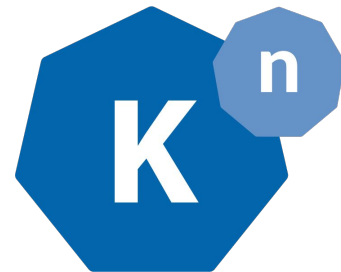


Serverless with Knative



Mete Atamel

Developer Advocate at Google

 @meteatamel

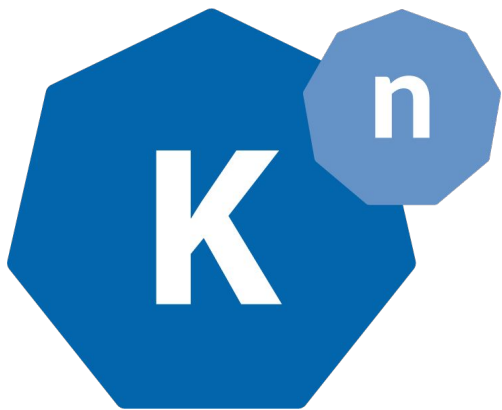
github.com/meteatamel/knative-tutorial



Introduction to Knative



What is Knative?



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

Ideal Serverless



No servers



Idiomatic

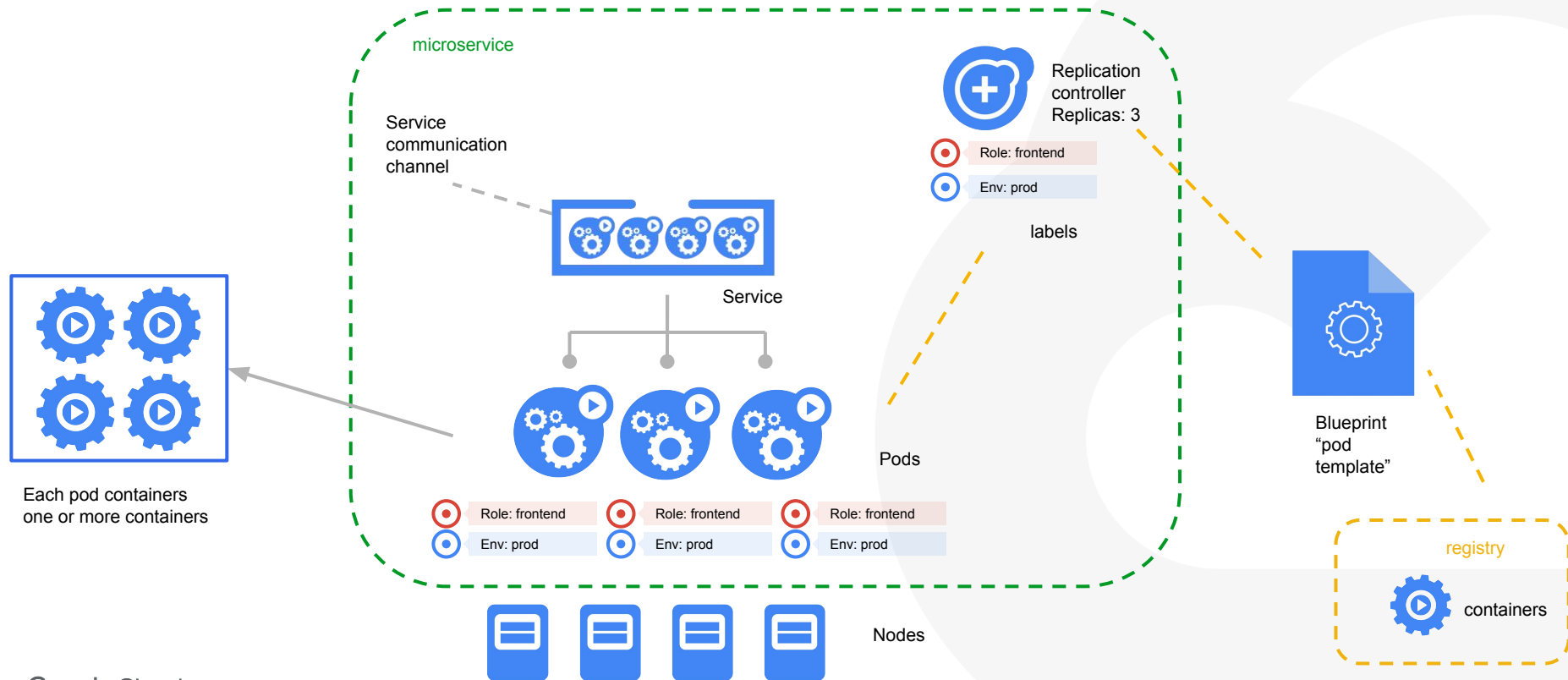


Event-driven



Portable

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 (serving, eventing, build)

Solves for modern development patterns

Implements learnings from Google, partners



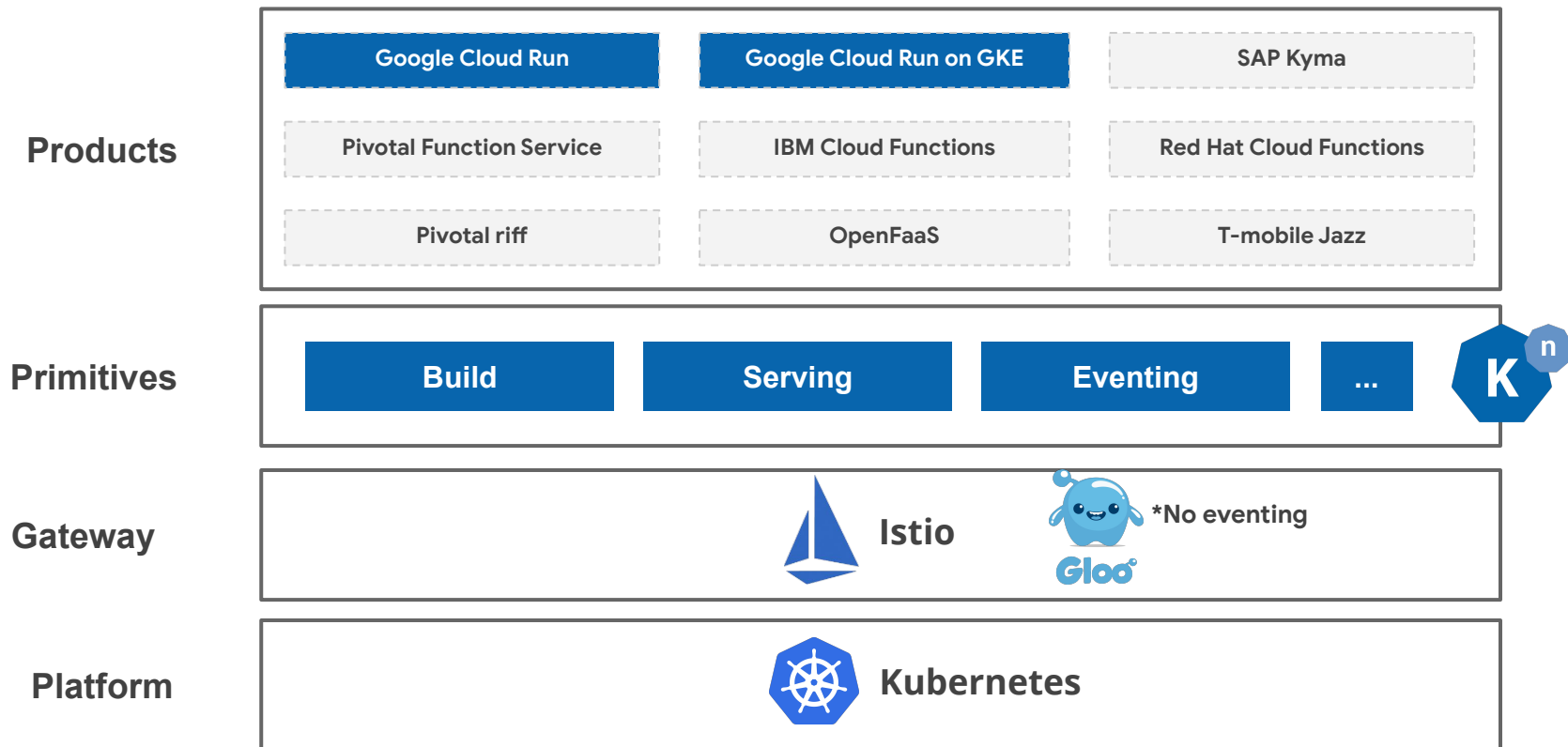
Pivotal®



redhat®



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/v0.7.0/serving.yaml
-l networking.knative.dev/certificate-provider!=cert-manager \
-f https://github.com/knative/build/releases/download/v0.7.0/build.yaml \
-f https://github.com/knative/eventing/releases/download/v0.7.0/release.yaml \
-f https://github.com/knative/serving/releases/download/v0.7.0/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

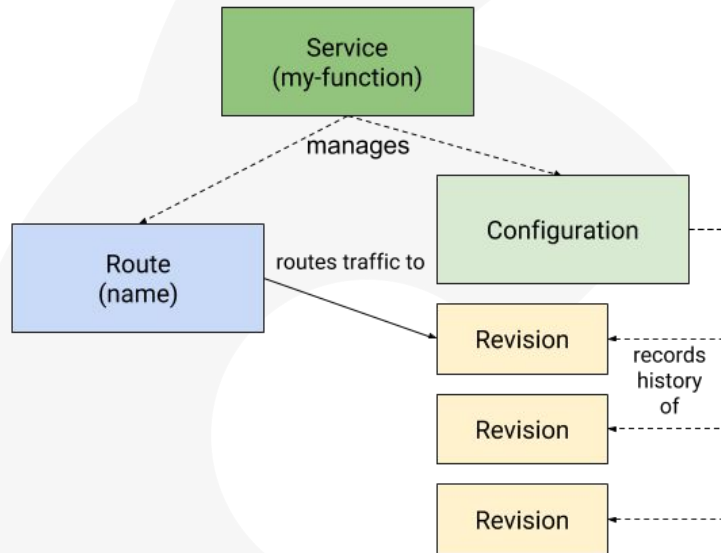
Code & configuration separated (a la 12-factor)

Revision

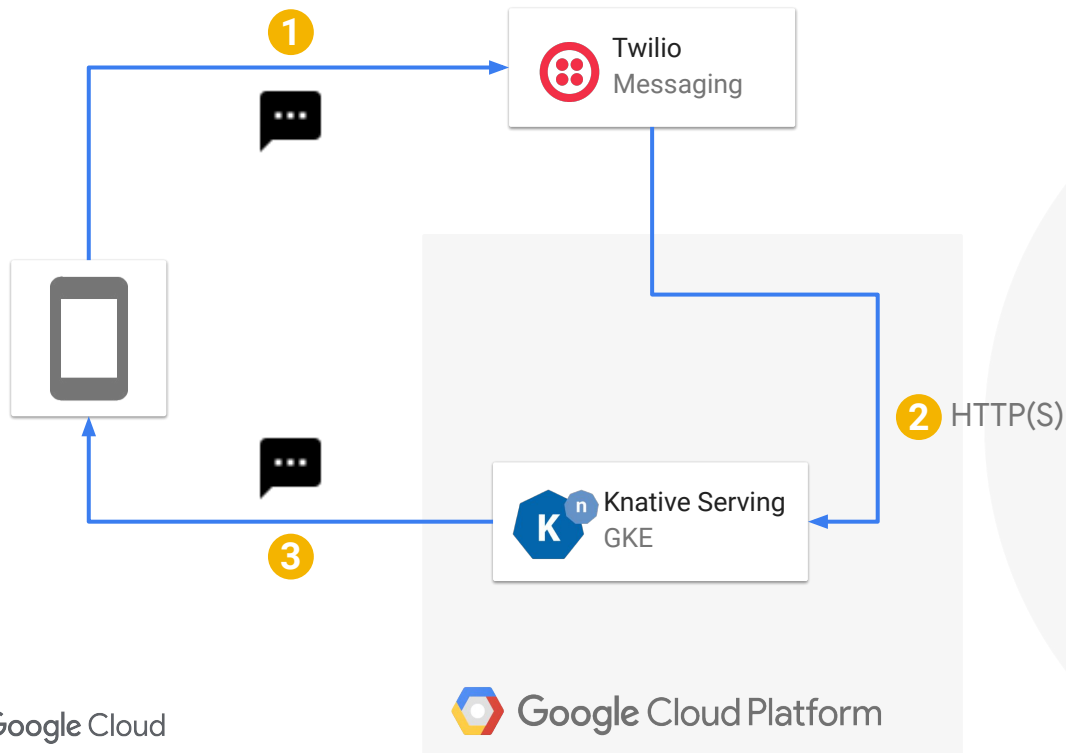
Point in time snapshots for your code and configuration

Route

Maps traffic to revisions



Integrate Twilio to Knative Serving

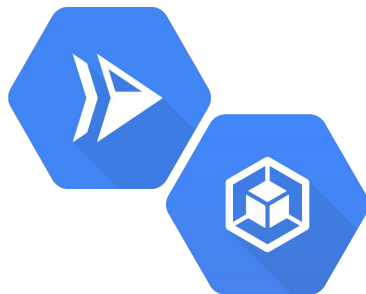


Serverless on Google Cloud



Cloud Run

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



Cloud Run on GKE

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



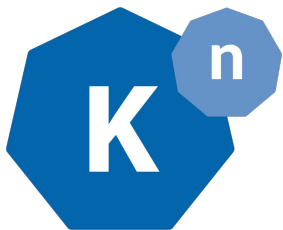
Knative Everywhere

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

Knative Eventing



Knative Eventing



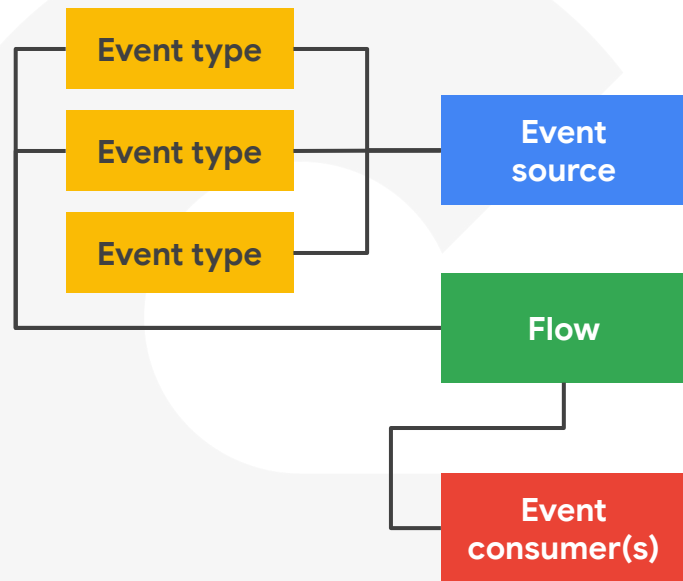
What is it?

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

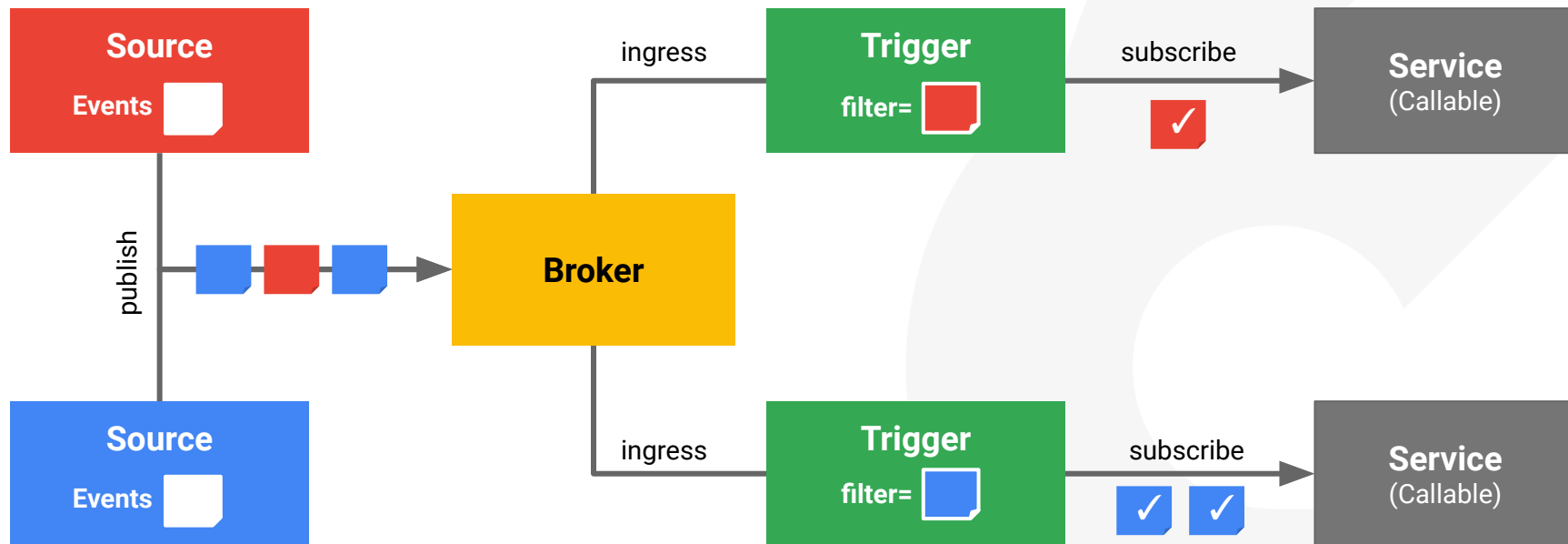


Knative Event Sources

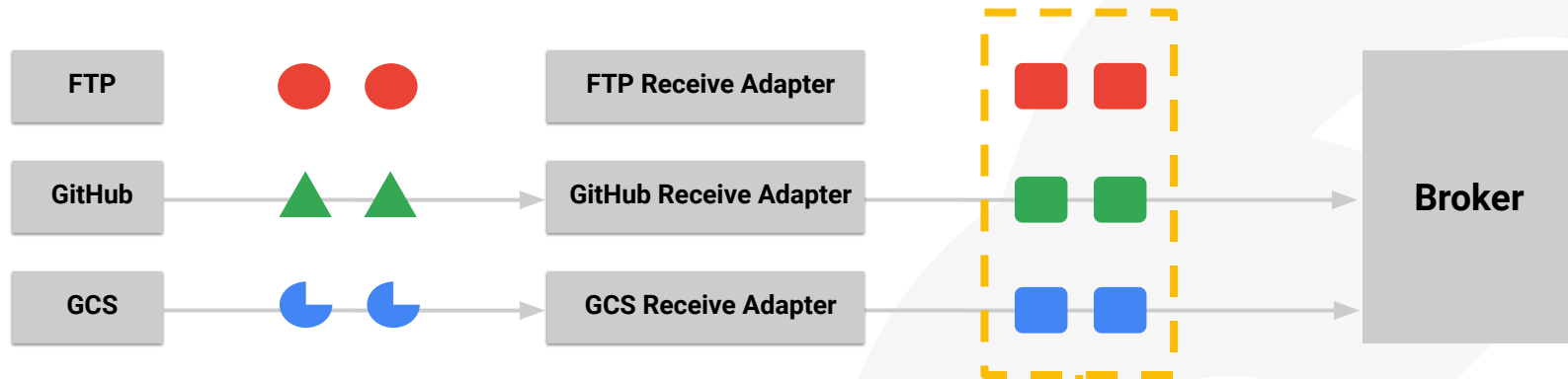
Name	Description
Apache Camel	Allows to use Apache Camel components for pushing events into Knative
Apache Kafka	Brings Apache Kafka messages into Knative
AWS SQS	Brings AWS Simple Queue Service messages into Knative
Cron Job	Uses an in-memory timer to produce events on the specified Cron schedule.
GCP 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 (post 0.5)

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... }"  
}
```

Knative Event Broker

One per namespace

Discoverable endpoint

Manages

- Channels
- Ingress filter/policy

Simple Broker

```
apiVersion: eventing.knative.dev/v1alpha1
kind: Broker
metadata:
  name: b1
  namespace: demo
spec: {}
status:
  address:
    hostname: b1-broker.demo.svc.cluster.local
```

Knative Event Trigger

Uses CloudEvents

Supports Filtering

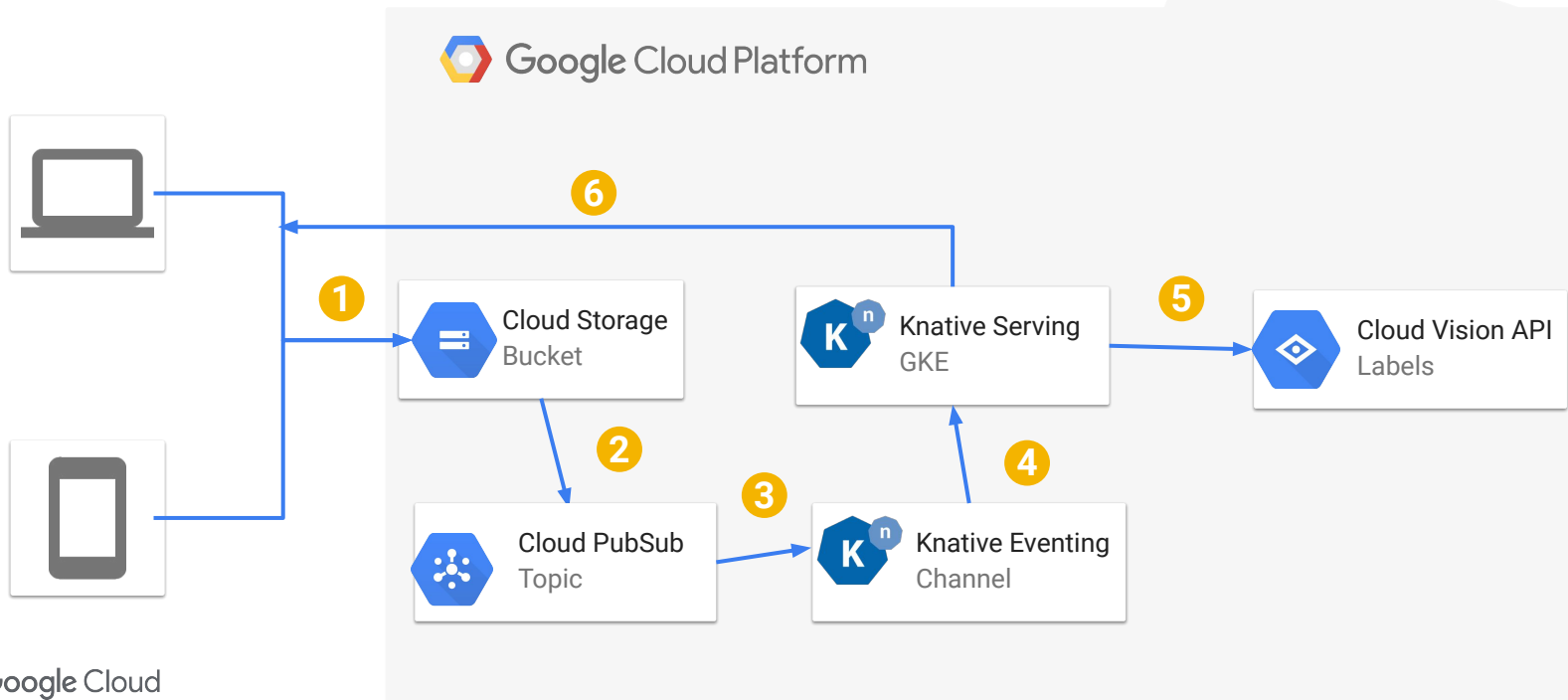
Can produce new events

Simple Trigger

```
apiVersion: eventing.knative.dev/v1alpha1
kind: Trigger
metadata:
  name: build-status-slack-notifier
spec:
  filter:
    sourceAndType:
      type: com.slack
  subscriber:
    ref:
      apiVersion: serving.knative.dev/v1alpha1
      kind: Service
      name: slack-sender
```

Integrate Cloud Storage to Vision API

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



Knative Build



Knative Build



What is it?

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

Build: Represents an in-cluster build job with 1 or more steps

BuildTemplate: A set of ordered and parameterized build steps.

Builder: A container in a Build step that performs an action (eg. build)

ServiceAccount: For authentication with DockerHub etc.

Thank you!

 @meteatamel

github.com/meteatamel/knative-tutorial

knative.dev

cloud.google.com/knative



Google Cloud