UNIT I INTRODUCTION TO DEVOPS

Devops Essentials - Introduction To AWS, GCP, Azure - Version control systems: Git and Github.

GOOGLE CLOUD PLATFORM (GCP)

GCP is a public cloud vendor — like competitors Amazon Web Services (AWS) and Microsoft Azure. With GCP and other cloud vendors, customers are able to access computer resources housed in Google's data centers around the world for free or on a pay-per-use basis.

GCP offers a suite of computing services to do everything from GCP cost management to data management to delivering web and video over the web to AI and machine learning tools.

Google Cloud vs Google Cloud Platform

Google Cloud includes a combination of services available over the internet that can help organizations go digital. Google Cloud Platform (which provides public

cloud infrastructure for hosting web-based applications and is the focus of this blog post) is a part of Google Cloud.

Some other services that are a part of Google Cloud include:

- Google Workspace, formerly known as G Suite and Google Apps. This product provides identity management for organizations, Gmail, and collaboration tools.
- Enterprise versions of Android and Chrome OS. These phone and laptop operating systems are ways for users to connect to web-based applications.
- Application programming interfaces (APIs) for machine learning and enterprise mapping services. These provide software-to-software communication. E.g.) Google Cloud Vision API, Google Cloud speech-to-text API, Google Cloud text-to-speech API, Google Cloud Natural language API, Cloud video Intelligence, Audio ML APIs, Tensorflow, BigQueryML etc.,

What are Google Cloud Platform services?

Each GCP region offers a category of services. Some services are limited to

specific regions. Major services of Google Cloud Platform include:

- Computing and hosting
- Storage and database
- Networking
- Big Data
- Machine learning

Google Cloud Platform Advantages:

1. **Good documentation:** We are talking about many pages in total, including a reasonably detailed API Reference guide.
2. **Different storage classes for every necessity:** Regional (frequent use), Nearline (infrequent use), and Coldline (long-term storage).
3. **High durability:** This suggests that data survives even within the event of the simultaneous loss of two disks.
4. **Many regions available to store your data:** North America, South America, Europe, Asia, and Australia.

Google Cloud Platform Disadvantages

1. The support fee is sort of hefty: Around 150 USD per month for the foremost basic service (Silver class).
2. Downloading data from Google Cloud Storage is expensive. 0, 12 USD per GB.
3. Google Cloud Platform web interface is somewhat confusing. Sometimes I am lost while browsing around the menus.
4. Prices in both Microsoft Azure (around 0.018 USD per GB/month) or Backblaze B2 (about 0.005 USD per GB/month) are less than Google Cloud Storage.
5. It has a high pricing schema, almost like AWS S3, so it's easy to urge unexpected costs (e.g. number of requests, transfers, etc.).

Cloud Storage in Google Cloud Platform

Google Cloud Platform provides a number of cloud storage choices, each with special features and applications. The types are listed below.

1. Google Cloud Persistent Disk(Block Storage)

2. Google Cloud Filestore(Network File storage)
3. Google Cloud Storage (Object Storage).
4. Google Cloud Storage for Firebase
5. Google Cloud Storage Transfer Service

Google Cloud Persistent Disks (Block Storage)

A type of block storage called Google Cloud Persistent Disks offers dependable and quick storage for your virtual machine instances on the Google Cloud Platform.

- We can back up our storage using persistent discs, which allow us to attach discs of various sorts and sizes, such as SSDs or HDDs, to the necessary virtual machines. This block storage will boost throughput and decrease latency.
- Because of its high durability and support for snapshots, persistent discs enable us to take a disc backup when necessary without losing any data.
- Once the disk is attached to the VMs then also we can change the size of the disk which makes them more flexible. It can be done without losing the data.
- Persistent Disks are more secure: we can encrypt the data by using a Google key or customer-managed keys and also we can restrict the access of the disk to specific users, groups, or resources by using IAM roles.

Google Cloud Filestore (Network File Storage)

A controlled network file storage service offered by Google Cloud Platform is Google Cloud File Store. It enables reliable performance and high availability for storing and sharing files. We can create files with the aid of file storage that can be mounted onto the necessary path and accessed from an instance operating on the GCP or on-premises. Automatic snapshots will be taken in the file storage, and since our storage is automatically backed up, we can prevent data loss.

File storage is available in two types:

1. **Standard tier:** It provides a throughput of 800 MB/s per share, which will result in minimal latency and good performance.
2. **Premium tier:** The premium tier's throughput is 1.2 GB/s per share, enables SSD storage and can be particularly beneficial for applications that require high IOPs and

low latency.

Google Cloud Storage (Object Storage)

Object storage is scalable, durable, and secure. Once we store our data in object storage it can be accessed from anywhere means the object storage is region independent.

1. Object storage is very different from Block storage and file storage in that we store the data in the form of objects. It is more suited for static data like videos, photos, etc.
2. We can save our data in accordance with our needs; for example, if we frequently use it, we will keep it in Standard storage, while less frequently accessed data can be kept in Coldline and Archive for long-term data access.
3. Object storage offers us data encryption, data replication, and lifecycle management which make it more reliable and we can integrate the object storage with multiple GCP services like Google Cloud Functions, BigQuery, and AI Platform, enabling you to build powerful applications.

Features of GCP

- **Object Lifecycle Management:** Define conditions that trigger data deletion or transition to a cheaper storage class.
- **Object Versioning:** Continue to store old copies of objects when they are deleted or overwritten.
- **Retention policies:** Define minimum retention periods that objects must be stored for before they're deleted.
- **The object holds:** Place a hold on an object to prevent its deletion
- **Customer-managed encryption keys:** Encrypt object data with encryption keys stored by the Cloud Key Management Service and managed by you.
- **Customer-supplied encryption keys:** Encrypt object data with encryption keys created and managed by you.
- **Uniform bucket-level access:** Uniformly control access to your Cloud Storage resources by disabling object ACLs.
- **Requester Pays:** Require access to your data to include a project ID to bill for network charges, operation charges, and retrieval fees.

- **Bucket Lock:** Bucket Lock allows you to configure a data retention policy for a Cloud Storage bucket that governs how long objects in the bucket must be retained.