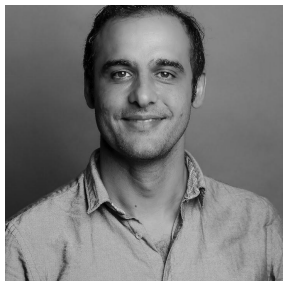


Serverless Containers with **Knative** and **Cloud Run**



Mete Atamel

Developer Advocate at Google

 @meteatamel

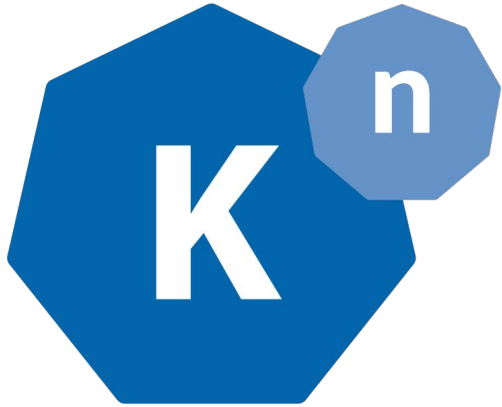
github.com/meteatamel/knative-tutorial



Introduction to Knative

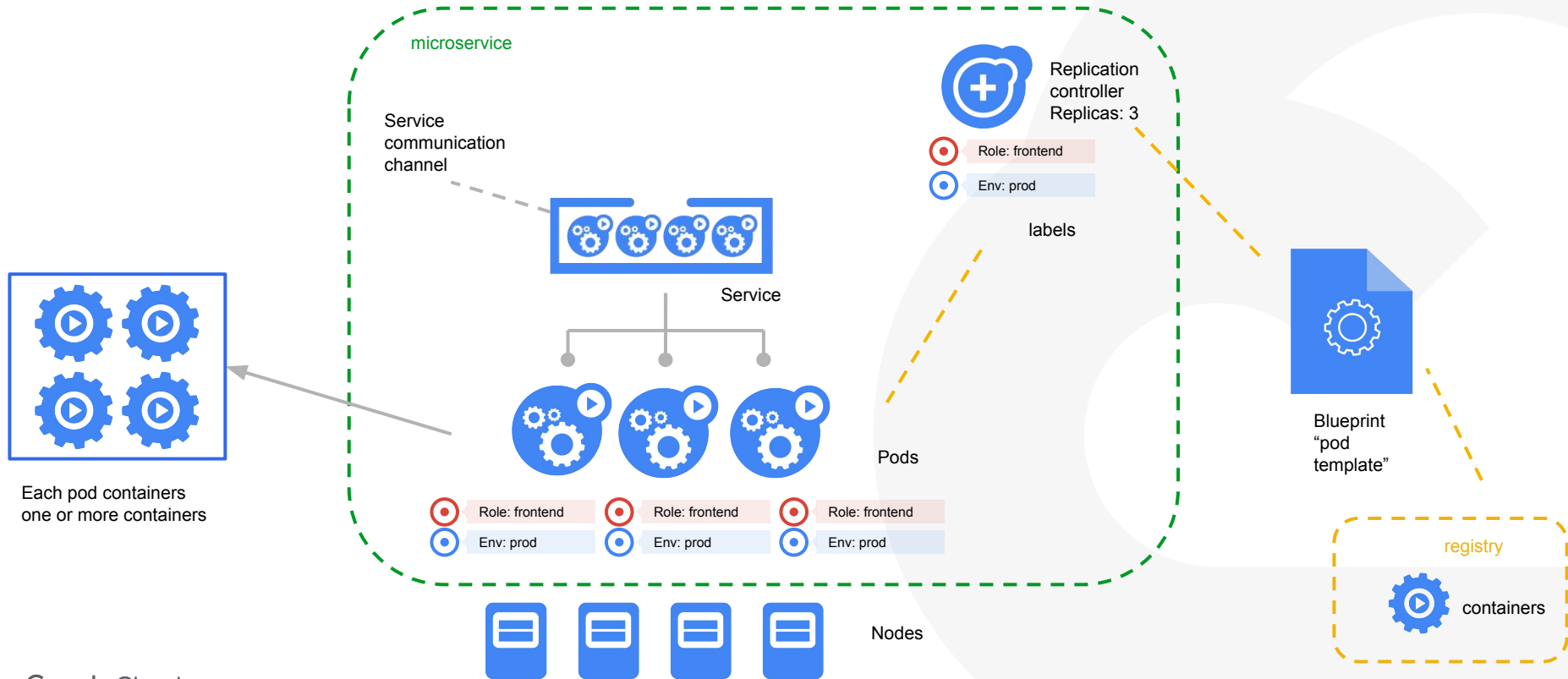


What is Knative?



Kubernetes based
open source building
blocks for **serverless**

Kubernetes





Developers want serverless

... just want to run their code.

... want to use their favorite languages and dependencies.

... don't want to manage the infrastructure.



Operators want Kubernetes

Kubernetes is great orchestrating microservices

They love using GKE and not having to do operations for Kubernetes.

Kubernetes is not the right abstraction for their developers.

Knative Project - github.com/knative

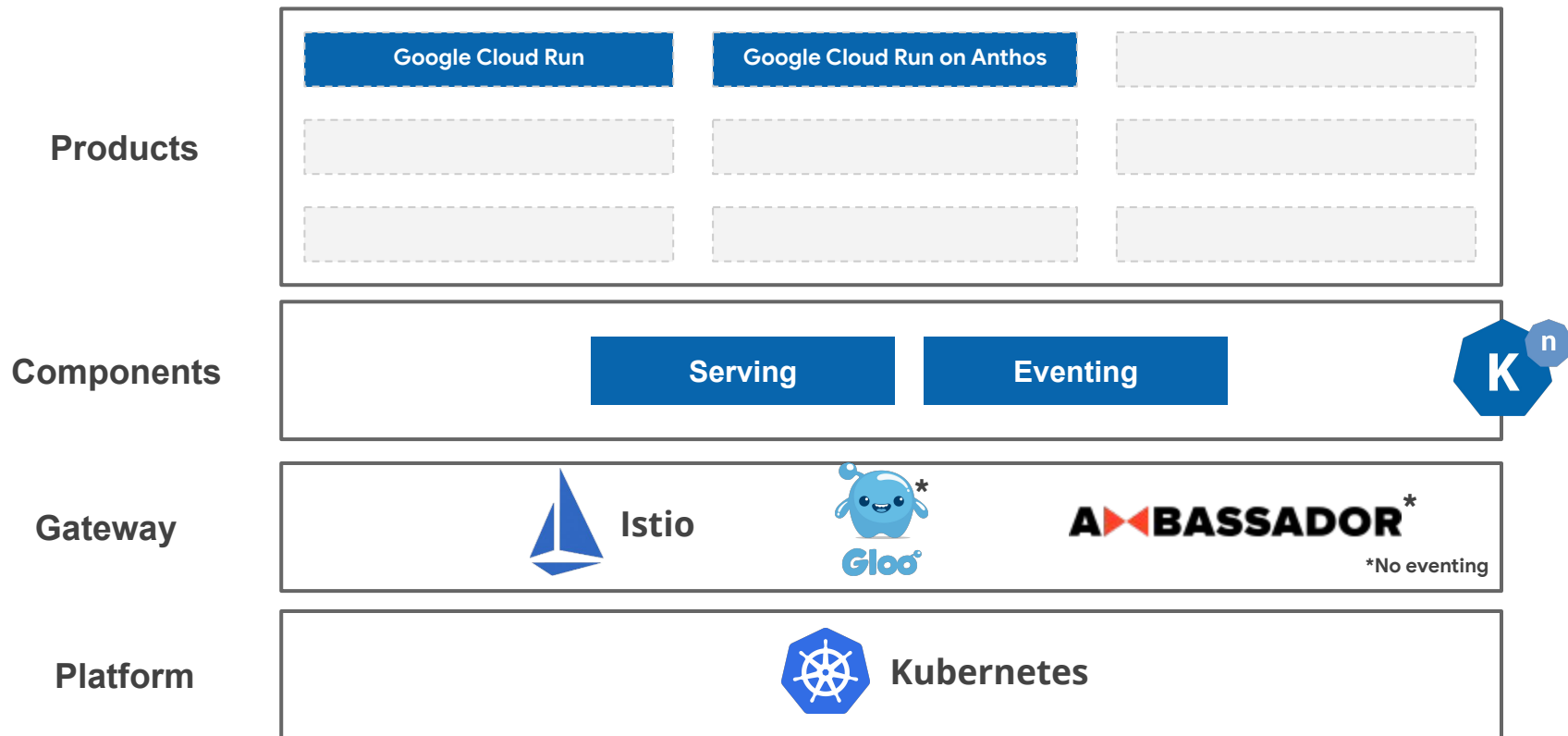


Set of components for serverless

Solves for modern development patterns

Implements learnings from Google, partners

Knative stack



```
# Get a Kubernetes Cluster
```

```
$ gcloud beta container clusters create $CLUSTER_NAME \  
  --addons=HorizontalPodAutoscaling,HttpLoadBalancing,Istio \  
  --machine-type=n1-standard-4 \  
  --cluster-version=latest --zone=$CLUSTER_ZONE \  
  --enable-stackdriver-kubernetes --enable-ip-alias \  
  --enable-autoscaling --min-nodes=1 --max-nodes=10 \  
  --enable-autorepair \  
  --scopes cloud-platform
```

```
Creating cluster hello-knative...done.
```

NAME	LOCATION	MASTER_VERSION	MASTER_IP	MACHINE_TYPE	NODE_VERSION	NUM_NODES	STATUS
Hello-knative	europa-west1-b	1.13.6-gke.5	35.190.182.251	n1-standard-1	1.13.6-gke.5	4	RUNNING

```
# Create Cluster Role Binding
```

```
$ kubectl create clusterrolebinding cluster-admin-binding \  
  --clusterrole=cluster-admin \  
  --user=$(gcloud config get-value core/account)
```

```
clusterrolebinding "cluster-admin-binding" created
```

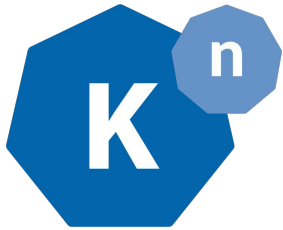

Install Knative

```
$ kubectl apply
  -f https://github.com/knative/serving/releases/download/v0.9.0/serving.yaml \
  -f https://github.com/knative/eventing/releases/download/v0.9.0/release.yaml \
  -f https://github.com/knative/serving/releases/download/v0.9.0/monitoring.yaml
```

Knative Serving



Knative Serving



What is it?

Rapid deployment of serverless containers

Automatic (0-n) scaling

Configuration and revision management

Traffic splitting between revisions

Pluggable

Connect to your own logging and monitoring platform, or use the built-in system

Auto-scaler can be tuned or swapped out for custom code

Knative Serving Primitives

Knative Service

High level abstraction for the application

Configuration

Current/desired state of an application

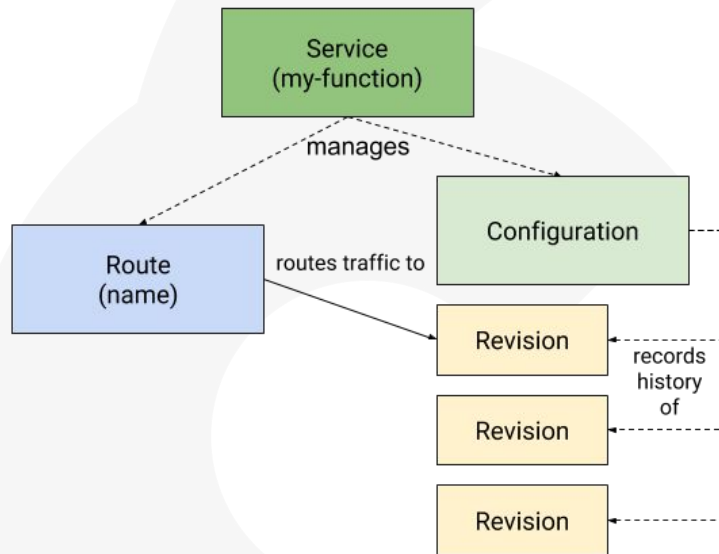
Code & configuration separated (a la 12-factor)

Revision

Point in time snapshots for your code and configuration

Route

Maps traffic to revisions



Serverless on Google Cloud



Cloud Run

Fully managed, deploy your workloads and don't see the cluster.



Cloud Run on Anthos

Deploy into Anthos, run serverless side-by-side with your existing workloads.



Knative Everywhere

Use the same APIs and tooling anywhere you run Kubernetes with Knative.

Knative Eventing



Knative Eventing



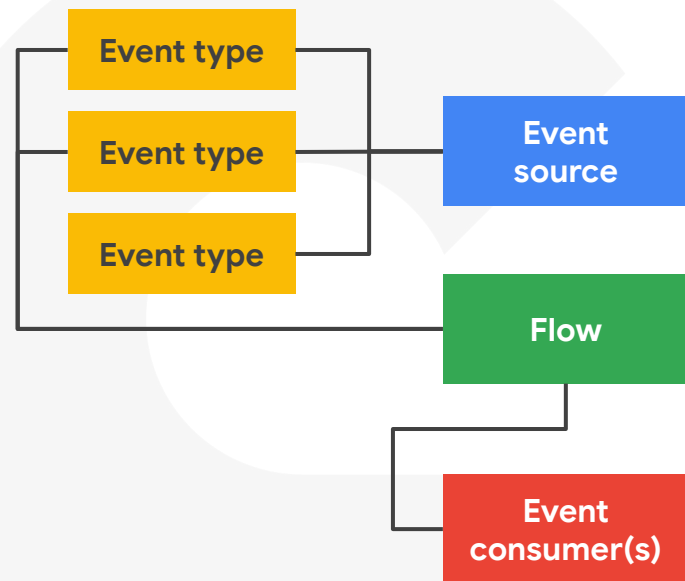
What is it?

For loosely coupled, event-driven services with on/off cluster event sources

Bind declaratively event sources, triggers and services

Scales from just few events to live streams

Uses standard CloudEvents

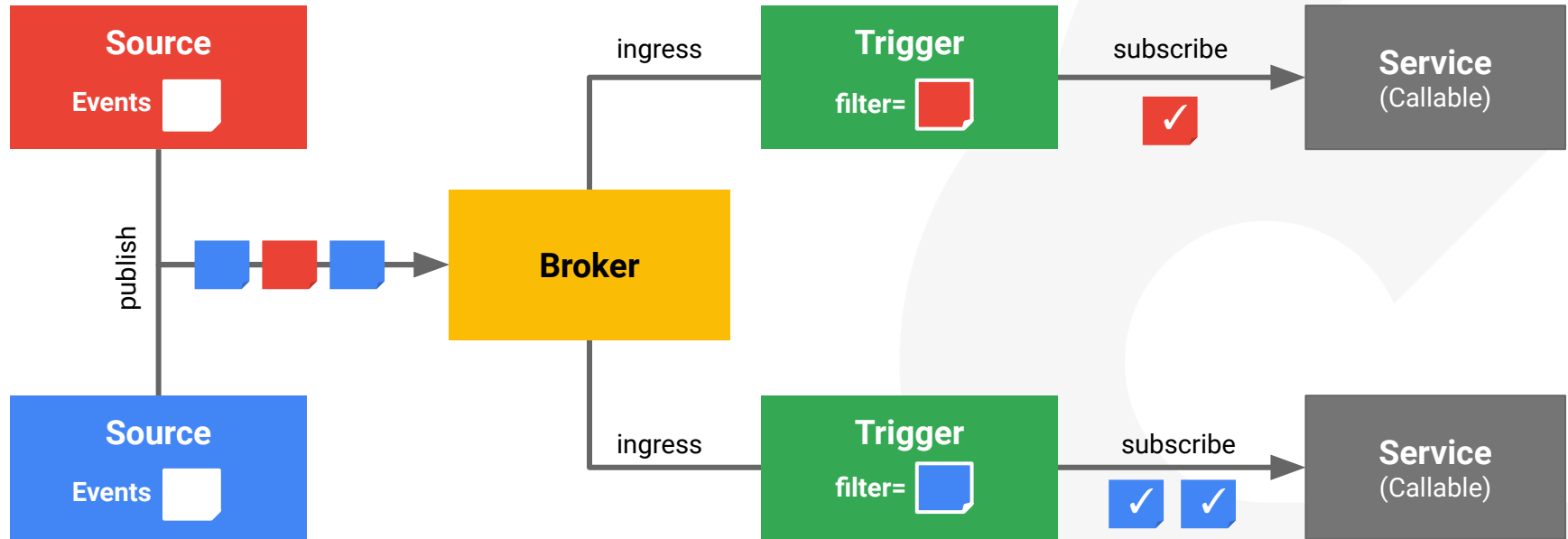


Knative Event Sources

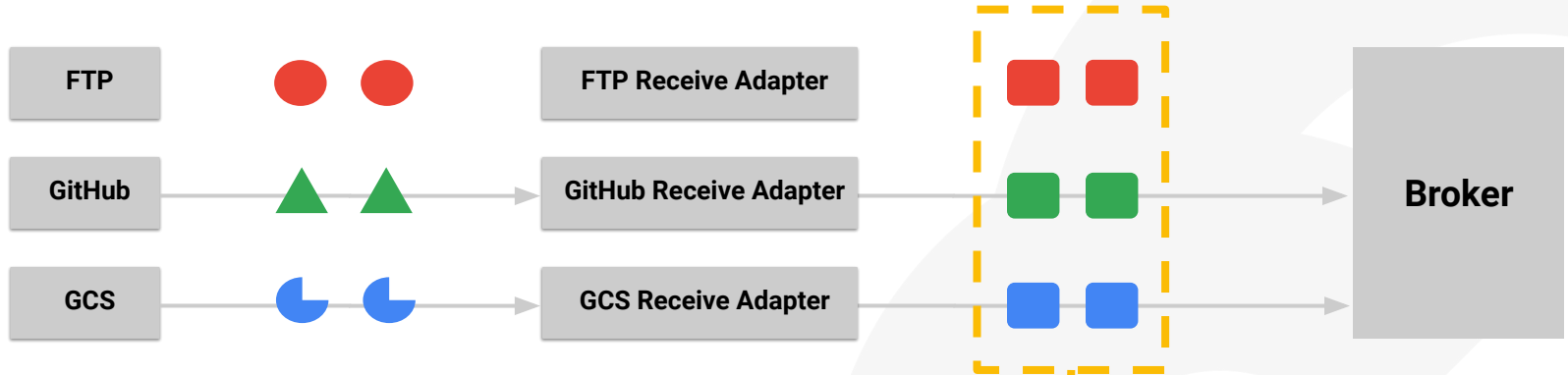
Name	Description
Apache Camel	Allows to use Apache Camel components for pushing events into Knative
Apache Kafka	Brings Apache Kafka messages into Knative
AWS SQS	Brings AWS Simple Queue Service messages into Knative
Cron Job	Uses an in-memory timer to produce events on the specified Cron schedule.
GCP PubSub	Brings GCP PubSub messages into Knative
GitHub	Brings GitHub organization/repository events into Knative
GitLab	Brings GitLab repository events into Knative.
Google Cloud Scheduler	Google Cloud Scheduler events in Knative when jobs are triggered
Google Cloud Storage	Brings Google Cloud Storage bucket/object events into Knative
Kubernetes	Brings Kubernetes cluster/infrastructure events into Knative

Knative Eventing

Namespace



Knative Events

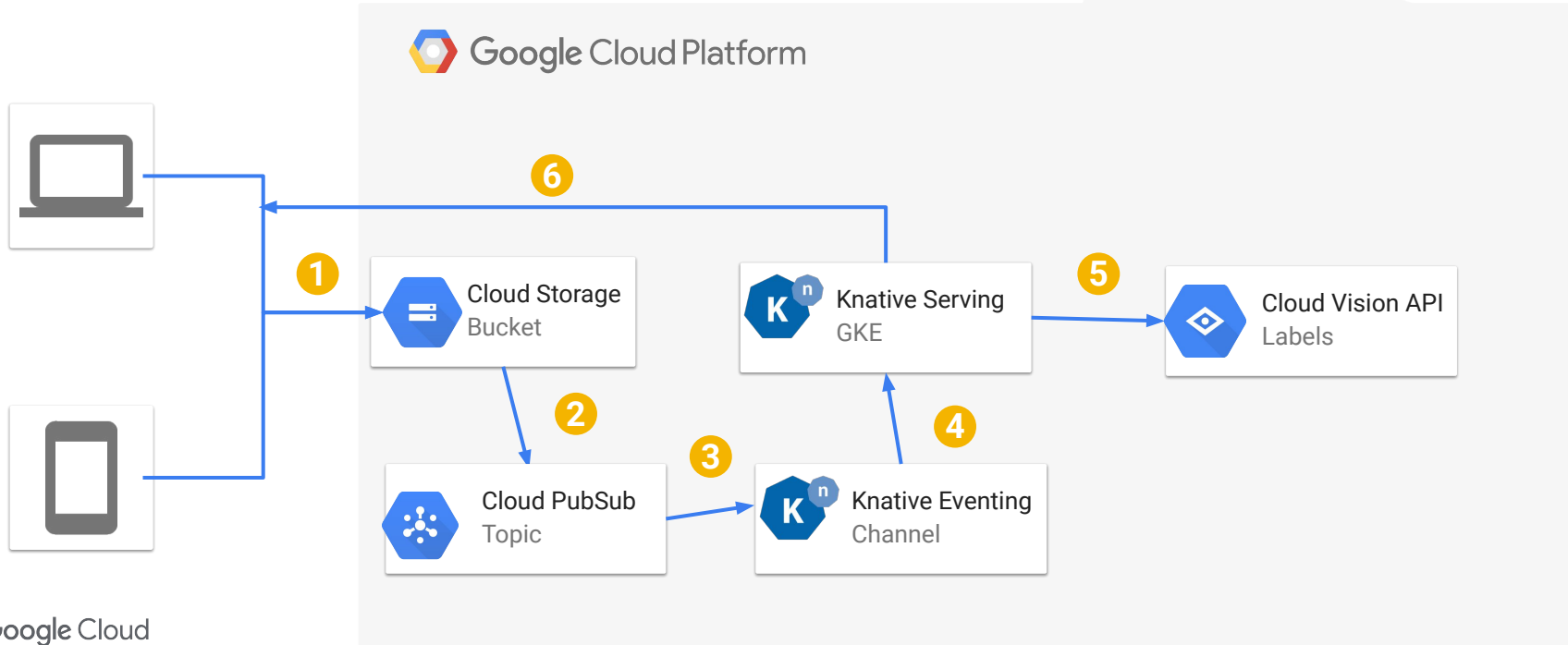


CloudEvent

```
{  
  "specversion": "0.2",  
  "type": "com.github.pull.create",  
  "source": "https://github.com/cloudevents/spec/pull/123",  
  "id": "A234-1234-1234",  
  "time": "2019-04-08T17:31:00Z",  
  "datacontenttype": "application/json",  
  "data": "{ GitHub Payload... }"  
}
```

Integrate Cloud Storage to Vision API

Cloud Storage -> Cloud PubSub -> Knative Eventing -> Knative Serving -> Vision API



Building



Knative Build (Pre 0.8)



Tekton Pipelines (Post 0.8)

Tekton Pipelines



What is it?

Kubernetes style resources for declaring CI/CD-style pipelines

Go from source code to container images on repositories

Build pipelines can have multiple steps and can push to different registries

Builds run in containers in the cluster. No need for Docker locally

Primitives

Task: Represents the work to be executed with 1 or more steps

TaskRun: Runs the Task with supplied parameters

Pipeline: A list of Tasks to execute in order

ServiceAccount: For authentication with DockerHub etc.

Thank you!

 @meteatamel

github.com/meteatamel/knative-tutorial

knative.dev

cloud.google.com/run

