FLIGHT MANAGEMENT SYSTEM

(Implemented using microservices)

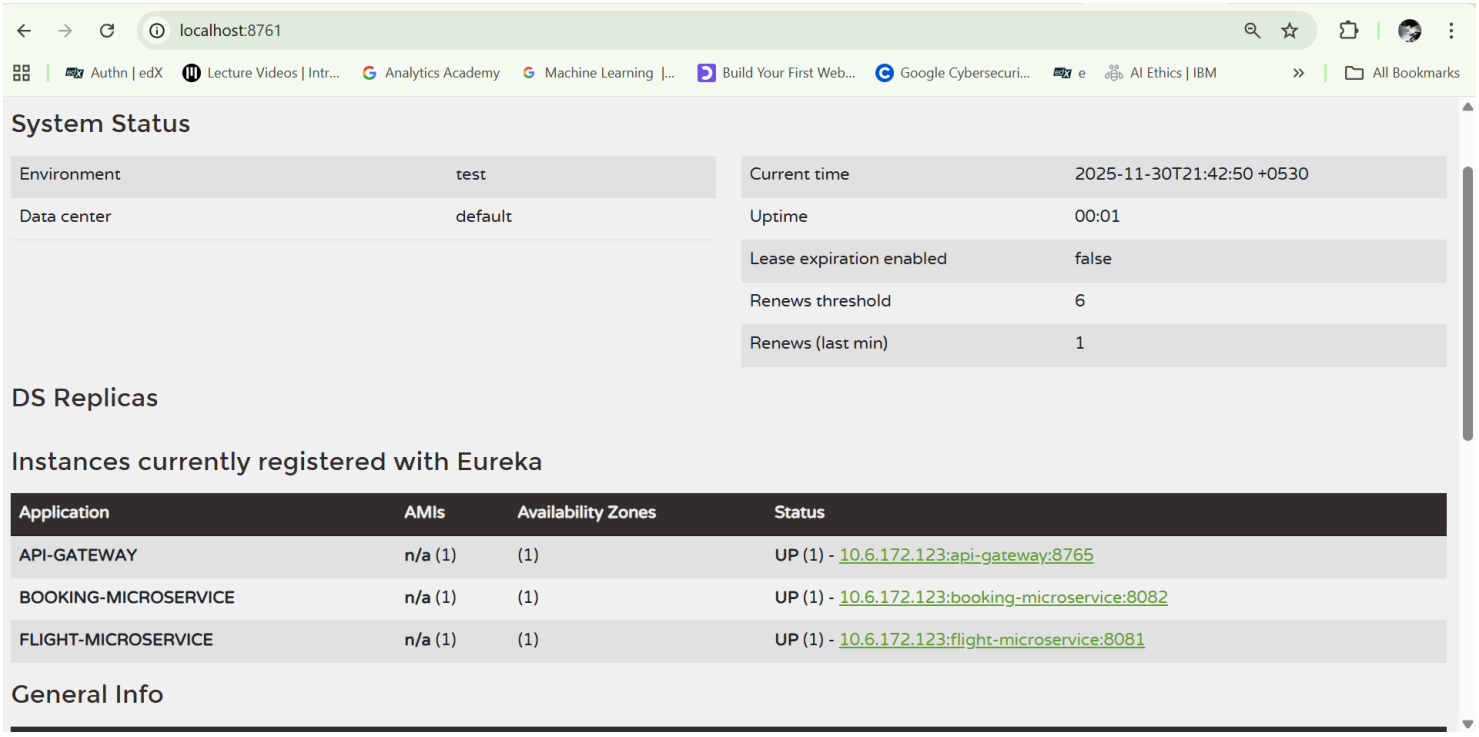
Debashrita Mandal

This microservices-based Flight Management System uses :

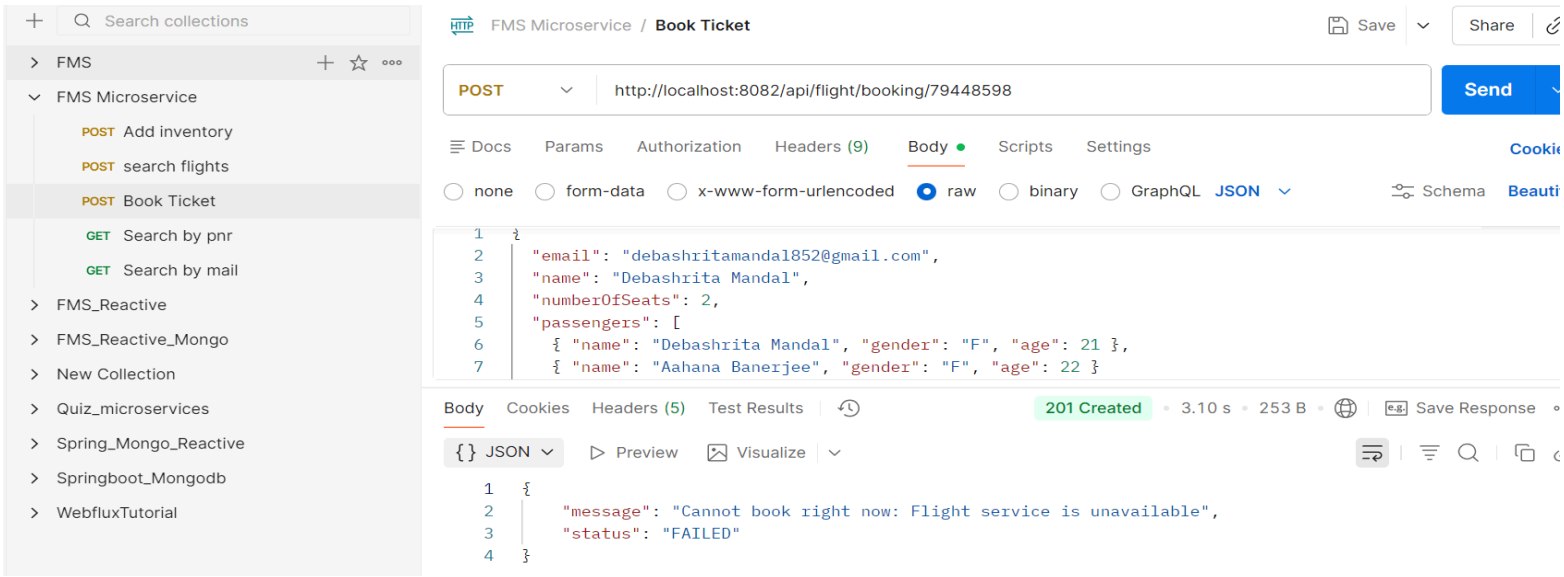
1. **Eureka Service Discovery**: For microservice registry
2. **OpenFeign and API Gateway:** For inter-service communication
3. **Resilience4j Circuit Breaker**: For fault tolerance
4. **Spring Cloud Config Server**: For centralized configuration
5. **RabbitMQ** (using **Docker)** : as an event-driven messaging layer (message broker)
6. **Notification Service** (using **Spring Mail)** for asynchronous email delivery.

The system persists data using **Spring Data JPA** with **MySQL**, supports validation using **Jakarta Validation**, and includes comprehensive **JUnit + Mockito** test coverage with **JaCoCo**.

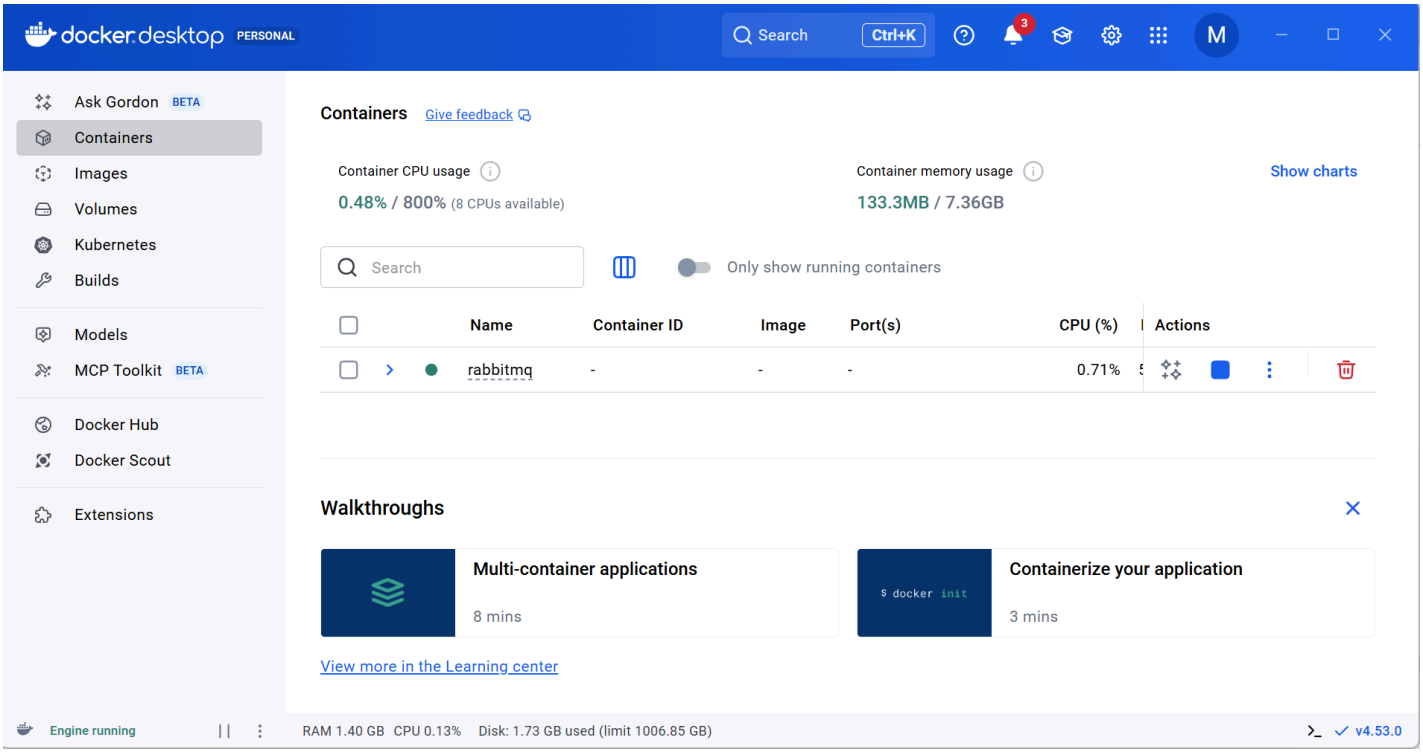
EUREKA SERVER



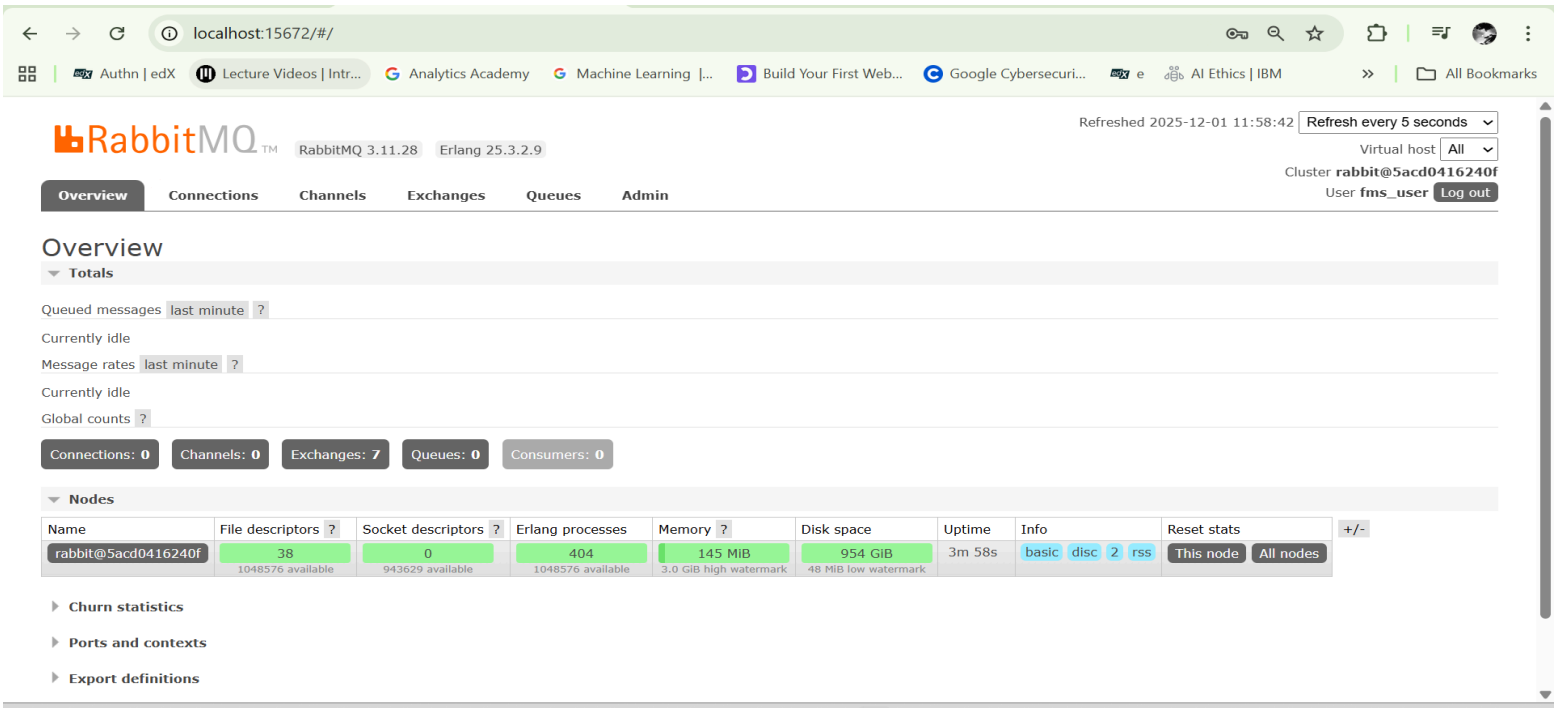
CIRCUIT BREAKER (Resilience4j)



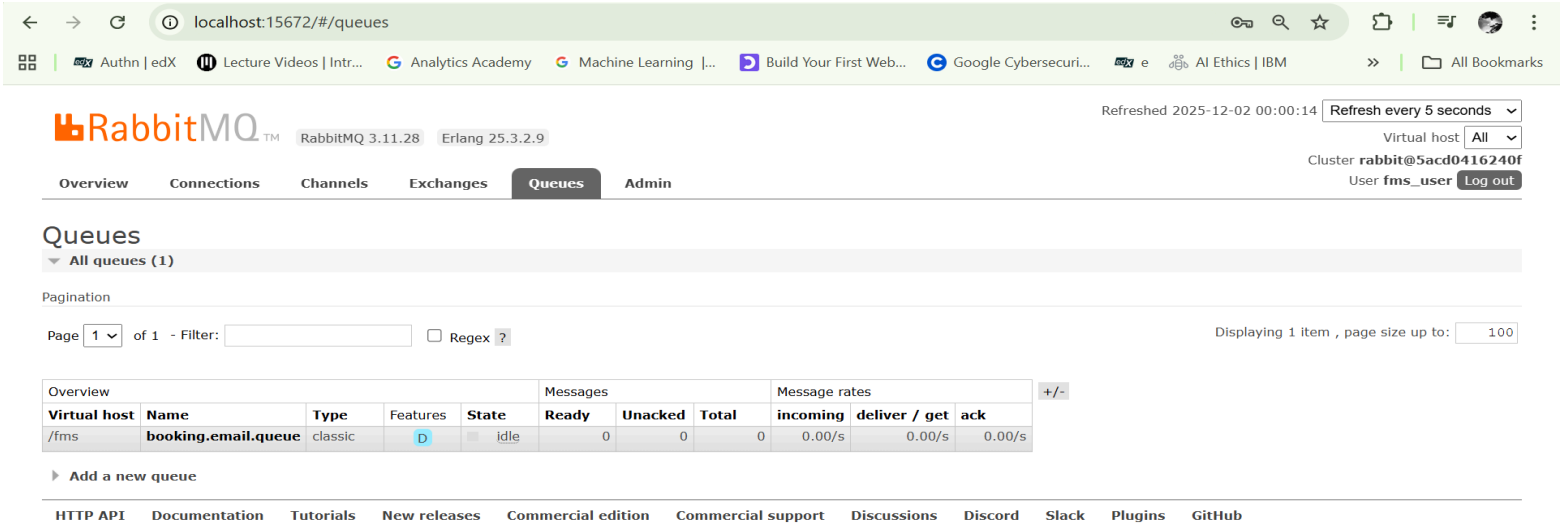
RABBITMQ SERVER



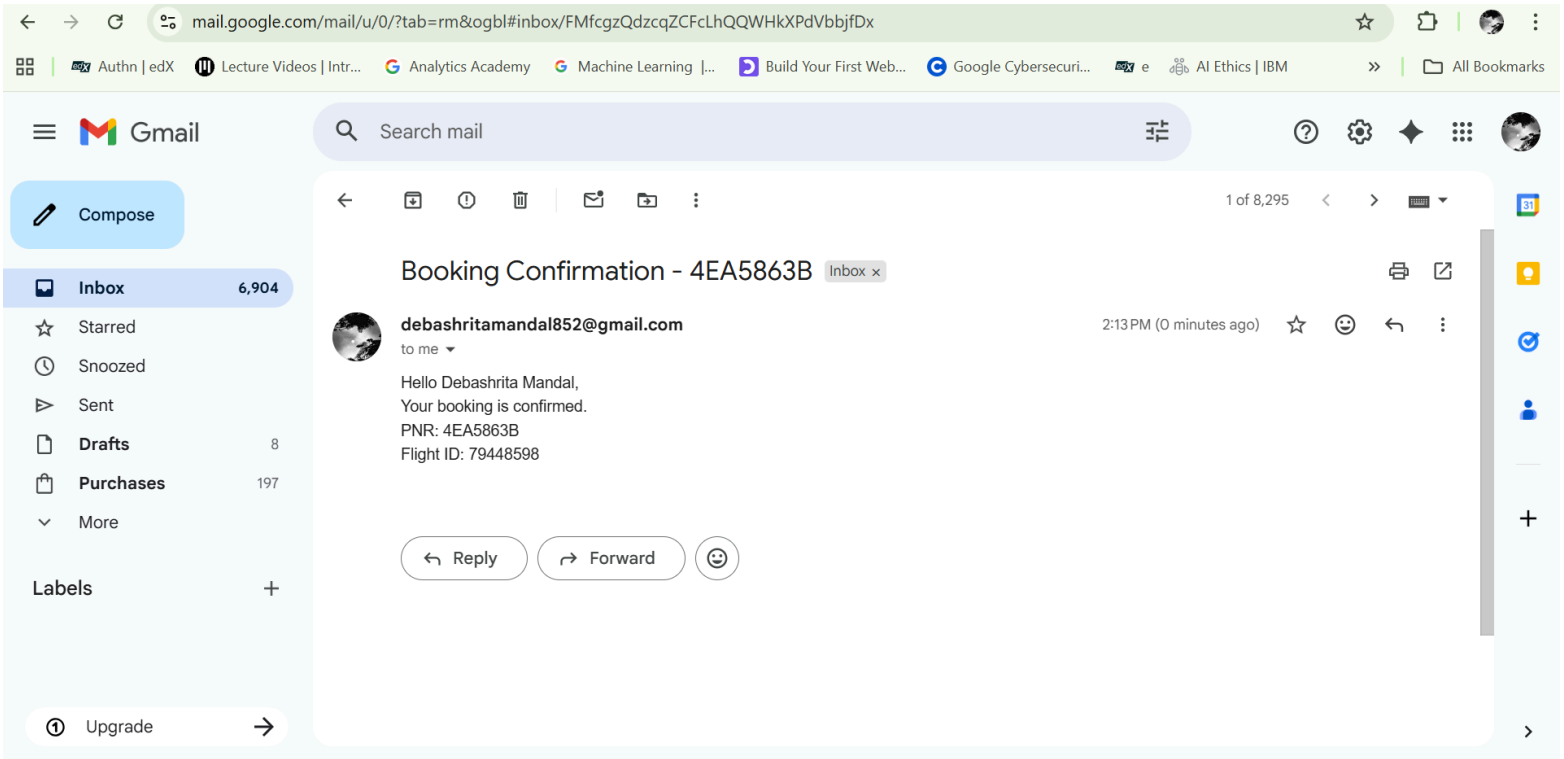
Registered RabbitMQ on Docker Desktop.



Logged into RabbitMQ.

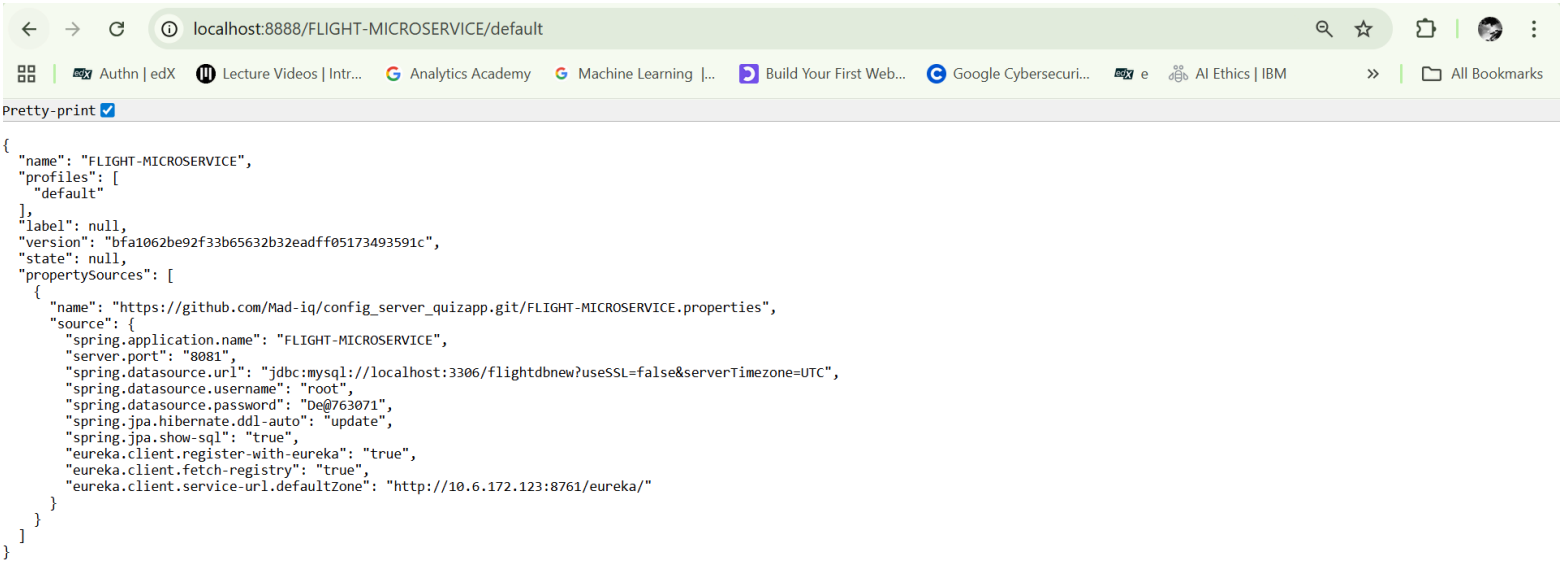


Created a queue for Booking-Microservice.

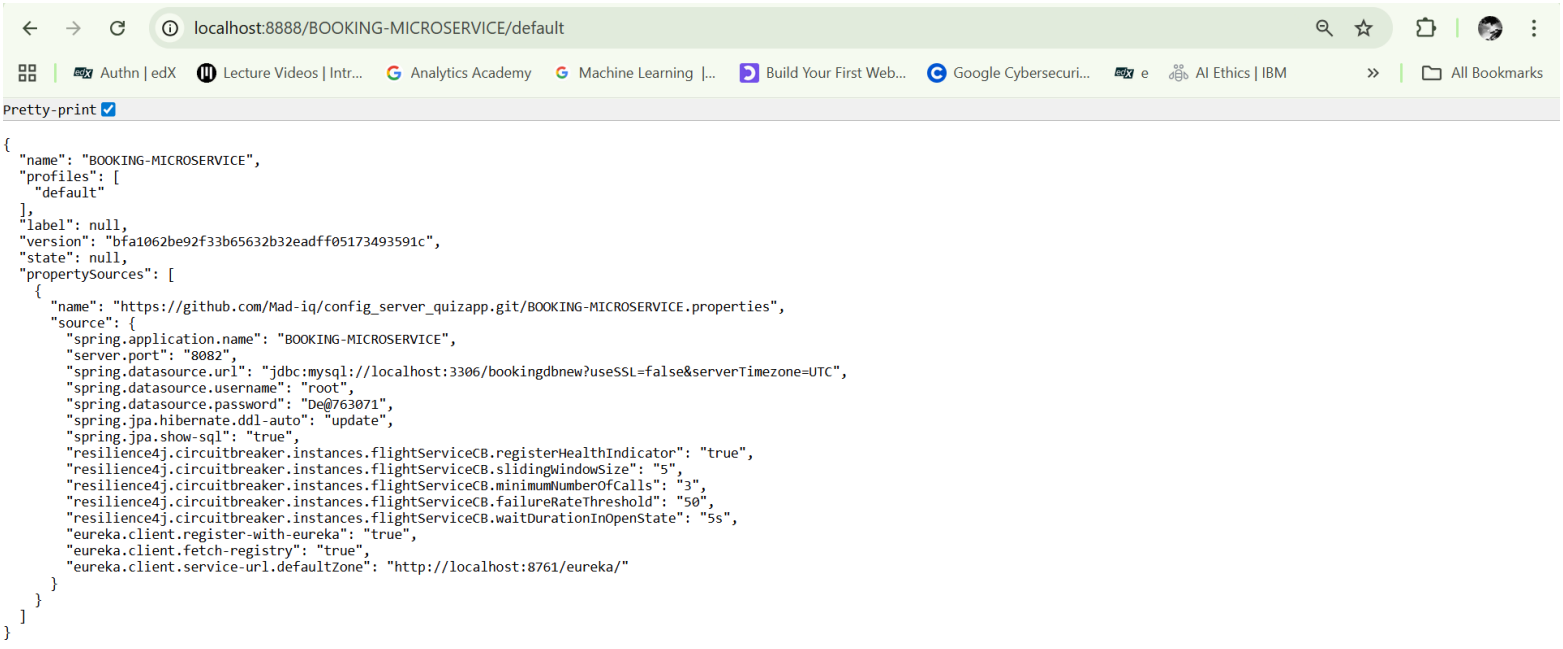


Received an email after successful booking on the provided booking email id.

CONFIG SERVER

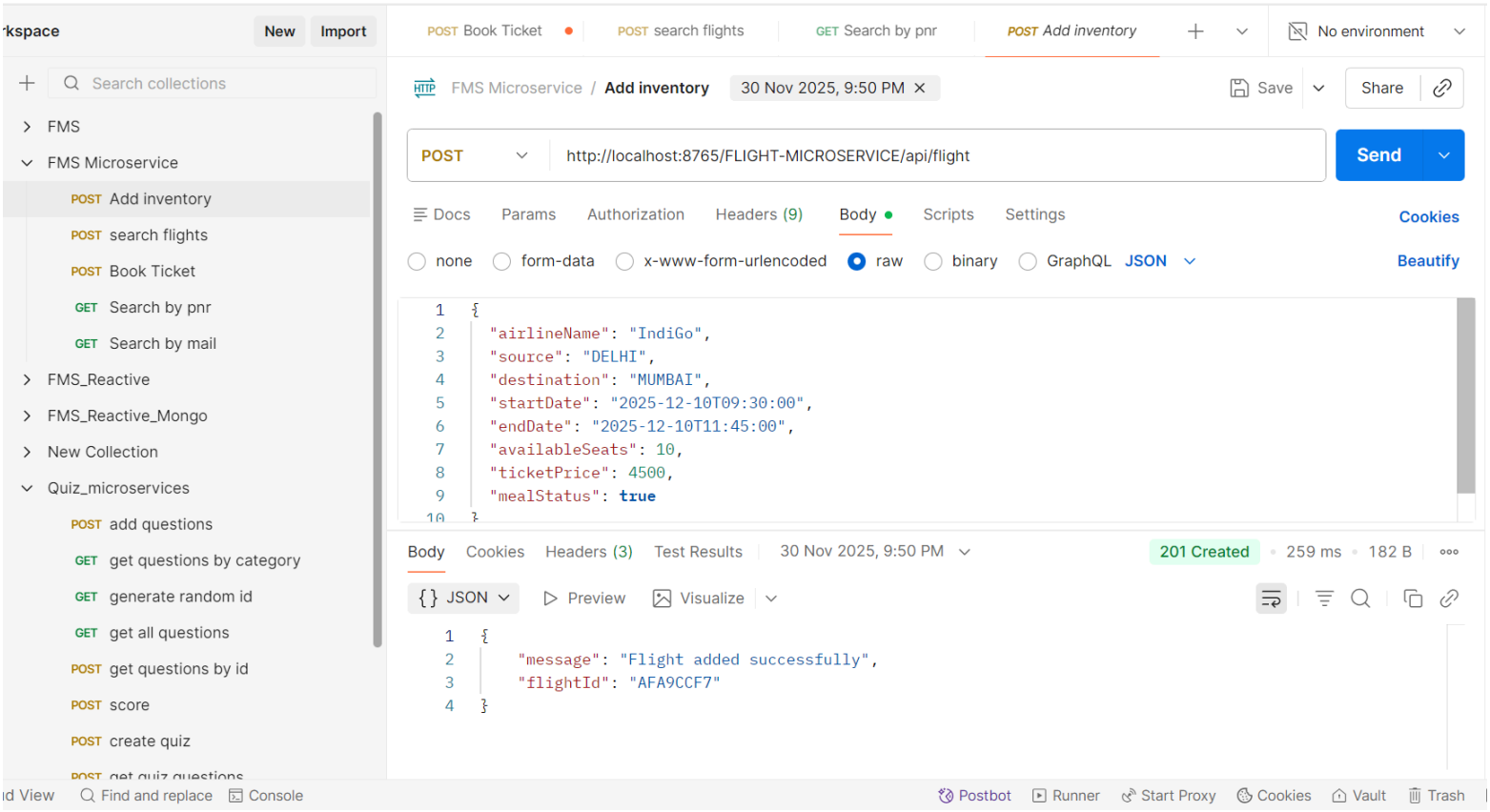


Uploaded the application.properties for Flight-microservice into the config server.



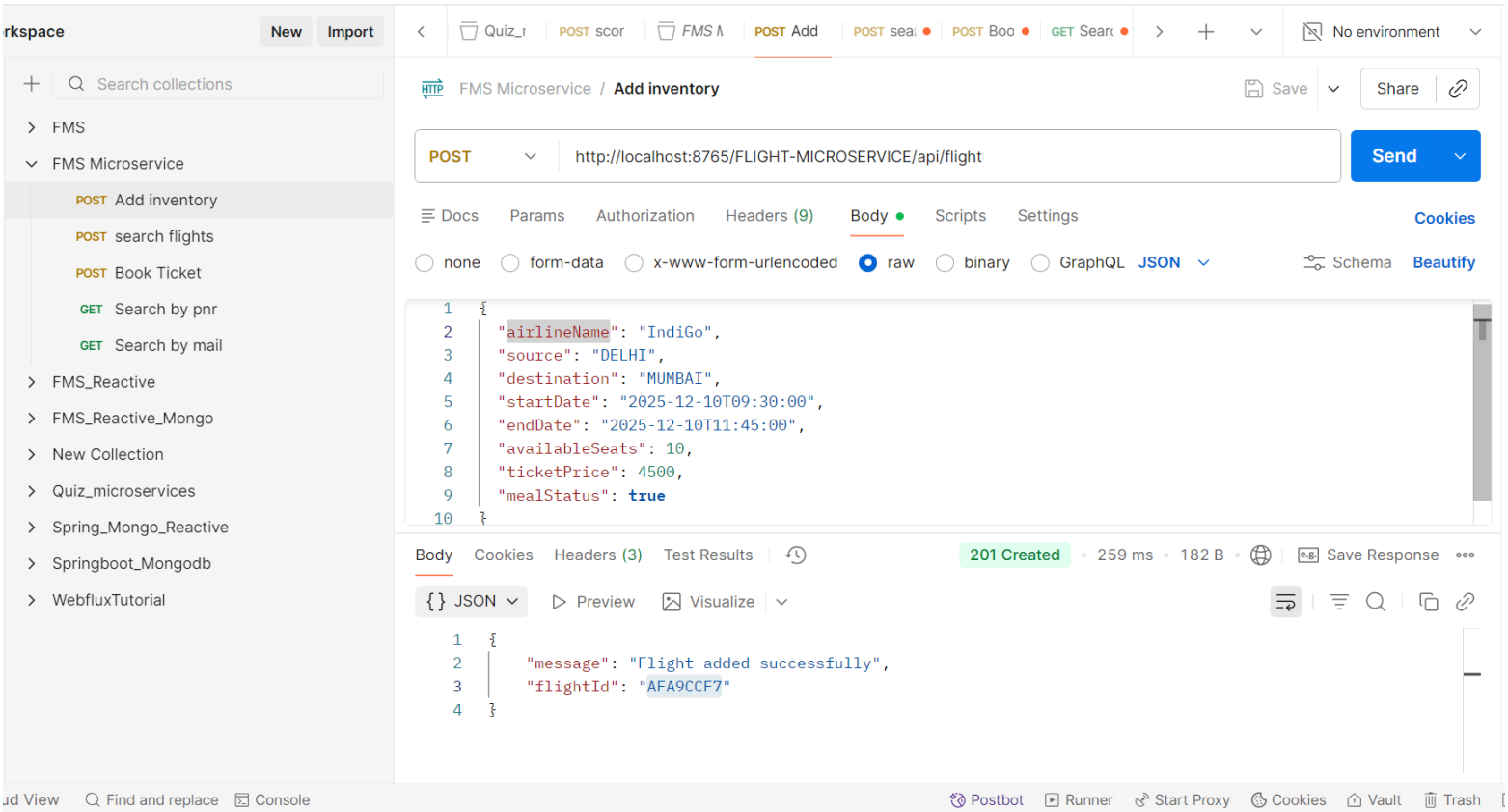
Uploaded the application.properties for Booking-microservice into the config server.

API-GATEWAY

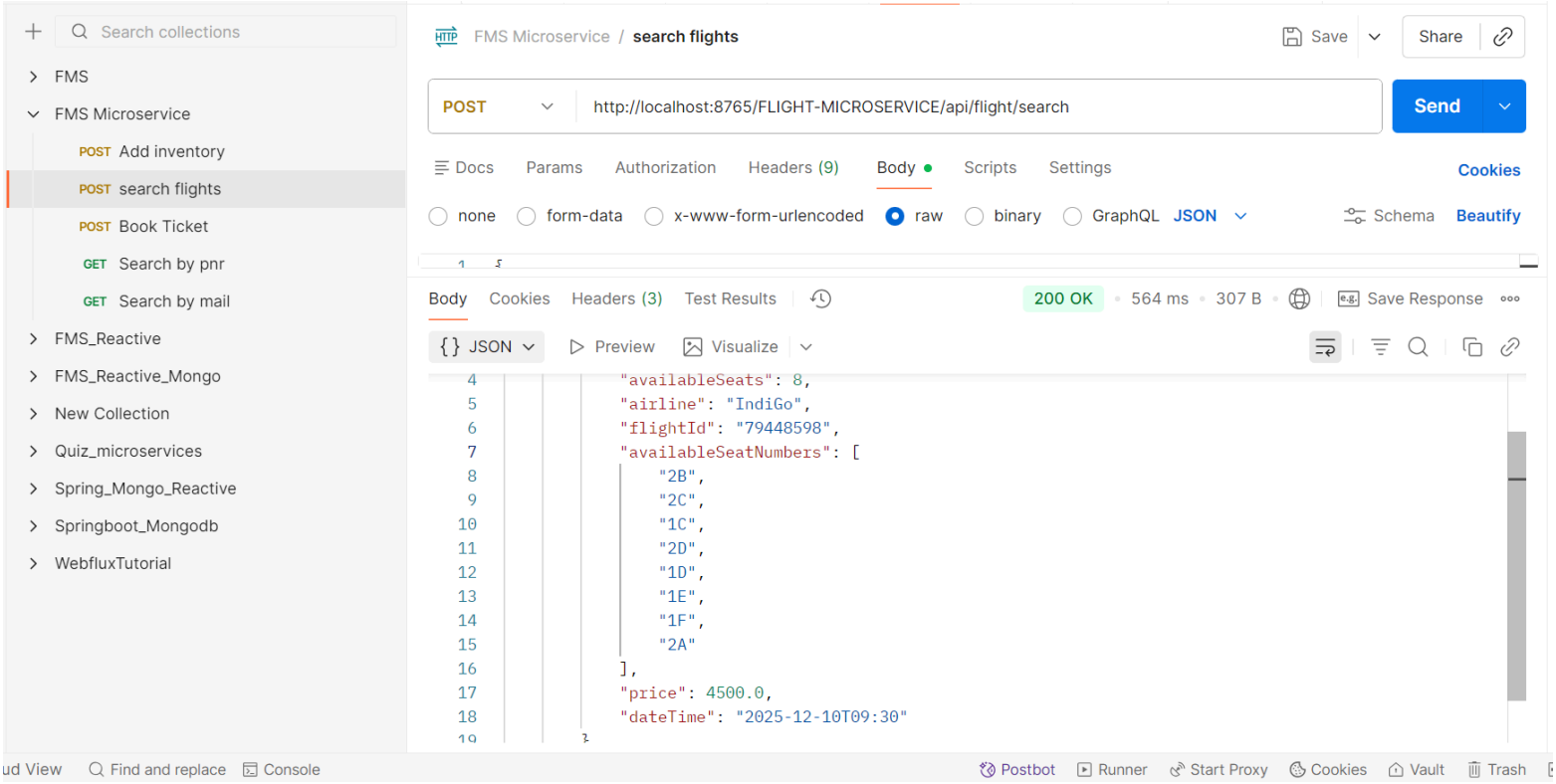


POSTMAN TESTING

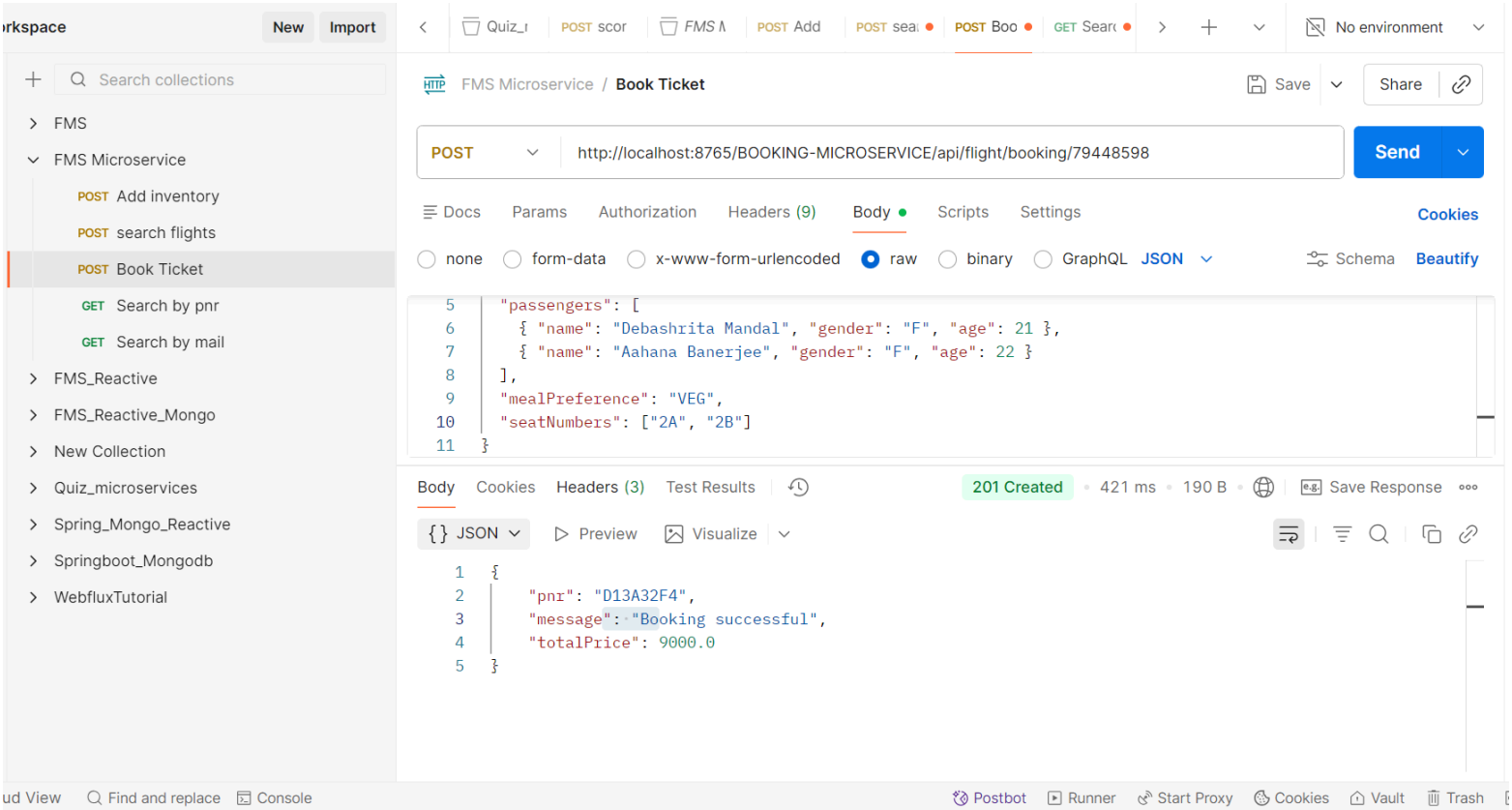
1. Add Inventory



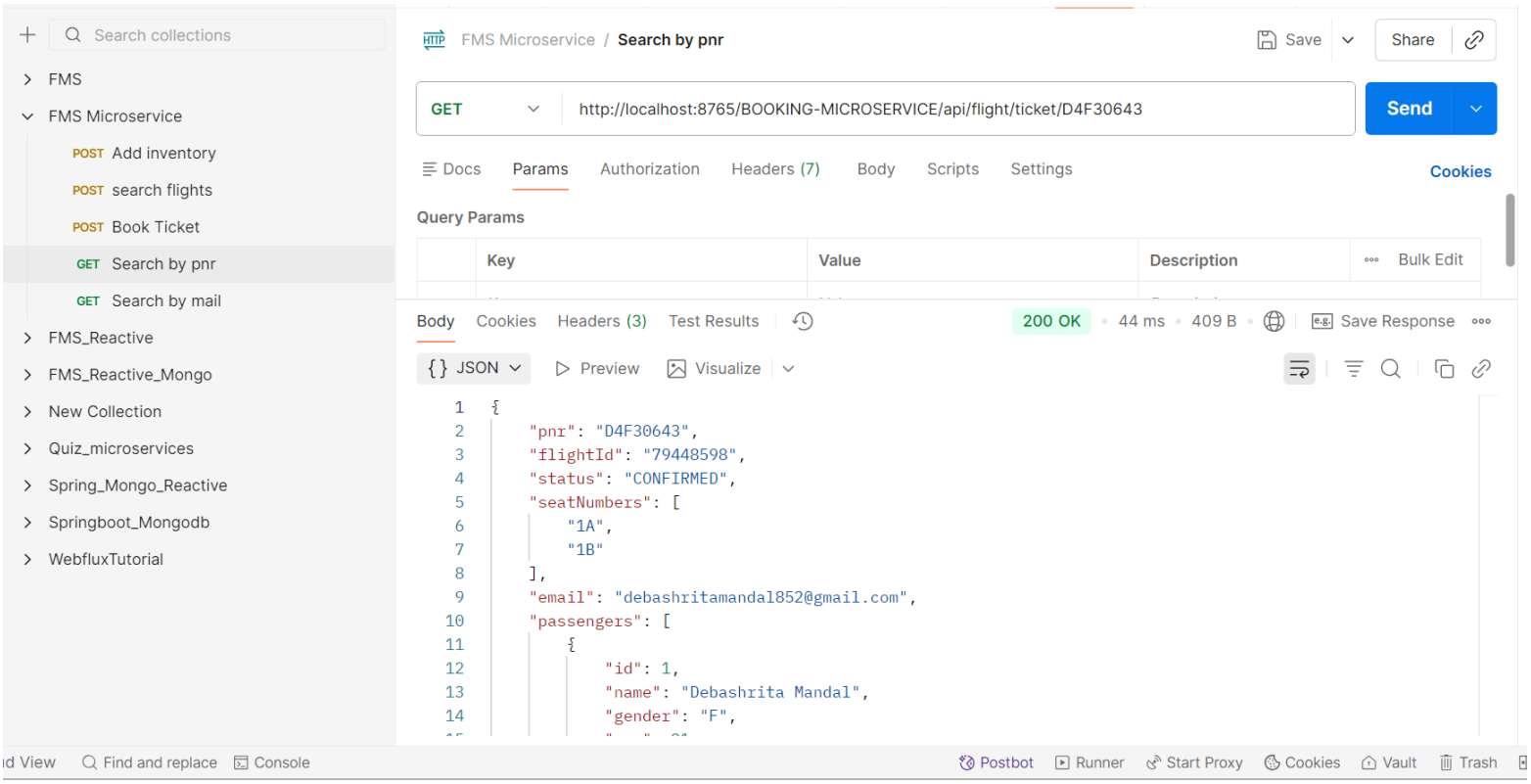
2. Search Flights



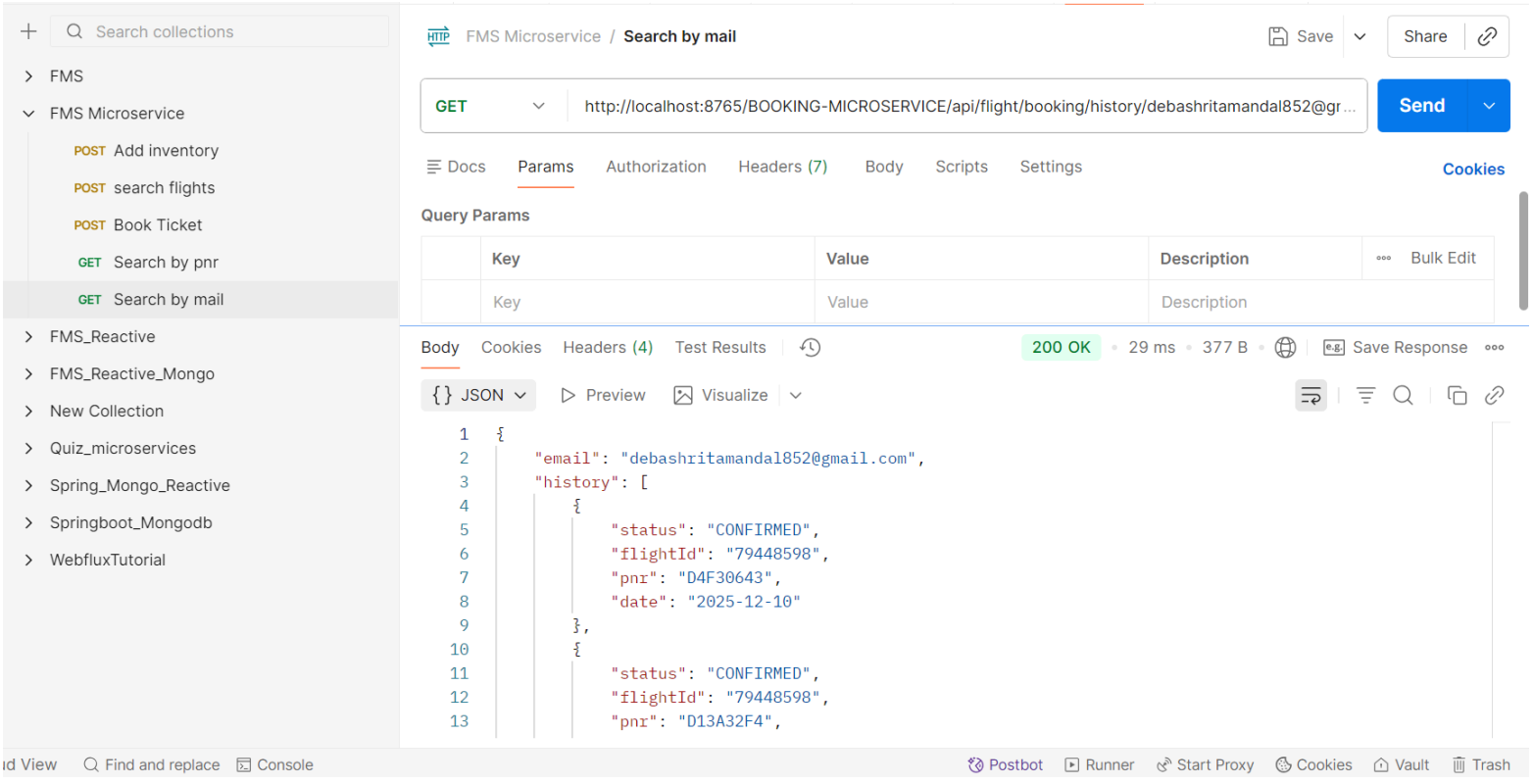
3. Book Tickets



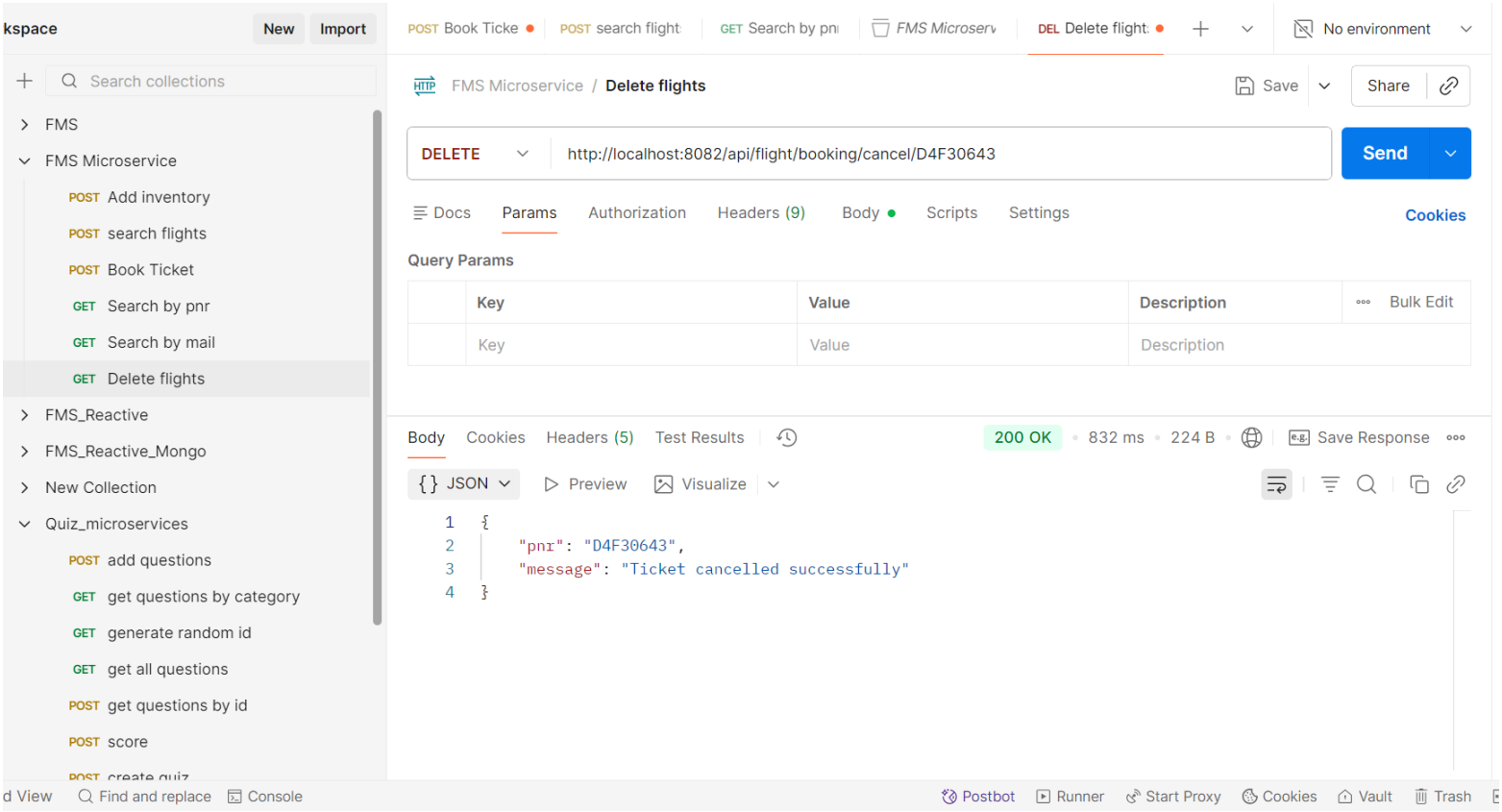
4. Search by PNR



5. Search by email



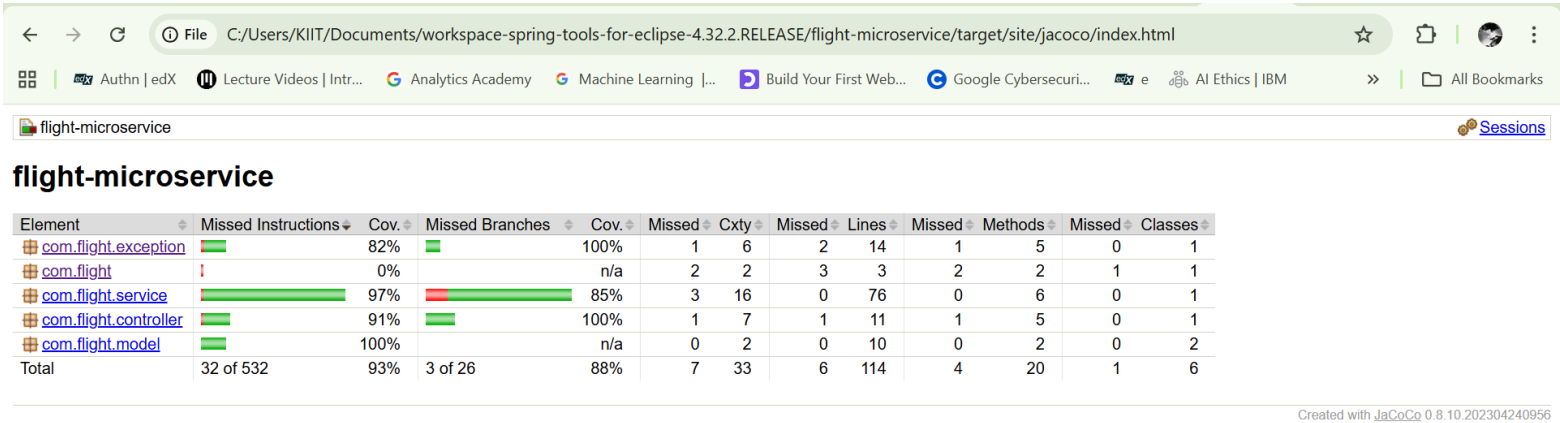
6. Delete ticket



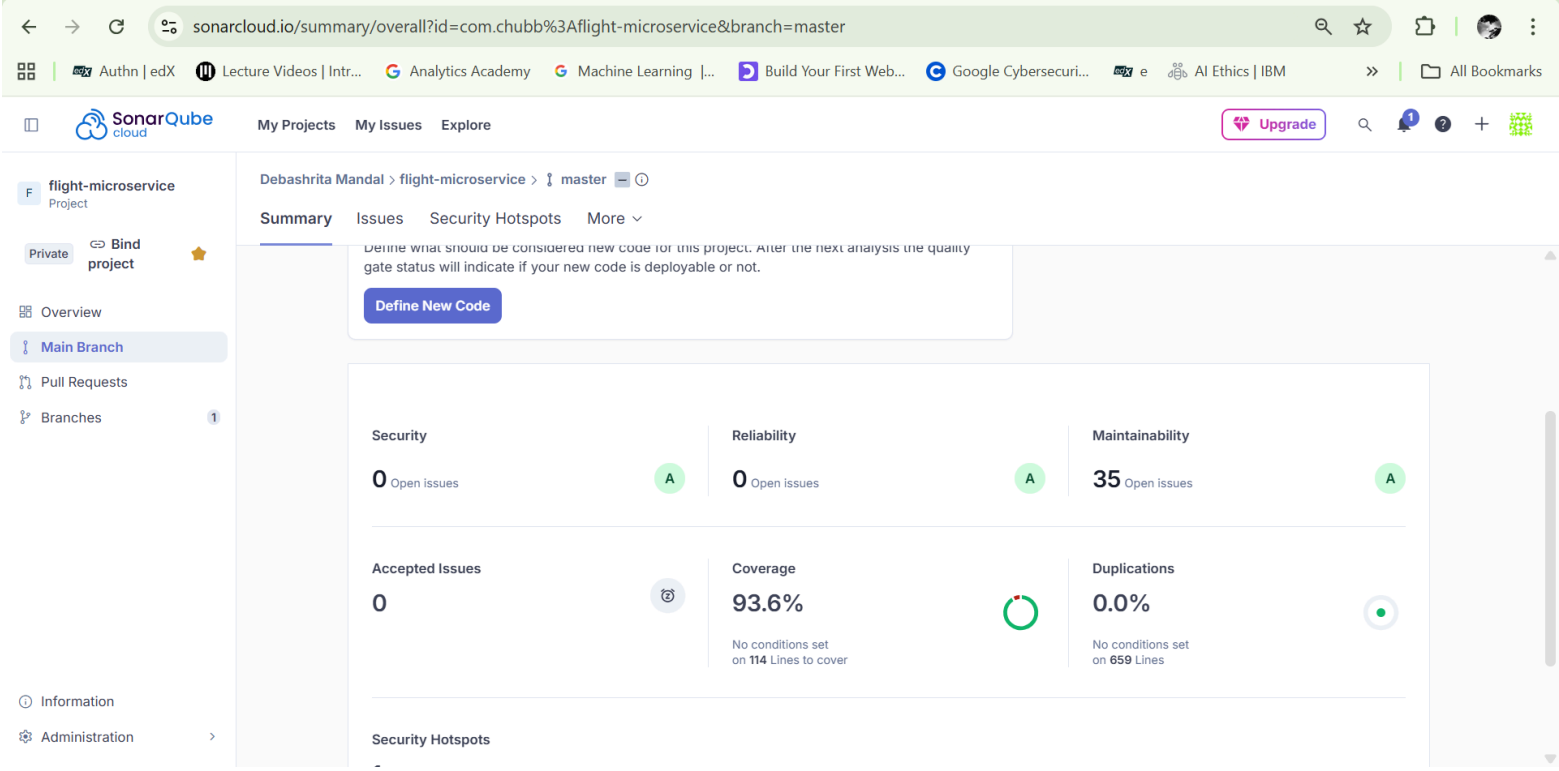
JACOCO AND SONARQUBE REPORTS:

FLIGHT-MICROSERVICE:

1. JACOCO REPORT
   Code Coverage: 93%

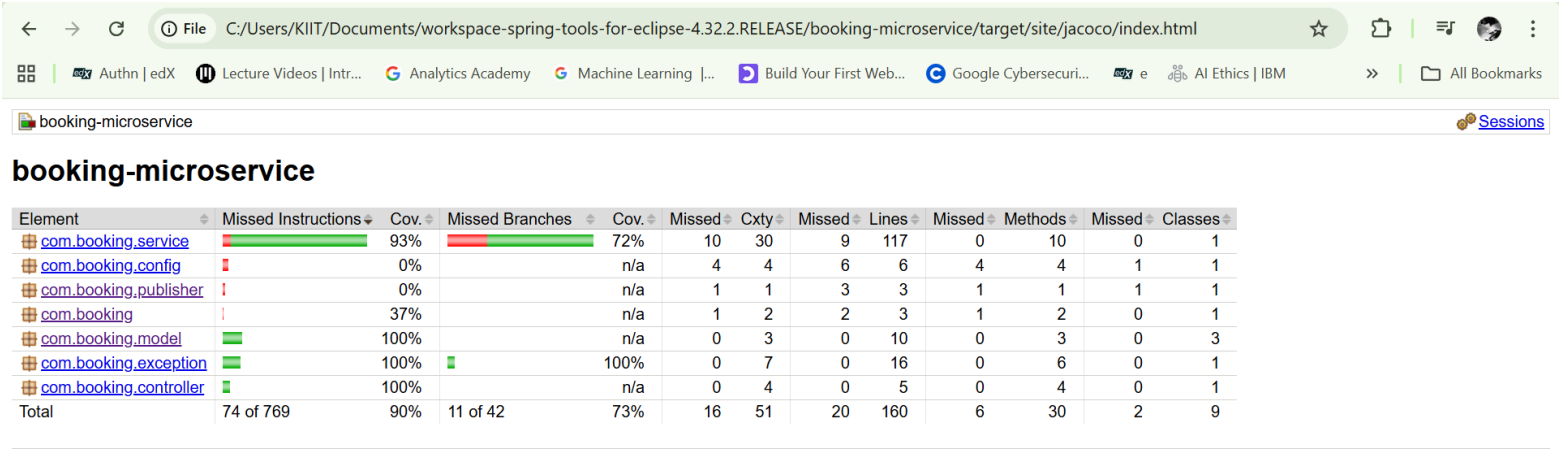


2. SONARQUBE REPORT
   Code Coverage: 93.6%



BOOKING-MICROSERVICE

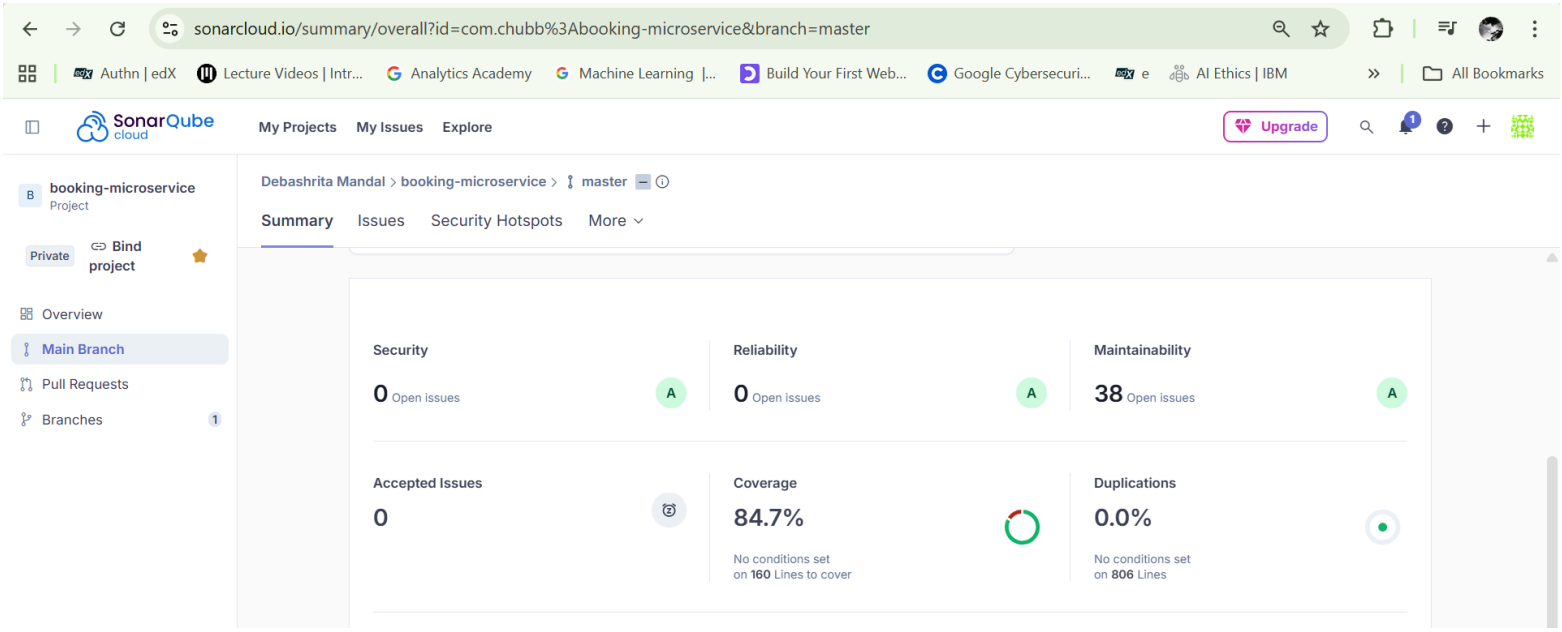
1. JACOCO REPORT:
   Code Coverage: 90%



Element	Missed Instructions	Cov.	Missed Branches	Cov.	Missed	Cxty	Missed	Lines	Missed	Methods	Missed	Classes
com.booking.service		93%		72%	10	30	9	117	0	10	0	1
com.booking.config		0%		n/a	4	4	6	6	4	4	1	1
com.booking.publisher		0%		n/a	1	1	3	3	1	1	1	1
com.booking		37%		n/a	1	2	2	3	1	2	0	1
com.booking.model		100%		n/a	0	3	0	10	0	3	0	3
com.booking.exception		100%		100%	0	7	0	16	0	6	0	1
com.booking.controller		100%		n/a	0	4	0	5	0	4	0	1
Total	74 of 769	90%	11 of 42	73%	16	51	20	160	6	30	2	9

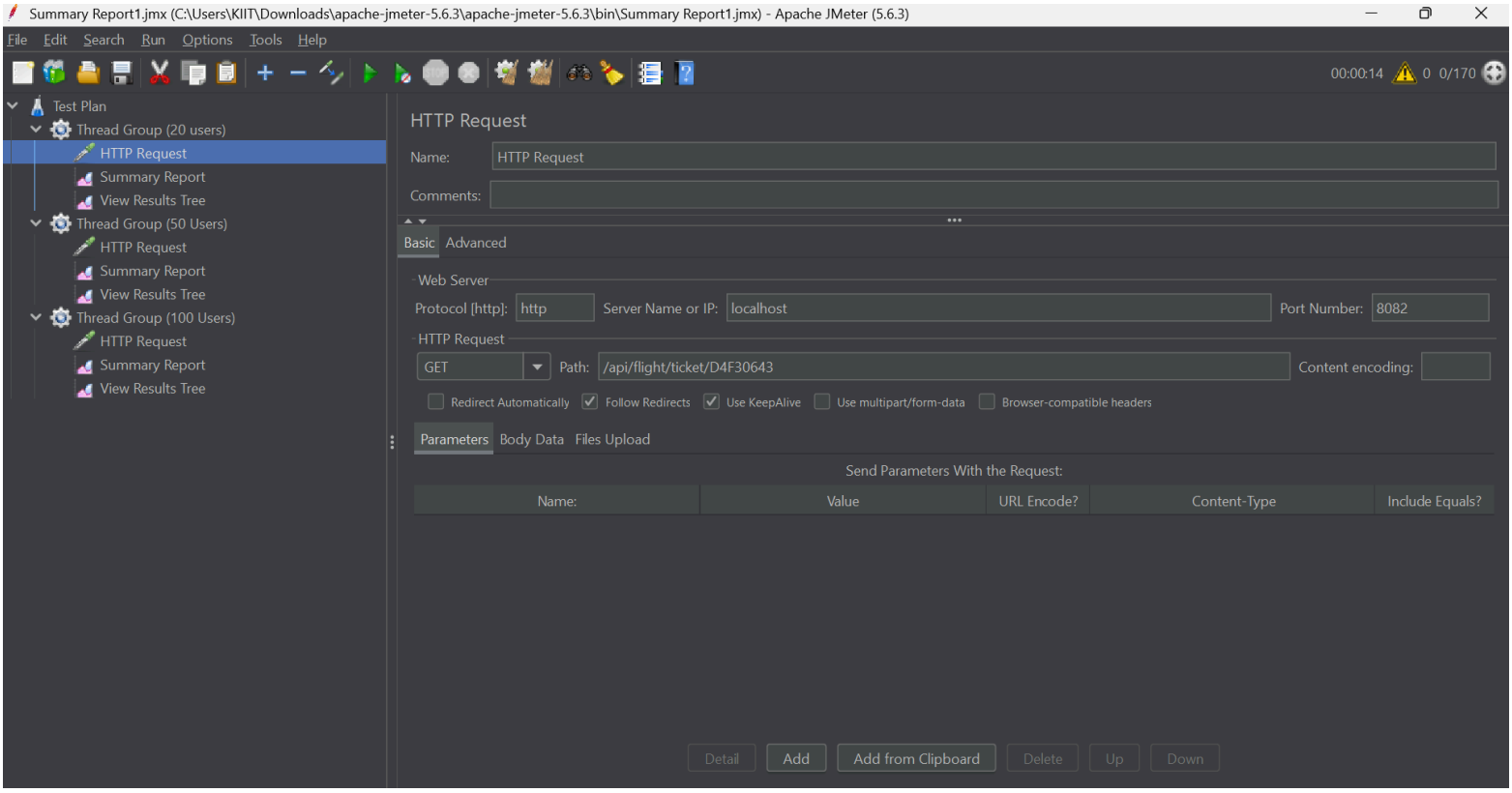
2. SONARQUBE REPORT

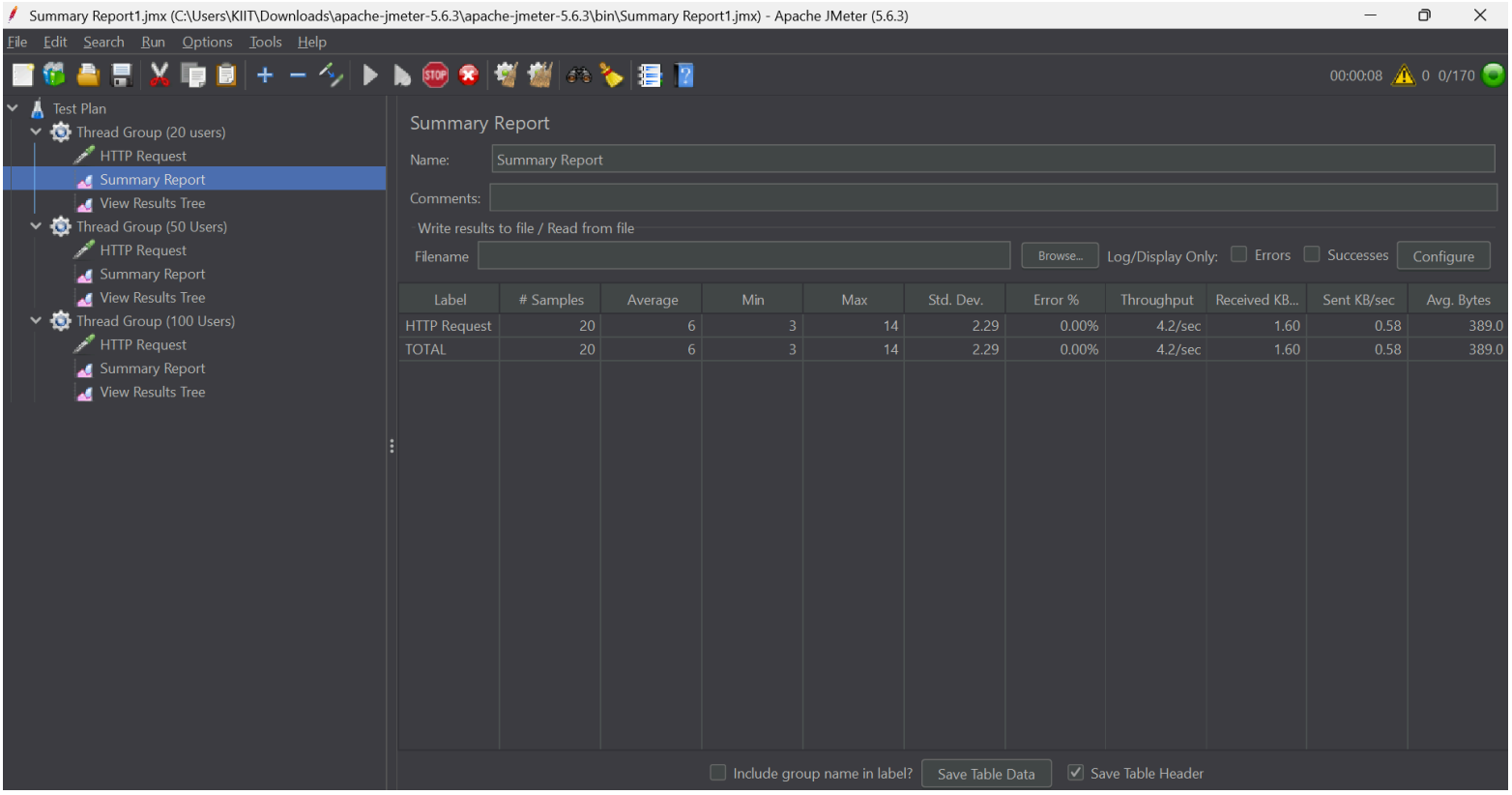
   Code Coverage: 84.7%

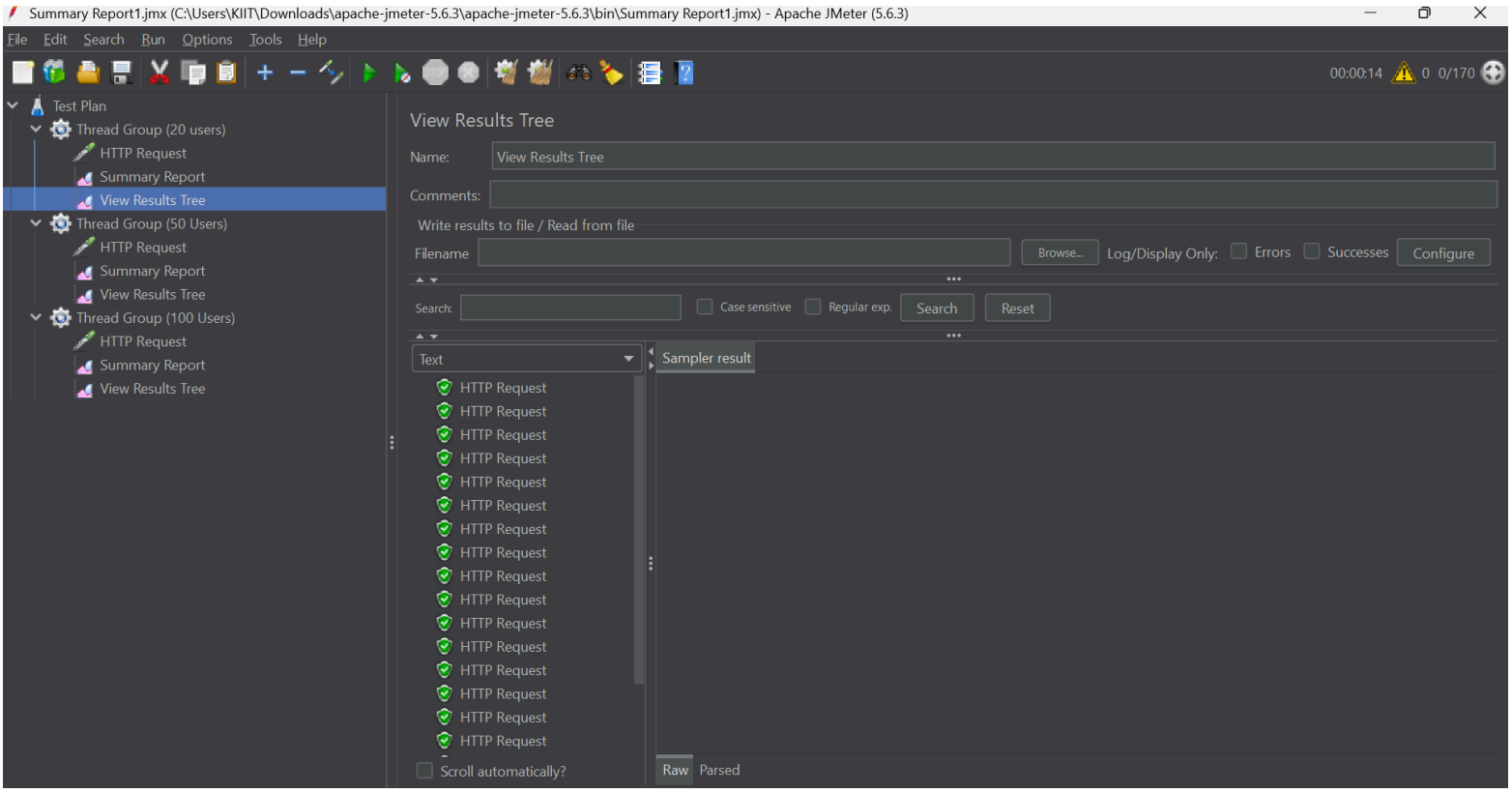


JMETER TESTING

1. 20 USERS




Summary Report1.jmx (C:\Users\KIIT\Downloads\apache-jmeter-5.6.3\apache-jmeter-5.6.3\bin\Summary Report1.jmx) - Apache JMeter (5.6.3)
File Edit Search Run Options Tools Help
00:00:08 0 0/170
Test Plan
Thread Group (20 users)
HTTP Request
Summary Report
View Results Tree
Thread Group (50 Users)
HTTP Request
Summary Report
View Results Tree
Thread Group (100 Users)
HTTP Request
Summary Report
View Results Tree
Summary Report
Name: Summary Report
Comments:
Write results to file / Read from file
Filename
Browse...
Log/Display Only: Errors Successes
Configure
Label # Samples Average Min Max Std. Dev. Error % Throughput Received KB... Sent KB/sec Avg. Bytes
HTTP Request 20 6 3 14 2.29 0.00% 4.2/sec 1.60 0.58 389.0
TOTAL 20 6 3 14 2.29 0.00% 4.2/sec 1.60 0.58 389.0
Include group name in label?
Save Table Data
Save Table Header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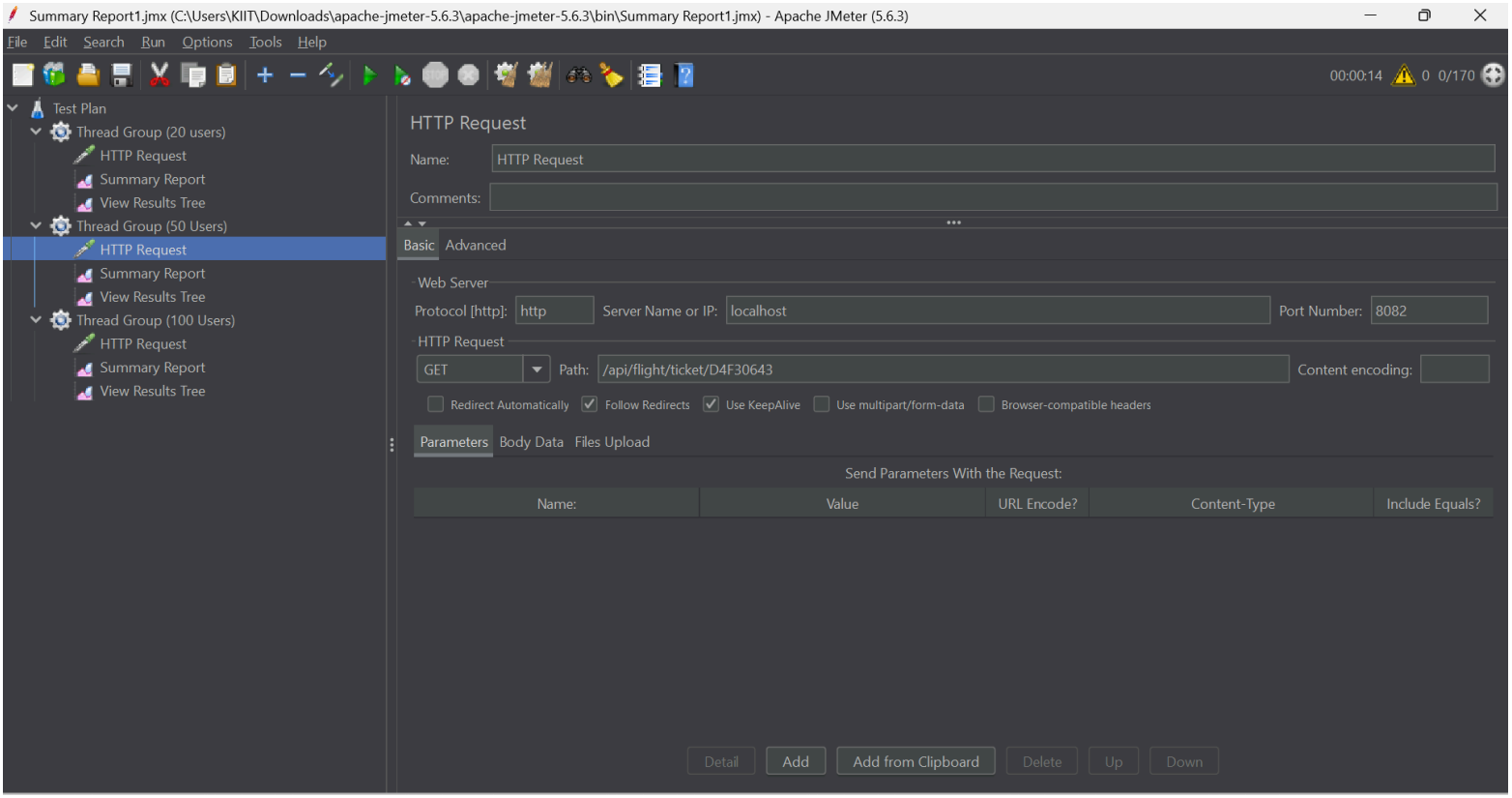
Write results to file / Read from file
Filename
Browse...
Log/Display Only: Errors Successes
Configure
Search:
Case sensitive
Regular exp.
Search
Reset
Text
Sampler result
HTTP Request
Scroll automatically?
Raw Parsed

2. 50 USERS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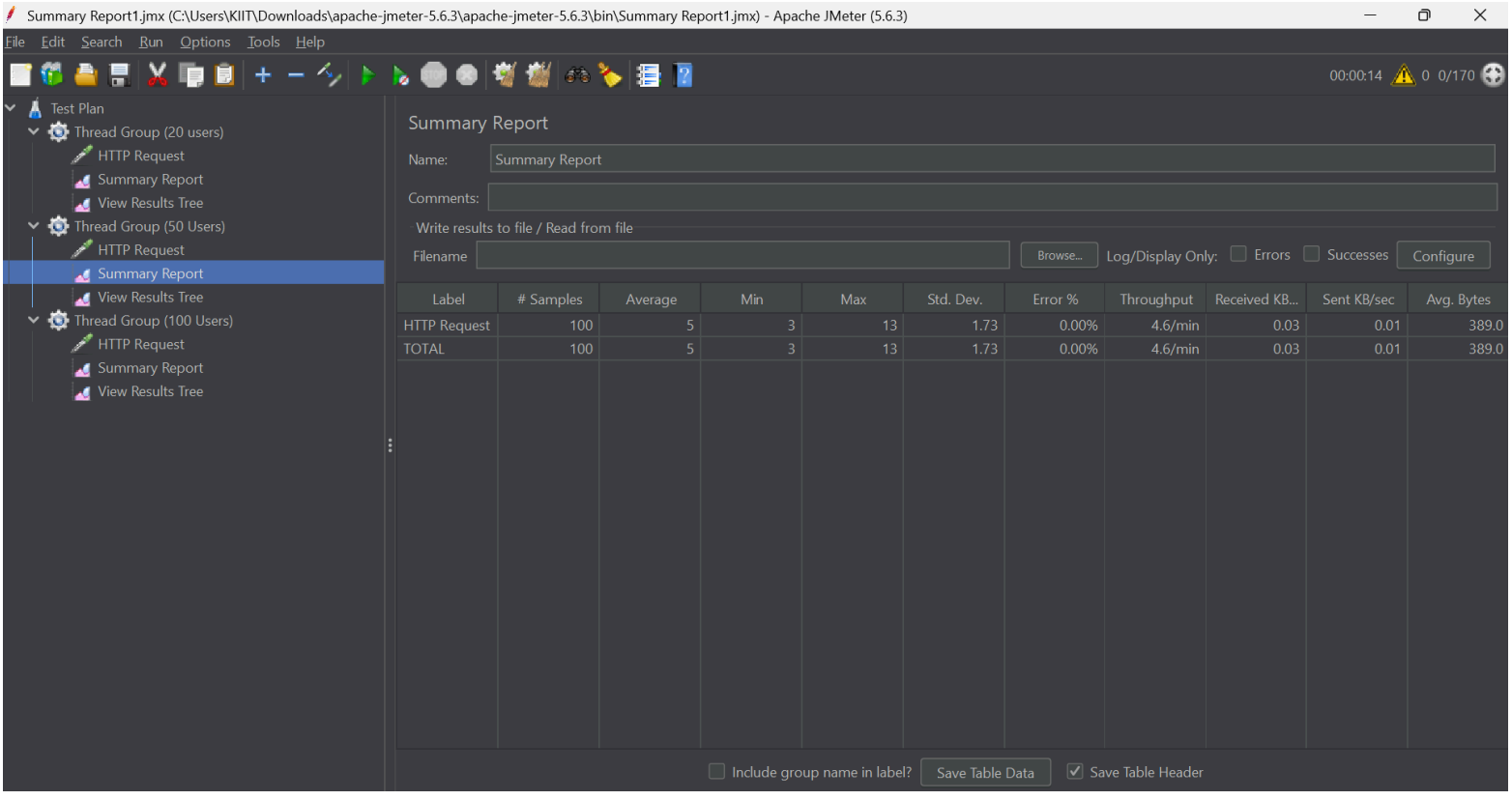
HTTP Request
Summary Report
View Results Tree
Thread Group (100 Users)
HTTP Request
Summary Report
View Results Tree
HTTP Request
Name: HTTP Request
Comments:
Basic Advanced
Web Server
Protocol [http]: http
Server Name or IP: localhost
Port Number: 8082
HTTP Request
GET
Path: /api/flight/ticket/D4F30643
Content encoding:
Redirect Automatically
Follow Redirects
Use KeepAlive
Use multipart/form-data
Browser-compatible headers
Parameters Body Data Files Upload
Send Parameters With the Request:
Name:
Value
URL Encode?
Content-Type
Include Equals?
Detail
Add
Add from Clipboard
Delete
Up
Down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HTTP Request
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View Results Tree
Summary Report
Name: Summary Report
Comments:
Write results to file / Read from file
Filename
Browse...
Log/Display Only:
Errors
Successes
Configure
Label # Samples Average Min Max Std. Dev. Error % Throughput Received KB... Sent KB/sec Avg. Bytes
HTTP Request 100 5 3 13 1.73 0.00% 4.6/min 0.03 0.01 389.0
TOTAL 100 5 3 13 1.73 0.00% 4.6/min 0.03 0.01 389.0
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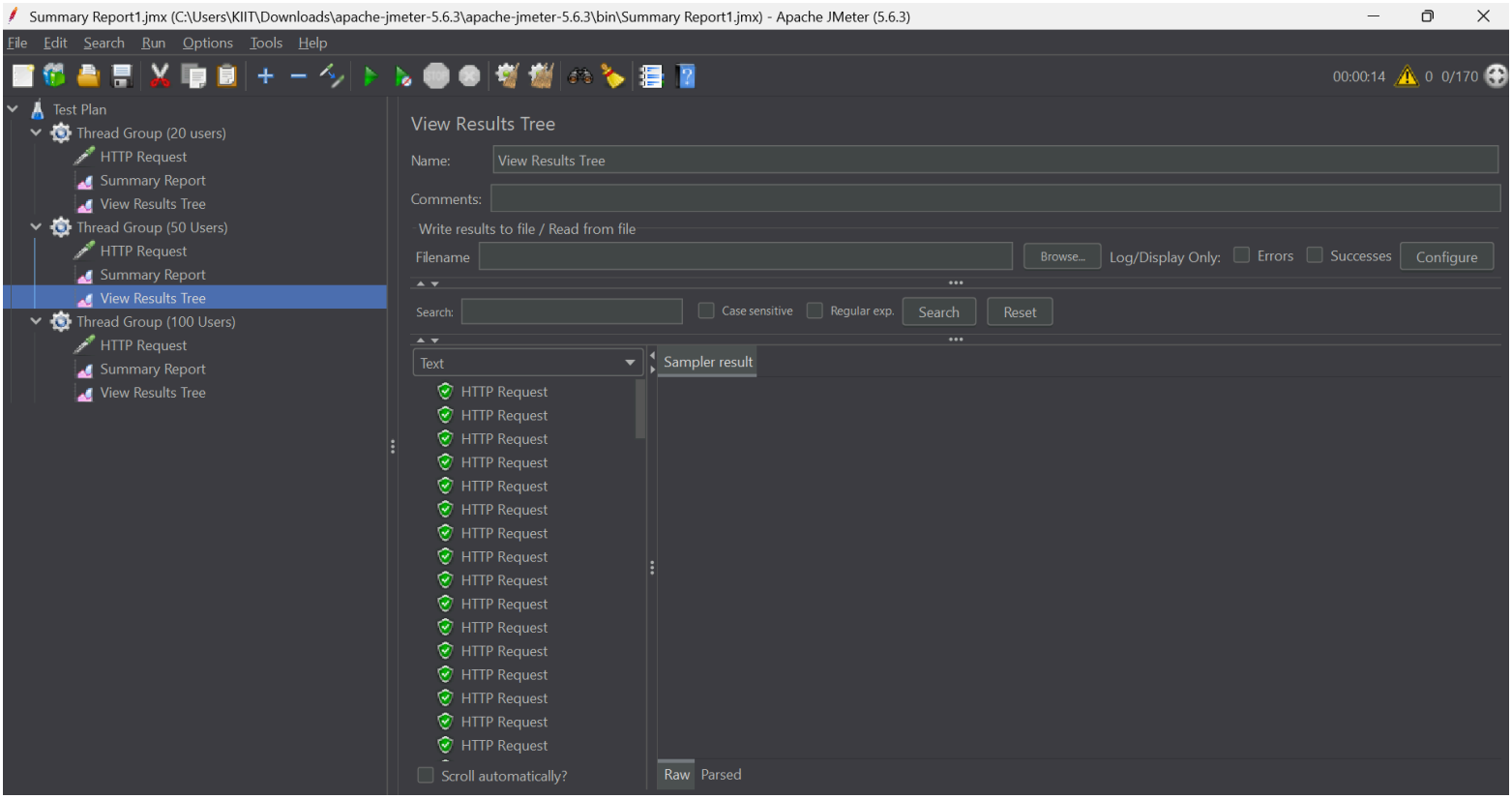
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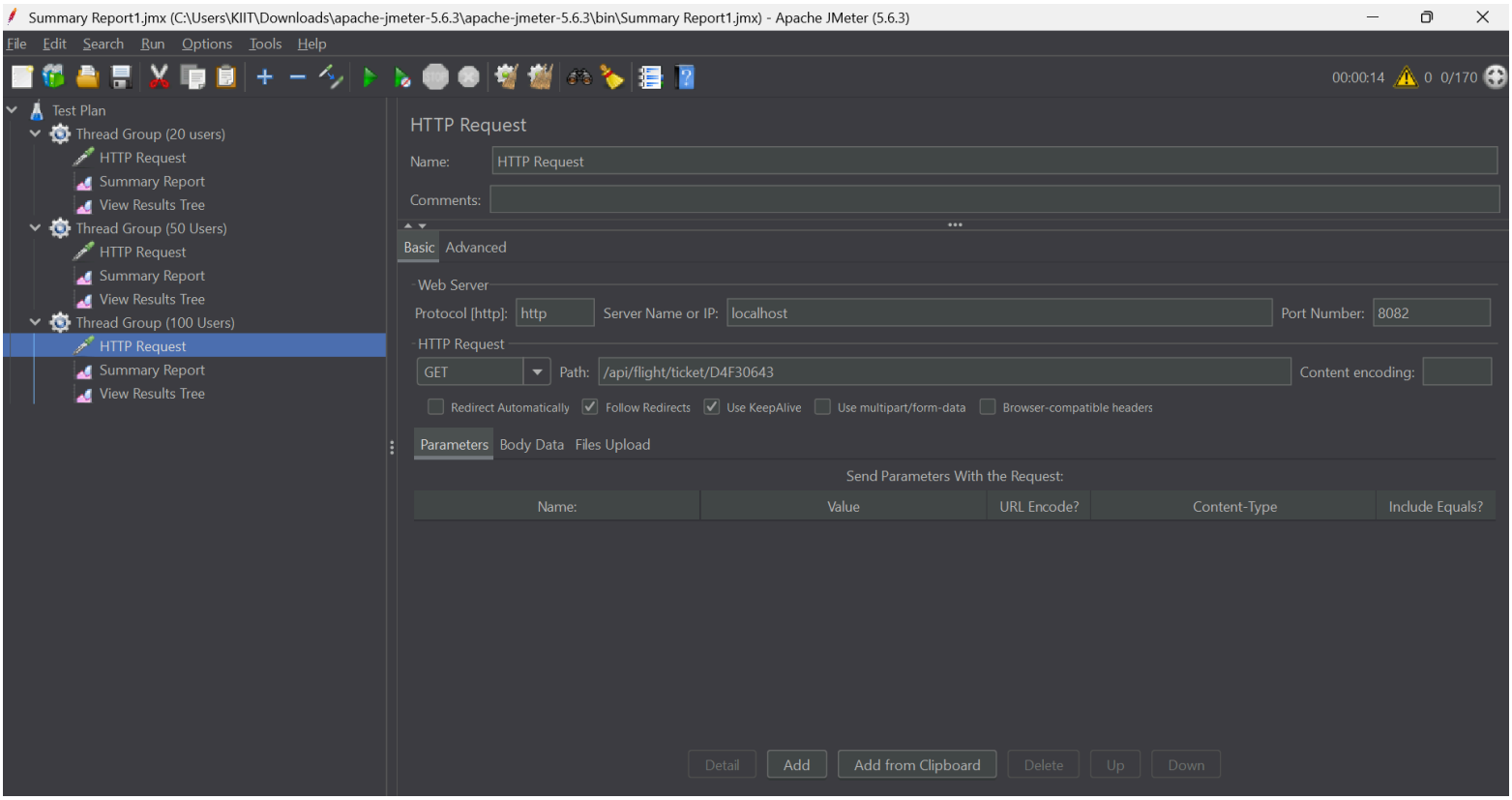
Filename
Browse...
Log/Display Only: Errors Successes
Configure
Search:
Case sensitive
Regular exp.
Search
Reset
Text
Sampler result
HTTP Request
Scroll automatically?
Raw
Parsed

3. 100 USERS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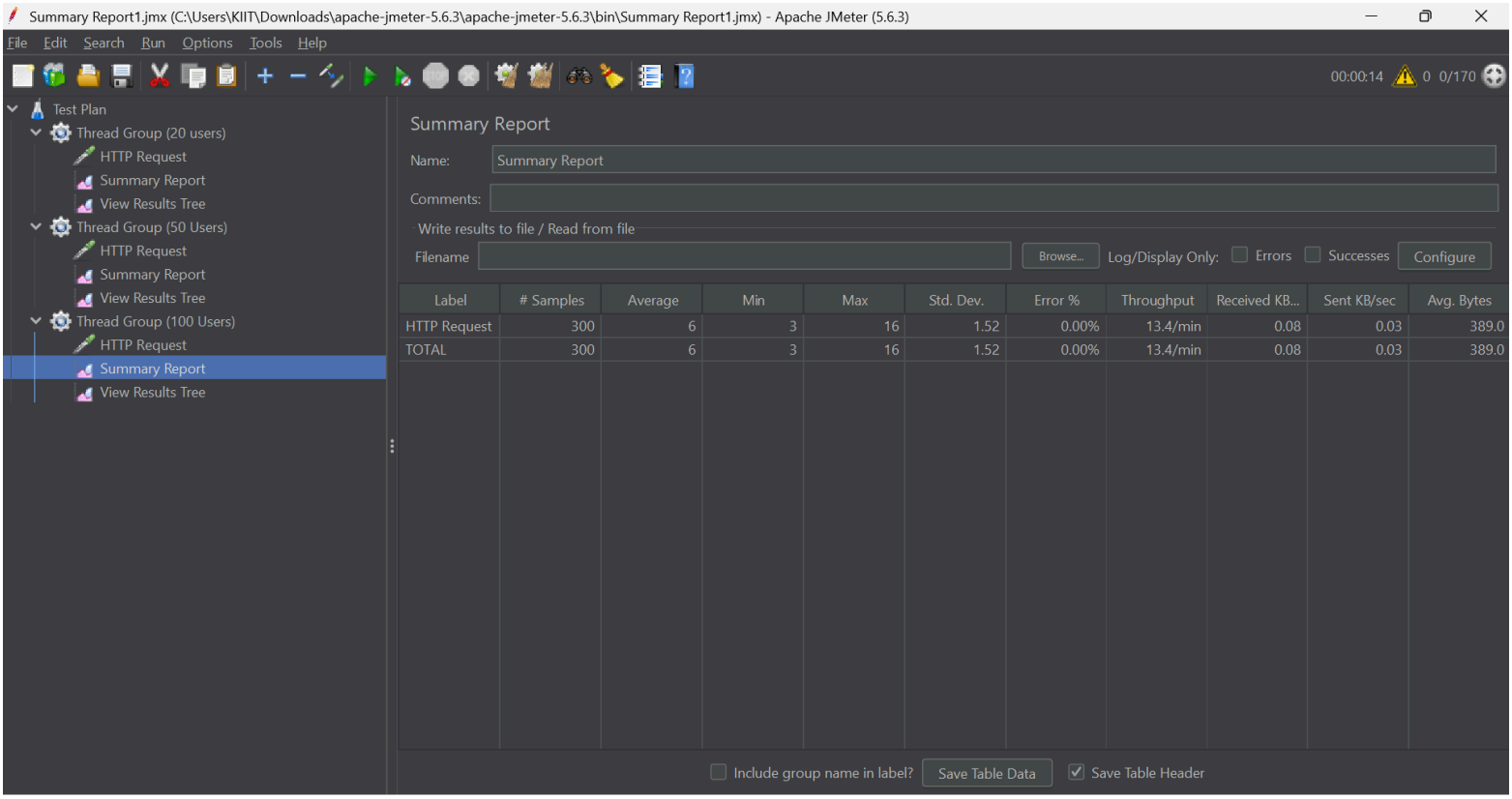
View Results Tree
Thread Group (100 Users)
HTTP Request
Summary Report
View Results Tree
HTTP Request
Name: HTTP Request
Comments:
Basic
Advanced
Web Server
Protocol [http]: http
Server Name or IP: localhost
Port Number: 8082
HTTP Request
GET
Path: /api/flight/ticket/D4F30643
Content encoding:
Redirect Automatically
Follow Redirects
Use KeepAlive
Use multipart/form-data
Browser-compatible headers
Parameters
Body Data
Files Upload
Send Parameters With the Request:
Name:
Value
URL Encode?
Content-Type
Include Equals?
Detail
Add
Add from Clipboard
Delete
Up
Down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Log/Display Only: Errors Successes
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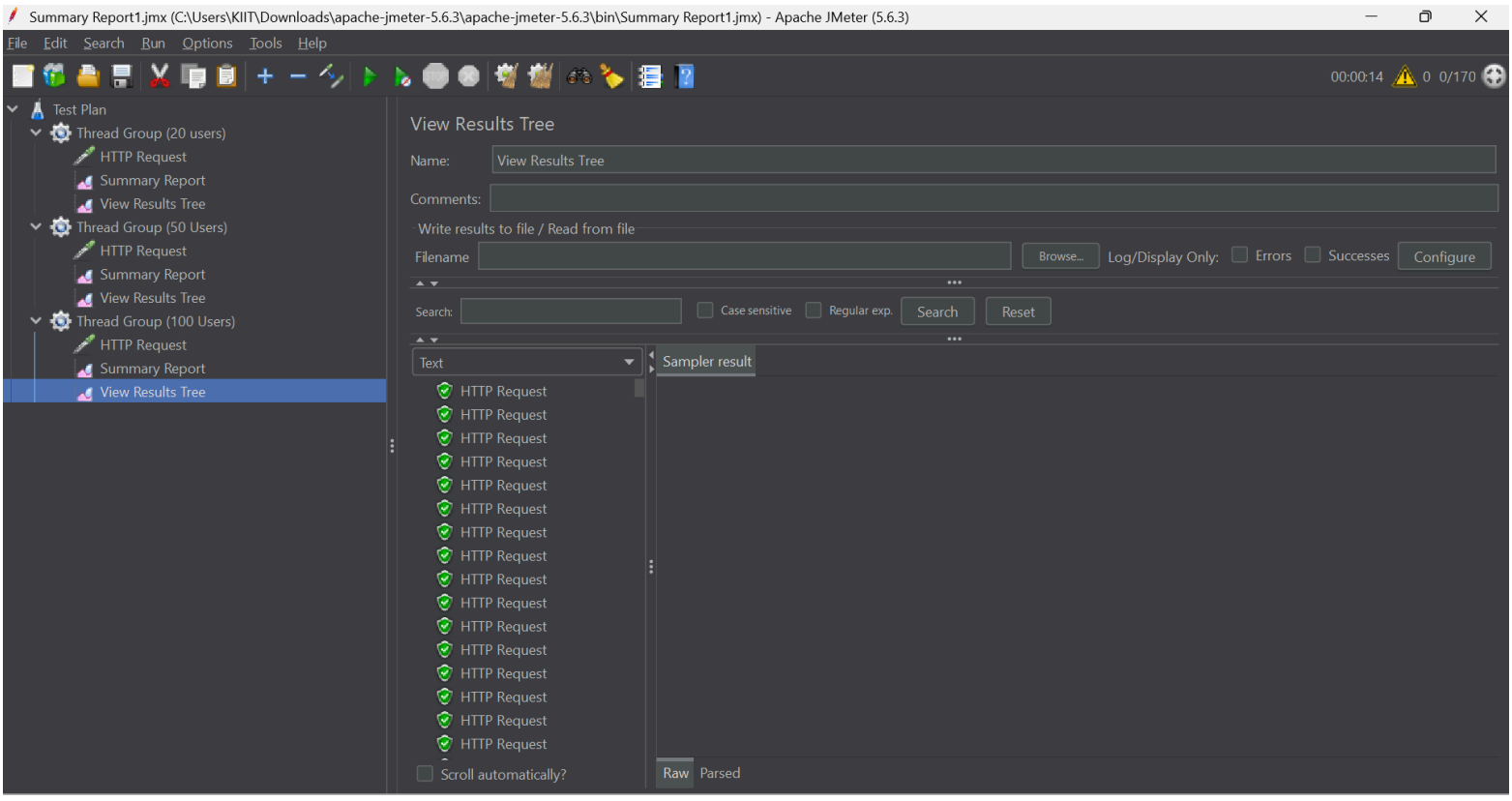
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Thread Group (100 Users)
HTTP Request
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View Results Tree
Name: View Results Tree
Comments:
Write results to file / Read from file
Filename
Browse...
Log/Display Only: Errors Successes
Configure
Search:
Case sensitive
Regular exp.
Search
Reset
Text
Sampler result
HTTP Request
Scroll automatically?
Raw Parsed