

Google Cloud Platform Compute Services



Learning Objectives

- Overview of GCP Compute Services
 - App Engine
 - Compute Engine
 - Kubernetes Engine
 - Cloud Functions
- Use Cases of Compute Services

Overview of GCP Compute Services

Overview of GCP Compute Services

- Compute services are a critical component of the cloud
- Code is deployed and executed in one of the compute services
- GCP offers a wide range of compute choices
 - App Engine
 - Compute Engine
 - Kubernetes Engine
 - Cloud Functions

Overview of Google App Engine

Google App Engine

- One of the first compute services from Google (PaaS)
- Fully managed platform for deploying web apps at scale
- Supports multiple languages, frameworks, and libraries
- App Engine is available in two environments
 - Standard
 - Flexible
- Applications deployed in standard environment run in a sandbox
- Flexible environment uses Docker containers to deploy and scale apps



Resource link: <https://cloud.google.com/appengine/docs/the-appengine-environments>

Overview of Google Compute Engine

Google Compute Engine

- GCE enables Linux and Windows VMs to run on Google's global infrastructure
- VMs are based on machine types with varied CPU and RAM configuration
- Persistence is available through standard and SSD disks
- VMs are charged a minimum of 1 minute and in 1 second increments after that
- Sustained use discounts are offered for running VMs for a significant portion of the billing month
- Committed use discounts are offered for purchases based on 1 year or 3 year contracts

Overview of Google Kubernetes Engine

Google Kubernetes Engine

- GKE is a managed environment for deploying containerized applications managed by Kubernetes
- Kubernetes has a control plane and worker node
- GKE provisions worker nodes as GCE VMs
- Node pools enable mixing and matching different VM configurations
- The service is tightly integrated with GCP resources such as networking, storage, and monitoring
- Auto scaling, automatic upgrades, and node auto-repair are some of the unique features of GKE

Overview of Google Cloud Functions

Google Cloud Functions

- Cloud Functions is a serverless execution environment for building and connecting cloud services
- Serverless compute environments execute code in response to an event
- Cloud Functions supports JavaScript, Python 3, and Go
- GCP events fire a Cloud Function through a trigger
- An example event includes adding an object to a storage bucket
- Trigger connects the event to the function

Google Cloud Platform Fundamentals

Lab Guide for Google Compute Engine

```
# Get a list of images
gcloud compute images list

PROJECT=<PROJECT_ID> # Replace this with your project id
ZONE=asia-south1-a    # Replace this with a GCP zone of your choice

# Launch a GCE instance
gcloud compute instances create gcp-lab1 \
  --project=$PROJECT \
  --zone=$ZONE \
  --machine-type=f1-micro \
  --tags=http-server \
  --image=ubuntu-1804-bionic-v20190722a \
  --image-project=ubuntu-os-cloud

# Open port 80 for HTTP access
gcloud compute firewall-rules create default-allow-http \
  --project=$PROJECT \
  --direction=INGRESS \
  --action=ALLOW \
  --rules=tcp:80 \
  --source-ranges=0.0.0.0/0 \
  --target-tags=http-server

# SSH into the VM
```

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```
gcloud compute ssh gcp-lab1 --zone=$ZONE
```

```
# Run these commands within the VM
```

```
sudo apt-get install -y apache2
```

```
sudo systemctl start apache2
```

```
# List instances
```

```
gcloud compute instances list --zone=$ZONE
```

```
# Access Apache through the public IP
```

```
# Terminate the instance
```

```
gcloud compute instances delete gcp-lab1 --zone $ZONE
```



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GCP Compute – Use Cases

The Choice of Compute on GCP



**Google Compute
Engine (GCE)**



**Google Kubernetes
Engine (GKE)**



**Google App
Engine (GAE)**



**Google Cloud
Functions**



Use Cases

Product	Delivery Model	Key Feature	Use Case
Google Compute Engine	IaaS	Virtual Machines	Highly customized workloads
Google Kubernetes Engine	CaaS	Containers & Microservices	Containerized workloads
Google App Engine	PaaS	Managed Runtime	Line-of-business applications
Google Cloud Functions	FaaS	Functions	Event-driven applications

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Resources for GCP Compute

Key Services

- [Google Compute Engine](#)
- [Google App Engine](#)
- [Google Kubernetes Engine](#)
- [Google Cloud Functions](#)

References

- [Choosing the right compute option in GCP: a decision tree](#)
- [Best practices for Compute Engine regions selection](#)