FAQ - Compute Engine

What is a Compute Engine? What can it do?

Compute Engine is an Infrastructure-as-a-Service product offering flexible, self-managed virtual machines (VMs) hosted on Google's infrastructure. Compute Engine includes Linux and Windows based VMs running on KVM, local and durable storage options, and a simple REST based API for configuration and control. The service integrates with Google Cloud technologies such as Cloud Storage, App Engine, and BigQuery to extend beyond the basic computational capability to create more complex and sophisticated apps.

What is a virtual CPU in a Compute Engine?

On Compute Engine, each virtual CPU (vCPU) is implemented as a single hardware hyper-thread on one of the available CPU Platforms. On Intel Xeon processors, Intel Hyper-Threading Technology allows multiple application threads to run on each physical processor core. You configure your Compute Engine VMs with one or more of these hyper-threads as vCPUs. The machine type specifies the number of vCPUs that your instance has.

You can identify the specific CPU platform for your instance using one of the following options:

- See what CPU platforms are available in each of the available regions and zones.
- Use the compute.instances.get method to obtain the cpuPlatform property for one of your existing instances.
- On Linux instances, run cat /proc/cpuinfo.

If you want to change the CPU platform for your instance, you can specify a minimum CPU platform.

How do App Engine and Compute Engine relate to each other?

We see the two as being complementary. App Engine is Google's Platform-as-a-Service offering and Compute Engine is Google's Infrastructure-as-a-Service offering. App Engine is great for running web-based apps, line of business apps, and mobile backends. Compute Engine is great for when you need more control of the underlying infrastructure. For example, you might use a Compute Engine when you have highly customized business logic or you want to run your own storage system.

How does pricing and purchasing work?

Compute Engine charges based on compute instance, storage, and network use. VMs are charged on a per-second basis with a 1 minute minimum. Storage cost is calculated based on the amount of data you store. Network cost is calculated based on the amount of data transferred between VMs that communicate with each other and with the Internet. For more information, [review our price sheet](#).

How can I authenticate to the Compute Engine API?

You can authenticate to the Compute Engine API using [OAuth 2.0](#). You can [authenticate through a client library](#), or [authenticate directly with an access token](#).

What are service accounts?

A *service account* is a Google account that represents an application, as opposed to representing an end user. These accounts can be used to authorize Compute Engine to act on the behalf of the user to access non-sensitive information. A service account is never used to access user information. Service accounts simplify the process of authenticating from Compute Engine to other services by handling the authorization process for the user.

Compute Engine developers typically use [Compute Engine service accounts](#) in their applications. For more information about service accounts, see [authentication overview](#).

How do I create a service account?

Compute Engine creates a service account automatically when you create a new instance and [specify a service account scope](#) for that instance.

What kind of machine configuration (memory, RAM, CPU) can I choose for my instance?

Compute Engine offers several configurations for your instance. You can also create custom configurations that match your exact instance needs. See the full list of available options on the Machine Types page.

If I accidentally delete my instance, can I retrieve it?

No, instances that have been deleted cannot be retrieved. However, if an instance is simply stopped, you can start it again.

What operating systems can my instances run on?

Compute Engine supports several operating system images and third-party images. Additionally, you can create a customized version of an image or build your own image.

What are the available zones I can create my instance in?

For a list of available regions and zones, see regions and zones.

How do I find out how much quota I have used or have left?

Check your quota limits and usage in the quota page on the Google Cloud console. If you reach the limit for your resources and need more quota, click the **Request increase** button on the quota page and complete the request form.

What kind of virtual CPU do I have running on my instance?

Check the specific CPU platform for your instance using one of the following options:

- See what CPU platforms are available in each of the available regions and zones.
- Use the compute.instances.get method to obtain the cpuPlatform property for one of your existing instances.
- On Linux instances, run cat /proc/cpuinfo.

What are Preemptible VM instances, and how are Preemptible instances different from normal instances?

Preemptible instances are instances that you can create and run at a much lower price than normal instances, but might stop if Compute Engine needs to reclaim the compute capacity for allocation to other VMs. For more information, see Creating a Preemptible VM Instance.

Do I need to enable the Cloud Storage service before I can store my images externally?

Yes, to store images externally, you need to enable the Cloud Storage service.

Can I attach my persistent disk to more than one instance?

You can attach a persistent disk to multiple instances only if the disk is in read-only mode. An SSD persistent disk in multi-writer mode can be attached to two N2 virtual machine (VM) instances. You cannot attach a persistent disk in both read/write mode and read-only mode at the same time. For more information, see Share persistent disks between VMs.

When does my custom startup script run?

Startup scripts run at the end of the boot process.

What are infrastructure maintenance events?

Compute Engine might periodically need to perform scheduled maintenance on zones that may affect your instances. By default, all instances are configured so that these maintenance events are transparent to your apps and work loads. This may cause some performance degradation but your instances will remain online through the maintenance event. For more information, see Transparent maintenance.

How often do scheduled infrastructure maintenance events happen?

Infrastructure maintenance events don't have a set interval between occurrences, but generally happen once every two weeks.

How do I know if an instance will be undergoing an infrastructure maintenance event?

Shortly before a maintenance event, Compute Engine changes a special attribute in a virtual machine's metadata server before any attempts to live migrate or stop and restart the virtual machine as part of a pending infrastructure maintenance event. The maintenance-event attribute is updated before and after an event, letting you detect when these events are imminent. You can use this information to help automate any scripts or commands you want to run before and/or after a maintenance event. For more information, see the [Transparent maintenance notice](#) documentation.

Google Cloud Storage : -

How durable is my data in Cloud Storage?

Cloud Storage is designed for an annual lifetime of 99.999999999% (11 9), making it suitable for primary storage and even mission-critical applications.

How do I protect myself from accidental data deletion?

Cloud Storage offers several options for **protecting** your data from accidental deletion. **[Data lifecycle](#) control options**

Can I delete a Cloud Storage object that I accidentally uploaded to a locked, retention-enabled bucket?

No. **Such objects** can only **be deleted** after **the retention period** has **expired.**

How can I get a summary of space usage for a Cloud Storage bucket?

You can use Cloud Monitoring **to monitor the bytes in** your **bucket daily,** or you can use the gsutil du command to get the total bytes in your bucket at a given **time.**

Can charges associated with accessing data be billed to the user who accesses the data?

yes. You can use the **[Pay by](#)** Requester feature to require requesters **to** include a billing account project in their requests.

I want to let someone download an individual object. How do I do that?

There are several ways **to** share an object. You can use signed **URLs that grant temporary** access to anyone **who has** the signed URL.

Can I use Cloud Storage to upload files to services in Google Workspace, such as Google Drive?

No, Cloud Storage is not integrated with Google Workspace.

Does Google offer other unstructured storage options?

Yes, Google offers several storage options for unstructured data, such as Google Drive.

Can I use Cloud Storage with my Google Workspace account or Cloud Identity domain?

Yes, you can use Cloud Storage with either.

Instance Groups : -

Why are instance groups used?

Managed instance groups allow you to run your application on multiple similarly configured virtual machines. In addition, managed instance groups offer multiple automated services such as autoscaling, autohealing, regional deployments, and auto updates.

What is a managed instance group?

A managed instance group (MIG) is a group of virtual machine (VM) instances that you treat as a single entity. Each VM in MIG is based on an instance template. If you just want to create multiple VMs and don't want to group them into a MIG, check out the Bulk Instance API.

How do I update a managed instance group?

In the Google Cloud console, go to the Instance groups page. Select the managed instance group that you want to update. Click Update VMs.

What are 2 ways you can deploy an instance group?

You can create two types of MIGs: A zonal MIG, which deploys instances to a single zone. A regional MIG, which deploys instances to multiple zones across the same region.

Pub/Sub : -

How does a Pub/Sub system work?

In the Pub/Sub model, a message published on a topic is immediately received by all subscribers of the topic. Pub/Sub messaging can be used to enable event-driven architectures and decouple applications for better performance, reliability, and scalability.

Does PubSub store data?

Pub/Sub reliably stores messages of any size. Once you publish a log entry or event, you don't have to worry about when it will be processed. If the subscriber, event handler, or consumer is not ready, defer the message until it is ready.

What are the advantages to pub sub?

Publish/subscribe (Pub/Sub) messaging provides instant event notification for these distributed applications. The publish/subscribe model enables event-driven architecture and asynchronous parallelism while improving performance, reliability, and scalability.

Is Pubsub a FIFO?

Pub/Sub is part of the system architecture that won't be deprecated anytime soon. One area where Pub/Sub struggles is when messages must follow a first-in-first-out (FIFO) order. The Pub/Sub pattern is not suitable for FIFO operations. This is because messages are processed strictly in the order received.

What are the topics in Pubsub?

A topic contains the message itself, along with additional subscriber and publisher information. The ITopic/Topic interface facilitates to create a topic, set topic priority while creation, get a topic, delete a topic simply and asynchronously.

Is PubSub multi region?

This means that publishers in multiple regions may publish messages to a single topic with low latency. Any individual message is stored in a single region. However, a topic may have messages stored in many regions.

Is PubSub global?

Google Cloud Pub/Sub is a global service, available from everywhere.

Is PubSub secure?

Security Overview for PubSub+ Cloud. PubSub+ Cloud is secure by default. Our platform has enterprise-grade security built into every level of the platform to ensure that your event-driven architecture and its data remains secure.