NEST HACKATHON

ARCHITECTURE AND DESIGN DOCUMENT

Submitted By

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Abstract

This Application is used for transfer money from one account to another accounts using mt103 parse method. When the user send a transfer request this application convert into MT103 Message Then Convert to MX message.

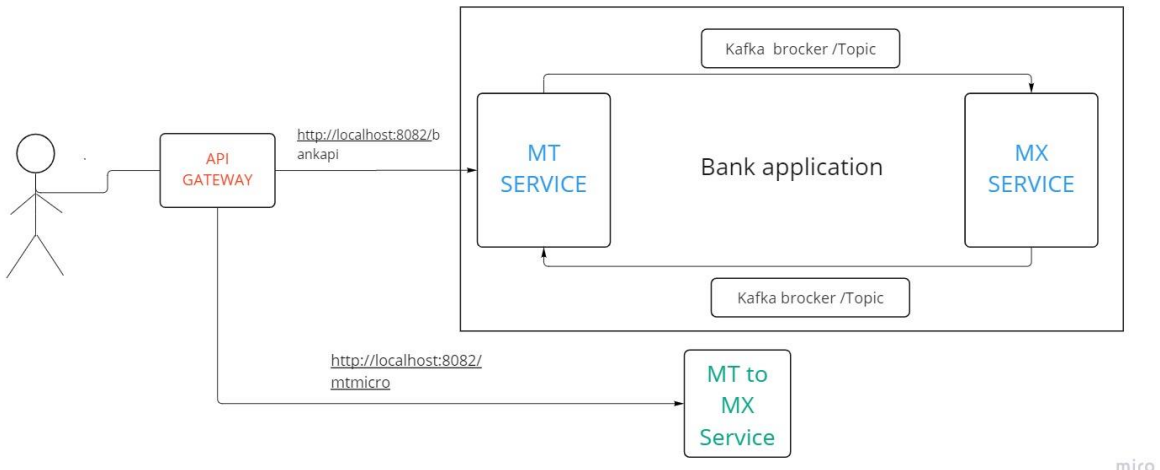
Used Technologies

- Java 8
- Spring boot
- Docker
- Kafka
- Mysql
- Swagger

Used Tools

- Docker Desktop
- Mysql Workbench
- Jmeter
- Spring tool
- Postman

ARCHITECTURE AND DESIGN



API GATEWAY

This Service is provides a flexible way of routing requests based on a number of criteria, as well as focuses on cross-cutting concerns such as security, resiliency, and monitoring. Spring Cloud Gateway aims to provide a simple, yet effective way to route to APIs and provide cross cutting concerns to them such as: security, monitoring/metrics, and resiliency.

Here we used to route the 2 micro services.

MT Service

This Service is used to convert User request to MT103 messages then This application produce message to a kafka topics(mtmessage).Also listening the kafka topic and Consume the messages and give a response to user .

- Also provide user registration for creating user account.
- Store Receiver account details.
- User Deposit
- Check user balance .

When we create account it is a zero balance account . All transactions are reflected through this given datas.

MX Service

This service is used to convert MT103 message to MX message .Using kafka consume technology for listening messages then this converted XML message produce to a kafka topics(mx message).

MT to MX Service .

This service is used to convert MT103 message to MX message Directly .Then give a response to user

Project Setup

- Install Java 8
- Set up Kafka Using Docker ,Docker compose file attached in project folder
- Create Kafka topic
  kafka-topics.sh --create --topic mtmessage --bootstrap-server localhost:9092

  kafka-topics.sh --create --topic mxmessage --bootstrap-server localhost:9092

Listen Kafka Messages

kafka-console-consumer.sh --topic mtmessage --from-beginning --bootstrap-server localhost:9092

{"SenderAccountnumber":"790773028412345","MTMessage":"{1:F01ENFEESS1A230000000000}{2:I103ENF43332XXXXN}{3:{121:724209c7-6d6e-4a68-becd-6c51bb0997bf}}{4:\r\n:20:REFERENCE\r\n:23B:CRED\r\n:32A:220829INR1\r\n:50A:/790773028412345\r\nSBI\r\n:59:/9539931867123\r\nSBI\r\n:71A:OUR\r\n-}","time":"2022-08-29T09:50:12.369307200Z"}

kafka-console-consumer.sh --topic mxmessage --from-beginning --bootstrap-server localhost:9092

{"MXmessage":"<message>\r\n<block1>\r\n\t<applicationId>F<\/applicationId>\r\n\t<serviceId>01<\/serviceId>\r\n\t<logicalTerminal>0000000000<\/logicalTerminal>\r\n<\/block1>\r\n<block2 type=\"input\">\r\n\t<messageType>103<\/messageType>\r\n\t<receiverAddress>N<\/receiverAddress>\r\n<\/block2>\r\n<block3>\r\n\t<tag>\r\n\t\t<name>121<\/name>\r\n\t\t<value>6e7e8273-8467-4b0b-8b3a-0bc9a1d356a5<\/value>\r\n\t<\/tag>\r\n<\/block3>\r\n<block4>\r\n\t<tag>\r\n\t\t<name>20<\/name>\r\n\t\t<value>REFERENCE<\/value>\r\n\t<\/tag>\r\n\t<tag>\r\n\t\t<name>23B<\/name>\r\n\t\t<value>CRED<\/value>\r\n\t<\/tag>\r\n\t<tag>\r\n\t\t<name>32A<\/name>\r\n\t\t<value>220829100<\/value>\r\n\t<\/tag>\r\n\t<tag>\r\n\t\t<name>50A<\/name>\r\n\t\t<value>/17203647899955554\r\nSBI<\/value>\r\n\t<\/tag>\r\n\t<tag>\r\n\t\t<name>59<\/name>\r\n\t\t<value>/11225546165621\r\nSBI<\/value>\r\n\t<\/tag>\r\n\t<tag>\r\n\t\t<name>71A<\/name>\r\n\t\t<value>OUR<\/value>\r\n\t<\/tag>\r\n<\/block4>\r\n<\/message>"}

- Install mysql and give password as root (password = root) and create Database mtbank(DB = mtbank)
- Then Run the 4 Spring boot applications using spring or other tools

Hackathon API Request Examples

Make sure all four API are running successfully

1. Create User

   URI = http://localhost:8082/bankapi/usercreate (post method)

   Json Request body =

```
{
  "accountnumber": "1720364789995555",
  "username": "Ajay"
}
```

2. Create Receivers bank details

   URI = http://localhost:8082/bankapi/addreceiveraccount (post method)
   Json Request body =

```
{
  "accountnumber": "11225546165620",
  "bankName": "SBI",
  "ifsccode": "SBIN112445",
  "receivername": "Arshad"
}
```

3. User Deposit

   URI = http://localhost:8082/bankapi/deposit (put method)
   Json Request body =

```
{
  "accountnumber": "1720364789995555"
}
```

4. Transfer amount :this api take user data and create mt103 then send the mt103 message

   URI = http://localhost:8082/bankapi/transfermessage (post method)

   Json Request body =

```
{
  "accountnumber": "790773028412345",
  "address": "SBI",
  "amount": "100",
  "bankname": "SBI",
  "currency": "INR",
  "receiver": "ENF43332",
  "receiverAccountNo": "9539931867123",
  "refernce": "CRED",
  "sender": "ENFEESS123
}
```

5. User Balance

   URI =http://localhost:8082/bankapi/userbalance (Get Method)

   Json request body:

```
{
  "accountnumber": "1720364789995555"
}
```

6. Receiver Balance

   URI =http://localhost:8082/bankapi/receiverbalance (Get Method)

   Json request body:

```
{
  "accountnumber": "1244"
}
```

7. MT to MX Converter

   URI = http://localhost:8082/mtmicro/mttovalue (Get Method)

   Json request body: This message takes from given 103.txt file


```
{
    "message":"{1:F01BICFOOYYAXXX8683497519}{2:O1031535051028ESPBESMMAXXX5423752247
0510281535N}{3:{113:ROMF}{108:0510280182794665}{119:STP}}{4:\r\n:20:006135011308990
8\r\n:13C:/RNCTIME/1534+0000\r\n:23B:CRED\r\n:23E:SDVA\r\n:32A:061028EUR100000,\r\n
:33A:081029EUR120000,\r\n:33B:EUR100000,\r\n:50K:/12345678\r\nAGENTES DE BOLSA FOO
AGENCIA\r\nAV XXXXX 123 BIS 9 PL\r\n12345 BARCELONA\r\n:52A:/2337\r\nFOOAESMMXXX\r\
n:53A:FOOAESMMXXX\r\n:57A:BICFOOYYXXX\r\n:59:/ES0123456789012345671234\r\nFOO AGENT
ES DE BOLSA ASOC\r\n:71A:OUR\r\n:72:/BNF/TRANSF. BCO. FOO\r\n-
}{5:{MAC:88B4F929}{CHK:22EF370A4073}}"
}
```

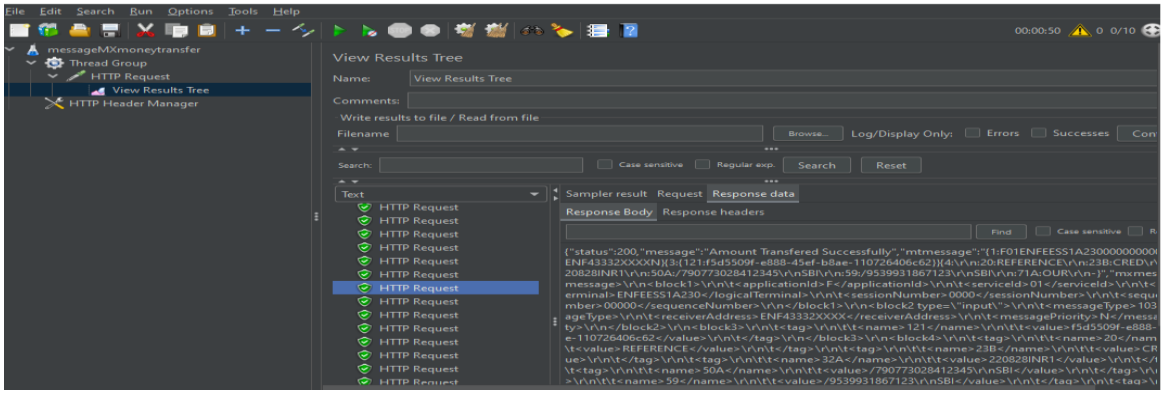
Project Performance Test

Using JMETER

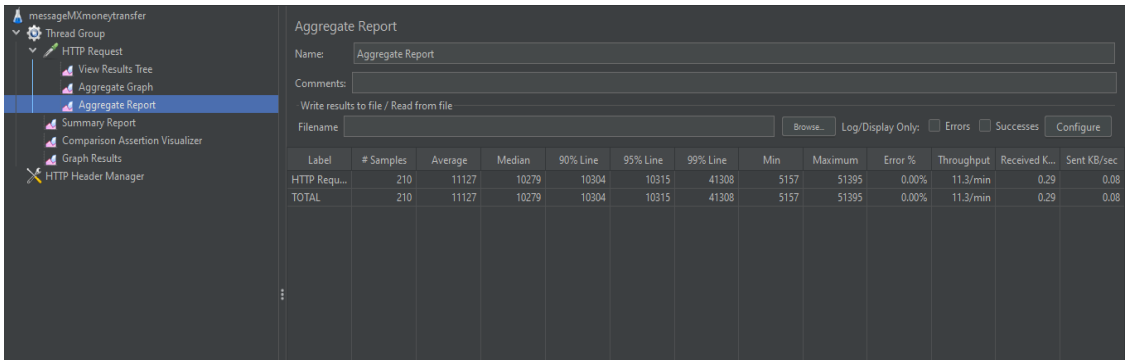
Here we give 2 threads and 100 loops in one second ramp period so we get zero Error%.

When we give 10 thread with 50 loops the error percentage is 5% .

Here only showing our major rest api call for Transfer money .

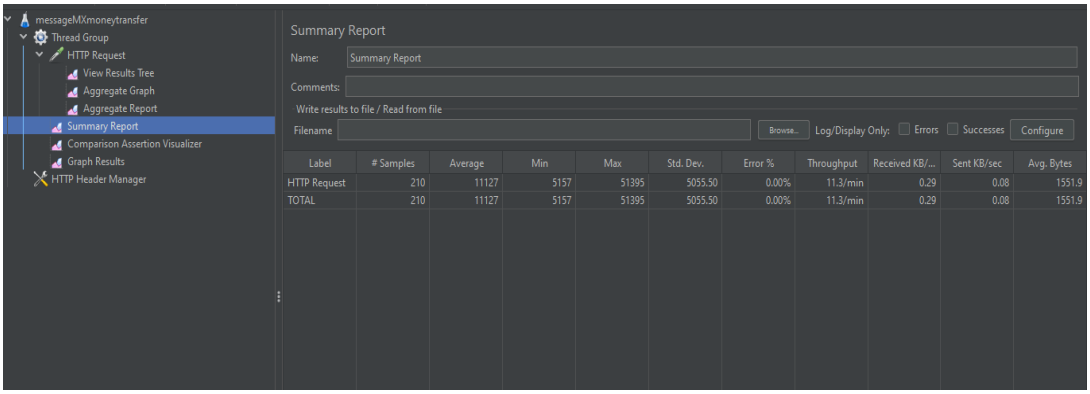


AGGREGATE REPORT

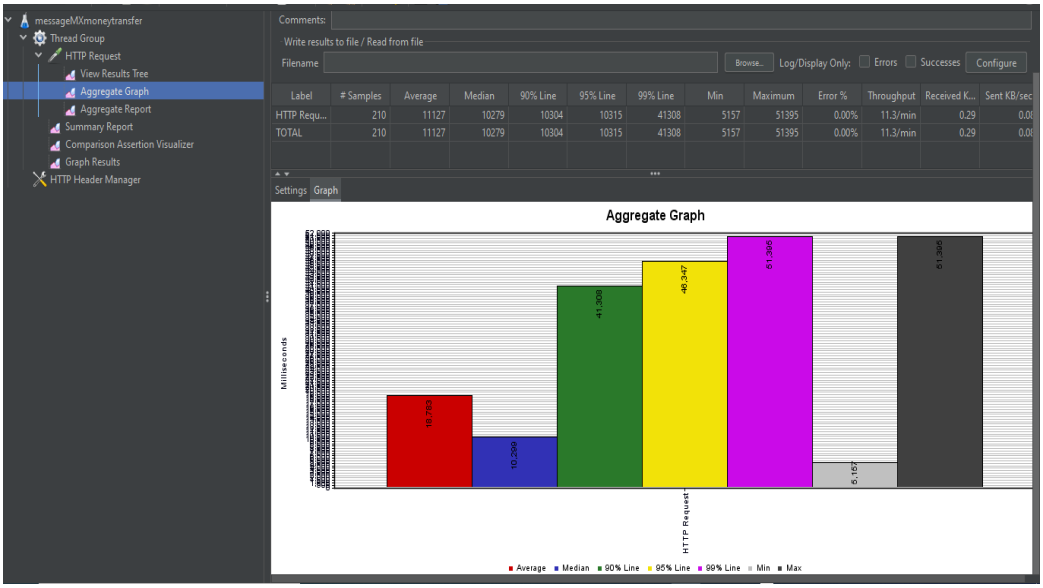


Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	Received KB/...	Sent KB/sec	Avg. Bytes
HTTP Request	10	25117	5150	45104	12747.95	0.00%	11.7/min	0.30	0.08	1557.0
TOTAL	10	25117	5150	45104	12747.95	0.00%	11.7/min	0.30	0.08	1557.0

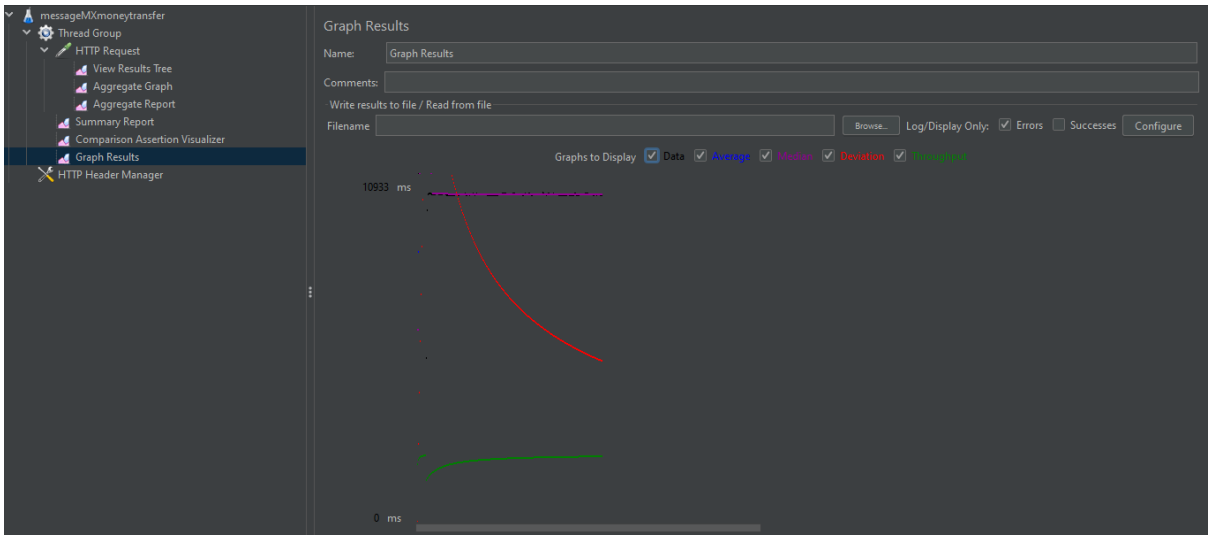
AGGREGATE Summary



AGGREGATE Graph



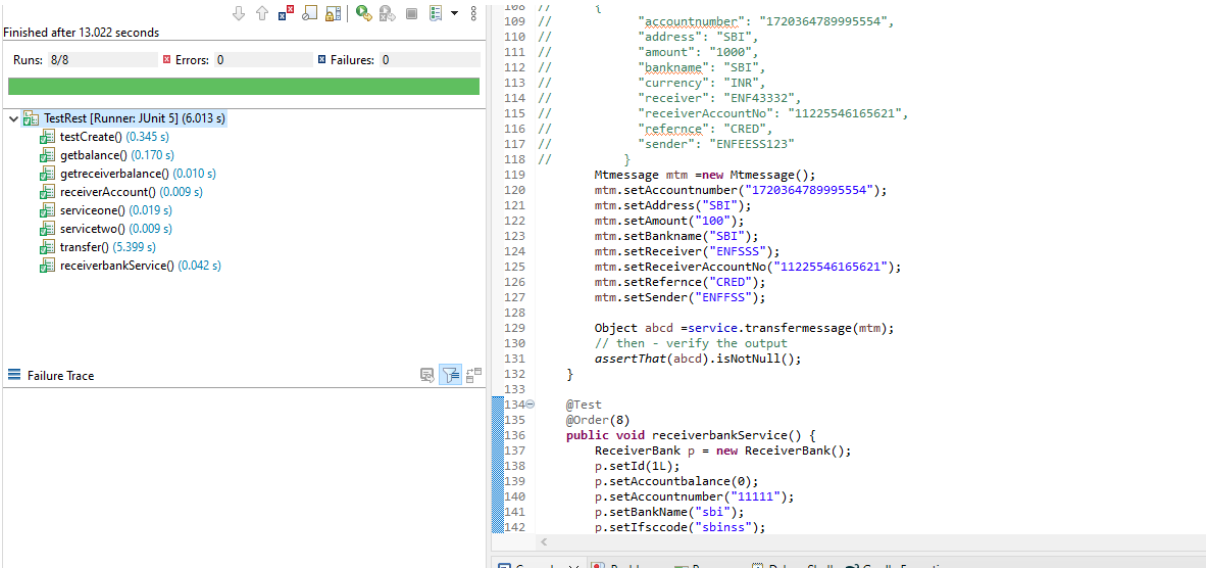
GRAPH



JUNIT TESTING

Junit test for 7 modules

Here we created 8 Unit test cases for all rest api services . All service tests are passed .



SWAGGER IMPLIMENTATION

We use the swagger for the rest control testing and documentation.

Bank Solution 1.0.0

[Base URL: localhost:8080/]

http://localhost:8080/v2/api-docs

"Transfer money from one Account to Another Account"

Anoop P M - Website

Send email to Anoop P M

Apache License Version 2.0

message-controller Message Controller

POST	/bankapi/addreceiveraccount	Register A Receiver User
PUT	/bankapi/deposit	Deposit to user account
GET	/bankapi/receiverbalance	Register A User
POST	/bankapi/transfermessage	Transfer amount
GET	/bankapi/userbalance	Check user account balance
POST	/bankapi/usercreate	Register A User