



# CLOUD DAY 2020

29 OTTOBRE • ONLINE CONFERENCE

## **ANTHOS, LA PIATTAFORMA DEFINITIVA PER LE APPLICAZIONI IBRIDE E MULTI-CLOUD**

GIORGIO CRIVELLARI  
Google



# Kudos



**managed/designs**



# Agenda



```
apiVersion: v1
kind: Agenda
metadata:
  name: cloud-day-2020
  labels:
    app: Anthos
spec:
  topics:
    - Anthos Introduction
    - Managed Kubernetes
    - Multi-cluster & Feature management
    - Managing configuration and policies
    - Service management
    - Operations
    - Migrate for Anthos (VM2Container)
```



**+75%**

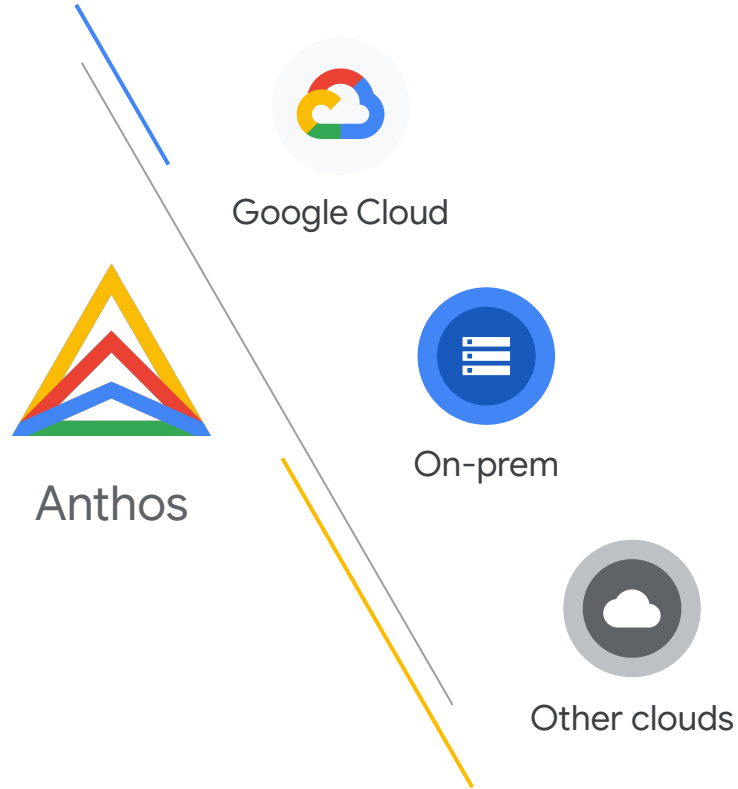
of medium and  
large businesses  
will have adopted a  
multi-cloud or hybrid  
strategy by 2021





*“An open, hybrid and multi-cloud application platform that enables you to modernize your existing applications, build new ones, and run them anywhere in a secure manner.”*

*( managed by*  *)*



Anthos gives you  
**freedom to  
modernize** without  
being locked in



Anthos

<https://anthos.dev>



Developer

Knative → Cloud Run



Service Operator / SRE

Istio → Anthos Service Mesh



Infrastructure Operator

Kubernetes → Anthos GKE

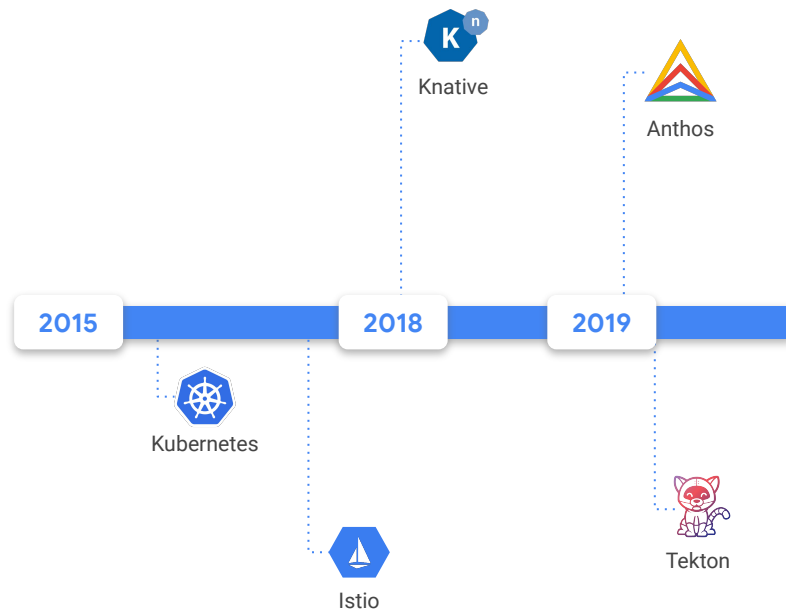


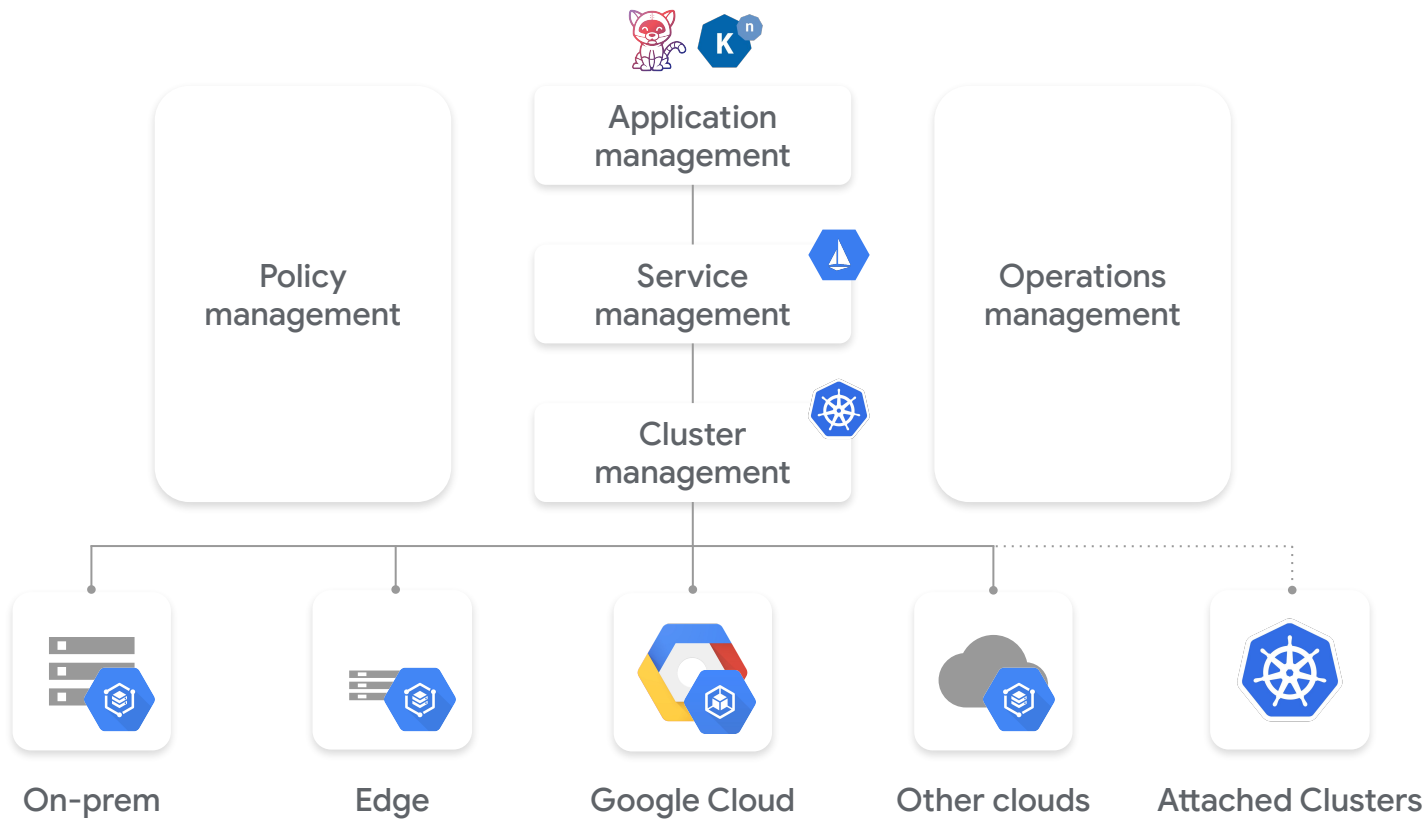
Release Engineer

Tekton → Cloud Build for Anthos

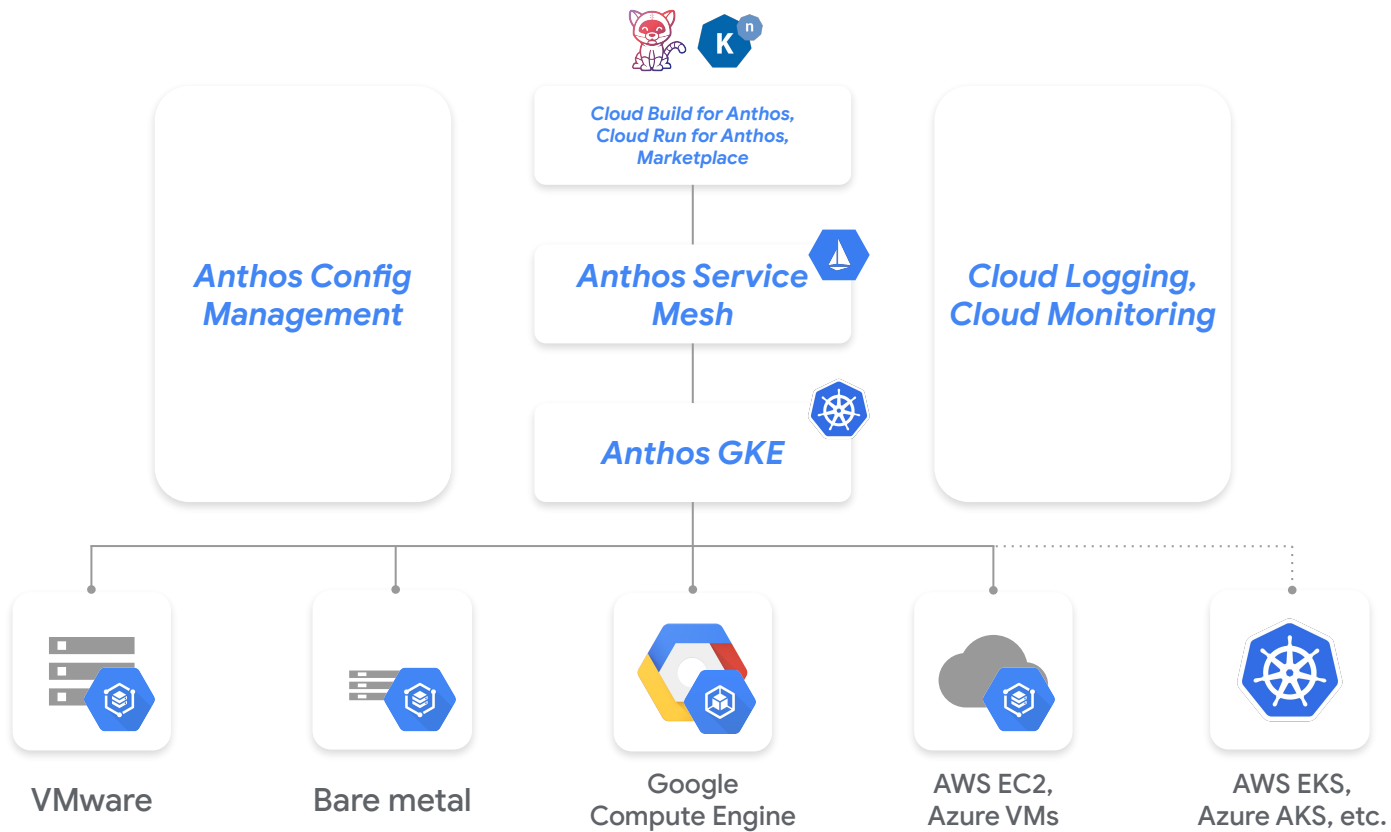
# The Anthos open source stack

- **Kubernetes** – container orchestration
  - Portable: runs on most clouds, hypervisors, and even bare-metal
  - The *lingua franca* of containers
- **Istio** – service mesh for Kubernetes and VMs
  - Connect, secure, manage, and monitor microservices
  - Application layer smarts: A/B testing, gradual rollouts, etc.
- **Knative** – serverless primitives on Kubernetes
  - Enabling Platform-as-a-service (PAAS) without vendor lock-in
  - Lets developers be developers – not Kubernetes experts
- **Tekton** – CI/CD primitives on Kubernetes

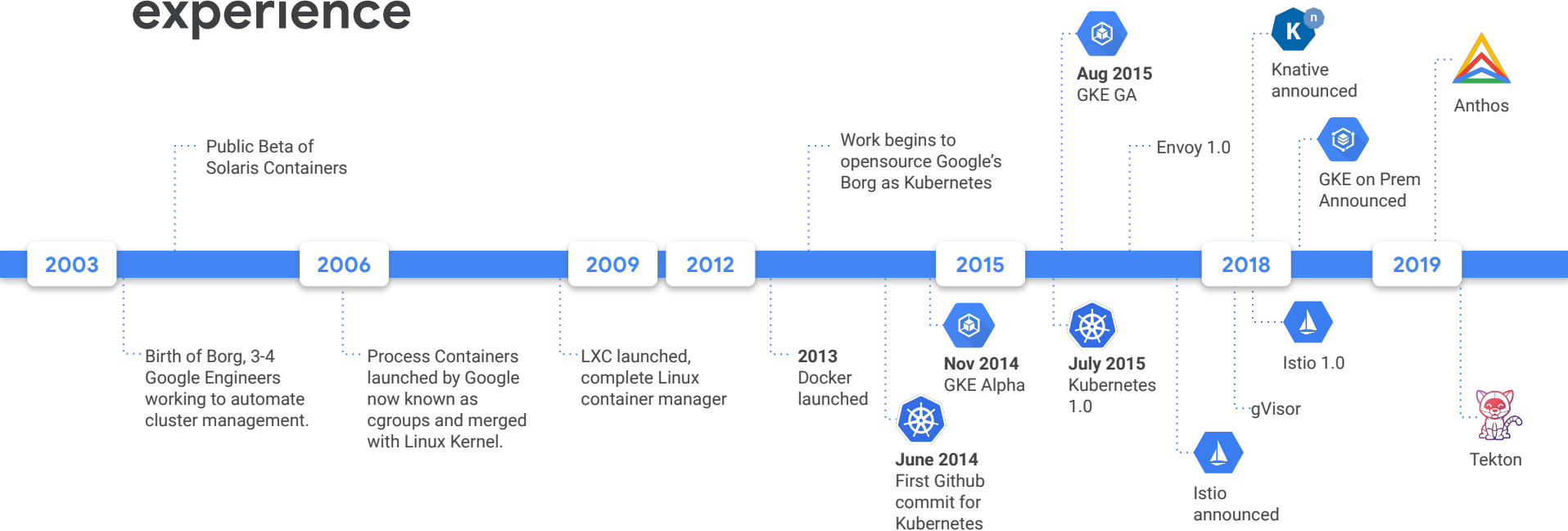








# Anthos builds on 15+ years of experience



# Differentiating Managed Kubernetes

Highly managed,  
Low customer  
effort



Anthos

Customers who want to have a **Google tested, Google integrated** container deployment offering across **multiple environments**



Anthos GKE

Customers who **don't want to worry about the complexity** of Kubernetes and want Google to handle deployment, scaling and management

Unmanaged,  
High customer  
effort



OSS K8s  
on GCP

OSS K8s  
on your own

Expert Kubernetes users who have **time to manage and configure various settings and deployment**, and are not looking to leverage any integrations nor take advantage of Google SRE

# GKE makes scaling easy



**GKE simplifies automated scaling with multiple offerings**

## Vertical Pod Autoscaling

Watch resource utilisation of your deployments and adjust requested CPU and RAM to stabilize the workloads

## Node Auto-Provisioning

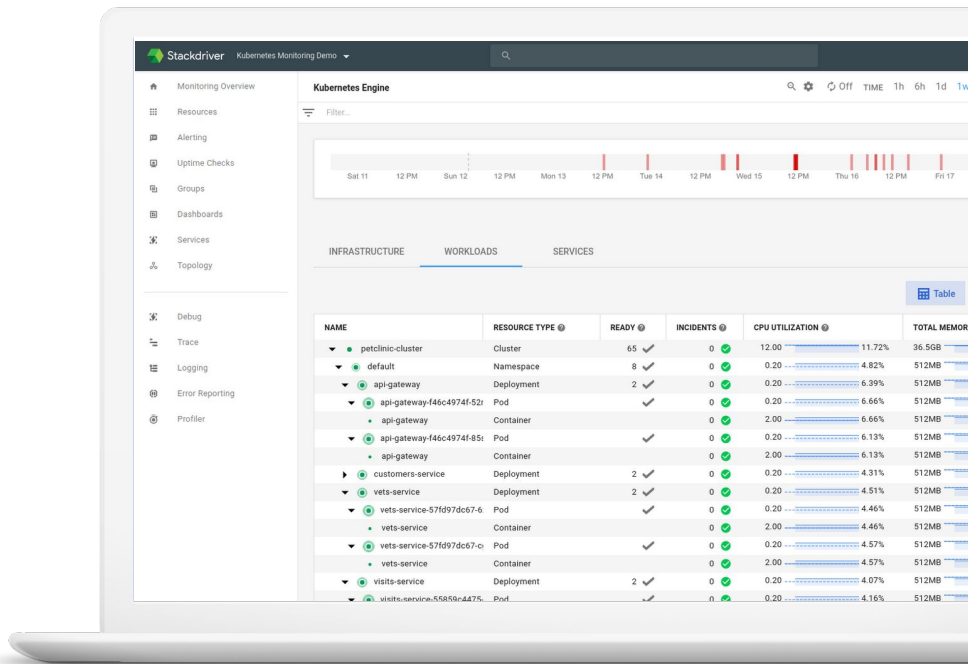
Optimizes cluster resources with an enhanced version of Cluster Autoscaling

## 15K+ nodes on GKE

Scale to meet the needs of any workload

# Kubernetes Monitoring

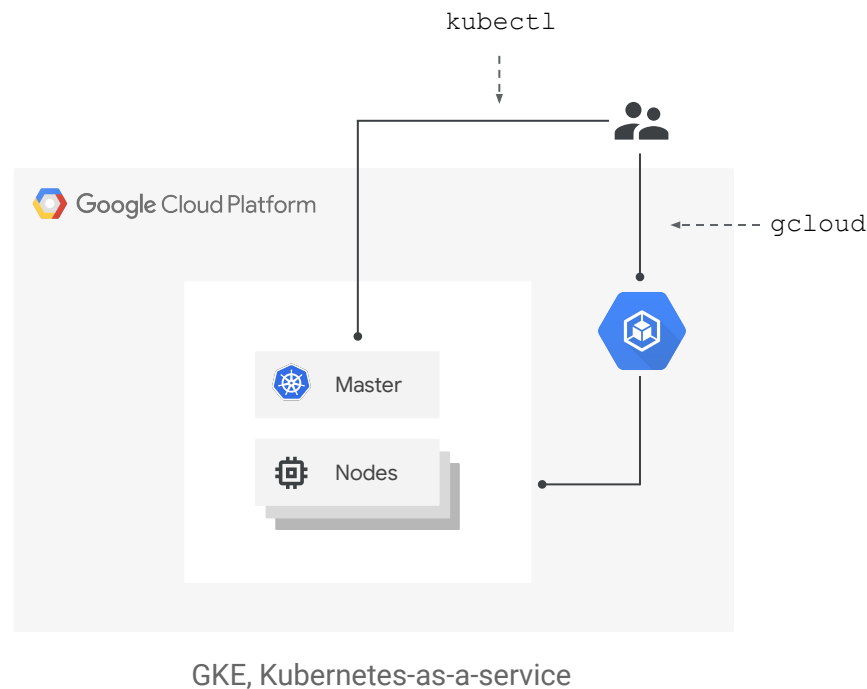
- ✓ **Comprehensive Kubernetes observability** at scale, right out of the box.
- ✓ **Works with Open Source:** Seamless integration with Prometheus.
- ✓ **Runs anywhere:** Pre-integrated on GCP, easily configured on hybrid cloud.
- ✓ **Integrated with Stackdriver:** reduces cost of using disparate tools to keep Kubernetes apps fast and available
- ✓ **Unlocks Google's SRE best practices** to developers and operators





# The GKE's

- The idea is to stand up the full GKE product on all major IAAS – on or off the cloud
  - GKE on Google Cloud (GA in [Aug 2015](#))
  - GKE on-prem (GA in [April 2019](#))
  - GKE on AWS (announced [April 2020](#), GA in July)
  - GKE on Azure, currently in preview
  - GKE on Bare Metal announced
- Additionally, Anthos Attached Clusters allow for a lightweight integration with less bells and whistles



# Unified Management

Single pane of glass across Google Cloud & on-premises

01

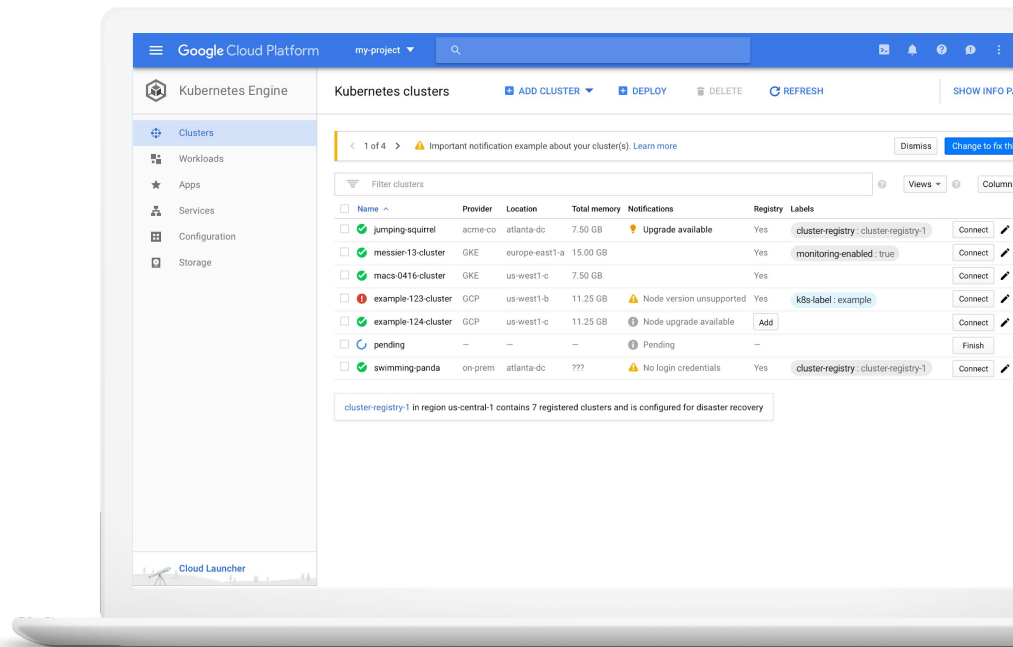
Orchestrate and manage on-prem containers just like GKE in the cloud

02

Consistent operating model with access to GCP services across hybrid environments

03

Single-pane-of-glass for multiple Kubernetes clusters, no matter where



Anthos

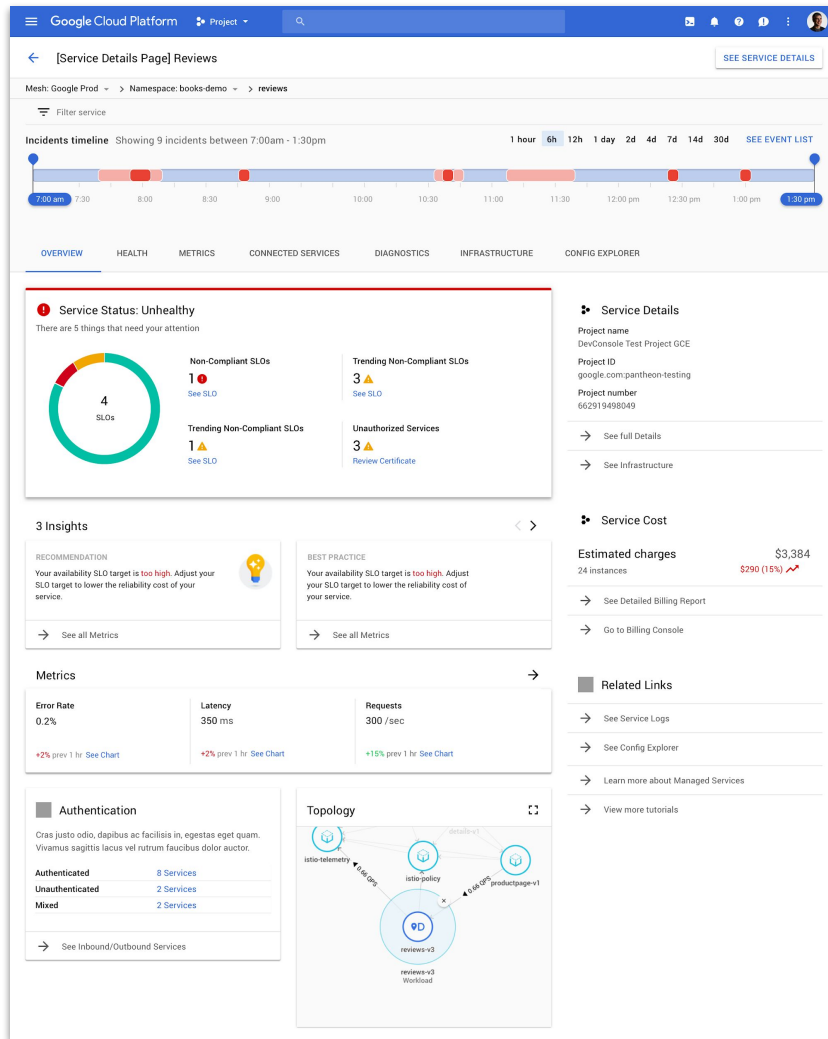
<https://anthos.dev>



**Anthos Service Mesh (ASM)** provides service management and a single pane of glass for

- Metrics, logging, tracing, and SLO monitoring
- Service identity, AuthN/Z, and encryption
- Traffic management: routing, and load balancing

Additionally, ASM provides insights and recommendations, and analytics.

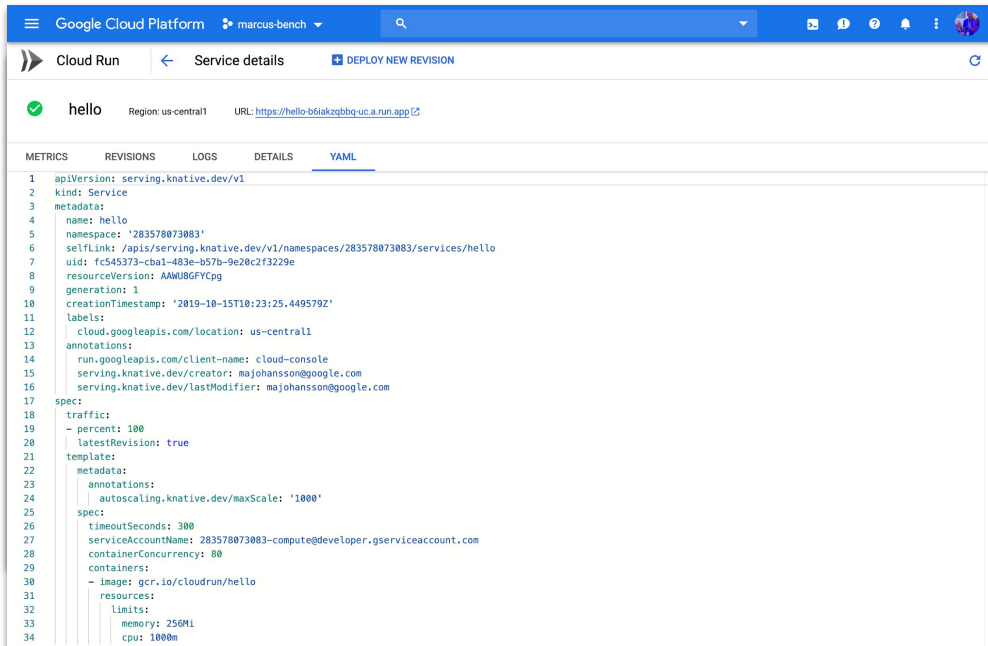




**Cloud Run** is a fully managed serverless product, compatible with Knative.

- Stateless containers via HTTP(s) or gRPC
- Built-in domain handling
- Scales to zero – or as high as you need

**Cloud Run for Anthos** enable serverless on your own cluster – wherever Anthos runs.



The screenshot shows the Google Cloud Platform console interface. At the top, the navigation bar includes the Google Cloud Platform logo, the user name 'marcus-bench', and a search bar. Below the navigation bar, the main header shows 'Cloud Run' and 'Service details' with a 'DEPLOY NEW REVISION' button. The service name 'hello' is displayed, along with the region 'us-central1' and the URL 'https://hello-b6iakzqbq-uc.a.run.app'. The 'YAML' tab is selected, showing the service configuration. The configuration includes metadata (name, namespace, uid, resourceVersion, generation, creationTimestamp, labels), annotations (cloud.googleapis.com/location, run.googleapis.com/client-name, serving.knative.dev/creator, serving.knative.dev/lastModifier), and a spec section with traffic, template, and container details.

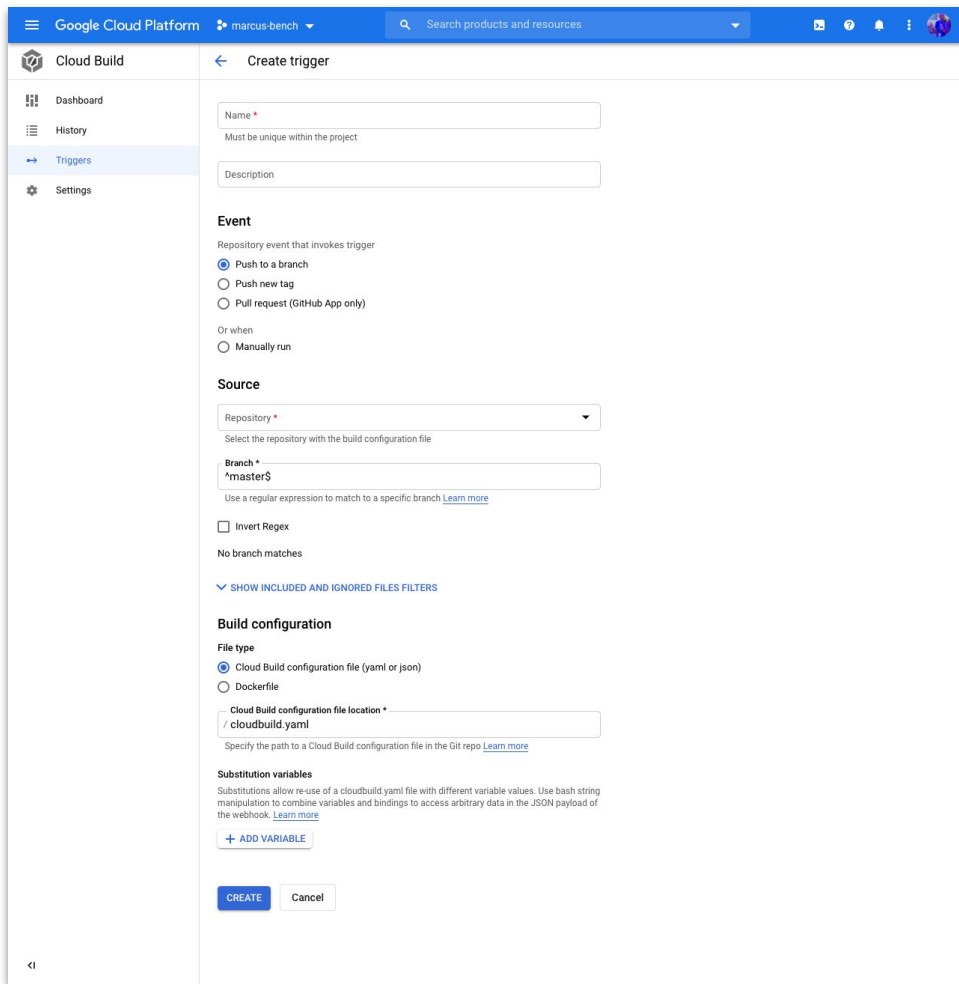
```
1 apiVersion: serving.knative.dev/v1
2 kind: Service
3 metadata:
4   name: hello
5   namespace: '283578073083'
6   selfLink: /apis/serving.knative.dev/v1/namespaces/283578073083/services/hello
7   uid: fc545373-cba1-483e-b57b-9e20c2f3229e
8   resourceVersion: AAMU8GFCpg
9   generation: 1
10  creationTimestamp: '2019-10-15T10:23:25.449579Z'
11  labels:
12    cloud.googleapis.com/location: us-central1
13  annotations:
14    run.googleapis.com/client-name: cloud-console
15    serving.knative.dev/creator: majohansson@google.com
16    serving.knative.dev/lastModifier: majohansson@google.com
17  spec:
18    traffic:
19      - percent: 100
20      latestRevision: true
21    template:
22      metadata:
23        annotations:
24          autoscaling.knative.dev/maxScale: '1000'
25      spec:
26        timeoutSeconds: 300
27        serviceAccountName: 283578073083-compute@developer.gserviceaccount.com
28        containerConcurrency: 80
29        containers:
30          - image: gcr.io/cloudrun/hello
31            resources:
32              limits:
33                memory: 256Mi
34                cpu: 1000m
```



**Cloud Build** is a fully managed pay-as-you-go CI/CD automation service

- Trigger builds on source repo and other external events
- Build, test, and deploy applications
- Executed as a series of containerized tasks

**Cloud Build for Anthos** unlocks the experience and runs wherever Tekton, and Anthos, runs.



The screenshot shows the 'Create trigger' interface in the Google Cloud Platform. The left sidebar contains navigation links: Dashboard, History, Triggers (selected), and Settings. The main content area is titled 'Create trigger' and includes the following sections:

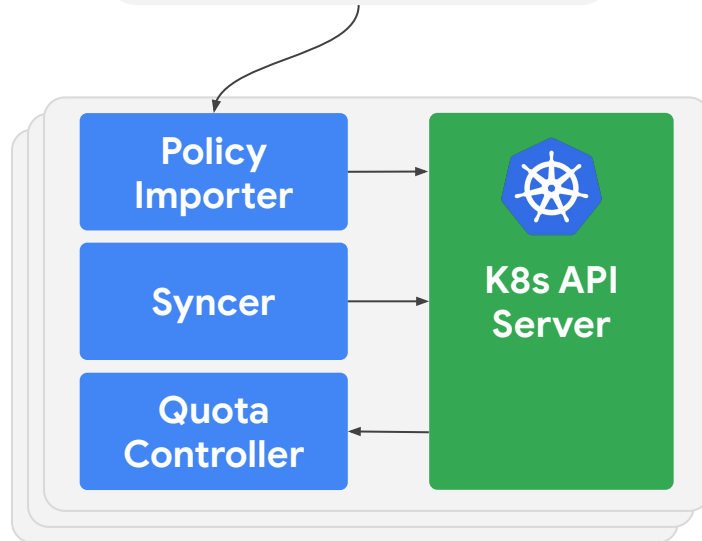
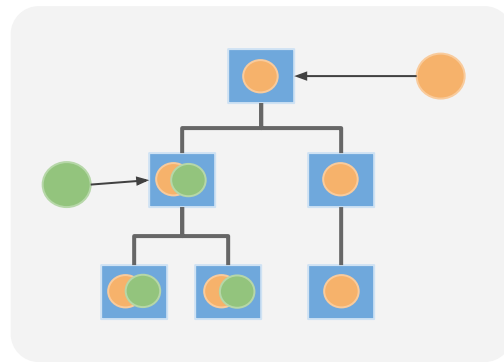
- Name \***: A text input field with a note 'Must be unique within the project'.
- Description**: A text input field.
- Event**: A section titled 'Repository event that invokes trigger' with three radio button options: 'Push to a branch' (selected), 'Push new tag', and 'Pull request (GitHub App only)'. Below these is the 'Or when' section with a radio button for 'Manually run'.
- Source**: A section with a 'Repository \*' dropdown menu (note: 'Select the repository with the build configuration file'), a 'Branch \*' text input field with the value '^master\$', and a note 'Use a regular expression to match to a specific branch [Learn more](#)'. There is an unchecked checkbox for 'Invert Regexp' and a note 'No branch matches'. A link 'SHOW INCLUDED AND IGNORED FILES FILTERS' is also present.
- Build configuration**: A section with a 'File type' section containing two radio buttons: 'Cloud Build configuration file (yaml or json)' (selected) and 'Dockerfile'. Below this is a 'Cloud Build configuration file location \*' text input field with the value '/ cloudbuild.yaml' and a note 'Specify the path to a Cloud Build configuration file in the Git repo [Learn more](#)'.
- Substitution variables**: A section with a note 'Substitutions allow re-use of a cloudbuild.yaml file with different variable values. Use bash string manipulation to combine variables and bindings to access arbitrary data in the JSON payload of the webhook. [Learn more](#)'. Below the note is a '+ ADD VARIABLE' button.
- Buttons**: At the bottom right, there are 'CREATE' and 'Cancel' buttons.

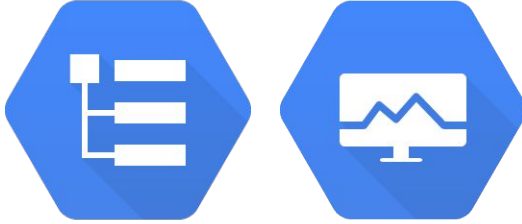




**Anthos Config Management (ACM)** automates policy and configuration at scale.

- Synchronize configuration across clusters on-prem and in the cloud
- Continuous enforcement and admission control of compliance policies
- Based on Git, enables auditability, review and CI through policy-as-code

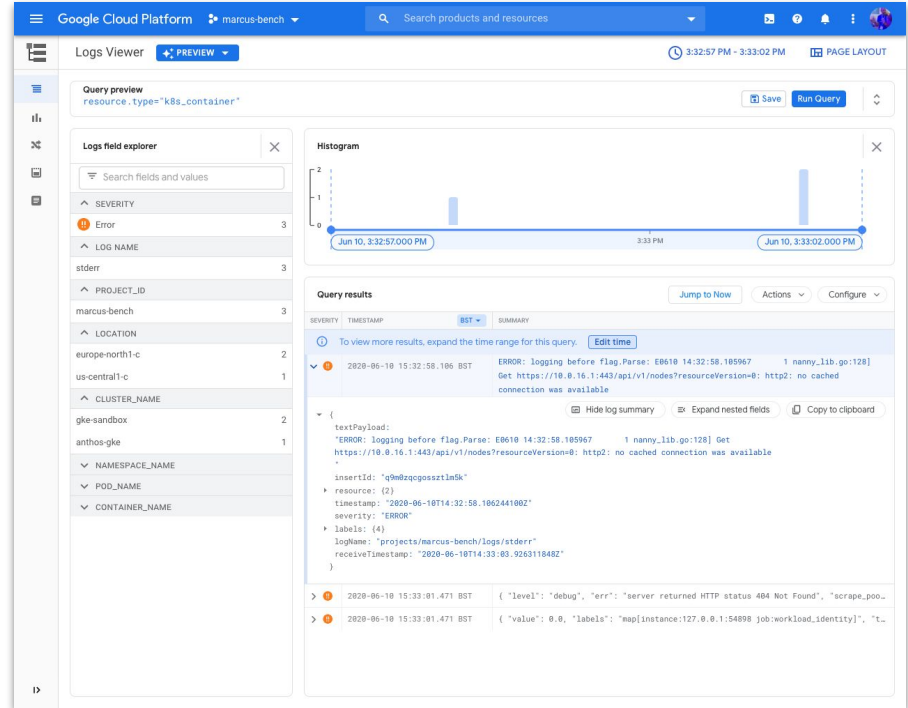




**Cloud Operations** is Google's operations suite enabling SRE practices

- Primarily Logging and Monitoring, but also supporting Tracing, Profiling & Debugging
- Natively supports Kubernetes, on GCP and elsewhere

In **Anthos**, Logging and Monitoring is included, but optional.



Cloud Monitoring and Cloud Logging



**Marketplace for Anthos** lets you manage production-grade 3rd party software in just a few clicks.

- Deploy packaged Kubernetes applications to wherever Anthos runs
- Single bill for GCP and 3rd party services
- Managed updates



# Migrate for Anthos

Bringing the power of containers to existing workloads

- Live migrate VMs into containers in GKE
  - Service processes converted into Dockerfiles
  - Disks imported to Persistent Volumes
  - Everything assembled in a StatefulSet
- Capitalize on increased resource utilization, unified logging and monitoring, and improved application lifecycle management
- **Migrates from:** VMware on-prem, AWS EC2, Azure VMs and Google Compute Engine
- **Migrates to:** GKE in GCP and GKE OP in preview

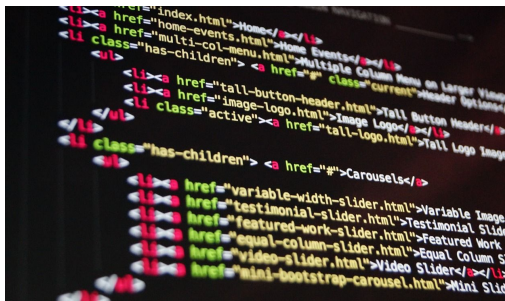
## Windows Workloads (Now in GA):

Stateless tiers of Windows web applications, application servers and web front ends meeting the following criteria:

- Running on Microsoft IIS version 7 or higher, AND
- Build on [ASP.NET](#) and .NET framework v3.5 and/or higher
- Currently running on Windows Server 2008 R2 or higher



# Anthos, hybrid done right.



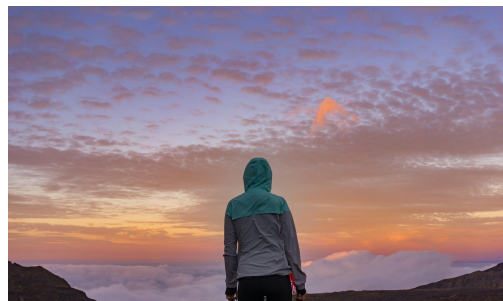
## Runs where you run

A software-based stack means no hardware purchases required. Zero to deployed in hours instead of months.



## Built on open source software

Ensuring workload portability; one platform that can run your applications both on-prem and in the cloud, without vendor lock-in.



## Ready for the cloud(s)

Focus on building cloud-native applications, not managing the underlying infrastructure.



Consumption or  
Subscription-based,  
patched via automation

Based on Kubernetes, Istio,  
Knative, Tekton

Tools to perform  
no-touch migration &  
automation

Anthos is a **managed application platform** for  
**enterprises** that want faster **modernization** and  
greater **consistency** in a **hybrid and multi-cloud**  
world.

Built for large companies with  
complex needs

Define declarative policies to enforce  
secure standards everywhere

Run on-premises, in GCP, and other  
public clouds

A Forrester Total Economic Impact™  
Study Commissioned By Google  
November 2019

## New Technology Projection: The Total Economic Impact™ Of Anthos

Projected Business Benefits And Cost  
Savings Enabled By Anthos For  
Application Platform Operators,  
Developers, And Security Professionals

FORRESTER®

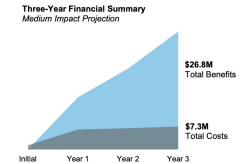
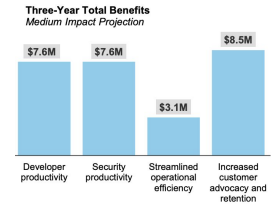
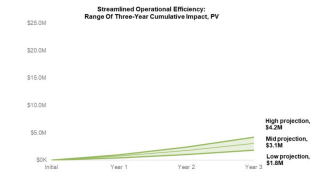
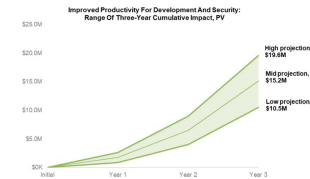
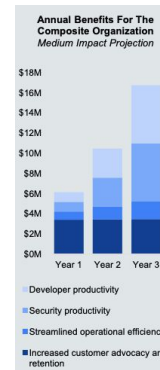
**“4.8x Return on Investment (ROI) within three years”**

<https://cloud.google.com/blog/topics/anthos/4-ways-anthos-delivers-roi-to-customers>

Improved Productivity

Streamlined Operational Efficiency

Increased Customer Advocacy And Retention



# This is the App Modernization week at Google Next EMEA !!!

Google Cloud OnAir Explore Sessions Demos Speakers Sponsors Regions

5 Application Modernization, Business Application Platform

Filter

Anthos deep dive: Part 1

BREAKOUT • APP316

Anthos Deep Dive: Part One

App Modernization & Containers

Available now

Build globally scalable services

BREAKOUT • APP210

Building Globally Scalable Services with Istio and ASM

App Modernization & Containers

Available now

Global scaling solutions for games

BREAKOUT • DEV211

Solutions for Launching Massive Global Games in the Cloud

Application Development

Available now

DEI and emoji design practices

BREAKOUT • DEI104

Encoding Gender into Technical Artifacts Such as Emoji

Diversity, Equity & Inclusion  
App Modernization & Containers

Available now

Anthos deep dive: Part 2

BREAKOUT • APP317

Anthos Deep Dive: Part Two

App Modernization & Containers

Unleash innovation with APIs

BREAKOUT • API105

Delivering New Customer Experiences Using APIs

GKE turns 5: What's new?

BREAKOUT • APP220

GKE Turns 5: What's New?

App Modernization & Containers

APIs for your migration journey

BREAKOUT • API301

APIs in Your Modernization Journey-Migration to

<https://cloud.withgoogle.com/next/sf/emea>



# Thank you!

Google Cloud