Google Cloud

Deploying Applications to Google Cloud

Learning objectives

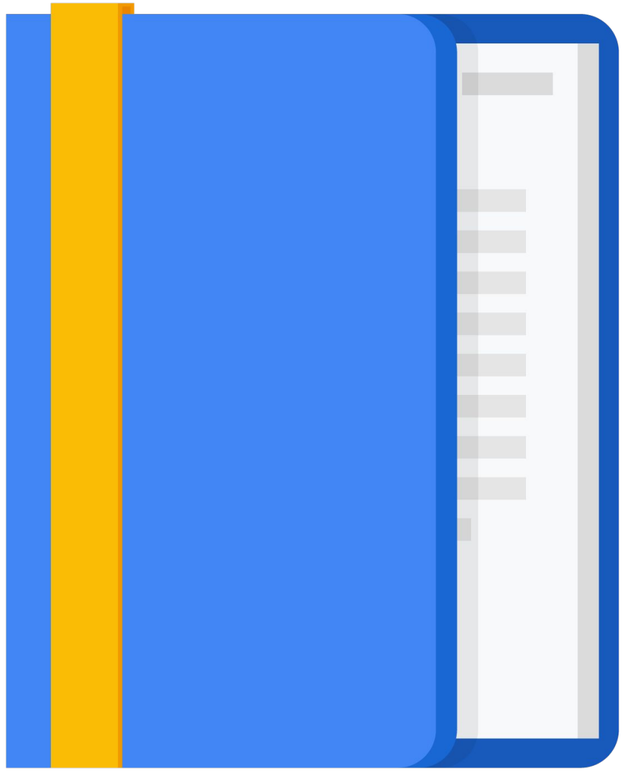
- Choose the appropriate Google Cloud deployment service for your applications.
- Configure scalable, resilient infrastructure using Instance Groups.
- Orchestrate microservice deployments using Kubernetes, GKE and Cloud Run.
- Leverage App Engine for a completely automated platform as a service (PaaS).
- Create serverless applications using Cloud Functions.

Agenda

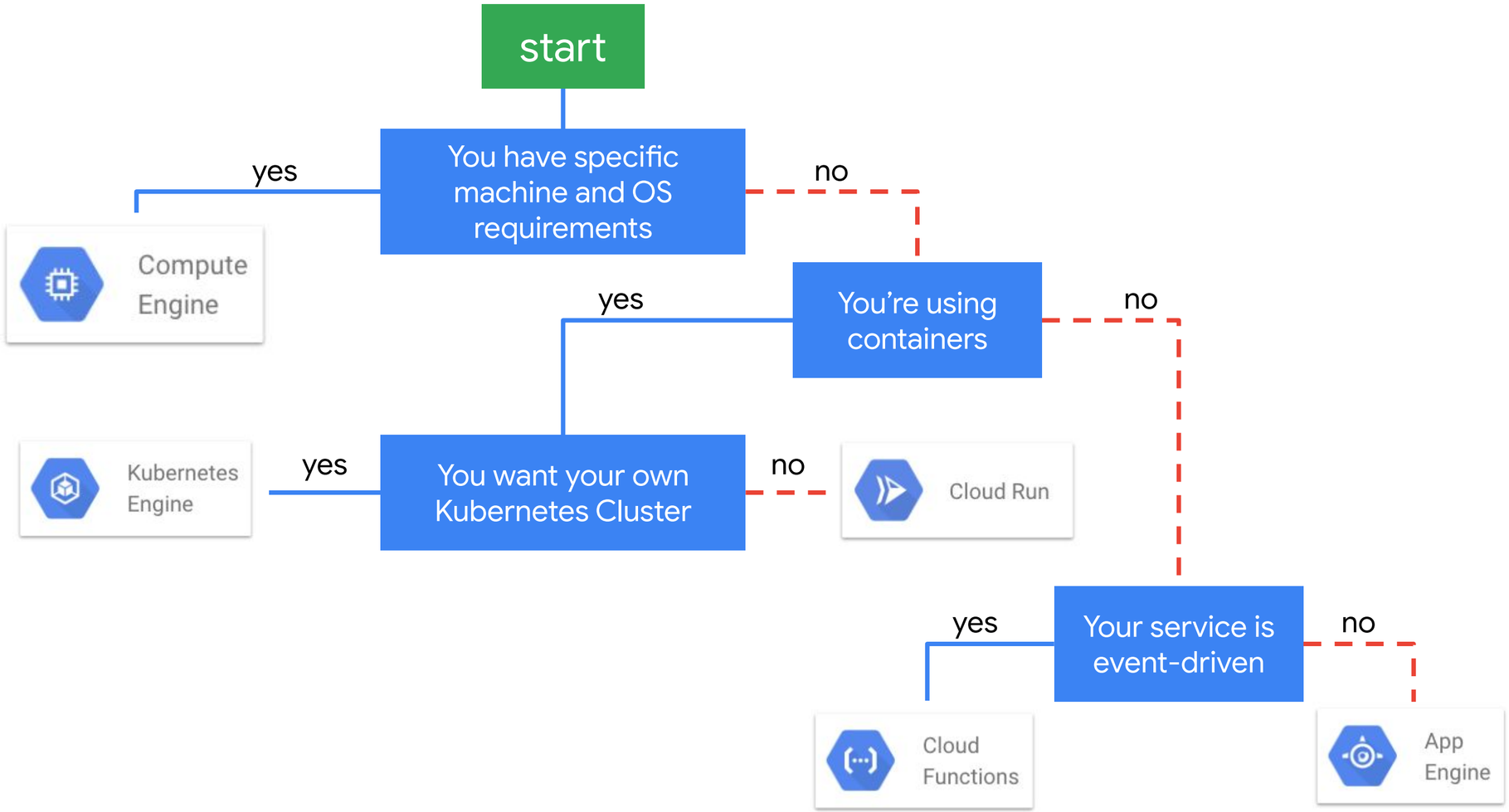
Google Cloud Infrastructure as a Service

Google Cloud Deployment Platforms

Lab



Choosing a Google Cloud deployment platform



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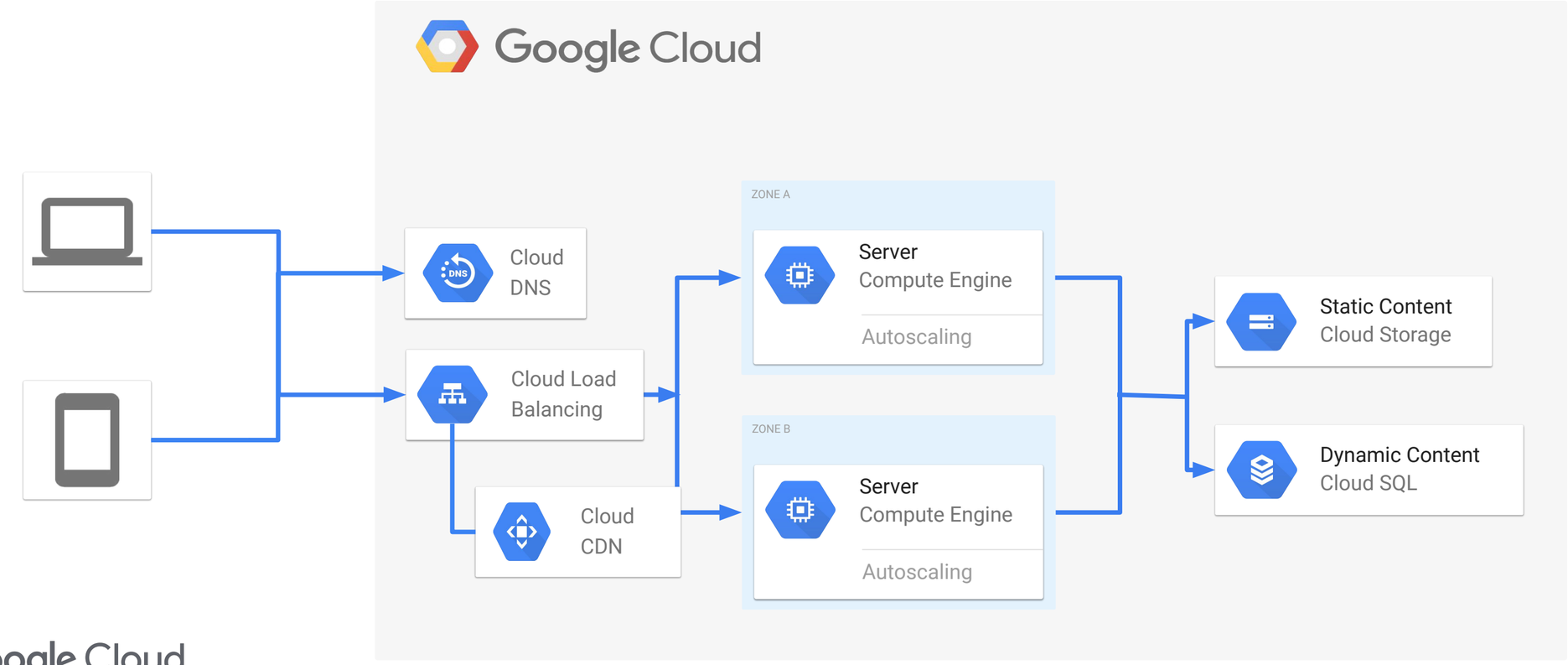
Use Compute Engine when you need complete control over operating systems, for apps that are not containerized or self-hosted databases



Google Cloud

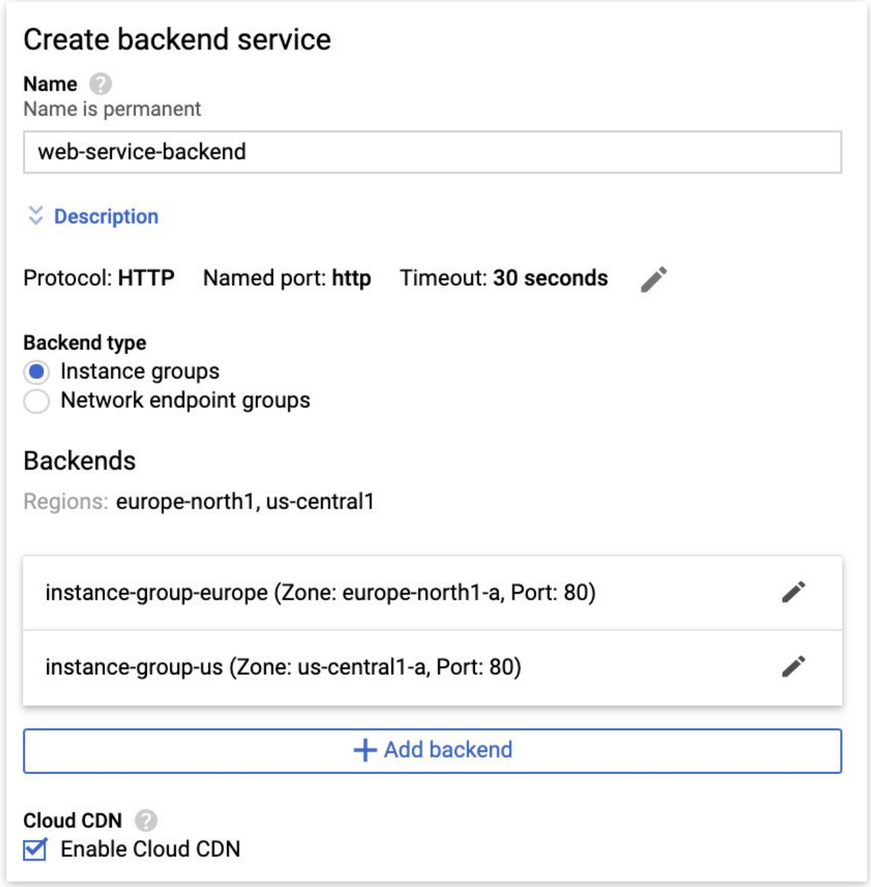
Managed instance groups create VMs based on instance templates

- Instance templates define the VMs: image, machine type, etc.
  - Test to find the smallest machine type that will run your program.
- Use a Startup Script to install your program from a Git repo.

- Instance group manager creates the machines.
- Set up auto scaling to optimize cost and meet varying user workloads.
- Add a health check to enable auto healing.
- Use multiple zones for high availability.

Use one or more instance groups as the backend for load balancers

- Use a global load balancer if you have instance groups in multiple regions.
- Enable the CDN to cache static content.
- For external services, set up SSL.
- For internal services, don't provide a public IP address.



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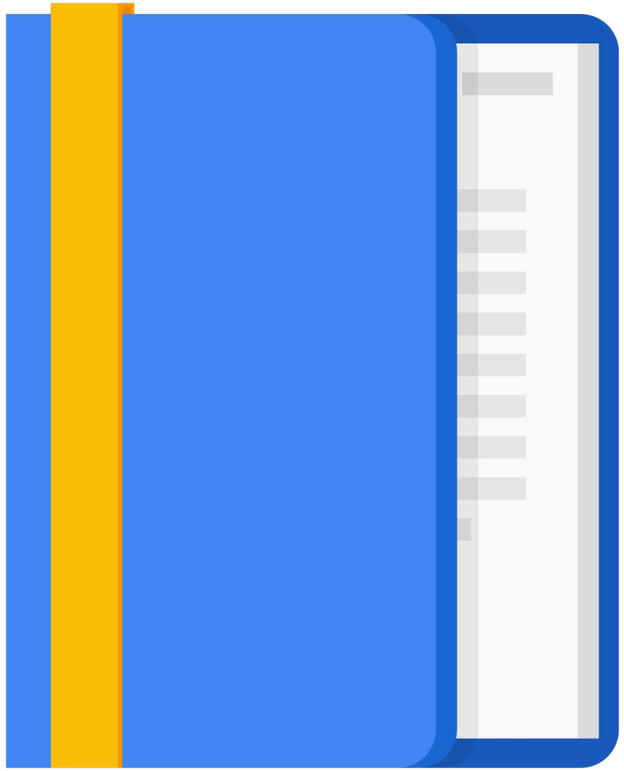
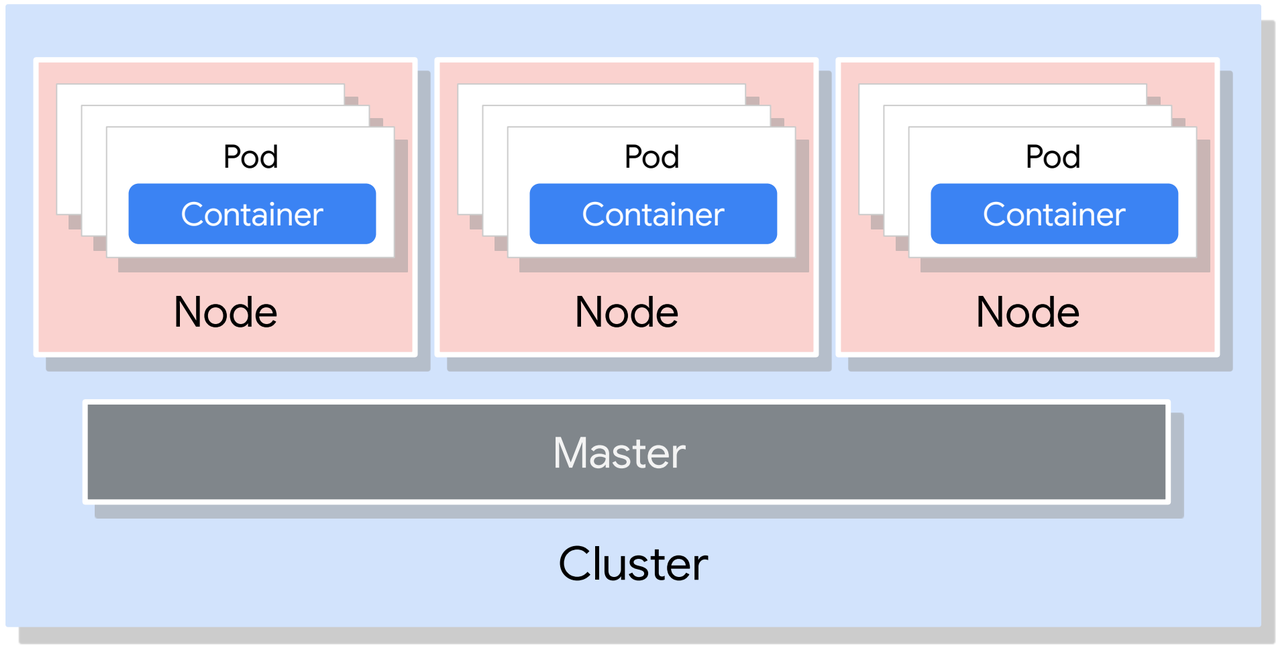


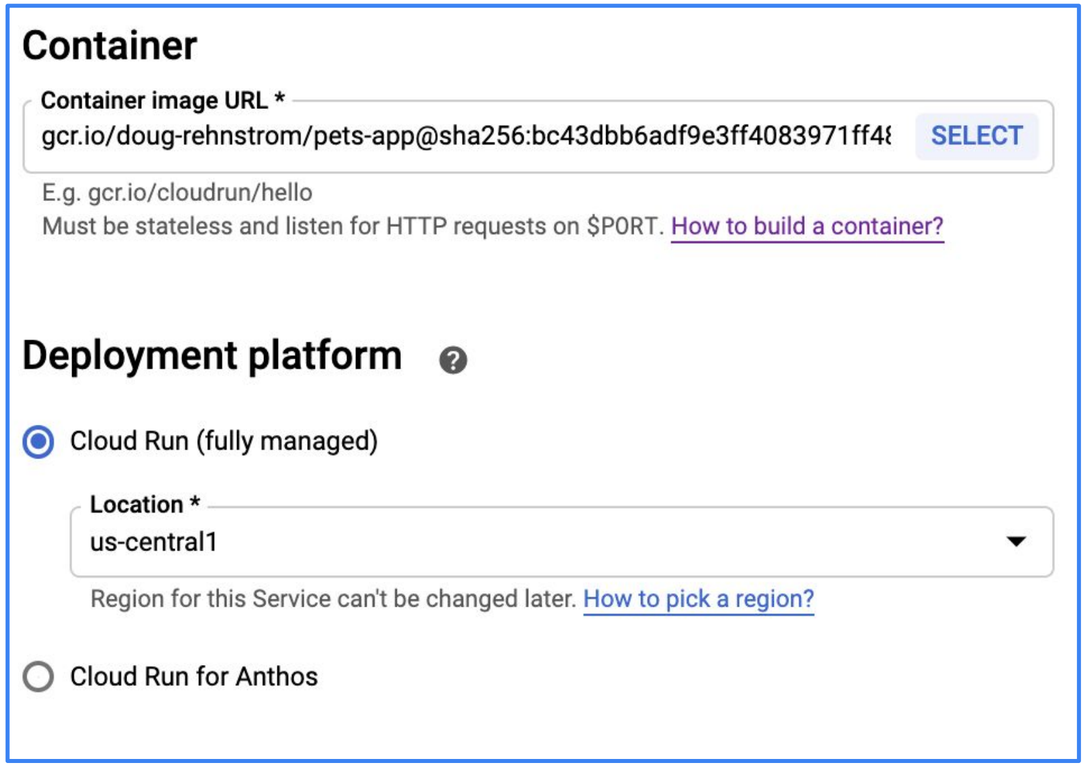
Google Kubernetes Engine (GKE) automates the creation and management of compute infrastructure

- Kubernetes clusters have a collection of nodes.
- In GKE, nodes are Compute Engine VMs.
- Services are deployed into pods.
- Optimize resource utilization by deploying multiple services to the same cluster.
- You pay for the VMs.



Cloud Run allows you to deploy containers to Google managed Kubernetes clusters

- Cloud Run allows you to use Kubernetes without the cluster management or configuration code.
- Apps must be stateless.
- Need to deploy apps using Docker images in Container Registry.
- Can also use Cloud Run to automate deployment to your own GKE cluster.



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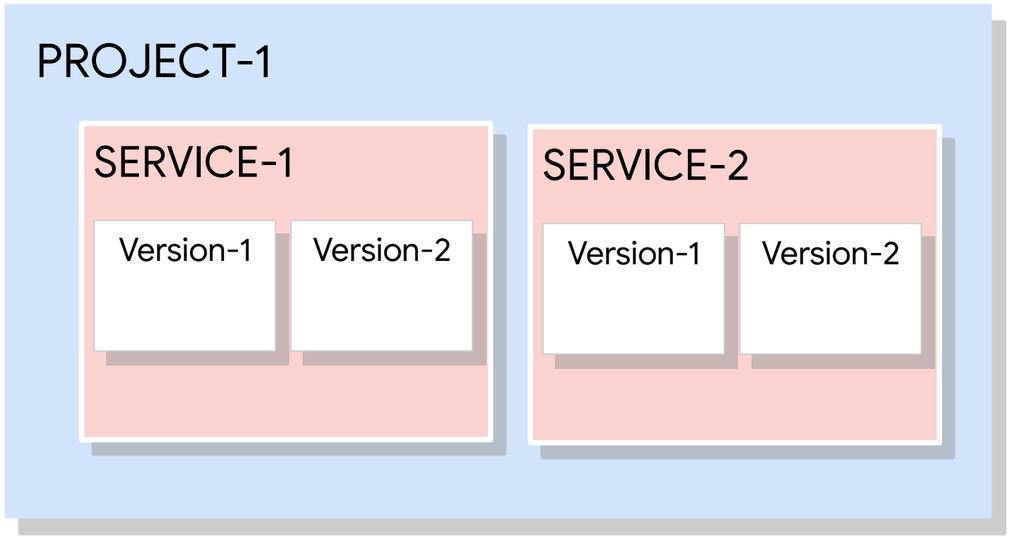
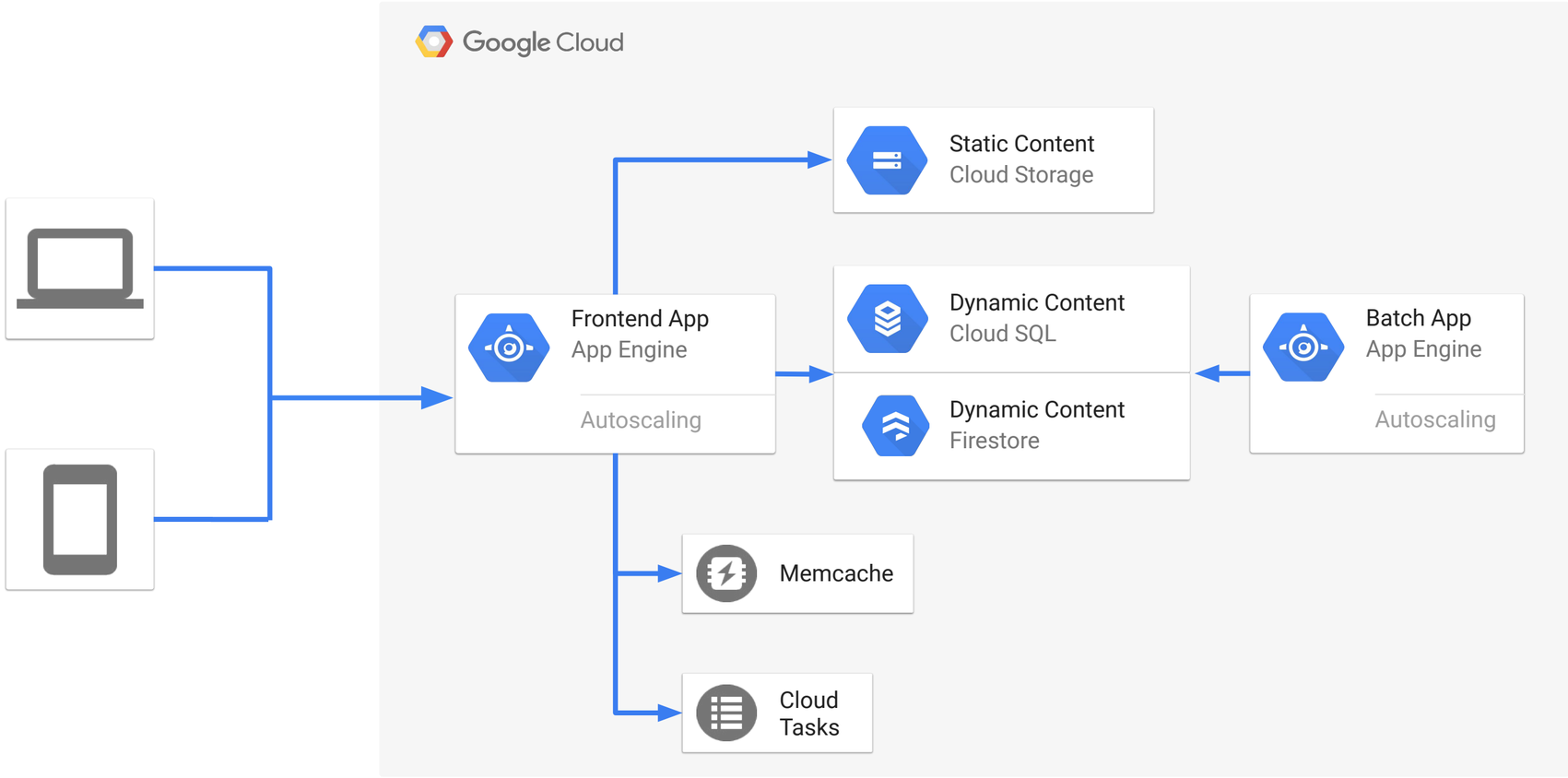
App Engine was designed for microservices

- Each Google Cloud project can contain 1 App Engine application.
- An application has 1 or more services.
- Each service has 1 or more versions.
- Versions have 1 or more instances.
- Automatic traffic splitting for switching versions.

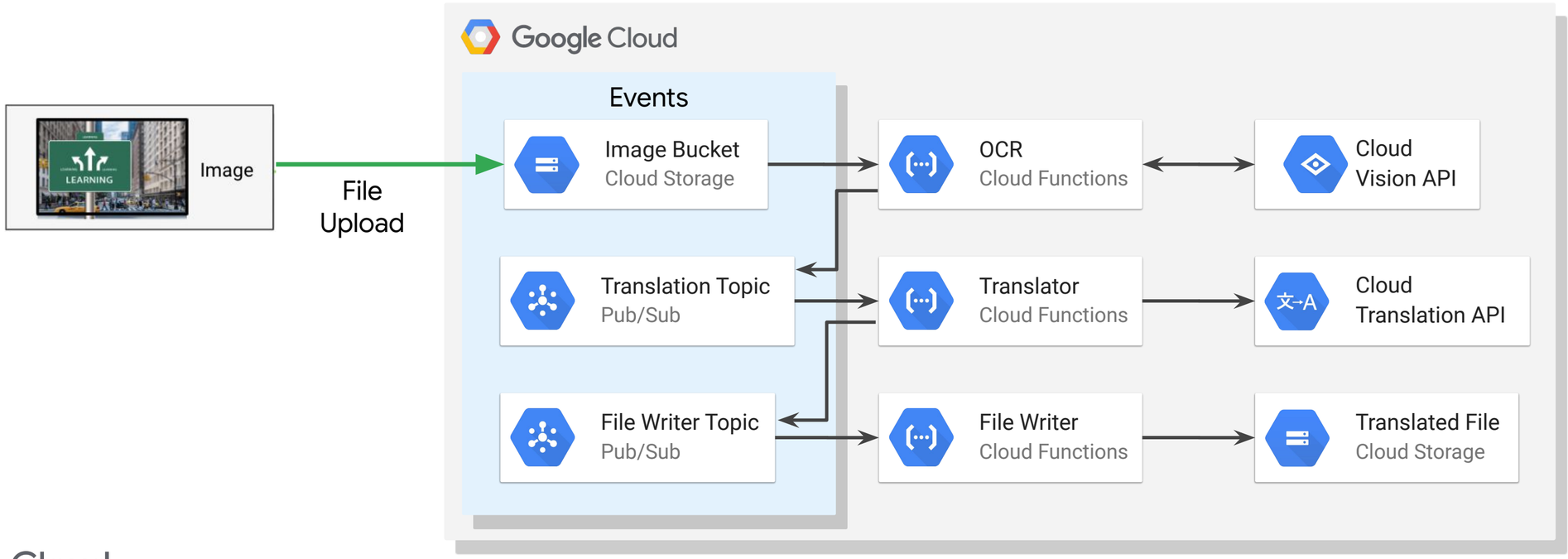


Typical App Engine microservice architecture



Cloud Functions is great way to create loosely coupled, event-driven microservices

- Can be triggered by changes in a storage bucket, Pub/Sub messages, or web requests
- Completely managed, scalable, and inexpensive



45 minutes

Lab

Deploying Apps to Google Cloud

App Engine

Google Kubernetes Engine

Cloud Run

Objectives

- Deploy to App Engine
- Deploy to Google Kubernetes Engine
- Deploy to Cloud Run

Google Cloud

Quiz

You need to deploy an existing application that was written in .NET version 4. The application requires Windows servers, and you don't want to change it. Which should you use?

A. Compute Engine

B. GKE

C. App Engine

D. Cloud Functions

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Quiz

You have containerized multiple applications using Docker and have deployed them using Compute Engine VMs. You want to save costs and simplify container management. What might you do?

A. Write Terraform scripts for all deployment.

B. Rewrite the applications to run in App Engine.

C. Rewrite the applications to run in Cloud Functions.

D. Migrate the containers to GKE.

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Quiz

You've been asked to write a program that uses Vision API to check for inappropriate content in photos that are uploaded to a Cloud Storage bucket. Any photos that are inappropriate should be deleted. What might be the simplest, cheapest way to deploy this program?

A. Compute Engine

B. GKE

C. Cloud Functions

D. App Engine

Quiz

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A. Compute Engine

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C. Cloud Functions

D. App Engine

Review

Deploying Applications to Google Cloud

More resources

Migration to Google Cloud: Deploying your workloads
https://cloud.google.com/solutions/migration-to-gcp-deploying-your-workloads

Compute Engine
https://cloud.google.com/compute/

GKE
https://cloud.google.com/kubernetes-engine/

App Engine
https://cloud.google.com/appengine/


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