



State of the Operators

Framework and SDKs

Openshift and Cloud Native Milan meetup, March 6th, 2019

Tero Ahonen
Principal Specialist Solution Architect, Openshift

OPERATORS ACROSS THE INDUSTRY



...and many more

<https://github.com/operator-framework/awesome-operators>

Why do we need Operators?

Why do we need Operators?

Containers brought simplicity to the development world

```
$ docker pull postgres  
$ docker pull redis
```

```
$ docker run --name some-postgres -e POSTGRES_PASSWORD=foo -d postgres  
$ docker run --name some-redis -d redis
```

Existing operational logic in Kubernetes

- Deployment
- ReplicaSet
- StatefulSet
- DaemonSet
- CronJob
- ...



⚙️ Resize/Upgrade

⚙️ Reconfigure

⚙️ Backup

⚙️ Healing



OK, but what *is* an Operator?

What is an Operator?

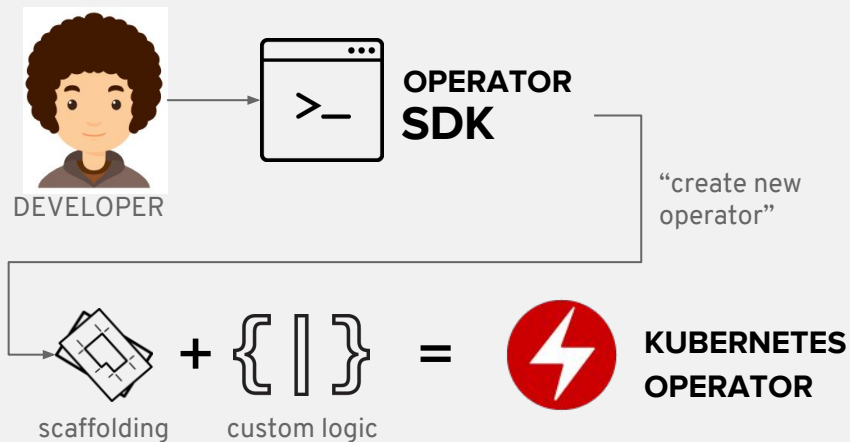
- An operator is a kubernetes native application
 - Leverages the kubernetes API (usable with kubectl)
 - Runs on kubernetes as containers
 - Resembles a custom controller
- Purposely built for an application
 - Operational knowledge baked in and automated
 - handling upgrades from one version to another
 - handling complex failure recovery scenarios
 - scaling a stateful application up and down
 - Best suited for complex and stateful applications (but not only!)
 - Example: a prometheus operator specifically designed for it



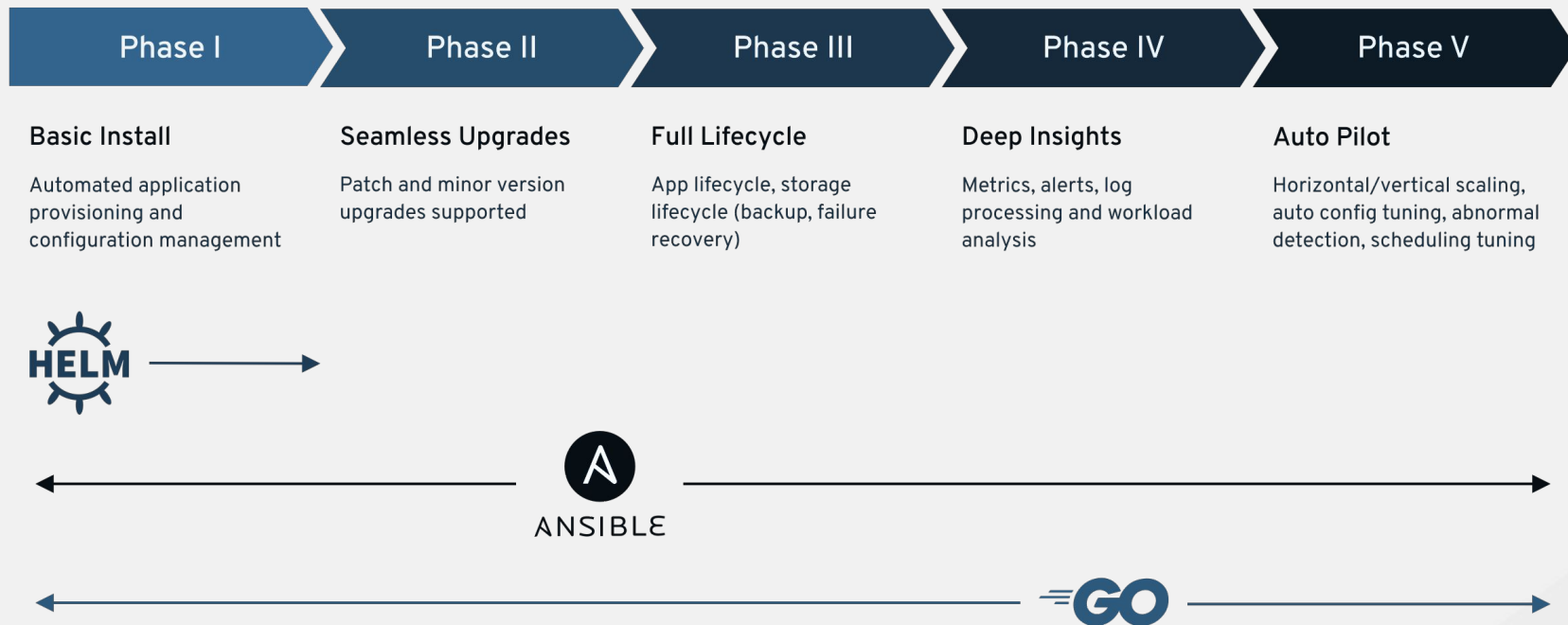


- **Operator SDK** - Allows developers to build, package and test an Operator based on your expertise without requiring all the knowledge of Kubernetes API complexities
- **Operator Lifecycle Manager** - Helps you to install, and update, and generally manage the lifecycle of all of the Operators (and their associated services) running across your clusters
- **Operator Metering** - Enable usage reporting for Operators and resources within Kubernetes

OPERATOR FRAMEWORK IN ACTION



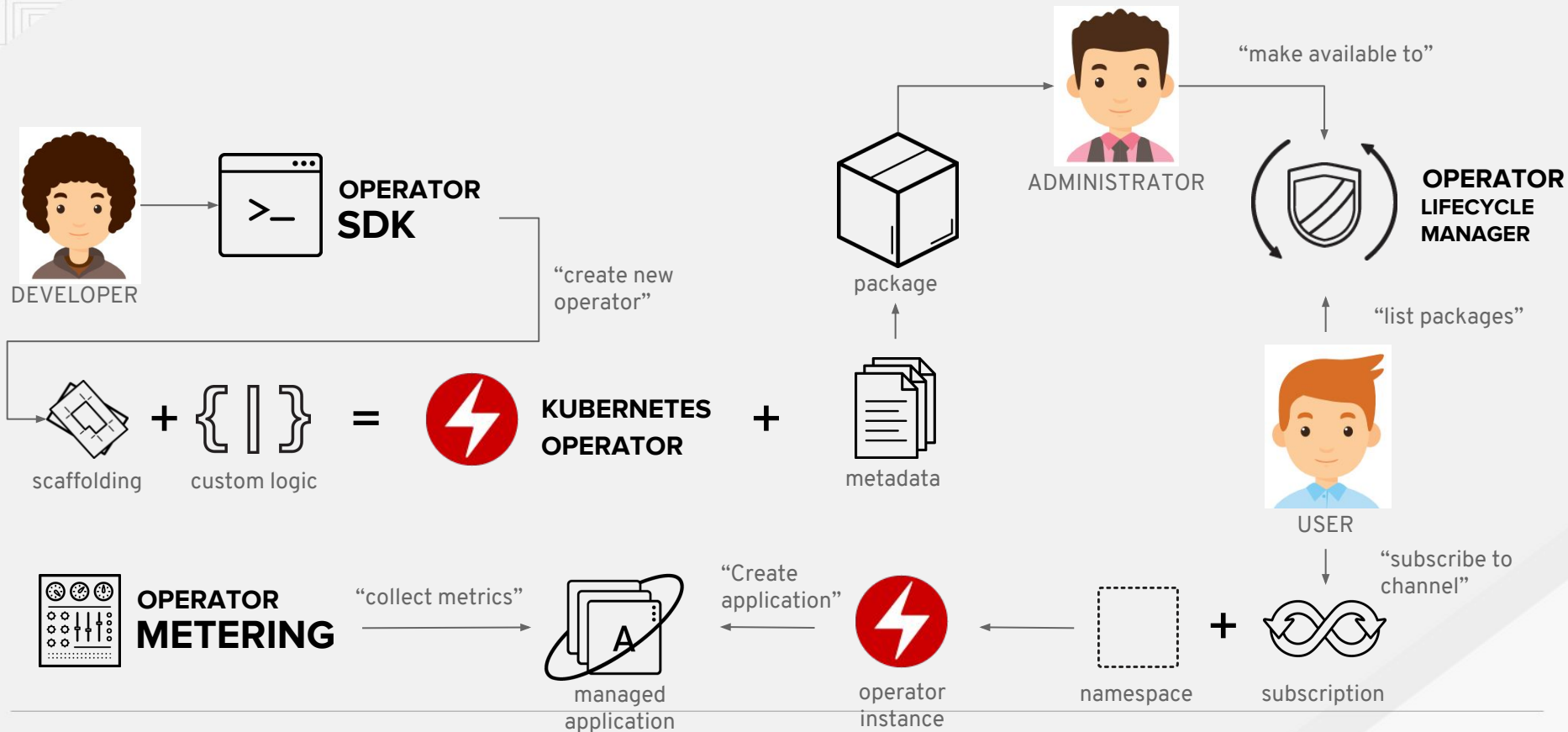
TYPES OF OPERATORS



CREATE AN OPERATOR WITHOUT CODING

```
$ operator-sdk new cockroachdb-operator --type=helm --helm-chart stable/cockroachdb
```

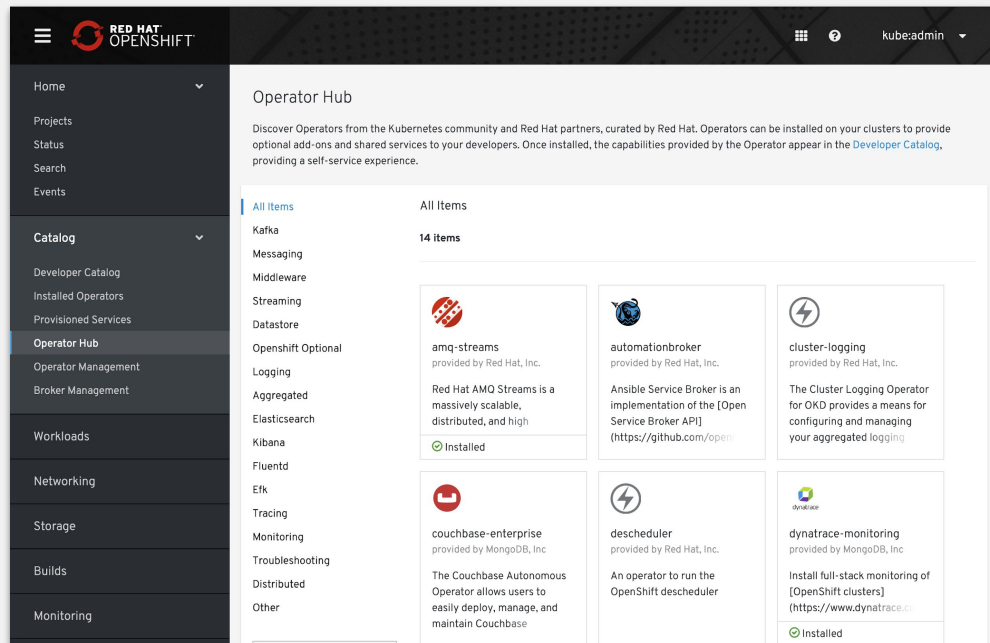
OPERATOR FRAMEWORK IN ACTION



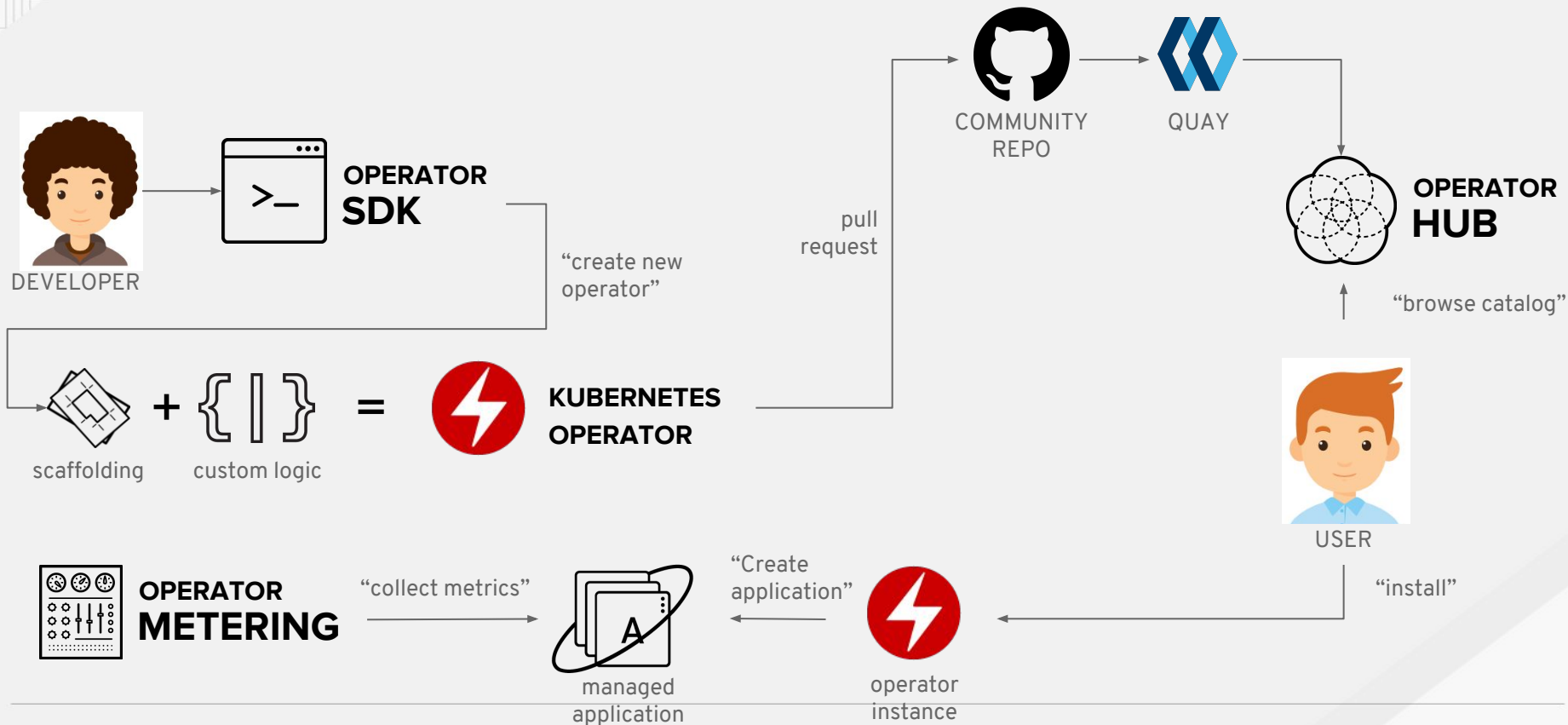


OPERATORS IN OPENSHIFT

Operator Hub - Allows administrators to selectively make operators available from curated sources to users in the cluster.



COMMUNITY OPERATOR CONTRIBUTION



OPERATORS IN OPENSIFT

cluster-kube-apiserver-operator
cluster-kube-controller-manager-operator
cluster-kube-scheduler-operator
cluster-openshift-api-server-operator
cluster-openshift-controller-manager-operator
cluster-monitoring-operator
cluster-network-operator
cluster-dns-operator
cluster-ingress-operator
machine-api-operator
auth-config-operator

cluster-autoscaler-operator
cluster-node-tuning-operator
cluster-storage-operator
cluster-samples-operator
cluster-image-registry-operator
cluster-logging-operator
cluster-service-catalog-operator
console-operator
machine-config-operator
service-serving-cert-signer
olm-operator

Demo

What's ahead

OPERATOR SDK & LIFECYCLE

Now

Operator Testability

SDK

Objectives:

- aid developers with e2e testing
- validate operator maturity

Features:

- scorecard utility

Stage: Prototype

Cross-Platform Support

OLM

SDK

Objectives:

- OCP, OKD and k8s consistency

Features:

- Universal Base Image Support
- installation for non-OCP clusters

Stage: Development

Next

Continuous Testing

SDK

Objectives:

- automated scorecard testing
- validate operator maturity

Stage: Discovery

Partner Enablement

SDK

Objectives:

- UBI support for partners
- scorecard for partners

Stage: Discovery

No-Fuzz Operator Install

OLM

Features:

- OperatorGroups

Stage: Prototype

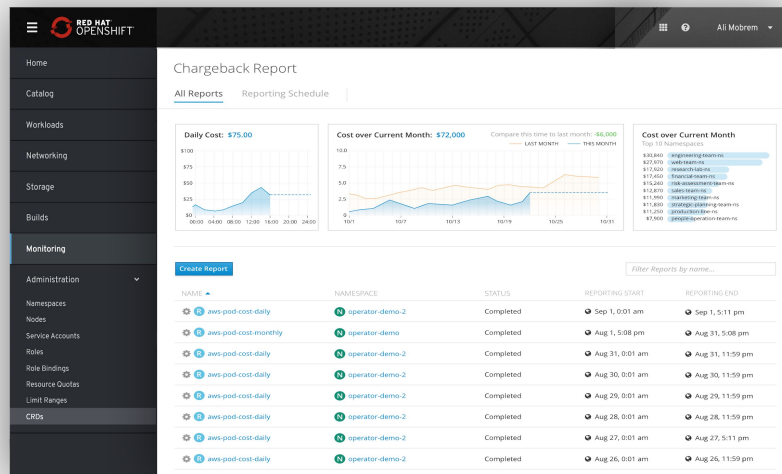
Future

TBD, ideas around over-the-air updates, operator status aggregated from operands...

<https://operatorhub.io>

METERING/CHARGEBACK

- Testing a developer preview now
 - Install from OperatorHub
- Base functionality on all providers
- Tie into cloud providers for \$\$
- Included reports for 80% use-case
 - Customers can write custom reports and time periods
- Popular use-case: shame teams over requesting RAM



CPU
Memory
Storage

Request
Actual Usage
Utilization %

Pod
Namespace
Node
Cluster

Where to get started?

- <https://github.com/operator-framework/getting-started>
- <https://github.com/operator-framework/community-operators>
- <https://commons.openshift.org/sig/operators.html>
- [#kubernetes-operators](#) on the kubernetes slack
- <https://groups.google.com/forum/#!forum/operator-framework>
- Openshift Commons Briefing my Daniel Messer
<https://youtu.be/GgEKEYH9MMM>

Thank you!