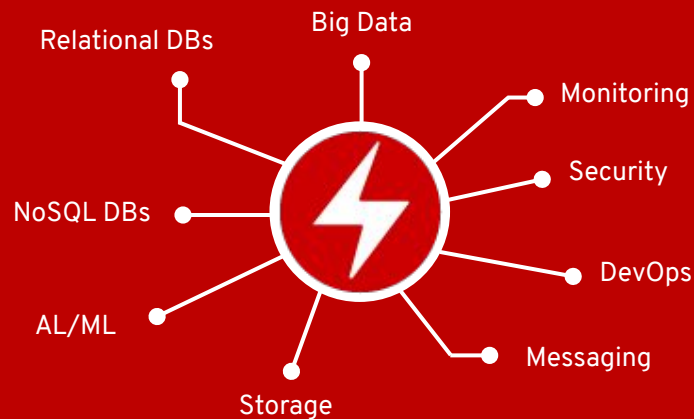# Operator Framework

A broad ecosystem of workloads

Operator-backed services allow for a
SaaS experience on your own infrastructure

Red Hat Certified Operators

Generally Available

OperatorHub data sources
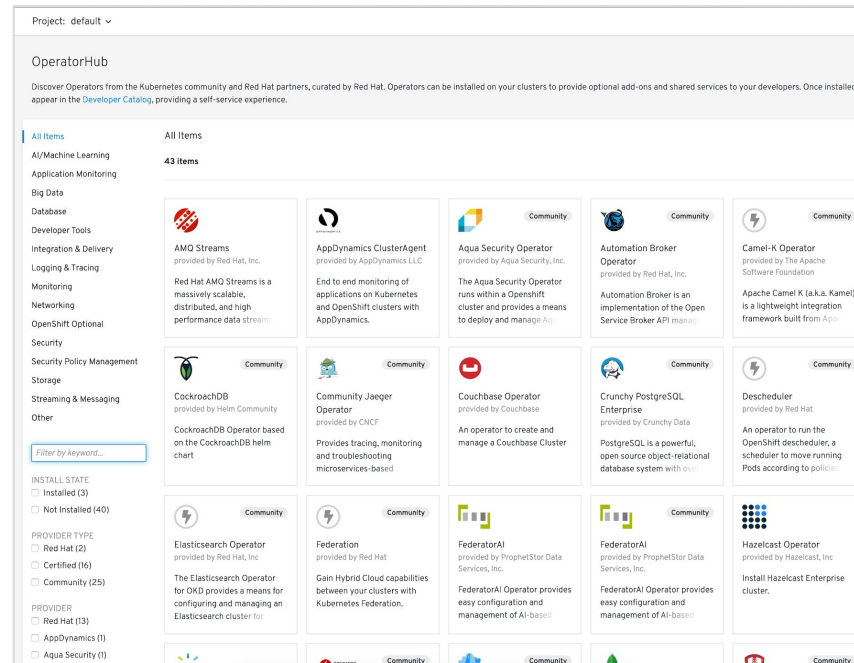
Requires an online cluster

- For 4.1, the cluster must have connectivity to the internet
- Later 4.x releases will add offline capabilities

Operator Metadata

- Stored in quay.io
- Fetches channels and available versions for each Operator

Container Images

- Red Hat products and certified partners come from RHCC
- Community content comes from a variety of registries

Services ready for your developers

New Developer Catalog aggregates apps

- Blended view of Operators, Templates and Broker backed services
- Operators can expose multiple CRDs. Example:
  - MongoDBReplicaSet
  - MongoDBSharded Cluster
  - MongoDBStandalone
- Developers can't see any of the admin screens

Self-service is key for productivity

- Developers with access can change settings and test out new services at any time

Product Manager: Daniel Messer   Generally Available
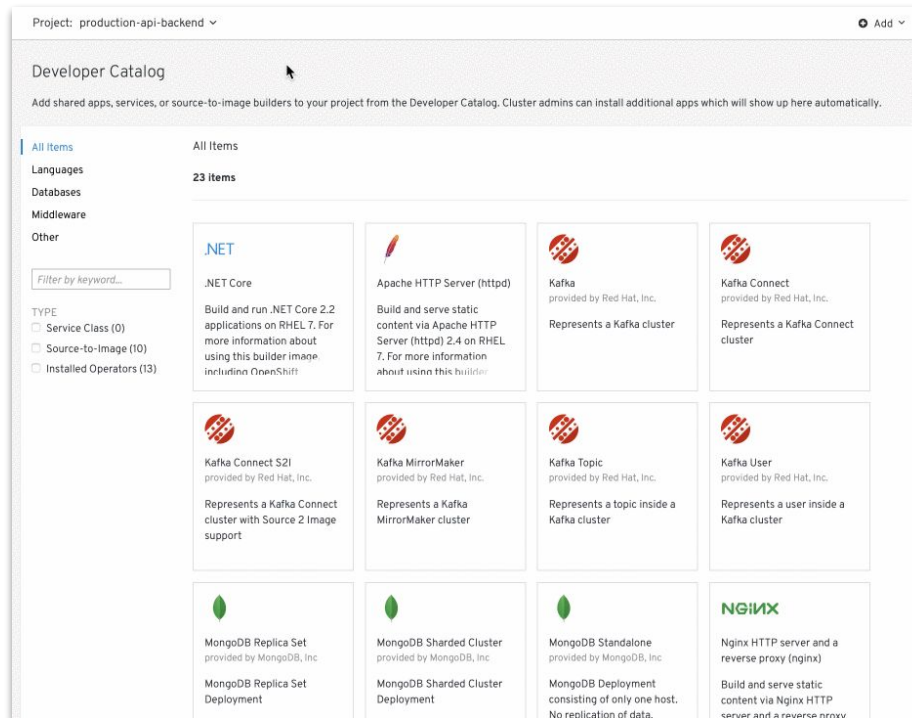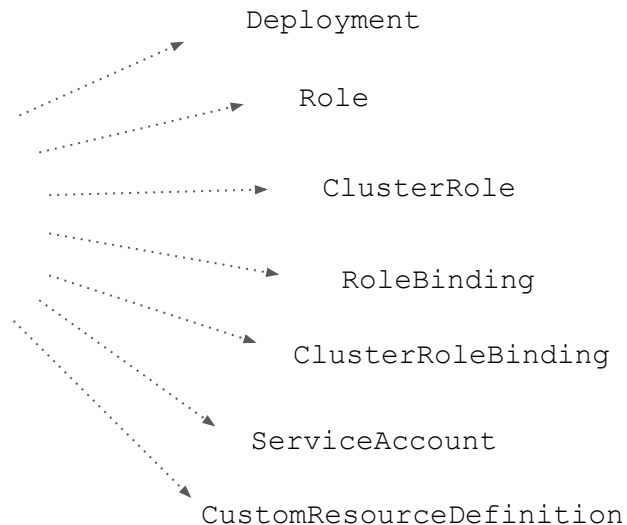
Operators as a First-Class Citizen

YourOperator v1.1.2 Bundle

OPERATOR LIFECYCLE MANAGER

Operator Deployment
Custom Resource
Definitions
RBAC
API Dependencies
Update Path
Metadata

```
Deployment

Role

ClusterRole

RoleBinding

ClusterRoleBinding

ServiceAccount

CustomResourceDefinition
```

Product Manager: Daniel Messer   Generally Available

Red Hat

Operator Lifecycle Management

Operator Catalog

OPERATOR LIFECYCLE MANAGER

Subscription for YourOperator

Version

YourOperator v1.2.2

YourOperator v1.2.0

YourOperator v1.1.3

YourOperator v1.1.2
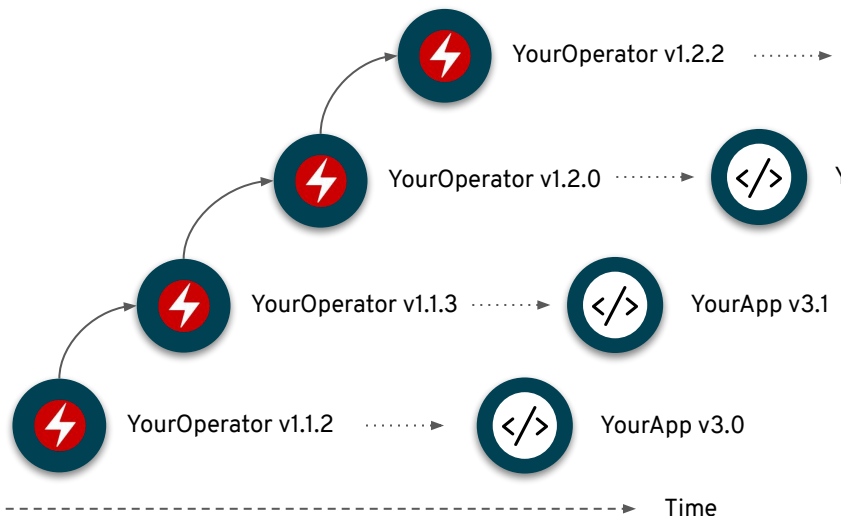
Time

Operator Lifecycle Management

Operator Catalog

OPERATOR LIFECYCLE MANAGER

Subscription for YourOperator

Version

YourOperator v1.2.2

YourOperator v1.2.0

YourOperator v1.1.3   YourApp v3.1

YourOperator v1.1.2   YourApp v3.0

Time

Generally Available

Red Hat

Operator Upgrade in Detail

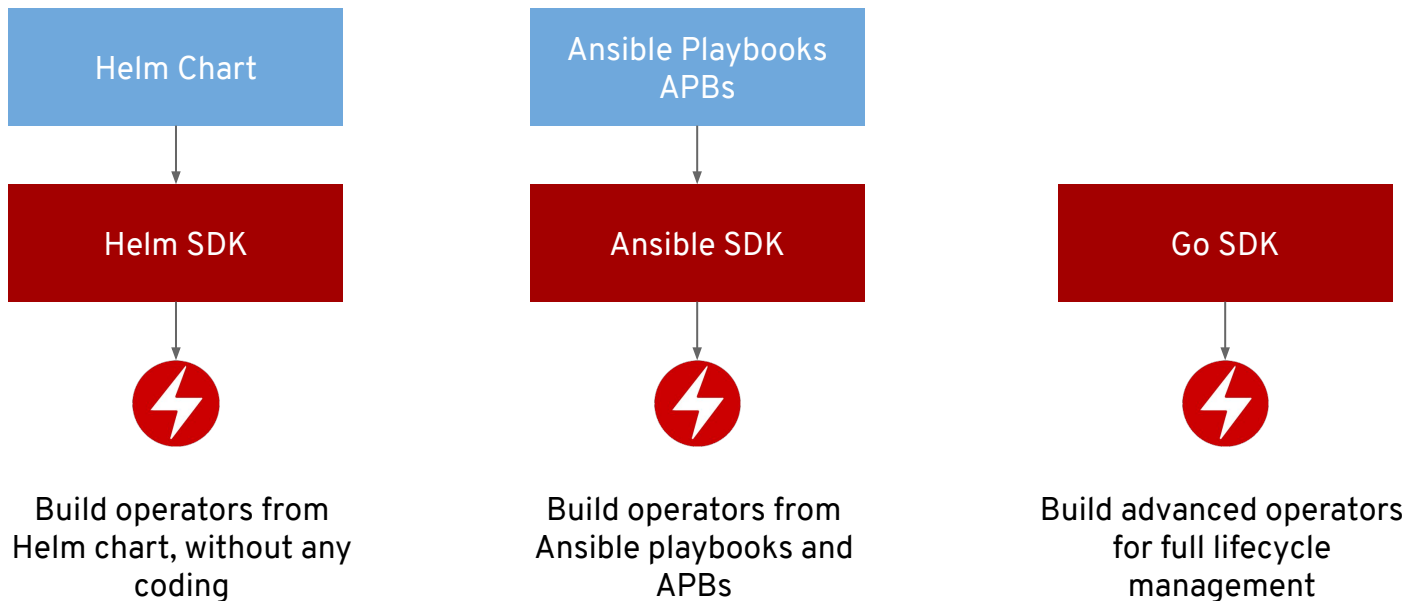**OperatorHub facilitates upgrades of installed Operators**

- Manual or automatic modes can be chosen per Operator
- The Operator itself is upgraded by OLM via Deployment and a regular rolling upgrade
- The objects managed by the Operator use built in mechanisms to maintain HA
  - Deployments/StatefulSets
  - affinity/anti-affinity
  - taints/tolerations
  - PodDisruptionBudgets
- Behavior is dependent on the maturity of the Operator
- Optional cluster components like Cluster Logging are well behaved during upgrades

Product Manager: Daniel Messer   Generally Available

OPERATOR
SDK

Build Operators for your apps

Helm Chart	Ansible Playbooks APBs	
Helm SDK	Ansible SDK	Go SDK

Build operators from Helm chart, without any coding

Build operators from Ansible playbooks and APBs

Build advanced operators for full lifecycle management

Depend on other Operators

Operator Framework Dependency Graphs

requires → jaeger.jaegertracing.io/v1 → resolves to → Jaeger Operator → installed by

YourOperator v1.1.2

requires → cockroachdb.charts.helm.k8s.io/v1alpha1 → resolves to → CockroachDB Operator → installed by

OPERATOR
LIFECYCLE MANAGER
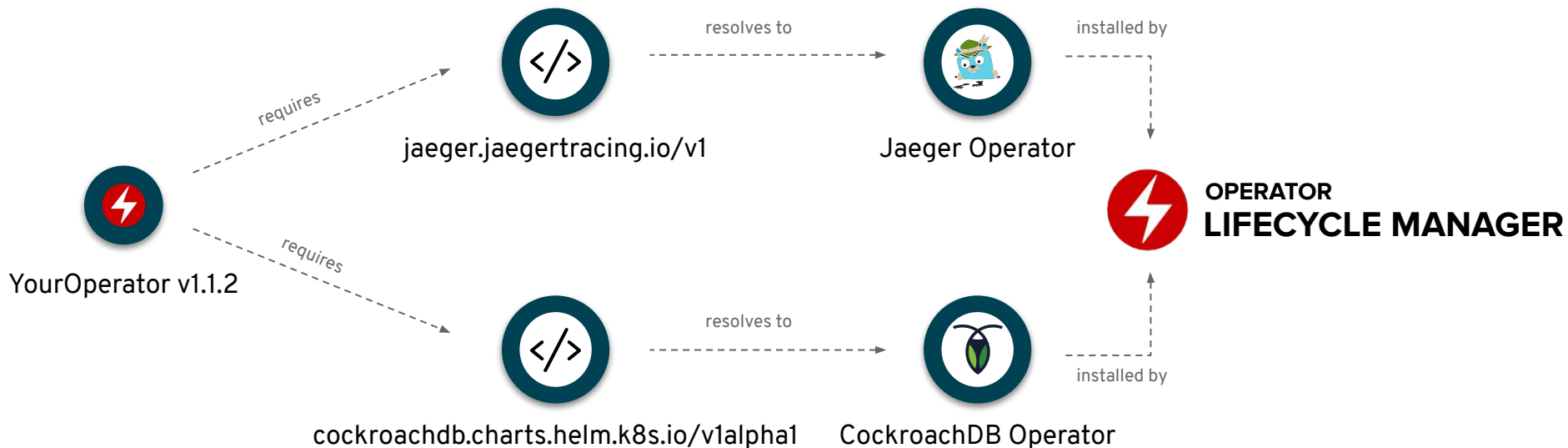
Red Hat Middleware

Same experience as 3.x for developers

- Admins install Service Brokers via OperatorHub
- Devs consume via Developer Catalog

Transitioning to Operators

- First Operators are out
  - AMQ Streams (Kafka)
  - Fuse Online
  - CodeReady Workspaces
  - Business Automation (Tech Preview)
  - Data Grid

- More to follow in 2019
  - Red Hat Integration - July:
    - AMQ Interconnect, AMQ Broker
    - 3scale API Management
    - Apicurio API Designer
  - Business Automation - July (GA)
  - Red Hat Application Runtimes
    - MW Component Operator - July

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