

FLIGHT MANAGEMENT SYSTEM

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(Dockerized the microservices)

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.
7. **Docker & Docker Compose** – Containerize all microservices and supporting tools, allowing easy multi-service deployment, scaling, and environment consistency.

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

DOCKER SCREENSHOTS

Building the docker containers for each microservice

```
=> => exporting config sha256:fd7cb25d6eb0c257d01681309d55a7752e95b1a1b06fb784d94720c278c895dd 0.0s
=> => exporting attestation manifest sha256:496af552440dddb4db22ba3ac333f1d3b2cc03a0c8f02df7a5f06e43ba3ed5c8 0.3s
=> => exporting manifest list sha256:8260a49088e36a847e3fbf59fb90269a84e2533478855cdd56a355787304ee5f 0.1s
=> => naming to docker.io/library/fms_microservices-booking-microservice:latest 0.1s
=> => unpacking to docker.io/library/fms_microservices-booking-microservice:latest 0.1s
=> [api-gateway] resolving provenance for metadata file 1.1s
=> [service-registry] resolving provenance for metadata file 1.0s
=> [flight-microservice] resolving provenance for metadata file 0.6s
=> [notification-microservice] resolving provenance for metadata file 0.4s
=> [booking-microservice] resolving provenance for metadata file 0.2s
=> [config-server] resolving provenance for metadata file 0.1s
[+] Building 6/6
  ✓fms_microservices-config-server Built 0.0s
  ✓fms_microservices-flight-microservice Built 0.0s
  ✓fms_microservices-notification-microservice Built 0.0s
  ✓fms_microservices-service-registry Built 0.0s
  ✓fms_microservices-api-gateway Built 0.0s
  ✓fms_microservices-booking-microservice Built 0.0s
PS C:\Users\KIIT\OneDrive\Desktop\chubb_training\FMS_Microservices> docker-compose up -d
time="2025-12-08T19:14:06+05:30" level=warning msg="C:\\Users\\KIIT\\OneDrive\\Desktop\\chubb_training\\FMS_Microservices\\docker-com
pose.yml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Running 9/9
  ✓Network fms_microservices_fms-net Created 0.1s
  ✓Container service-registry Healthy 60.7s
  ✓Container rabbitmq Healthy 123.5s
  ✓Container mysql Healthy 60.7s
  ✓Container config-server Healthy 123.2s
  ✓Container api-gateway Started 59.5s
  ✓Container notification-microservice Started 123.9s
  ✓Container booking-microservice Started 123.2s
  ✓Container flight-microservice Started 123.3s
PS C:\Users\KIIT\OneDrive\Desktop\chubb_training\FMS_Microservices> docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS
```

Running the dockerized containers

```
[+] Running 9/9
✔Network fms_microservices_fms-net      Created      0.1s
✔Container service-registry              Healthy      60.7s
✔Container rabbitmq                       Healthy      123.5s
✔Container mysql                         Healthy      60.7s
✔Container config-server                  Healthy      123.2s
✔Container api-gateway                    Started      59.5s
✔Container notification-microservice      Started      123.9s
✔Container booking-microservice           Started      123.2s
✔Container flight-microservice            Started      123.3s

PS C:\Users\KIIT\OneDrive\Desktop\chubb_training\FMS_Microservices> docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        P
ORTS
93227a0cea3c   fms_microservices-booking-microservice  "java -jar app.jar"     2 minutes ago Up 38 seconds    0
0.0.0:8082->8082/tcp, [::]:8082->8082/tcp   booking-microservice
08e848c18dfe   fms_microservices-flight-microservice    "java -jar app.jar"     2 minutes ago Up 38 seconds    0
0.0.0:8081->8081/tcp, [::]:8081->8081/tcp   flight-microservice
5446d922fc4f   fms_microservices-notification-microservice  "java -jar app.jar"     2 minutes ago Up 38 seconds    0
0.0.0:8083->8083/tcp, [::]:8083->8083/tcp   notification-microservice
88771e10d0f1   fms_microservices-config-server          "java -jar app.jar"     2 minutes ago Up About a minute (healthy) 0
0.0.0:8888->8888/tcp, [::]:8888->8888/tcp   config-server
1d4d63f19348   rabbitmq:3-management                   "docker-entrypoint.s..." 2 minutes ago Up 2 minutes (healthy) 0
0.0.0:5672->5672/tcp, [::]:5672->5672/tcp, 0.0.0.0:15672->15672/tcp, [::]:15672->15672/tcp rabbitmq
09ff251db821   fms_microservices-service-registry       "java -jar app.jar"     2 minutes ago Up 2 minutes (healthy) 0
0.0.0:8761->8761/tcp, [::]:8761->8761/tcp   service-registry
b7c7607a5b10   mysql:8.0                               "docker-entrypoint.s..." 2 minutes ago Up 2 minutes (healthy) 0
0.0.0:3306->3306/tcp, [::]:3306->3306/tcp   mysql

PS C:\Users\KIIT\OneDrive\Desktop\chubb_training\FMS_Microservices> docker restart flight-microservice booking-microservice api-gatew
ay
Flight-microservice
booking-microservice
api-gateway
PS C:\Users\KIIT\OneDrive\Desktop\chubb_training\FMS_Microservices>
```

Creating the databases inside the mysql container

```
at org.hibernate.boot.registry.internal.StandardServiceRegistryImpl.initiateService(StandardServiceRegistryImpl.java:130) ~[hibernate-core-6.6.36.Final.jar!/:6.6.36.Final]
at org.hibernate.service.internal.AbstractServiceRegistryImpl.createService(AbstractServiceRegistryImpl.java:263) ~[hibernate-core-6.6.36.Final.jar!/:6.6.36.Final]
... 37 common frames omitted

PS C:\Users\KIIT> docker exec -it mysql mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 55
Server version: 8.0.44 MySQL Community Server - GPL

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

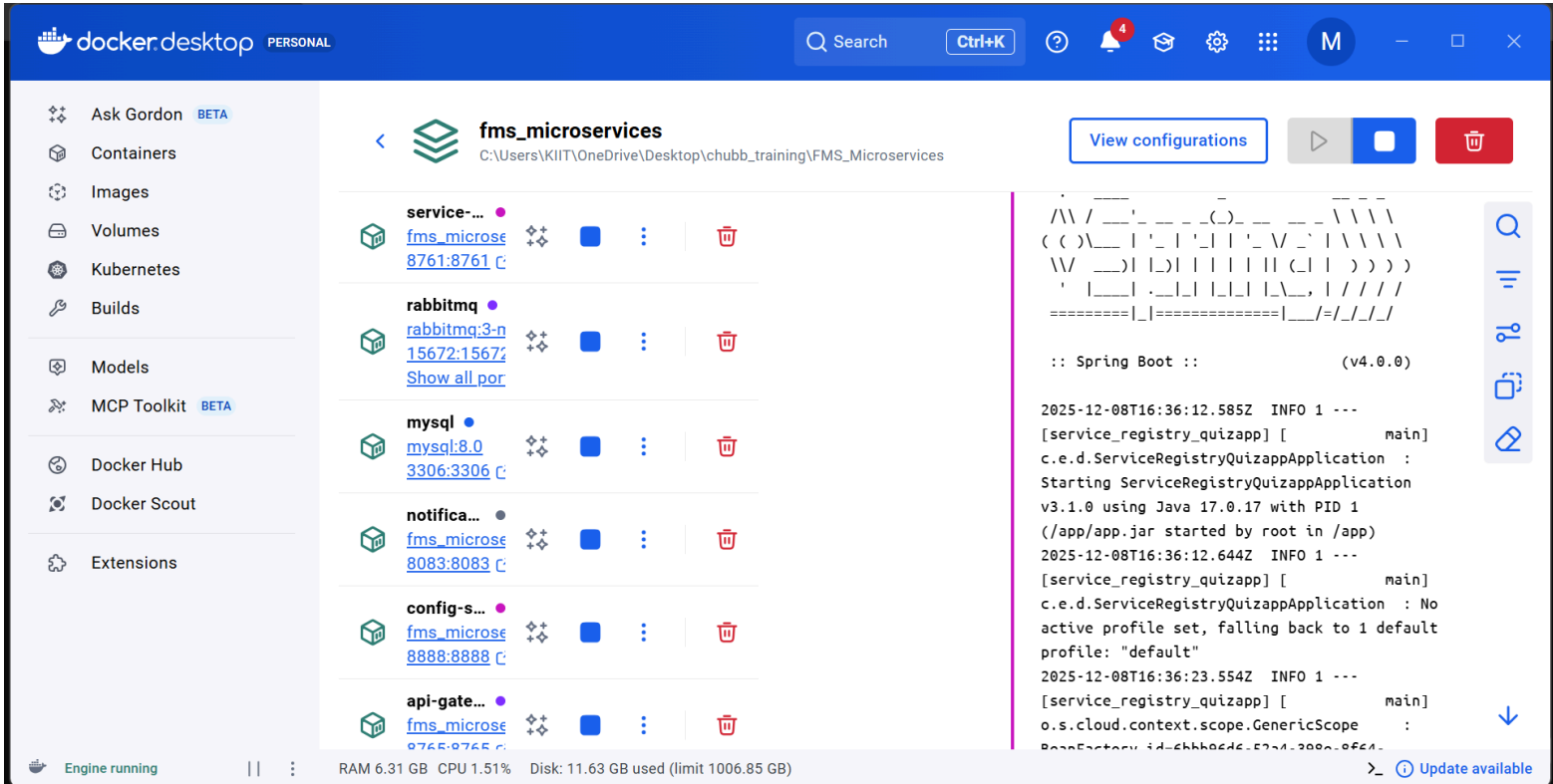
mysql> CREATE DATABASE flightdbnew;
Query OK, 1 row affected (0.01 sec)

mysql> CREATE DATABASE bookingdbnew;
Query OK, 1 row affected (0.04 sec)

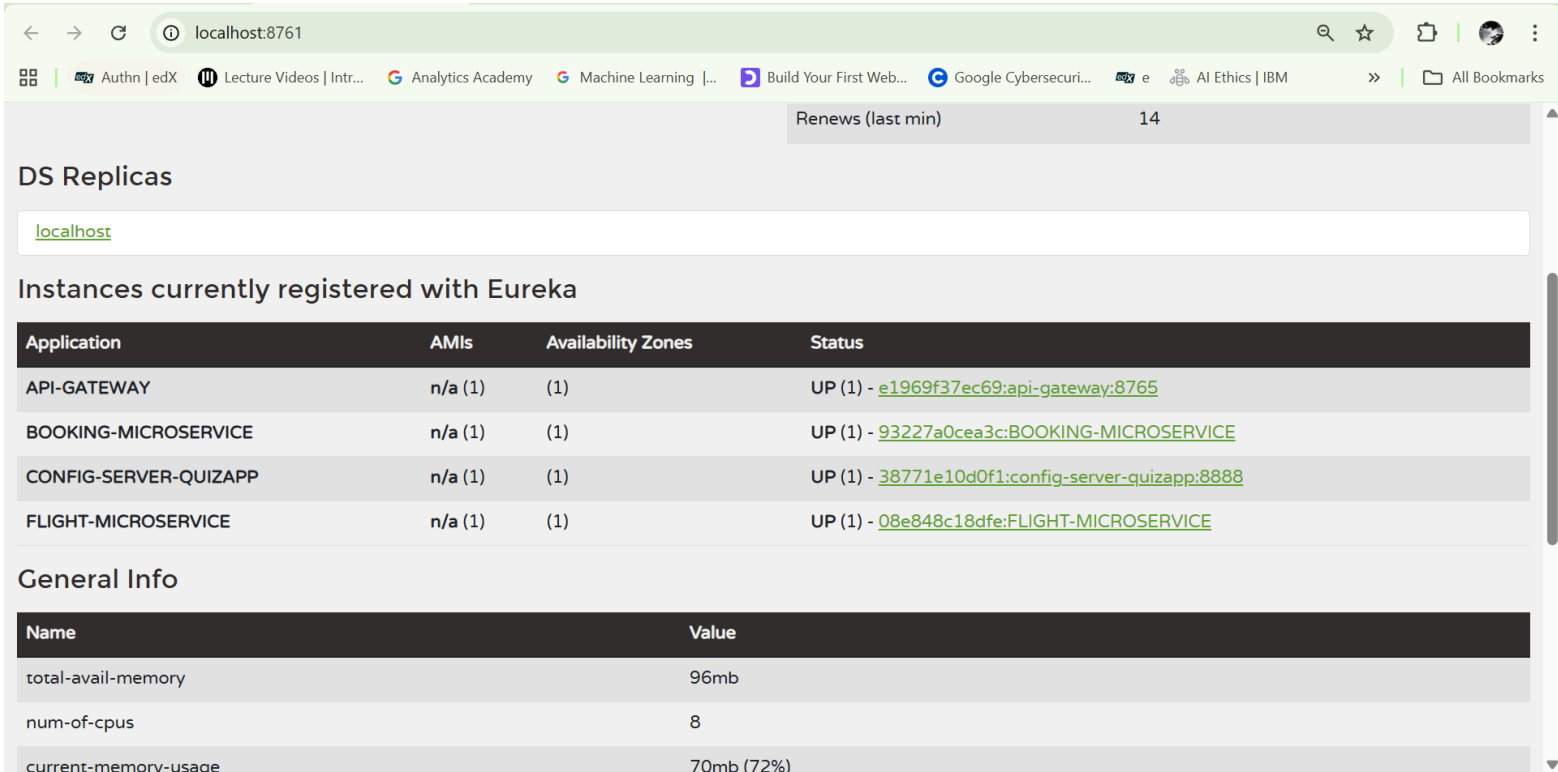
mysql> CREATE DATABASE gatewaydb;
Query OK, 1 row affected (0.01 sec)

mysql> exit;
Bye
PS C:\Users\KIIT> docker logs flight-microservice --tail=100
at org.springframework.boot.loader.launch.Launcher.launch(Launcher.java:106) ~[app.jar:3.1.0]
```

Docker Desktop



EUREKA SERVER



POSTMAN TESTING

Registering the User or Admin (depending on role)

Login as User of Admin

The screenshot displays the kspace API client interface. On the left sidebar, under "FMS Microservice", the "POST signin" endpoint is selected. The main panel shows a REST client configuration for a POST request to "http://localhost:8765/auth/login". The request body is raw JSON:

```
{
  "username": "debashrita",
  "password": "password123"
}
```

The response status is "200 OK" with headers "Content-Type: application/json; charset=utf-8" and "Access-Control-Allow-Origin: *". The response body contains a JWT token:

```
{
  "token": "eyJzdWUiOiJkZWJhc2hyaXRhIiwicm9sZSI6IlVTRVIiLCJpYXQiOiE3NjUxNDc3MzYsImV4cCI6MTc2NTIzNDZnOj0KbGZCLMV8IkY_MgzUNzGapL3nVzmPNqhUS0-IDWmA"
}
```

Adding inventory (Only by Admin)

workspace New Import

Search collections

- FMS
 - FMS Microservice
 - POST Add inventory
 - POST Search Flights
 - POST Book Ticket
 - GET Search by pnr
 - GET Search by mail
 - GET Delete flights
 - POST register
 - POST signin
 - FMS_Reactive
 - FMS_Reactive_Mongo
 - New Collection
 - Quiz_microservices
 - Redis tutorial
 - Scratch_SpringSecurity
 - Spring_Mongo_Reactive
 - Springboot_Mongodb
 - SpringBootSecurity

FMS Microservice / Add inventory

POST http://localhost:8765/FLIGHT-MICROSERVICE/api/flight

Auth Type: Bearer Token

Token: eyJhbGciOiJIUzI1NiU9.eyJzdWIiOiJhY1

403 Forbidden • 108 ms • 285 B

Access Denied

Searching for a flight (open for any role)

workspace New Import

Search collections

- FMS
 - FMS Microservice
 - POST Add inventory
 - POST Search Flights
 - POST Book Ticket
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FMS Microservice / Search Flights

POST http://localhost:8765/FLIGHT-MICROSERVICE/api/flight/search

Body: raw

```
{
  "onwardFlights": [
    {
      "price": 4500.0,
      "availableSeatNumbers": [
        "1A",
        "1B",
        "2D",
        "1E",
        "1F"
      ],
      "flightId": "79448598",
      "airline": "IndiGo",
      "availableSeats": 5,
      "dateTime": "2025-12-10T09:30"
    }
  ]
}
```

200 OK • 2.37 s • 1020 B

Booking a flight (only for User)

workspace New Import

+

- > FMS
- ✓ FMS Microservice
 - POST Add inventory
 - POST search flights
 - POST Book Ticket
 - GET Search by pnr
 - GET Search by mail
 - GET Delete flights
 - POST register
 - POST signin
- > FMS_Reactive
- > FMS_Reactive_Mongo
- > New Collection
- > Quiz_microservices
- > Redis tutorial
- > Scratch_SpringSecurity
- > Spring_Mongo_Reactive
- > Springboot_Mongodb
- > SpringBootSecurity

... ...

POST Add • POST signr • POST sea: • POST regi • POST Boo • GET Searc • GET Searc • > + ▾ No environment ▾

FMS Microservice / Book Ticket Save ▾ Share 🔗

POST ▾ Send ▾

Docs Params Authorization Headers (10) Body • Scripts Settings Cookies

Auth Type

Bearer Token ▾ Token

The authorization header will be automatically generated when you send the request. Learn more about [Bearer Token](#) authorization.

Body Cookies Headers (10) Test Results | ↺ 201 Created • 2.63 s • 390 B • 🌐 Save Response ...

{ } JSON ▾ ▶ Preview 🖼 Visualize ▾

```
1 {
2   "pnr": "E434EF57",
3   "message": "Booking successful",
4   "totalPrice": 9000.0
5 }
```

🔍 Find and replace 📄 Console 📄 Terminal 🔗 Postbot ▶ Runner 🌐 Start Proxy 🍪 Cookies 🏠 Vault 🗑 Trash

Search by PNR (only by User)

workspace New Import

+

- > FMS
- ✓ FMS Microservice
 - POST Add inventory
 - POST search flights
 - POST Book Ticket
 - GET Search by pnr
 - GET Search by mail
 - GET Delete flights
 - POST register
 - POST signin
- > FMS_Reactive
- > FMS_Reactive_Mongo
- > New Collection
- > Quiz_microservices
- > Redis tutorial
- > Scratch_SpringSecurity
- > Spring_Mongo_Reactive
- > Springboot_Mongodb
- > SpringBootSecurity

... ...

POST Add • POST signr • POST sear • POST regi • POST Boo • GET Searc • GET Searc • > + ▾ No environment ▾

FMS Microservice / Search by pnr Save ▾ Share 🔗

GET ▾ Send ▾

Docs Params Authorization Headers (8) Body Scripts Settings Cookie

Auth Type

Bearer Token ▾ Token

The authorization header will be automatically generated when you send the request. Learn more about [Bearer Token](#) authorization.

Body Cookies Headers (10) Test Results | ↺ 200 OK • 340 ms • 534 B • 🌐 Save Response ...

{ } JSON ▾ ▶ Preview 🖼 Visualize ▾

```
1 {
2   "pnr": "6AF5A39E",
3   "flightId": "AFA9CCF7",
4   "status": "CONFIRMED",
5   "seatNumbers": [
6     "1A",
7     "1B"
8   ],
9   "passengers": [
```

🔍 Find and replace 📄 Console 📄 Terminal 🔗 Postbot ▶ Runner 🌐 Start Proxy 🍪 Cookies 🏠 Vault 🗑 Tra

Search by mail (for User)

Workspace New Import

+ Search collections

- FMS
 - FMS Microservice
 - POST Add inventory
 - POST search flights
 - POST Book Ticket
 - GET Search by pnr
 - GET Search by mail**
 - GET Delete flights
 - POST register
 - POST signin
 - FMS_Reactive
 - FMS_Reactive_Mongo
 - New Collection
 - Quiz_microservices
 - Redis tutorial
 - Scratch_SpringSecurity
 - Spring_Mongo_Reactive
 - Springboot_Mongodb
 - SpringBootSecurity

FMS Microservice / **Search by mail** Save Share

GET Send

Docs Params **Authorization** Headers (8) Body Scripts Settings Cookies

Auth Type: Bearer Token Token:

The authorization header will be automatically generated when you send the request. Learn more about [Bearer Token](#) authorization.

Body Cookies Headers (11) Test Results 200 OK • 135 ms • 847 B Save Response

{} JSON Preview Visualize

```
1 {
2   "email": "debashritamandal852@gmail.com",
3   "history": [
4     {
5       "pnr": "D4F30643",
6       "status": "CANCELLED",
7       "flightId": "79448598"
8     },
9     {}
10  ]
11 }
```

Full View Find and replace Console Terminal Postbot Runner Start Proxy Cookies Vault Trash

Delete the ticket (only by User)

Workspace New Import

+ Search collections

- FMS
 - FMS Microservice
 - POST Add inventory
 - POST search flights
 - POST Book Ticket
 - GET Search by pnr
 - GET Search by mail
 - GET Delete flights**
 - POST register
 - POST signin
 - FMS_Reactive
 - FMS_Reactive_Mongo
 - New Collection
 - Quiz_microservices
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 - Spring_Mongo_Reactive
 - Springboot_Mongodb
 - SpringBootSecurity

FMS Microservice / **Delete flights** Save Share

DELETE Send

Docs Params **Authorization** Headers (8) Body Scripts Settings Cookies

Auth Type: Bearer Token Token: jzUNzGapL3nVrmPNqhU8SO-IDWmA

The authorization header will be automatically generated when you send the request. Learn more about [Bearer Token](#) authorization.

Body Cookies Headers (10) Test Results 200 OK • 833 ms • 376 B Save Response

{} JSON Preview Visualize

```
1 {
2   "pnr": "97A2B1B1",
3   "message": "Ticket cancelled successfully"
4 }
```

Full View Find and replace Console Terminal Postbot Runner Start Proxy Cookies Vault Trash