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# State of the Operators

## Framework, SDKs, and beyond

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# 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 FRAMEWORK

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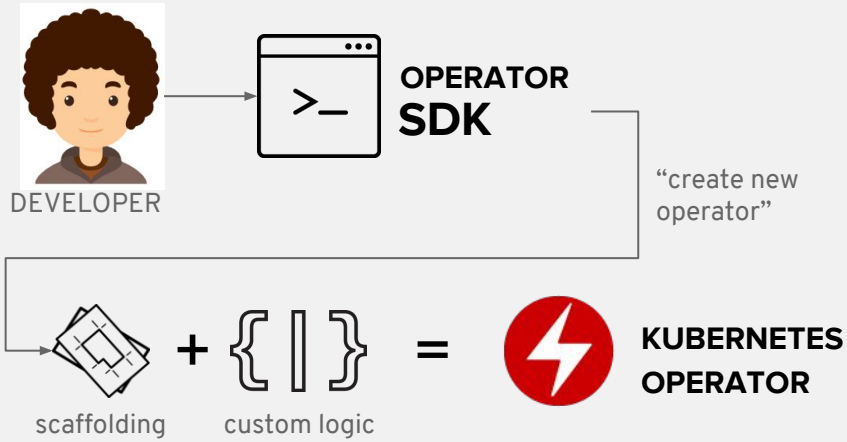
# OPERATOR FRAMEWORK

- **Operator SDK** - Allows developers to build, package and test an Operator based on your expertise without requiring all the knowledge of Kubernetes API complexities

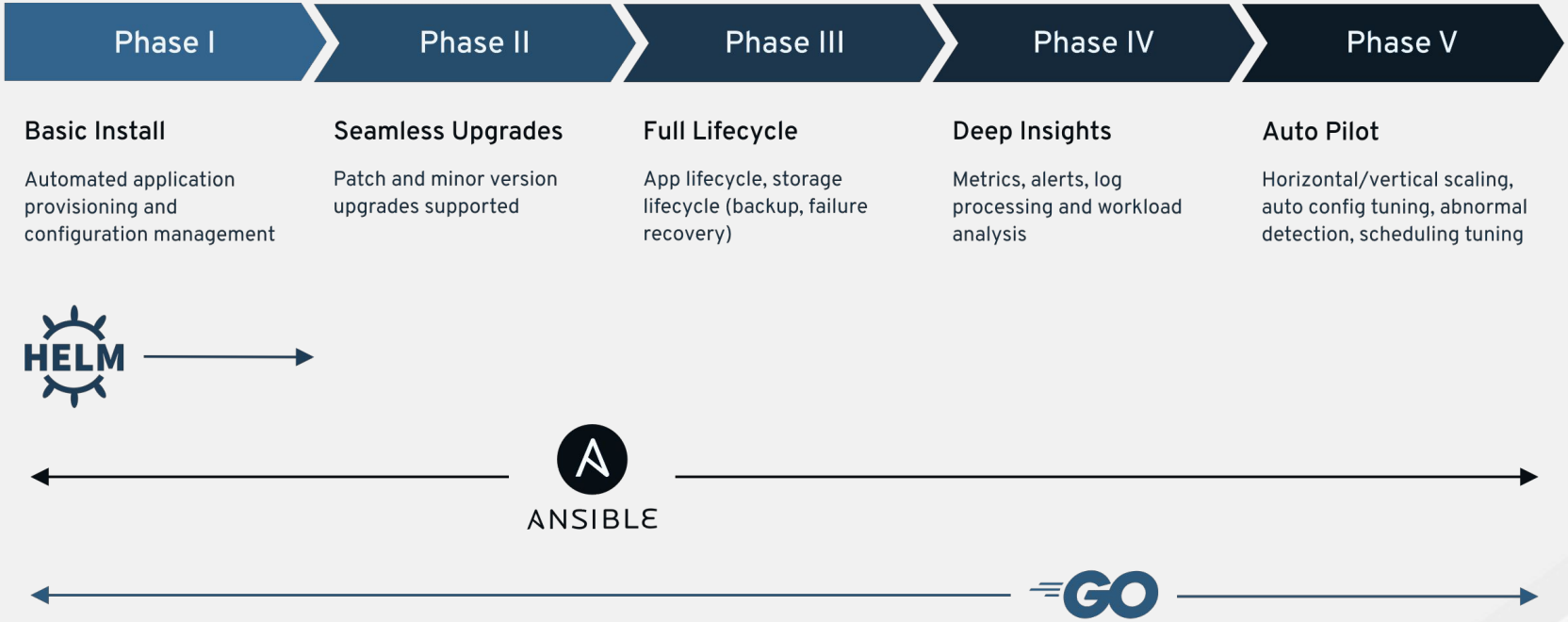
- **Operator Lifecycle Manager** - Helps you to install, and update, and generally manage the lifecycle of all of the Operators (and their associated services) running across your clusters

- **Operator Metering** - Enable usage reporting for Operators and resources within Kubernetes

# OPERATOR FRAMEWORK IN ACTION



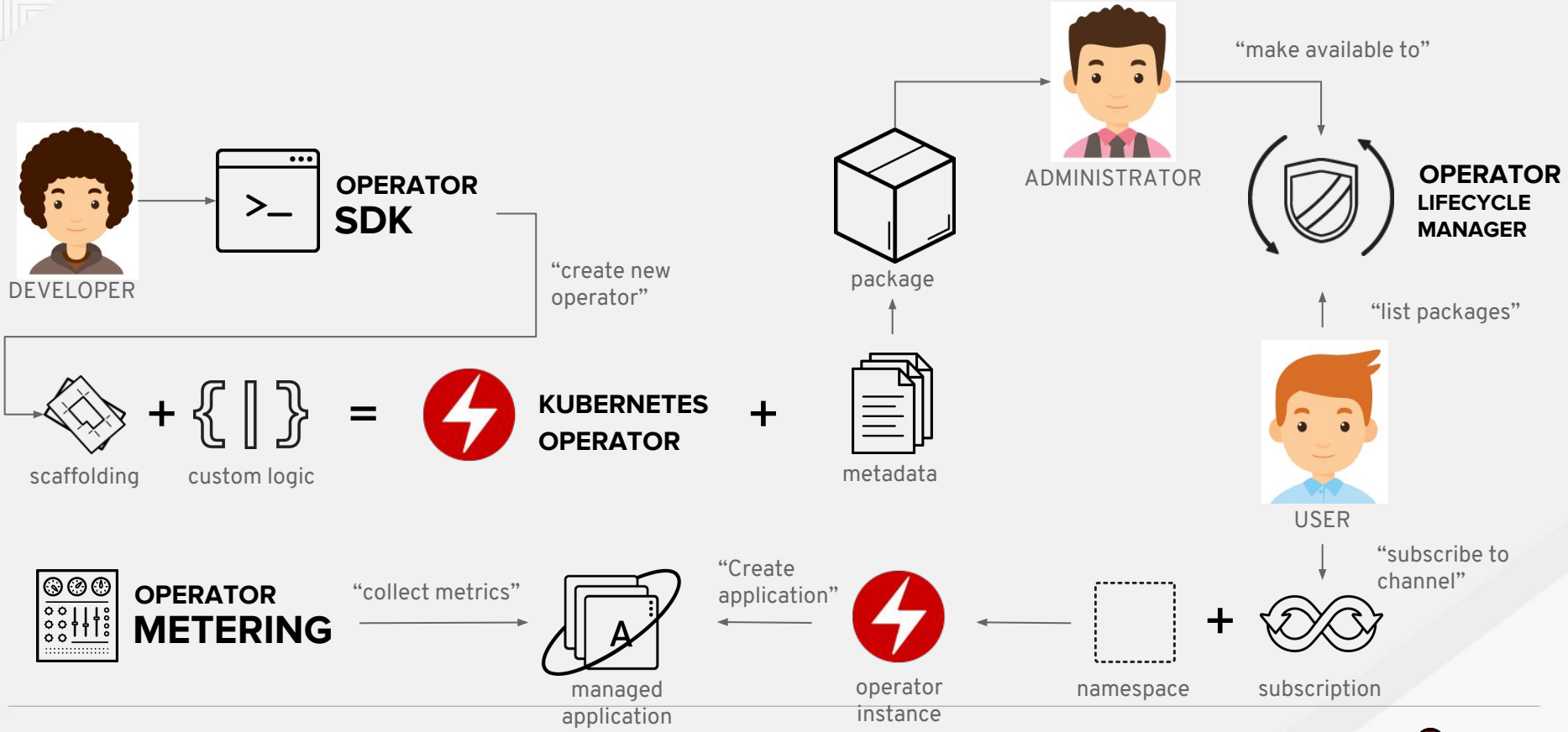
# TYPES OF OPERATORS



# CREATE AN OPERATOR WITHOUT CODING

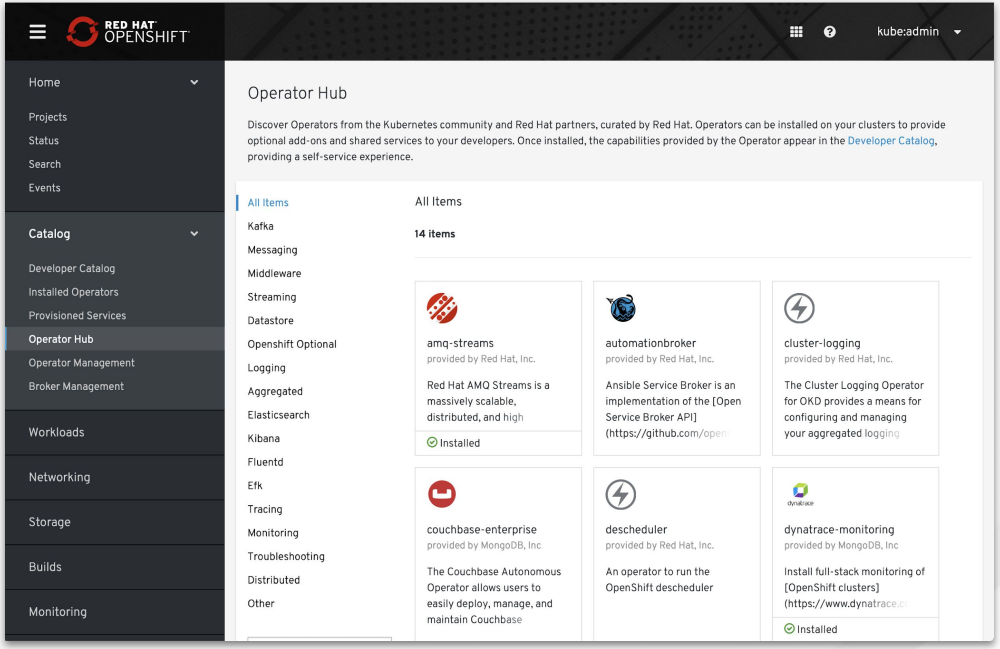
```
$ operator-sdk new cockroachdb-operator --type=helm --helm-chart stable/cockroachdb
```

# 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

DEVELOPER

OPERATOR
**SDK**

"create new operator"

scaffolding + custom logic =

**KUBERNETES OPERATOR**

pull request

COMMUNITY REPO

QUAY

OPERATOR
**HUB**

"browse catalog"

USER

"install"

"Create application"

operator instance

"collect metrics"

managed application

OPERATOR
**METERING**

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# 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**

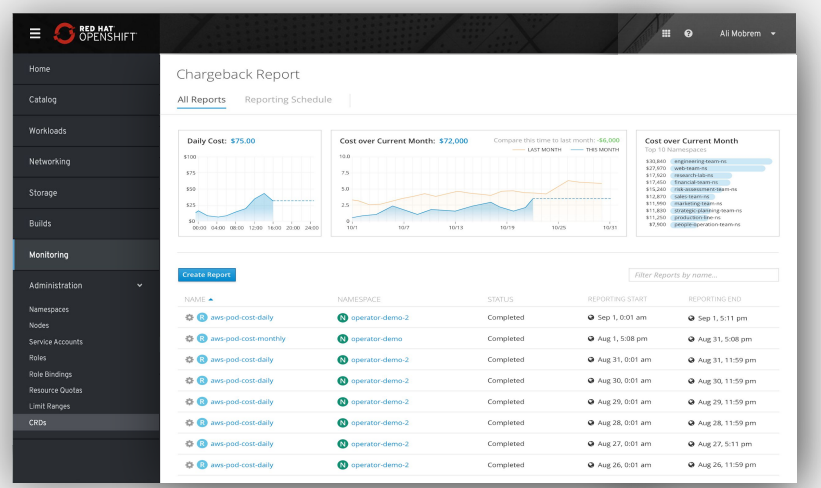
## Future

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

https://github.com/operator-framework/community-operators

# 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

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# 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

# Thank you!