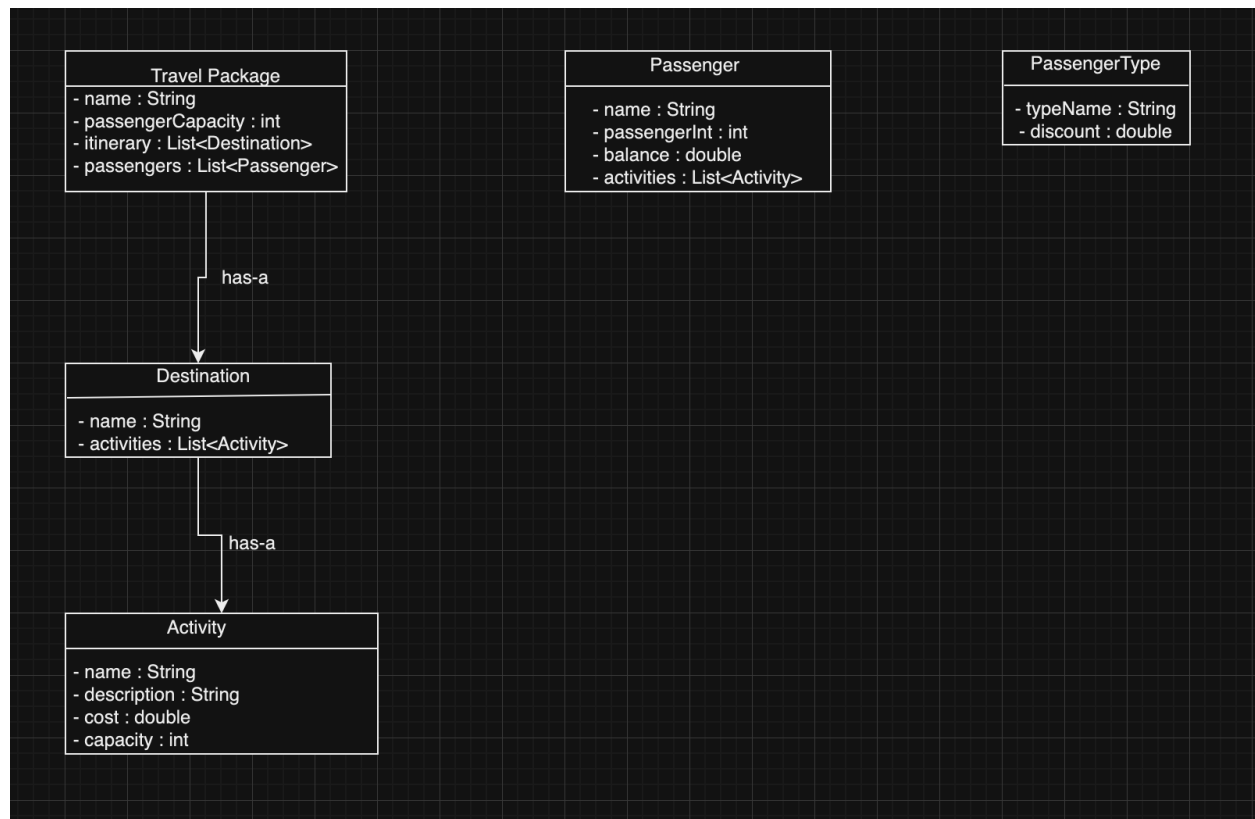**Low level Design(LLD) - UML Diagram**

High Level Design(HLD)

Capacity and storage estimation

1. **Passenger Activities**:
   ○ Let's assume:
      ■ 50 passengers sign up for activities per day.
      ■ 20 passengers pay for activities.
      ■ 30 passengers update their balances.
   ○ Total Daily Changes:
      ■ New Passenger Activity Records: 50 records
      ■ Updated Passenger Balance Records: 30 records
   ○ Estimated Daily Data Change:
      ■ New Data per Day: (50 records * 200 bytes) + (30 records * 200 bytes) = 16,000 bytes = 16 KB
2. **Booking Activities**:
   ○ Let's assume:
      ■ 100 passengers enroll in activities per day.
      ■ 50 activities' available spaces are updated.
   ○ Total Daily Changes:

- ■ New Booking Records: 100 records
- ■ Updated Available Spaces Records: 50 records
  - ○ Estimated Daily Data Change:
    - ■ New Data per Day: (100 records * 100 bytes) + (50 records * 100 bytes) = 15,000 bytes = 15 KB

Total Estimated Daily Data Change: Adding up the daily data changes from each category:

- Passenger Activities: 16 KB
- Booking Activities: 15 KB

Total Estimated Daily Data Change: 31 KB
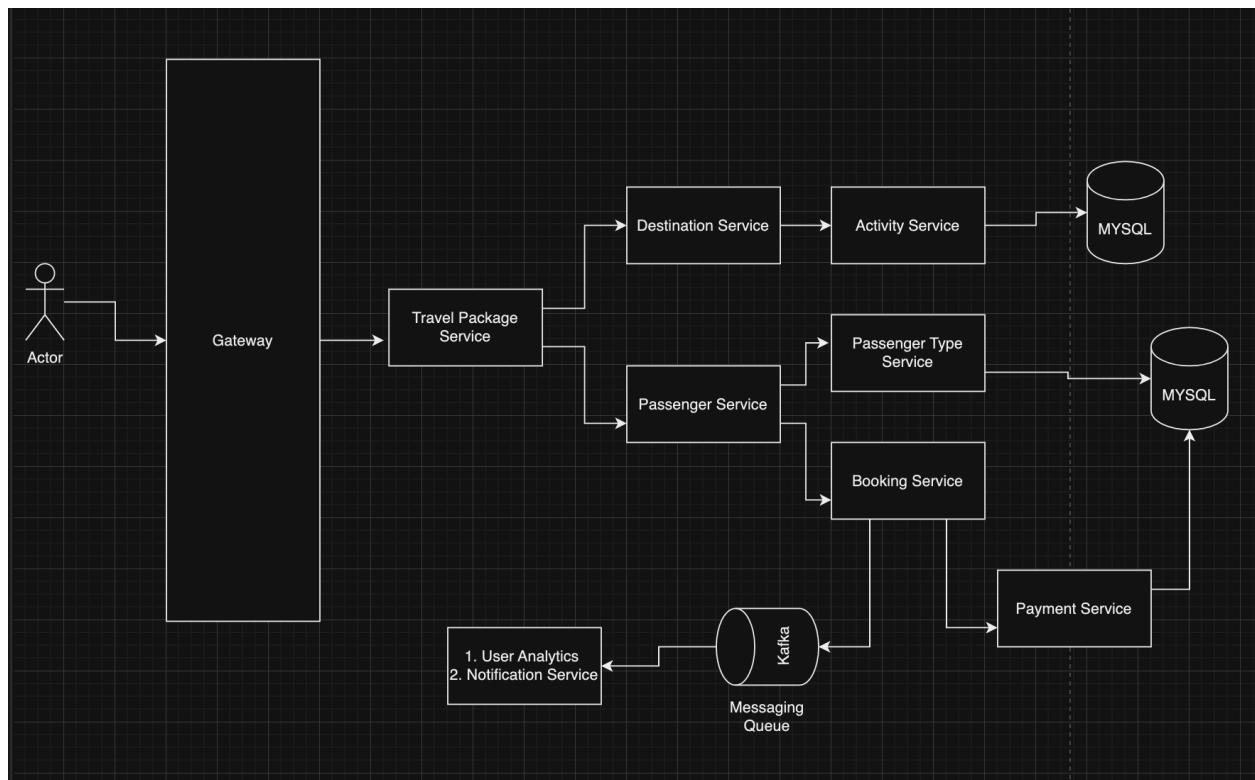
Database Schema

Entities and Relationships:

1. PassengerType:
   - ○ passenger_type_id (Primary Key)
   - ○ type_name
   - ○ discount
2. Passenger:
   - ○ passenger_id (Primary Key)
   - ○ name
   - ○ passenger_number
   - ○ balance
   - ○ passenger_type_id (Foreign Key referencing PassengerType)
3. Activity:
   - ○ activity_id (Primary Key)
   - ○ name
   - ○ description
   - ○ cost
   - ○ capacity
   - ○ destination_id (Foreign Key referencing Destination)
4. Destination:
   - ○ destination_id (Primary Key)
   - ○ name
5. DestinationActivity:
   - ○ destination_activity_id (Primary Key)
   - ○ destination_id (Foreign Key referencing Destination)
   - ○ activity_id (Foreign Key referencing Activity)
6. TravelPackage:
   - ○ travel_package_id (Primary Key)
   - ○ name
   - ○ passenger_capacity

7. TravelPackageDestination:
    ○ travel_package_destination_id (Primary Key)
    ○ travel_package_id (Foreign Key referencing TravelPackage)
    ○ destination_id (Foreign Key referencing Destination)
8. Booking:
    ○ booking_id (Primary Key)
    ○ passenger_id (Foreign Key referencing Passenger)
    ○ activity_id (Foreign Key referencing Activity)
    ○ booking_timestamp

High Level Design

The main services are:

● TravelPackageService: Manages travel packages.
● DestinationService: Manages destinations within travel packages.
● ActivityService: Manages activities available at different destinations.
● PassengerService: Manages passenger information, enrollments, and activities.
● PassengerTypeService: Manages passenger types (standard, gold, premium) and their discounts.
● BookingService: Manages enrollments and bookings for activities.