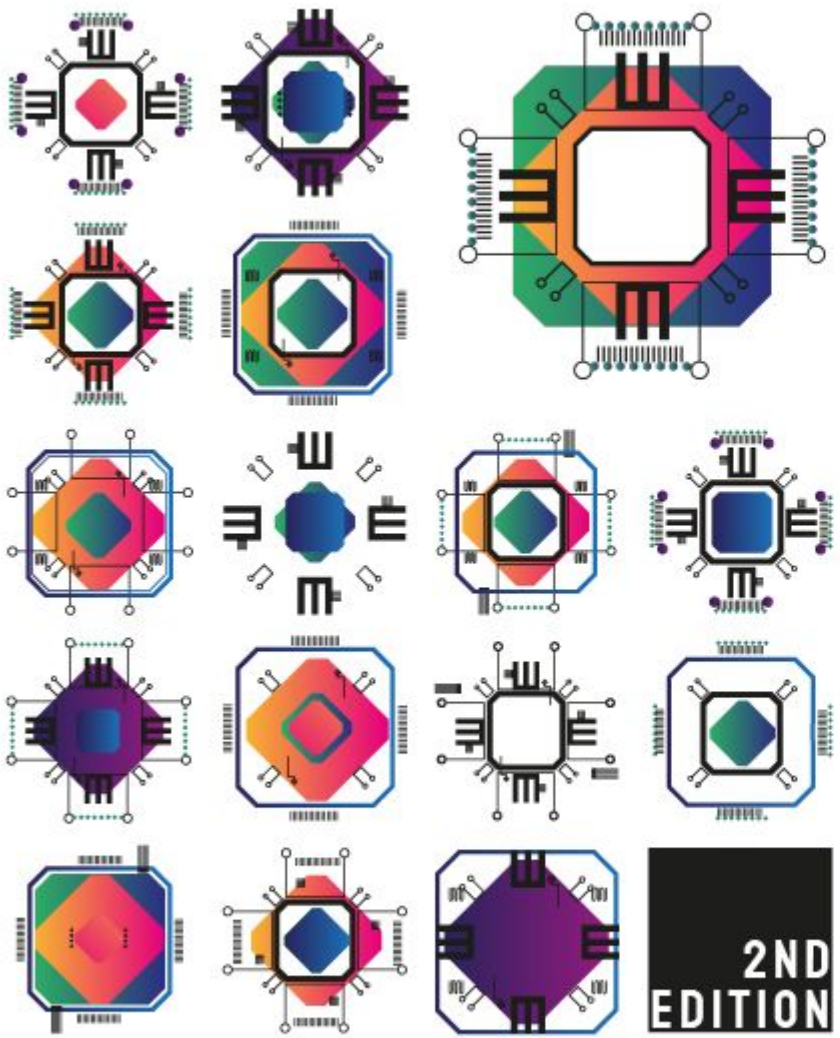

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Apache Camel K: Bringing serverless workloads to the enterprise

Luca Burgazzoli
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Red Hat

SORINT lab

About me

Luca Burgazzoli
Principal Software Engineer @ Red Hat

Works on:
- Apache Camel, Camel K and Camel Quarkus
- Syndesis
- Red Hat Fuse

What is Apache Camel K ?

A lightweight integration platform based on Apache Camel, born on Kubernetes, with serverless superpowers

Serverless: what does it mean ?

“Serverless computing refers to the concept of building and running applications that do not require server management. It describes a finer-grained deployment model where applications, bundled as one or more functions, are uploaded to a platform and then executed, scaled, and billed in response to the exact demand needed at the moment.”

CLOUD NATIVE
COMPUTING FOUNDATION

Technology landscape

Kubernetes

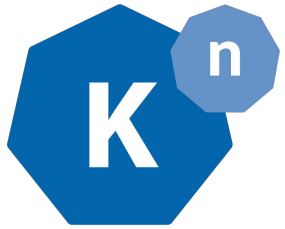
The helmsman

A portable, extensible open-source platform for managing containerized workloads and services

Apache Camel

Integrate everything

- a versatile open-source integration framework based on known Enterprise Integration Patterns (EIP) that allow to define routing and mediation rules using a powerful Domain Specific Language (DSL).
- it offers a large selection of connectors (300+) making it possible to integrate almost every 3th party system.



Knative

Serverless building blocks

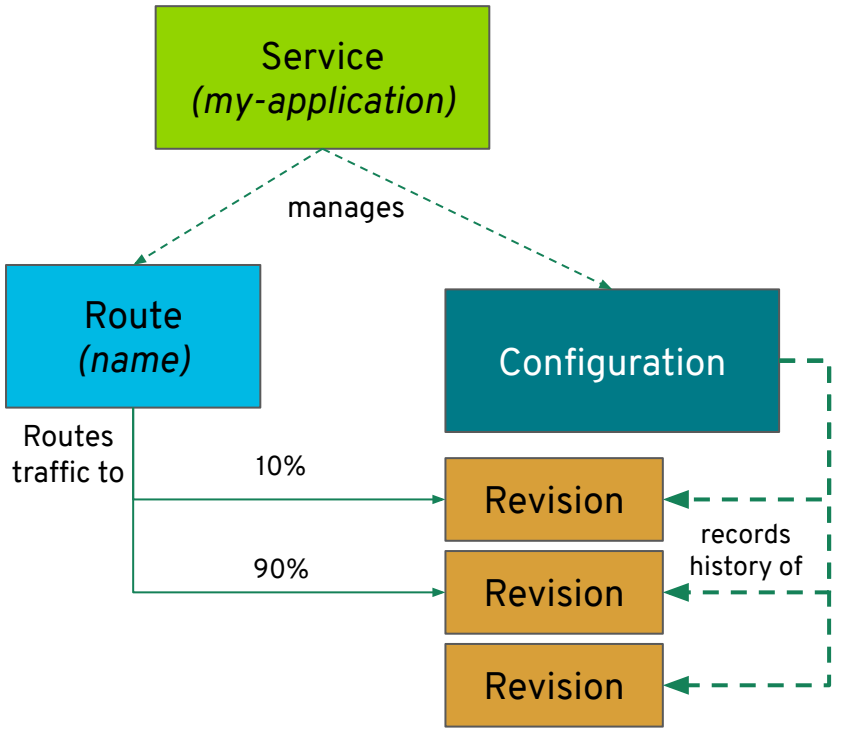
Building blocks to build, deploy and manage serverless workload on top Kubernetes.

As today the main components Knative provides are:

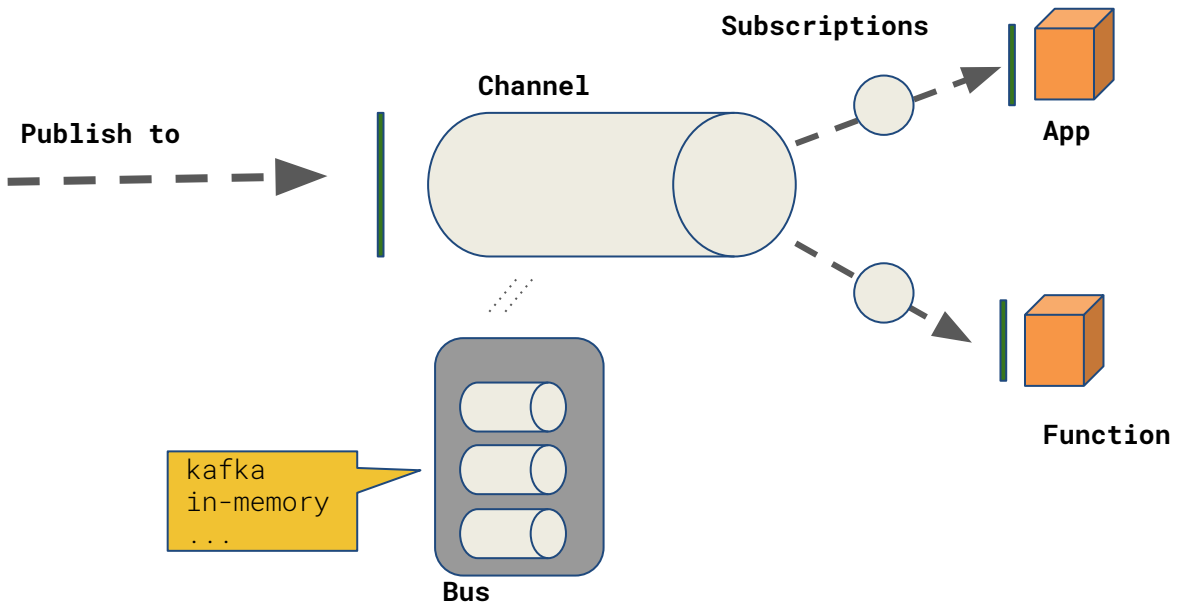
- Serving: scale-to-zero, request-driven compute functionalities
- Eventing: functionalities to create loosely-coupled and event-driven serverless application

Knative Serving

- **Configurations** represent the 'floating HEAD' of a history of Revisions
- **Revisions** represent immutable snapshot of code and configuration
- **Routes** configure ingress over a collection of Revisions and/or Configurations
- **Services** (nope, not k8s services) are top-level controllers that manage a set of **Routes** and **Configurations** to implement a network service



Knative Eventing



- Standardized message format on CloudEvents
- **Push model**: the broker will invoke the subscribers service through an http call

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Apache Camel K 101

Red Hat

SORINT.lab

1. Create an integration file

Camel DSL

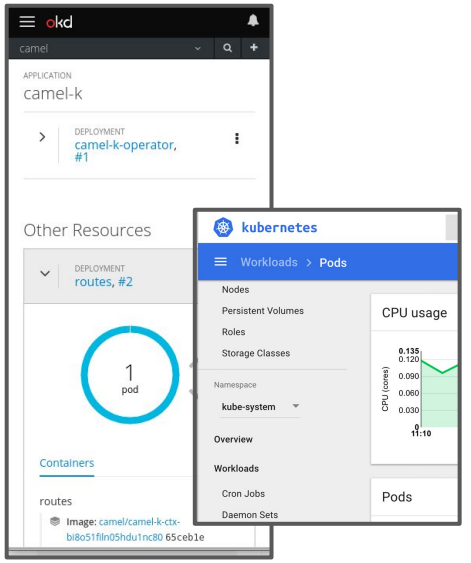
```
from('timer:groovy?period=1s')
    .setBody()
        .simple('Hello Camel K!')
    .to('log:info?showAll=false')
```

2. Run it

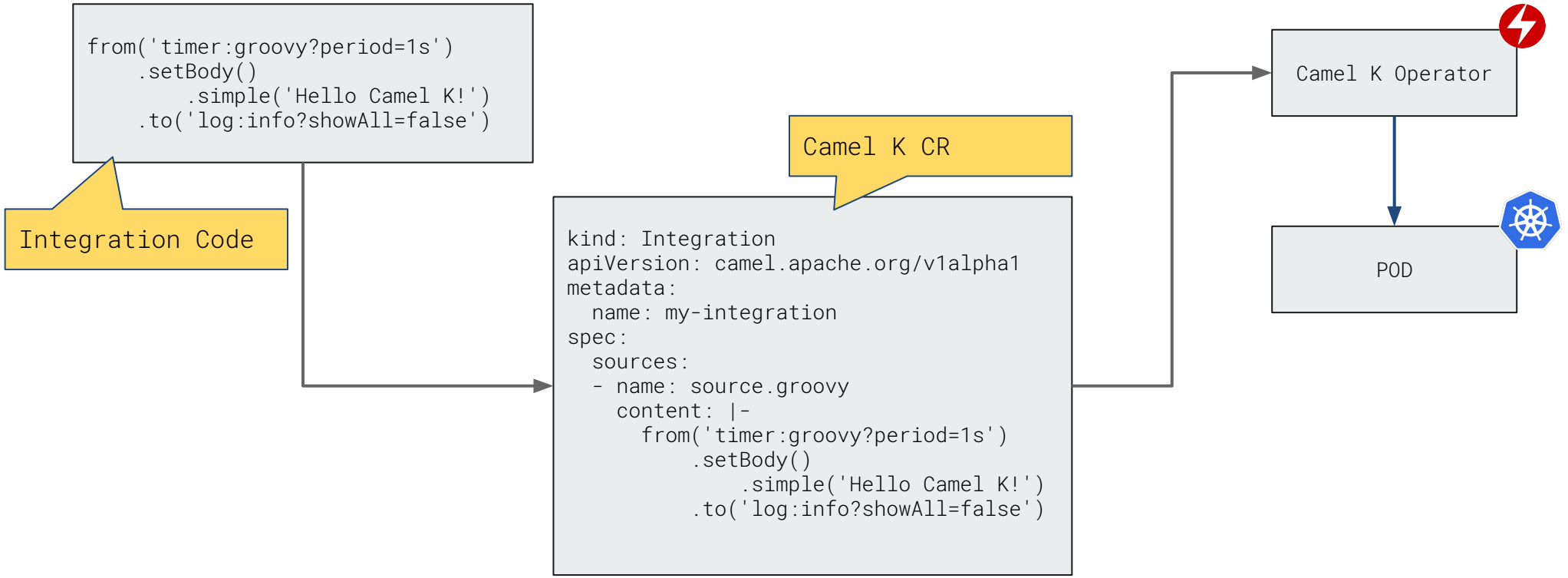
```
$ kamel run integration.groovy
```

The camel-k CLI is (kamel) is optional

3. It runs on Kubernetes/OpenShift



Under the hoods



Apache Camel K- Operator

golang / operator-sdk

- Choose the runtime
- Scaffold a project
- Add boilerplate
- Discover and manage dependencies
- Create container image
- Materialize the integration

Apache Camel K- Operator

golang / operator-sdk

Code driven

- Choose the runtime
- Scaffold a project
- Add boilerplate
- Discover and manage dependencies
- Create container image
- Materialize the integration

```
from(undertow:http://0.0.0.0:8080/api')
    .to(slack:channel')
```

Apache Camel K- Operator

golang / operator-sdk

- Choose the runtime
- Scaffold a project
- Add boilerplate
- Discover and manage dependencies
- Create container image
- Materialize the integration

- Not always needed
- Incremental

Apache Camel K- Integration Runtime

java / apache camel

Runtimes

- Java Main
- Quarkus (WIP)
- ~~Spring Boot~~

Languages

- Java
- XML
- Groovy
- Kotlin
- JavaScript
- YAML

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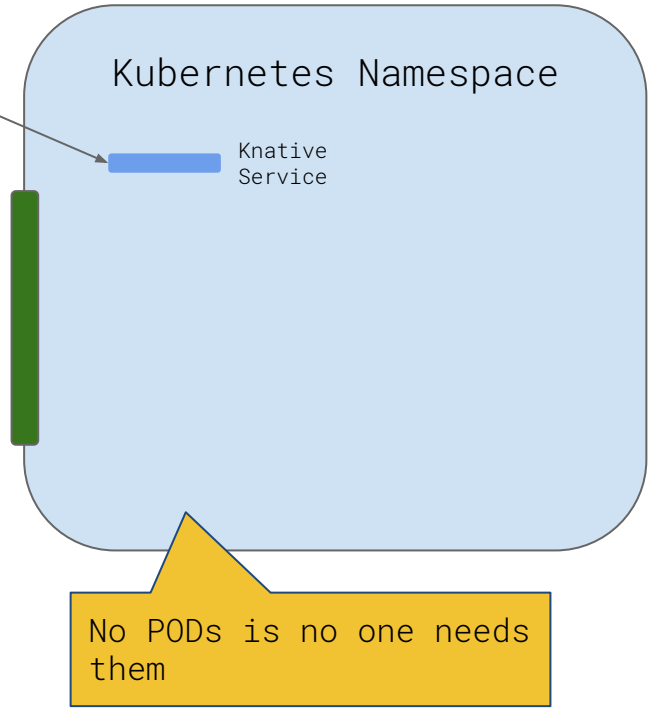
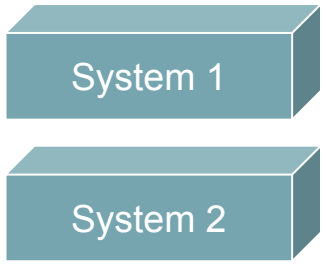
Apache Camel K + Knative

Serving

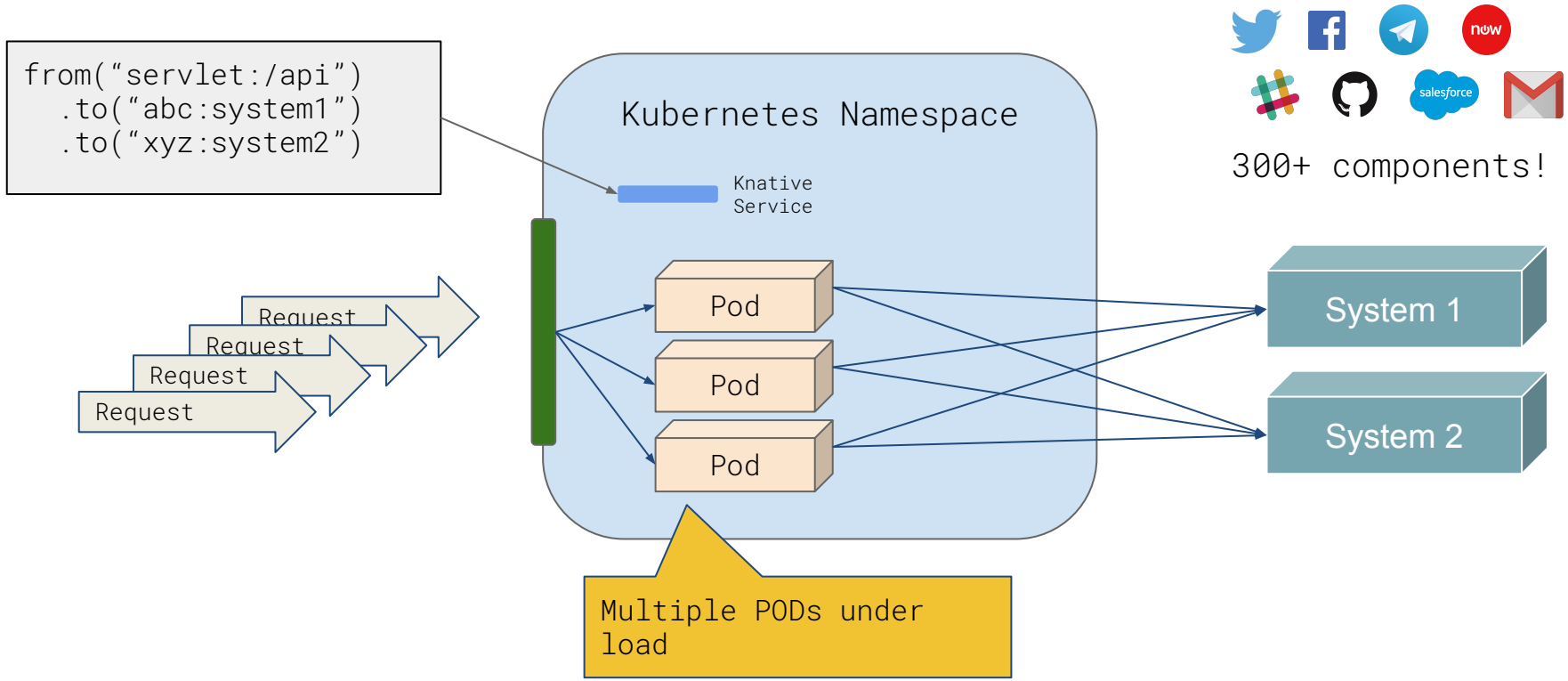
```
from("servlet:/api")
  .to("abc:system1")
  .to("xyz:system2")
```



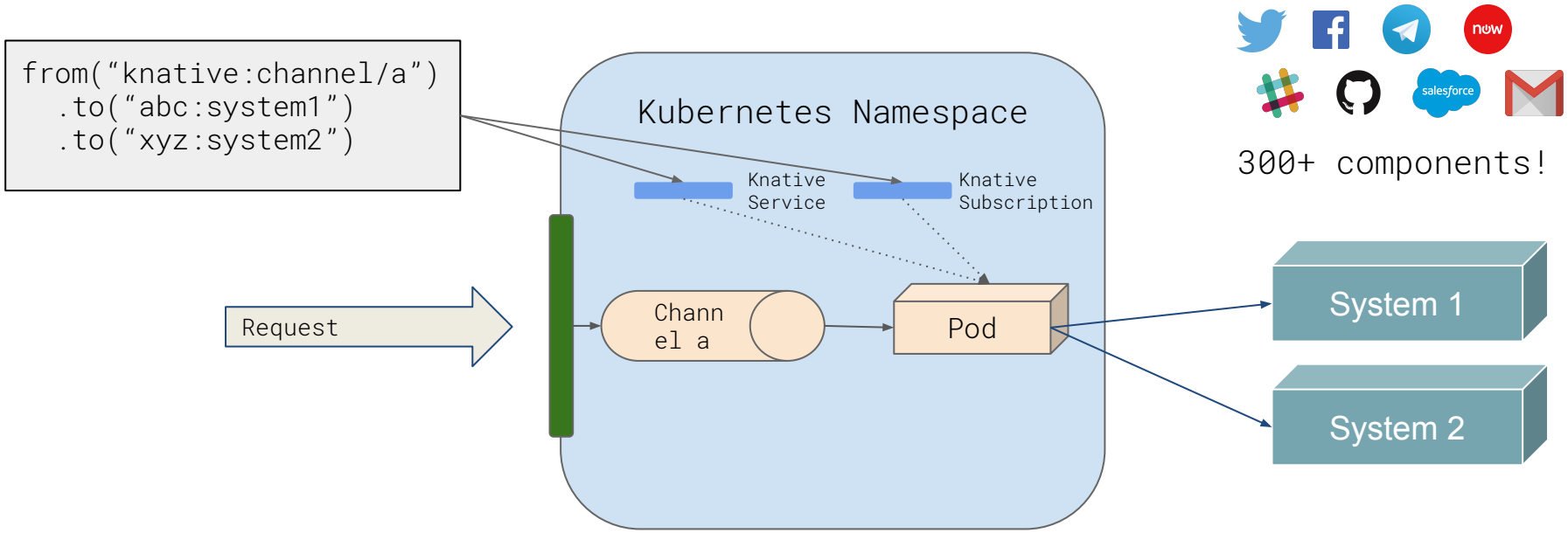
300+ components!



Serving


from("servlet:/api")
.to("abc:system1")
.to("xyz:system2")
Kubernetes Namespace
Knative Service
Pod
Pod
Pod
Request
Request
Request
Request
300+ components!
System 1
System 2
Multiple PODs under load

Eventing

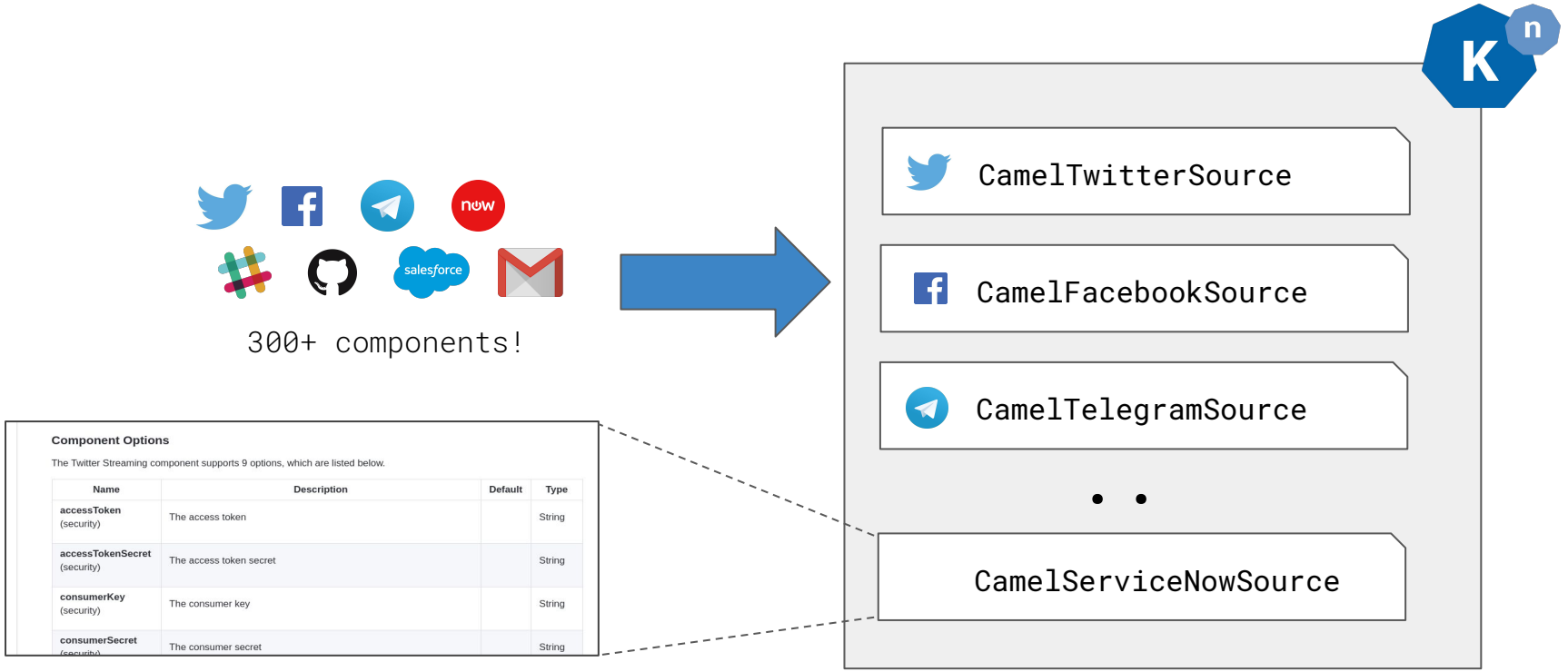

from("knative:channel/a")
.to("abc:system1")
.to("xyz:system2")
Kubernetes Namespace
Knative Service
Knative Subscription
Request
Chann el a
Pod
System 1
System 2
300+ components!

Eventing - Sources

Event Sources are Kubernetes Custom Resources which provide a mechanism for registering interest in a class of events from a particular software system.

Mh, doesn't it look similar to a Camel consumer ?

Eventing - Sources

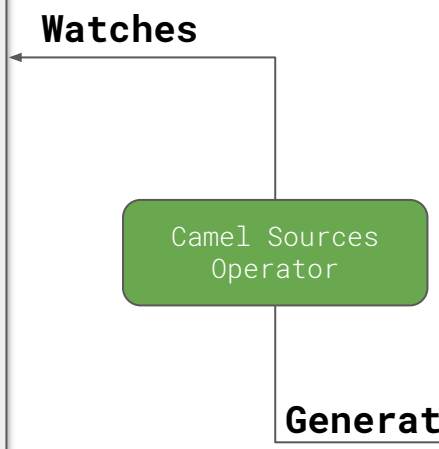


Eventing - Sources

Camel Sources are an addon to Knative, currently in Knative eventing-contrib:

https://github.com/knative/eventing-contrib/tree/master/camel/source

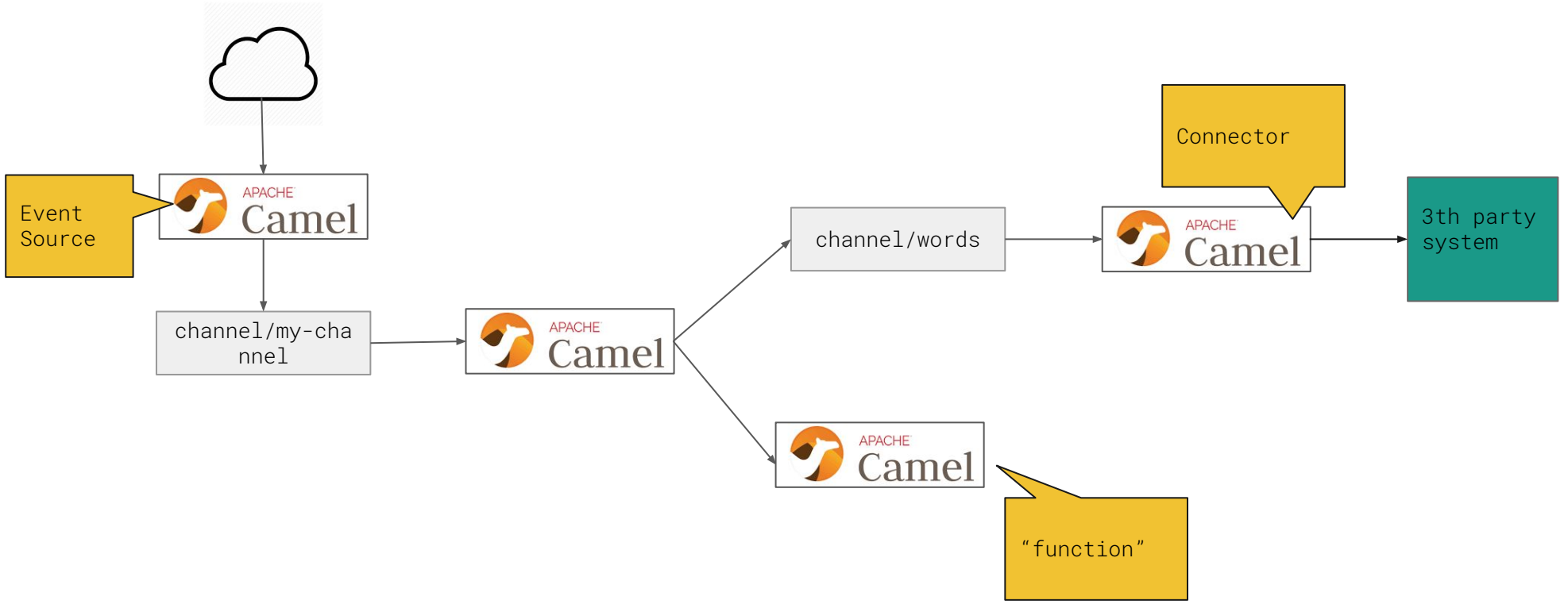
```yaml
apiVersion: sources.eventing.knative.dev/v1alpha1
kind: CamelSource
metadata:
 name: camel-timer-flow-source
spec:
 source:
   flow: |
     from:
       uri: timer:tick?period=3s
       steps:
         - set-body:
             constant: Hello world!
 sink:
   apiVersion: eventing.knative.dev/v1alpha1
   kind: Channel
   name: camel-test
```




```yaml
kind: Integration
apiVersion: camel.apache.org/v1alpha1
metadata:
  name: my-integration
spec:
  source:
  - content: |
    - from:
      uri: timer:tick?period=3s
      steps:
      - set-body:
        constant: Hello world!
      - to:
        uri: knative://endpoint/sink
    language: yaml
    name: flow.yaml
  ...
```

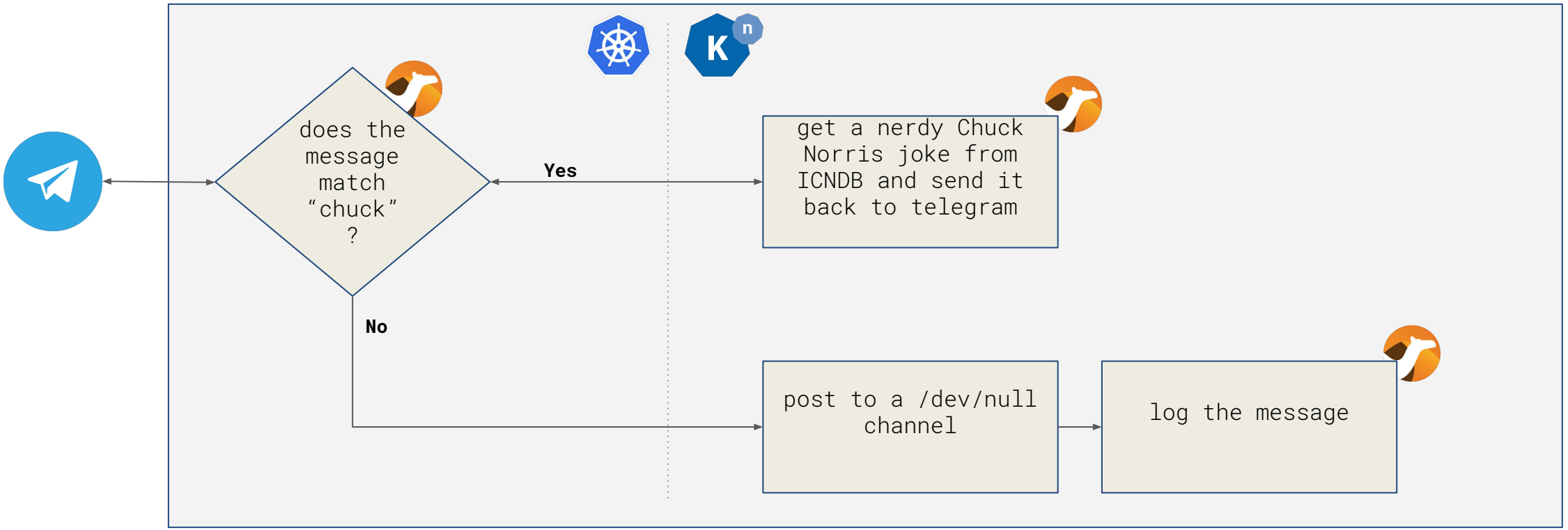
Wrap up

Same model for different purposes



Demo

Abstract

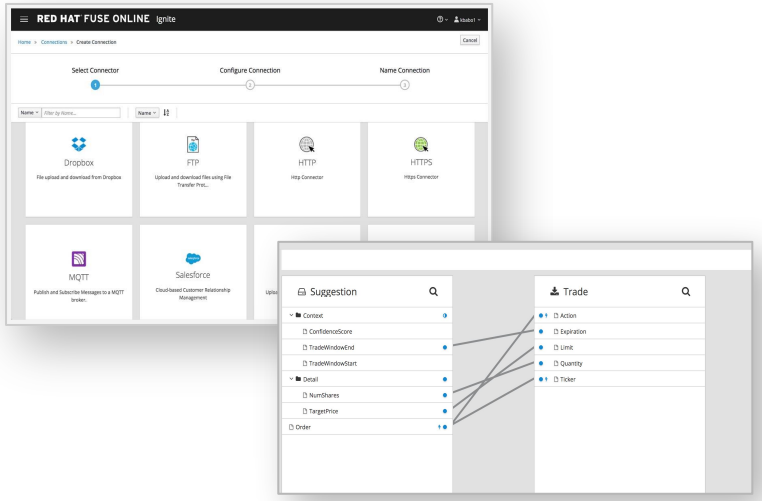

does the message match “chuck” ?
Yes
No
get a nerdy Chuck Norris joke from ICNDB and send it back to telegram
post to a /dev/null channel
log the message

Something more ...

Engine behind Syndesis

SYNDESIS

3scale by Red Hat



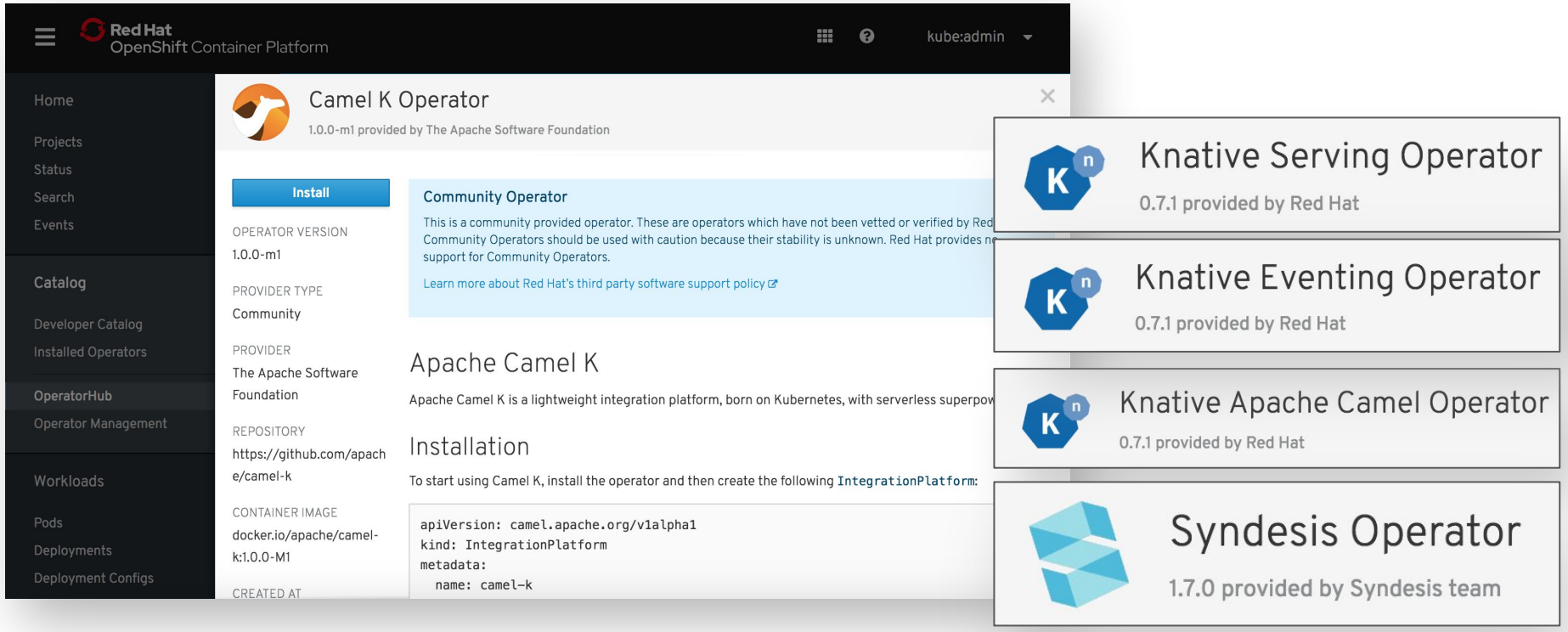
A web-based integration platform

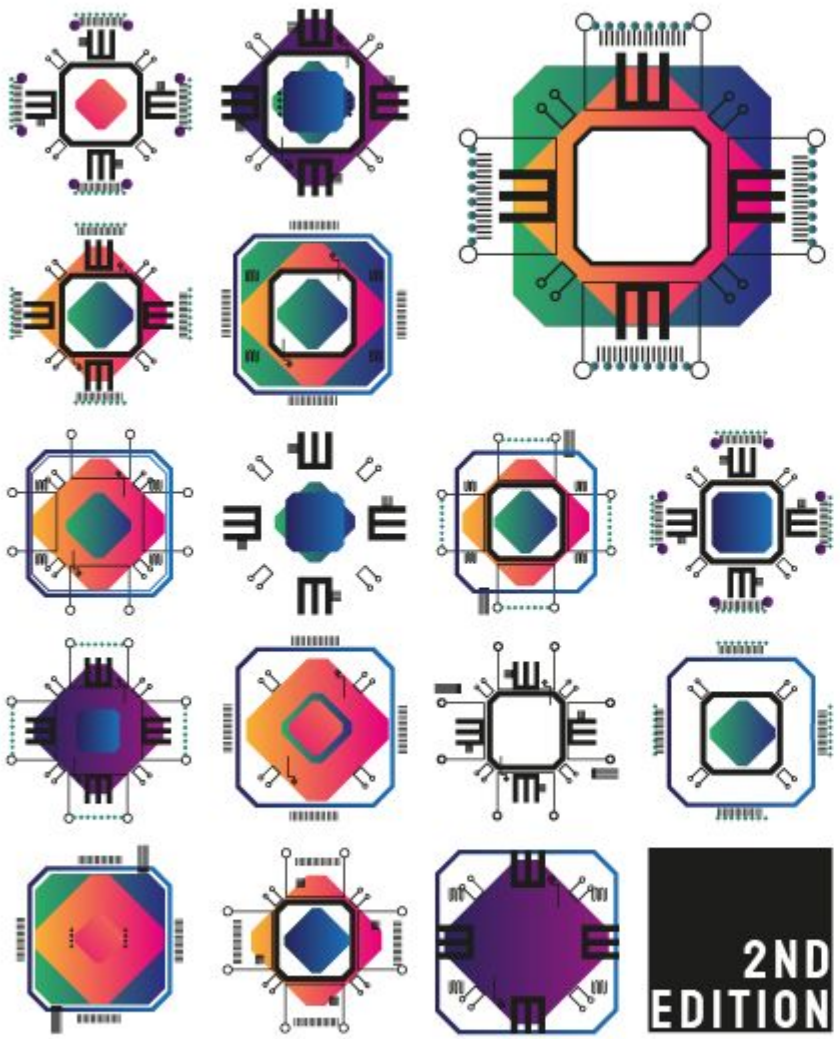
For: Citizen Integrators

Features:

- Multiple connectors built from Camel components
- Few clicks to define a integration
- Graphical data mapping capabilities
- Design, expose or consume REST API
- Integrated with Apicur.io for API design
- Integrated with 3Scale for API management

Available in OperatorHub





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THANKS!

@lburgazzoli

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Click to add subtitle

Insert paragraph of copy here. Do not exceed 40 words.

- Bullet
- Bullet
- Bullet