



Cluster API as Code



What is Cluster API?

<https://github.com/kubernetes-sigs/cluster-api>

Cluster API

Declarative API

To manage one, or more,
Kubernetes cluster from a
Kubernetes cluster

Responsibilities

Create & Provision

Upgrade

Operations

Alpha

v1alpha3

Collaborative

AWS
DigitalOcean
Equinix Metal
Google
Microsoft
+ More



Vocabulary



Infrastructure Provider

A source of computational resources, such as compute and networking. For example, cloud Infrastructure Providers include AWS, Azure, Equinix Metal, and Google.

Management Cluster

A Kubernetes cluster that manages the lifecycle of Workload Clusters. A Management Cluster is also where one or more Infrastructure Providers run, and where resources such as Machines are stored.

Workload Cluster

A Kubernetes cluster whose lifecycle is managed by a Management Cluster.

Vocabulary

Machine

- Bare Metal
- Virtual Machine
- Immutable

Machine Set

A MachineSet's purpose is to maintain a stable set of Machines running at any given time.

Machine Deployment

A MachineDeployment provides declarative updates for Machines and MachineSets.

Machine Health Check

A MachineHealthCheck defines the conditions when a Node should be considered unhealthy.



Familiar

Similar to how we deploy our applications with Pods, ReplicaSets, and Deployments

Demo



Getting Started

<https://cluster-api.sigs.k8s.io/user/quick-start.html>



The Problem



Writing YAML: ProgrammerHumor reddit.com



YAML - Rainbow Spongbob | Ma... makeameme.org



Ah yes! Mark Yaml: ProgrammerHumor reddit.com



Meme Maker - YAML mememakernet



Meme Creator - Funny hey kid wanna ... memecreator.org



power of yaml! - greysk... memegenerator.net



Seriously, are we all yaml engineers... reddit.com



YAML SSSS - WEW | Ma... makeameme.org



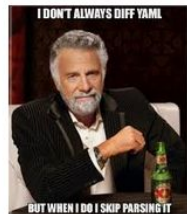
YAML - national geographic ma... memegenerator.net



Azure DevOps: Debt, Pipelines and YAML freshbrewed.science



YAML YAML, everywhere - X, X Everywh... memegenerator.net



diff yaml but when i do i ... makeameme.org



Sad But True by yaml - Meme Center memecenter.com



yaml files yaml files everywh... memegenerator.net



Meme: "Json is a subset Of YAML" - All ... meme-arsenal.com



YAML camel Does not approve of your ... makeameme.org



i know kung fu | Meme Generator memegenerator.net



Json Yaml Txt deD Me ... me.me



JSON? We have YAM! for that. ... memegenerator.net



Kubernetes lets you put YAM! ... twitter.com



Isminuslr: Convert YAM! into JSON ... Isminuslr.blogspot.com



You know what this needs bab... memegenerator.net



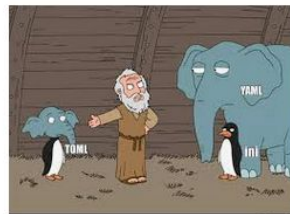
there is no yaml - | Make a Meme makeameme.org



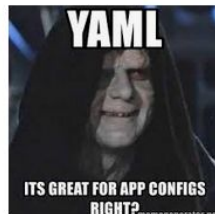
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Comics meme: "YAML TOML ini" - Comic... meme-arsenal.com



yaml Its great for app configs ... memegenerator.net




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Jason DeTiberus / @detiber

Cluster API is meant to be a set of primitives for declarative lifecycle management of Kubernetes Clusters. It was never intended to be a user-friendly or “easy” installation or upgrade tool, but rather a platform that could be used to build that higher level user-friendly tooling.

This was a deliberate design decision that was made, rather than add yet another opinionated installer/management tool to an already fragmented ecosystem, the idea was to build a relatively un-opinionated platform upon which new (and eventually existing) tooling could build upon. Similar to how kubeadm commoditized the installation and management of Kubernetes components within the scope of a single Node, Cluster API is attempting to do the same for an entire Kubernetes cluster.





A Solution



A Solution

Flexible

Composable

Ergonomic

Pulumi

○○○

```
const resourceGroup = new azure.core.ResourceGroup("example");

const handler = () => ()

const fn = new azure.appservice.HttpEventSubscription("fn", {
  resourceGroup,
  callback: handler,
});
```



Pulumi

CRD2Pulumi

○ ○ ○

```
./crd2pulumi --nodejsName capi --nodejsPath ./ ./crd.yaml
```

Language Support

TypeScript

Go

Python

dotNet

Cross Language Magic



Demo





Next Steps?



CDK8s



OPA Tests



More Providers

AWS, Azure, Google



More Abstractions

More Operating Systems, Image Support, Resource Sets

Sláinte

[github.com](https://github.com/rawcode/pulumi-kubernetes-cluster-api)
[/rawcode](https://github.com/rawcode/pulumi-kubernetes-cluster-api)
[/pulumi-kubernetes-cluster-api](https://github.com/rawcode/pulumi-kubernetes-cluster-api)

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