Cloud Computing

Project Report

On

Smart Cloud Storage

Submitted by:

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Objective

To develop a public cloud storage which shares data and contents among users within a closed group and provides functionality for interaction among the user (messaging) as well as give information and details regarding the shared contents to enable users to understand those contents using Cloud API tools.

Motivation

Various Cloud Provider offers different kinds of storage and database functionality to its users. Google Drive provides platform to share the user contents with an individual, a group or through a public shareable link, but it provides no such feature to analyze the text, document or an image shared among those users. The only way to understand those documents and images is either by asking the creator about those contents or by doing a separate google search across a web. In this project, I have added few machine learning tools available on Google Cloud Platform such as Cloud Vision API to analyze those images without the need of having to ask the creator about the content or to perform a google search. These Cloud APIs enables anyone to understand the content of an image by encapsulating powerful machine learning models using REST API. While google search simply returns available web contents across the internet on those searched items, by using those Cloud Vision API, users will be able to understand the contents of the shared images too. Users will also be able to share contents among a certain group of authenticated users as well as be interact with those users from within the app.

Goal

The platform has been developed for android phone. In simple term, the app has three major functionalities: **cloud storage (public), social platform and integrated Cloud machine learning tool** to analyze an image**.** Users will be able to upload/share any user generated contents, images, documents, video, audio and so on. In terms of security, only authenticated users will be able to join a group and access the shared contents. The uploaded/shared contents will be stored on Google Cloud Storage using the Google Firebase Cloud API. The app can be beneficial for an organization to share the information among only a certain employees within the same department, or among employees in a meeting.

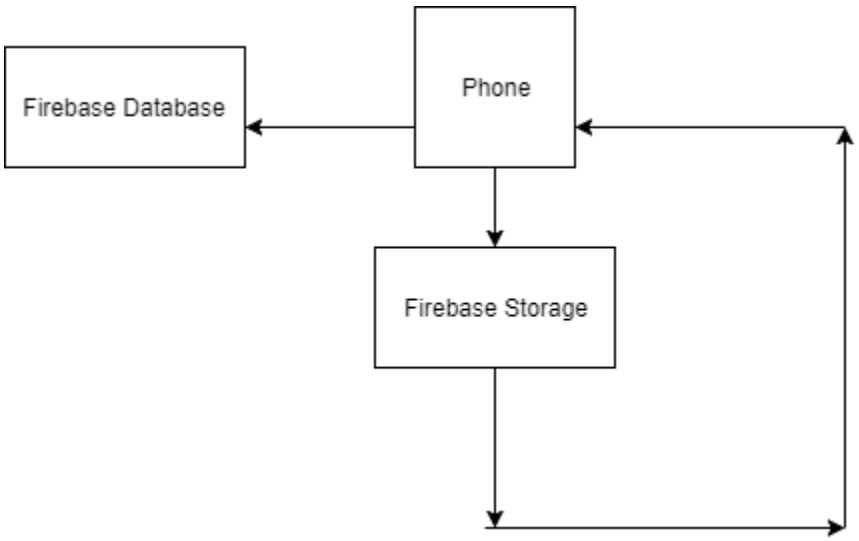
Language/Tools used

In this project, I have used two Cloud APIs “Cloud Vision API” and “Google Firebase API”. Google Firebase API is a platform as a service provided by Google to integrate the app with the backend cloud servers (Authentication, Storage, Database and so on). Cloud Vision API is a REST API incorporating powerful machine learning models to understand the content of an image. I have

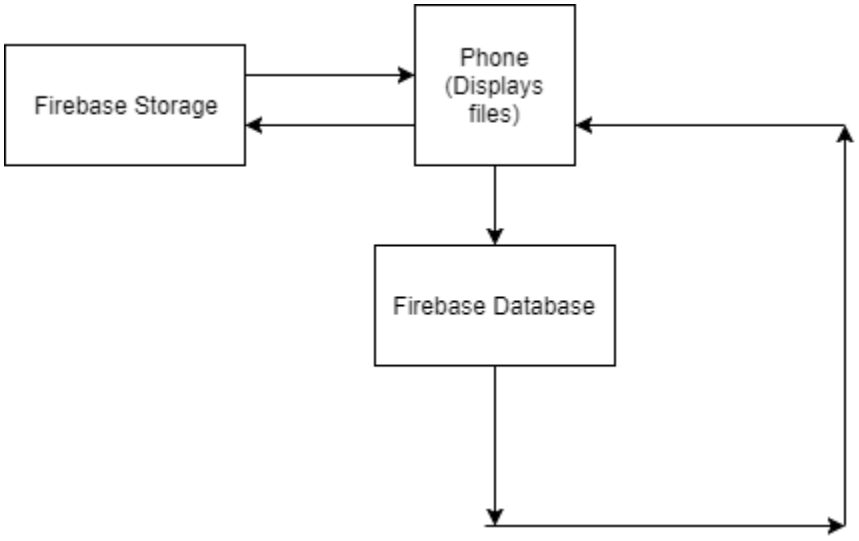
also used an API “Multiple Image Select” to select multiple images from the phone directory. I have also used “Glide” API to view the images in the android activity.

Process

After uploading the file, the file is saved on Firebase Storage, the uri and the details of the file are then saved in real-time Firebase Database.

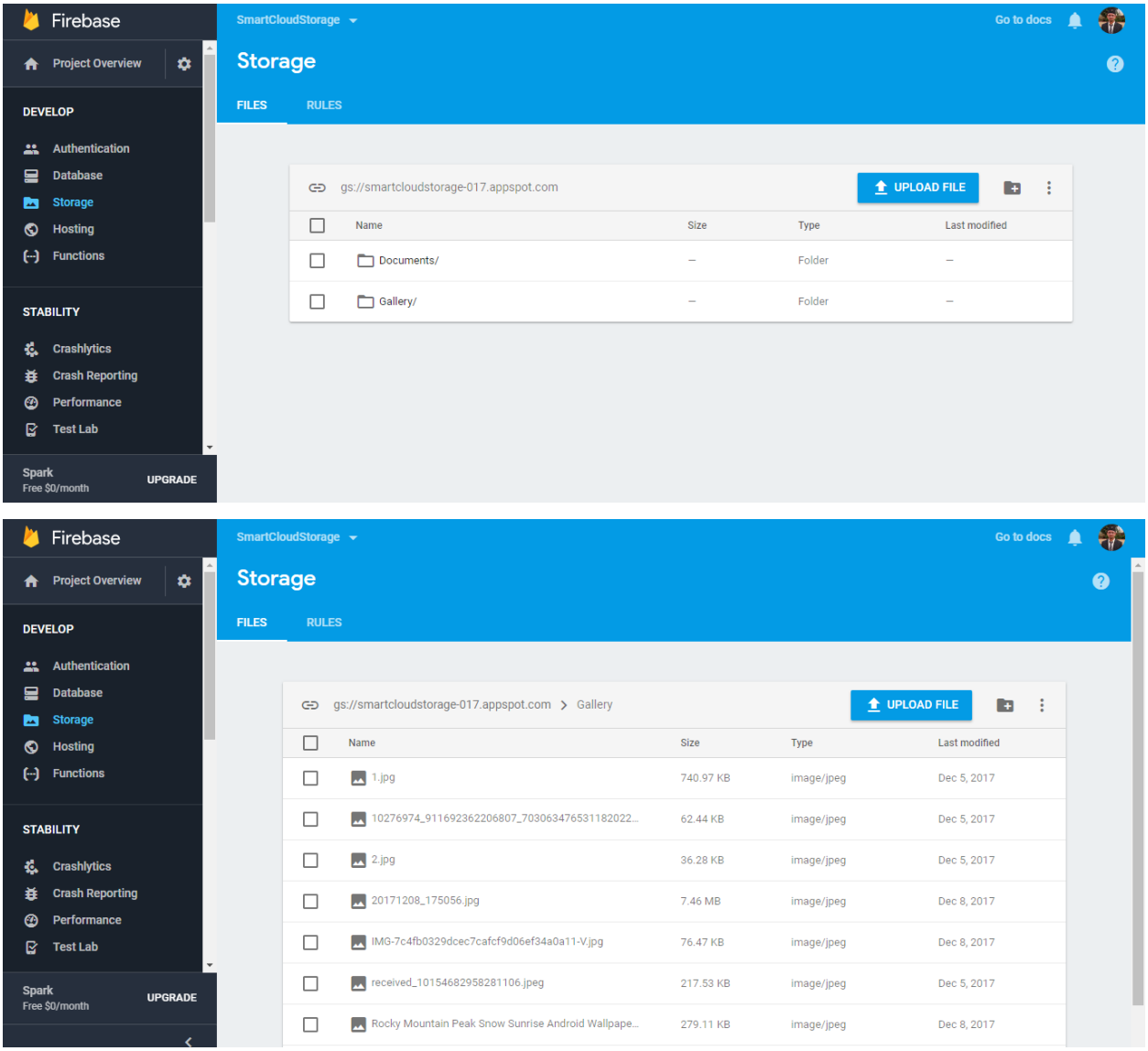


When fetching the file, the app makes a request to the Firebase Database to fetch the database columns and obtains the uri and details of the files stored on Firebase Storage. After receiving the uri, the app fetches the files from the Google Cloud Storage (Firebase Storage).

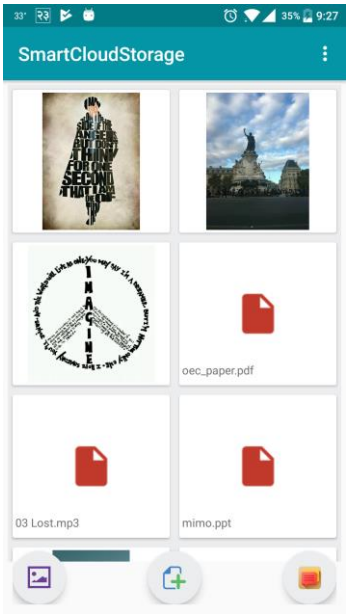


Results

In the screenshot below, we can see the files stored on the Firebase Storage and the files displayed on the android phone.

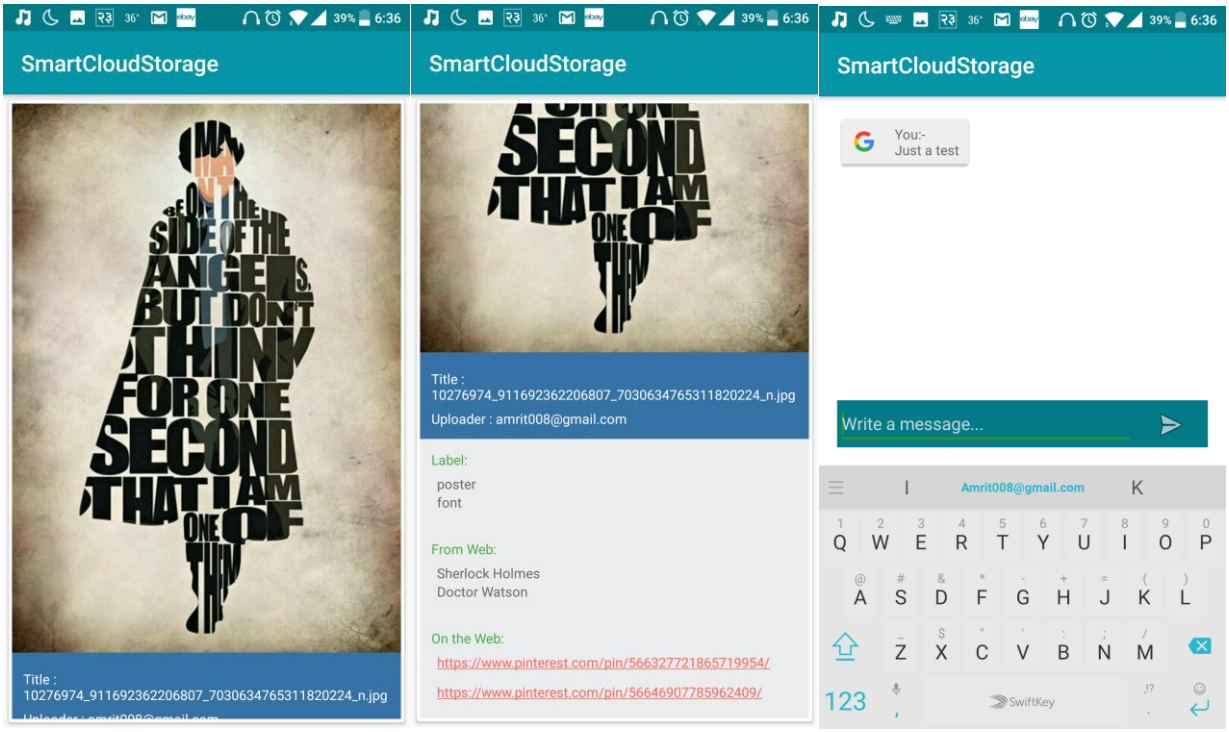


Firebase Storage



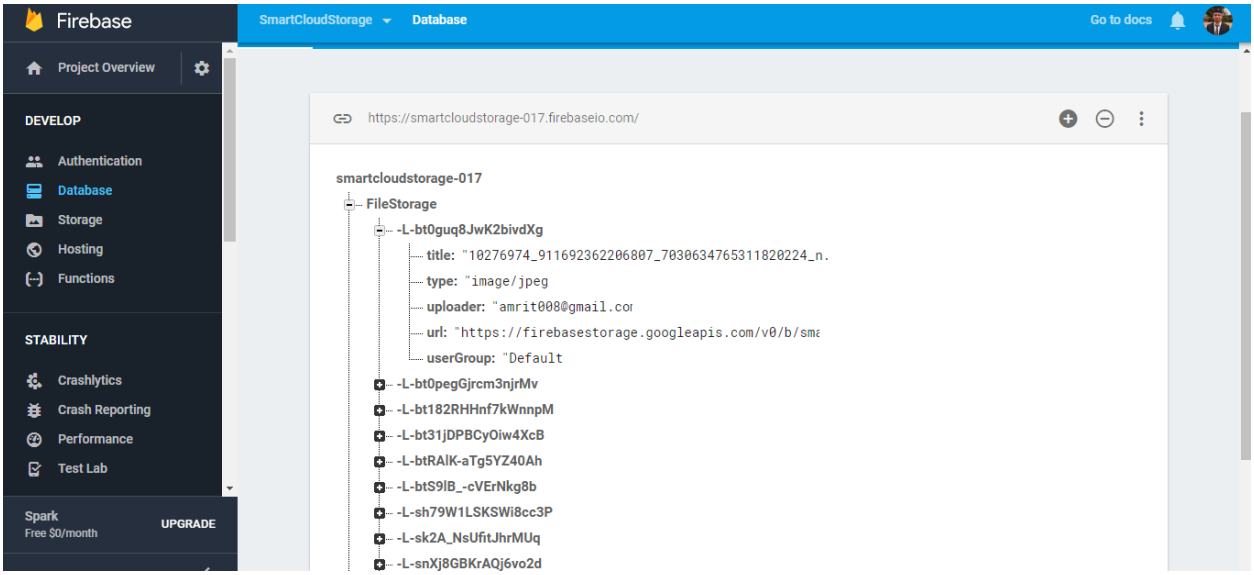
Shared Files inside Group

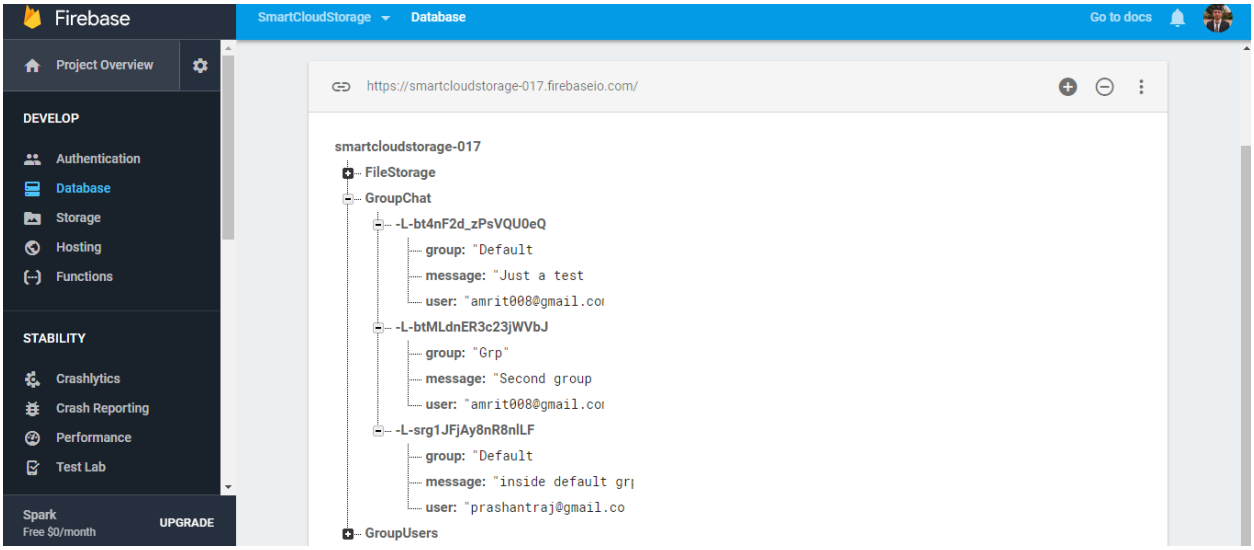
In the screenshot below, we can see the Cloud Vision API results inside an image and chat application within the group.



The chat application is developed by storing the text messages from the users in the real-time database.

Below are the screenshots of the Real-time database “Firebase Database” used to store the reference to the uri and details, as well as the messages from the users.





Firebase Database

Discussion

By integrating such Cloud tools, we can be capable to better understand the shared contents. This app can also be used to share the contents within a group containing only the relevant users, such as, within certain employees working on the same department, and so on.

Problem Faced

During initial phase, I faced few problems like uploading multiple images at once to the cloud storage from the app. I also faced problems while handling the real-time database.

Future Direction

Incorporating various API such as Cloud Speech API to select and share files through voice recognition, Natural Language API to analyze the structure and meaning of text messages including text detection, entity recognition, Translation API to translate text from one language to another can make the Cloud Storage smarter and user-friendly.

Project on GitHub

https://github.com/amrit015/Smart-Cloud-Storage

You can find the Java and xml code used to develop the app in the above link.