

Holberton - HBnB Project

Part 1 - Project Documentation



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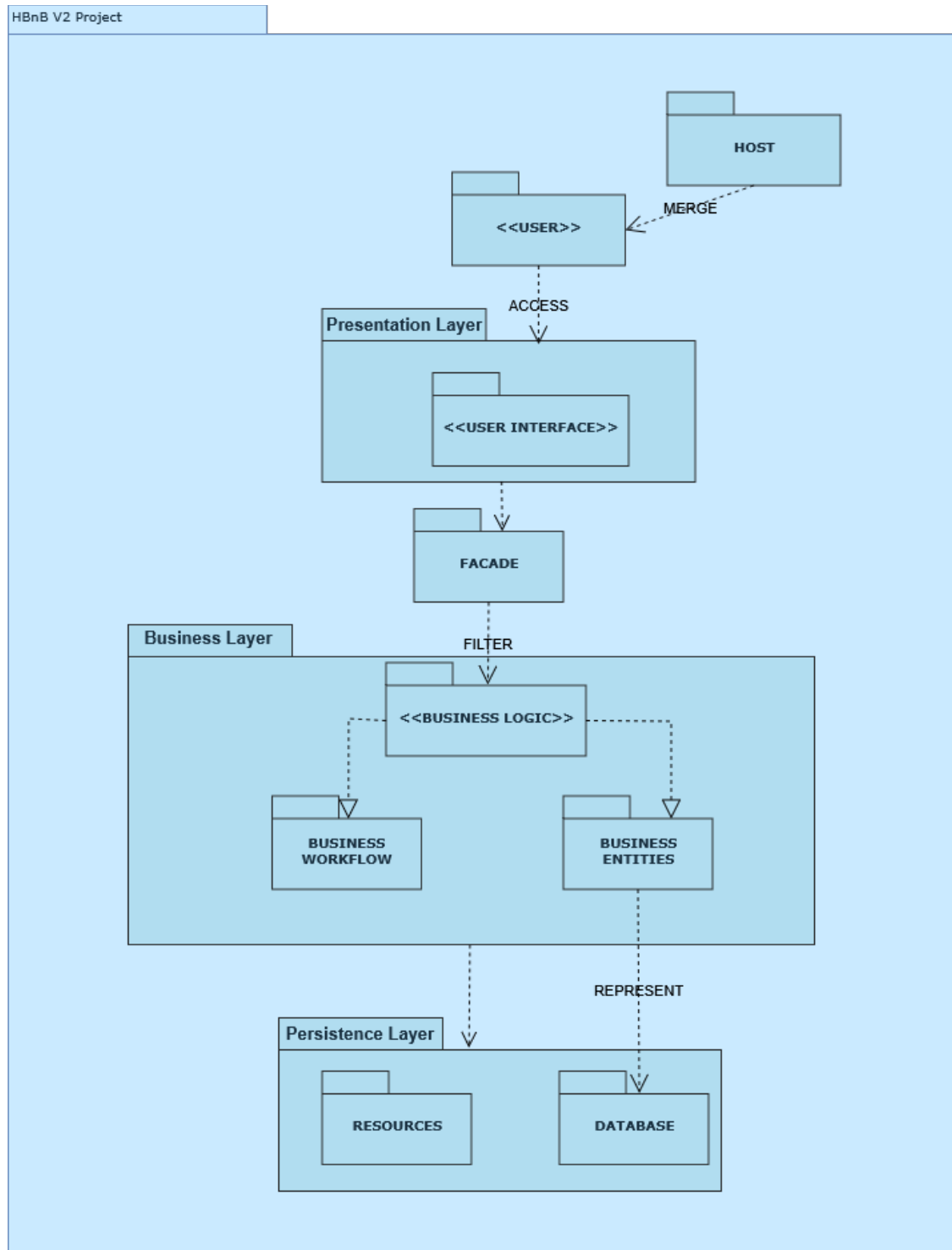
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❏ Introduction

Welcome to the documentation for our **HBnB Project**. This document provides a comprehensive overview of the project's scope.

High-Level Package Diagram

The system follows a layered architecture, ensuring separation of concerns and maintainability. Below is a high-level package diagram illustrating said structure:



The package diagram features the following:

A Layered Architecture

- **Presentation Layer:** Handles user interactions through user interface and API calls.
- **Business Logic Layer:** Contains an abstraction of the business rules and logic.
- **Data Access Layer:** Manages persistence and data operations.

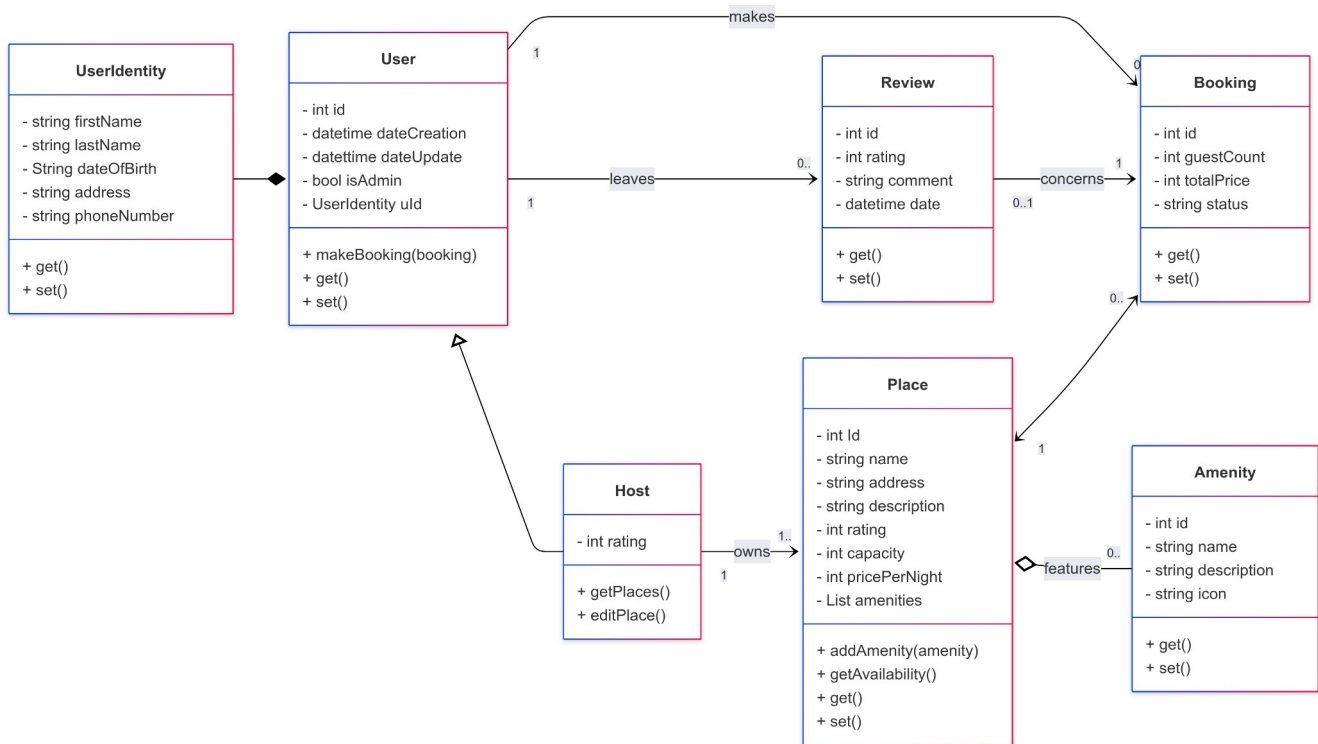
A Facade Pattern

- **Facade** is a structural design pattern that provides a simplified interface to a library, a framework, or any other complex set of classes.
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Business Logic Layer

Class Diagram

The core business logic is abstracted through classes and objects as is the aim of object-oriented principles. The class diagram below illustrates the main entities and their relationships:



Entities Overview

- User and UserIdentity**: Is used to describe an user of the service with attributes fitting its role. It is the entity around which the service revolves.
- Host**: Herited from the User class, his particularity is to offer a service in the form of one or more places to rent.
- Place**: It is the service provided by hosts. A host must owns at least one place, but can also own several.
- Review**: This entity translates the quality of the service as experienced by the user.
- Booking**: Is used to keep track of the availability of places as well as the number of guests, the duration of the stay or the price total of the service provided.
- Amenity**: This entity is a surplus service provided by the host. It is not mandatory, but it greatly appreciates the value of a place.

These components work together to provide a well defined abstraction of the business workings.

Translating Classes relationship to code

Relations between entities are not mere cosmetic, they serve to describe reality and, as such, help build a reliable code that translates to a real-life service.

The most important relations featured in this class diagram are *** Composition *** and *** Aggregation ***.

What follows are code snippets that aim to illustrate how composition and aggregation work in Python:

Here, Amenity is aggregated to Place; Amenity is used as an attribute of the class Place, but is not mandatory for it to work.

```
class Amenity:
    def __init__(self, id : int, name : str, description : str):
        self.__id = id
        self.__name = name
        self.__description = description

    def __str__(self):
        return self.__name

class Place:
    def __init__(self, id : int, name : str, address : str, description : str):
        self.__id = id
        self.__name = name
        self.__address = address
        self.__description = description
        self.__amenities = []

    def __str__(self):
        strList = ', '.join(str(amenity) for amenity in self.__amenities)
        format = "Nom du lieu: {}\n" \
        "Adresse: {}\n" \
        "Description: {}\n" \
        "Commodités: {}\n".format(self.__name, self.__address, self.__description, strList)
        return format

    def add_amenities(self, amenity):
        self.__amenities.append(amenity)
```

Then, composition; the instance of the class `UserIdentity` by being a parameter of the object constructor of the `User` class is an integral part of the `User` class. An instance of the `User` class cannot exist if it is not composed of an instance of the `UserIdentity` class.

```
class UserIdentity:
    def __init__(self, firstName, lastName, dateOfBirth, address, phoneNumber):
        self.__firstName = firstName
        self.__lastName = lastName
        self.__address = address
        self.__dateOfBirth = dateOfBirth
        self.__phoneNumber = phoneNumber

    def __str__(self):
        format = "L'utilisateur {} {} est né le {} à {}".format(
            self.__firstName,
            self.__lastName,
            self.__dateOfBirth,
            self.__address)
        return format

class User:
    def __init__(self, id, dateCreation, dateUpdate, isAdmin, userIdentity):
        self.__id = id
        self.__dateCreation = dateCreation
        self.__dateUpdate = dateUpdate
        self.__isAdmin = isAdmin
        self.__userIdentity = userIdentity

    def __str__(self):
        return str(self.__userIdentity)
```

Eventually, in the `main.py` file:

```
#!/usr/bin/python3
from classesAgreg import Amenity, Place
from classesComp import UserIdentity, User

if __name__ == '__main__':

    place1 = Place(1, "Siège du PCF", "2, place du Colonel-Fabien", "Un bâtiment avant-gardiste")

    userId = UserIdentity("Thierry", "Martin", "22 avril 1970", "Clermont-Ferrand", "+33 6 75 58 12 12")
    user1 = User(1, "06/06/2025", "06/06/2025", True, userId)

    amenity1 = Amenity(1, "micro onde", "ne pas y sécher le chien")
    amenity2 = Amenity(2, "sèche cheveux", "peut servir à sécher le chien")
    amenity3 = Amenity(3, "wifi", "code wifi: Octore1917")

    place1.add_amenities(amenity1)
    place1.add_amenities(amenity2)
    place1.add_amenities(amenity3)

    print(place1, end="")

    print("_" * 50)
    print()

    print(user1)
```

Which gives us the following output:

```
theo@PC:~/holbertonschool-hbnb/part1$ ./main.py
Nom du lieu: Siège du PCF
Adresse: 2, place du Colonel-Fabien
Description: Un bâtiment avant-gardiste
Commodités: micro onde, sèche cheveux, wifi

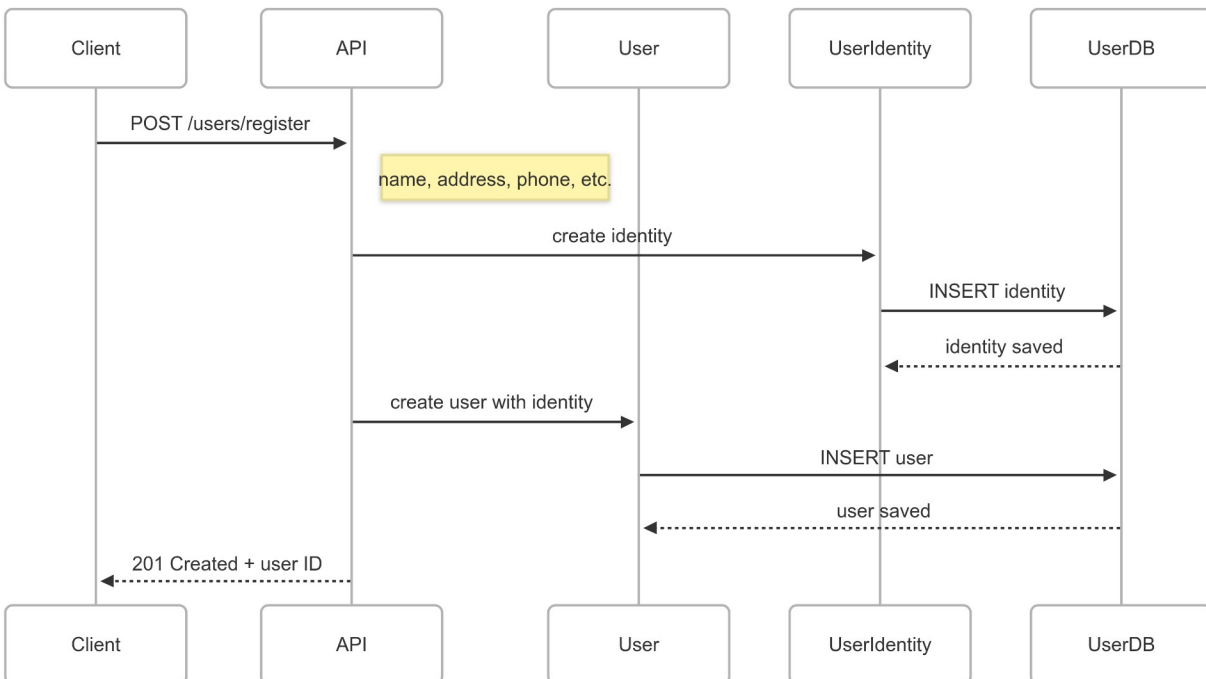
L'utilisateur Thierry Martin est né le 22 avril 1970 à Clermont-Ferrand
```

API Interaction Flow

Sequence Diagrams

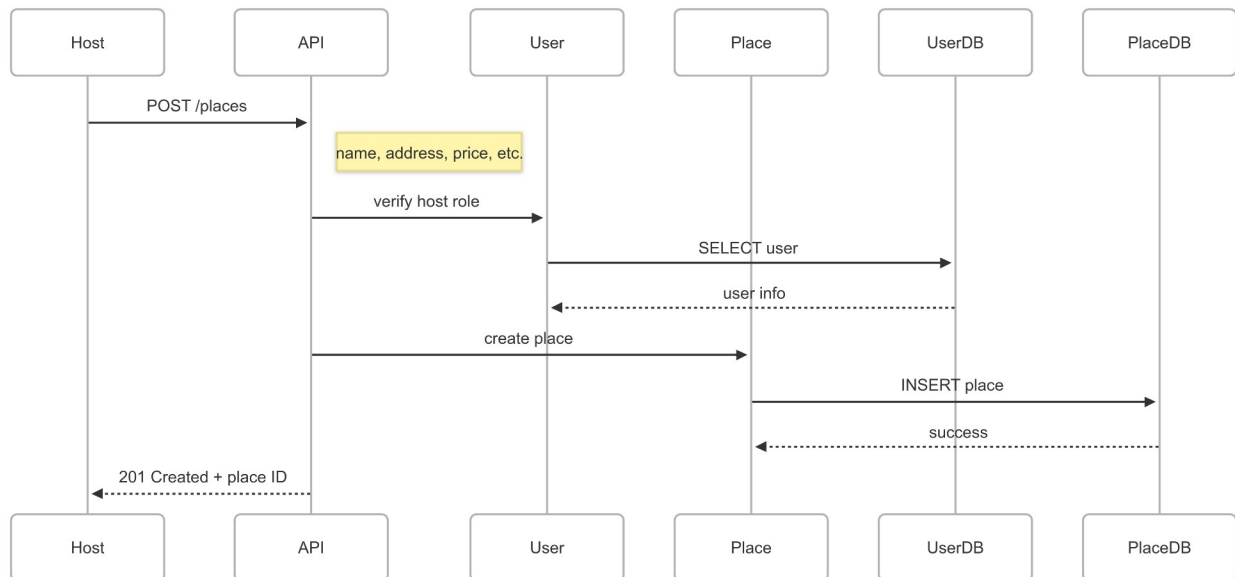
The following sequence diagrams illustrate the flow of API calls, demonstrating interactions between components:

Use case 1: `POST /users/register`



- Client:** initiates registration by submitting user and identity information.
- API Gateway:** handles the request and delegates to the logic layer.
- UserIdentity:** is instantiated and persisted as a separate entity.
- User:** is created and linked to the persisted identity.
- Database:** stores both identity and user records.
- API Gateway:** returns confirmation with the new user ID.

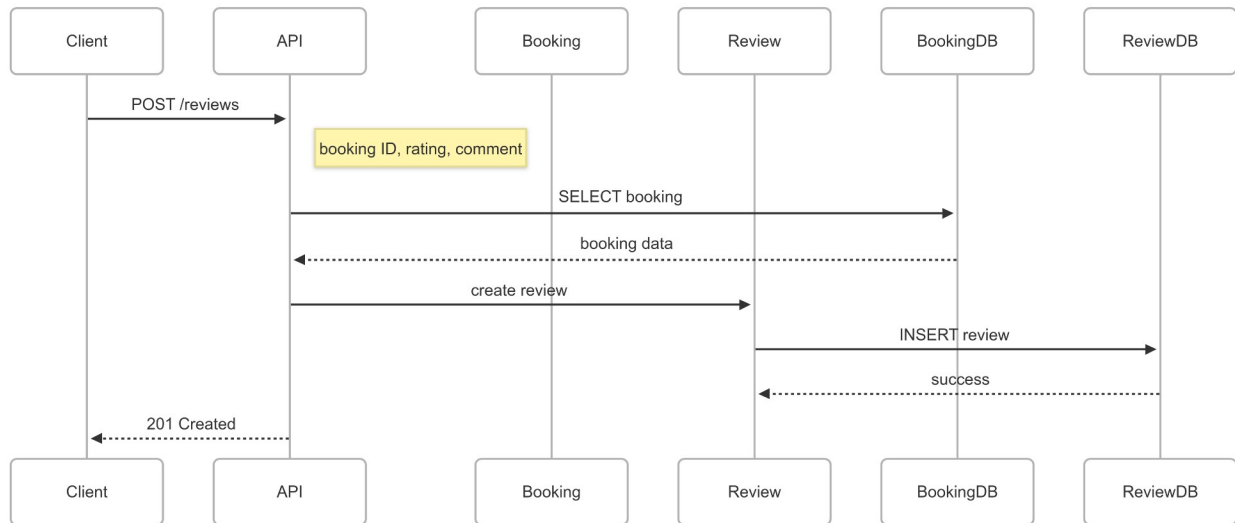
Use case 2: POST /places



Description

- **Host:** submits a request to list a new place.
- **API Gateway:** verifies the user's role as a host.
- **UserDB:** is queried to confirm host identity and status.
- **Place:** is instantiated with submitted data.
- **PlaceDB:** stores the new place in the system.
- **API Gateway:** confirms creation and returns the place ID.

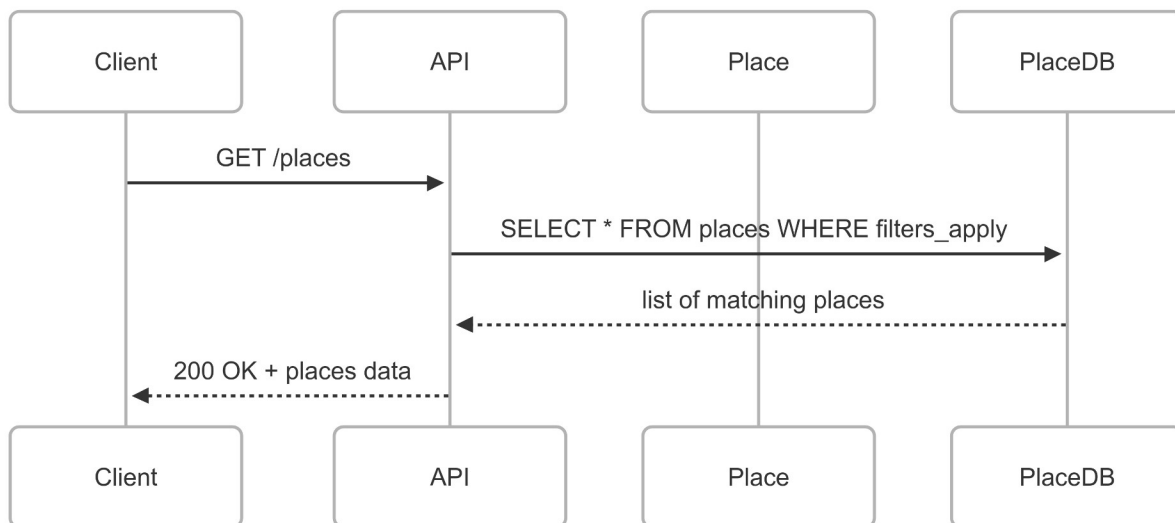
Use case 3: POST /reviews



Description

- Client:** submits a review linked to a completed booking.
- API Gateway:** validates input and ensures booking validity.
- BookingDB:** is queried to fetch the corresponding booking.
- Review:** is created based on user input and booking context.
- ReviewDB:** stores the new review.
- API Gateway:** returns a confirmation of successful submission.

Use case 4: GET /places



Description

- Client:** requests a list of available places, with optional filters.
- API Gateway:** builds and executes the query using the filters.
- PlaceDB:** returns all places that match the criteria.
- API Gateway:** responds with place data and a success status.

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Thank you for your attention 🙏