Introduction to Google Compute Engine

Google Cloud Platform offered by Google is a suite of Cloud Computing Services that runs on the same infrastructure that Google uses internally for its end-user products such as Google Search, Gmail, File storage, and YouTube. Along with the set of management tools, it also provides a series of modular cloud services including

GCE is part of Compute Platform in Google Cloud. Google Compute Engine offers Virtual Machines running in Google data centers connected to worldwide fiber networks. The tooling and workflow offered by the compute engine enable serving from single instances to global ones. It enables users to launch Virtual Machines on-demand VMs can be launched from the standard images or custom images created by users. The GCE users must authenticate based on 2.0 before launching the Virtual Machine. Auth 2.0 is here the Open Standard for access delegation commonly used as a way for internet users to brand websites or applications access to their information on other websites but without giving them the passwords.

The mechanism is used by companies such as Amazon, Meta, Microsoft, Twitter, and Google to permit users to share information about their accounts with third-party applications of websites. GCE can be accessed via the developer Consoles or Restful APIs or Command Line Interface.

Applications of Google Compute Engine

Google Compute Engine will allow you to run your application and services on virtual machines. Below are some common applications of Google Compute Engine.

1. **Web applications hosting:** Google compute engine will provide the storage, and networking resources to host your web application.
2. **Can run large-scale data:** Google compute engine is suitable for data analysis, and scientific simulations which need to handle large-scale data.
3. **Gaming servers:** Google's compute engine has low latency so it is very suitable to host multiple gaming infrastructures.
4. **Support Docker and Kubernetes:** Google compute engine will support containerization applications. Either you can run containers as a single or you can maintain the clusters which are provided by Kubernetes and docker-compos

Features of Google Compute Engine

- **Machine Type:-** It describes Virtual hardware attached to an instance, it also includes RAM and CPU. It can further have two types:
- **Local SSD:** GCE always offers encrypted local solid-state drive block storage which is physically attached to the Virtual Machine running it. It improves performance and also reduces latency.
- **Persistent Disk:** Durable high-performance block storage for VM instances that can be created in Hard Disk and SSD formats, so users can take snapshots and create a new persistent disk from the snapshots.

- **GPU Accelerators:** GPUs are added to accelerate workloads like Machine Learning or virtual workstation applications etc.
- **Image:** An image contains the Operating system of the root file that uses leverage to run a virtual machine instance. So GCP provides two main types of images:

Usage of Virtual Machines

Virtual machines (VMs) are frequently utilized in a variety of contexts and businesses. Here are a few frequent scenarios for using virtual machines:

1. Virtual machines are frequently employed in software development and testing. Without using physical hardware, developers can create several virtual machines (VMs) to imitate various settings and test their apps there.
2. Disaster Recovery A VM-based disaster recovery plan is an option. Businesses can build virtual machines (VMs) containing important data and applications and duplicate them to different locations. The replicated VMs can be turned on to maintain business operations in the event that the primary location suffers a calamity.
3. VMs are frequently utilized when moving workloads and applications to the cloud. Businesses can establish virtual machines (VMs) in the cloud, move their programs and data there, then turn down their on-premise servers.
4. Web applications, databases, and other services can be hosted on VMs. Hosting companies are able to generate virtual machines (VMs) for their clients, allowing them total control over their virtual environment.

Advantages of Google Compute Engine

1. **Scalability:** Google compute engines helps us to scale up or down our VMs automatically based on incoming traffic to meet the changing demands.
2. **Load balancing:** We can increase the performance of an application by distributing traffic to several regions and availability zones with the aid of the Google compute engine load balancing.
3. **Security:** You can protect data which is stored in GCP by applying encryptions, restricting access to the users, and restricting the incoming traffic to our application.
4. **Integration:** You can integrate with different services which are available in google cloud like kubernetes and storage. It can manage different workloads based on the incoming traffic.
5. **Operating systems:** It can support no.of operating systems like RedHat, Ubuntu Windows servers, and so on.