

Flight Management System Front-End Implementation

Week – 8

Assignment

Project Report
Important Screenshots

Role Based Access Control (RBAC): Admin

Login (Admin) :-

Flight Management Home Login Register

Login

Email

Password

Logged in as Admin

[Login](#)

Don't have an account? [Register here](#)

Admin Home Page – There is extra tabs like Add Airline & Add Flight which will be visible only if you login as admin

Flight Management Home Search Flights Add Airline Add Flight admin@gmail.com Change Password Logout



Flight Management System

Search, book, and manage flights with ease

Get started by searching for available flights or login to your account

[Login](#)



Search Flights

Find the best flights for your journey with our advanced search.



Book Tickets

Easy and secure online booking for domestic and international flights.



Manage Bookings

View and manage your flight bookings anytime, anywhere.

Add Airline

The header bar includes a logo, 'Flight Management' text, and links for 'Home', 'Search Flights', 'Add Airline', and 'Add Flight'. On the right, it shows 'john@gmail.com' and a 'Logout' button.

Add New Airline

Airline Name
e.g., IndiGo

Logo URL
https://example.com/logo.png

Airline added successfully!

Add Airline

Add airline Logs

X	Headers	Payload	Preview	Response	Initiator	Timing	Cookies
▼ General							
Request URL				http://localhost:8080/api/flight/airline			
Request Method				POST			
Status Code				201 Created			
Remote Address				[:1]:8080			
Referrer Policy				strict-origin-when-cross-origin			
▼ Response Headers			<input type="checkbox"/> Raw				
Access-Control-Allow-Credentials				true			
Access-Control-Allow-Origin				http://localhost:4200			
Access-Control-Expose-Headers				Authorization, Set-Cookie, Access-Control-Allow-Origin, Access-Control-Allow-Credentials			
Cache-Control				no-cache, no-store, max-age=0, must-revalidate			
Content-Length				28			
Content-Type				application/json			
Date				Mon, 15 Dec 2025 19:24:06 GMT			
Expires				0			
Pragma				no-cache			
Referrer-Policy				no-referrer			
Vary				Origin			

Add Flight

Flight Management [Home](#) [Search Flights](#) [Add Airline](#) [Add Flight](#)

admin@gmail.com [Change Password](#) [Logout](#)

Add Flight Inventory

Select Airline

Flight Number

From

To

Departure Time

Arrival Time

Price (₹)

Total Seats

Flight added successfully!

Add Flight

Name	Headers	Payload	Preview	Response	Initiator	Timing	Cookies
airlines	▼ General						
airlines	Request URL			http://localhost:8080/api/flight/airline/693a7609816df45a84d1d66a/inventory			
airlines	Request Method			POST			
airlines	Status Code			201 Created			
login	Remote Address			[::]:8080			
login	Referrer Policy			strict-origin-when-cross-origin			
login	▼ Response Headers	□ Raw					
login	Access-Control-Allow-Credentials			true			
login	Access-Control-Allow-Origin			http://localhost:4200			
login	Access-Control-Expose-Headers			Authorization, Set-Cookie, Access-Control-Allow-Origin, Access-Control-Allow-Credentials, X-USER-EMAIL, X-USER-ROLE			
login	Cache-Control			no-cache, no-store, max-age=0, must-revalidate			
airlines	Content-Length			35			
inventory	Content-Type			application/json			
	Date			Mon, 22 Dec 2025 23:10:11 GMT			
	Expires			0			
	Pragma			no-cache			
	Referrer-Policy			no-referrer			
	Vary			Origin			
				Access-Control-Request-Method			

Registering User: -

Flight Management Home Login Register

Full Name
Joy

Email
joy.sagarn@gmail.com

Password

Role
Customer

Registration successful! Redirecting to login...

Register

One or more settings have changed which requires a reload to take effect [Reload DevTools](#)

Elements Console Sources Network Performance Memory Application Privacy and security Lighthouse Recorder

Preserve log Disable cache No throttling

domain:localhost scheme:http

1,000,000 ms	2,000,000 ms	3,000,000 ms	4,000,000 ms	5,000,000 ms	6,000,000 ms	7,000,000 ms	8,000,000 ms	9,000,000 ms	10,000,000 ms	11,000,000 ms	12,000,000 ms	13,000,000 ms

Name	Headers	Payload	Preview	Response	Initiator	Timing	Cookies
component?c=src%2...	Request URL	http://localhost:8080/auth/register					
component?c=src%2...	Request Method	POST					
component?c=src%2...	Status Code	201 Created					
component?c=src%2...	Remote Address	[:1]:8080					
component?c=src%2...	Referrer Policy	strict-origin-when-cross-origin					
component?c=src%2...	Response Headers	Raw					
component?c=src%2...	Access-Control-Allow-Credentials	true					
component?c=src%2...	Access-Control-Allow-Origin	http://localhost:4200					
favicon.ico	Access-Control-Expose-Headers	Set-Cookie					
register	Cache-Control	no-cache, no-store, max-age=0, must-revalidate					
register	Content-Type	application/json					
register	Date	Mon, 15 Dec 2025 17:51:46 GMT					
register	Expires	0					
register	Pragma	no-cache					
register	Referrer-Policy	no-referrer					

92 / 97 requests | 1,303 kB

Login User

The header bar is blue with white text. It features a logo icon, the text "Flight Management", a "Home" link, and "Login" and "Register" links on the right.

Login

Email
joy.sagarn@gmail.com

Password
.....

Logged in as Customer

Login

Don't have an account? [Register here](#)

X	Headers	Payload	Preview	Response	Initiator	Timing	Cookies
▼ General							
Request URL				http://localhost:8080/auth/login			
Request Method				POST			
Status Code				200 OK			
Remote Address				[:1]:8080			
Referrer Policy				strict-origin-when-cross-origin			
▼ Response Headers	<input type="checkbox"/> Raw						
Access-Control-Allow-Credentials				true			
Access-Control-Allow-Origin				http://localhost:4200			
Access-Control-Expose-Headers				Set-Cookie			
Cache-Control				no-cache, no-store, max-age=0, must-revalidate			
Content-Type				application/json			
Date				Mon, 15 Dec 2025 14:01:15 GMT			
Expires				0 /			
Pragma				no-cache			
Referrer-Policy				no-referrer			
Set-Cookie				jwt=eyJhbGciOiJIUzI1NiJ9eyJzdWIiOiJzYXR5YXN3YXJvb3AyMjA3QGdtYWlsLmNvbSlzInJvbGUiOiJST0xFX0NVU1RPTUVSiiwiaWF0IjoxNzY1ODA3Mjc1LCJleHAiOjE3NjU4OTM2NzV9.IVvfeQag5cl1xQG7WY1EGPOVH9qNbJxXwFV2Q84ar4; Path=/; Max-Age=86400; Expires=Tue, 16 Dec 2025 14:01:15 GMT; HttpOnly; SameSite=Strict			

After Logging in as a Customer :-

Tabs such as Search Flights, View Ticket and My Booking appear

Flight Management Home Search Flights View Ticket My Bookings

joy.sagarn@gmail.com

Change Password

Logout



Flight Management System

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Get started by searching for available flights or login to your account

Login



Search Flights

Find the best flights for your journey with our advanced search.



Book Tickets

Easy and secure online booking for domestic and international flights.



Manage Bookings

View and manage your flight bookings anytime, anywhere.

Search Flights (For User) :-

Flight Management Home Search Flights View Ticket My Bookings

joy.sagarn@gmail.com Change Password Logout

Search Flights

From To Date

Bangalore Mumbai 12/25/2025

SpiceJet - AI137

Route: Bangalore → Mumbai
Departure: 25/12/2025, 05:00:00
Arrival: 25/12/2025, 07:15:00
Price: ₹4500
Available Seats: 117

DevTools - localhost:4200/login

Elements Console Sources Network Performance Memory Application Privacy and security Lighthouse Recorder

Preserve log Disable cache No throttling Invert More filters All Fetch/XHR Doc CSS JS Font Img Media Manifest Socket Wasm Other

Name	Headers	Payload	Preview	Response	Initiator	Timing	Cookies
airlines	▼ General						
airlines	Request URL	http://localhost:8080/api/flight/search					
airlines	Request Method	POST					
airlines	Status Code	200 OK					
login	Remote Address	[:1]:8080					
login	Referrer Policy	strict-origin-when-cross-origin					
login	▼ Response Headers	Access-Control-Allow-Credentials	true				
login		Access-Control-Allow-Origin	http://localhost:4200				
login		Access-Control-Expose-Headers	Authorization, Set-Cookie, Access-Control-Allow-Origin, Access-Control-Allow-Credentials, X-USER-EMAIL, X-USER-ROLE				
airlines		Cache-Control	no-cache, no-store, max-age=0, must-revalidate				
inventory		Content-Type	application/json				
login		Date	Mon, 22 Dec 2025 23:12:44 GMT				
search		Expires	0				
		Pragma	no-cache				
		Referrer-Policy	no-referrer				
		Transfer-Encoding	chunked				
		Vary	Origin				
			Access-Control-Request-Method				

16 / 604 requests | 12.2 kB / 56.230 kB transferred

Change Password Feature Added :-

Flight Management [Home](#) [Search Flights](#) [View Ticket](#) [My Bookings](#)

joy.sagarn@gmail.com

[Change Password](#)

[Logout](#)

Change Password

Current Password

New Password

Confirm New Password

Change Password

[Cancel](#)

Name	X	Headers	Payload	Preview	Response	Initiator	Timing	Cookies
airlines		▼ General						
airlines		Request URL			http://localhost:8080/auth/change-password			
airlines		Request Method			POST			
airlines		Status Code			200 OK			
login		Remote Address			[::1]:8080			
login		Referrer Policy			strict-origin-when-cross-origin			
login		▼ Response Headers		□ Raw				
login		Access-Control-Allow-Credentials			true			
login		Access-Control-Allow-Origin			http://localhost:4200			
login		Access-Control-Expose-Headers			Authorization, Set-Cookie, Access-Control-Allow-Origin, Access-Control-Allow-Credentials, X-USER-EMAIL, X-USER-ROLE			
airlines		Cache-Control			no-cache, no-store, max-age=0, must-revalidate			
inventory		Content-Type			application/json			
login		Date			Mon, 22 Dec 2025 23:22:01 GMT			
search		Expires			0			
login		Pragma			no-cache			
login		Referrer-Policy			no-referrer			
change-password		Transfer-Encoding			chunked			
change-password		Vary			Origin			
20 / 746 requests		Vary			Access-Control-Request-Method			

Booking History Tab Added

Flight Management [Home](#) [Search Flights](#) [View Ticket](#) [My Bookings](#)

joy.sagarn@gmail.com

[Change Password](#)

[Logout](#)

My Booking History

PNR: C5789BDE	CANCELLED
Email: joy.sagarn@gmail.com	
Flight ID: 6944ca5f48f05d0d261c9cdd	
Seats Booked: 1	
Booking Time: Dec 19, 2025, 4:43:21 AM	
Cancelled At: Dec 20, 2025, 5:56:42 AM	
View Details	

PNR: DEFC4B30	CONFIRMED
Email: joy.sagarn@gmail.com	
Flight ID: 6944ca5f48f05d0d261c9cdd	
Seats Booked: 1	
Booking Time: Dec 19, 2025, 5:02:42 AM	
View Details	Cancel Booking

PNR: 550B40B9	CONFIRMED
Email: joy.sagarn@gmail.com	
Flight ID: 6944ca5f48f05d0d261c9cdd	

Name	X	Headers	Preview	Response	Initiator	Timing	Cookies
airlines	X						
airlines	X						
airlines	⌚						
login	⌚						
login	X						
login	X						
login	X						
login	X						
login	X						
login	X						
login	X						
airlines	⌚						
inventory	⌚						
login	⌚						
search	⌚						
login	⌚						
login	⌚						
change-password	⌚						
change-password	⌚						
joy.sagarn@gmail.com	⌚						
joy.sagarn@gmail.com	⌚						

22 / 750 requests | 19.2 kB / 69,518 kB transferred

Booking Flight

Flight Management [Home](#) [Search Flights](#) [View Ticket](#) [My Bookings](#)

joy.sagarn@gmail.com

[Change Password](#)

[Logout](#)

Flight Details

Flight: SpiceJet - AI137

Departure: 25/12/2025, 05:00:00

Route: Bangalore → Mumbai

Price per seat: ₹4500

Available Seats: 117

Book Your Flight

Email Address *

Enter your email

Passenger Details

[Add Passenger](#)

Passenger 1

[Remove](#)

Full Name *

Enter passenger name

Gender *

Select

Age *

Age

localhost:4200/book-flight/6944ca5f48f05d0d261c9cdd

Book Your Flight

Email Address *

joy.sagarn@gmail.com

Passenger Details

[Add Passenger](#)

Passenger 1

[Remove](#)

Full Name *

John

Gender *

Male

Age *

19

Seat Number *

16S

Meal Preference *

Non-Vegetarian

Total Amount: ₹4500 (1 passenger)

 **Booking Successful!**

PNR: AA067D49

Confirmation email sent to joy.sagarn@gmail.com

The screenshot shows the Chrome DevTools Network tab. A POST request to `http://localhost:8080/api/book/book` has been made. The response status is `201 Created`. The response headers include:

Header	Value
Access-Control-Allow-Credentials	true
Access-Control-Allow-Origin	http://localhost:4200
Access-Control-Expose-Headers	Authorization, Set-Cookie, Access-Control-Allow-Origin, Access-Control-Allow-Credentials, X-USER-EMAIL, X-USER-ROLE
Cache-Control	no-cache, no-store, max-age=0, must-revalidate
Content-Type	application/json
Date	Mon, 22 Dec 2025 23:28:45 GMT
Expires	0
Pragma	no-cache
Referrer-Policy	no-referrer
Transfer-Encoding	chunked
Vary	Origin
Vary	Access-Control-Request-Method

Request Headers:

Header	Value
Accept	*/*
Accept-Encoding	gzip, deflate, br
Accept-Language	en-US,en;q=0.9
Connection	keep-alive
Content-Type	application/json
Cookie	sessionToken=6944ca5f48f05d0d261c9cdd; email=joy.sagarn@gmail.com; role=ADMIN
Host	localhost:8080
Origin	http://localhost:4200
Referer	http://localhost:4200/api/book/book
User-Agent	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/120.0.0.0 Safari/537.36

DockerFile Optimization :-

```
FROM eclipse-temurin:17-jdk-alpine
WORKDIR /app
```



```
EXPOSE 8080
```

```
ENTRYPOINT ["java","-jar","/app/app.jar"]
```

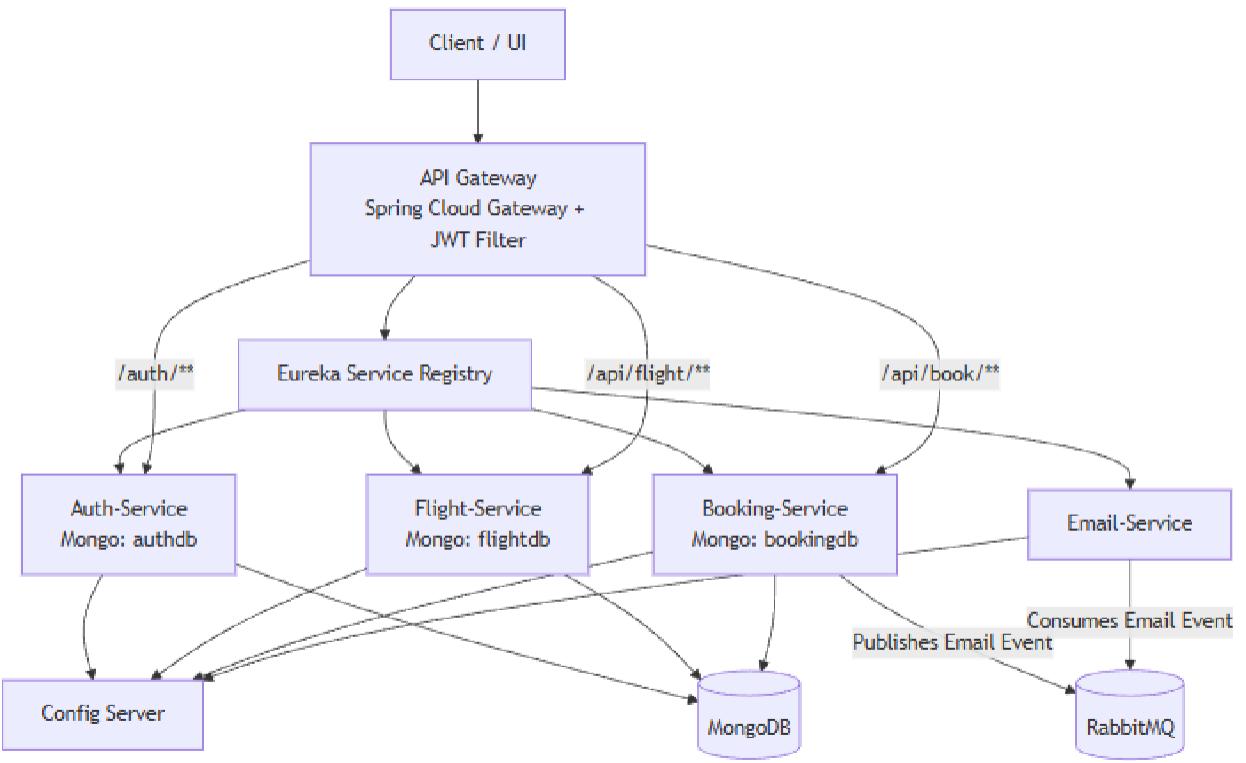
After Optimization

```
FROM eclipse-temurin:17-jdk-alpine
WORKDIR /app

COPY target/api-gateway-0.0.1-SNAPSHOT.jar app.jar

EXPOSE 8080
ENTRYPOINT ["java", "-jar", "/app/app.jar"]
```

MicroServices Architecture



All my microservices are deployed in docker and running from there:-

The screenshot shows a list of Docker containers running on port 8080. Each service is associated with a MongoDB instance. The services listed are:

- service-registry (flightmanagements) 8761:8761
- auth-service (flightmanagements) 8001:8001
- booking-service (flightmanagements) 8082:8082
- flight-service (flightmanagements) 8081:8081
- email-service (flightmanagements) 8084:8084
- api-gateway (flightmanagements) 8080:8080

Each service entry includes a blue square icon, a three-dot menu icon, and a trash icon. To the right of the list, detailed log entries for the mongo-db instances are displayed. The logs show MongoDB checkpoints at various timestamps.

```

{"t": {"$date": "2025-12-15T17:02:18.506+00:00"}, "s": "I", "c": "WTCHKPT", "id": 22430, "ctx": "Checkpointer", "msg": "WiredTiger message", "attr": {"message": {"ts_sec": 1765818138, "ts_usec": 506152, "thread": "1:0x7f43ff668640", "session_name": "WT_SESSION.checkpoint", "category": "WT_VERB_CHECKPOINT_PROGRESS", "category_id": 6, "verbose_level": "DEBUG", "verbose_level_id": 1, "msg": "saving checkpoint snapshot min: 376, snapshot max: 376 snapshot count: 0, oldest timestamp: (0, 0), meta checkpoint timestamp: (0, 0) base write gen: 1038"}}}
```

```

{"t": {"$date": "2025-12-15T17:03:18.518+00:00"}, "s": "I", "c": "WTCHKPT", "id": 22430, "ctx": "Checkpointer", "msg": "WiredTiger message", "attr": {"message": {"ts_sec": 1765818198, "ts_usec": 518451, "thread": "1:0x7f43ff668640", "session_name": "WT_SESSION.checkpoint", "category": "WT_VERB_CHECKPOINT_PROGRESS", "category_id": 6, "verbose_level": "DEBUG", "verbose_level_id": 1, "msg": "saving checkpoint snapshot min: 378, snapshot max: 378 snapshot count: 0, oldest timestamp: (0, 0), meta checkpoint timestamp: (0, 0) base write gen: 1038"}}}
```

```

{"t": {"$date": "2025-12-15T17:04:18.537+00:00"}, "s": "I", "c": "WTCHKPT", "id": 22430, "ctx": "Checkpointer", "msg": "WiredTiger message", "attr": {"message": {"ts_sec": 1765818258, "ts_usec": 537321, "thread": "1:0x7f43ff668640", "session_name": "WT_SESSION.checkpoint", "category": "WT_VERB_CHECKPOINT_PROGRESS", "category_id": 6, "verbose_level": "DEBUG", "verbose_level_id": 1, "msg": "saving checkpoint snapshot min: 378, snapshot max: 378 snapshot count: 0, oldest timestamp: (0, 0), meta checkpoint timestamp: (0, 0) base write gen: 1038"}}}
```

RAM 5.79 GB CPU 16.63% Disk: 21.34 GB used (limit 1006.85 GB)

> Terminal Update available

The screenshot shows a list of Docker containers running on port 8080 for a flight management system with JWT Docker. Each service is associated with a MongoDB instance. The services listed are:

- mongo-db (mongo:6) 27017:27017
- rabbitmq (rabbitmq:3-management) 15672:15672
- config-server (flightmanagements) 8888:8888
- service-registry (flightmanagements) 8761:8761
- auth-service (flightmanagements) 8001:8001
- booking-service (flightmanagements) 8082:8082
- flight-service (flightmanagements) 8081:8081

Each service entry includes a blue square icon, a three-dot menu icon, and a trash icon. To the right of the list, detailed log entries for the mongo-db instances are displayed. The logs show MongoDB checkpoints at various timestamps.

```

timestamp: (0, 0), meta checkpoint timestamp: (0, 0) base write gen: 1038}}}
```

```

{"t": {"$date": "2025-12-15T17:02:18.506+00:00"}, "s": "I", "c": "WTCHKPT", "id": 22430, "ctx": "Checkpointer", "msg": "WiredTiger message", "attr": {"message": {"ts_sec": 1765818138, "ts_usec": 506152, "thread": "1:0x7f43ff668640", "session_name": "WT_SESSION.checkpoint", "category": "WT_VERB_CHECKPOINT_PROGRESS", "category_id": 6, "verbose_level": "DEBUG", "verbose_level_id": 1, "msg": "saving checkpoint snapshot min: 376, snapshot max: 376 snapshot count: 0, oldest timestamp: (0, 0), meta checkpoint timestamp: (0, 0) base write gen: 1038"}}}
```

```

{"t": {"$date": "2025-12-15T17:03:18.518+00:00"}, "s": "I", "c": "WTCHKPT", "id": 22430, "ctx": "Checkpointer", "msg": "WiredTiger message", "attr": {"message": {"ts_sec": 1765818198, "ts_usec": 518451, "thread": "1:0x7f43ff668640", "session_name": "WT_SESSION.checkpoint", "category": "WT_VERB_CHECKPOINT_PROGRESS", "category_id": 6, "verbose_level": "DEBUG", "verbose_level_id": 1, "msg": "saving checkpoint snapshot min: 378, snapshot max: 378 snapshot count: 0, oldest timestamp: (0, 0), meta checkpoint timestamp: (0, 0) base write gen: 1038"}}}
```

```

{"t": {"$date": "2025-12-15T17:04:18.537+00:00"}, "s": "I", "c": "WTCHKPT", "id": 22430, "ctx": "Checkpointer", "msg": "WiredTiger message", "attr": {"message": {"ts_sec": 1765818258, "ts_usec": 537321, "thread": "1:0x7f43ff668640", "session_name": "WT_SESSION.checkpoint", "category": "WT_VERB_CHECKPOINT_PROGRESS", "category_id": 6, "verbose_level": "DEBUG", "verbose_level_id": 1, "msg": "saving checkpoint snapshot min: 378, snapshot max: 378 snapshot count: 0, oldest timestamp: (0, 0), meta checkpoint timestamp: (0, 0) base write gen: 1038"}}}
```

These are my services which are registered in service registry

Instances currently registered with Eureka			
Application	AMIs	Availability Zones	Status
API-GATEWAY	n/a (1)	(1)	UP (1) - DESKTOP-U2KN9DC:api-gateway:8080
AUTH-SERVICE	n/a (1)	(1)	UP (1) - DESKTOP-U2KN9DC:auth-service:8001
BOOKING-SERVICE	n/a (1)	(1)	UP (1) - DESKTOP-U2KN9DC:booking-service:8082
EMAIL-SERVICE	n/a (1)	(1)	UP (1) - DESKTOP-U2KN9DC:email-service:8084
FLIGHT-SERVICE	n/a (1)	(1)	UP (1) - DESKTOP-U2KN9DC:flight-service:8081
FMS-CONFIG-SERVER	n/a (1)	(1)	UP (1) - DESKTOP-U2KN9DC:fms-config-server:8888

General Info	
Name	Value
total-avail-memory	72mb
num-of-cpus	12
current-memory-usage	48mb (66%)

I have added Authentication Endpoints such as :-
Register User – Customer (Books Flights)

POST http://localhost:8080/auth/register

Docs Params Authorization Headers (9) Body Scripts Settings

none form-data x-www-form-urlencoded raw binary GraphQL JSON

```
1 {  
2   "name": "Joel",  
3   "email": "joel@example.com",  
4   "password": "password123",  
5   "role": "ROLE_CUSTOMER"  
6 }
```

Body Cookies Headers (13) Test Results |

201 Created

Raw Preview Visualize

1 User created

Register Admin (Add Flights and Airlines)

POST http://localhost:8080/auth/register

Docs Params Authorization Headers (9) Body Scripts Settings

none form-data x-www-form-urlencoded raw binary GraphQL JSON

```
1 {  
2   "name": "Raj",  
3   "email": "Raj@example.com",  
4   "password": "password123",  
5   "role": "ROLE_ADMIN"  
6 }
```

Body Cookies Headers (13) Test Results |

201 Created

Raw Preview Visualize

1 User created

Login

The screenshot shows a POST request to `http://localhost:8080/auth/login`. The request body is:

```
1 {  
2   "email": "joel@example.com",  
3   "password": "password123"  
4 }
```

The response status is `200 OK` with a response time of 158 ms and a response size of 944 B. The response body is:

```
1 {  
2   "token": "eyJhbGciOiJIUzI1NiJ9.  
3     eyJzdWIiOiJqb2VsQGV4YW1wbGUuY29tIiwicm9sZSI6IlJPTEVfQ1VTVE9NRVIiLCJpYXQiOjE3NjUyMjExMDMsImV4cCI  
4     6MTc2NTMwNzUwM30.oXM7aN6m32Y8Gwba03ZyzJ1ujj1myakA00jAtyfc0iw",  
5   "tokenType": "Bearer",  
6   "email": "joel@example.com",  
7   "role": "ROLE_CUSTOMER"  
8 }
```

Logout

The screenshot shows a POST request to `http://localhost:8080/auth/logout`. The request body is:

Body Cookies Headers (14) Test Results |

200 OK • 374 ms

Raw ▾ Preview Visualize |

1 Logged out successfully

I have implemented Role Based Authentication so if a customer tries to access Admin Endpoints it will return 401 Error

The screenshot shows a REST client interface with the following details:

- HTTP:** Flight Management System - Microservices (With Auth) / Flight S... / Add Airline (Admin)
- Method:** POST
- URL:** http://localhost:8080/api/flight/airline
- Headers:** (10)
- Body:** (1)
- Query Params:** (Empty table)
- Body Content:** (Raw) 1
- Status:** 401 Unauthorized • 18 ms

MongoDB – AuthDB

The screenshot shows the MongoDB Compass interface. The top navigation bar has 'spring-boot' > 'authdb' > 'users'. Below the navigation is a toolbar with 'Documents' (0), 'Aggregations', 'Schema', 'Indexes' (1), and 'Validation'. A search bar says 'Type a query: { field: 'value' } or [Generate query](#)'. Below the search bar are buttons for creating (+), updating (edit), and deleting (trash). On the right, it shows '25' documents, '1-1 of 1', and a back arrow. The main area displays a single document:

```
_id: ObjectId('6937208ecd6b645dda0ff905')
name : "Joel"
email : "joel@example.com"
password : "$2a$10$G0jIkPH08mqgp8WAIJdKS0VhA43ljtCRsXK9C3iSWv.rI9NLmJM4u"
role : "ROLE_CUSTOMER"
_class : "com.example.fms.auth.model.User"
```

BookingDB

The screenshot shows the MongoDB Compass interface. The top navigation bar has 'spring-boot' > 'bookingdb' > 'bookings'. Below the navigation is a toolbar with 'Documents' (7), 'Aggregations', 'Schema', 'Indexes' (1), and 'Validation'. A search bar says 'Type a query: { field: 'value' } or [Generate query](#)'. Below the search bar are buttons for creating (+), updating (edit), and deleting (trash). On the right, it shows '7' documents, '1-1 of 7', and a back arrow. The main area displays a single document:

```
_id: ObjectId('692e09b516c49c0911074fde')
pnr : "EC2AEC3E"
email : "joel@example.com"
flightId : "692e07c458e0122b39e5e1d2"
seatsBooked : 1
bookingTime : 2025-12-01T21:33:41.227+00:00
canceled : true
canceledAt : 2025-12-02T00:35:59.871+00:00
_class : "com.example.fms.booking.model.Booking"
```

spring-boot > bookingdb > passengers

Documents 9

Aggregations

Schema

Indexes 1

Validation



Type a query: { field: 'value' } or [Generate query](#)



25

```
_id: ObjectId('692e09b516c49c0911074fdf')
name : "Joel"
gender : "Male"
age : 22
seatNumber : "11A"
meal : "VEG"
bookingId : "692e09b516c49c0911074fde"
_class : "com.example.fms.booking.model.Passenger"
```

FlightDB

spring-boot > flightdb > airlines

Documents 5

Aggregations

Schema

Indexes 1

V



Type a query: { field: 'value' } or [Generate query](#)



```
_id: ObjectId('692e070f58e0122b39e5e1d1')
name : "Indigo"
logoUrl : "https://airindia.com/logo.png"
_class : "com.example.fms.flight.model.Airline"
```

Documents 4

Aggregations

Schema

Indexes 1

Validation



Type a query: { field: 'value' } or [Generate query](#) +:

Ex



25

1

```
_id: ObjectId('692e07c458e0122b39e5e1d2')
flightNumber : "AI101"
fromPlace : "Bangalore"
toPlace : "Mumbai"
departureTime : 2025-12-14T23:30:00.000+00:00
arrivalTime : 2025-12-15T01:45:00.000+00:00
price: 4500
totalSeats : 120
availableSeats : 110
airlineId : "692e070f58e0122b39e5e1d1"
_class : "com.example.fms.flight.model.Flight"
```

I have used RabbitMQ as my Message Broker to send emails

Containers [Give feedback](#)

Show charts

Container CPU usage

0.65% / 1200% (12 CFUs available)

Container memory usage

156MB / 6.54GB

Search



Only show running containers

<input type="checkbox"/>	Name	Container ID	Image	Port(s)	CPU (%)	Last started	Actions
<input type="checkbox"/>	rabbitmq	d62f89d2be6b	rabbitmq:3-management	15672:15672	0.27%	5 hours ago	

[Overview](#)
[Connections](#)
[Channels](#)
[Exchanges](#)
[Queues and Streams](#)
[Admin](#)

Queues

[▼ All queues \(1\)](#)

Pagination

 Page of 1 - Filter: Regex ? [?](#)

Overview					Messages				Message rates			+/-
Virtual host	Name	Type	Features	State	Ready	Unacked	Total	incoming	deliver / get	ack		
/	email.queue	classic	D	running	0	0	0	0.00/s	0.00/s	0.00/s		

[▶ Add a new queue](#)
[HTTP API](#)
[Documentation](#)
[Tutorials](#)
[New releases](#)
[Commercial edition](#)
[Commercial support](#)
[Discussions](#)
[Discord](#)
[F](#)

Connections

[▼ All connections \(2\)](#)

Pagination

 Page of 1 - Filter: Regex ? [?](#)

Overview			Details				Network		+/-
Name	User name	State	SSL / TLS	Protocol	Channels	From client	To client		
172.17.0.1:43606 rabbitConnectionFactory#3909a854:0	guest	running	○	AMQP 0-9-1	1	0 B/s	0 B/s		
172.17.0.1:58122 rabbitConnectionFactory#14fded9d:0	guest	running	○	AMQP 0-9-1	1	2 B/s	2 B/s		

[HTTP API](#)
[Documentation](#)
[Tutorials](#)
[New releases](#)
[Commercial edition](#)
[Commercial support](#)
[Discussions](#)
[Discord](#)

This is the email that it will send when you book or cancel a ticket

Booking Confirmed

Inbox ×

J

joelphilip208@gmail.com

to joel ▾

Your flight booking is confirmed.

PNR: F54F5B8B



Mail Delivery Subsystem <mailer-daemon@googlemail.com>

to me ▾



Address not found

Your message wasn't delivered to **joel@example.com** because the domain [example.com](#) couldn't be found. Check for typos or unnecessary spaces and try again.

LEARN MORE

▲ This link will take you to a third-party site

```
: EMAIL SERVICE → Using SMTP user: joelphilip208@gmail.com
: Attempting to send email to: joel@example.com
: Email sent successfully to joel@example.com
: Received EmailEvent from RabbitMQ: EmailEvent[to=joel@example.com, subject=Booking Confirmed, body=Your flight booking is confirmed.

: EMAIL SERVICE → Using SMTP user: joelphilip208@gmail.com
: Attempting to send email to: joel@example.com
: Email sent successfully to joel@example.com
: Received EmailEvent from RabbitMQ: EmailEvent[to=joel@example.com, subject=Booking Cancelled, body=Your booking has been cancelled.
```

I have used SMTP to do it and I put my credentials in my run configurations

The screenshot shows an email inbox with two messages. The first message is from 'joelphilip208@gmail.com' with the subject 'Booking Cancelled'. It contains the text: 'Your booking has been cancelled. PNR: F54F5B8B'. The second message is from 'Mail Delivery Subsystem <mailer-daemon@googlemail.com>' with the subject 'to me'. It displays an error message: 'Address not found' with the text: 'Your message wasn't delivered to **joel@example.com** because the domain example.com couldn't be found. Check for typos or unnecessary spaces and try again.' Below this, there is a 'LEARN MORE' link.

I have used newman tool to test my API end points and every request gave a valid response

```
C:\Users\Hp\OneDrive\Documents\Postman - Collections>newman --version
6.2.1

C:\Users\Hp\OneDrive\Documents\Postman - Collections>newman run FlightManagementSystem-Microservices.postman_collection.json
newman
```

```

Flight Management System - Microservices

□ Health Check
└ API Gateway Health
    GET http://localhost:8080/actuator/health [200 OK, 114B, 235ms]

└ Eureka Server UI
    GET http://localhost:8761 [200 OK, 6.08kB, 153ms]

□ Flight Service (via API Gateway)
└ Add Airline (Admin)
    POST http://localhost:8080/api/flight/airline [201 Created, 149B, 529ms]

└ Add Flight Inventory (Admin)
    POST http://localhost:8080/api/flight/airline/692e070f58e0122b39e5e1d1/inventory [201 Created, 156B, 53ms]

└ Search Flights (User)
    POST http://localhost:8080/api/flight/search [200 OK, 583B, 34ms]

└ Get Flight Details
    GET http://localhost:8080/api/flight/details/692e07c458e0122b39e5e1d2 [200 OK, 342B, 18ms]

□ Booking Service (via API Gateway)
└ Book Flight
    POST http://localhost:8080/api/book/book [201 Created, 222B, 634ms]

└ Cancel Booking
    DELETE http://localhost:8080/api/book/cancel/EC2AEC3E [200 OK, 155B, 83ms]

└ Booking History
    GET http://localhost:8080/api/book/history/joel@example.com [200 OK, 595B, 28ms]

└ Get Ticket
    GET http://localhost:8080/api/book/ticket/EC2AEC3E [200 OK, 648B, 36ms]

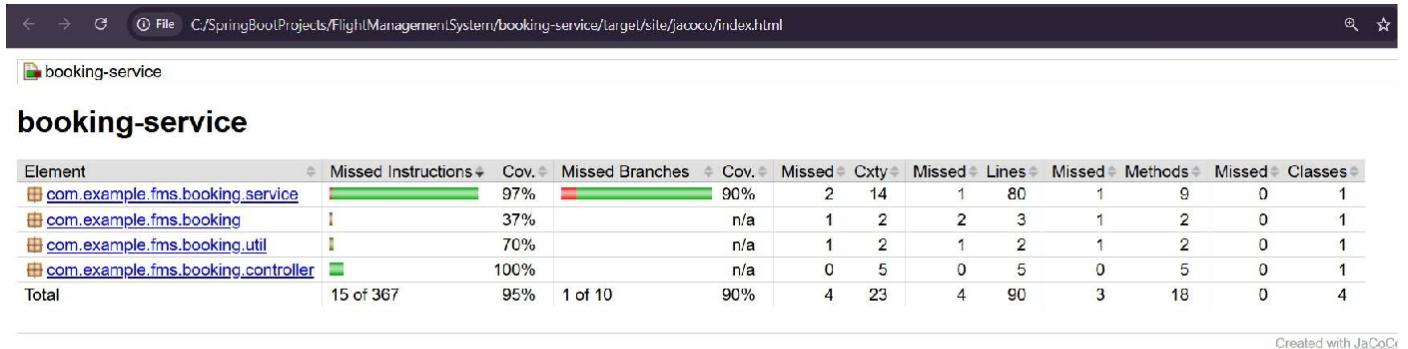
```

	executed	failed
iterations	1	0
requests	10	0
test-scripts	0	0
prerequest-scripts	0	0
assertions	0	0
total run duration:	1007ms	
total data received:	8.21kB (approx)	
average response time:	16ms [min: 10ms, max: 29ms, s.d.: 6ms]	

JaCoCo Report

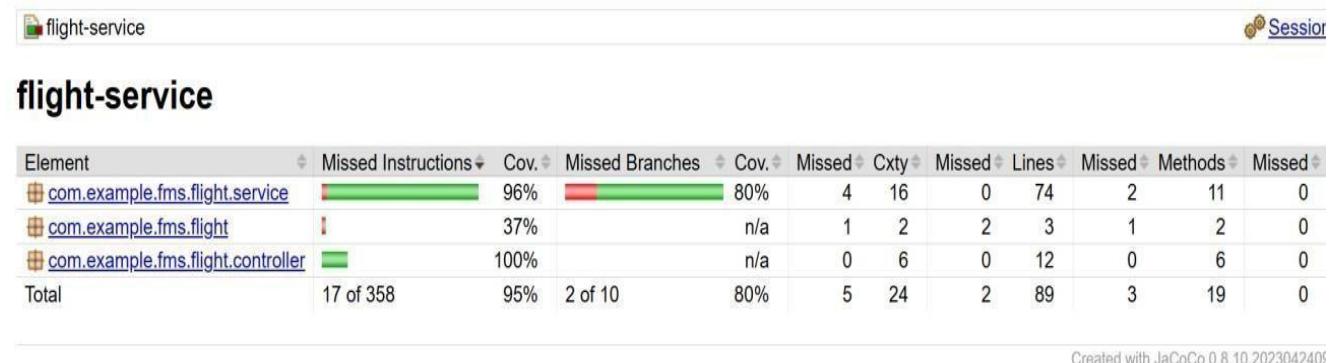
For Booking Service :-

Code coverage is 95 %



For Flight Service:-

Code Coverage is 95%



SonarQube Report

Before :-

FlightManagementSystem > main

Issues Security Hotspots More

Quality Gate: Sonar way

Not computed

Next scan will generate a Quality Gate.

Security	Reliability	Maintainability
0 Open issues	A	14 Open issues

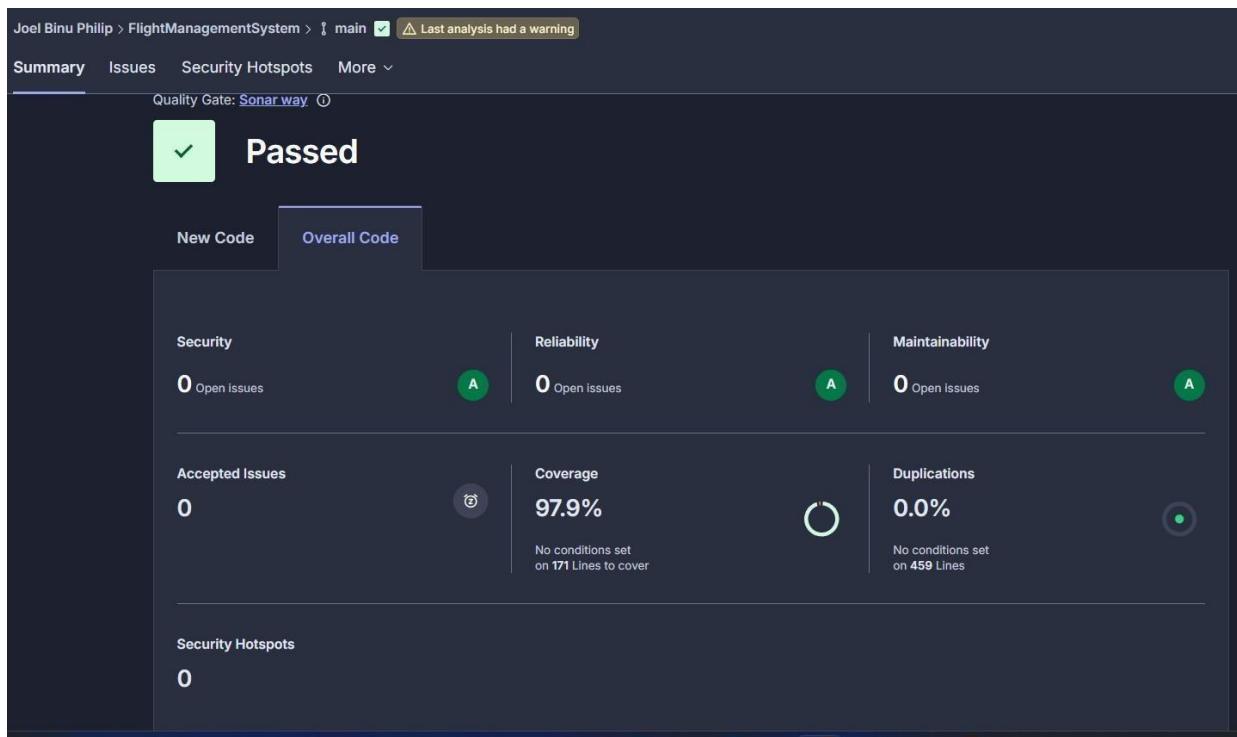
Accepted Issues	Coverage	Duplications
0	A few extra steps are needed for SonarQube Cloud to analyze your code coverage. Set up coverage analysis	3.6% No conditions set on 1.9K Lines

Security Hotspots
0

Issue fixing history graph



After :-



JMeter Load Testing Using CLI 20 threads

```
C:\Users\Hp\Downloads> "C:\Tools\apache-jmeter-5.6.3\apache-jmeter-5.6.3\bin\jmeter.bat" -n -t working_plan.jmx -l results20.jtl -e -o report20
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
Creating summariser <summary>
Created the tree successfully using working_plan.jmx
Starting standalone test @ 2025 Dec 2 07:23:55 IST (1764640435750)
Waiting for possible Shutdown/StopTestNow/HeapDump/ThreadDump message on port 4445
summary + 217 in 00:00:04 = 51.3/s Avg: 5 Min: 3 Max: 35 Err: 0 (0.00%) Active: 1 Started: 73 Finished: 72
summary + 293 in 00:00:06 = 51.2/s Avg: 4 Min: 3 Max: 10 Err: 0 (0.00%) Active: 0 Started: 170 Finished: 170
summary = 510 in 00:00:10 = 51.2/s Avg: 5 Min: 3 Max: 35 Err: 0 (0.00%)
Tidying up ... @ 2025 Dec 2 07:24:05 IST (1764640445783)
... end of run
```

50 threads

```
C:\Users\Hp\Downloads> "C:\Tools\apache-jmeter-5.6.3\apache-jmeter-5.6.3\bin\jmeter.bat" -n -t working_plan.jmx -l results50.jtl -e -o report50
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
Creating summariser <summary>
Created the tree successfully using working_plan.jmx
Starting standalone test @ 2025 Dec 2 07:24:42 IST (1764640482536)
Waiting for possible Shutdown/StopTestNow/HeapDump/ThreadDump message on port 4445
summary = 510 in 00:00:10 = 51.2/s Avg: 5 Min: 3 Max: 36 Err: 0 (0.00%)
Tidying up ... @ 2025 Dec 2 07:24:52 IST (1764640492569)
... end of run
```

100 Threads

```
C:\Users\Hp\Downloads> "C:\Tools\apache-jmeter-5.6.3\apache-jmeter-5.6.3\bin\jmeter.bat" -n -t working_plan.jmx -l results100.jtl -e -o report100
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
Creating summariser <summary>
Created the tree successfully using working_plan.jmx
Starting standalone test @ 2025 Dec 2 07:25:12 IST (1764640512339)
Waiting for possible Shutdown/StopTestNow/HeapDump/ThreadDump message on port 4445
summary = 510 in 00:00:10 = 51.2/s Avg: 4 Min: 2 Max: 32 Err: 0 (0.00%)
Tidying up ... @ 2025 Dec 2 07:25:22 IST (1764640522375)
... end of run
```

20 threads report



Statistics

Requests	Executions							Response Times (ms)					Throughput		Network (KB/sec)	
	Label	#Samples	FAIL	Error %	Average	Min	Max	Median	90th pct	95th pct	99th pct	Transactions/s	Received	Sent		
Total	510	0	0.00%	5.28	3	35	4.00	7.90	8.00	10.00	51.87	28.37	28.37	7.36		
GET Booking History	170	0	0.00%	3.86	3	6	4.00	4.90	5.00	6.00	17.36	10.64	10.64	2.46		
GET Flight Details	170	0	0.00%	4.92	3	35	4.00	5.00	5.00	35.00	17.30	6.30	6.30	2.62		
GET Ticket	170	0	0.00%	7.07	5	10	7.00	8.00	9.00	10.00	17.37	11.54	11.54	2.31		

50 Threads Report

Screenshot of the Apache JMeter Dashboard showing the results of a 50-thread test.

Test and Report information:

Source file	"results50.jtl"
Start Time	"12/25, 7:24 AM"
End Time	"12/25, 7:24 AM"
Filter for display	""

APDEX (Application Performance Index):

Apdex	T (Toleration threshold)	F (Frustration threshold)	Label
1.000	500 ms	1 sec 500 ms	Total
1.000	500 ms	1 sec 500 ms	GET Ticket
1.000	500 ms	1 sec 500 ms	GET Flight Details
1.000	500 ms	1 sec 500 ms	GET Booking History

Requests Summary:

PASS
100%

Statistics:

Requests		Executions		Response Times (ms)									Throughput		Network (KB/sec)	
Label	#Samples	FAIL	Error %	Average	Min	Max	Median	90th pct	95th pct	99th pct	Transactions/s	Received	Sent			
Total	510	0	0.00%	5.17	3	36	4.00	7.00	8.00	9.00	51.88	28.38	7.36			
GET Booking History	170	0	0.00%	3.85	3	6	4.00	5.00	5.00	6.00	17.37	10.64	2.46			
GET Flight Details	170	0	0.00%	4.94	3	36	4.00	5.00	6.00	36.00	17.31	6.31	2.62			
GET Ticket	170	0	0.00%	6.72	5	9	7.00	8.00	8.00	9.00	17.37	11.54	2.31			

100 Threads

Screenshot of the Apache JMeter Dashboard showing results for 100 threads.

Test and Report information:

Source file	"results100.jtl"
Start Time	"12/25, 7:25 AM"
End Time	"12/25, 7:25 AM"
Filter for display	""

APDEX (Application Performance Index):

Apdex	T (Toleration threshold)	F (Frustration threshold)	Label
1.000	500 ms	1 sec 500 ms	Total
1.000	500 ms	1 sec 500 ms	GET Ticket
1.000	500 ms	1 sec 500 ms	GET Flight Details
1.000	500 ms	1 sec 500 ms	GET Booking History

Requests Summary:

PASS
100%

Statistics:

Requests	Executions				Response Times (ms)							Throughput		Network (KB/sec)	
	Label	#Samples	FAIL	Error %	Average	Min	Max	Median	90th pct	95th pct	99th pct	Transactions/s	Received	Sent	
Total	510	0	0.00%	4.87	2	32	4.00	7.00	7.00	10.00	51.88	28.37	7.36		
GET Booking History	170	0	0.00%	3.65	2	7	4.00	4.00	5.00	7.00	17.36	10.63	2.46		
GET Flight Details	170	0	0.00%	4.64	3	32	4.00	5.00	5.00	32.00	17.31	6.30	2.62		
GET Ticket	170	0	0.00%	6.34	4	10	6.00	7.90	8.00	10.00	17.36	11.53	2.31		

API Endpoints POST Add Airline :-

The screenshot shows a POST request to `http://localhost:8080/api/flight/airline`. The request body is set to "raw" and contains the following JSON:

```
1 {  
2   "name": "Spice Jet",  
3   "logoUrl": "https://airindia.com/logo.png"  
4 }
```

The response body shows the message: "Airline created successfully".

POST Add Flight Inventory

POST <http://localhost:8080/api/flight/airline/692e070f58e0122b39e5e1d1/inventory>

Docs Params Authorization Headers (9) Body Scripts Settings

none form-data x-www-form-urlencoded raw binary GraphQL [JSON](#)

```
1 {
2   "airlineId": "692e070f58e0122b39e5e1d1",
3   "flightNumber": "AI132",
4   "fromPlace": "Bangalore",
5   "toPlace": "Mumbai",
6   "departureTime": "2025-12-15T05:00:00",
7   "arrivalTime": "2025-12-15T07:15:00",
8   "price": 4500,
9   "totalSeats": 120
10 }
```

Body Cookies Headers (3) Test Results [⟳](#) 201 Created

[Raw](#) [Preview](#) [Visualize](#)

```
1 Flight inventory added successfully
```

POST Search flights

HTTP Flight Management System - Microservices / Flight Service (via API Gateway) / Search Flights (User)

POST http://localhost:8080/api/flight/search

Docs Params Authorization Headers (9) Body Scripts Settings

none form-data x-www-form-urlencoded raw binary GraphQL JSON

```
1 {  
2   "fromPlace": "Bangalore",  
3   "toPlace": "Mumbai",  
4   "date": "2025-12-15"  
5 }
```

Body Cookies Headers (3) Test Results 200 OK

{ } JSON ▾ Preview Visualize

```
1 {  
2   "flights": [  
3     {  
4       "id": "692e07c458e0122b39e5e1d2",  
5       "flightNumber": "AI101",  
6       "airlineName": "Indigo",  
7       "fromPlace": "Bangalore",  
8       "toPlace": "Mumbai",  
9       "departureTime": "2025-12-15T05:00",  
10      "arrivalTime": "2025-12-15T07:15",  
11      "price": 4500.0,  
12      "availableSeats": 115  
13    },  
14  ]  
15}
```

GET Get Flight Details

HTTP Flight Management System - Microservices / Flight Service (via API Gateway) / **Get Flight Details**

GET http://localhost:8080/api/flight/details/692e07c458e0122b39e5e1d2

Docs Params Authorization Headers (6) **Body** Scripts Settings

none form-data x-www-form-urlencoded raw binary GraphQL

This request does not have a body

Body Cookies Headers (3) Test Results

200 OK

{ } JSON Preview Visualize

```
1 {  
2   "id": "692e07c458e0122b39e5e1d2",  
3   "flightNumber": "AI101",  
4   "fromPlace": "Bangalore",  
5   "toPlace": "Mumbai",  
6   "departureTime": "2025-12-15T05:00",  
7   "arrivalTime": "2025-12-15T07:15",  
8   "price": 4500.0,  
9   "availableSeats": 115,  
10  "airlineName": "Indigo"  
11 }
```

POST Book Seat in Flight

HTTP Flight Management System - Microservices / Booking Service (via API Gateway) / **Book Flight**

POST <http://localhost:8080/api/book/book>

Docs Params Authorization Headers (9) Body Scripts Settings

none form-data x-www-form-urlencoded raw binary GraphQL **JSON**

```
1 {  
2   "flightId": "692e07c458e0122b39e5e1d2",  
3   "email": "joel@example.com",  
4   "passengers": [  
5     {  
6       "name": "Joel",  
7       "gender": "Male",  
8       "age": 22,  
9       "seatNumber": "1A",  
10      "meal": "VEG"  
11    }  
12  ]  
13 }
```

Body Cookies Headers (3) Test Results

201 Created

{ } JSON Preview Visualize

```
1 {  
2   "pnr": "E93CA33A",  
3   "email": "joel@example.com",  
4   "flightId": "692e07c458e0122b39e5e1d2",  
5   "status": "BOOKED"  
6 }
```

DELETE Cancel Booking

DELETE <http://localhost:8080/api/book/cancel/E93CA33A>

☰ Docs [Params](#) Authorization Headers (6) Body Scripts Settings

Query Params

	Key	Value
	Key	Value

Body Cookies Headers (3) Test Results | ⏱ 2

{ } JSON ▾ ▷ Preview ⚖ Visualize ▾

```
1 {  
2   "pnr": "E93CA33A",  
3   "status": "CANCELLED"  
4 }
```

GET Get Booking History

GET <http://localhost:8080/api/book/history/joel@example.com>

Docs Params Authorization Headers (6) Body Scripts Settings

Query Params

Key	Value	Descrip
Key	Value	Descrip

Body Cookies Headers (4) Test Results 200 OK

{ } JSON ▾ ▶ Preview Visualize ▾

```
1 [  
2 {  
3   "id": "692e09b516c49c0911074fde",  
4   "pnr": "EC2AEC3E",  
5   "email": "joel@example.com",  
6   "flightId": "692e07c458e0122b39e5e1d2",  
7   "seatsBooked": 1,  
8   "bookingTime": "2025-12-02T03:03:41.227",  
9   "canceled": true,  
10  "canceledAt": "2025-12-02T06:05:59.871"  
11 },  
12 {  
13   "id": "692e346fdd67044a16bbdf32",  
14 }
```

GET Ticket Details

GET

▼

http://localhost:8080/api/book/ticket/E93CA33A

☰ Docs

Params

Authorization

Headers (6)

Body

Scripts

Settings

Query Params

	Key	Value
	Key	Value

Body

Cookies

Headers (3)

Test Results



{ } JSON ▾

▷ Preview

Visualize

▼

```
1  {
2      "booking": {
3          "pnr": "E93CA33A",
4          "flightId": "692e07c458e0122b39e5e1d2",
5          "email": "joel@example.com",
6          "seatsBooked": 1,
7          "bookingTime": "2025-12-02T08:06:39.552",
8          "cancelled": true,
9          "cancelledAt": "2025-12-02T08:07:55.368"
10     },
11     "passengers": [
12         {
13             "name": "Joel",
14             "gender": "Male",
15             "age": 22,
16             "seatNumber": "1A",
17             "meal": "VEG"
18         }
19     ],
}
```

```
    },
],
"flight": {
    "id": "692e07c458e0122b39e5e1d2",
    "flightNumber": "AI101",
    "fromPlace": "Bangalore",
    "toPlace": "Mumbai",
    "departureTime": "2025-12-15T05:00",
    "arrivalTime": "2025-12-15T07:15",
    "price": 4500.0,
    "availableSeats": 114,
    "airlineName": "Indigo"
}
}
```