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at
Sathyabama Institute of Science and Technology
(Deemed to be University)

Submitted in partial fulfillment of the requirements for
the award of
B.Tech (Bachelor in Technology) Bachelor of Engineering Degree
in
Information Technology
By
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SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY
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April 2022



SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

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DEPARTMENT OF INFORMATION TECHNOLOGY

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of
AKULA SRAVANTH SATYA RAMKI(Reg. No: 39120119) who
carried out the project entitled “**Storage Solution in Google
Cloud platform**” under my supervision from FEB 2022 to April
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Submitted for Viva voce Examination held on _____

InternalExaminer

ExternalExaminer

DECLARATION

I , **A.S.S.RAMKI** hereby declare that the project report entitled “**Storage Solution in Google Cloud platform**” done by me under the guidance of **Dr. A. Sivasangari M.E.,Ph.D.** is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering Degree in Information technology.

DATE: 19/04/2022

A.S.S.Ramki

PLACE: Chennai

SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to Board of Management of **SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

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I wish to express my thanks to all Teaching and Non-teaching staff members of the **DEPARTMENT OF INFORMATION TECHNOLOGY** who were helpful in many ways for the completion of the project.

TRAINING CERTIFICATE



Award of Completion

Akula Sravanth Satya Ramki

Has Successfully Completed

Star Cloud Computing

Star Authorized Delivery Partner

Advantage Pro

You can verify authenticity of this certificate by visiting
<http://www.starcertification.org/Verification/Participation>

10-04-2022

DATE

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DIRECTOR
GLOBAL CERTIFICATIONS



ABSTRACT

Google Cloud Platform (GCP), 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, Google Drive, and YouTube . In Google Cloud it is easy to deploy new storage Capacity much faster than other Clouds. It Replicates all our data between regions in 15 min or less. There are so many companies or customers building global businesses on this google cloud. There is some difference between storing data in a hard disk and storing data in the cloud. In Google Cloud there are different types of storage available . we are finding various storage solutions available in Google Cloud , implement storage Solution and Deploying a file in google cloud .

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CHAPTER-1 : INTRODUCTION

- Cloud computing means storing and accessing the data and programs on remote servers that are hosted on the internet instead of a computer's hard drive or local server. Cloud computing is also referred to as Internet based computing.
- Google Cloud Platform is a set of services that enables developers to build, test and deploy applications on Google's reliable infrastructure.
- Google Cloud Platform (GCP) offers us so many types of storage options based on the type of data.
- Google Cloud Storage allows world-wide storage and retrieval of any amount of data at any time. You can use Cloud Storage for a range of scenarios including serving website content, storing data for archival and disaster recovery, or distributing large data objects to users via direct download.

CHAPTER-2: AIM AND SCOPE OF PRESENT INVESTIGATION

2.1 AIM:

- Explain various storage options available in Google cloud platform , implement Storage solution .

2.2 SCOPE OF THE PROJECT :

- Finding the storage solution of Google cloud platform and hosting a file in google cloud.

CHAPTER- 3 : EXPERIMENTAL OR MATERIAL AND METHODS

3.1 Cloud Computing :

1) Cloud computing is on-demand access, via the internet, to computing

resources—applications, servers(physical servers and virtual servers), data storage, development tools, networking capabilities, and more—hosted at a remote datacenter managed by a cloud services provider (or CSP).

The CSP makes these resources available for a monthly subscription fee or bills them according to usage. Compared to traditional on-premises IT, and depending on the cloud services you select,

2) cloud computing helps do the following:

- i) Lower IT costs
- ii) Improve agility and time-to-value
- iii) Scale more easily and cost-effectively

3) Types of cloud :

- i) Public Cloud
- ii) Private Cloud
- iii) Hybrid Cloud
- iv) Multi Cloud and hybrid multicloud

3.2 Google Cloud Platform :

Google Cloud Platform is a set of Computing, Networking, Storage, Big Data, Machine Learning and Management services provided by Google that runs on the same Cloud infrastructure that Google uses internally for its end-user products, such as Google Search, Gmail, Google Photos and YouTube.



Figure 1 : GCP

3.3 Storage Solution in GCP:

There are different types of storage available in google cloud platform , based on the data .

- i) **Blob storage :** It allows you to store unstructured object data.This means that we're looking at data which often consists of items which don't need to sit within a file structure.

1)Cloud Storage : It is most commonly used storage options - Cloud Storage. Cloud Storage is GCP's blob storage solution and it is often

used alongside other tools such as Compute Engine, App Engine and BigQuery. In terms of its structure, it uses buckets to group items.

ii) Relational storage : It organises data into tables which can be linked to each other. They are the industry standard and GCP provides a couple of options for storing relational data within the cloud.

1) Cloud SQL : Cloud SQL is the obvious choice when setting up a relational database in GCP. It provides a fully managed service which now allows you to create instances of MySQL, PostgreSQL as well as Microsoft SQL Server.

2) Cloud Spanner : GCP's alternative to Cloud SQL is Cloud Spanner. Cloud Spanner provides a relational database structure with the added advantage of horizontal scaling.

iii) NoSQL storage : NoSQL databases store data in non-tabular formats. This can include document storage, key-value pairs or wide-column databases. GCP offers two main NoSQL databases .

1) Cloud Bigtable : Cloud Bigtable consists of sparsely populated columns, where rows are indexed by a single key. It is possible to group columns into column families to capture which columns are related. Each row-column intersection can contain multiple cells at different timestamps, and this allows Cloud Bigtable to record a history of data updates. Cloud Bigtable works well for operational and analytical use cases, and is often used with IoT applications.

2) **Datastore (or) Firestore** : Firestore is the new generation of this

NoSQL document database. Unlike Cloud Bigtable, it uses JSON to store data.

iv) File and block storage :

File Storage : It mean storage which allows us to replicate the commonly used file structure of nested folders.

Block Storage :It stores data as separate pieces, where each piece can be uniquely identified.

1) **Filestore** : It is GCP's fully managed network attached storage option. It is often used alongside instances of Compute Engine and Kubernetes Engine. Filestore also offers four tiers (basic HDD, basic SSD, high scale SSD and enterprise) to allow you to pick the best solution for your needs.

2) **Persistent disk** : GCP provides a variety of options within the persistent disk offering. As expected, at the the highest level of categorisation, you can choose between SSD and HDD.

V) **BigQuery** : GCP's data warehouse solution, BigQuery can handle data storage as well as analysis. It isn't the most common storage solution, and is often used alongside other storage options for data analysis only.

3.4 Methodology :

1) Create a Google cloud account with Gmail .

2) Create a Project .

3) Now, go to the Compute engine and enable it . In compute engine no goto VM

instance and create an instance.

- 4) Now start the Instance and select an SSH console .
- 5) After Completing the above steps , then go to cloud Storage option and create a bucket in google cloud site and fill the mandatory fields .
- 6) Now select the created Bucket and go to the bucket in cloud storage option
- 7) Now upload the file and make sure it will be publicly viewed or not .
- 8) If it is not publically then goto the edit bucket details and go to public option and make it fine grained . Then it will be accessed publicly.
- 9) Now start versioning .
 - > First goto edit option in uploaded file and select icon and make versioning option on .
- 10) Click the uploaded file and copy the gsutil link .
- 11) Now open the SSH console and start our instance in the SSH console .
- 12) Copy our uploaded file to the Instance by using gsutil commands .
- 13) Now if we want to see what we uploaded in the text file then by using linux commands . we can see it in SSH console otherwise, we can access it by cloud publically enabled link.
 - > Public link : we can access that link in that file in cloud website
- 14) Otherwise we can create an file in ssh console and copy that file to that cloud website . If we want to see that file then, we have to follow step 13 again.
- 15) If we modified the uploaded text file than, we have to start upload again with the same file . It will be uploaded .

16) If we want to see the old uploaded text , then goto versioning history ,
then we will access the old and modified file .

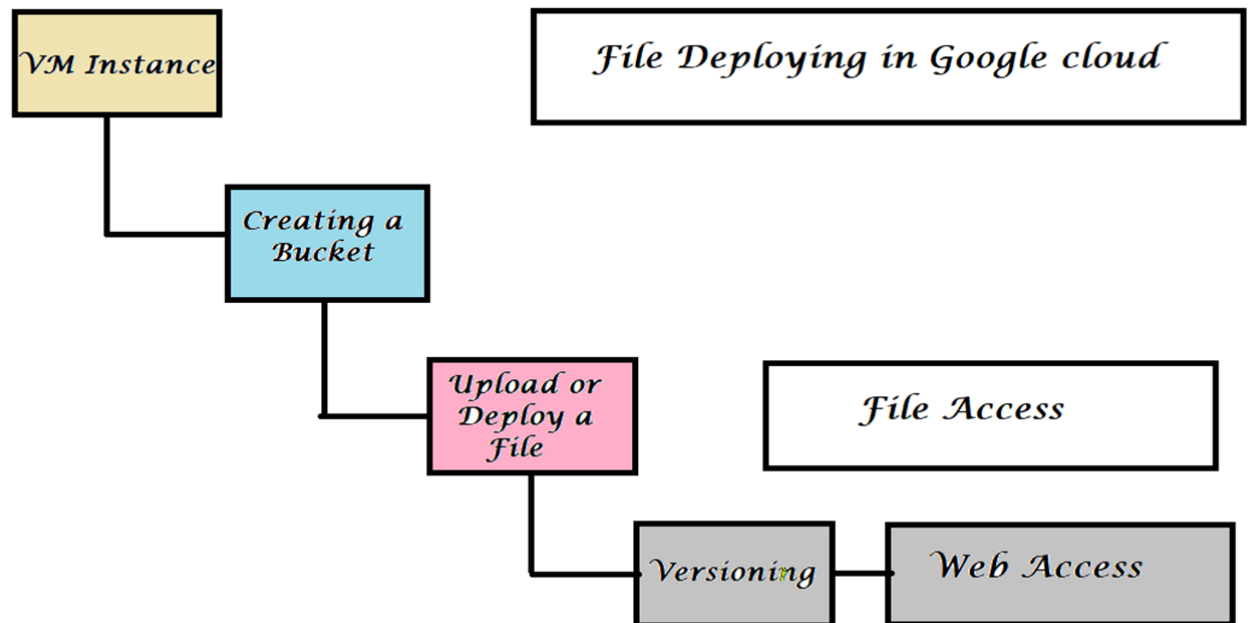


FIG PROCESS TO DEPLOY IN GOOGLE CLOUD

CHAPTER-4 : RESULTS AND PERFORMANCE ANALYSIS

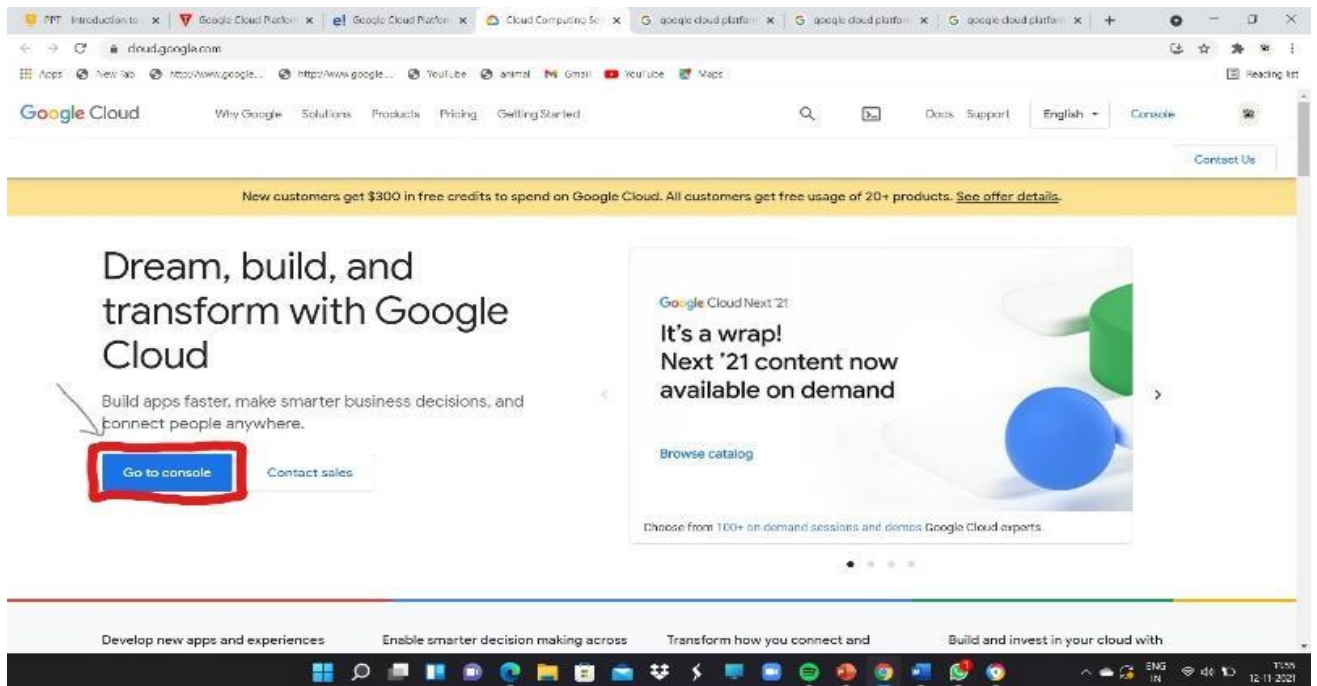


Fig Creating an Cloud account in google cloud platform and go to console

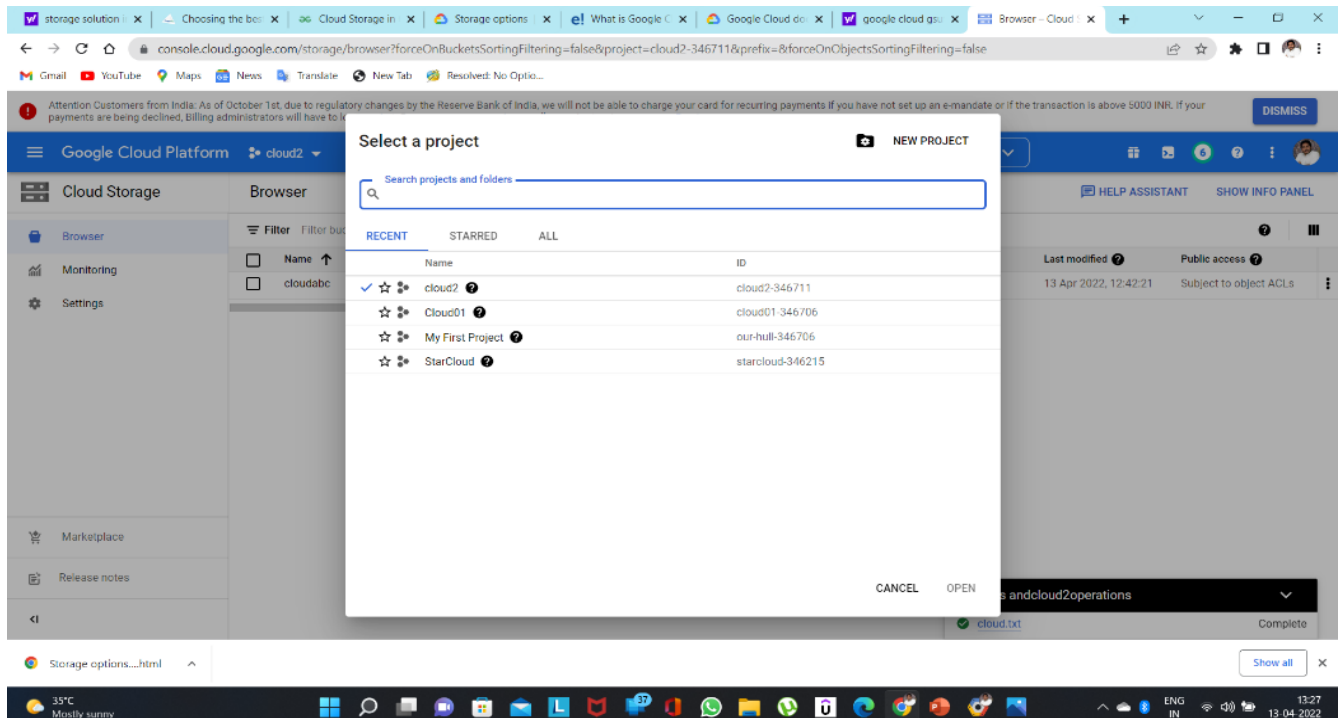


Fig 4 Create a Project and start the Project in GCP

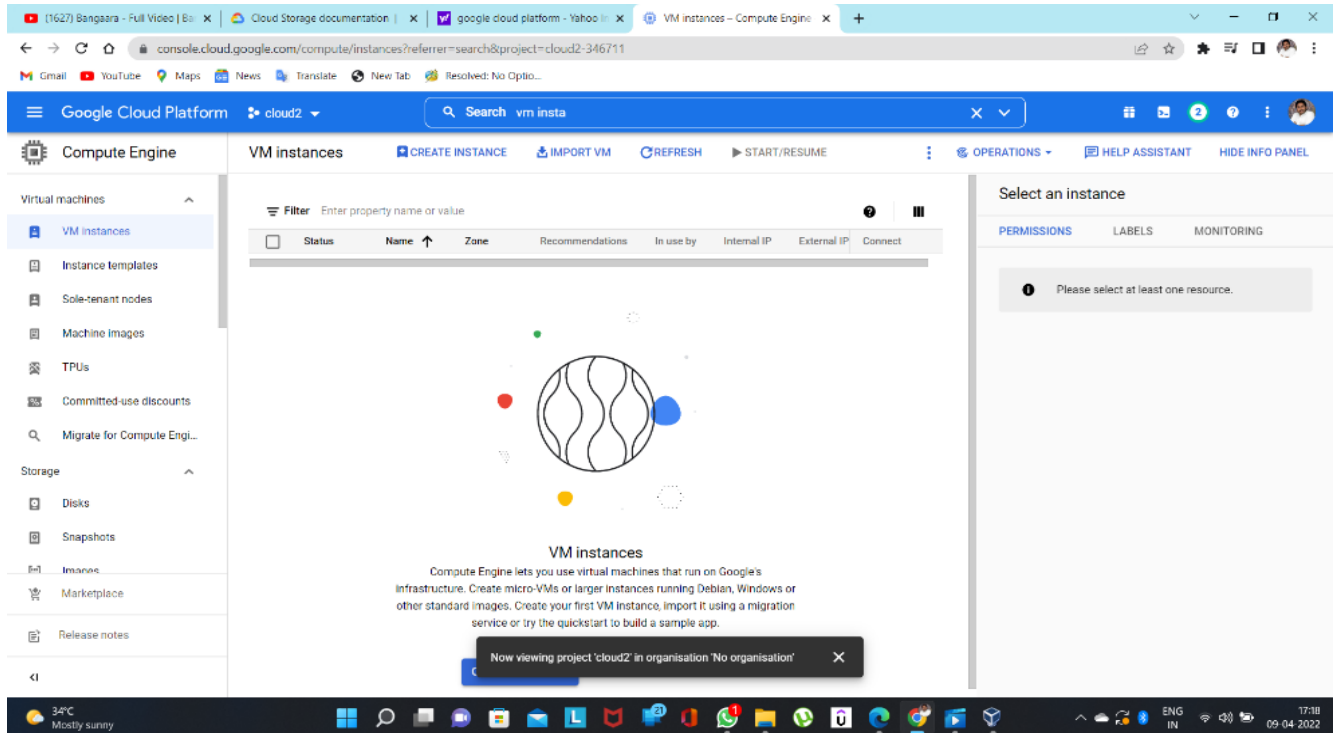


Fig 5 Create an Instance

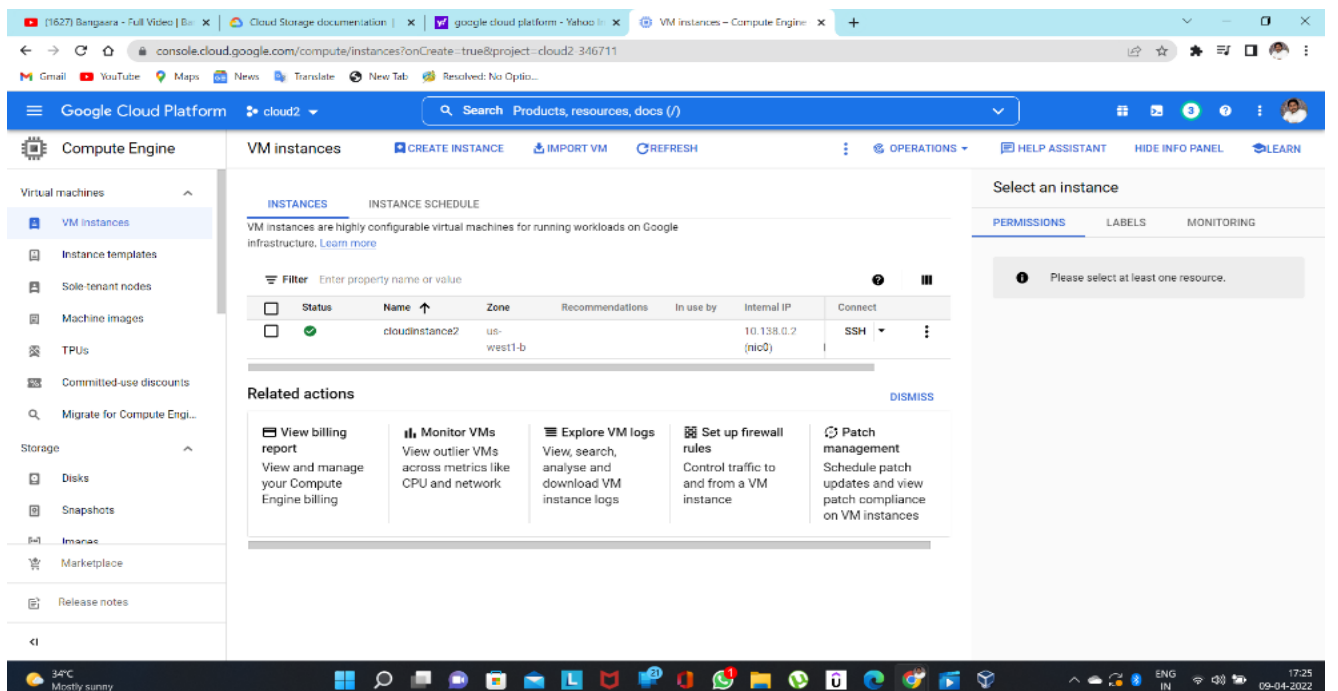


Fig 6. Created instance

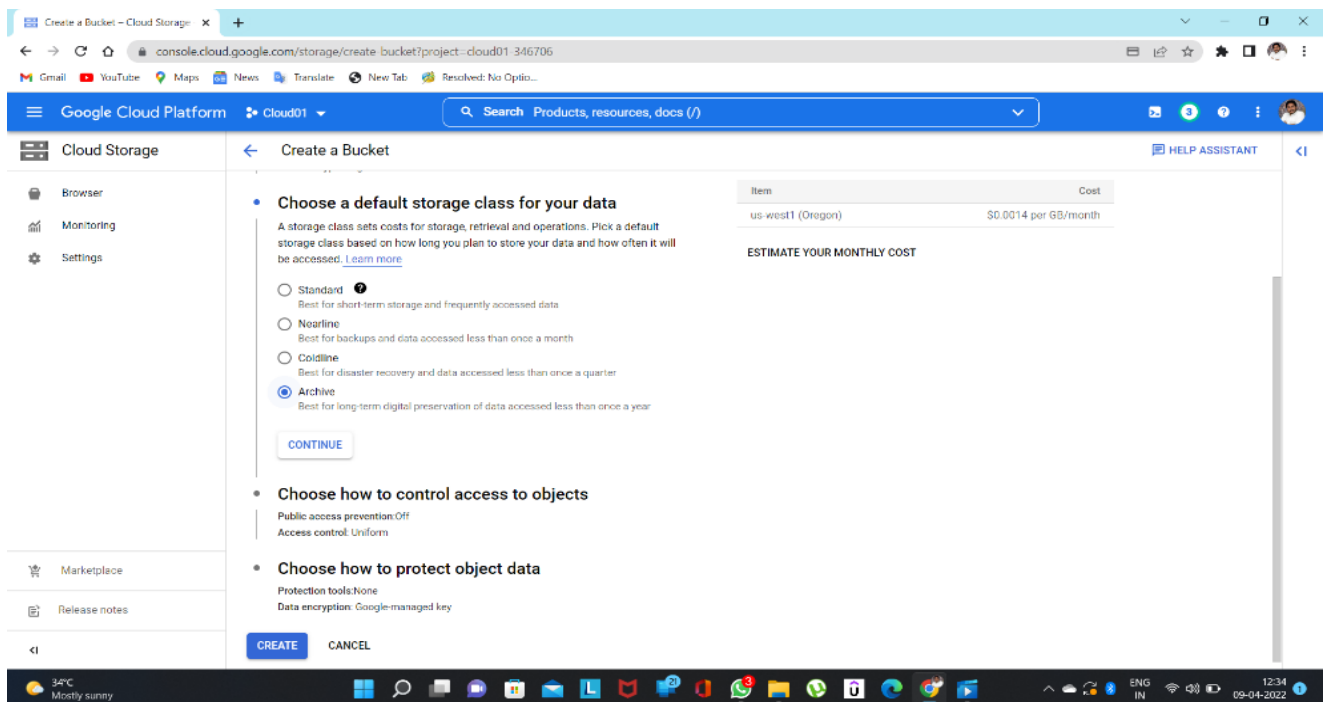


Fig 7 Creating a Bucket

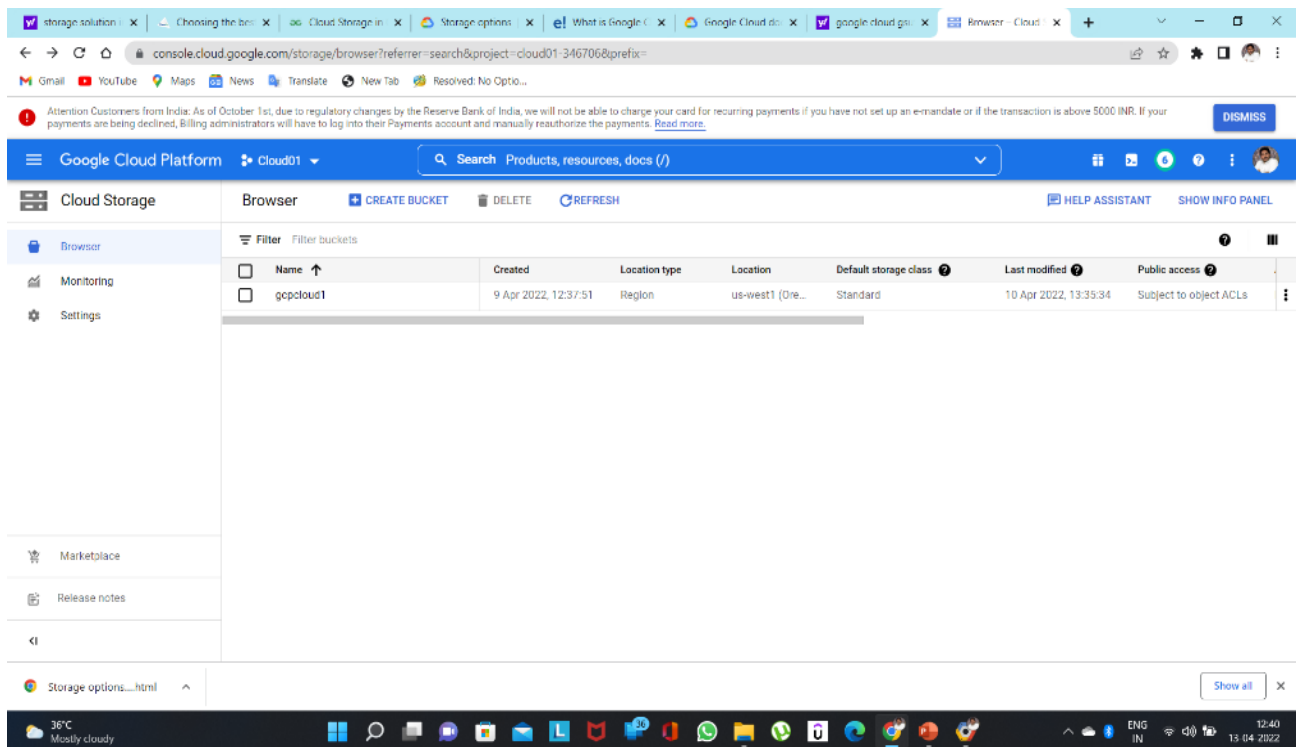


Fig 8 Created Bucket

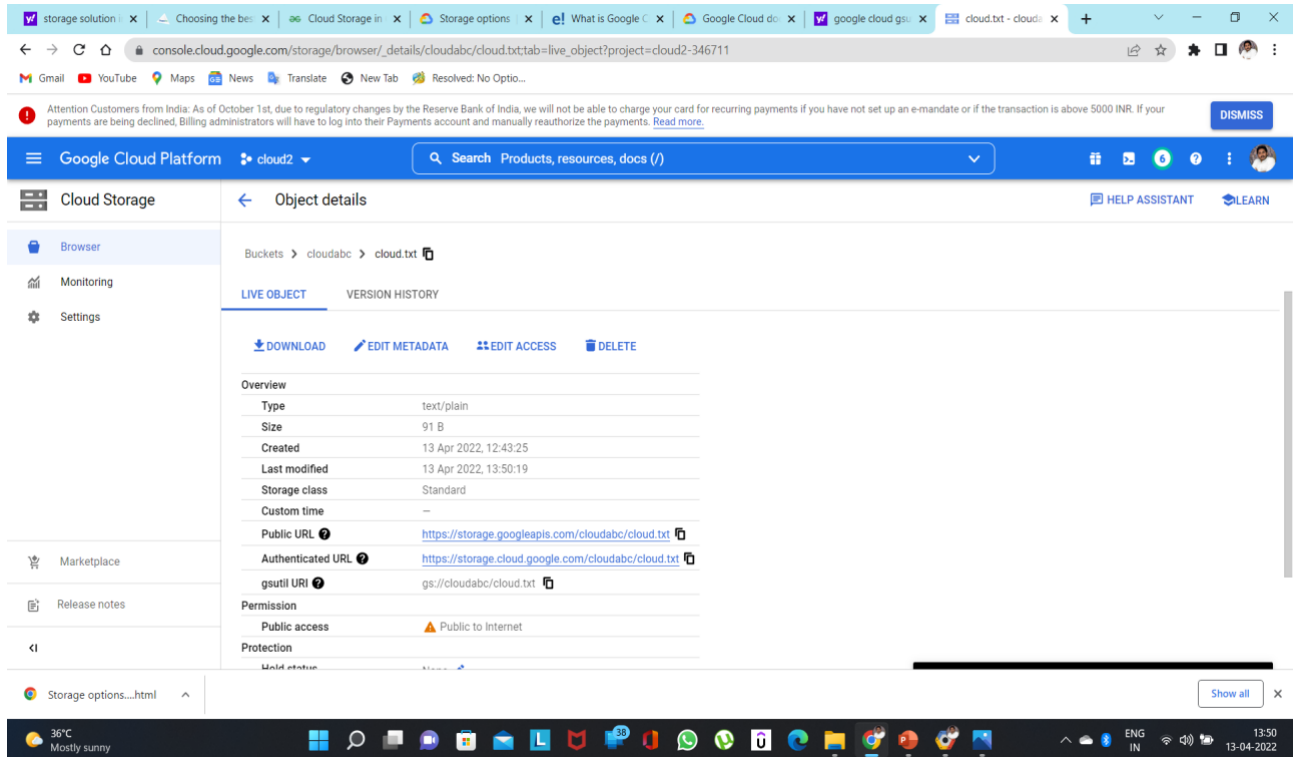


Fig 9 Uploaded File in Bucket

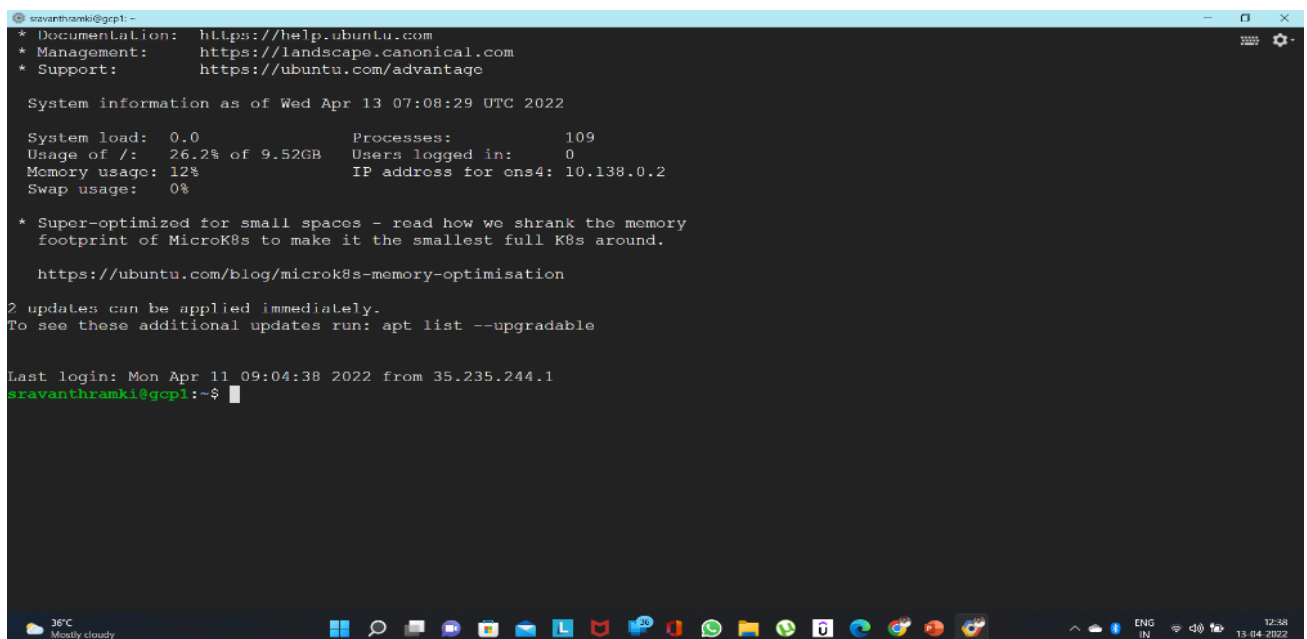


Fig 10 SSH Console

```
root@gcpl: ~  
System load: 0.0          Processes:          119  
Usage of /: 26.2% of 9.52GB Users logged in:      1  
Memory usage: 12%        IP address for ens4: 10.138.0.2  
Swap usage: 0%  
  
* Super-optimized for small spaces - read how we shrank the memory  
  footprint of MicroK8s to make it the smallest full K8s around.  
  
  https://ubuntu.com/blog/microk8s-memory-optimisation  
  
2 updates can be applied immediately.  
To see these additional updates run: apt list --upgradable  
  
New release '20.04.4 LTS' available.  
Run 'do-release-upgrade' to upgrade to it.  
  
Last login: Wed Apr 13 07:08:30 2022 from 35.235.244.1  
sravanthramki@gcpl:~$ sudo su  
root@gcpl:/home/sravanthramki# cd  
root@gcpl:~# gsutil cp gs://gcpcloud1/cloud.txt  
CommandException: Wrong number of arguments for "cp" command.  
root@gcpl:~# gsutil cp gs://gcpcloud1/cloud.txt .  
Copying gs://gcpcloud1/cloud.txt...  
/ [0 files] 0.0 B/ 91.0 B]  
/ [1 files] 91.0 B/ 91.0 B]  
  
Operation completed over 1 objects/91.0 B.  
  
root@gcpl:~# cat cloud.txt  
cloud computing  
gs://gcpcloud1/cloud.txt  
root@gcpl:~#
```

Fig 11 SSH Console

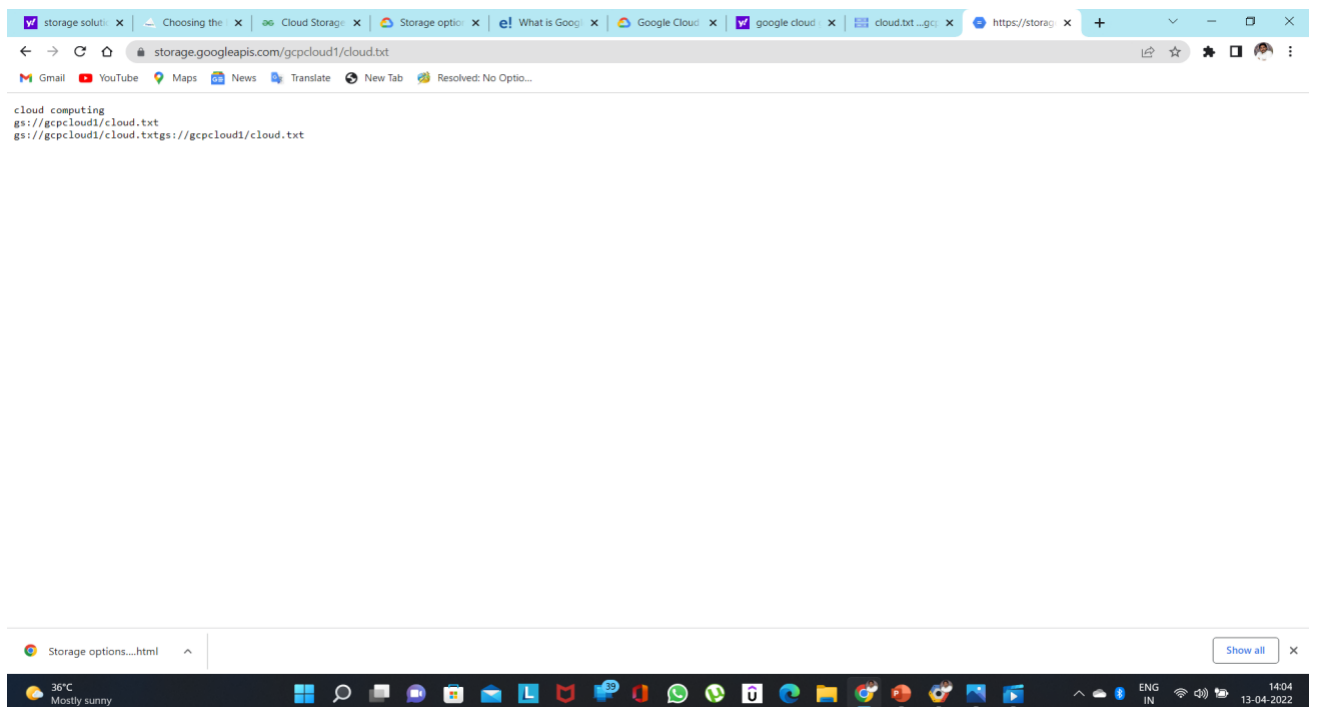


Fig 12 Web Browser

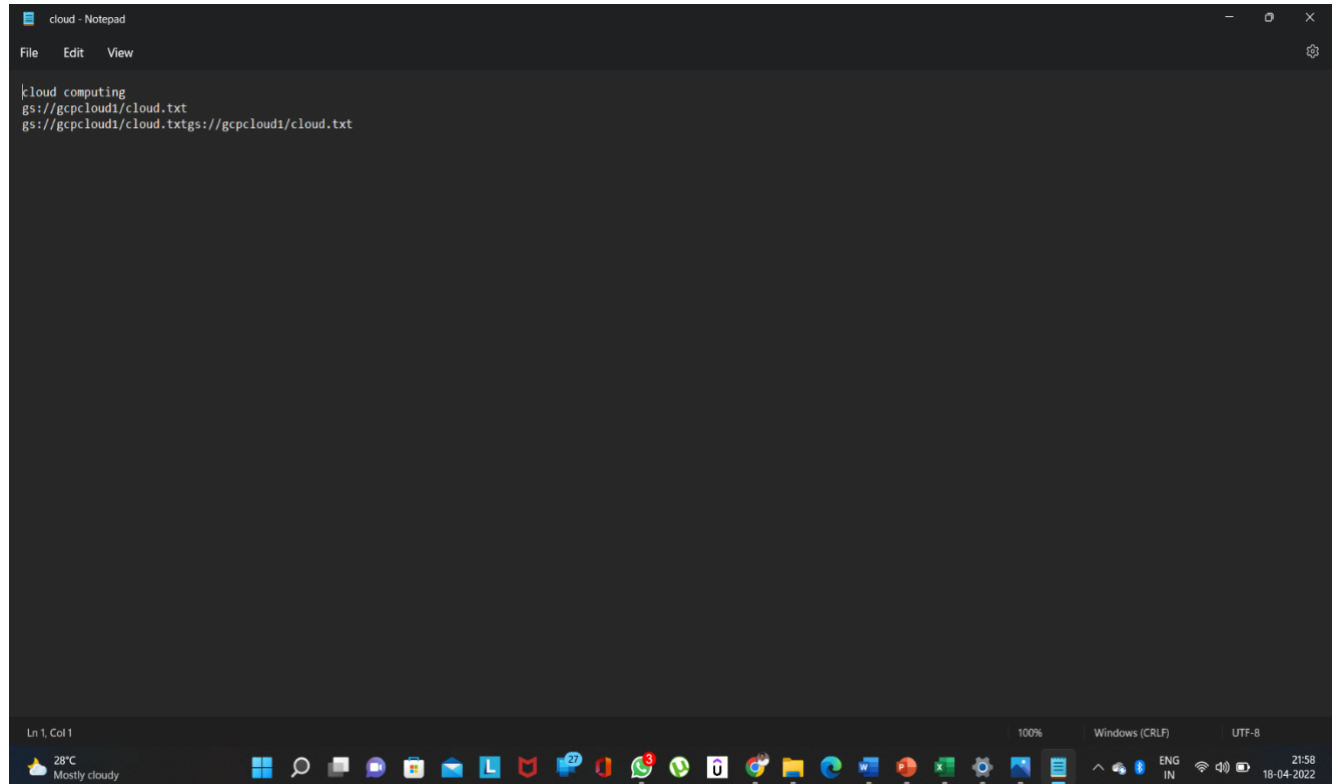


Fig 13 Text File

CHAPTER-5

5.1 SUMMARY AND CONCLUSIONS

In this project, we explored different storage building blocks in the cloud and provided a good overview of the different storage services available in Google Cloud. To store a file in cloud is very easy , and we can access it very easy and cost-effective . It has many benefits that it provides to its users and businesses. Google cloud platform is a public cloud provider . It offers us so many types of storage options . The possibilities for solutions on the Cloud Platform is endless.

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