Cloud Engineer Intern

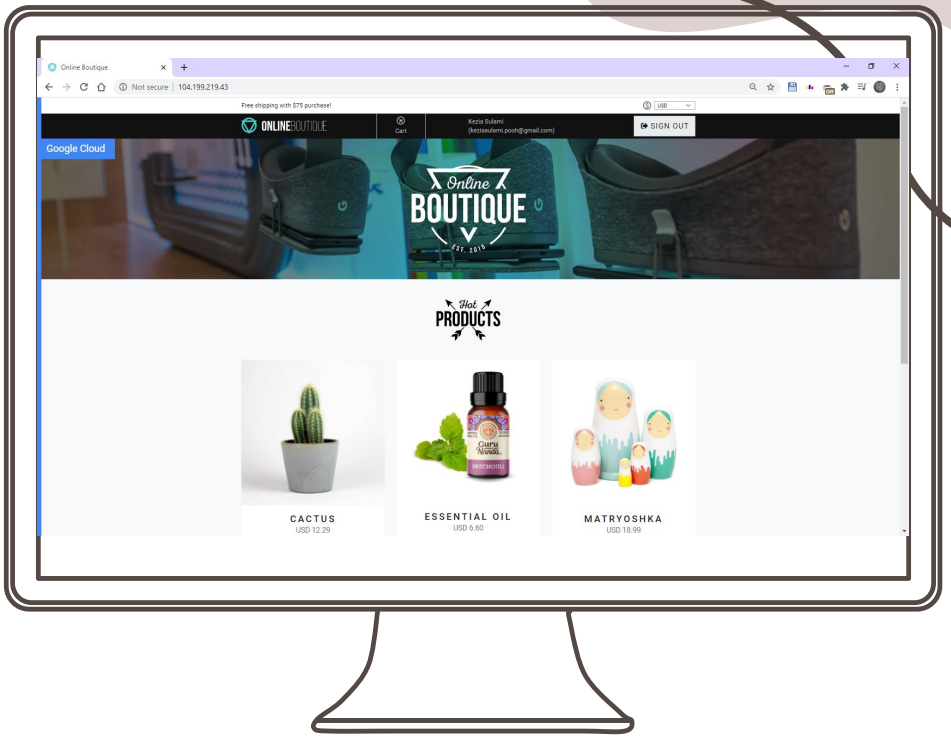
Kezia Sulami

Friday, August 28th 2020

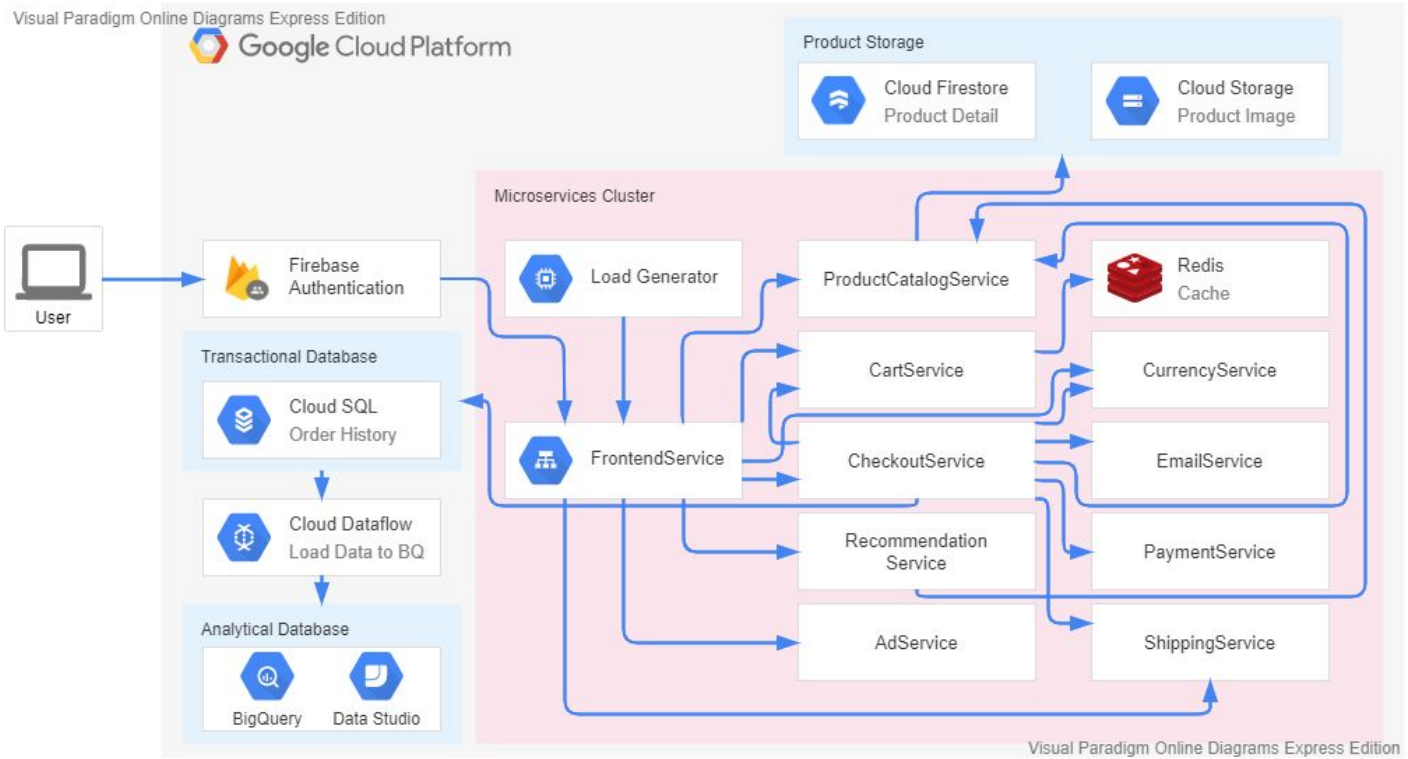
Project:

Online Boutique

a.k.a. Hipster Shop



Microservices



01 User Authentication

02 Product Storage

03 Order History

04 Terraform Infrastructure

05 Load Generator

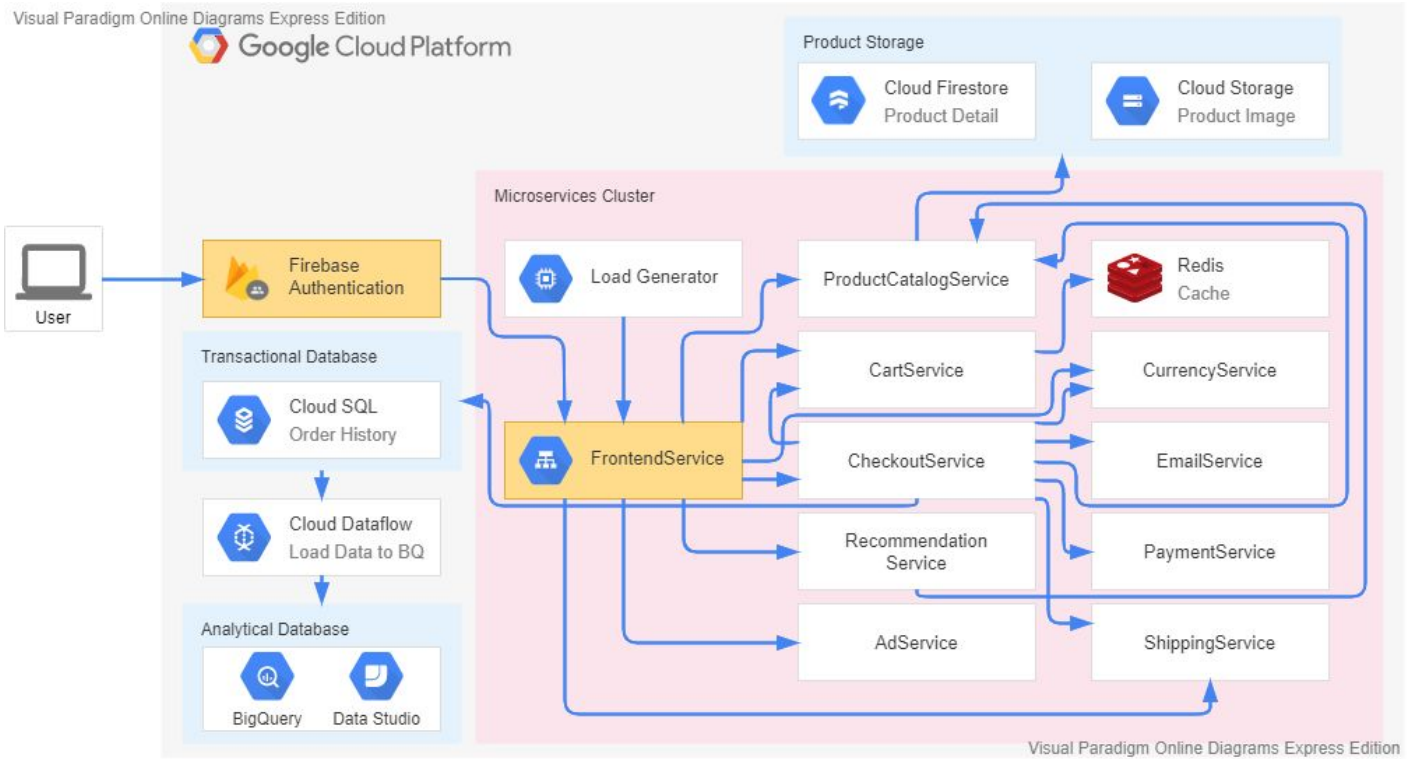
06 Dataflow Pipeline

07 BigQuery Analytics

08 Data Studio Dashboard

01

User Authentication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Cloud Storage
Product Image
Microservices Cluster
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Firebase
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Load Generator
ProductCatalogService
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CheckoutService
EmailService
Cloud Dataflow
Load Data to BQ
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PaymentService
Analytical Database
AdService
ShippingService
BigQuery
Data Studio
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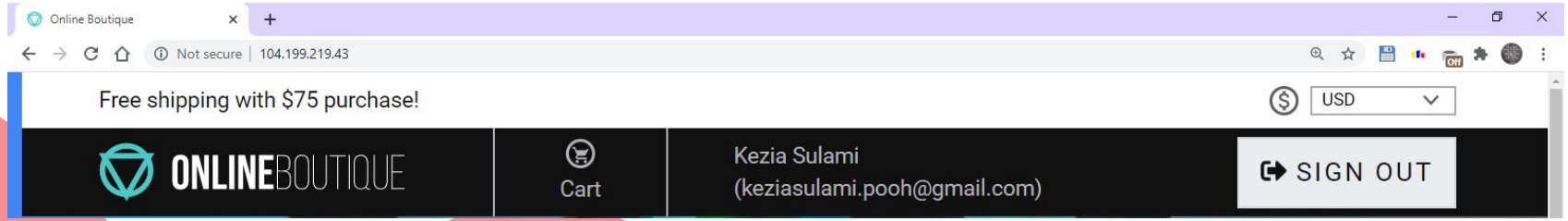
Before

After



Online Boutique

Not secure | 104.199.219.43/cart

Free shipping with $75 purchase!

USD

ONLINEBOUTIQUE

Cart 1

Kezia Sulami
(keziasulami.pooh@gmail.com)

SIGN OUT

Google Cloud

1 item in your cart

EMPTY CART

KEEP BROWSING

Matryoshka

SKU: #matryoshka

Quantity: 1

USD 18.99

Shipping Cost: **USD 4.72**

Total Cost: **USD 23.72**

Checkout

E-mail Address

keziasulami.pooh@gmail.com

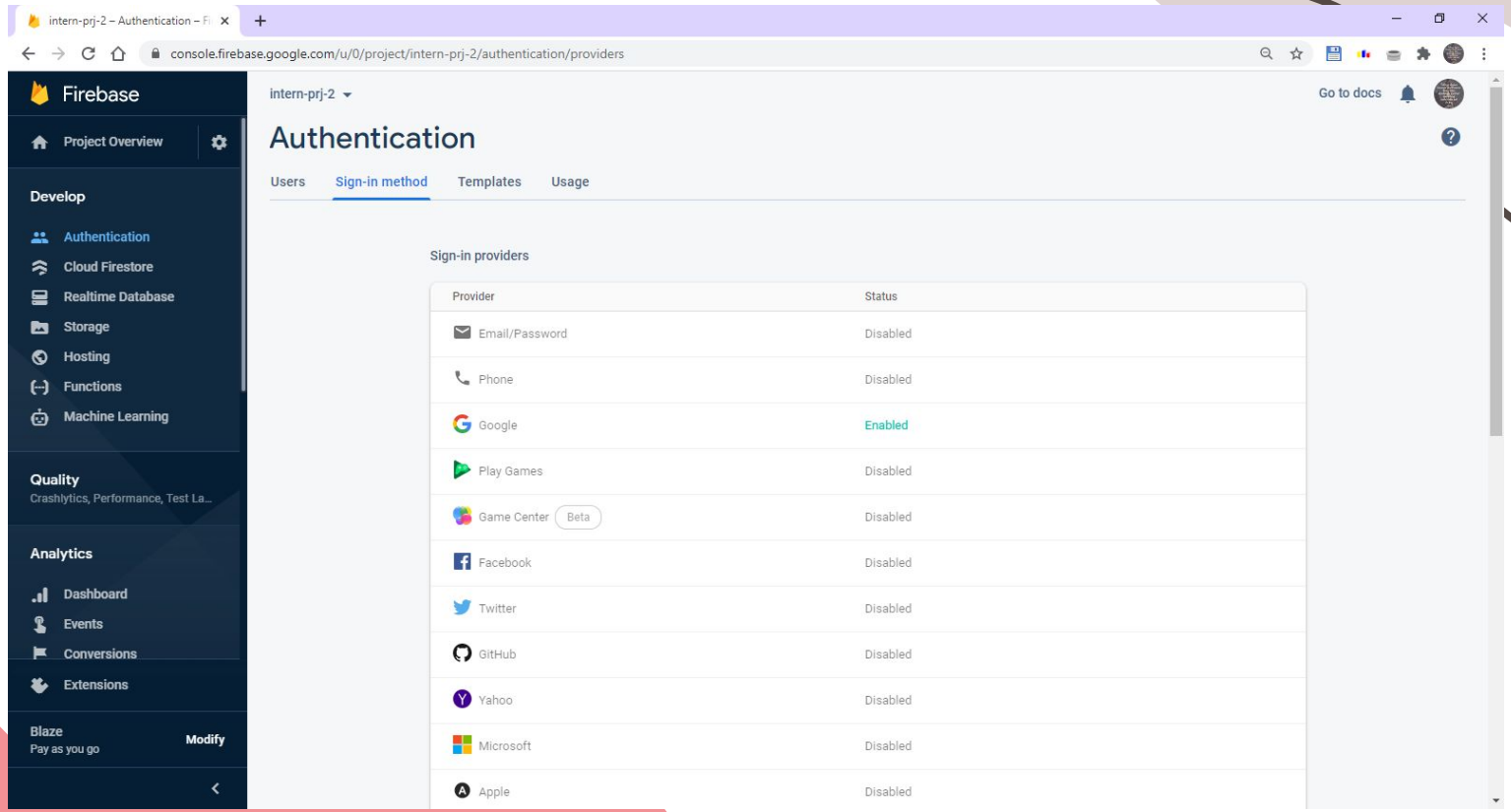
Street Address

1600 Amphitheatre Parkway

Zip Code

94043

Providers


intern-prj-2 – Authentication – Fi
console.firebase.google.com/u/0/project/intern-prj-2/authentication/providers
Firebase
intern-prj-2
Go to docs
Project Overview
Develop
Authentication
Cloud Firestore
Realtime Database
Storage
Hosting
Functions
Machine Learning
Quality
Crashlytics, Performance, Test La...
Analytics
Dashboard
Events
Conversions
Extensions
Blaze
Pay as you go
Modify
Authentication
Users
Sign-in method
Templates
Usage
Sign-in providers
Provider
Status
Email/Password
Disabled
Phone
Disabled
Google
Enabled
Play Games
Disabled
Game Center
Beta
Disabled
Facebook
Disabled
Twitter
Disabled
GitHub
Disabled
Yahoo
Disabled
Microsoft
Disabled
Apple
Disabled

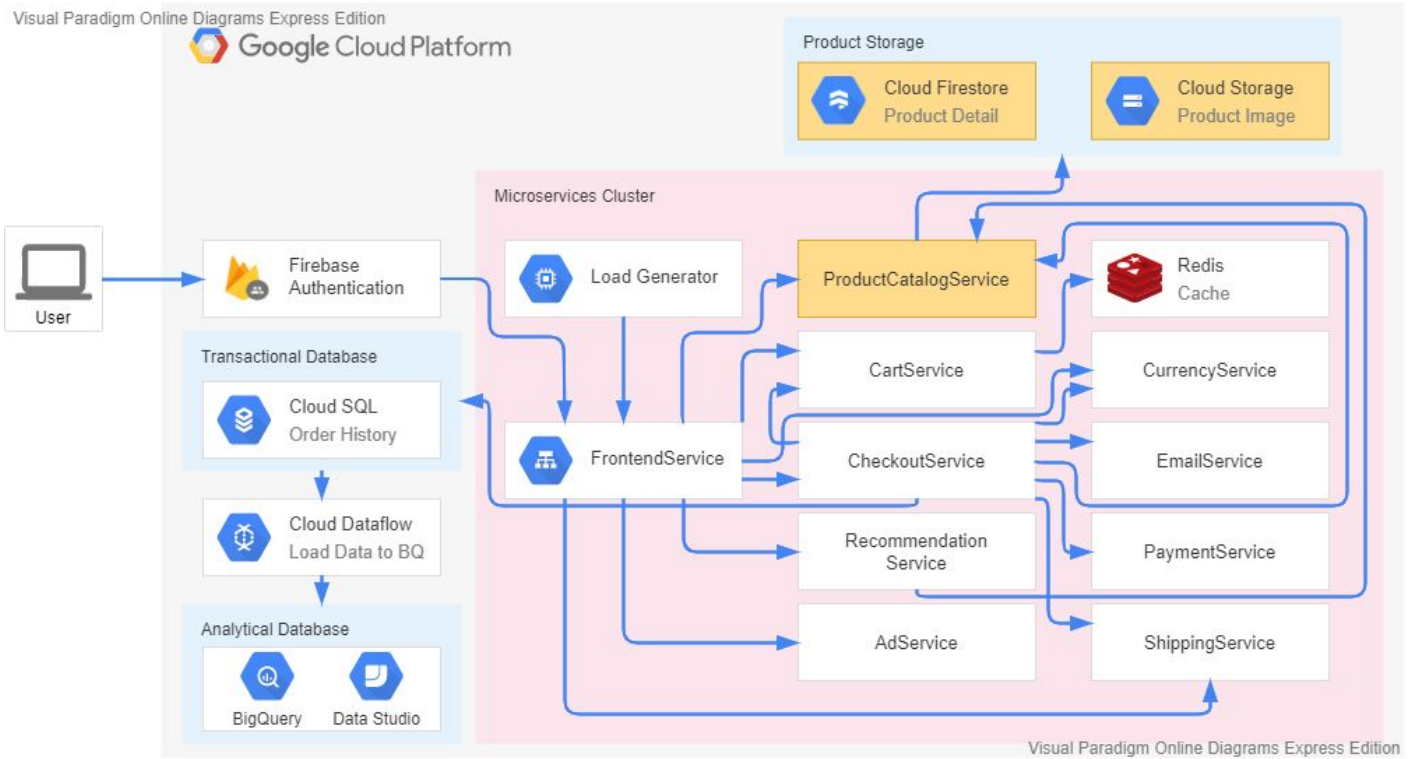
Technologies Used

Firebase Authentication

Bootstrap

02

Product Storage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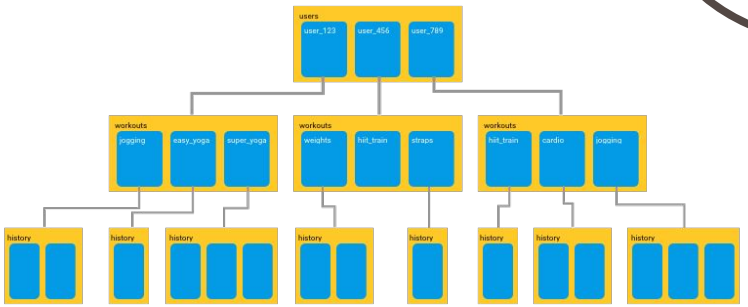
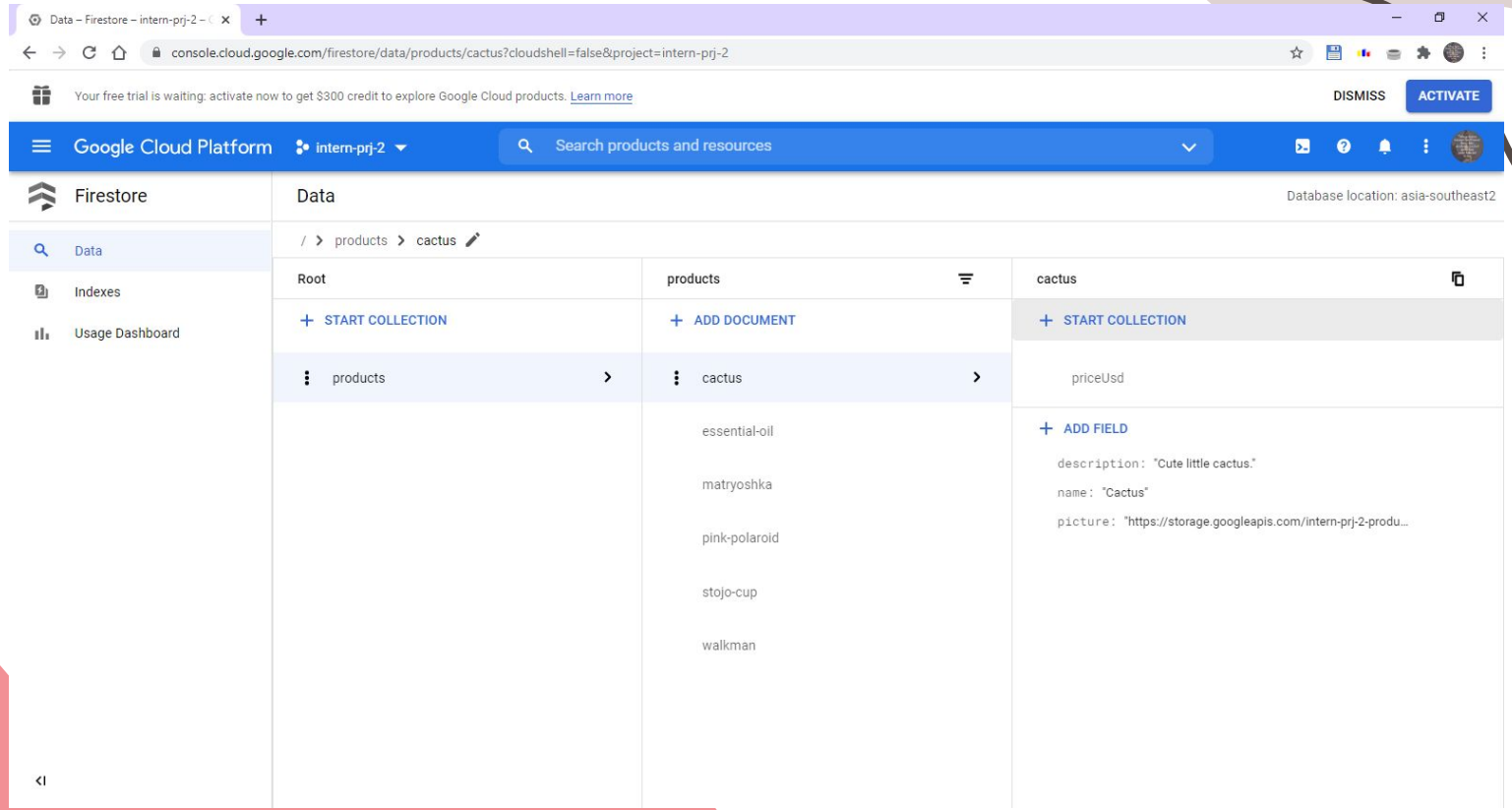
Product Storage

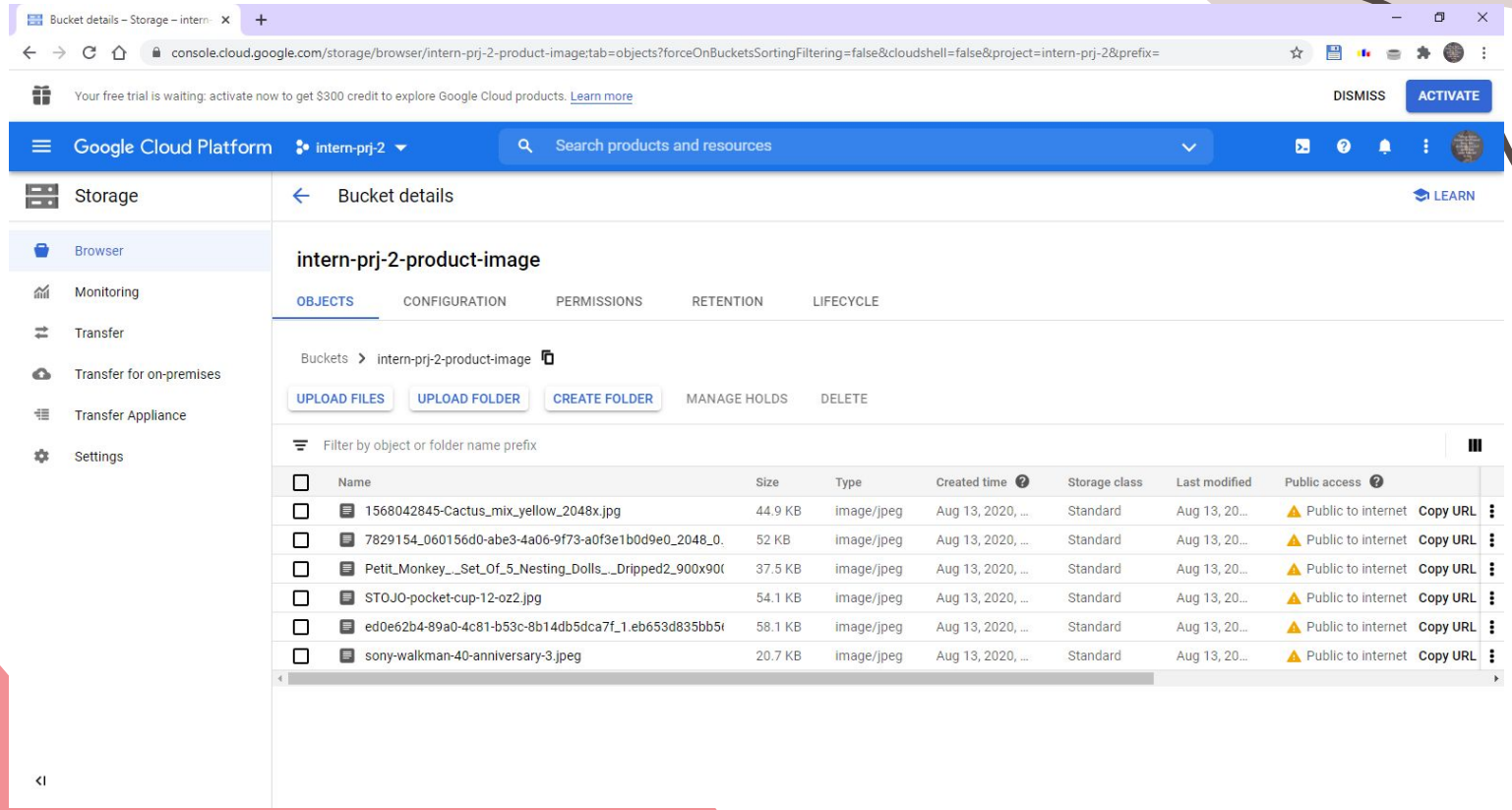


Cloud Firestore

Firestore Interface



Cloud Storage for Product Images



Technologies Used

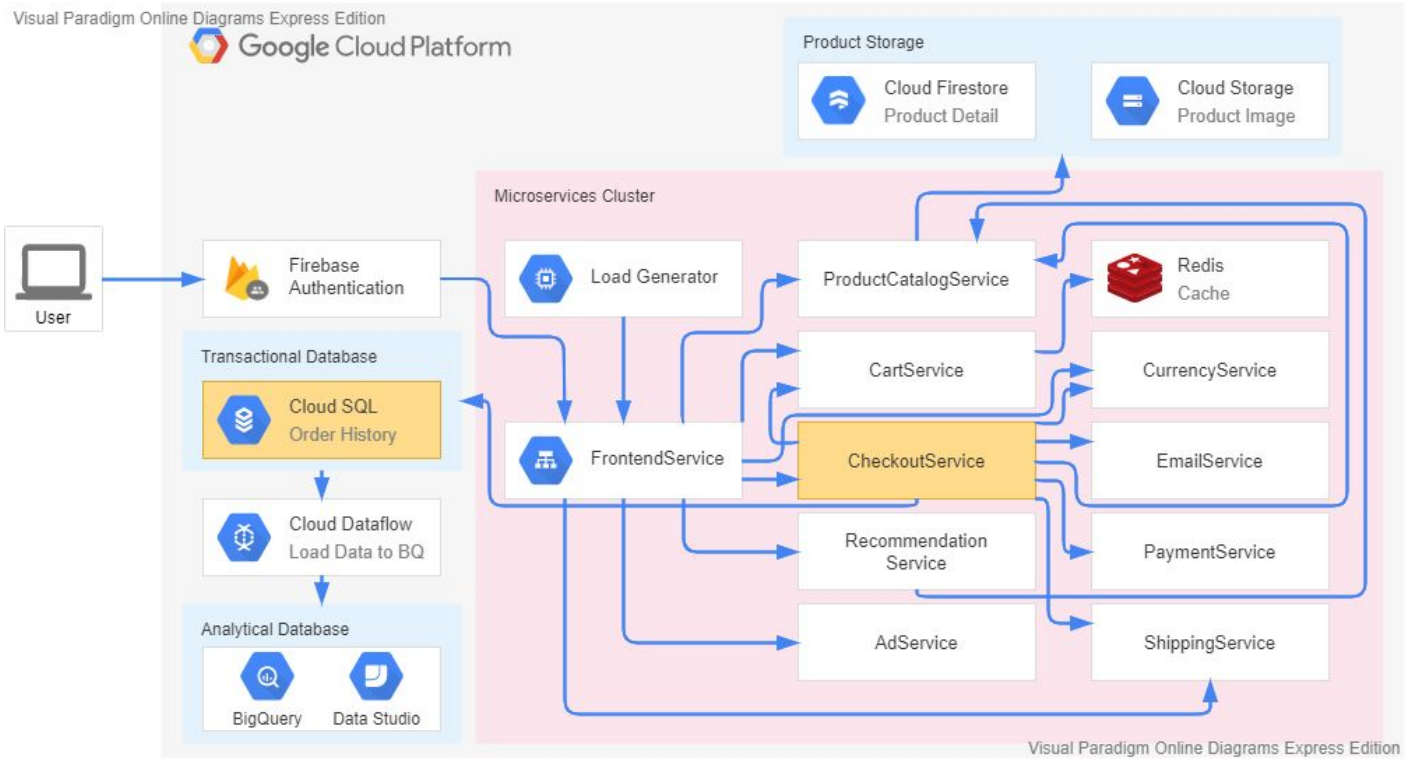
Cloud Firestore

Cloud Storage

Golang

03

Order History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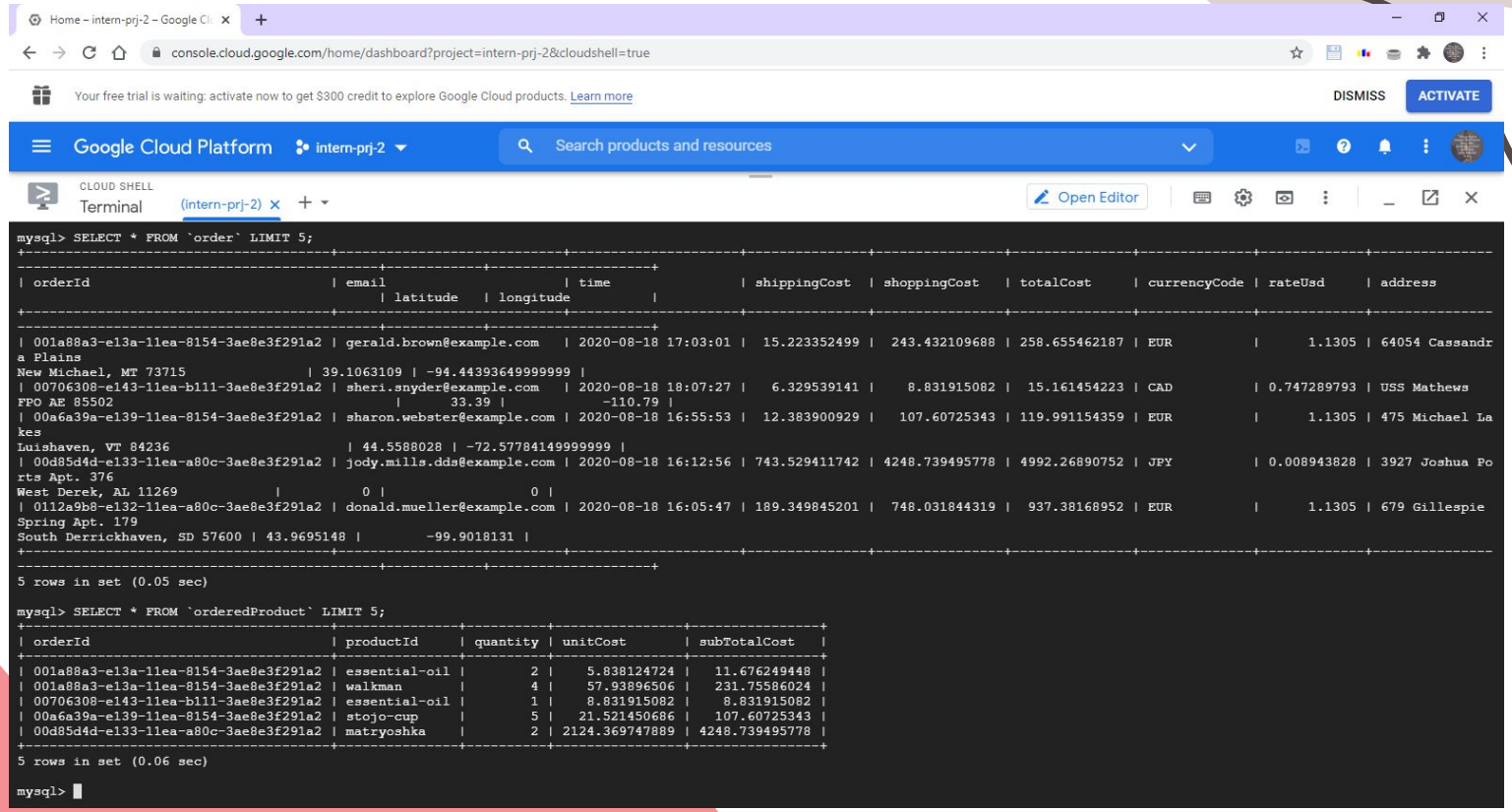
Database Schema

Order		OrderedProduct
OrderId	CurrencyCode	OrderId
Email	RateUsd	ProductId
Time	Address	Quantity
ShippingCost	Latitude	UnitCost
ShoppingCost	Longitude	SubTotalCost
TotalCost	-	-

Order History



Cloud SQL Proxy

https://cloud.google.com/sql/docs/mysql/connect-kubernetes-engine

- Enable workload identity for the GKE cluster
- Create Kubernetes service account (KSA)
- Bind & annotate with the KSA with GCP service account
- Create sidecar container for the Cloud SQL Proxy that shares the same pod with checkout service

Technologies Used

Cloud SQL for MySQL

Golang

04

Terraform Infrastructure

Resources

Resources	Explanation
GKE cluster	For deployment
Cloud Storage Buckets	Product images, Firestore backup
Cloud Storage Objects	Product images
Cloud SQL Instance	Store Order information
Service Accounts	For Firestore, Cloud SQL

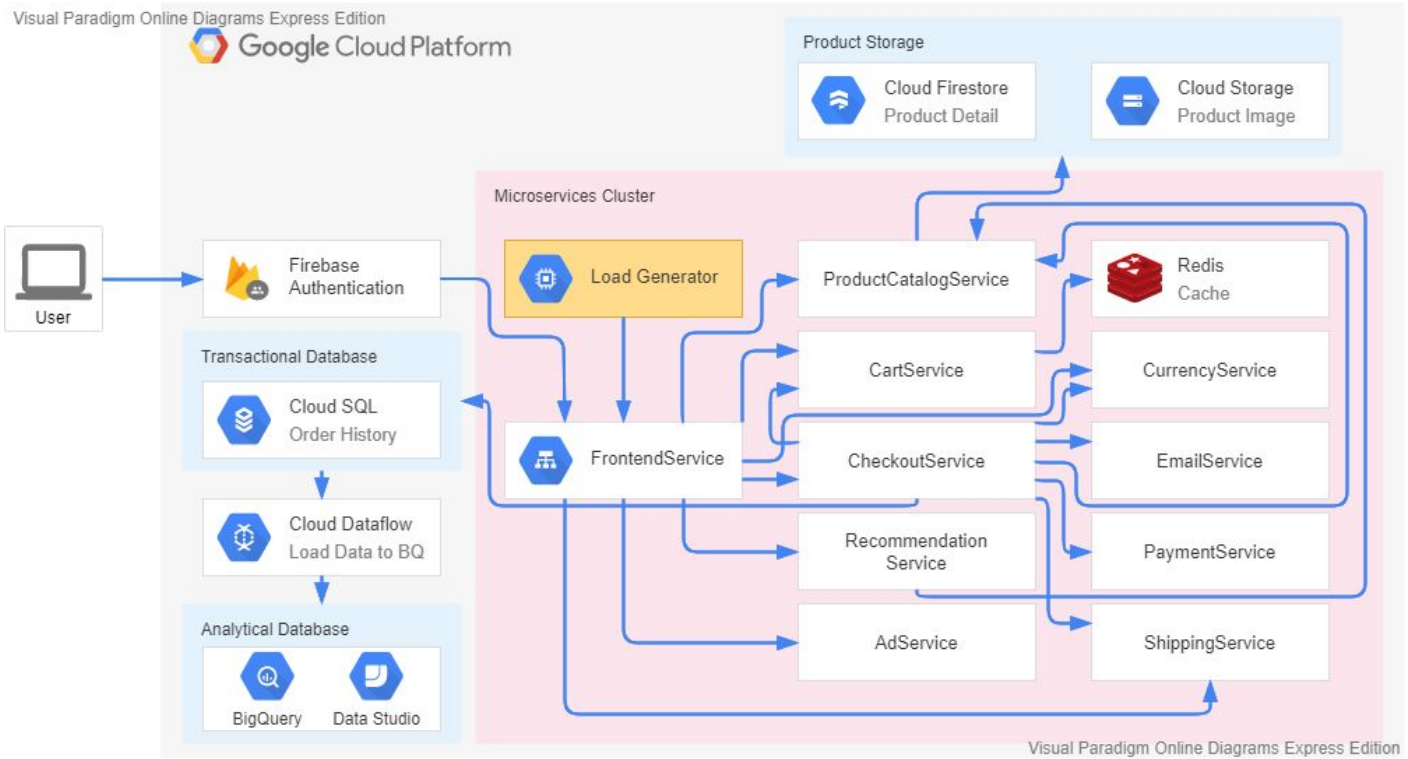
Code Sample: Cloud SQL

```
17  resource "random_id" "db_name_suffix" {
18    byte_length = 4
19  }
20
21  resource "google_sql_database" "database" {
22    name     = "order"
23    instance = google_sql_database_instance.instance.name
24  }
25
26  resource "google_sql_database_instance" "instance" {
27    name   = "order-${random_id.db_name_suffix.hex}"
28    region = var.region
29    settings {
30      tier = "db-f1-micro"
31    }
32  }
33
34  resource "google_sql_user" "root" {
35      name = "root"
36      instance = google_sql_database_instance.instance.name
37      password = var.project
38  }
```

Technology Used

05

Load Generator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Requests

Request URL	Purpose	HTTP Method
/	Visit homepage	GET
/setCurrency	Set user currency	POST
/product/<productID>	Get a product	GET
/cart	View cart	GET
/cart	Add to cart	POST
/cart/checkout	Checkout	POST

Random email & street address

```
mysql> SELECT `email`, REPLACE(REPLACE(`address`, CHAR(13), ' '), CHAR(10), ' ') AS `address`, `latitude`, `longitude` from `order` LIMIT 5;
+--------------------------+-------------------------------------------------------------+-----------+--------------------+
| email                    | address                                                     | latitude  | longitude          |
+--------------------------+-------------------------------------------------------------+-----------+--------------------+
| gerald.brown@example.com | 64054 Cassandra Plains New Michael, MT 73715                | 39.1063109 | -94.44393649999999 |
| sheri.snyder@example.com | USS Mathews FPO AE 85502                                    |      33.39 |            -110.79 |
| sharon.webster@example.com | 475 Michael Lakes Luishaven, VT 84236                     | 44.5588028 | -72.57784149999999 |
| jody.mills.dds@example.com | 3927 Joshua Ports Apt. 376 West Derek, AL 11269           |          0 |                  0 |
| donald.mueller@example.com | 679 Gillespie Spring Apt. 179 South Derrickhaven, SD 57600 | 43.9695148 |        -99.9018131 |
+--------------------------+-------------------------------------------------------------+-----------+--------------------+
5 rows in set (0.05 sec)

mysql>
```


```
   "formatted_address" : "1600 Amphitheatre Pkwy, Mountain View, CA 94043, USA",
   "geometry" : {
      "location" : {
         "lat" : 37.4220656,
         "lng" : -122.0840897
      },
      "location_type" : "ROOFTOP",
      "viewport" : {
         "northeast" : {
            "lat" : 37.4234145802915,
            "lng" : -122.0827407197085
         },
         "southwest" : {
            "lat" : 37.4207166197085,
            "lng" : -122.0854386802915
         }
      }
   },
   "place_id" : "ChIJVYBZP-Oxj4ARls-qJ_G3tgM",
   "plus_code" : {
      "compound_code" : "CWC8+R9 Mountain View, CA, USA",
      "global_code" : "849VCWC8+R9"
   },
   "types" : [ "street_address" ]
  }
 ],
 "status" : "OK"
}
```

Technologies Used

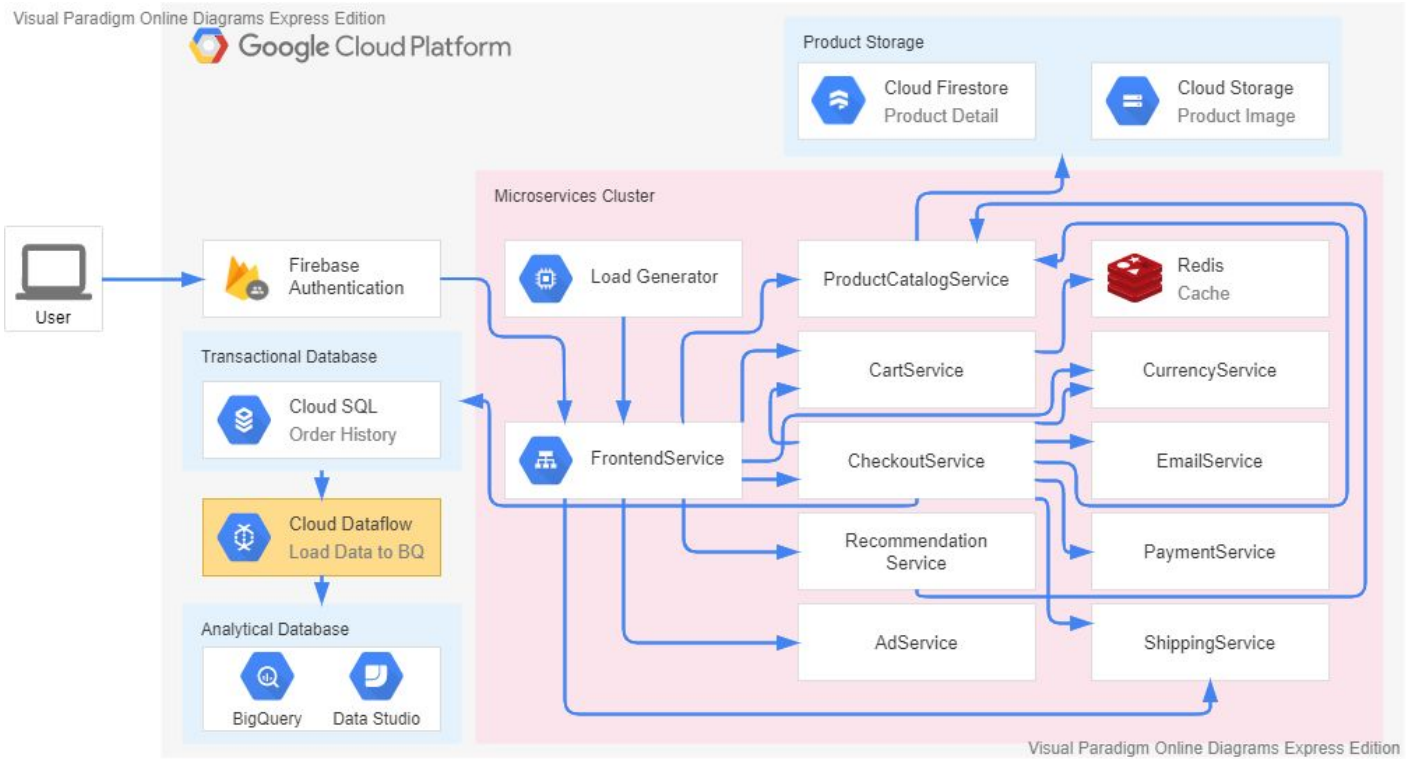
Locust (Python)

Faker PyPI

Google
Geocoding API

06

Dataflow Pipeline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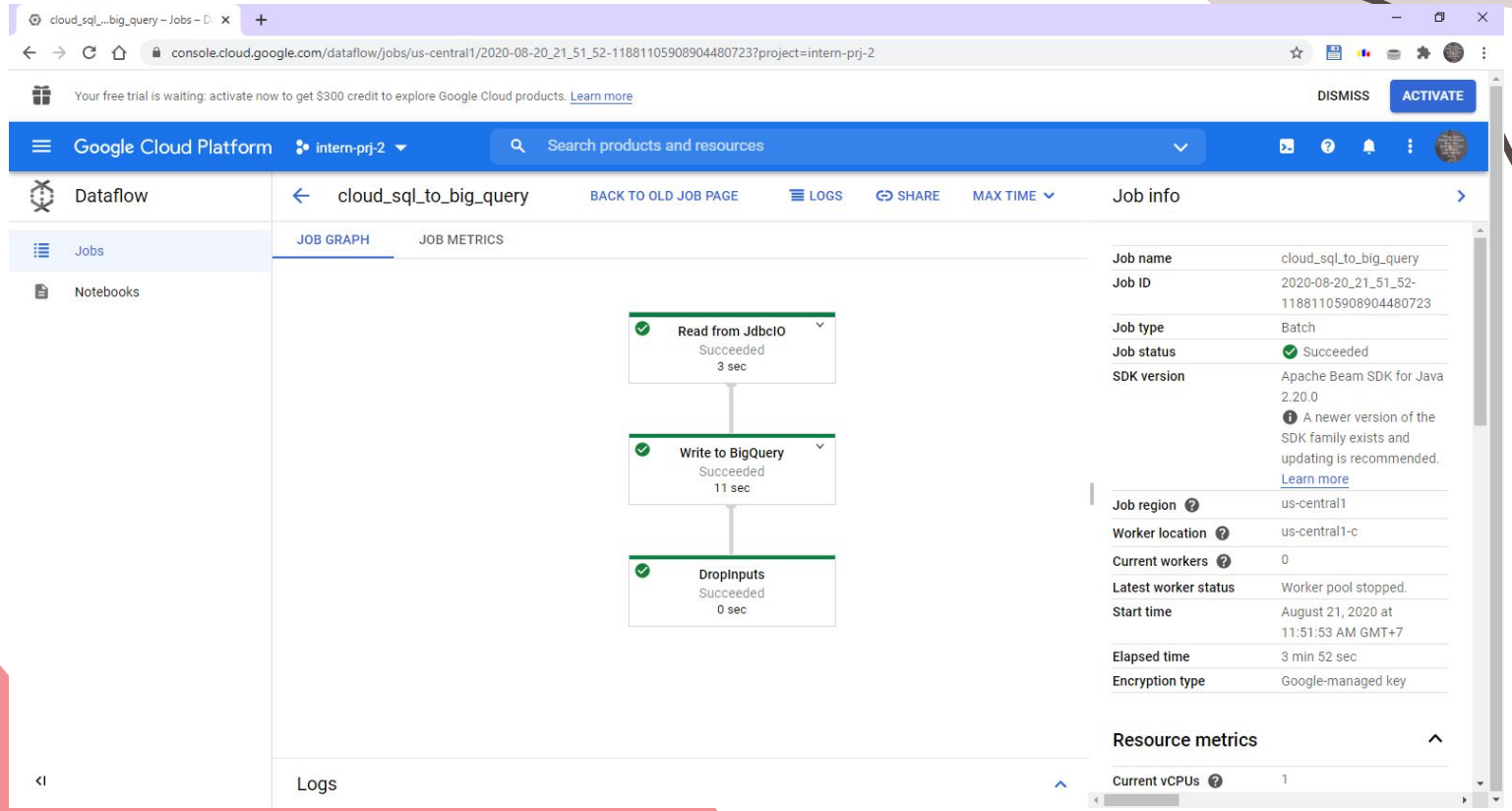
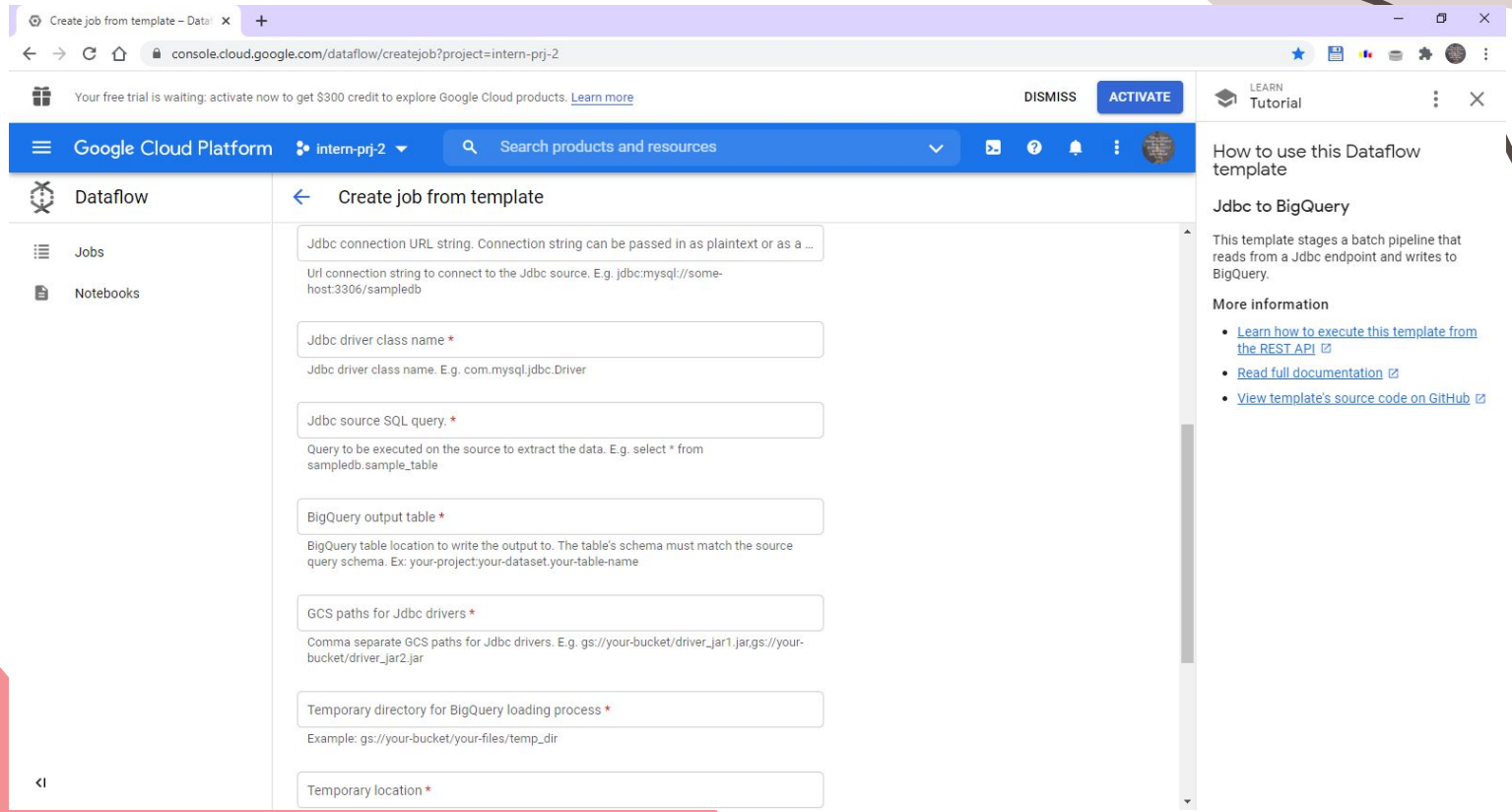
Job (JDBC to BigQuery template)



Job (JDBC to BigQuery template)



Job (JDBC to BigQuery template)

- For JDBC connection URL, use the Cloud SQL's public IP

  `jdbc:mysql://<public_IP>:3306/<DB>?user=...&password=...`

- Cloud Storage bucket with MySQL JDBC driver (.jar) inside

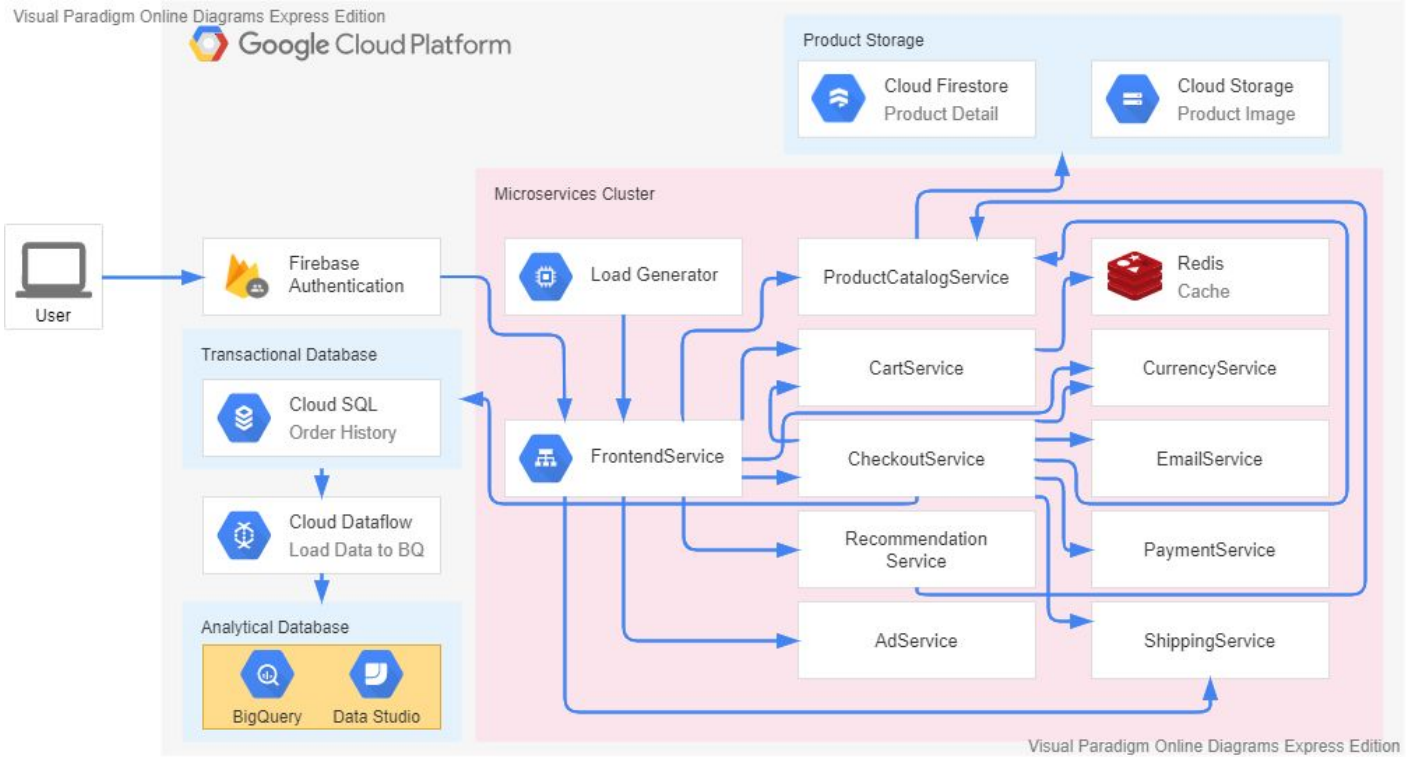
  (https://dev.mysql.com/downloads/connector/j/)

  Select OS: Platform Independent (.zip) with (.jar) inside

- Use the GCS path (gs://<bucket>/.jar) to fill template form

07

BigQuery Analytics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ShippingService
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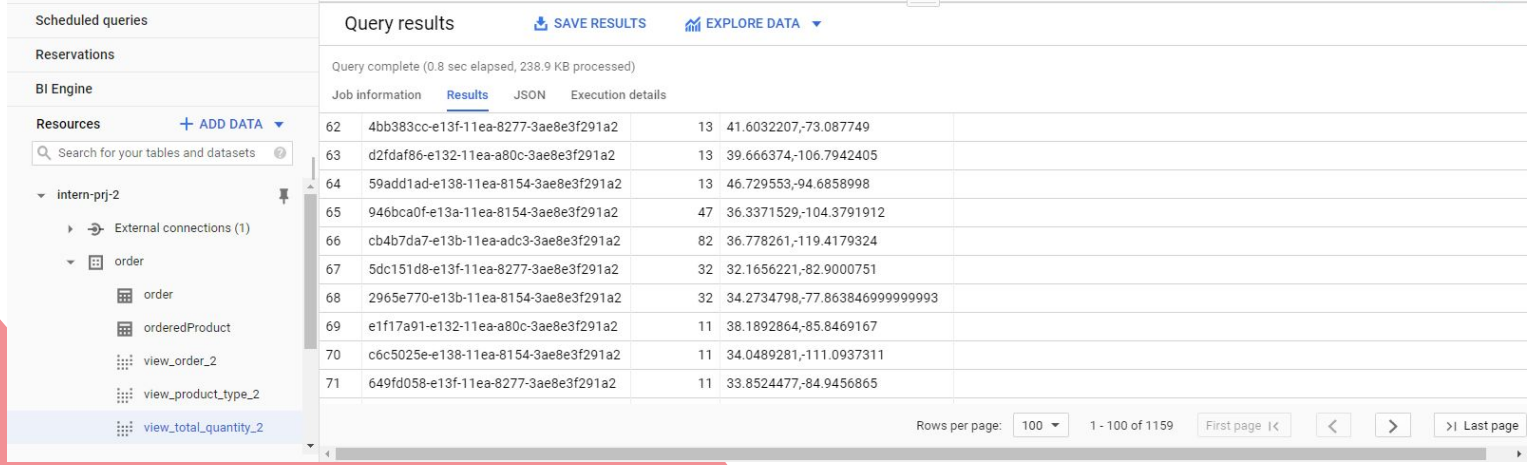
BigQuery Dataset

Order		OrderedProduct
OrderId	CurrencyCode	OrderId
Email	RateUsd	ProductId
Time	Address	Quantity
ShippingCost	Latitude	UnitCost
ShoppingCost	Longitude	SubTotalCost
TotalCost	-	-

Query: Quantity on Locations

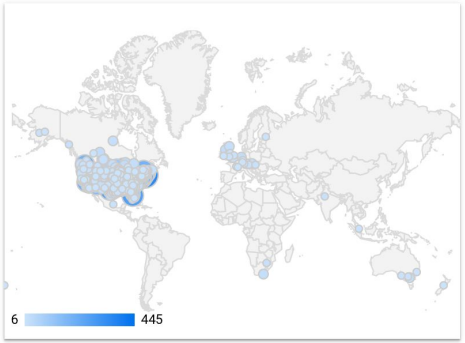


08

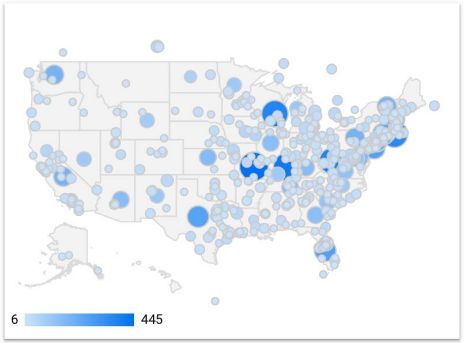
Data Studio Dashboard

Dashboard: Quantity

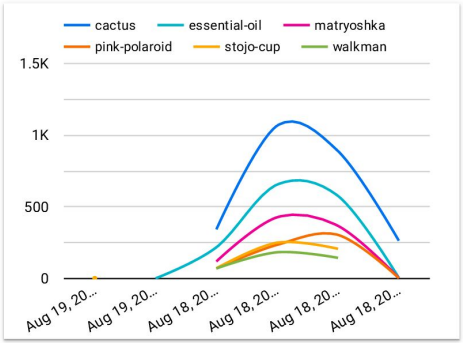
Zoom area = World



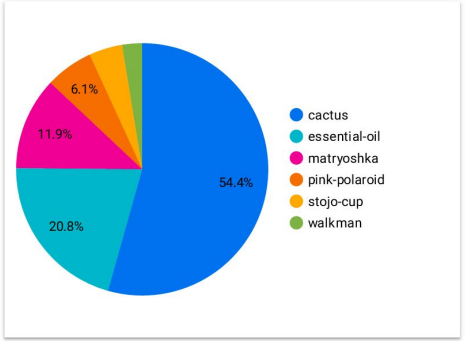
Zoom area = Country - United States

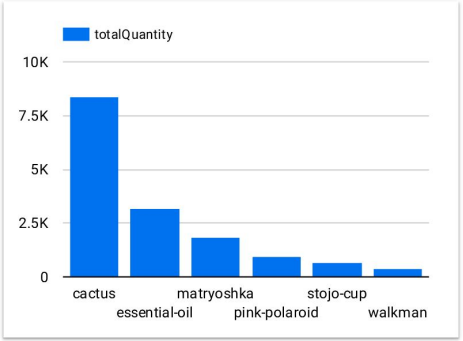


Smoothed Line Chart

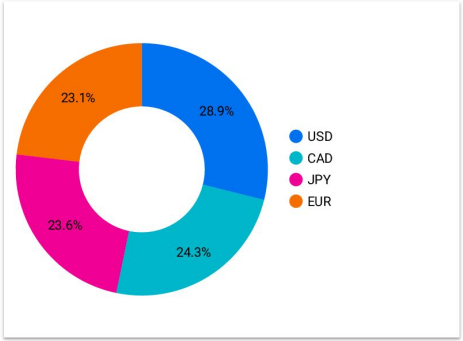


Total Quantity





Currency Codes



Final Remarks

Final Remarks

- Working with Online Boutique has been a great experience.
- Online Boutique is a well-made microservice project that is ideal for learning purpose.
- Learned the logical reasoning to use a particular GCP service.
- This internship is recommended! You'll learn a lot.

Thanks!

Do you have any questions?

keziasulami.pooh@gmail.com

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