



KubeCon



CloudNativeCon

Europe 2020

Virtual

Serverless Integration on Kubernetes with Apache Camel K

Nicola Ferraro

Agenda



- What is Apache Camel (and Camel K)?
- Camel K in the serverless space
- Demo
- Future developments

About me



Virtual



Nicola Ferraro

Principal Software Engineer at Red Hat

Twitter: @ni_ferraro

I work on:

- Apache Camel and Camel K
- Red Hat Integration
- Knative Contrib

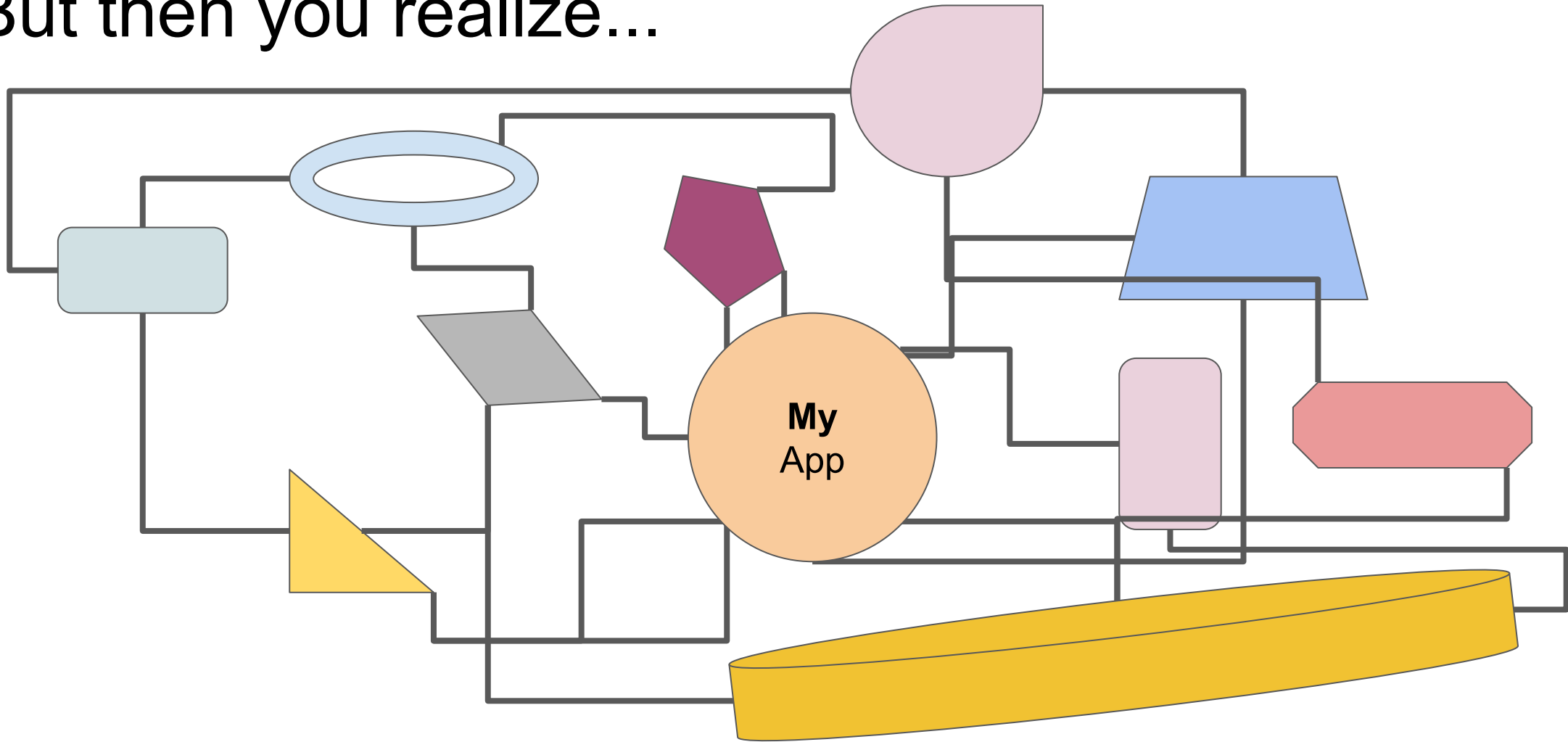
INTRO TO APACHE CAMEL

Software development is fun...



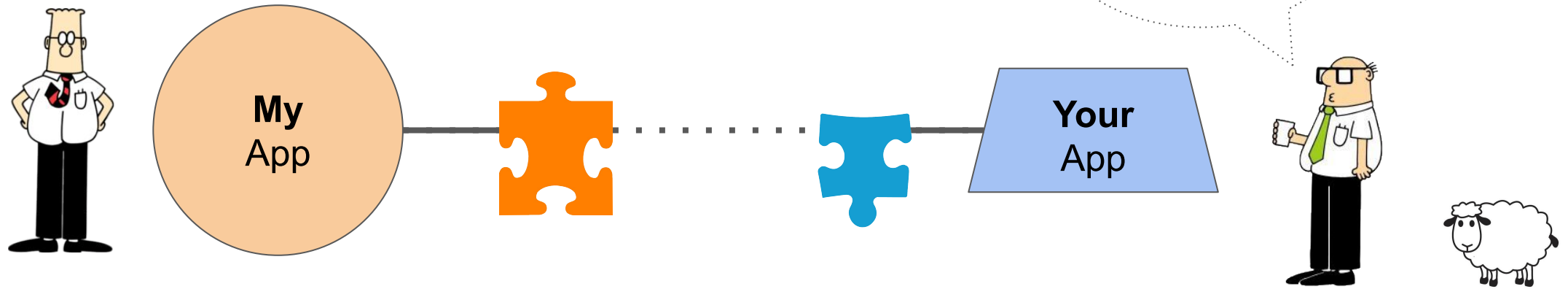
... when you're free to play!

But then you realize...



... that you're not alone in the world!

Even with only two systems...



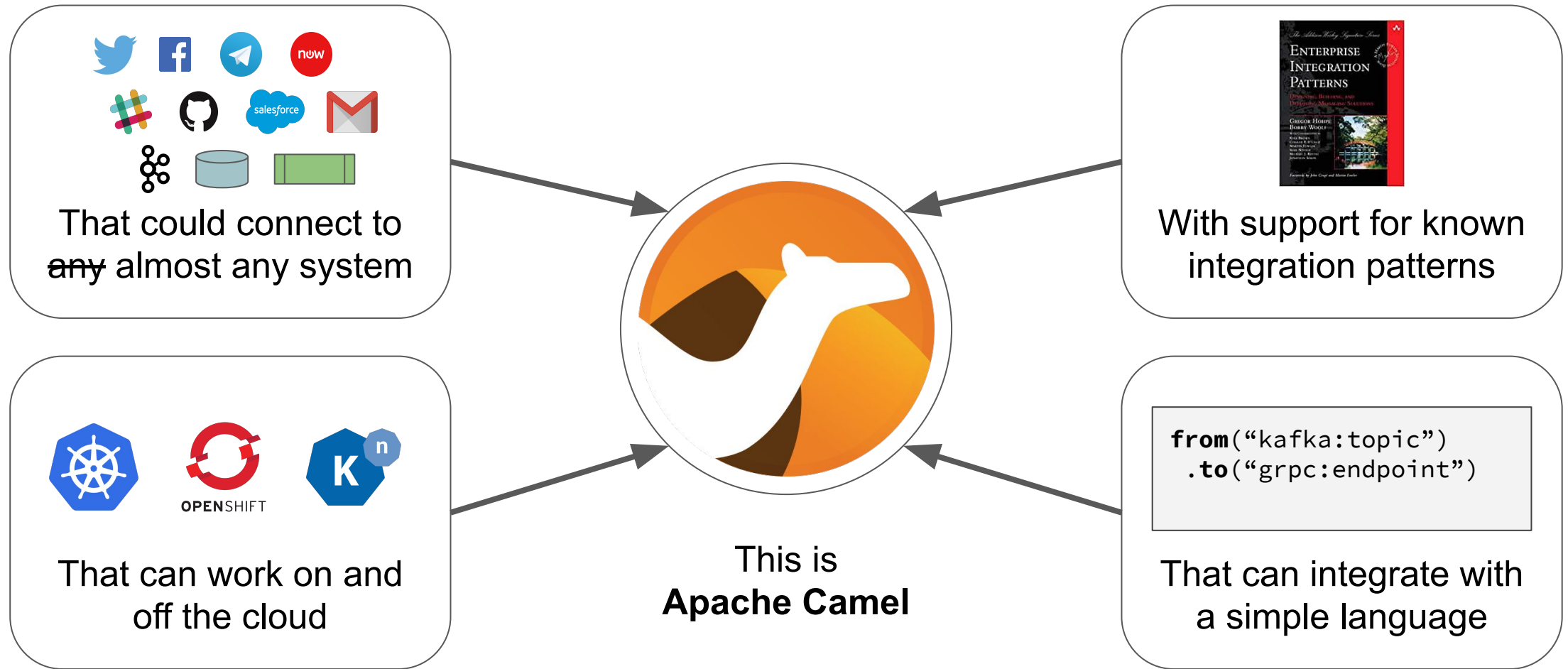
You need to solve a lot of problems:

- Different **communication** models (e.g. sync / async)
- Different **protocols** or **messaging** systems
- Different **languages** or **technologies**
- Different **business** domains
- Different **data** access patterns
- ...
- What if your app is **unavailable**?
- How do we manage **consistency**?

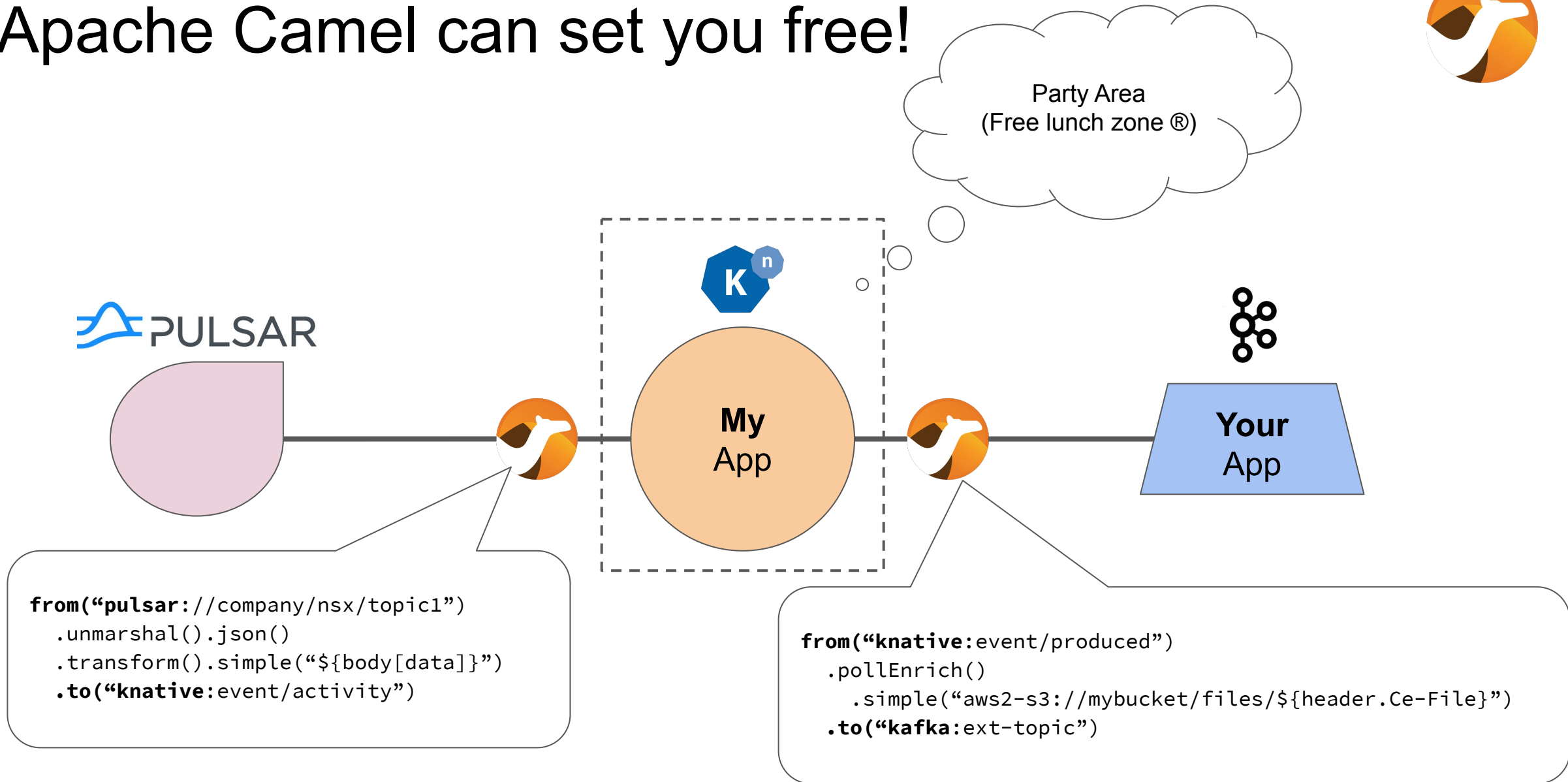


- **Different life philosophy**
- **Inability to change** the other side
- ...

If we had the perfect tool to deal with integration...



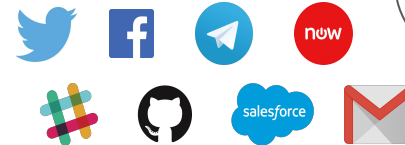
Apache Camel can set you free!



Apache Camel as of 2019/2020



- One of the **most active Apache projects**
- Several components **contributed by the community**
 - We have ~~329~~ **346** components today



Community is
what makes
Camel different

↑ **+40% New Users** (users@camel.apache.org and StackOverflow)

↑ **+5 New Committers** and **PMC** members

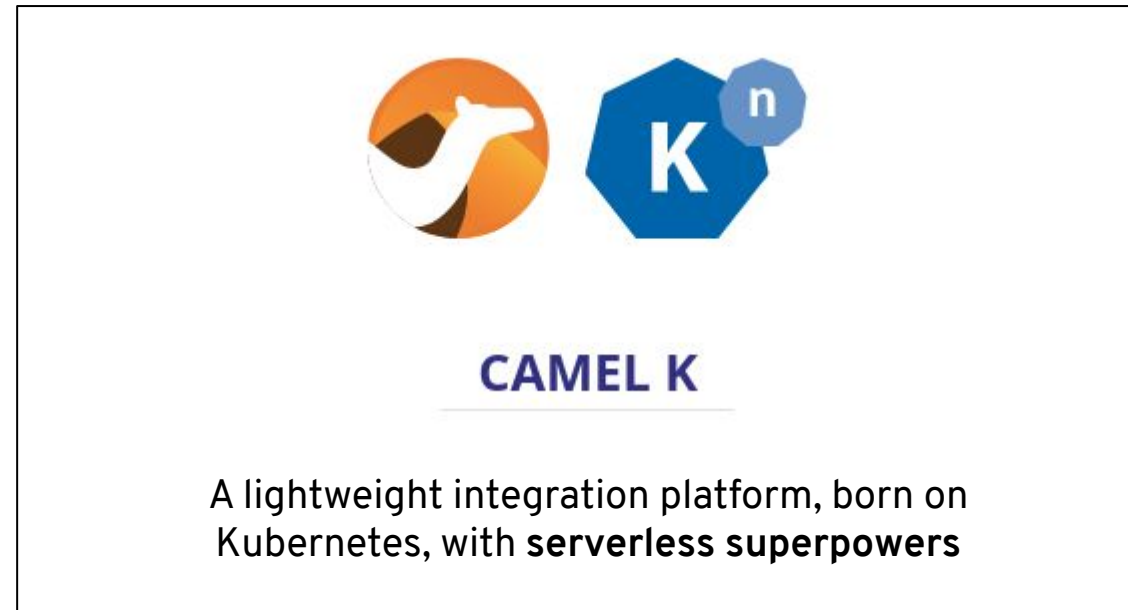
↑ **+4 New awesome sub-projects**

(**Camel K**, Camel Quarkus, Camel Kafka Connect, Camel Spring-Boot)

It does not look
11 years “old” ;)

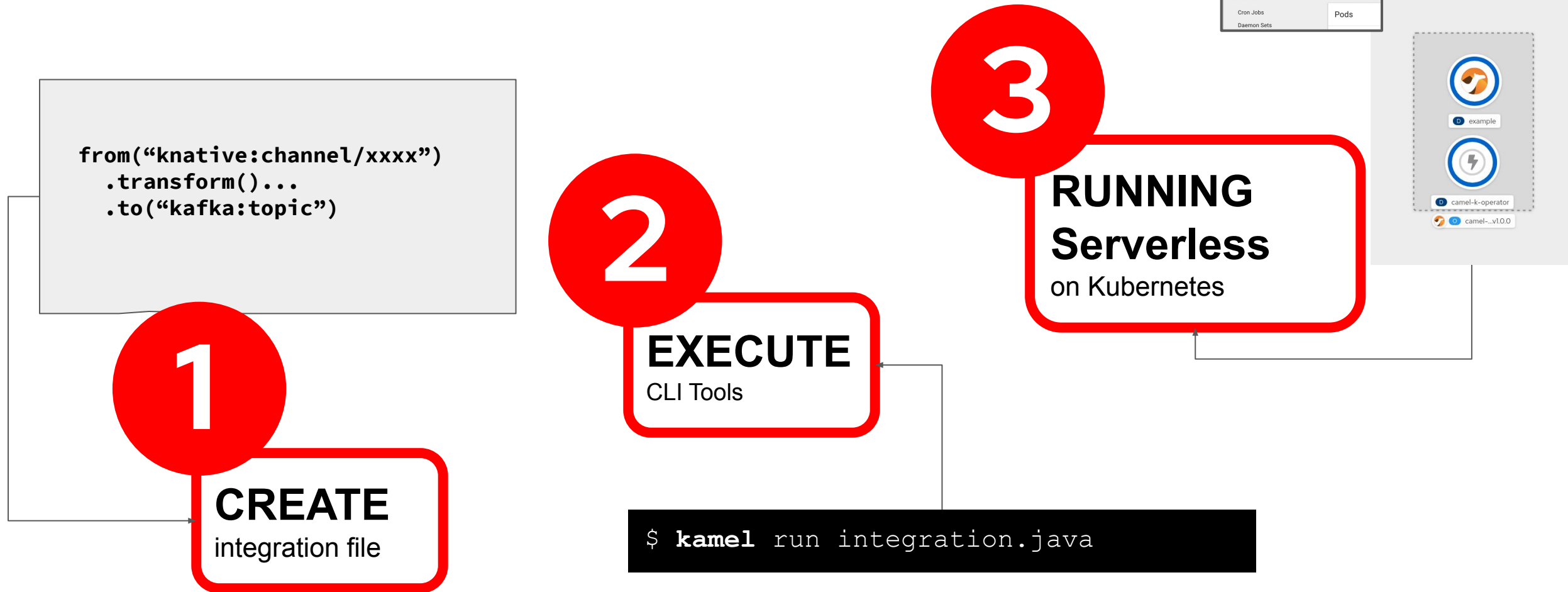
CAMEL K

What is Apache Camel K?



- <https://github.com/apache/camel-k>
- A lightweight platform for running integrations on Kubernetes
- Reached version 1.0.0 on June 9, 2020

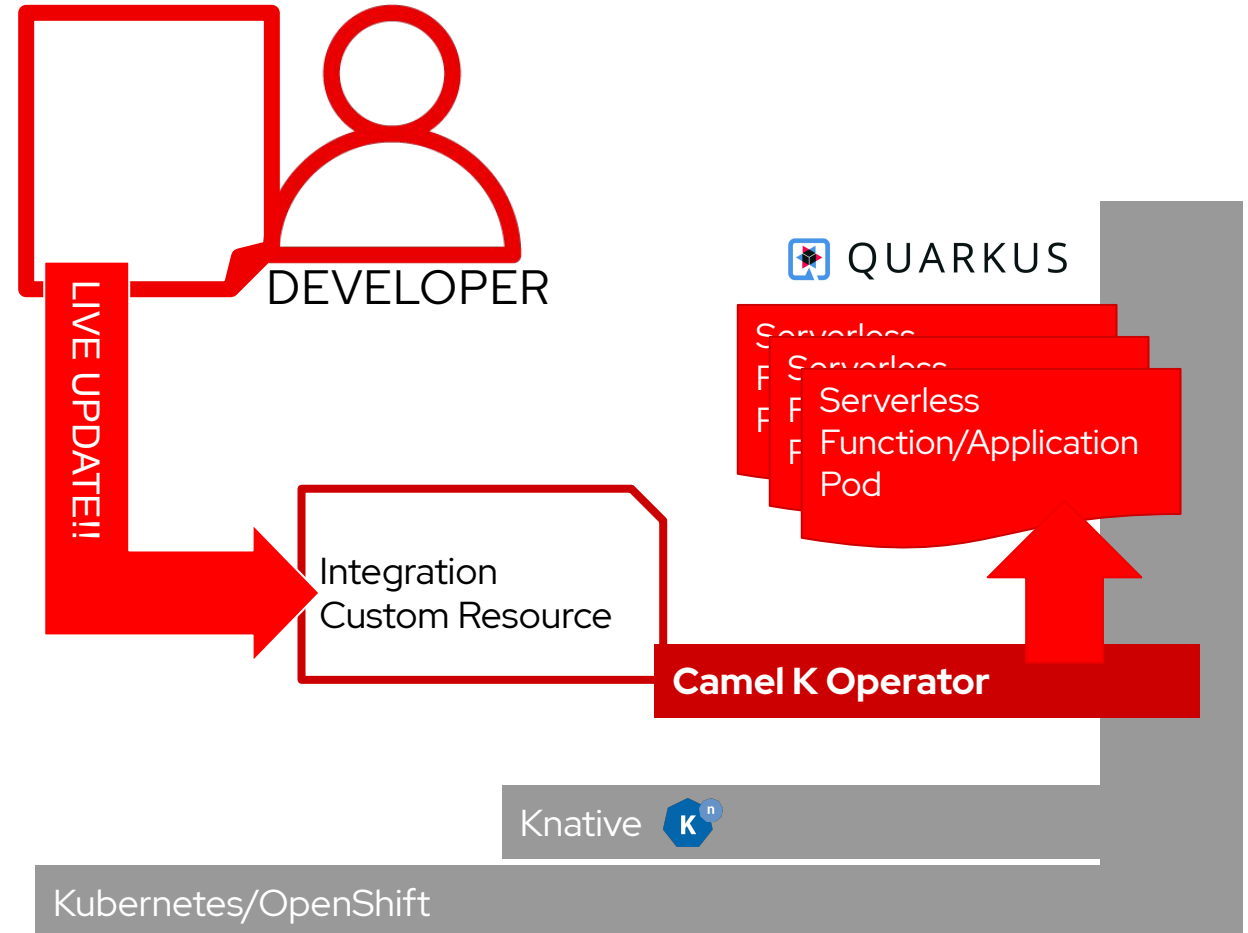
Camel K for Developers



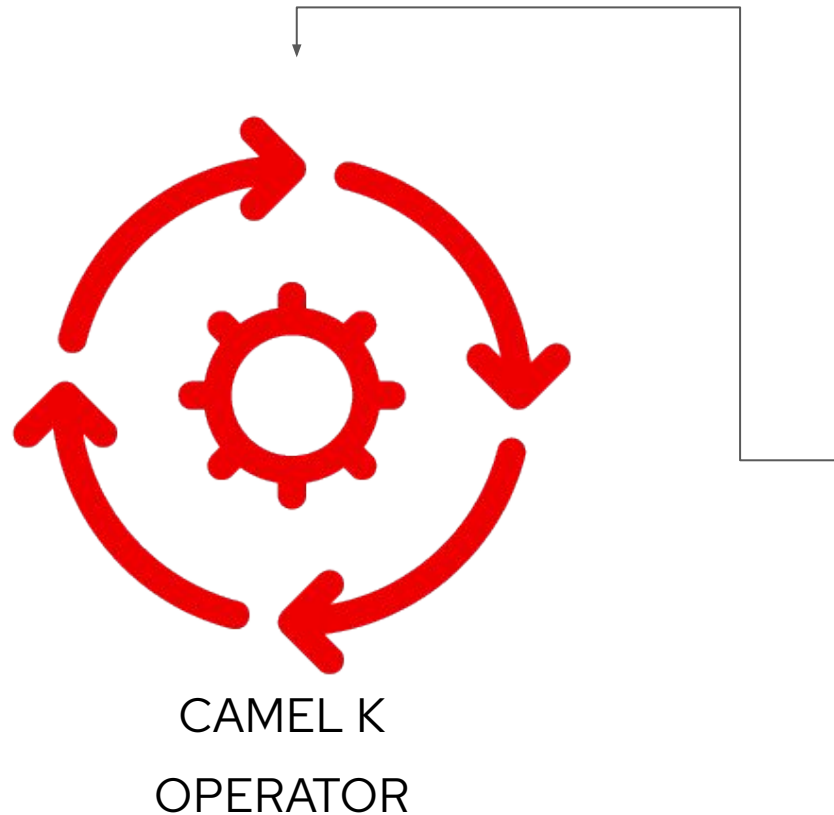
Camel K Architecture


Tailored for **cloud-native development** experience.

- Live coding on cloud
- Built-in dependency management
- Rapid deployment, incremental updates
- Automate cloud resource generation
- Highly customizable

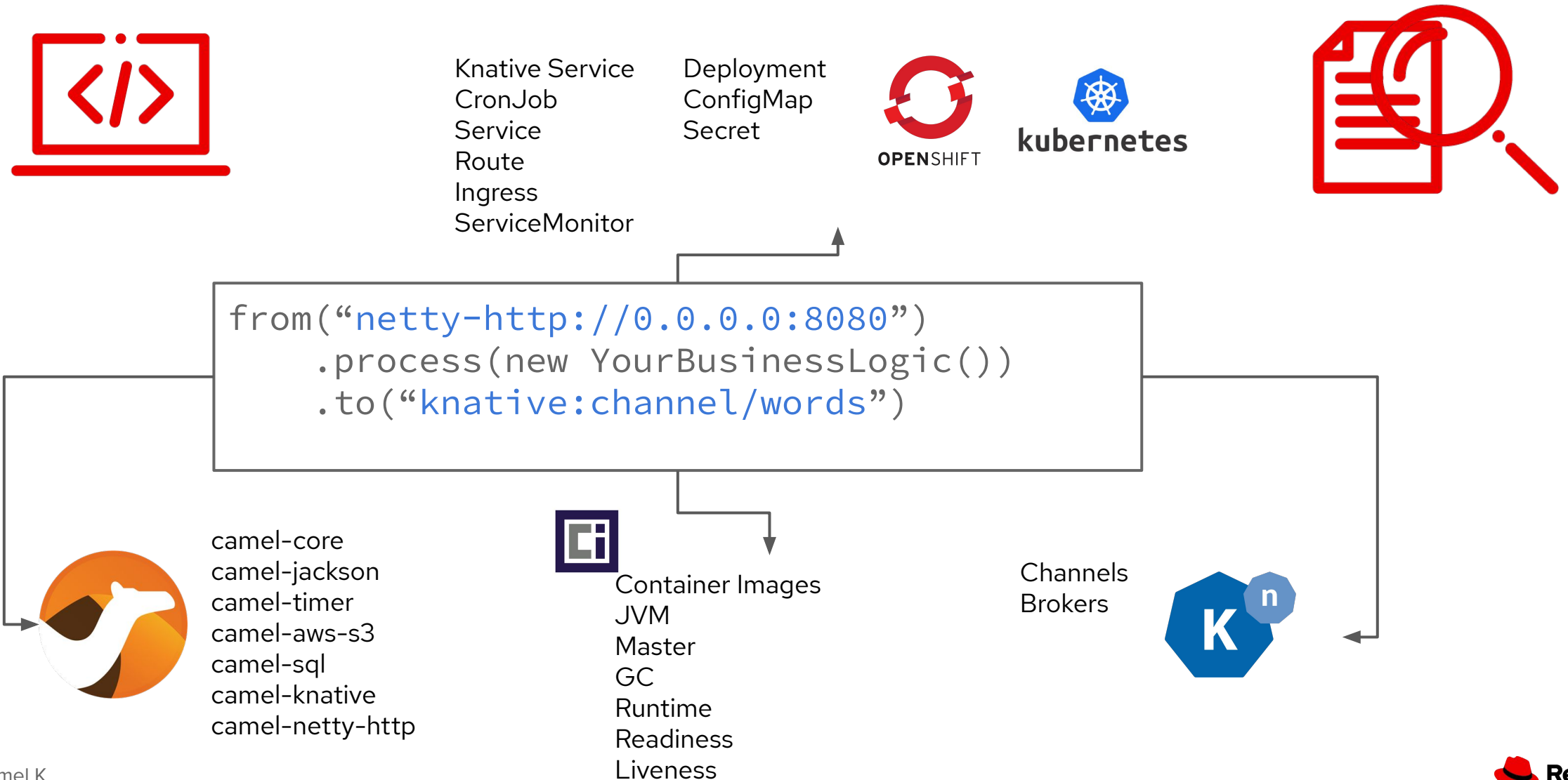


Camel K Operator



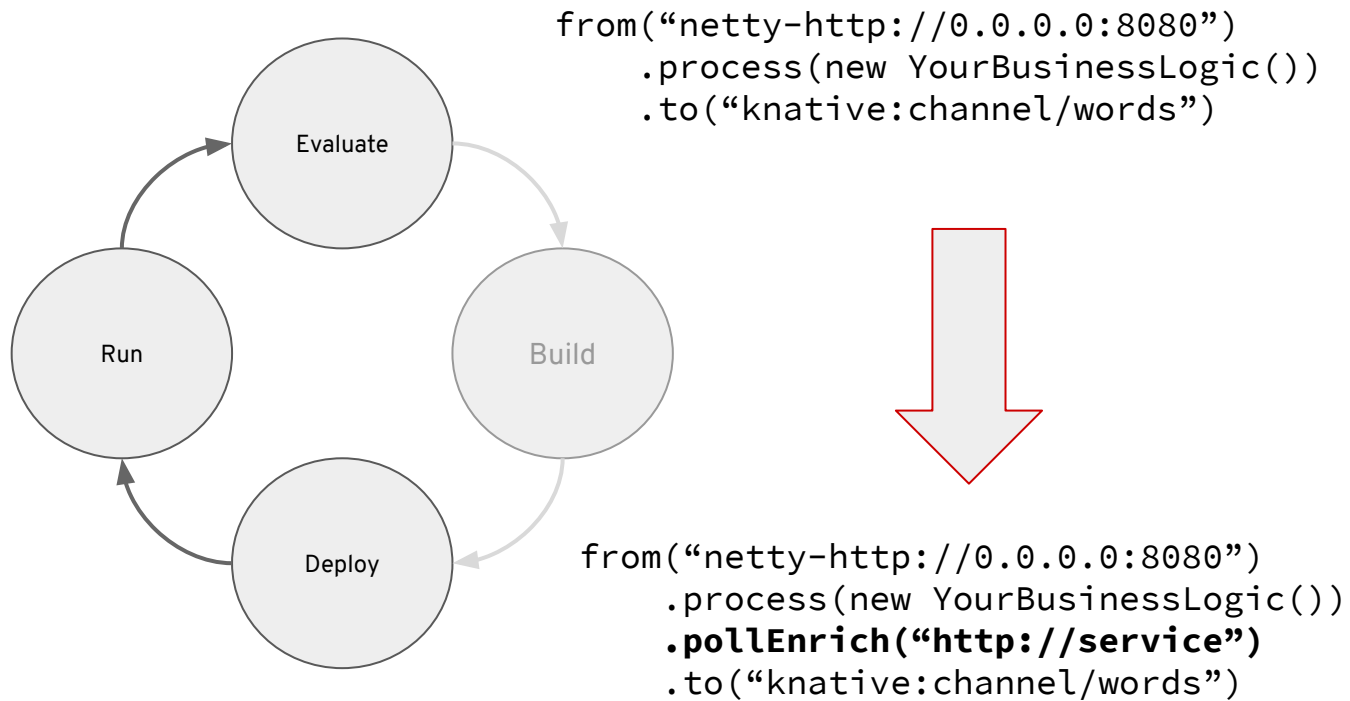
- Choose a runtime
 - Java main
 - **Quarkus** 
- Scaffold a project
- Add boilerplate
 - Container behaviour
 - Serverless behaviour
 - Monitoring setup ...
- Add dependencies
- Create container image
 - Incremental updates
- Create OpenShift and Knative resources for deployment
 - Secrets
 - Service
 - Config Map
 - Deployment
 - Ingress

Code Driven Serverless



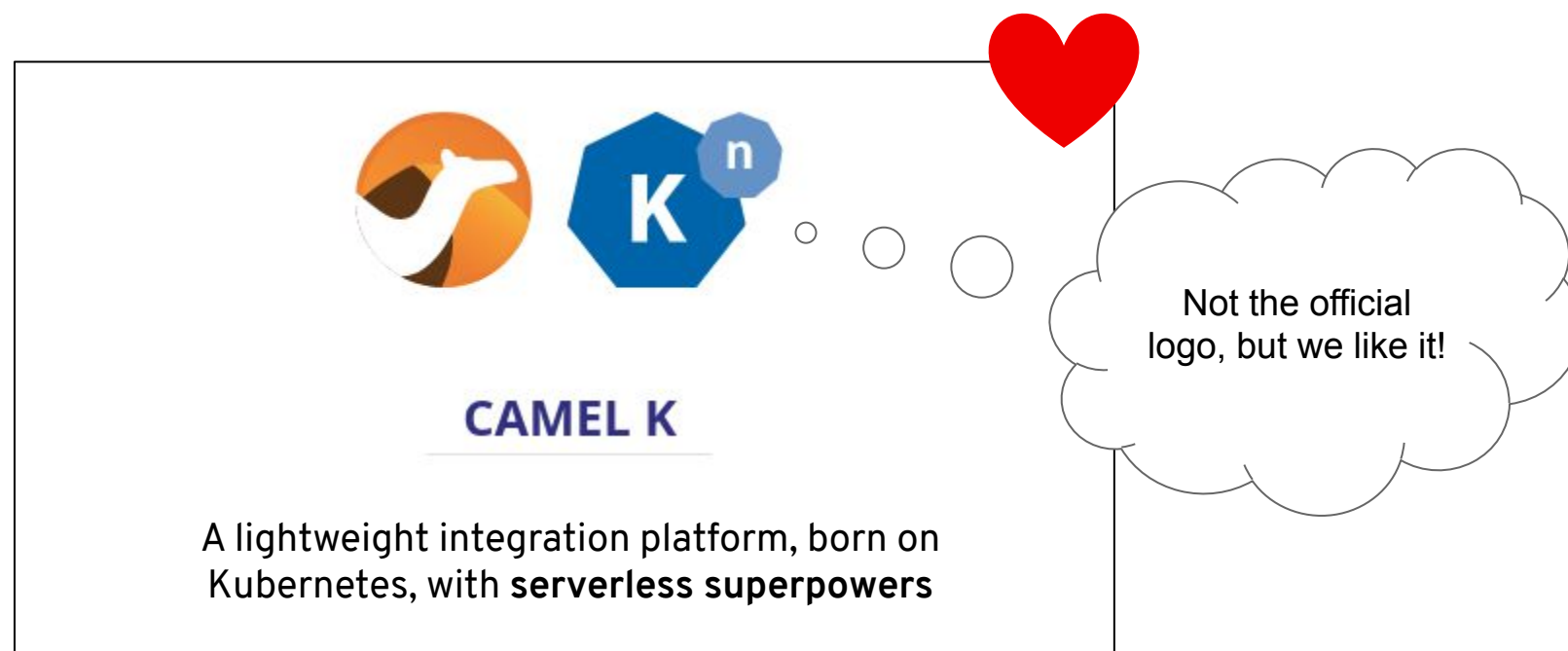
Fast Deployment

Operator Phases



CAMEL K AND KNATIVE

Camel K loves Knative



Camel K can also live without Knative, but it doesn't want to ;)

Knative



Knative Serving

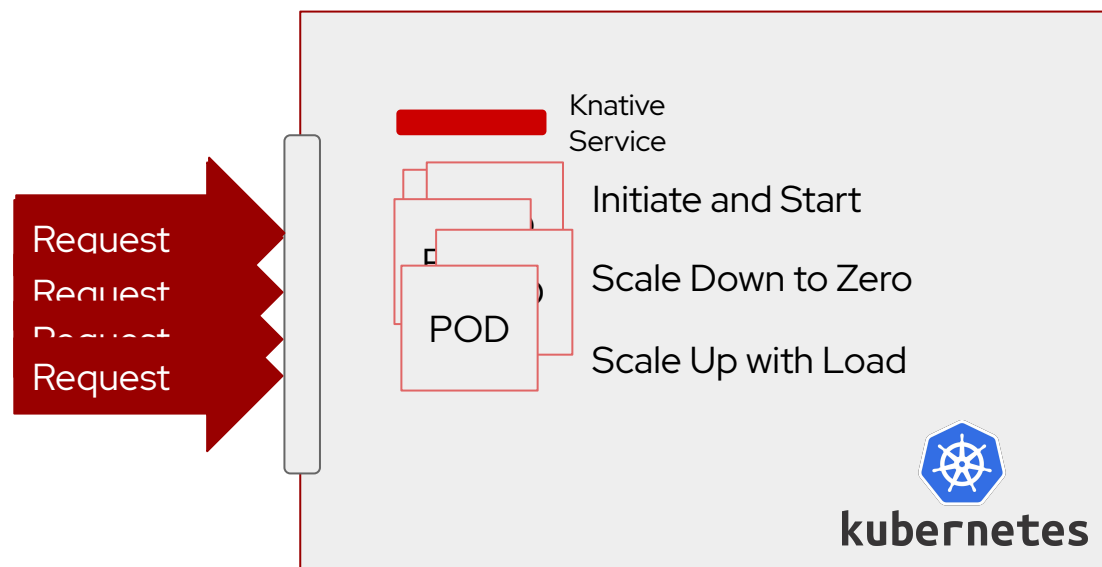
Auto-scaling and scale-to-zero



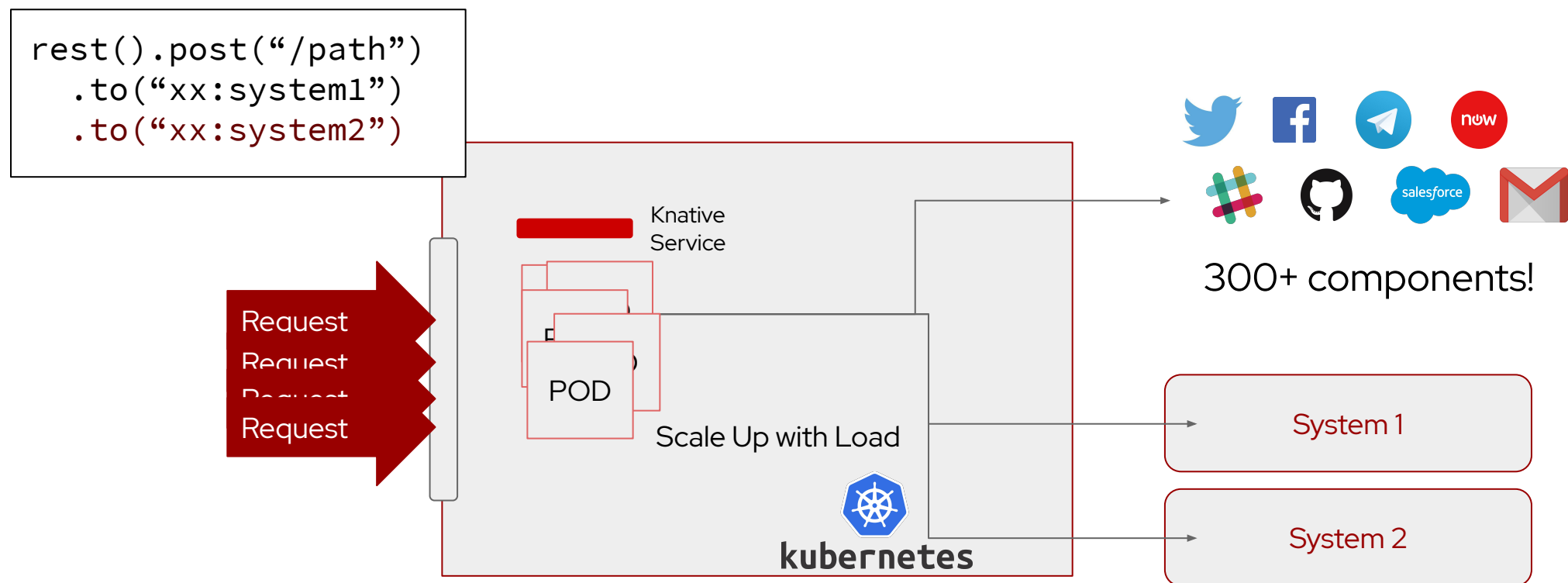
Knative Eventing

Messaging for event-based applications

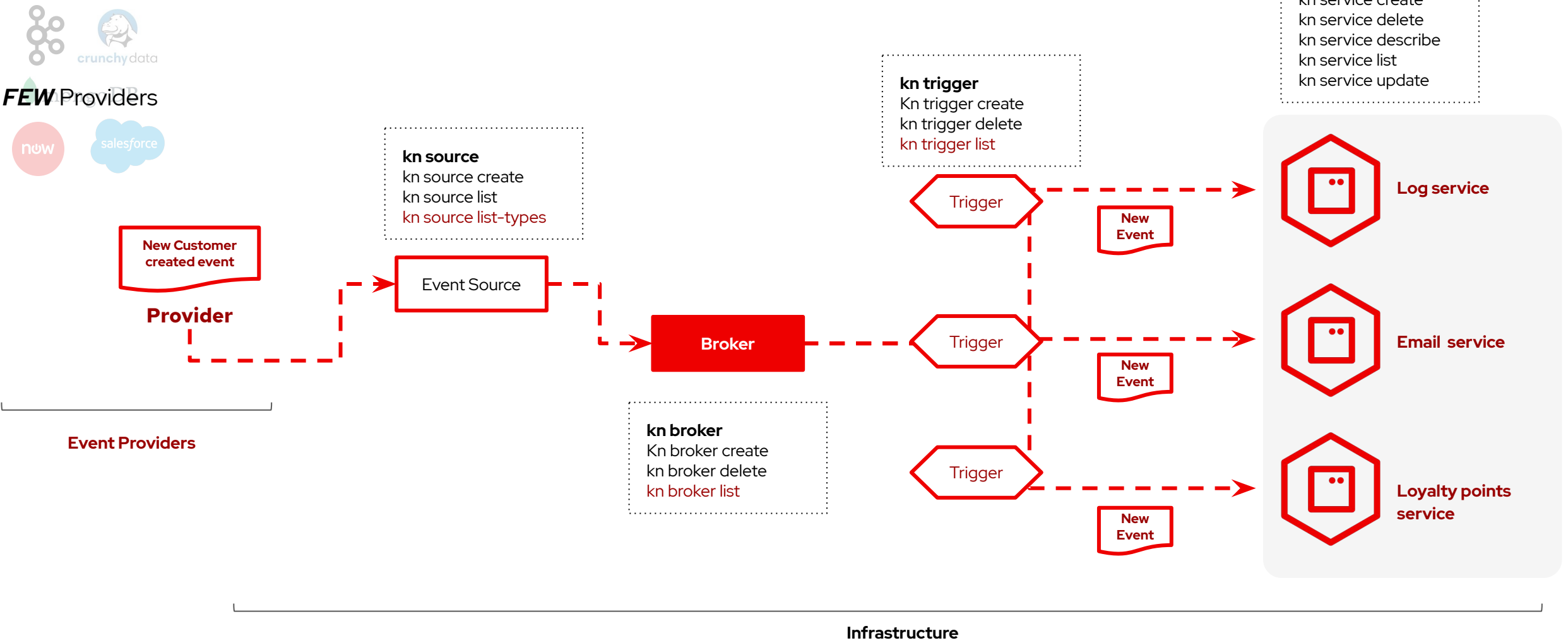
Knative Serving



Knative Serving **with Camel K**



Knative Eventing



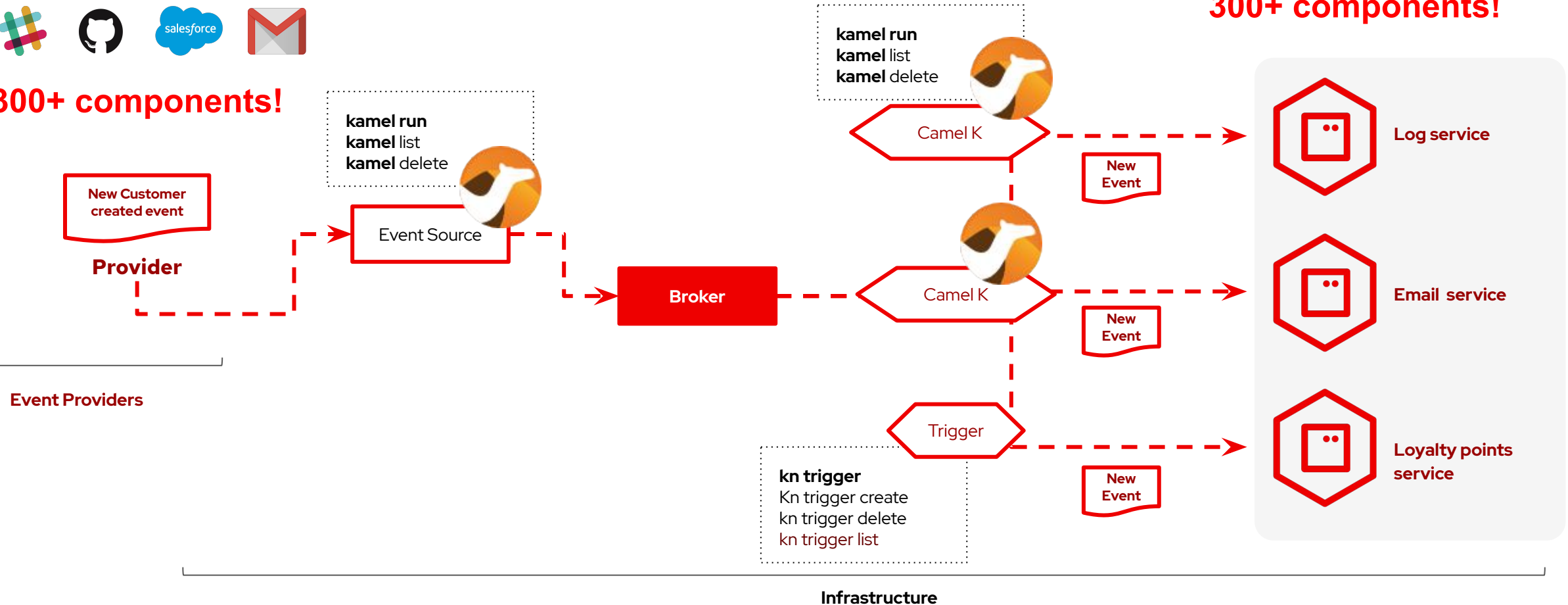
Knative Eventing with Camel K



300+ components!

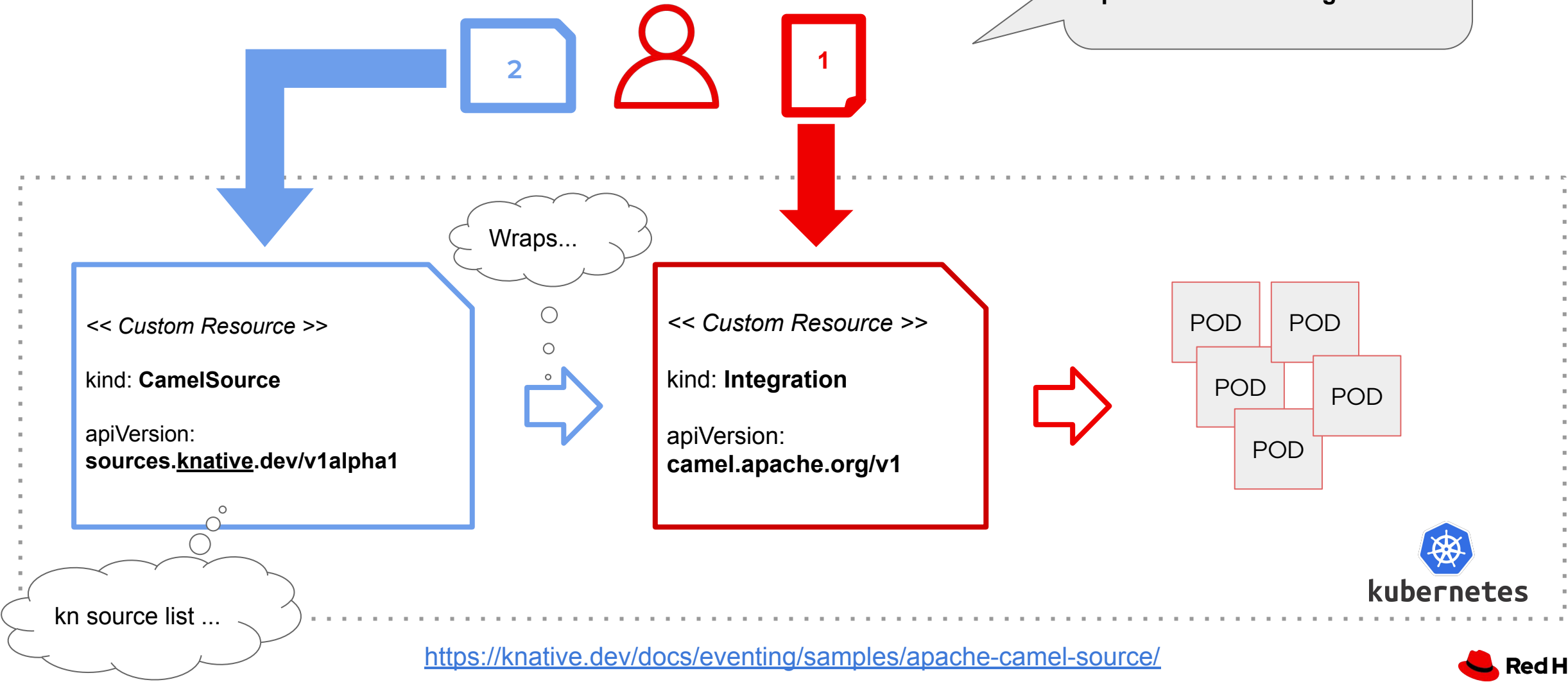


300+ components!



Knative Camel Sources

For sources, users can choose to deploy **Knative CamelSources** or **Apache Camel K Integrations**

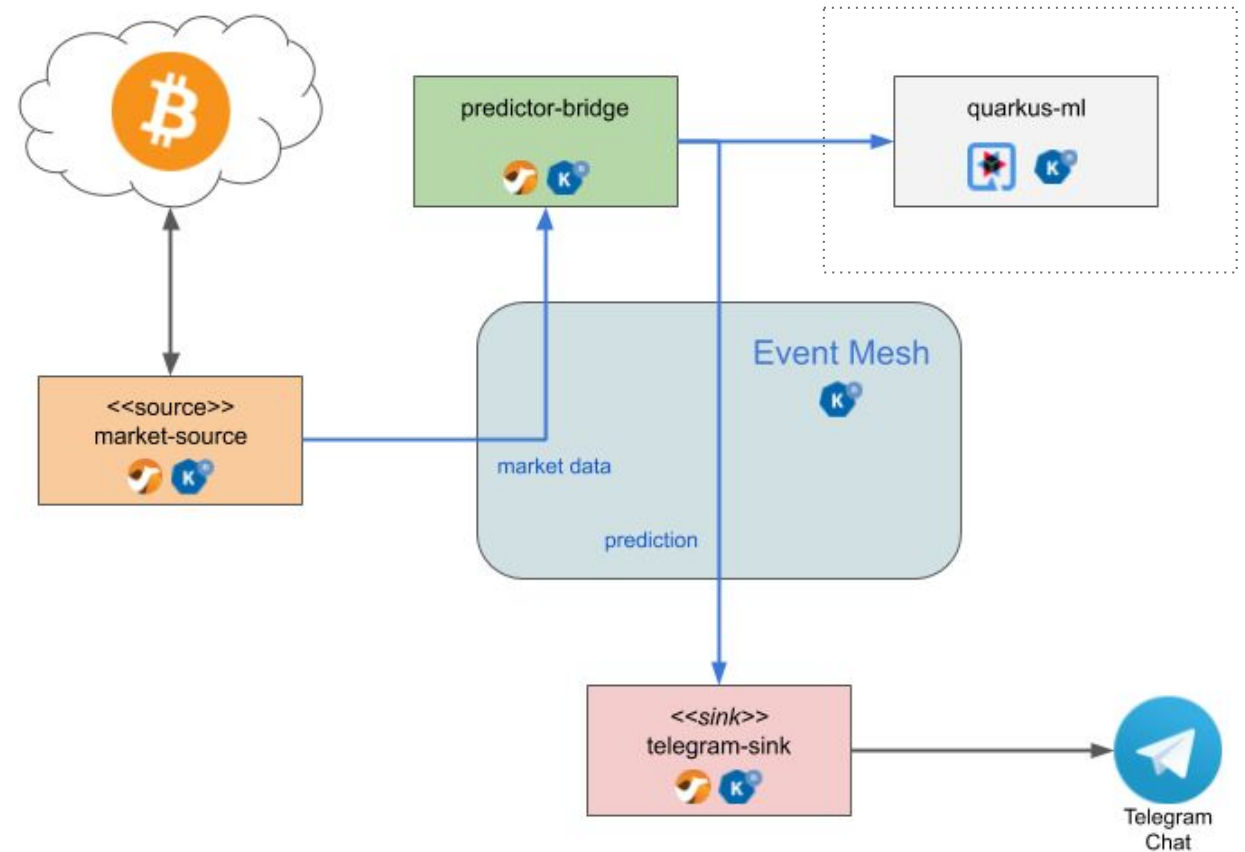


DEMO

Demo

Today 1 bitcoin is worth \$ 9,000.
Should you buy more or sell them?

Camel Sources and Sinks in an event mesh



Code: <https://github.com/nicolaferaro/camel-k-example-knative/tree/knative>

THE FUTURE

Quarkus



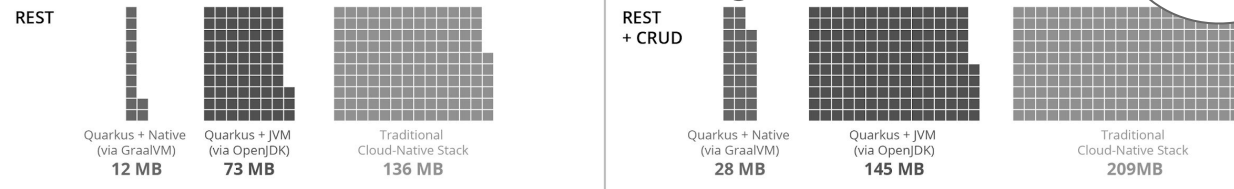
Currently, integrations can run on Quarkus in JVM mode:

```
from("knative:event/produced")
    .pollEnrich()
    .simple("aws2-s3://mybucket/files/${header.Ce-File}")
    .to("kafka:ext-topic")
```

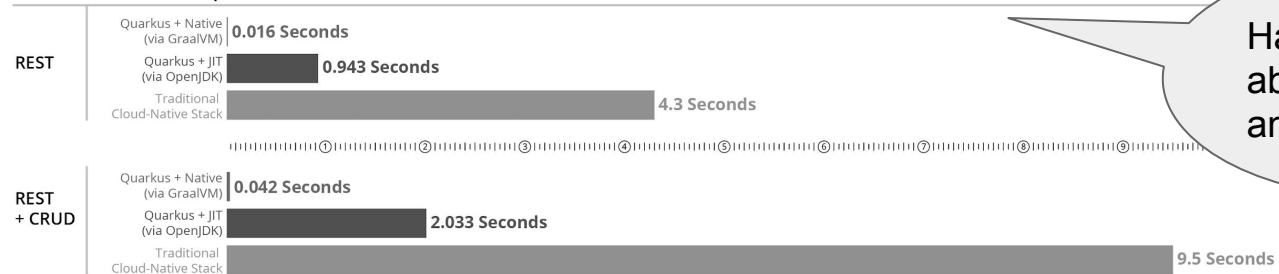
The future is native,
with no changes in ux,
and much better
performance!



Memory (RSS) in Megabytes*



BOOT + First Response Time



Have you heard
about GraalVM
and Mandrel?

<https://github.com/apache/camel-quarkus>



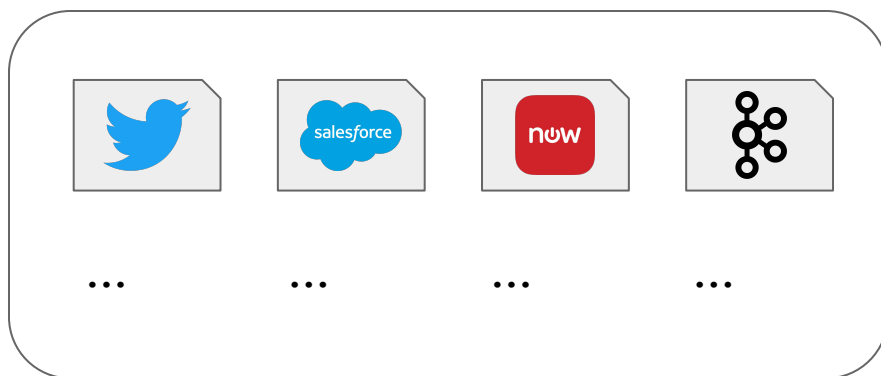
Kamelets



Meaning: **Kamel** route snippets

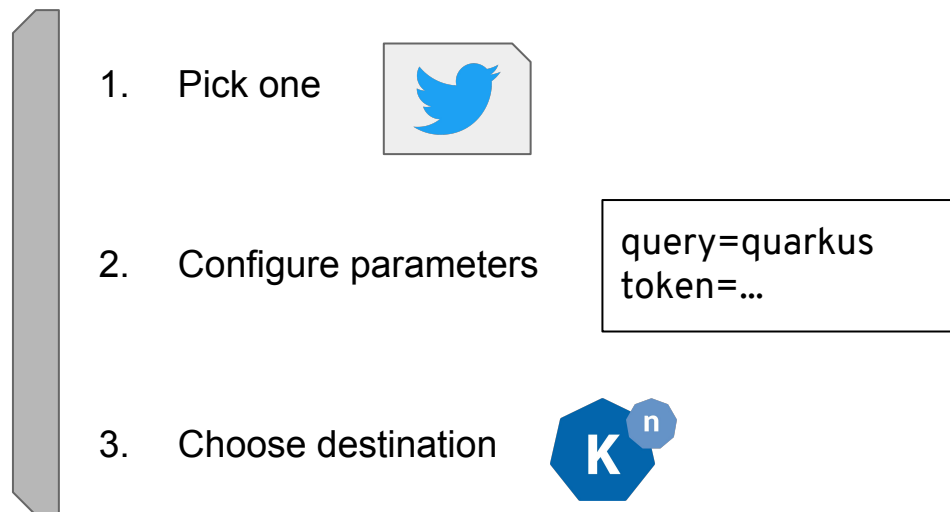
Non-camel users find it difficult to write Camel DSL, they just want to leverage it.

Kamelet Catalog (Kubernetes Objects)



Kamelets have many more use cases outside Knative:

- Camel Kafka Connect
- Visual Tools for Camel K development



YAKS

Testing software using BDD style.

Now part of citrusframework.org.

Same structure of Camel K (CLI + operator)

To run the test:

```
yaks test gateway.feature
```

<https://github.com/citrusframework/yaks>

```
Feature: API Gateway Works
```

```
Background:
```

```
Given URL: https://myservice/api/films
```

```
Scenario: Get a result from API
```

```
When send GET /
```

```
Then receive HTTP 200 OK
```

Other important future developments

- **Webhooks:** reduce the amount of components that need an “always-on” pod
- **Keda:** autoscaling not only limited to http workloads

Want to learn more about Camel?



[What's new with Apache Camel 3? | DevNation Tech Talk](https://developers.redhat.com/devnation/tech-talks/apache-camel-3/)

<https://developers.redhat.com/devnation/tech-talks/apache-camel-3/>

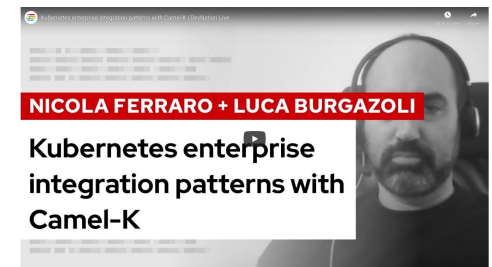
By Andrea Cosentino and Claus Ibsen



[Kubernetes enterprise integration patterns with Camel-K | DevNation Tech Talk](https://developers.redhat.com/videos/youtube/51x9BewGCYA/)

<https://developers.redhat.com/videos/youtube/51x9BewGCYA/>

By Luca Burgazzoli and Nicola Ferraro



Thank you!

If you like Camel K:

1) Use it!

2) Contribute!

(We love any contribution!)



<https://github.com/apache/camel-k>

Follow me on Twitter:

@ni_ferraro



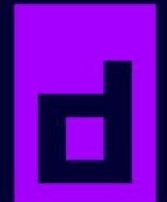
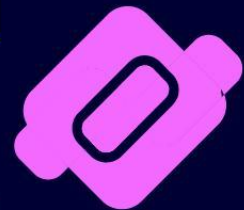


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KEEP CLOUD NATIVE

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