

TELECOM SERVICES

Presented by: Team2 from Batch1



Introduction

- Telecom services are essential in our modern world, connecting people and businesses across the globe.
- However, managing these services efficiently requires a robust system to handle various aspects, including subscription plans, customer data, and call history.



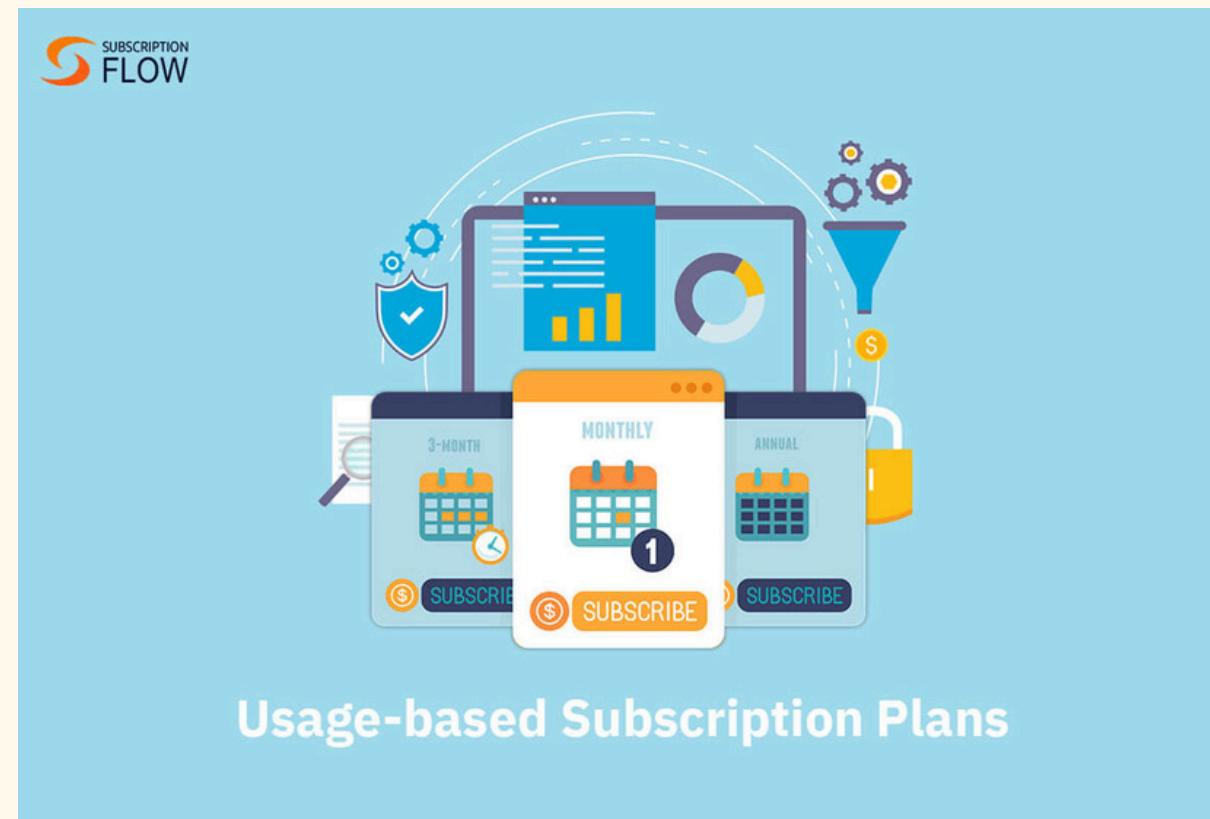
Product Backlog

PRODUCT BACKLOG OF Telecommunication Services Team2

ID	As a...	I want to be able to...	So that...	Priority	Sprint	Status
1	Administrator	see the list of customers	I can monitor site visits	Must	1	Done
2	Administrator	see the list of plans	I can monitor plan's activity	Must	1	Done
3	Administrator	add new plans	I can provide a new plan	Must	1	Done
4	Administrator	get the call history	I can know user's activity	Could	2	Done
5	Customer	view all the plans	I can select the plan	Must	1	Done
6	Customer	view my existing plan	I can check no.of days left	Must	2	Done
7	Customer	share the invitation link	I can invite my friends and family	Could	(-)	To be started
8	Customer	view plan by no.of days	I can find suitable plan for me	Must	1	Done
9	Customer	view plans by price	I can find suitable plan for me	Must	1	Done
10	Customer	view plans by pack name	I can find a plan in offer	Must	1	Done
12	Customer	view prepaid plans	I can take pack according to my budget/requirement	Could	2	Done
13	Customer	view postpaid plans	I can have unlimited access	Could	2	Done
14	Customer	view my postpaid charges	I can know my total amount to be paid	Must	2	Done

Project Overview

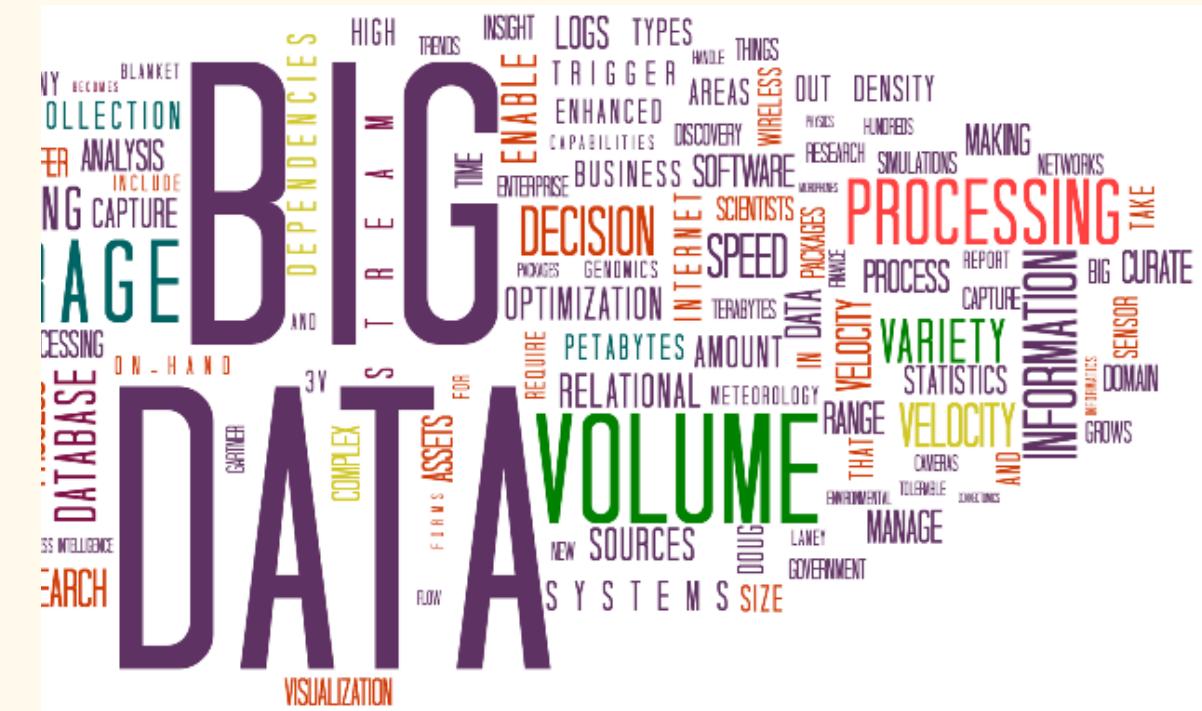
- Our project aims to develop a comprehensive telecommunication management system.
- The goal is to design a database that organizes and manages three core elements: subscription plans, customer records, and call history.



Problem Statement

Telecom companies:-

- Faces significant challenges in managing the vast amount of data generated by customers.
 - Faces difficulty managing their customers subscription details, call histories and usage patterns.



- This complexity necessitates an efficient system to ensure data accuracy, streamline operations, and provide valuable insights.

Tech Stack



We used spring boot for **CRUD Operations** and used **embedded tomcat server** to execute the application.

SPRING BOOT



We used oracle database for **connectivity and management of data** as it supports advanced datatypes like **XML and Json**.

ORACLE DATABASE



We used JUnit tool for unit testing **to assure quality of the code** as it **automates testing process** and **enhances the code coverage**.

JUNIT TESTING

To address this problem, our system includes three primary tables:

- O1 Plan Table:** Manages subscription plans with details such as PlanID, PlanName, Price, NoOfCalls, NoOfMsg, Type and DataLimit.
- O2 Customer Table:** Stores customer information including CustomerID, Name, PhoneNumber, Email, StartDuration, EndDuration and associated PlanID.
- O3 CallHistory Table:** Tracks call records with CallID, CustomerID, CallDate, CallDuration, TotalTime, and Destination Number.



**CORE
COMPONENTS**



Plan Service

POST /addPlan

Parameters

No parameters

Request body required

```
{"pid": 6,
  "pname": "Family",
  "price": 499,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 55,
  "typeOfPlan": "PostPaid"}
```

Responses

Curl

```
curl -X POST \
  "http://localhost:8081/addPlan" \
  -H "accept: */*" \
  -d '{"pid": 6,
  "pname": "Family",
  "price": 499,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 55,
  "typeOfPlan": "PostPaid"}'
```

Request URL

http://localhost:8081/addPlan

Server response

Code Details

200 Response body

```
added
```

GET /getAllPlans

Parameters

No parameters

Responses

Curl

```
curl -X GET \
  "http://localhost:8081/getAllPlans" \
  -H "accept: */*"
```

Request URL

http://localhost:8081/getAllPlans

Server response

Code Details

200 Response body

```
[{"pid": 1,
  "pname": "Family",
  "price": 199,
  "noOfCalls": 100,
  "dataPerDay": 1,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 2,
  "pname": "Friends",
  "price": 299,
  "noOfCalls": 100,
  "dataPerDay": 1,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 3,
  "pname": "Family",
  "price": 499,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 4,
  "pname": "Family",
  "price": 699,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 5,
  "pname": "Friends",
  "price": 399,
  "noOfCalls": 100,
  "dataPerDay": 1,
  "noOfMsg": 100,
  "noOfDays": 45,
  "typeOfPlan": "PostPaid" },
 {"pid": 6,
  "pname": "Family",
  "price": 499,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 55,
  "typeOfPlan": "PostPaid" }]
```

Response headers

```
connection: keep-alive
content-type: application/json
date: Tue, 03 Sep 2024 12:42:12 GMT
keep-alive: timeout=60
transfer-encoding: chunked
```

GET /getAllPlans

Parameters

No parameters

Responses

Curl

```
curl -X GET \
  "http://localhost:8081/getAllPlans" \
  -H "accept: */*"
```

Request URL

http://localhost:8081/getAllPlans

Server response

Code Details

200 Response body

```
[{"pid": 1,
  "pname": "Family",
  "price": 199,
  "noOfCalls": 100,
  "dataPerDay": 1,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 2,
  "pname": "Friends",
  "price": 299,
  "noOfCalls": 100,
  "dataPerDay": 1,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 3,
  "pname": "Family",
  "price": 499,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 4,
  "pname": "Family",
  "price": 699,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 5,
  "pname": "Friends",
  "price": 399,
  "noOfCalls": 100,
  "dataPerDay": 1,
  "noOfMsg": 100,
  "noOfDays": 45,
  "typeOfPlan": "PostPaid" },
 {"pid": 6,
  "pname": "Family",
  "price": 499,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 55,
  "typeOfPlan": "PostPaid" }]
```

Response headers

```
connection: keep-alive
content-type: application/json
date: Tue, 03 Sep 2024 12:43:42 GMT
keep-alive: timeout=60
transfer-encoding: chunked
```

GET /getPlanByDays/{days}

Parameters

Name Description

days required integer(int32) (path)

45

Responses

Curl

```
curl -X GET \
  "http://localhost:8081/getPlanByDays/45" \
  -H "accept: */*"
```

Request URL

http://localhost:8081/getPlanByDays/45

Server response

Code Details

200 Response body

```
[{"pid": 1,
  "pname": "Family",
  "price": 199,
  "noOfCalls": 100,
  "dataPerDay": 1,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 2,
  "pname": "Friends",
  "price": 299,
  "noOfCalls": 100,
  "dataPerDay": 1,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 3,
  "pname": "Family",
  "price": 499,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 4,
  "pname": "Family",
  "price": 699,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 5,
  "pname": "Friends",
  "price": 399,
  "noOfCalls": 100,
  "dataPerDay": 1,
  "noOfMsg": 100,
  "noOfDays": 45,
  "typeOfPlan": "PostPaid" },
 {"pid": 6,
  "pname": "Family",
  "price": 499,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 55,
  "typeOfPlan": "PostPaid" }]
```

Response headers

```
connection: keep-alive
content-type: application/json
date: Tue, 03 Sep 2024 12:43:42 GMT
keep-alive: timeout=60
transfer-encoding: chunked
```

GET /getPlanPrice/{price}

Parameters

Name Description

price required integer(int32) (path)

499

Responses

Curl

```
curl -X GET \
  "http://localhost:8081/getPlanPrice/499" \
  -H "accept: */*"
```

Request URL

http://localhost:8081/getPlanPrice/499

Server response

Code Details

200 Response body

```
[{"pid": 1,
  "pname": "Family",
  "price": 199,
  "noOfCalls": 100,
  "dataPerDay": 1,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 2,
  "pname": "Friends",
  "price": 299,
  "noOfCalls": 100,
  "dataPerDay": 1,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 3,
  "pname": "Family",
  "price": 499,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 4,
  "pname": "Family",
  "price": 699,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 5,
  "pname": "Friends",
  "price": 399,
  "noOfCalls": 100,
  "dataPerDay": 1,
  "noOfMsg": 100,
  "noOfDays": 45,
  "typeOfPlan": "PostPaid" },
 {"pid": 6,
  "pname": "Family",
  "price": 499,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 55,
  "typeOfPlan": "PostPaid" }]
```

Response headers

```
connection: keep-alive
content-type: application/json
date: Tue, 03 Sep 2024 12:43:42 GMT
keep-alive: timeout=60
transfer-encoding: chunked
```

GET /getPlanByType/{typeOfPlan}

Parameters

Name Description

typeOfPlan required string (path)

PrePaid

Responses

Curl

```
curl -X GET \
  "http://localhost:8081/getPlanByType/PrePaid" \
  -H "accept: */*"
```

Request URL

http://localhost:8081/getPlanByType/PrePaid

Server response

Code Details

200 Response body

```
[{"pid": 1,
  "pname": "Family",
  "price": 199,
  "noOfCalls": 100,
  "dataPerDay": 1,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 2,
  "pname": "Friends",
  "price": 299,
  "noOfCalls": 100,
  "dataPerDay": 1,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 3,
  "pname": "Family",
  "price": 499,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 4,
  "pname": "Family",
  "price": 699,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 10,
  "typeOfPlan": "PostPaid" },
 {"pid": 5,
  "pname": "Friends",
  "price": 399,
  "noOfCalls": 100,
  "dataPerDay": 1,
  "noOfMsg": 100,
  "noOfDays": 45,
  "typeOfPlan": "PostPaid" },
 {"pid": 6,
  "pname": "Family",
  "price": 499,
  "noOfCalls": 100,
  "dataPerDay": 2,
  "noOfMsg": 100,
  "noOfDays": 55,
  "typeOfPlan": "PostPaid" }]
```

Response headers

```
connection: keep-alive
content-type: application/json
date: Tue, 03 Sep 2024 12:43:42 GMT
keep-alive: timeout=60
transfer-encoding: chunked
```

Customer Service

POST /addCustomer

Parameters

No parameters

Request body required

```
{"customerId": 1,
"name": "Sonal",
"phone": "1111111111",
"email": "sonal@gmail.com",
"planId": 3,
"startDuration": "2024-09-01",
"endDuration": "2024-11-27",
"status": "active"}
```

application/json

Execute Clear

Responses

Curl

```
curl -X 'POST' \
http://localhost:8082/addCustomer \
-H 'Content-Type: application/json' \
-d '{ "customerId": 1,
"name": "Sonal",
"phone": "1111111111",
"email": "sonal@gmail.com",
"planId": 3,
"startDuration": "2024-09-01",
"endDuration": "2024-11-27",
"status": "active" }'
```

Request URL

<http://localhost:8082/addCustomer>

Server response

Code Details

200 Response body

```
ADDED
```

Code Description

200 OK

GET /getAllCustomers

Parameters

No parameters

Execute Clear

Responses

Curl

```
curl -X 'GET' \
http://localhost:8082/getAllCustomers \
-H 'accept: */*'
```

Request URL

<http://localhost:8082/getAllCustomers>

Server response

Code Details

200 Response body

```
[{"customerId": 1,
"name": "Sonal",
"phone": "1111111111",
"email": "sonal@gmail.com",
"planId": 3,
"startDuration": "2024-09-01",
"endDuration": "2024-11-27",
"status": "active"}, {"customerId": 2,
"name": "Rukma",
"phone": "2222222222",
"email": "rukma@gmail.com",
"planId": 4,
"startDuration": "2024-09-01",
"endDuration": "2024-10-28",
"status": "active"}, {"customerId": 3,
"name": "Rukma",
"phone": "3333333333",
"email": "rukma@gmail.com",
"planId": 4,
"startDuration": "2024-09-01",
"endDuration": "2024-09-28",
"status": "active"}]
```

Response headers

```
connection: keep-alive
content-type: application/json
date: Tue, 03 Sep 2024 13:04:22 GMT
keep-alive: timeout=60
transfer-encoding: chunked
```

Responses

Code Description

200 OK

GET /getCustomerByPlanId/{planId}

Parameters

planId required

integer(\$int32)

(path)

Value: 4

Execute Clear

Responses

Curl

```
curl -X 'GET' \
http://localhost:8082/getCustomerByPlanId/4 \
-H 'accept: */*'
```

Request URL

<http://localhost:8082/getCustomerByPlanId/4>

Server response

Code Details

200 Response body

```
[{"customerId": 2,
"name": "Rukma",
"phone": "3333333333",
"email": "rukma@gmail.com",
"planId": 4,
"startDuration": "2024-09-01",
"endDuration": "2024-09-28",
"status": "active"}]
```

Response headers

```
connection: keep-alive
content-type: application/json
date: Tue, 03 Sep 2024 13:06:01 GMT
keep-alive: timeout=60
transfer-encoding: chunked
```

Responses

Code Description

200 OK

GET /getCustomerByPhoneNo/{phoneNo}

Parameters

Name Description

phoneNo required

string (path)

Value: 1111111111

Execute Clear

Responses

Curl

```
curl -X 'GET' \
http://localhost:8082/getCustomerByPhoneNo/1111111111 \
-H 'accept: */*'
```

Request URL

<http://localhost:8082/getCustomerByPhoneNo/1111111111>

Server response

Code Details

200 Response body

```
[{"customerId": 1,
"name": "Sonal",
"phone": "1111111111",
"email": "sonal@gmail.com",
"planId": 3,
"startDuration": "2024-09-01",
"endDuration": "2024-11-27",
"status": "active"}]
```

Response headers

```
connection: keep-alive
content-type: application/json
date: Tue, 03 Sep 2024 13:06:00 GMT
keep-alive: timeout=60
transfer-encoding: chunked
```

Responses

Code Description

200 OK

GET /getCustomerByStatus/{status}

Parameters

Name Description

status required

string (path)

Value: Active

Execute Clear

Responses

Curl

```
curl -X 'GET' \
http://localhost:8082/getCustomerByStatus/active \
-H 'accept: */*'
```

Request URL

<http://localhost:8082/getCustomerByStatus/active>

Server response

Code Details

200 Response body

```
[{"customerId": 1,
"name": "Sonal",
"phone": "1111111111",
"email": "sonal@gmail.com",
"planId": 3,
"startDuration": "2024-09-01",
"endDuration": "2024-11-27",
"status": "active"}, {"customerId": 2,
"name": "Rukma",
"phone": "2222222222",
"email": "rukma@gmail.com",
"planId": 4,
"startDuration": "2024-09-01",
"endDuration": "2024-10-28",
"status": "active"}, {"customerId": 3,
"name": "Rukma",
"phone": "3333333333",
"email": "rukma@gmail.com",
"planId": 4,
"startDuration": "2024-09-01",
"endDuration": "2024-09-28",
"status": "active"}]
```

Responses

Code Description

200 OK

POST /addCustomer

GET /getRemainingDays/{customerId}

Parameters

customerId required

integer(\$int32)

(path)

Value: 21

Execute Clear

Responses

Curl

```
curl -X 'GET' \
http://localhost:8082/getRemainingDays/21 \
-H 'accept: */*'
```

Request URL

<http://localhost:8082/getRemainingDays/21>

Server response

Code Details

200 Response body

```
Remaining Days are:21
```

Response headers

```
connection: keep-alive
content-length: 21
content-type: application/plain; charset=UTF-8
date: Tue, 03 Sep 2024 14:31:29 GMT
keep-alive: timeout=60
```

Responses

Code Description

200 OK

Call Details Management

POST /addCall

Parameters

No parameters

Request body **required**

application/json

```
{ "callid": 1, "fromid": 21, "starttime": "2024-09-03T13:39:29.223Z", "endtime": "2024-09-03T13:59:29.223Z", "totaltime": 0, "planid": 3 }
```

Responses

Curl

```
curl -X 'POST' \
http://localhost:8088/addCall \
-H 'Accept: */*' \
-H 'Content-Type: application/json' \
-d '{
  "callid": 1,
  "fromid": 21,
  "starttime": "2024-09-03T13:39:29.223Z",
  "endtime": "2024-09-03T13:59:29.223Z",
  "totaltime": 0,
  "planid": 3
}'
```

Request URL

http://localhost:8088/addCall

Server response

Code Details

200 Response body

Added

GET /getAllCalldetails

Parameters

No parameters

Responses

Curl

```
curl -X 'GET' \
http://localhost:8088/getAllCalldetails \
-H 'Accept: */*'
```

Request URL

http://localhost:8088/getAllCalldetails

Server response

Code Details

404 Error: response status is 404

Response body

No call records found

Response headers

```
connection: keep-alive
content-length: 21
content-type: application/json; charset=UTF-8
date: Tue, 03 Sep 2024 13:39:17 GMT
keep-alive: timeout=60
```

Responses

Code Description

200 OK

Media type

* JSON

Controls Accept header

Example Value Schema

```
[ ]
```

GET /getCallByTotalTime/{totaltime}

Parameters

toid **required** integer(\$int32) 22 (path)

Responses

Curl

```
curl -X 'GET' \
http://localhost:8088/getCallByTotalTime/22 \
-H 'Accept: */*'
```

Request URL

http://localhost:8088/getCallByTotalTime/22

Server response

Code Details

200 Response body

```
[
  {
    "callid": 1,
    "fromid": 21,
    "starttime": "2024-09-03T13:39:29.223Z",
    "endtime": "2024-09-03T13:59:29.223Z",
    "totaltime": 20,
    "planid": 3
  }
]
```

Response headers

```
connection: keep-alive
content-type: application/json
date: Tue, 03 Sep 2024 13:39:48 GMT
keep-alive: timeout=60
transfer-encoding: chunked
```

GET /getCallByPlanId/{planId}

Parameters

Name Description

planid **required** integer(\$int32) 8 (path)

Responses

Curl

```
curl -X 'GET' \
http://localhost:8088/getCallByPlanId/8 \
-H 'Accept: */*'
```

Request URL

http://localhost:8088/getCallByPlanId/8

Server response

Code Details

404 Error: response status is 404

Response body

No calls found for plan ID: 8

Response headers

```
connection: keep-alive
content-type: application/json
date: Tue, 03 Sep 2024 13:44:23 GMT
keep-alive: timeout=60
```

Responses

Code Description

200 OK

GET /getCallAmountByCustomerId/{fromId}

Parameters

Name Description

fromid **required** integer(\$int32) 21 (path)

Responses

Curl

```
curl -X 'GET' \
http://localhost:8088/getCallAmountByCustomerId/21 \
-H 'Accept: */*'
```

Request URL

http://localhost:8088/getCallAmountByCustomerId/21

Server response

Code Details

200 Response body

27

Response headers

```
connection: keep-alive
content-type: application/json
date: Tue, 03 Sep 2024 14:12:55 GMT
keep-alive: timeout=60
transfer-encoding: chunked
```

Responses

Code Description

200 OK

GET /getCallByCallId/{callid}

Parameters

callid **required** integer(\$int32) 1 (path)

Responses

Curl

```
curl -X 'GET' \
http://localhost:8088/getCallByCallId/1 \
-H 'Accept: */*'
```

Request URL

http://localhost:8088/getCallByCallId/1

Server response

Code Details

200 Response body

```
{
  "callid": 1,
  "fromid": 21,
  "toid": 22,
  "starttime": "2024-09-03T13:39:29.223Z",
  "endtime": "2024-09-03T13:59:29.223Z",
  "totaltime": 20,
  "planid": 3
}
```

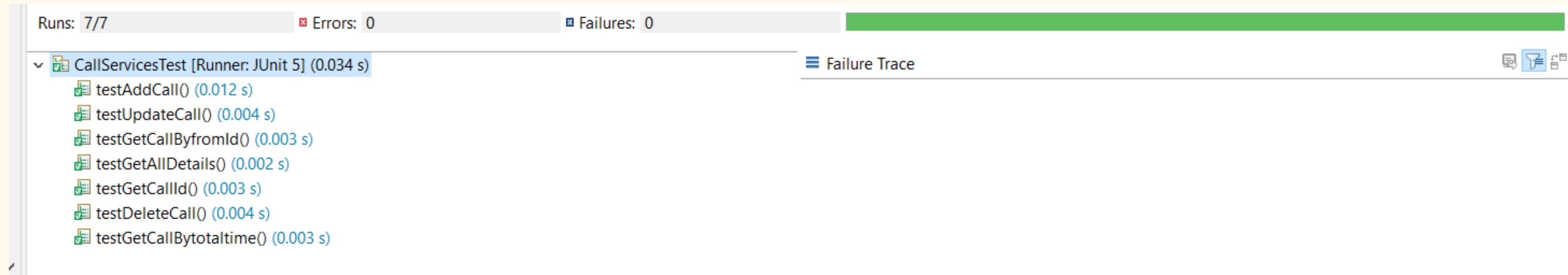
Response headers

```
connection: keep-alive
content-type: application/json
date: Tue, 03 Sep 2024 13:46:08 GMT
keep-alive: timeout=60
transfer-encoding: chunked
```

Testing and Quality Assurance

Testing Overview:

- **Unit Testing:**
 1. Utilized JUnit for testing individual components
 2. **Key Tests:** Service Methods, repository interactions
- Test Coverage:
 - Ensured high coverage for critical methods and components



Custom Exceptions and Error Handling

Custom Exceptions Implemented:

- CustomerNotFoundException: For handling non-existent customer queries.
- PlanNotFoundException: For handling cases where a plan is not found.
- CallHistoryNotFoundException: For handling missing call history records.

Conclusion

Summary:

- Successfully implemented and tested Customer, Plan, and Call history management.
- Integrated custom exceptions for robust error handling.

Future Enhancements:

- Adding more features (e.g., analytics, reporting)
- Optimizing performance and scalability.
- DevOps for Deployment
- UI implementation
- Selenium For UI testing
- Add feature like Sharing Invite link to Others

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THANK YOU!!!!

