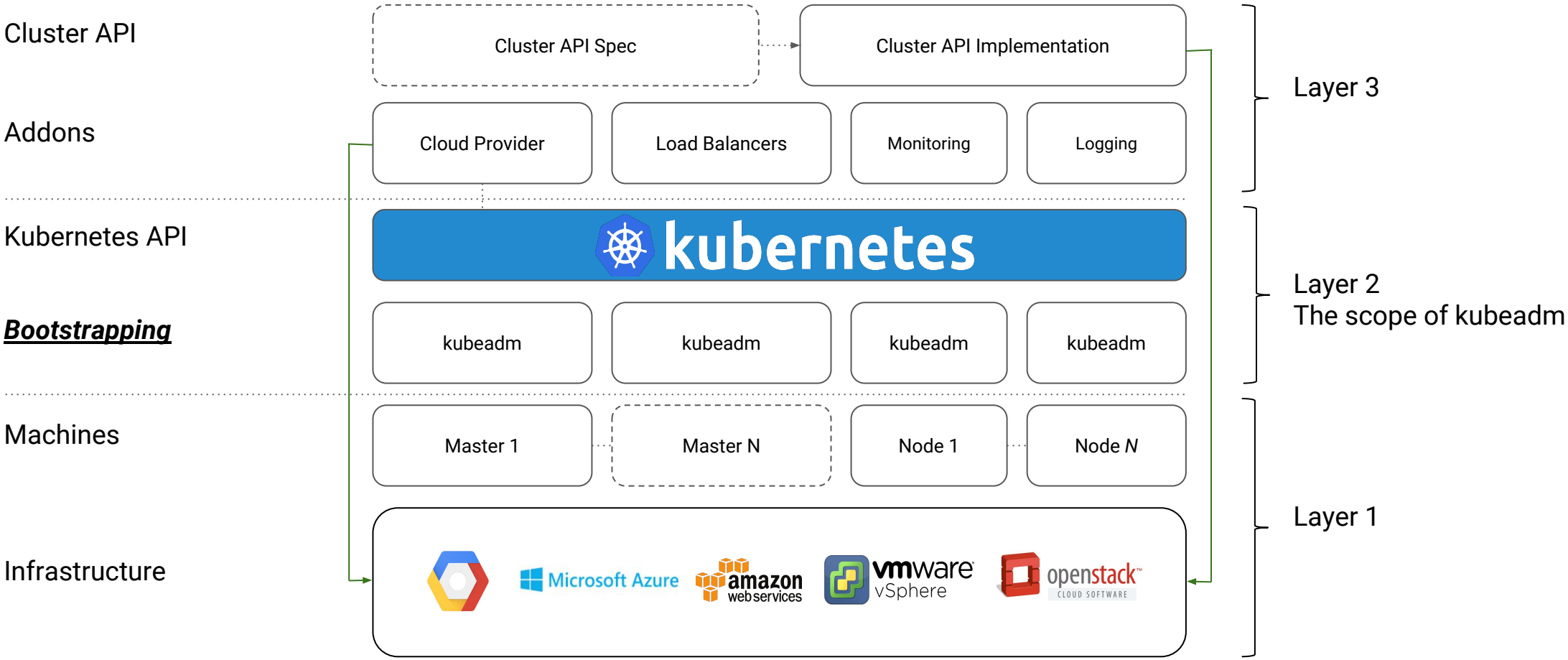
What do we *really* do?

5. Etcd Management
   - *“How should we run etcd?”*
   - Building etcdadm, a etcd management tool tailored to Kubernetes (KEP)

Kubeadm & ClusterAPI

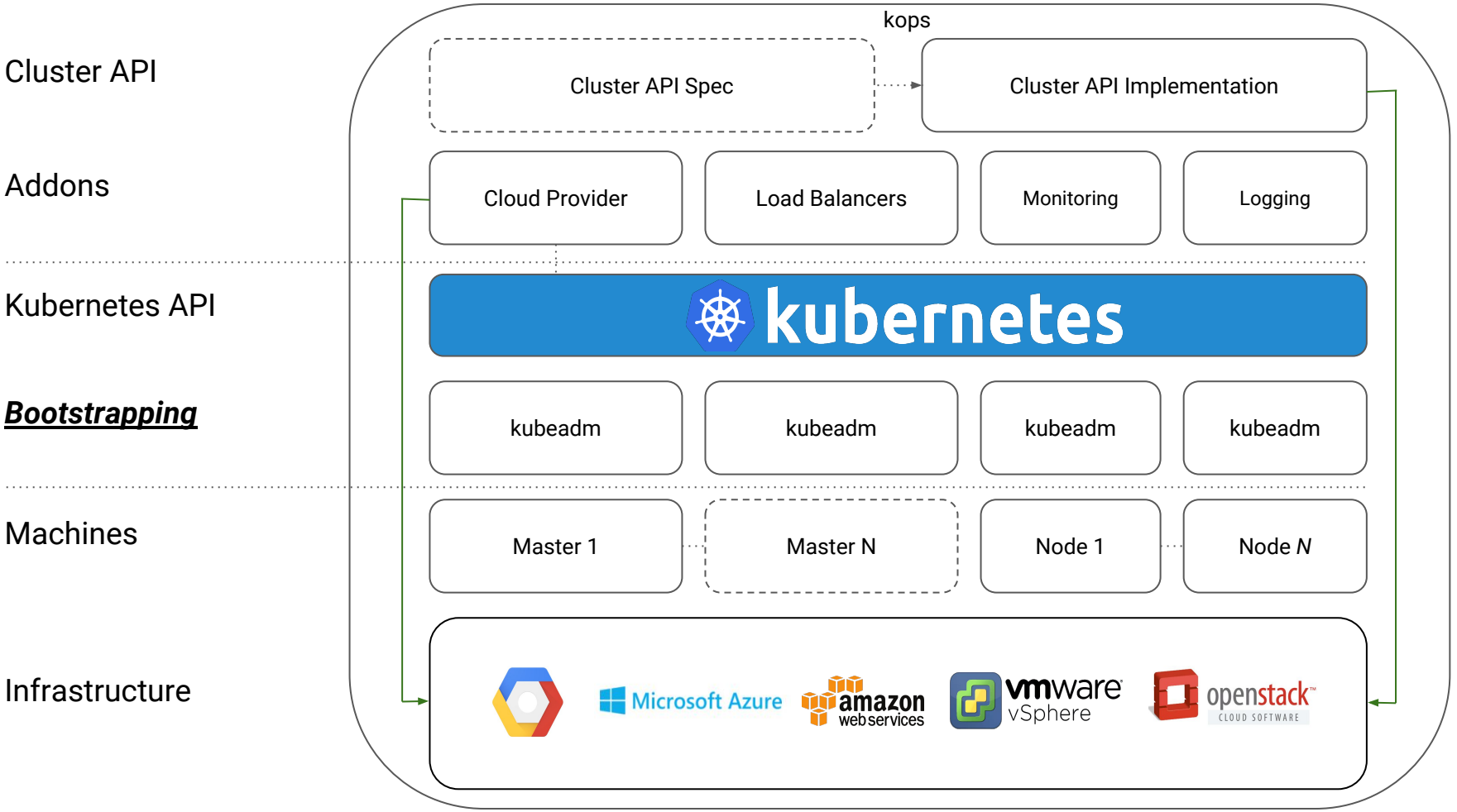
kubeadm (GA)

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



kubeadm vs kops or kubespray

Two different projects, two different scopes

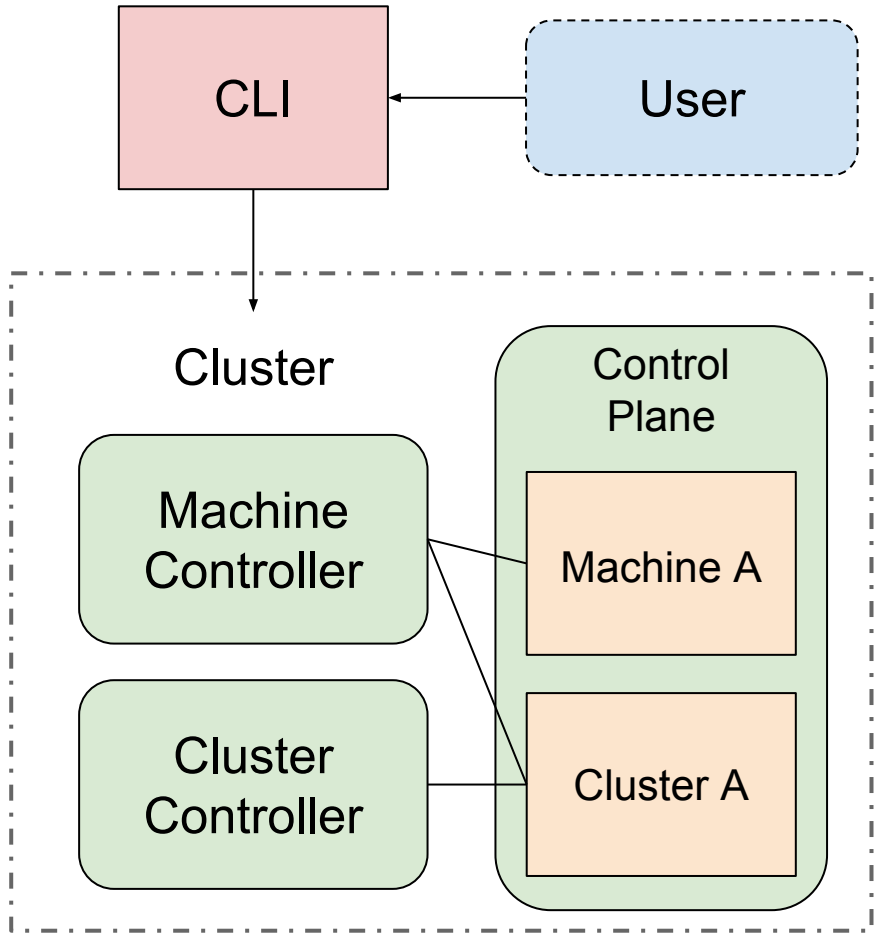


Key Design Takeaways

- 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 ***composable*** **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**

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 physical or virtual machine running a kubelet
- MachineSet / MachineDeployment
  - Groups of similarly configured machines



Cluster API (cont)

- Controllers reconcile desired vs. actual state
  - These could run inside or outside the cluster
- Cloud Providers will implement support for their IaaS
  - AWS, AWS/OpenShift, Azure, Baidu, DigitalOcean, GCE, OpenStack, Tencent, vSphere
  - Up-to-date list of providers can be found on Cluster API project homepage
- Port existing tools to target Cluster API
  - Cluster upgrades, auto repair, cluster autoscaler

Why?

<BRACE FOR RANT}

Why are we doing this?

- To prevent the mistakes of other open source clustering tools
  - Because…
    - kubernetes is the beginning of the story, not the end
    - commoditizing the deployment of the core raises all boats and allows the community to focus on solving end user problems
    - “production grade” shouldn’t be firewalled by providers
    - It should “just work”
    - Because cross provider matters
- To make the management of (X) clusters across (Y) providers simple, secure, and configurable.
- unix philosophy 4 lyfe

Deets:Where & When & How?

Getting Involved

- Contributing to SIG Cluster Lifecycle documentation
- We're working on growing the contributor/reviewers pool; scaling the SIG
- We have "Office Hours" for our projects: weekly for kubeadm, bi-weekly for kops and kubespray…
- Cluster API office hours weekly for both US West Coast and EMEA
- Full list of SIG meetings and links to minutes and recordings can be found on SIG page
- Attend our meetings / be around on Slack
- Look for **"good first issue"**, **"help wanted"** and **"sig/cluster-lifecycle"** labeled issues in our repositories

Other Logistics

- Follow the SIG Cluster Lifecycle YouTube playlist
- Check out the meeting notes for our bi-weekly SIG meetings
- Join #sig-cluster-lifecycle, #kubeadm, #cluster-api, #kops-dev, #kops-users, #kubespray, #minikube, …
- Prep for and take the Certified Kubernetes Administrator exam
- Check out the kubeadm setup guide, reference doc and design doc
- Read how you can get involved and improve kubeadm!

What's coming in 2019?

- Addon Managment
- Etcdadm
- Mo' Better Dev-Test w/Kind
- Kubeadm
  - HA to GA
- Grand unified field theory on ComponentConfigs
- ClusterAPI
  - alpha + beta
  - More Providers
- Kubespray & Kops
  - Integration with the other building blocks

BUT WAIT THERE'S MORE!!!

- **Come see other SIG related talks this week**
  - Tuesday
    - Cluster API On-Prem & Cloud @3:40
  - Wednesday
    - Intro to Minikube @10:50
    - Deep Dive Kubespray @11:40
  - Thursday
    - Deep Dive Kubeadm @1:45
    - Deep Dive ClusterAPI @2:35
    - Managing Addons with Operators @4:30

KubeCon
CloudNativeCon
North America 2018
Thank You!