Plan

Overview

Build an email server for internal use

Requirements Description

Functional Requirements

- send emails
- search the status of sent emails

  (by date, sender, receiver, sender-receiver...)

Non-functional Requirements

- limit of sent emails: 2000 per day

API

1. `POST` `/v1/send-email`

   request body:

   ```
   {
     "receivers": ["example.receiver@example.com","example.receiver2@example.com"],
     "subject": "Sample Email Title",
     "content": "This is the content of the email.",
     "attachments": [
         {
           "filename": "example.txt",
           "filetype": "text/plain", // optional
           "blob_name": "SGVsbG8sIHdvcmxkIQ=="
         }
     ]
   }
   ```

2. `GET` `/v1/email-status`

   query params:

   - timestamp
     - from_time
     - to_time
   - receivers (doc 要標注用逗號 separate)
   - keywords (search from subject and content)

System Cost

- Emails:
  - limit to 2000 emails per day
  - assume avg email: 1MB

    1KB * 2000 = 2MB (Total Stored Data per day)
- Queries:
  - Amount of data queried:
    - 每次查詢處理數據量 = 每次查詢處理的電子郵件數量 * 平均每封電子郵件大小
      = 500 封 * 1 KB
      = 2MB
    - 一個月查詢次數 = 1 次
    - Amount of data queried = 每次查詢處理數據量 * 一個月查詢次數

      = 2MB * 1

      = 2MB
  - Active logical storage （過去 90 天頻繁被修改的資料量）

    2 MB * 90天 =180 MB

https://cloud.google.com/products/calculator?hl=zh-tw&dl=CiQ1MGE2M2NkZi00MGExLTQyOTEtODRjNi02MzgyYzFlNzM0OGIQCxokMUI2REI0RTgtRkYwMi00NERBLUJCRTEtOE

Data Description

Firestore (NoSQL)

```
{
  "email_id": 1,
  "email_details": {
    "receivers": ["example.receiver@example.com", "example.receiver2@example.com"],
    "subject": "Sample Email Title",
    "content": "This is the content of the email.",
    "attachments": [
      {
        "filename": "example.txt",
        "filetype": "text/plain", // optional
        "blob_name": "SGVsbG8sIHdvcmxkIQ=="
      }
    ],
    "sent_time": "2024-07-04T12:34:56Z"
  },
  "is_sent": false
}
```

BigQuery (SQL)

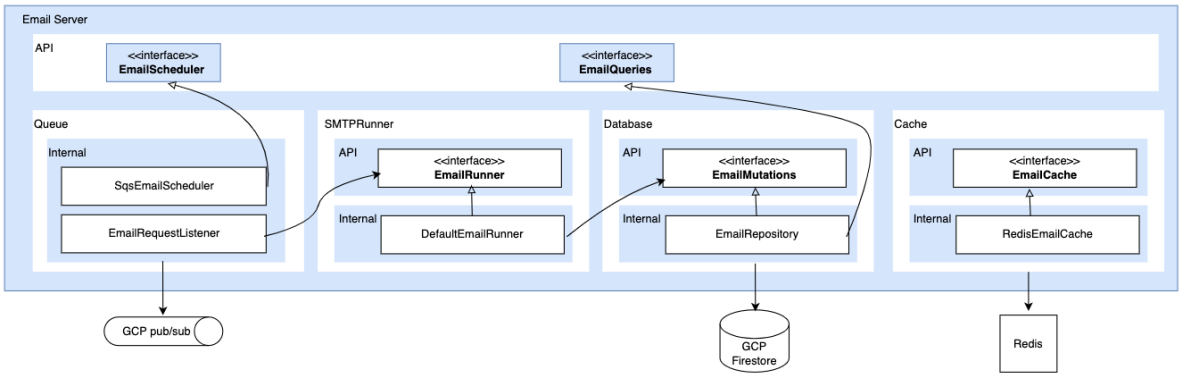
使用 extension 的話轉移過程會自動產生 table，預想如下

email_data Table Schema

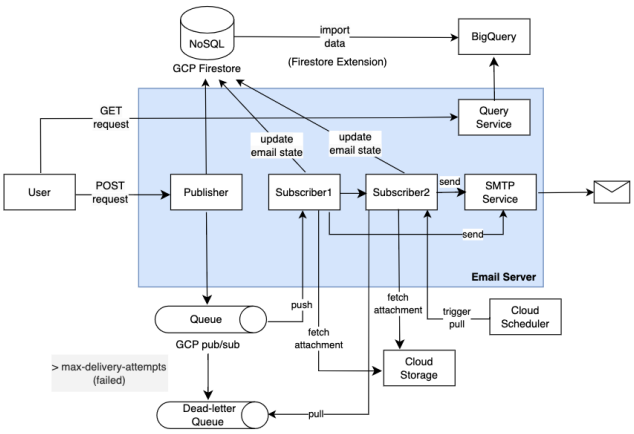
Column Name	Data Type	Description
email_id	INT64	Unique identifier for the email
sender	STRING	Email address of the sender
receiver	STRING	Email address of the receiver
subject	STRING	Subject of the email
content	STRING	Content/body of the email
attachment	STRUCT	Attachment details
- filename	STRING	Name of the attachment file
- filetype	STRING	MIME type of the attachment file
- data	STRING	Base64 encoded data of the attachment file
timestamp	TIMESTAMP	Timestamp when the email was sent or received
is_sent	BOOL	Boolean indicating if the email was sent

System Architecture

static architecture



dynamic architecture



Questions

- Is updating data from FireStore to BigQuery best practice?

  ⇒ https://extensions.dev/extensions/firebase/firestore-bigquery-export

  ### How this extension works

  Use this extension to export the documents in a Cloud Firestore collection to BigQuery. Exports are realtime and incremental, so the data in BigQuery is a mirror of your content in Cloud Firestore.

  If you create, update, or delete a document in the specified collection, this extension sends that update to BigQuery. You can then run queries on this mirrored dataset.

- BigQuery 90 days

Store data in BigQuery

Best practice: Store your data in BigQuery.

When you load data into BigQuery from Cloud Storage, you are not charged for the load operation, but you do incur charges for storing the data in Cloud Storage. After the data is loaded into BigQuery, the data is subject to BigQuery storage pricing. You are charged for the physical or the logical storage your table consumes including the time travel storage blocks.

Rather than exporting your older data to another storage option (such as Cloud Storage), take advantage of BigQuery long-term storage pricing.

If you have a table that is not edited for 90 consecutive days, the price of storage for that table automatically drops by 50 percent. If you have a partitioned table, each partition is considered separately for eligibility for long-term pricing subject to the same rules as non-partitioned tables.

- google 2000封信件限制會在24小時後解除（沒有特定reset時間）