

CASE STUDY: Office Meeting Room Management System with Room Preparation Notifications

1. Database Schema

Employee

```
CREATE TABLE employees (
    employee_id INT AUTO_INCREMENT PRIMARY KEY,
    name VARCHAR(100) NOT NULL,
    department VARCHAR(100) NOT NULL,
    email VARCHAR(150) NOT NULL UNIQUE
);
```

Sample data

```
{
    "name": "Reception-Staff",
    "email": "recereceptionstaff@yopmail.com",
    "department": "Reception"
}
```

User

```
CREATE TABLE users (
    user_id      BIGINT AUTO_INCREMENT PRIMARY KEY,
    employee_id  INT NOT NULL,
    passwordhash VARCHAR(150),
    role         ENUM('SYSTEM_ADMIN', 'RECEPTION_STAFF', 'INVENTORY_STAFF',
'MAINTENANCE_STAFF') NOT NULL,
    is_active     BOOLEAN DEFAULT TRUE,
    created_at   TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
    FOREIGN KEY (employee_id) REFERENCES employees(employee_id)
);
```

Sample Data

```
{
    "userId": 1,
    "employeeId": 1,
    "passwordHash": "$2a$10$VPwqtVUVKQpS168zD3RdSuqpXbD6hyUoRy/pzADacIdejLDmUG7Ru",
```

```
"role": "SYSTEM_ADMIN",
"isActive": true,
"createdAt": "2025-11-18T12:27:33Z"
}
```

Meeting Rooms

```
CREATE TABLE meeting_rooms (
    room_id      BIGINT AUTO_INCREMENT PRIMARY KEY,
    room_name    VARCHAR(100) NOT NULL UNIQUE,
    floor        INT,
    capacity     INT,
    has_projector BOOLEAN DEFAULT FALSE,
    has_whiteboard BOOLEAN DEFAULT FALSE,
    status        ENUM('AVAILABLE', 'UNAVAILABLE') DEFAULT 'AVAILABLE'
);
```

Sample Data

```
{
    "room_id": 1,
    "room_name": "Neem Room",
    "floor": 1,
    "capacity": 12,
    "has_projector": true,
    "has_whiteboard": true,
    "status": "AVAILABLE"
}
```

Reservations

```
CREATE TABLE reservations (
    reservation_id BIGINT AUTO_INCREMENT PRIMARY KEY,
    room_id        BIGINT NOT NULL,
    booked_by      BIGINT NOT NULL,
    employee_name  VARCHAR(100) NOT NULL,
    department     VARCHAR(100),
```

```

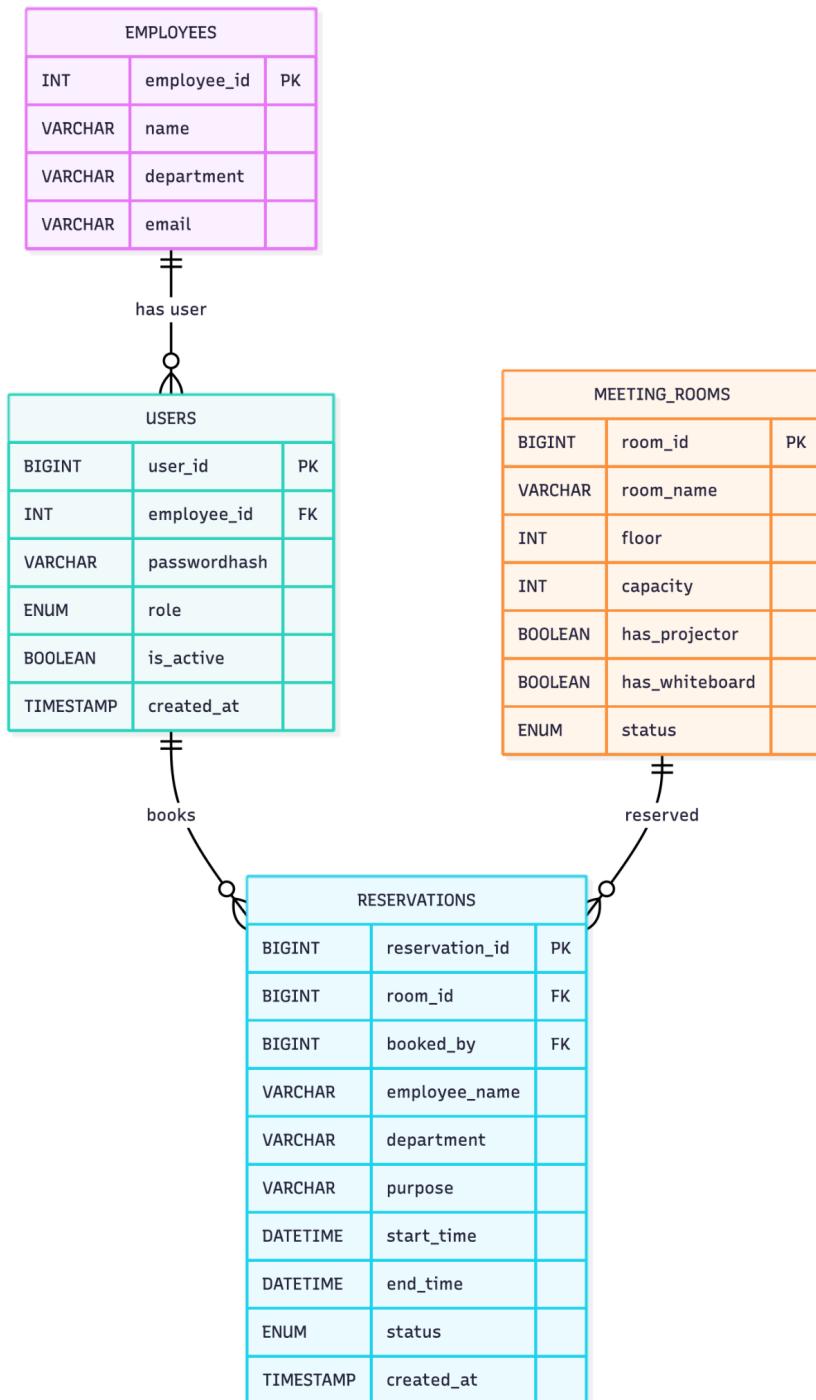
purpose      VARCHAR(255),
start_time   DATETIME NOT NULL,
end_time     DATETIME NOT NULL,
status       ENUM('BOOKED', 'CANCELLED', 'COMPLETED', 'AUTO_RELEASED') DEFAULT
'BOOKED',
created_at   TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
CONSTRAINT fk_reservation_room
    FOREIGN KEY (room_id) REFERENCES meeting_rooms(room_id),
CONSTRAINT fk_reservation_user
    FOREIGN KEY (booked_by) REFERENCES users(user_id)
);

```

Sample data

```
{
  "reservation_id": 10,
  "room_id": 4,
  "booked_by": 3,
  "employee_id": 5,
  "purpose": null,
  "start_time": "2025-11-22T13:40:00",
  "end_time": "2025-11-22T14:00:00",
  "status": "BOOKED",
  "special_requirements": null,
  "is_occupied": false,
  "created_at": "2025-11-22T13:17:35"
}
```

2. ER Diagram



3. Output screenshots

3.1 Login and staff registration

3.1.1 Login as System Admin

The screenshot shows a Postman collection named "Room Booking". The "Login" endpoint is selected. A POST request is made to `http://localhost:9001/api/auth/login`. The body is set to "raw" JSON:

```
1 {
2   "email": "systemadmin@yopmail.com",
3   "password": "Password@123"
4 }
```

The response status is **200 OK**, with a response time of 401 ms and a size of 432 B. The response body contains a token:

```
1 {
2   "token": "eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.
eyJpc3MiOiJtZW0aW5nXlb2tc3IzdGVtIiwiZXhwIjoxNzY0ODIwMjA0LCJ1c2VyIjoie1widXNlcklkXCI6MSxIImVtcGxveWVLSWRcIjoxLFwibmFtZVwiOlwiU3RhZmYtMwvifFwizWihaxcIjpCIhN5c3RlbWFkbWluQHlvcGihawuY29tXCIsKCJyb2x1XC16XCJTWvNURU1fQURNSU5cIn0ifQ.
4b80uEoZz3Hty0IgV04gAGXio2mCauUjTxxqEZRh3-o"
```

3.1.2 Create and Register Admin Staff

The screenshot shows a Postman collection named "Room Booking". The "Employee" endpoint is selected. A POST request is made to `http://localhost:9001/api/employees`. The body is set to "raw" JSON:

```
1 {
2   "name": "Booking-Staff",
3   "email": "reservationadmin@yopmail.com",
4   "department": "Reservation"
5 }
```

The response status is **201 Created**, with a response time of 297 ms and a size of 187 B. The response body indicates success:

```
1 {
2   "status": "success",
3   "employeeId": 6,
4   "email": "reservationadmin@yopmail.com"
5 }
```

Room Booking / User

POST <http://localhost:9001/api/users>

Body `raw`

```

1 {
2   "email": "reservationadmin@yopmail.com",
3   "password": "Password@123",
4   "role": "ADMIN_STAFF"
5 }
```

201 Created | 578 ms | 169 B | Save Response

Key	Value	Description
status	success	
employeeId	6	
role	ADMIN_STAFF	

3.2 Meeting Rooms

Room Booking / Meeting-rooms

GET <http://localhost:9001/api/meeting-rooms>

Headers (7)

Key	Value
Postman-Token	<calculated when request is sent>
Host	<calculated when request is sent>
User-Agent	PostmanRuntime/7.49.1
Accept	*/*
Accept-Encoding	gzip, deflate, br
Connection	keep-alive
Authorization	Bearer eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9...

200 OK | 332 ms | 728 B | Save Response

roomId	roomName	floor	capacity	hasProjector	hasWhiteboard	status
0 1	Neem Room	1	12	true	true	AVAILABLE
1 2	Banyan Room	0	20	true	true	AVAILABLE
2 3	Peepal Room	0	6	false	true	AVAILABLE
3 4	Teak Room	1	12	true	false	AVAILABLE
4 5	Cypress Room	1	14	true	true	AVAILABLE

3.3 Create Meeting Room Reservation

3.3.1 Login as Admin Staff

Room Booking / Login

POST <http://localhost:9001/api/auth/login>

Body raw

```

1 {
2   "email": "reservationadmin@yopmail.com",
3   "password": "Password@123"
4 }

```

200 OK | 402 ms | 445 B | Save Response | [View Response](#)

Body Cookies Headers (3) Test Results | [Copy](#) [Share](#) [Edit](#)

{ } JSON [Preview](#) [Visualize](#)

```

1 {
2   "token": "eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.
eyJpc3MiOiJtZwV0aw5nXvb20tc3LzdGVtIwiZXhwIjoxNzYzODIwODYwLCJ1c2VyIjoie1widXNlcklkXCI6MyxCImVtcGxveWlSWRcIjo2LFwibm
FtZWvi0lwim9va2luZy1TdGFmZlwiLFWiZhahWxcIjpcInJlc2VydM0aw9uYWRTaW5AeW9bwFpbC5jb21ciixcinJvbGVCIjpcIkFETU10X1NUQUZG
XCJ9In0.CZEH83e8RuH76qC9rD3cGRJP4G5Up-0olHXCW-Udир"
3 }

```

3.3.2 Create reservation and a automated notification will be send to employee and room service for preparing the room

http://localhost:9001/api/reservations

POST <http://localhost:9001/api/reservations>

Body raw

```

1 {
2   "roomId": 4,
3   "employeeId": 5,
4   "startTime": "2025-11-22T13:40:00Z",
5   "endTime": "2025-11-22T14:00:00Z",
6   "specialRequirements": "None"
7 }
8

```

201 Created | 1.72 s | 133 B | [View Response](#)

Body Cookies Headers (3) Test Results | [Copy](#) [Share](#) [Edit](#)

{ } JSON [Preview](#) [Visualize](#)

```

1 {
2   "reservationId": 10
3 }

```

3.3.3 Notifications

Booking Confirmed – Teak Room

sownthariponnuusamy@gmail.com
to ford ▾

6:47 PM (1 minute ago) ☆ ☺ ↶ ↷ :

Meeting Room Booking Confirmed

Hello Ford,

Your meeting room has been successfully booked:

- **Room:** Teak Room
- **Floor:** 1
- **Start:** 22-Nov-2025 07:10 PM
- **End:** 22-Nov-2025 07:30 PM
- **Requirements:** None

Regards,
Admin Team

This is an automated email — please do not reply.

Reply Forward 🤗

Room Setup Required – Teak Room

sownthariponnuusamy@gmail.com
to roomservice ▾

6:47 PM (2 minutes ago) ☆ ☺ ↶ ↷ :

Room Setup Required

A new meeting is scheduled:

- **Room:** Teak Room
- **Floor:** 1
- **Start:** 22-Nov-2025 07:10 PM
- **Requirements:** None

Please prepare the room in advance.

Regards,
Admin Team

This is an automated email — please do not reply.

Reply Forward 🤗

3.4 Automated Remainder mail to employee and room service before 15mins of meetings starts

Upcoming Meeting Reminder

sownthariponnusamy@gmail.com
to ford ▾

6:54 PM (1 minute ago) ☆ ☺ ↶ ⋮

Meeting Reminder

Hello Ford,

Your meeting will begin at **22-Nov-2025 07:10 PM**.

Room: Teak Room (Floor 1)

Regards,
Admin Team

This is an automated email — please do not reply.

↶ Reply ↷ Forward ☺

Room Prep Reminder – Teak Room

sownthariponnusamy@gmail.com
to roomservice ▾

6:54 PM (2 minutes ago) ☆ ☺ ↶ ⋮

Room Service Reminder

Reminder for an upcoming meeting:

- **Room:** Teak Room
- **Start:** 22-Nov-2025 07:10 PM
- **Requirements:** None

Please ensure the room is ready on time.

Regards,
Admin Team

This is an automated email — please do not reply.

↶ Reply ↷ Forward ☺

3.5 Auto release if the room is not occupied for 15mins

Reservation Auto-Released – Teak Room

sownthariponnuusamy@gmail.com
to ford ▾

7:25 PM (16 minutes ago) ☆ ☺ ↵ ⋮

Reservation Auto-Released

Hello Ford,

Your reservation for **Teak Room** was auto-released because the room was not occupied within 15 minutes.

Released At: 22-Nov-2025 07:25 PM

Regards,
Admin Team

This is an automated email — please do not reply.

Reply Forward

Room Reset Required – Teak Room

sownthariponnuusamy@gmail.com
to roomservice ▾

7:25 PM (17 minutes ago) ☆ ☺ ↵ ⋮

Room Reset Required

The meeting in **Teak Room** has ended automatically.

- **Room:** Teak Room
- **Released At:** 22-Nov-2025 07:25 PM
- **Floor:** 1

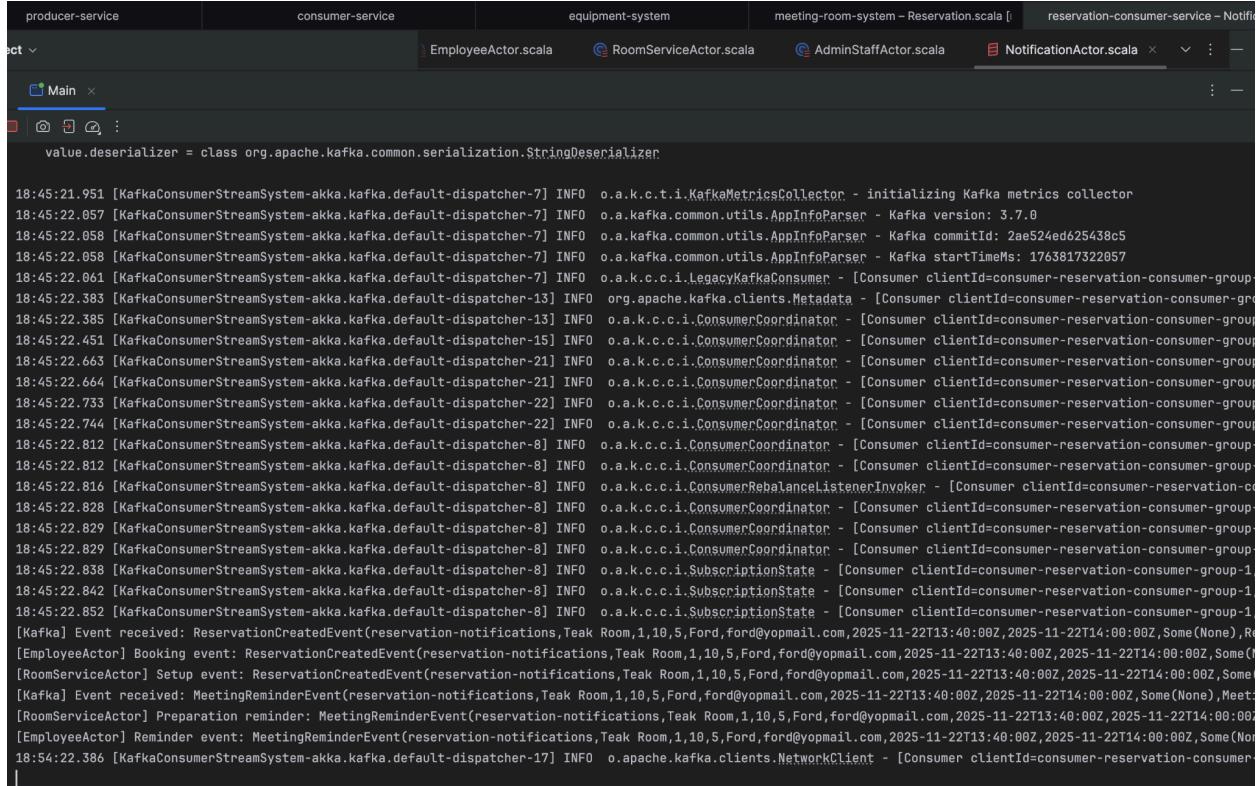
Please reset the room for the next meeting.

Regards,
Admin Team

This is an automated email — please do not reply.

Reply Forward

4 Kafka Consumer Logs



The screenshot shows a code editor interface with multiple tabs open. The active tab is 'Main' under the 'producer-service' project. The code in the editor is as follows:

```
value.deserializer = class org.apache.kafka.common.serialization.StringDeserializer
```

Below the code, there is a large block of log output from a Kafka consumer. The logs are timestamped and show various Kafka metrics collector initialization, consumer group coordination, and specific event handling for ReservationCreatedEvent and MeetingReminderEvent.

```
18:45:21.951 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-7] INFO o.a.k.c.t.i.KafkaMetricsCollector - initializing Kafka metrics collector
18:45:22.057 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-7] INFO o.a.kafka.common.utils.AppInfoParser - Kafka version: 3.7.0
18:45:22.058 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-7] INFO o.a.kafka.common.utils.AppInfoParser - Kafka commitId: 2ae524ed625438c5
18:45:22.058 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-7] INFO o.a.kafka.common.utils.AppInfoParser - Kafka startTimeMs: 1763817322057
18:45:22.061 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-7] INFO o.a.k.c.c.i.LegacyKafkaConsumer - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Connected to broker /192.168.1.11:9092
18:45:22.383 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-13] INFO org.apache.kafka.clients.Metadata - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Updated broker list {id=1, address=192.168.1.11:9092}
18:45:22.385 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-13] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Became leader for partition Teak Room,1,10,5
18:45:22.451 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-15] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Received event from leader for partition Teak Room,1,10,5
18:45:22.663 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-21] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Received event from leader for partition Teak Room,1,10,5
18:45:22.664 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-21] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Received event from leader for partition Teak Room,1,10,5
18:45:22.733 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-22] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Received event from leader for partition Teak Room,1,10,5
18:45:22.744 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-22] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Received event from leader for partition Teak Room,1,10,5
18:45:22.812 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Received event from leader for partition Teak Room,1,10,5
18:45:22.812 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Received event from leader for partition Teak Room,1,10,5
18:45:22.816 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.ConsumerRebalanceListenerInvoker - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Rebalanced partitions [Teak Room,1,10,5]
18:45:22.828 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Received event from leader for partition Teak Room,1,10,5
18:45:22.829 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Received event from leader for partition Teak Room,1,10,5
18:45:22.829 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Received event from leader for partition Teak Room,1,10,5
18:45:22.838 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.SubscriptionState - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Subscribed to partitions [Teak Room,1,10,5]
18:45:22.842 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.SubscriptionState - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Subscribed to partitions [Teak Room,1,10,5]
18:45:22.852 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.SubscriptionState - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Subscribed to partitions [Teak Room,1,10,5]
[Kafka] Event received: ReservationCreatedEvent(reservation-notifications,Teak Room,1,10,5,Ford,ford@yopmail.com,2025-11-22T13:40:00Z,2025-11-22T14:00:00Z,Some(None),None)
[EmployeeActor] Booking event: ReservationCreatedEvent(reservation-notifications,Teak Room,1,10,5,Ford,ford@yopmail.com,2025-11-22T13:40:00Z,2025-11-22T14:00:00Z,Some(None),None)
[RoomServiceActor] Setup event: ReservationCreatedEvent(reservation-notifications,Teak Room,1,10,5,Ford,ford@yopmail.com,2025-11-22T13:40:00Z,2025-11-22T14:00:00Z,Some(None),None)
[Kafka] Event received: MeetingReminderEvent(reservation-notifications,Teak Room,1,10,5,Ford,ford@yopmail.com,2025-11-22T13:40:00Z,2025-11-22T14:00:00Z,Some(None),MeetingReminderEvent)
[RoomServiceActor] Preparation reminder: MeetingReminderEvent(reservation-notifications,Teak Room,1,10,5,Ford,ford@yopmail.com,2025-11-22T13:40:00Z,2025-11-22T14:00:00Z,Some(None),MeetingReminderEvent)
[EmployeeActor] Reminder event: MeetingReminderEvent(reservation-notifications,Teak Room,1,10,5,Ford,ford@yopmail.com,2025-11-22T13:40:00Z,2025-11-22T14:00:00Z,Some(None),MeetingReminderEvent)
18:45:22.386 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-17] INFO o.apache.kafka.clients.NetworkClient - [Consumer clientId=consumer-reservation-consumer-group-1, groupId=consumer-reservation-consumer-group-1] Connected to broker /192.168.1.11:9092
```