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Europe 2018

Accelerating Kubernetes Native Applications

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CoreOS

Operators: Kube Native Apps



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kubernetes

⚡ OPERATOR



kubernetes

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Prometheus

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Introducing Operators: Putting Operational Knowledge into Software

November 03, 2016 • By Brandon Philips

Tags: [announcements](#) [Operators](#)

A Site Reliability Engineer (SRE) is a person that operates an application by writing software. They are an engineer, a developer, who knows how to develop software specifically for a particular application domain. The resulting piece of software has an application's operational domain knowledge programmed into it.

Our team has been busy in the Kubernetes community designing and implementing this concept to reliably create, configure, and manage complex application instances atop Kubernetes.

Operators: Kube Native Apps



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Operators: Kube Natives Apps which:

Run in Kube Pods

Managed w/ Kube APIs

Operators: Kube Native Apps

```
# install the service types
```

```
$ kubectl create -f etcd-operator.yml
```

Operators: Kube Natives Apps which:

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Operators: Kube Native Apps



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```
# install the service types
```

```
$ kubectl create -f etcd-operator.yml
```

```
$ cat etcd-operator.yml | head -n 3
```

```
kind: Deployment
```

```
metadata:
```

```
  name: etcd-operator
```

Operators: Kube Natives Apps which:

Run in Kube Pods

Managed w/ Kube APIs

Operators: Kube Native Apps



```
# create a new etcd cluster  
$ kubectl create -f etcd-instance.yml
```

Operators: Kube Natives Apps which:

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```
# create a new etcd cluster
```

```
$ kubectl create -f etcd-instance.yml
```

```
$ cat etcd-instance.yml | head -n 1
```

```
kind: "EtdCluster"
```

Operators: Kube Natives Apps which:

Run in Kube Pods

Managed w/ Kube APIs

Operators: Kube Native Apps



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Operators: Kube Native Apps

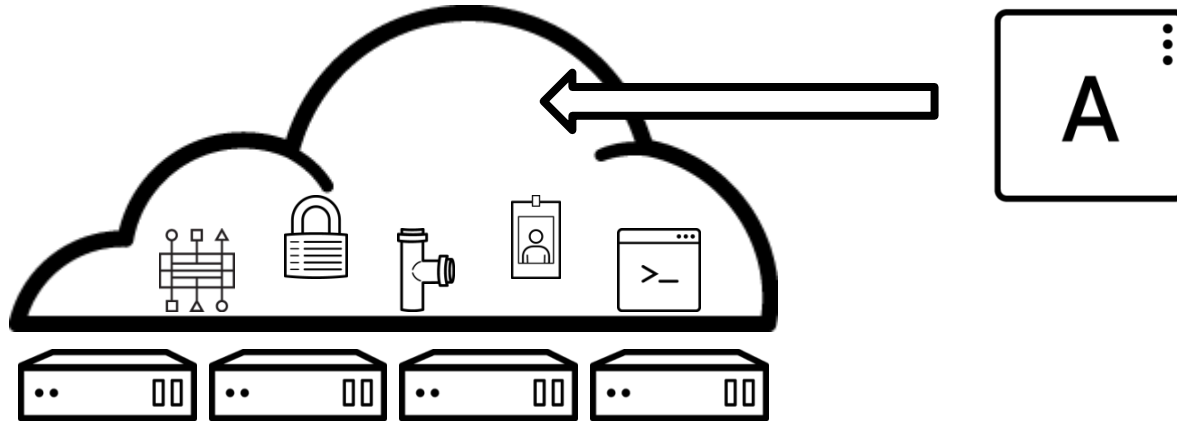


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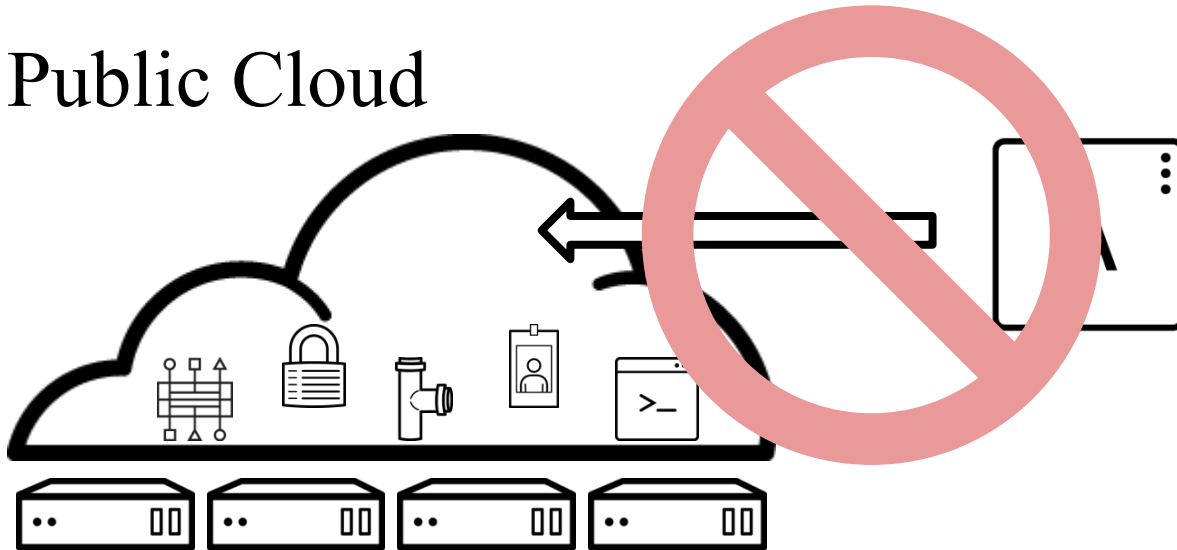
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Public Cloud



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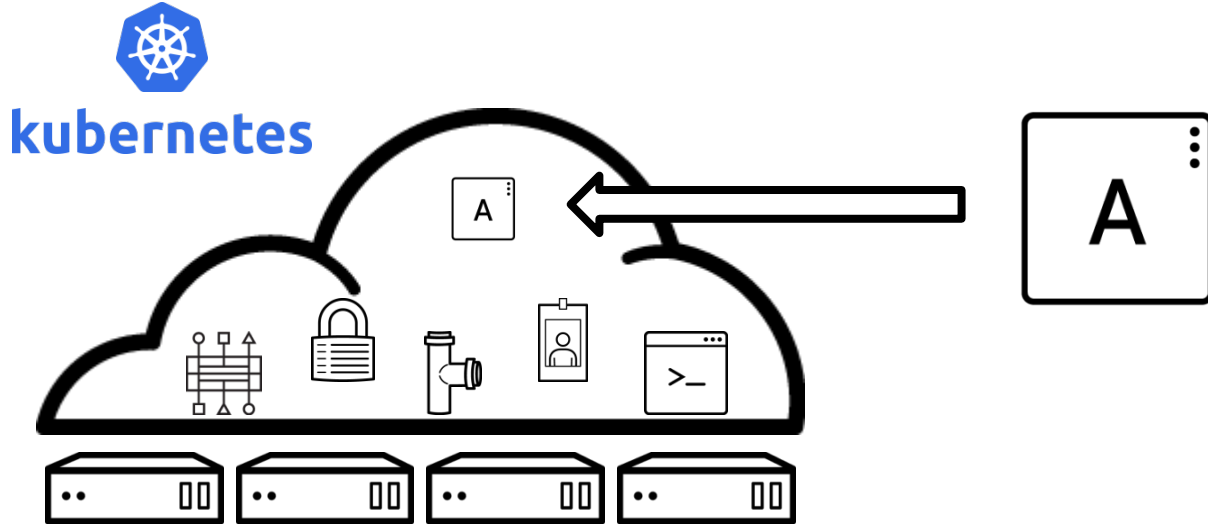


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Operators: Kube Native Apps



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Using the Prometheus Operator, our dev teams are able to provision their own end-to-end monitoring. We could not hope to manage the 344 Prometheus instances without the domain knowledge the Operator encapsulates.

- Michael Goodness, Lead Systems Engineer at Ticketmaster

Operators: The Next Step



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Building on this success, how do we?

- Create more Operators more easily
- Bring Operators to more users

The Operator Framework



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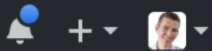
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OPERATOR FRAMEWORK

An open source toolkit to help developers build new Kube Native Apps, called Operators, and make them available and manageable by Kubernetes users.



Operator Framework

The Operator Framework is an open source toolkit to manage Kubernetes native applications, called Operators, in an effective, automated, and scalable way.

<http://coreos.com/operators>

Repositories 8

People 13

Teams 3

Settings

Type: All ▾

Language: All ▾

Customize pinned repositories



operator-lifecycle-manager Private

Kubernetes Operator Lifecycle Manager

1 10 Apache-2.0 Updated 6 hours ago



Top languages

Go Shell

operator-sdk Private

Kubernetes Operator SDK



People

13 >



Operator SDK

Tools to build, test and package your Operator.

Operator Development Challenges



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Tracking related Kube resources

Test scaffolding and repo organization

Vendoring a working set of libraries

Simplify Operator Development



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```
operator-sdk new myapp-operator  
  --api-version=myapp.example.com/v1alpha1  
  --kind=MyApp
```

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“We are working together with Red Hat and the broader Kubernetes community to help enable this ecosystem with an easier way to create and operate their applications on Kubernetes”

- Phillip Wittrock, Software Engineer at Google and Kubernetes community member

Operator Lifecycle Management

*Enable cluster admins to manage Operators on any
Kubernetes cluster.*

Answering these questions?



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Maintain a catalog of Operators and dependencies

Make an Operator available to specific namespaces

Track Operator app instances across namespaces

Apply updates to Operator app instances

Install/upgrade your Operators



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Lifecycle Managements Role

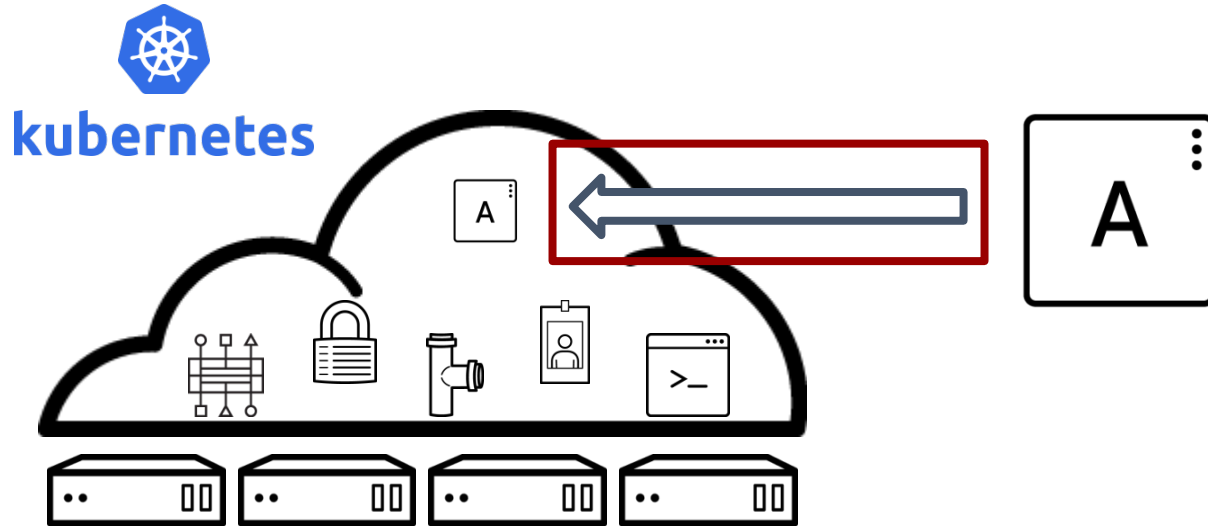


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Operator Lifecycle Manager

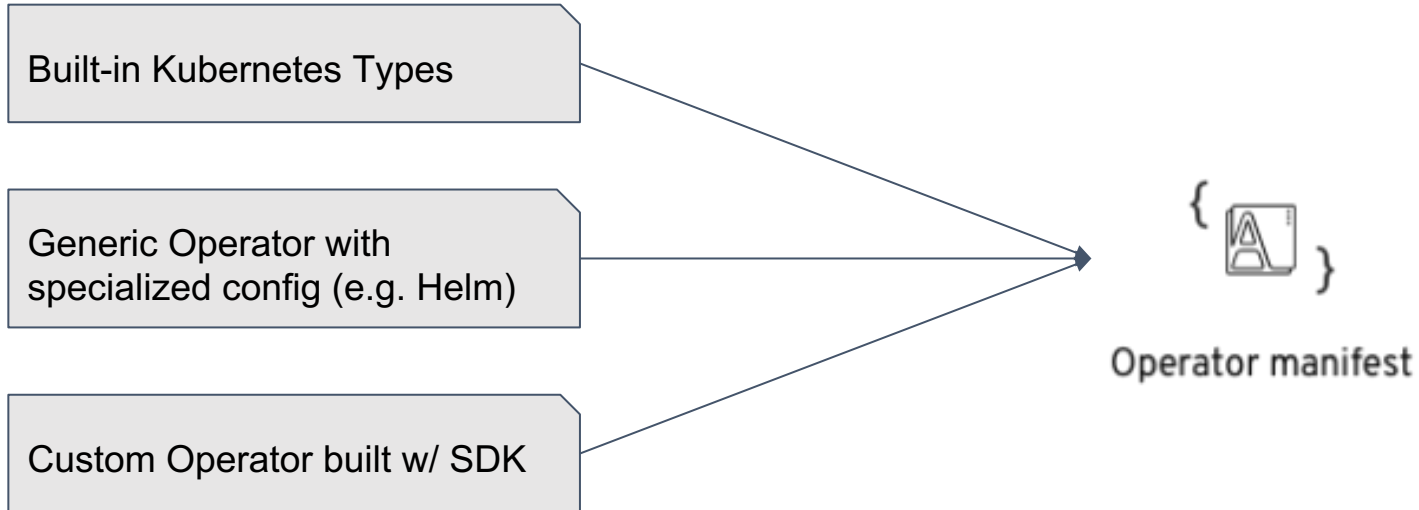


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Operator Framework Recap



Operator Framework

The Operator Framework is an open source toolkit to manage Kubernetes native applications, called Operators, in an effective, automated, and scalable way.

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Top languages

Go Shell

operator-sdk Private

Kubernetes Operator SDK



People

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Operators: The Next Step



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With the goal to:

- Create more Operators more easily
- Bring Operators to more users

Why?

*Make Kubernetes the dominate API
for Cloud Native apps.*

Thank You!



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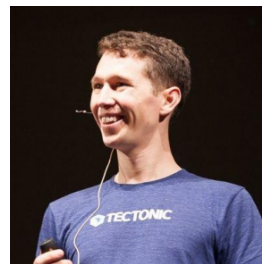
Come find us at the Red Hat Booth or around the conference



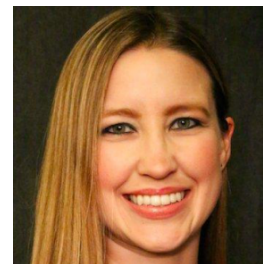
Jimmy Zelinskie



Rob Szumski



Brandon Philips



Kelly Tenn