

U18ISE0006 - Cloud Architecture

Google Cloud Platform

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Google Cloud Platform:



1.Introduction :

As technology continues to advance and become a significant part of our everyday lives, cloud computing has, as well. There are several different cloud providers to choose from, and it can be a bit overwhelming at first. Google Cloud Platform (GCP) is a widely used cloud computing platform for several reasons, including their convenient, easy-to-use tools and services.

2.1Google Cloud:

Google Cloud Platform is a set of cloud computing services that Google offers, which runs on the same infrastructure that Google uses for its end-user products, such as YouTube, Gmail, and more. Google Cloud Platform offers a variety of services, including:

- *Compute*
- *Network*
- *Machine learning and AI*
- *Big data processing*

3.Need to use Google Cloud Platform :

GCP is popular for many reasons, including:

1. Competitive Pricing

- *Pricing is one of the significant factors that make Google Cloud stand out among the other cloud providers*
- *Google Cloud offers a monthly pricing plan*
- *Google Cloud pricing provides committed use discounts*
 - *In this plan, if you commit to purchasing a specific amount of vCPUs and memory for one or three years, you can get a discount of up to 57 percent*

2. Speed

- *Google Cloud provides its Google Cloud and Google App customers network speeds of up to 10Tbs*
- *The network has connections throughout the world in United States, Europe, main cities in Japan, major hubs in Asia and much more.*
- *The low-latency network processes data in less time, leading to high customer satisfaction*

3. Big Data

- *Google has many innovative tools for cloud warehousing like BigQuery and real-time data processing tools like Google Cloud Dataflow*
- *BigQuery is a data warehouse that enables massive processing of data at high speeds*
- *Google has also launched new machine learning and Artificial Intelligence tools*

4. Google Cloud Platform Components :

Several components and services are an important feature of Google Cloud Platform; let's dive into each one individually and learn more about what they provide.

1. Compute

The compute service enables compute and hosting the cloud. The various services under this are as follows:

- *App Engine*
- *Compute Engine*
- *Kubernetes Engine*
- *Cloud Functions*
- *Cloud Run*

2. Storage and Database

The storage and database service enables the application to store media files, backups, or other file-like objects. The services include:

- *Cloud Storage*
- *Cloud SQL*
- *Cloud Bigtable*
- *Cloud Spanner*

- *Cloud Datastore*

3. Networking

The networking service enables us to load-balance traffic across resources, create DNS records, and much more. Some of the services include:

- *VPC*
- *Cloud Load Balancing*
- *Cloud Armor*
- *Cloud CDN*
- *Cloud Interconnect*

- *Cloud DNS*
- *Network Service Tiers*

4. Big Data

The big data service enables us to process and query big data in the cloud. A few of the included services are the following::

- *BigQuery*
- *Cloud Dataproc*
- *Cloud Datalab*
- *Cloud Data Studio*

5. Developer Tools

The developer tools service includes tools that enable software and application development.

- *Artifact Registry (beta)*
- *Cloud SDK*
- *Cloud Code*
- *CloudBuild*
- *Cloud Scheduler*
- *Cloud Tasks*

6. Identity and Security

This service deals with security and authentication:

- *Cloud Identity*
- *Cloud IAM*
- *Cloud Data Loss Prevention API*
- *Security Key Enforcement*

7. Internet of Things(IoT)

You can leverage GCP to create IoT environments with the following tools:

- *Cloud IoT Core*
- *Edge TPU*
- *Cloud IoT*

8. Cloud AI

Cloud AI comprises services related to machine learning, which also encompasses:

- *Cloud AutoML*
- *Cloud Natural Language*
- *Cloud Speech-to-Text*

- *Cloud Text-to-Speech*
- *Cloud Translation API*
- *Cloud Vision API*
- *Cloud Video Intelligence*

9. Management Tools

This domain includes services related to management and monitoring. The services under this are as follows:

- *Cloud Deployment Manager*
- *Cloud Console*
- *Cloud Shell*
- *Cloud APIs*

10. API Platform

The few services under this are as follows:

- *Maps Platform*
- *Developer Portal*
- *API Analytics*
- *Apigee Sense*
- *Cloud Endpoints*

4.Hand -ons :

01.Creation of Linux virtual machine in Google cloud :

Creating a Linux virtual machine instance in Compute Engine using the Google Cloud Console:

- *In the cloud console and on the project selector page, select or create a cloud project.*
- *Make sure that billing is enabled for your Google Cloud project*
- *Enable the Compute Engine API*

Create a virtual machine instance

- *In the cloud console, go to the VM Instances page*
- *Click Create instance.*
- *Fill in the specifications as follows:*
 - *In the “Boot disk” section, click “Change” to begin configuring your boot disk.*
 - *On the “Public images” tab, choose “Ubuntu.” Choose “Ubuntu 18.04” and click “Select.”*
 - *In the “Firewall” section, select “Allow HTTP traffic.”*
 - *Download the required version of PuTTY that you’ll need*

- Go to puttygen and click on “generate” to generate a public/private key pair
- Enter a username and password and save the private key
- Go back to Google Cloud console and click “Create” to create the instance.

The instance will start shortly after. Once it is ready, it is listed on the VM instances page with a green status icon.

Connect to Your Instance

- In Cloud Console, go to the VM instances page
- In the list of virtual machine instances, click “SSH” in the row of the instance that you want to connect to—the SSH button is located next to the instance name

Clean Up

- Go to the VM instances page in the Google Cloud Console
- Click the name of the instance you created
- At the top of the instance's details page, click “Delete”

02.Cloud Storage in Google cloud :

To perform basic tasks in cloud storage using the Google Cloud Console:

- In the cloud console, which is located on the project selector page, select or create a cloud project.
- Go to the project selector page
- Confirm that billing is enabled for your Google Cloud project

Create a bucket

- Open the cloud storage browser in Google Cloud Console.
- Click “Create bucket” to open the bucket creation form.
- Enter your bucket information and click “Continue” to complete each step
- Enter a unique name for your bucket. In this example, the bucket will be named “mydataimp.”
- Select “Region” for location type and us-east1 (South Carolina) for location.
- Select “Standard” for default storage class.
- Select “Uniform” for access control.
- Click Create.

Upload an Object to the Bucket

- In the cloud storage browser, click on the name of the bucket that you created.
- Click the “Upload files” button in the “Objects” tab.

- Download an image and keep it in a designated folder
- In the file dialog, navigate to the file that was downloaded and select it.

After the upload completes, you should see the file name and details, such as its size and type.

Download the Object

- Click the drop-down menu associated with the image. The drop-down menu appears as three vertical dots to the far right.
- Click “Download.”

The image is saved to your local system.

Share the Object

- Click the “Permissions” tab above the list of files.
- Click the “Add members” button.
- In the “New members” text field, enter “allUsers”
- In the “Select a role” drop-down, select Storage > Storage Object Viewer.
- Click “Save.”

When you click on the “Objects” tab and return to the list of objects, you should see that the image is publicly accessible and has a link icon. The link icon reveals a shareable URL that looks like:

To remove public access from the bucket and stop sharing the image publicly:

- Click the “Permissions” tab above the list of objects.
- Find the entry that has “allUsers” listed in the “Members” column.
- Click the trash can icon that is associated with the allUsers entry.
- Click “Remove.”

You should see that the image no longer has a link icon associated with it.

Create Folders

- Click “Create folder.”
- Enter “Immedata” for name and click “Create.”

You should see the folder in the bucket with an image of a folder icon to distinguish it from objects.

Create a subfolder and upload a file to it

- Click immedata.
- Click “Create” folder.
- Enter folder2 for name and click “Create.”
- Click folder2.

- Click “Upload files.”
- In the file dialog, navigate to the screenshot that you downloaded and select it.

After the upload completes, you should see the file name and information about the file, such as its size and type.

Delete the Objects

- Click the buckets link to return to the buckets level.
- Select the bucket.
- Select the checkbox next to folder1.
- Click on the “Delete” button.
- Click “OK” to permanently delete the folder, including all objects and subfolders inside the folder.
- Clean up.

5.Conclusion:

Its clear that cloud computing is fundamental to the next wave of digital development . Currently corporates stores 60% of their data in the cloud platform. In present big data processing includes petabytes , in future it might become exabytes and zettabytes . To process these huge data , on -premises options is not suitable , cloud is the best option . Also big data processing in cloud is 7.5 faster than on -premises options. To conclude , using cloud

“You don’t want to be shipping terabytes and petabytes around. Keep the data where it is , and then you move the analytics to that data “

6.References :

<https://cloud.google.com/compute/docs/quickstart-linux>

<https://cloud.google.com/storage/docs/quickstart-console>

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