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Visa Transaction Manager Project

Description

This project was to build a transaction management application that allows searching by merchant details. Users can search using account information (ex: account number) and merchant information (ex: merchant name), and receive a list of relevant transactions with more detailed information (ex: transaction date and monetary value).

Tech Stack

This project uses Apache Cassandra for its database, and I used DataStax Studio to visualize the data. As Cassandra is a NoSQL distributed database and this application requires requests that join tables, Apache Spark is utilized by the API to efficiently perform SQL commands on Cassandra tables.

The backend API is written in Java utilizing Apache Maven project management and Spring Boot microservices. To test my API, I used Postman to send HTTP requests and verify results.

Finally, the UI was developed in Angular, using Javascript, HTML, and CSS.

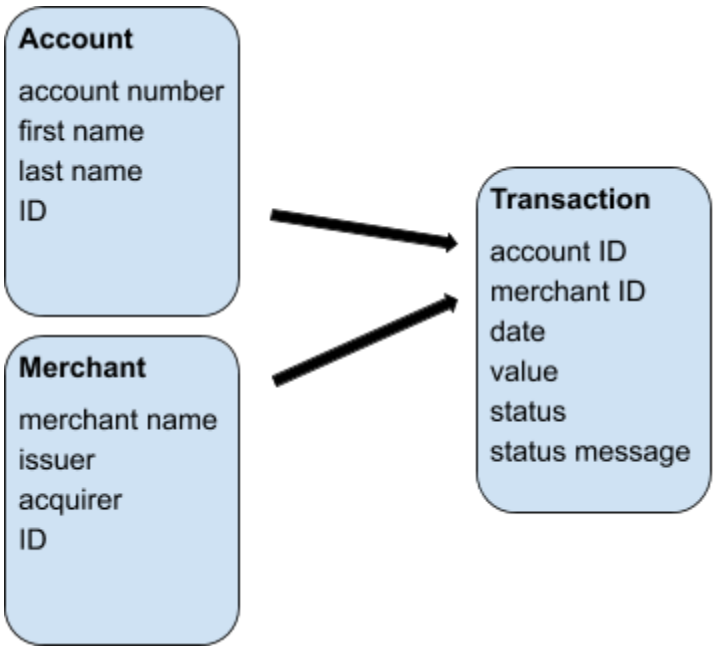
Advantages

Why Cassandra? Cassandra is a NoSQL database that is highly scalable and available. Being a distributed scheme, it is linearly scalable and resistant to total failure. In addition, data in NoSQL databases are not stored as tables like relational databases, but rather as documents or formatted objects, which makes the NoSQL scheme better for efficiently storing more complex data types.

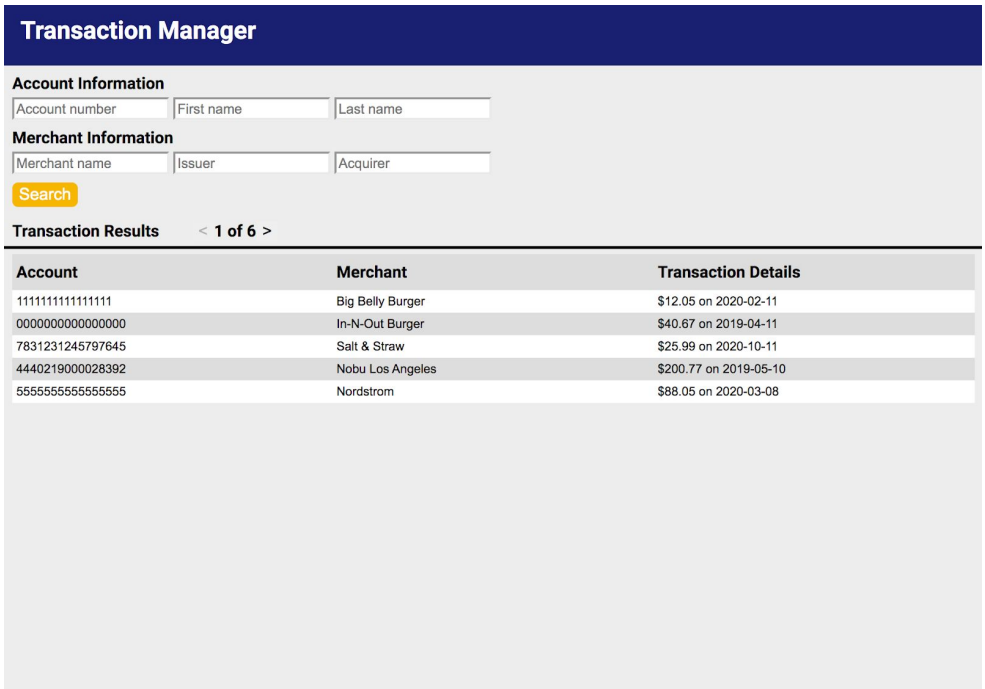
Why Microservices? Microservice architecture organizes an application as a collection of modular services in order to efficiently service a variety of user requests. Microservices allow for continuous delivery of software, i.e. changing one part of an application does not significantly affect others so long as the APIs connecting different microservices remain the same. In addition, it is easier to maintain more lightweight, modular microservices throughout development and this architecture can flexibly adapt to changes in product design and shifting business priorities.

Visualization

Data Model



User Interface



Transaction Manager

Account Information

Account number | Eric | Clapton

Merchant Information

Merchant name | Issuer | Stripe

Search

Transaction Results < 1 of 6 >

Account	Merchant	Transaction Details
1111111111111111	Big Belly Burger	$12.05 on 2020-02-11
0000000000000000	In-N-Out Burger	$40.67 on 2019-04-11
7831231245797645	Salt & Straw	$25.99 on 2020-10-11
4440219000028392	Nobu Los Angeles	$200.77 on 2019-05-10
5555555555555555	Nordstrom	$88.05 on 2020-03-08

Transaction Manager

Account Information

Account number | Eric | Clapton

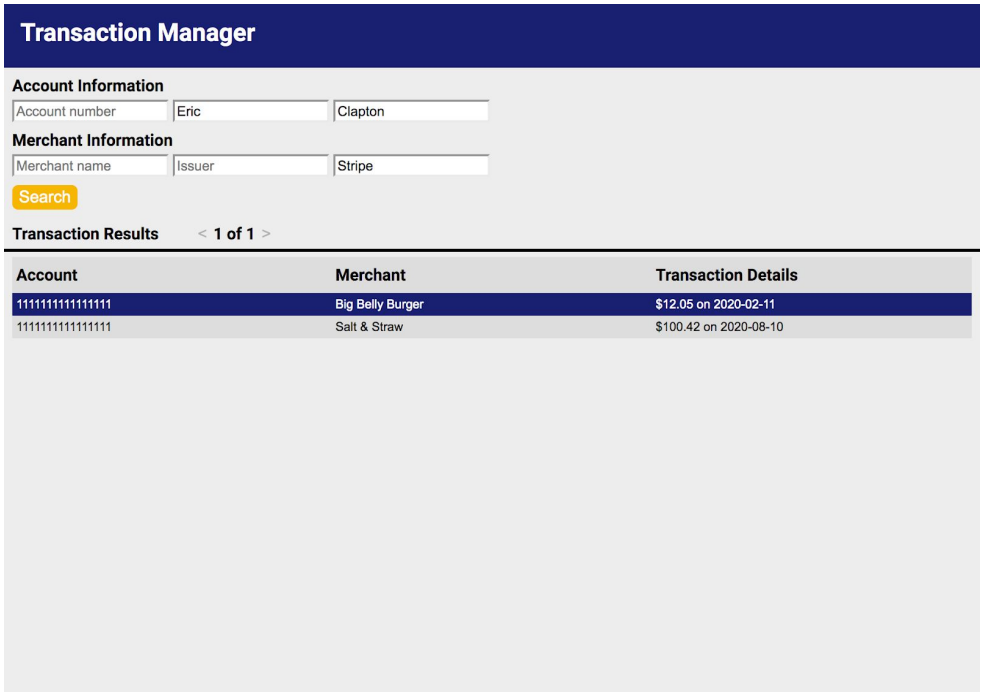
Merchant Information

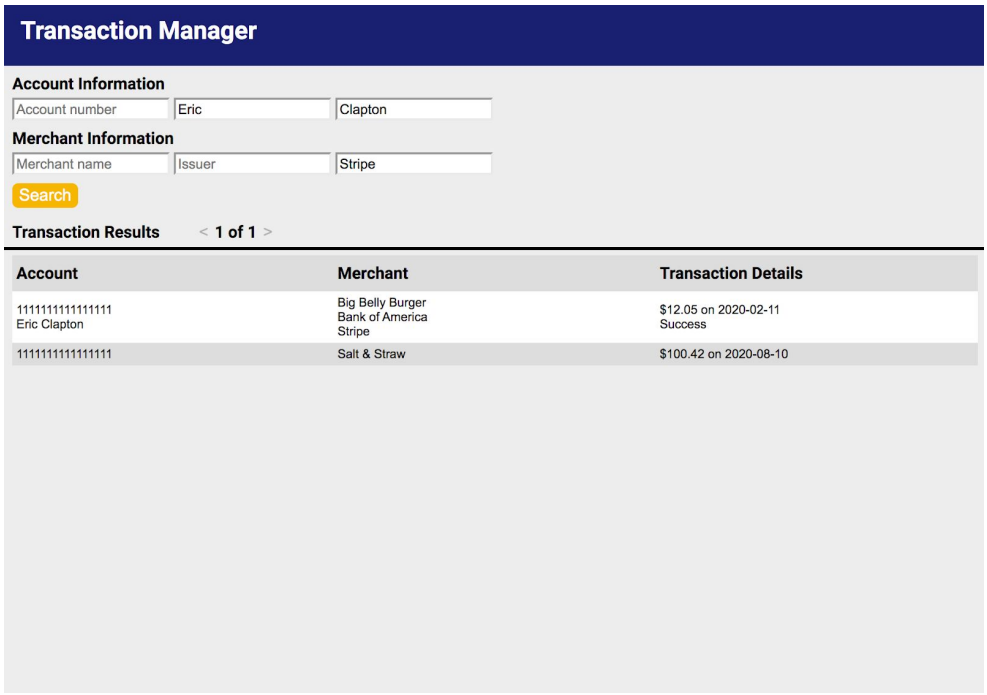
Merchant name | Issuer | Stripe

Search

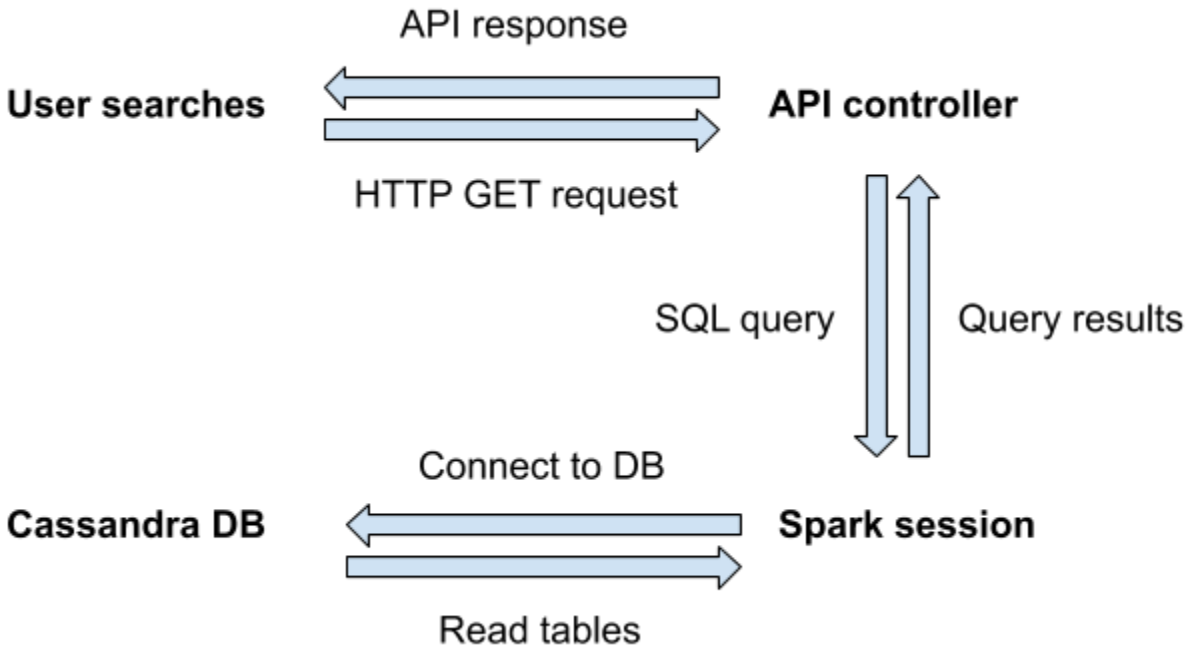
Transaction Results < 1 of 1 >

Account	Merchant	Transaction Details
1111111111111111	Big Belly Burger	$12.05 on 2020-02-11
1111111111111111	Salt & Straw	$100.42 on 2020-08-10


Transaction Manager
Account Information
Account number
Eric
Clapton
Merchant Information
Merchant name
Issuer
Stripe
Search
Transaction Results
< 1 of 1 >
Account
Merchant
Transaction Details
1111111111111111
Big Belly Burger
$12.05 on 2020-02-11
1111111111111111
Salt & Straw
$100.42 on 2020-08-10


Transaction Manager
Account Information
Account number
Eric
Clapton
Merchant Information
Merchant name
Issuer
Stripe
Search
Transaction Results
< 1 of 1 >
Account
Merchant
Transaction Details
1111111111111111
Eric Clapton
Big Belly Burger
Bank of America
Stripe
$12.05 on 2020-02-11
Success
1111111111111111
Salt & Straw
$100.42 on 2020-08-10

Data Flow


API response
User searches
API controller
HTTP GET request
SQL query
Query results
Connect to DB
Cassandra DB
Spark session
Read tables