



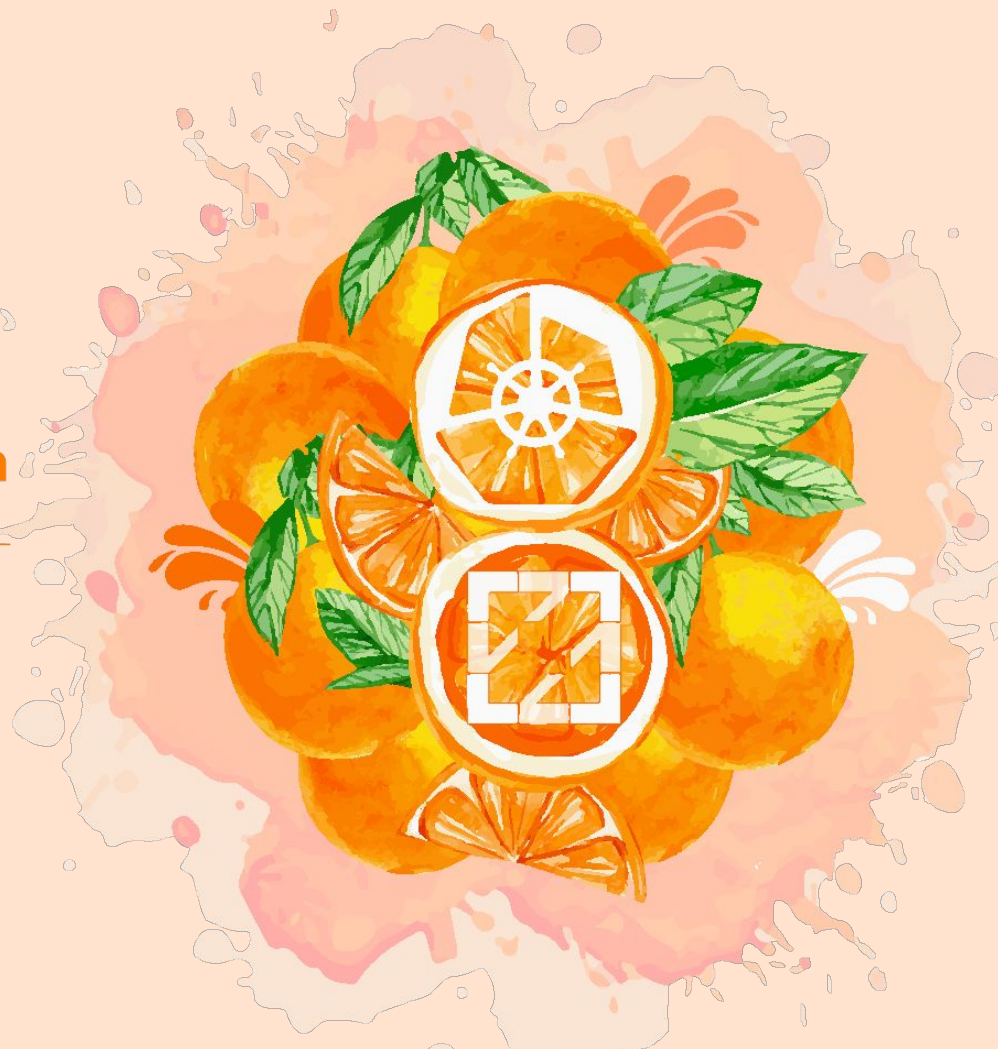
**KubeCon**



**CloudNativeCon**

**Europe 2022**

**WELCOME TO VALENCIA**





KubeCon



CloudNativeCon

Europe 2022

# Thinking Cloud Native, CloudEvents Future

CNCF Serverless Working Group Update  
Scott Nichols, Chainguard, Inc.



# But first, TL;DR: How we got here.

- 2018: [Serverless WG Whitepaper](#). Recommendation,  
Events: define a common event format and API along with metadata.  
Serverless Landscape came from a part of this paper research.
- 2019: v1.0.0 CloudEvents Specification
- 2020: v1.0.1 CloudEvents Specification
- 2022: v1.0.2 CloudEvents Specification



# Serverless Landscape ~2017

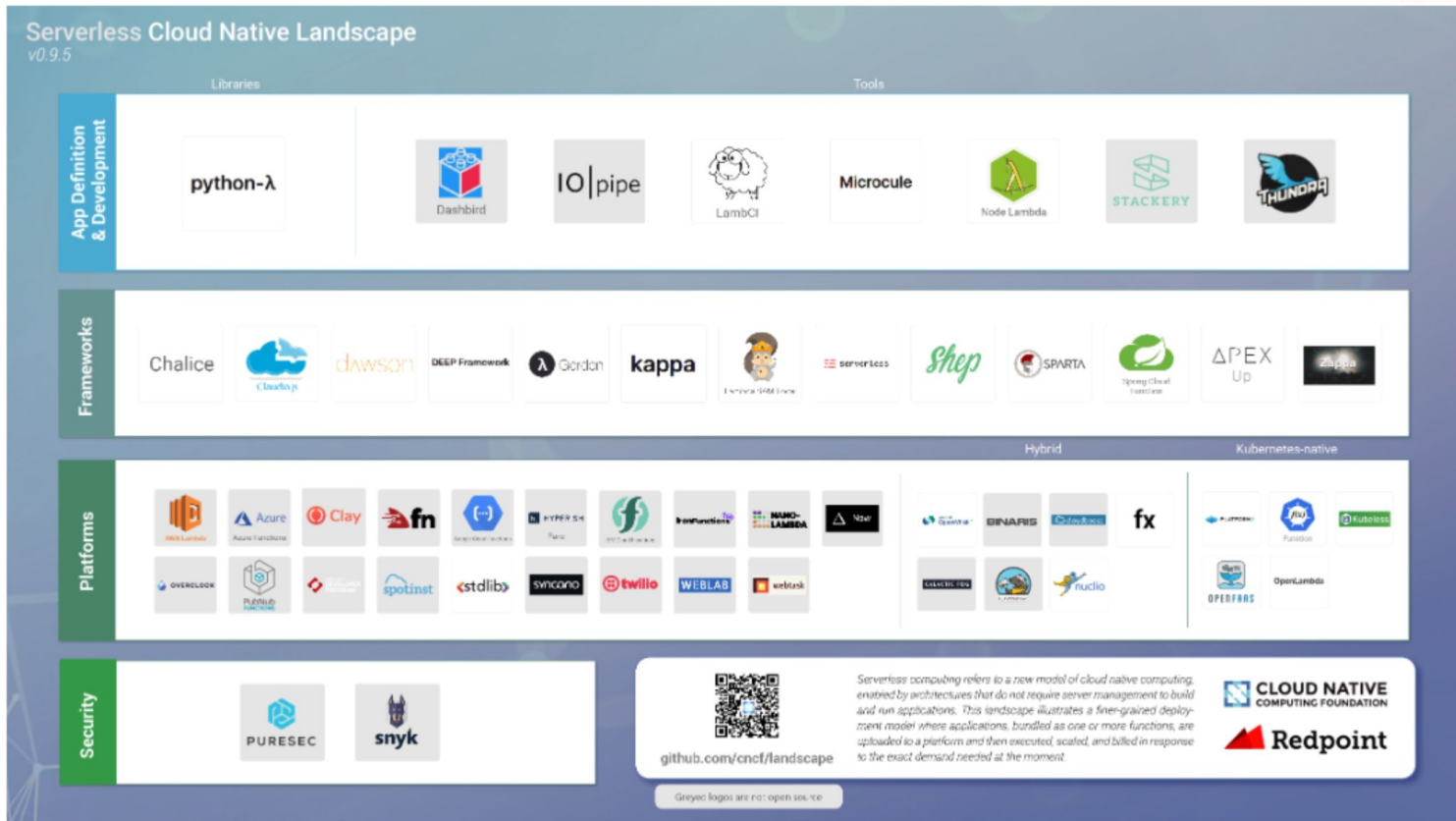


KubeCon

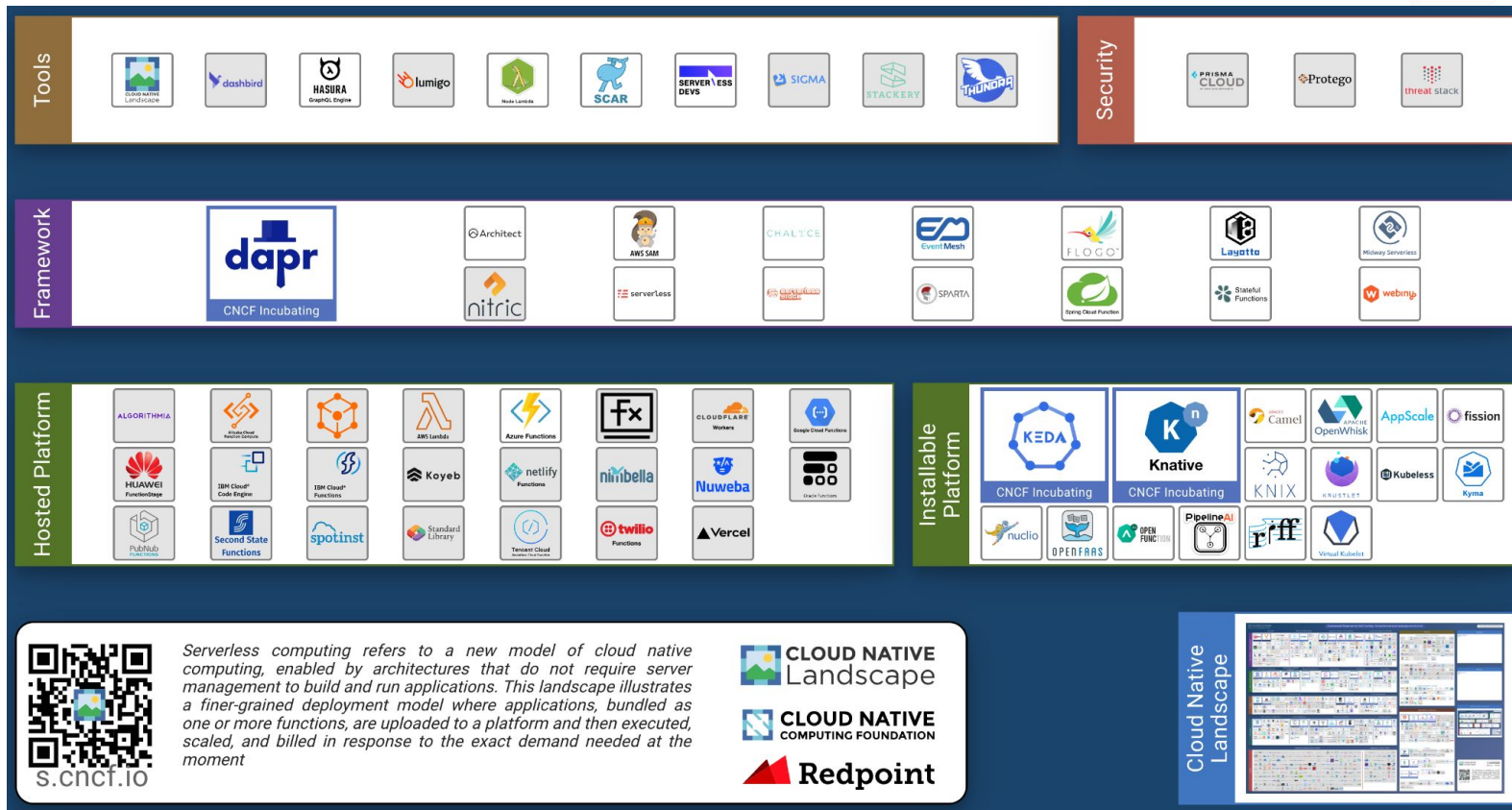


CloudNativeCon

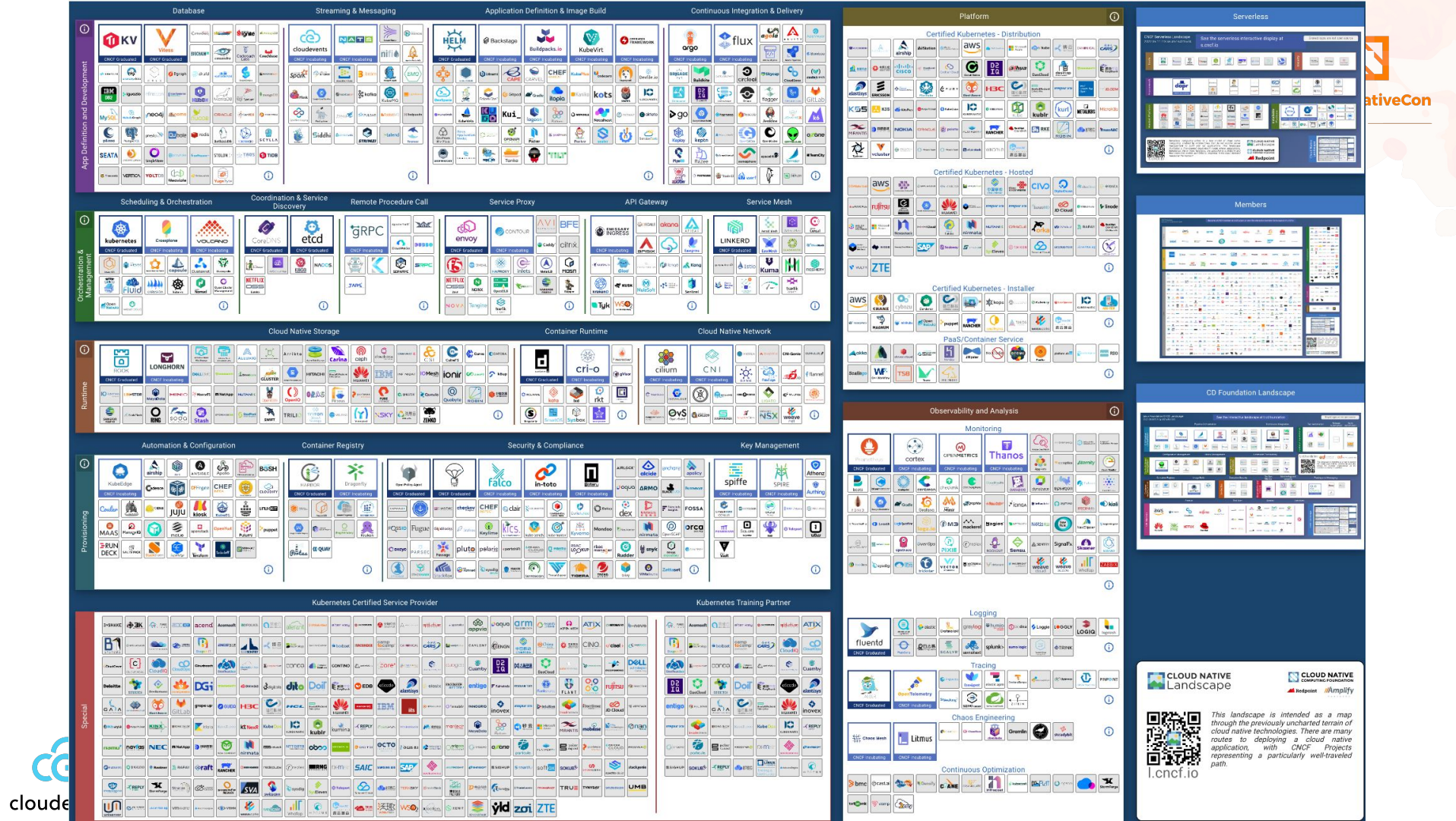
Europe 2022



# Serverless Landscape 2022









KubeCon



CloudNativeCon

Europe 2022

# Framing the Problem

# Prometheus Architecture

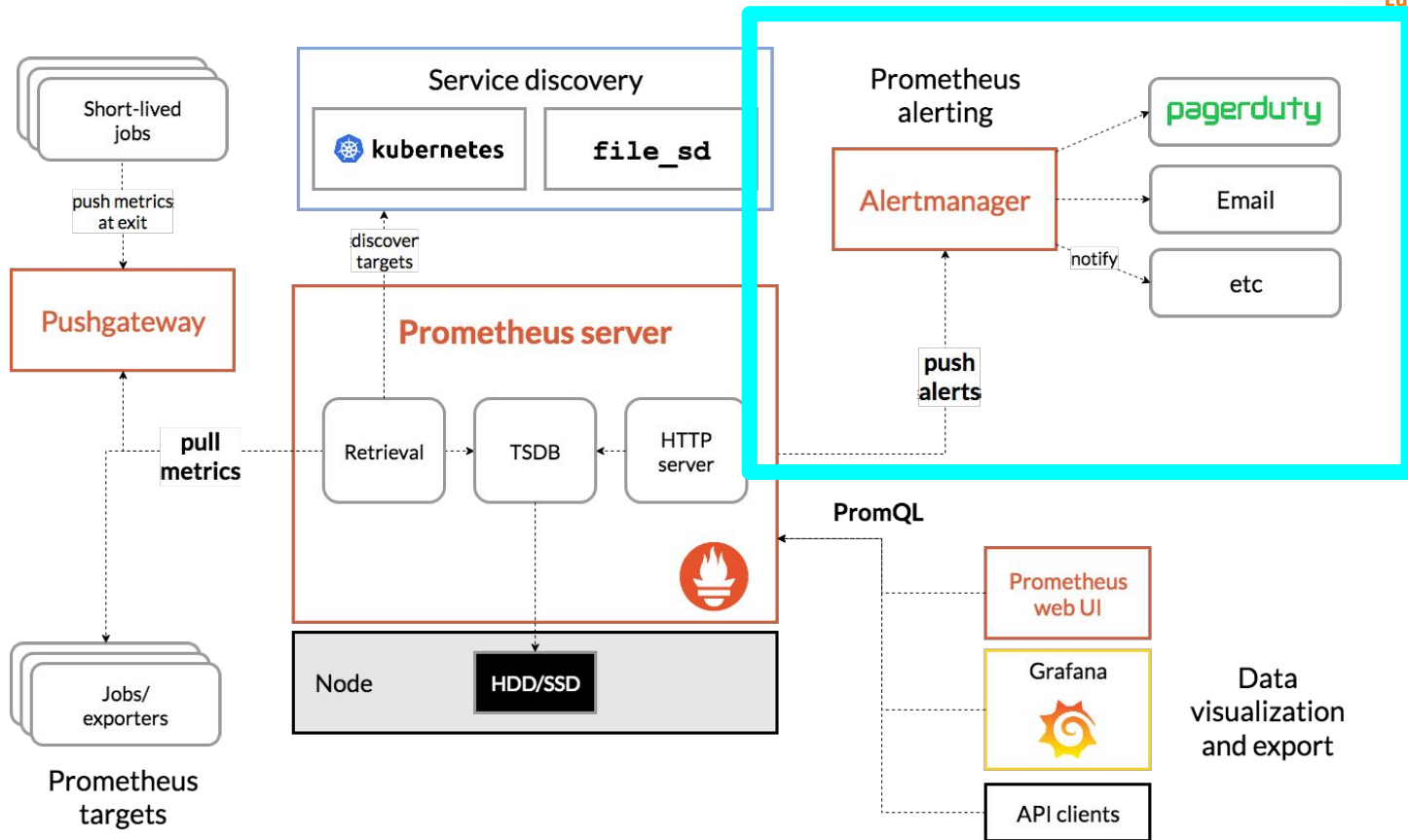


KubeCon



CloudNativeCon

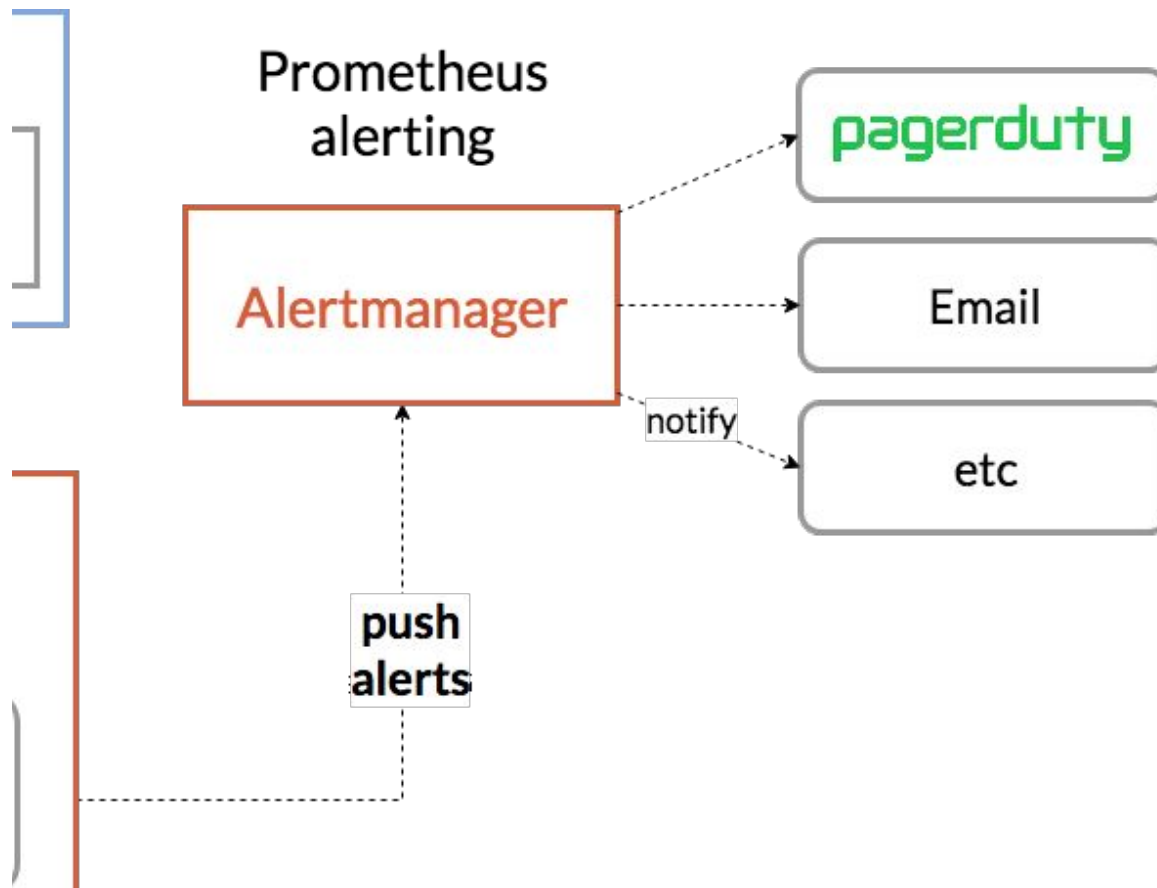
Europe 2022



cloudevents



# Prometheus Architecture



# KubeEdge Architecture

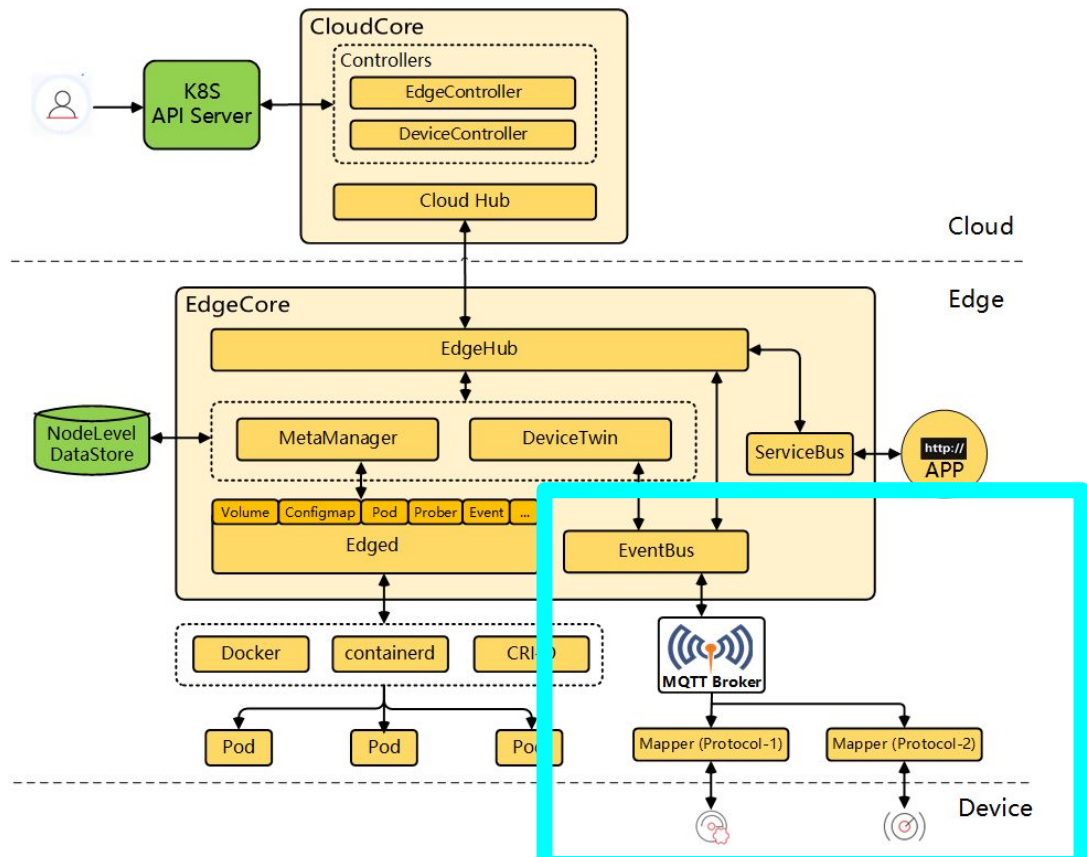


KubeCon



CloudNativeCon

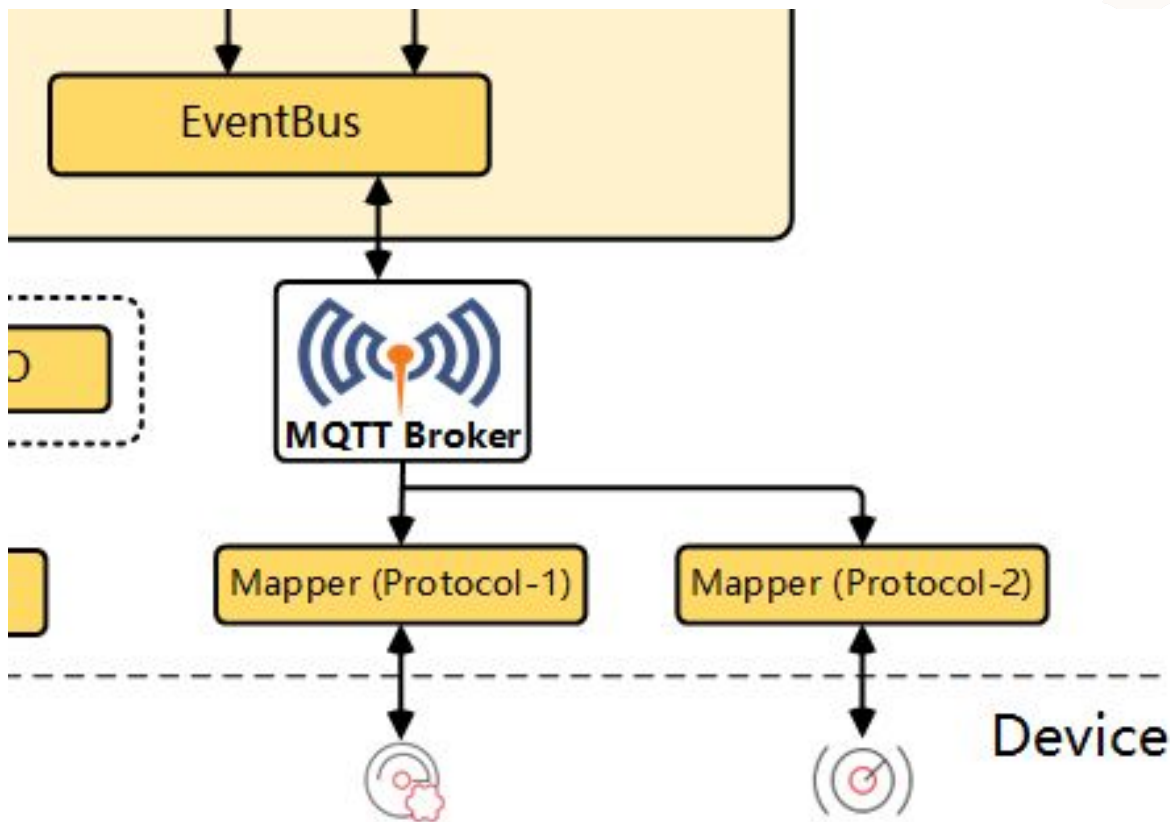
Europe 2022



cloudevents

# KubeEdge Architecture

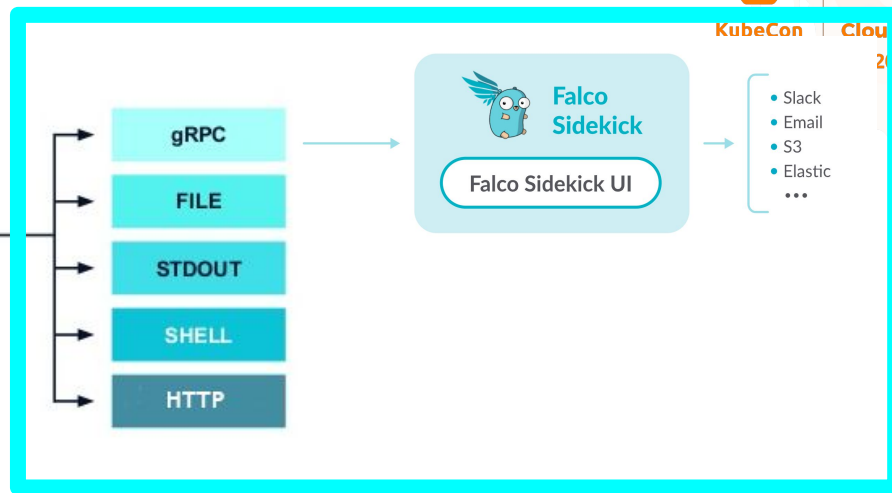
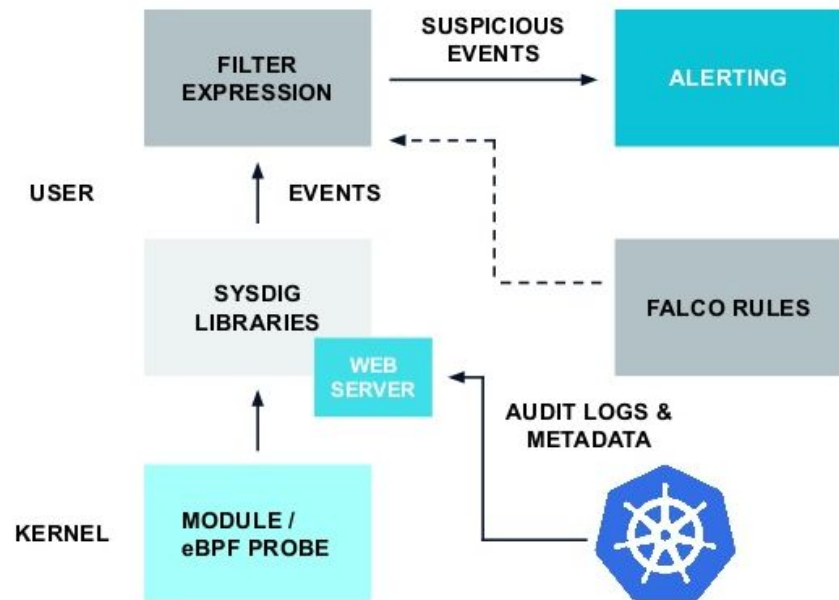
**EventBus**: an MQTT client to interact with MQTT servers (mosquitto), offering publish and subscribe capabilities to other components.



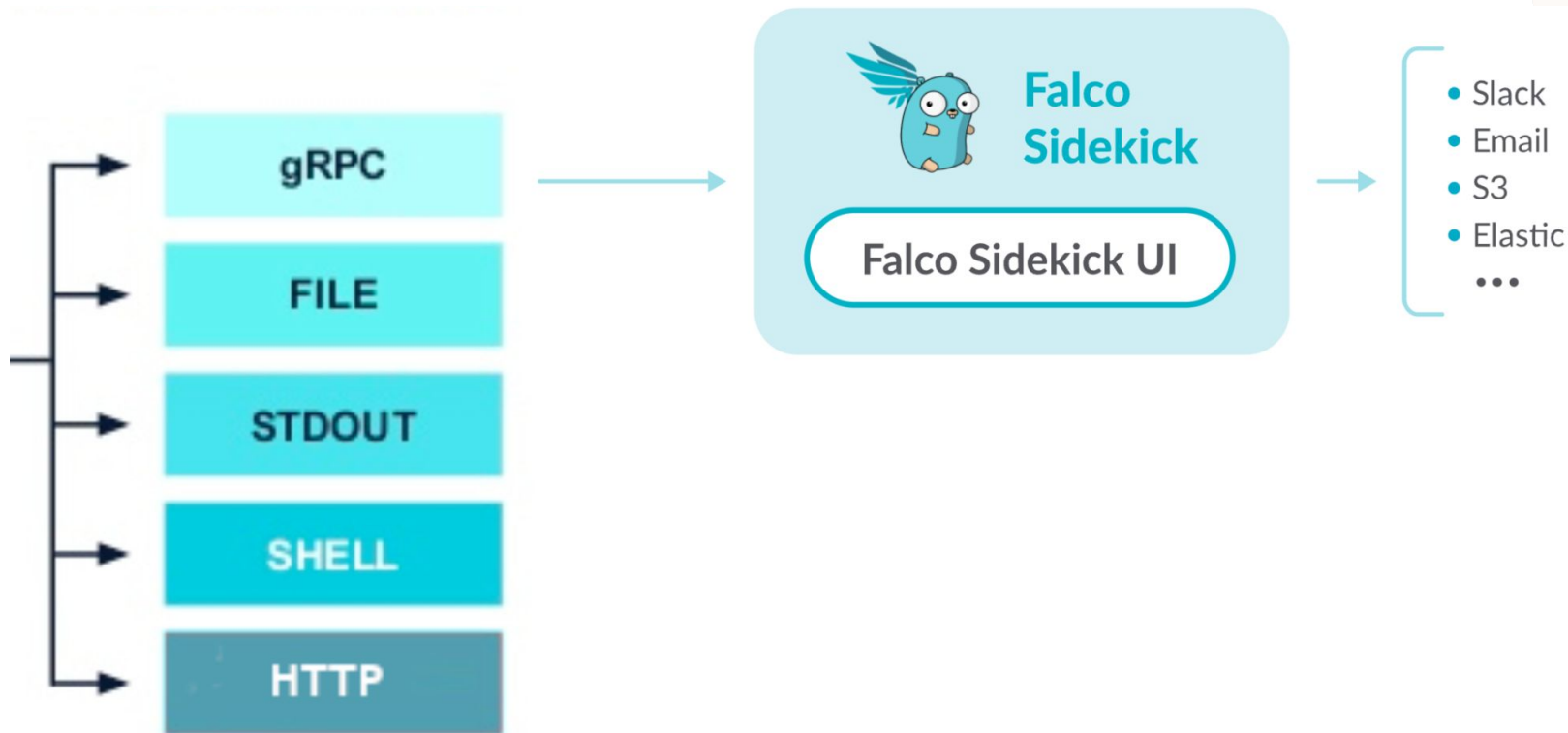
# Falco Architecture



KubeCon | Cloud NativeCon  
2022



# Falco Architecture



# Eventing Everywhere

- Many projects have the ability to produce or consume events.
- Many of those have multiple output options. (*duplication*)
- Custom integrations are common. (*fragile*)

In your own application, you might want to consume or produce events.

Will the choices you make today meet the needs you will have tomorrow?





# Island Architectures



KubeCon



CloudNativeCon

Europe 2022

MyCluster

Prometheus



Falco



MyProject



\* just an example



cloudevents



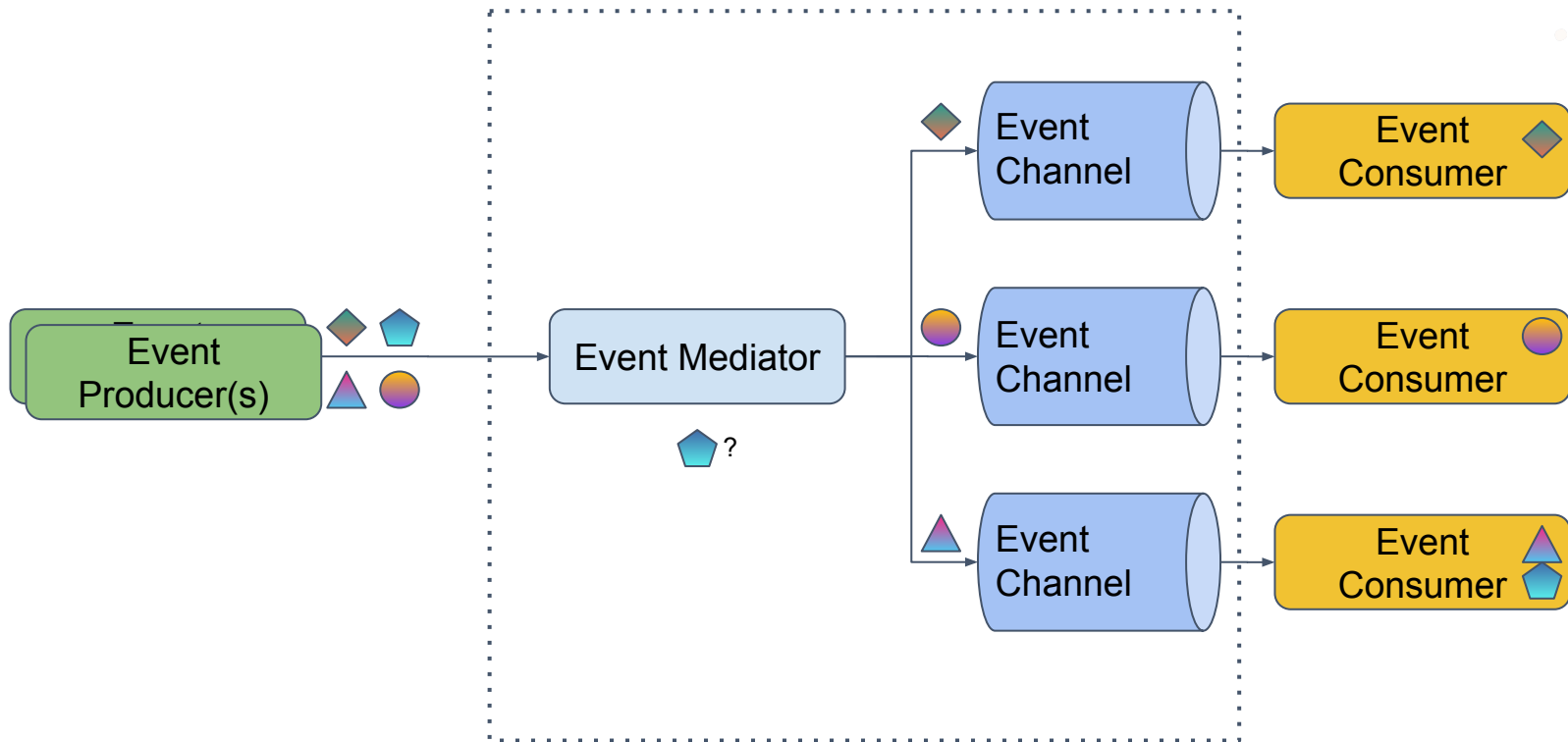
KubeCon



CloudNativeCon

Europe 2022

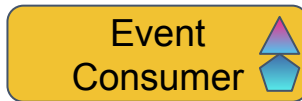
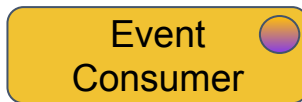
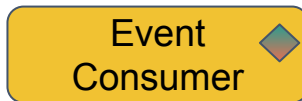
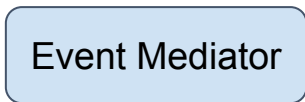
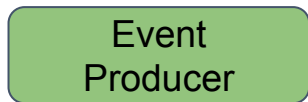
# A Solution



Likely 3rd party

*Custom, necessary evil.*

**Real Business value.**



Routing code becomes part of the core  
business logic developed and maintained.



KubeCon



CloudNativeCon

Europe 2022

If we can define an event  
*independent* of **protocol**, and then  
translate that for each protocol  
format, we become *free of the*  
*protocol choice*.



cloudevents



KubeCon



CloudNativeCon

Europe 2022

1. Protocol or routing choices get baked into the application.
2. Event format is dictated by the protocol choices made upfront.
3. New schemas might require the entire application to be redeployed.



imgflip.com

JAKE-CLARK.TUMBLR



cloudevents





KubeCon



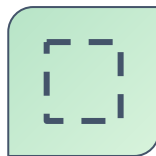
CloudNativeCon

Europe 2022

Occurrence  
(event)



*CloudEvent*  
*Envelope*



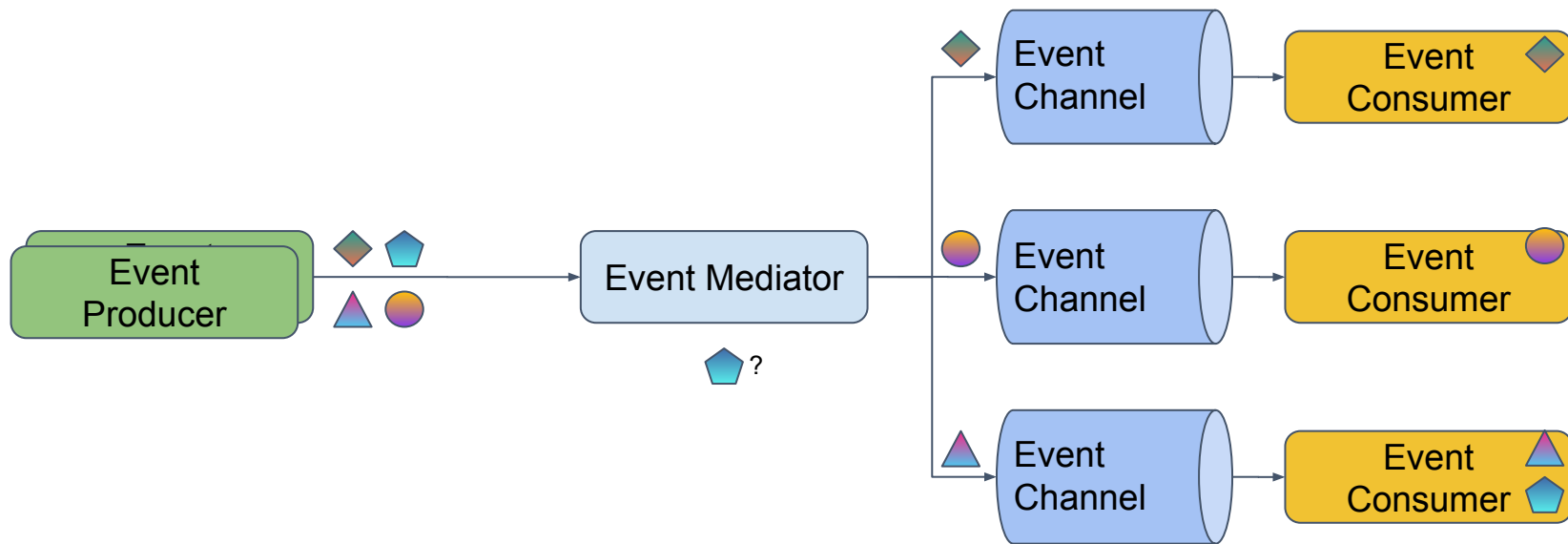
*Wrapped*  
*Occurrence*

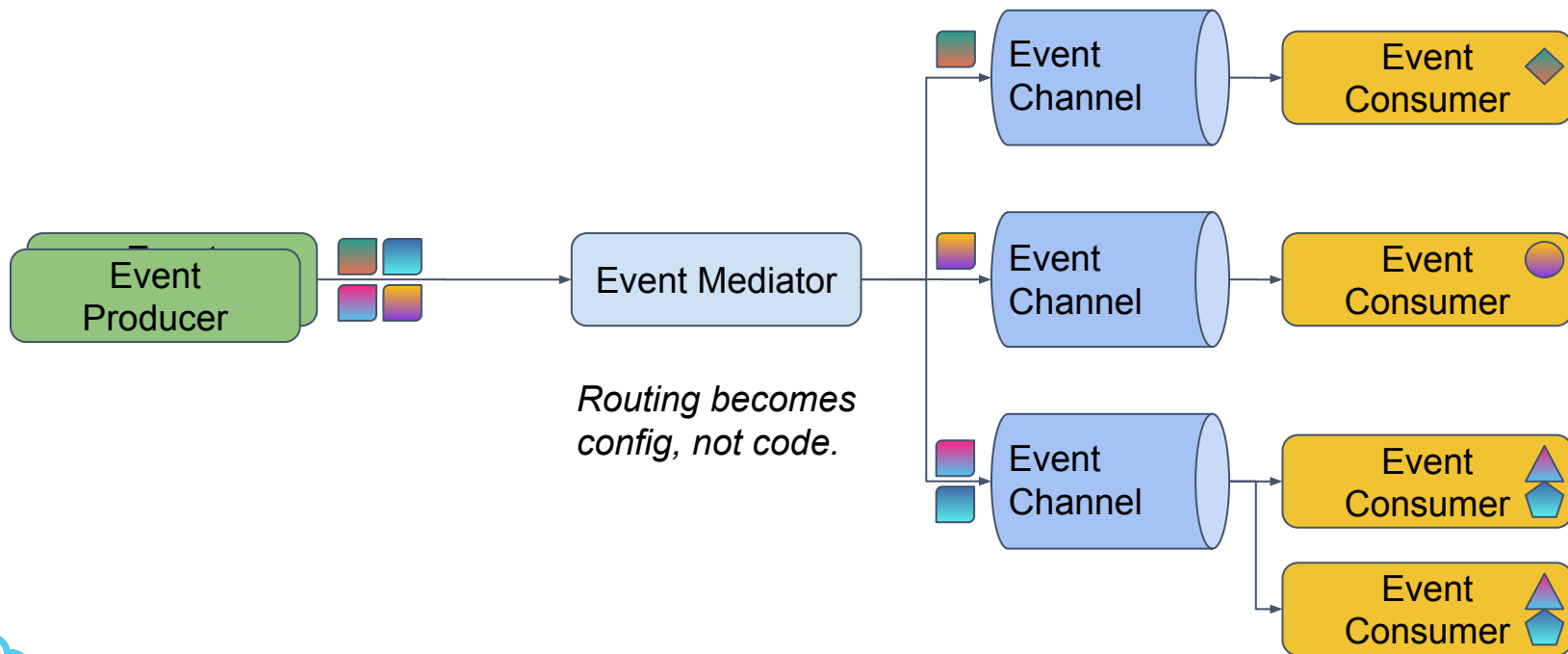


**CloudEvent**



cloudevents







KubeCon



CloudNativeCon

Europe 2022

# Next Steps

*\*pause\**

# Call to Action

- Add a CloudEvents POST option to an existing notification endpoint.
- Adopt CloudEvents as an "internal" format between components (makes it easier to expose someday).
- Ask for CloudEvent integrations on off-the-shelf components

*If you are not asking for CloudEvents support,  
it will not be provided 😊*



# Bridged Island Architectures

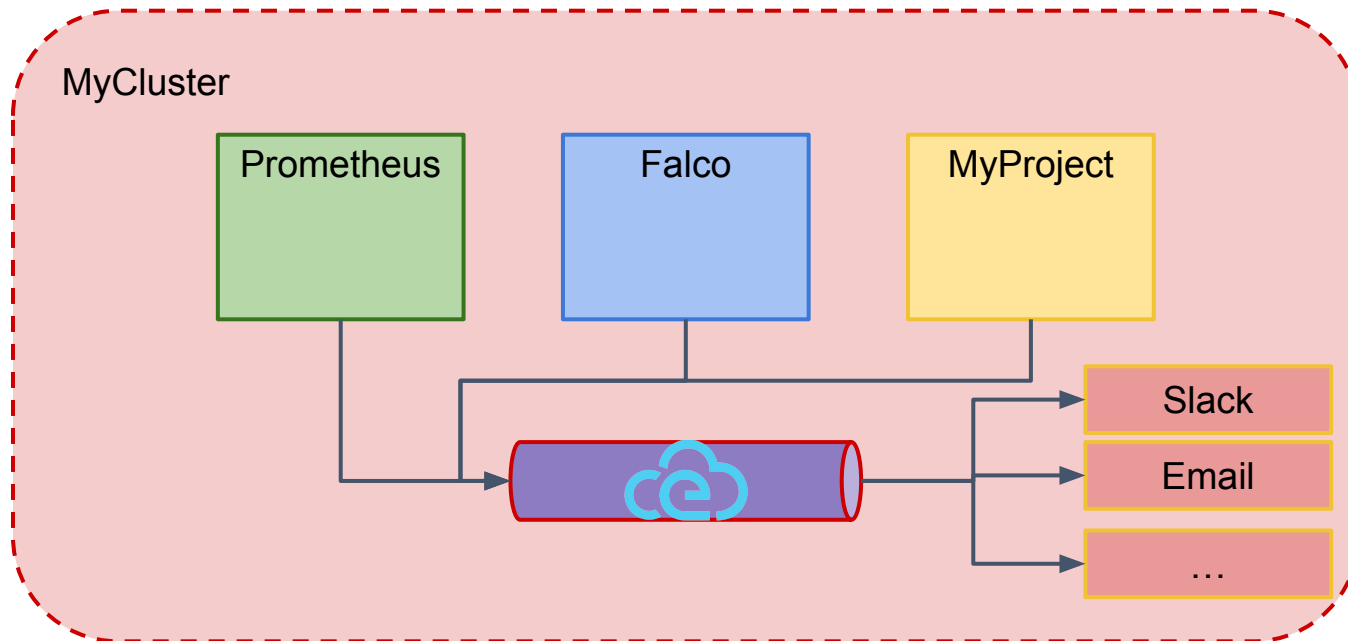


KubeCon



CloudNativeCon

Europe 2022



cloudevents





KubeCon



CloudNativeCon

Europe 2022

# CloudEvents Mechanics



KubeCon



CloudNativeCon

Europe 2022

*Business Logic*

*Custom Glue*

*Protocol Library*

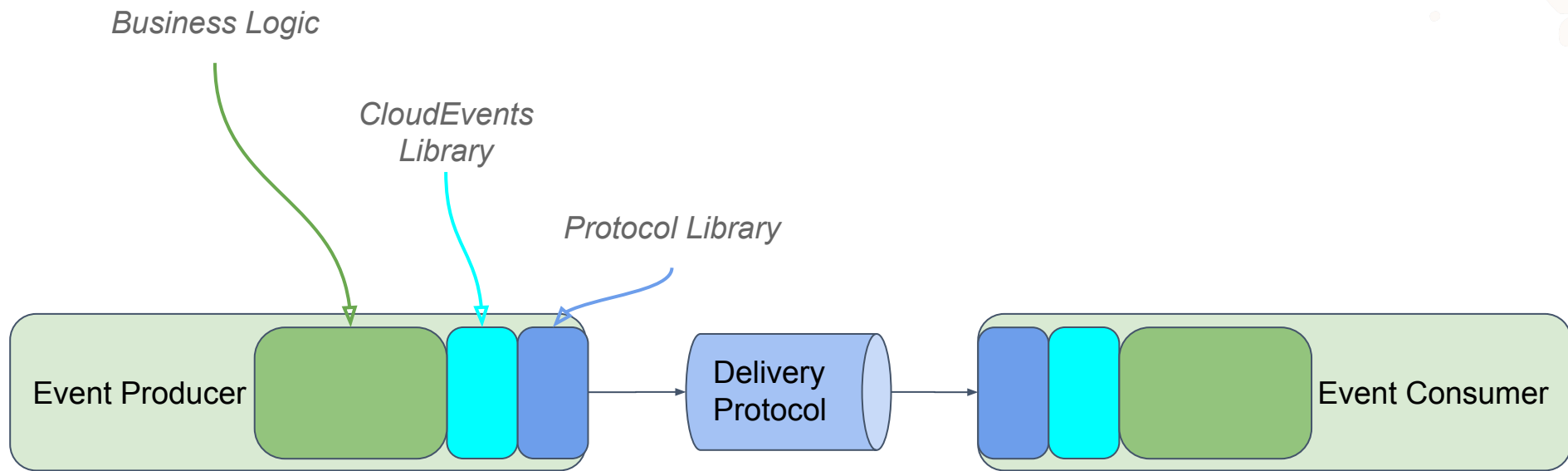
Event Producer

Delivery  
Protocol

Event Consumer



cloudevents





KubeCon



CloudNativeCon

Europe 2022

A side effect of CloudEvents:  
selecting off the shelf integrations  
in place of bespoke software.



cloudevents



KubeCon



CloudNativeCon

Europe 2022

## Business Logic

CloudEvents  
Library

Protocol Library

Event Producer

Event Consumer

Event Consumer

Focus on business logic, not *protocol integrations*. Switching out protocols later becomes **trivially possible**.



cloudevents

## HTTP - Structured

POST /event HTTP/1.0

Host: example.com

Content-Type:

application/cloudevents+json

```
{
  "specversion": "1.0",
  "type": "com.bigco.newItem",
  "source": "http://bigco.com/repo",
  "id":
    "610b6dd4-c85d-417b-b58f-3771e532",
  "datacontenttype": "application/json",
  "data": {
    "action": "newItem",
    "itemID": "93"
  }
}
```



## HTTP - Binary

POST /event HTTP/1.0

Host: example.com

Content-Type: application/json

**ce-specversion: 1.0**

**ce-type: com.bigco.newItem**

**ce-source: http://bigco.com/repo**

**ce-id: 610b6dd4-c85d-417b-b58f-3771e532**

```
{
  "action": "newItem",
  "itemID": "93"
}
```





KubeCon



CloudNativeCon

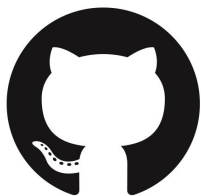
Europe 2022

## Required attributes

id: String  
source: URI-reference  
specversion: String  
type: String

## Optional attributes

datacontenttype: String  
dataschema: URI  
subject: String  
time: Timestamp



```
{  
  "specversion": "1.0",  
  "type": "com.github.create.branch",  
  "source": "https://github.com/cloudevents/spec",  
  "id": "610b6dd4-c85d-417b-b58f-3771e532",  
  "datacontenttype": "application/json",  
  "subject": "70823088e52b393b4251abd1ab03b6cfa233d427"  
  "data": {  
    ...  
  }  
}
```



cloudevents



KubeCon



CloudNativeCon

Europe 2022

The CloudEvents community has been developing and maintaining **SDKs** and **Protocol Bindings** to enable adoption where you are today.



cloudevents

\*cat not yet supported



## Software Development Kits



## Protocol Bindings



## SDKs

- Go
- JavaScript
- Java
- C#
- Ruby
- PHP
- Python
- Rust
- PowerShell

## Integrations

- Adobe I/O Events
- Alibaba Cloud EventBridge
- Argo Events
- Azure Event Grid
- Choria
- commercetools
- Debezium
- Direktiv
- Falco
- Google Cloud Eventarc
- IBM Cloud Code Engine
- Keptn
- Knative Eventing
- Kogito
- OpenFaaS
- Oracle Cloud
- Serverless.com Event Gateway
- Serverless Workflow
- Tekton Pipelines
- Tencent Cloud EventBridge
- TriggerMesh
- VMware Event Broker Appliance
- wasmCloud



KubeCon



CloudNativeCon

Europe 2022



cloudevents



KubeCon



CloudNativeCon

Europe 2022

# Project Update: Future Work

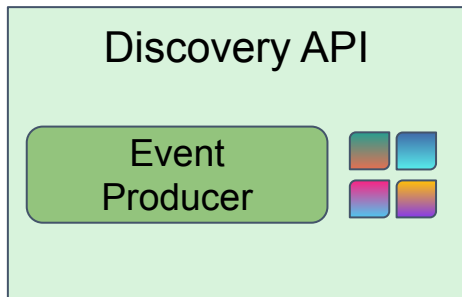


KubeCon

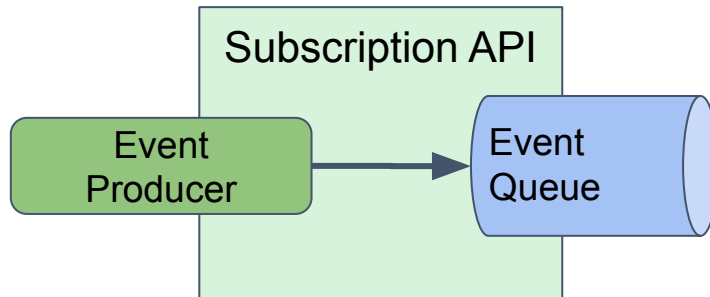


CloudNativeCon

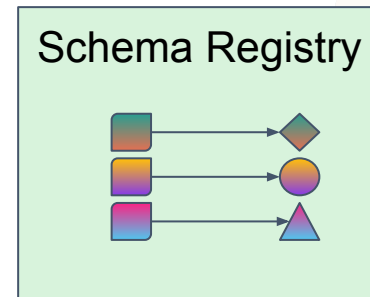
Europe 2022



Ask a producer what it produces, which attributes are used, and how to subscribe to those events.



Ask a producer to subscribe to events, with possible filters for those events.



A common way to store, organize, and access schema documents for use with serialization and data validation.



# Major Rewrite of Next Specs

Work is happening now to draft next gen specs:

- Discovery
  - With Offline Documents
- Schema Registry
  - With Offline Documents
- Subscription API





# Questions?

<https://cloudevents.io>

This working group meets every Thursday at 9AM PT (USA Pacific) 6PM CEST

See the CNCF public events calendar.