Travlr Getaways Full Stack Web Application

CS 465 Project Software Design Document

Version 1.0

Table of Contents

Document Revision History

Version	Date	Author	Comments
0.1	07/11/2023	Eric Slutz	Completed the executive summary and design constraints.
0.1	07/12/2023	Eric Slutz	Completed the component diagram for the system architecture view.
0.2	07/24/23	Eric Slutz	Added current API endpoints, the sequence diagram and explanation, and the class diagram.
0.2	07/25/23	Eric Slutz	Updated the class diagram and add the diagram explanation.
1.0	08/09/23	Eric Slutz	Added new API endpoints, completed user interface section, updated design constraints based on feedback.

Executive Summary

The web application for Travlr Getaways will be built using the MEAN (MongoDB, Express.js, Angular, and Node.js). The application will have a static portion displaying content for the site, and an admin portion for managing the website. Node.JS serves as the application runtime that the entire web application will run on.

On the customer facing side of the web application, Express.js, Handlebars, and MongoDB will be used. Express.js is a framework for Node.js that is used to serve the static content of the web application. MongoDB in conjunction with Handlebars will be used to generate the static content that Express.js can serve. Handlebars is a templating language that can be used to dynamically populate a static page with content. MongoDB is the NoSQL (non-relational) database that will be used to store the static content to be displayed in the Handlebars templates.

On the admin side of the web application, a single page application (SPA) will be created using Angular. This will allow an admin to perform various administrator functions. First, to access the admin page, they will have to authenticate and login. Then they will be able to manage the content for the web application and add, update, or remove content for different parts of the static side of the web application. This will be accomplished by updating the documents in MongoDB to reflect what is done in the admin portal.

Design Constraints

There are several design constraints to consider when developing a web application using the MEAN tech stack for Travlr Getaways. First, it needs to be easy to update the content on the static portion of the site without having to redeploy the entire website. The design needs to be responsive, providing a good user experience regardless of the type of device that is being used. The admin portal needs to be a single page application (SPA) that can be used to dynamically display the different components needed to let the admin manage the web application.

In regard to the parts of the MEAN tech stack, MongoDB is the database used in the MEAN stack. While MongoDB is typically well suited for web applications, it can suffer performance issues if the dataset becomes too large. Express, Angular, and Node.js work well together to complete the MEAN tech but, can result in a large codebase that could become difficult to manage. Additionally, if an existing site is converted to use the MEAN tech stack, it can be difficult to revert to the traditional website.

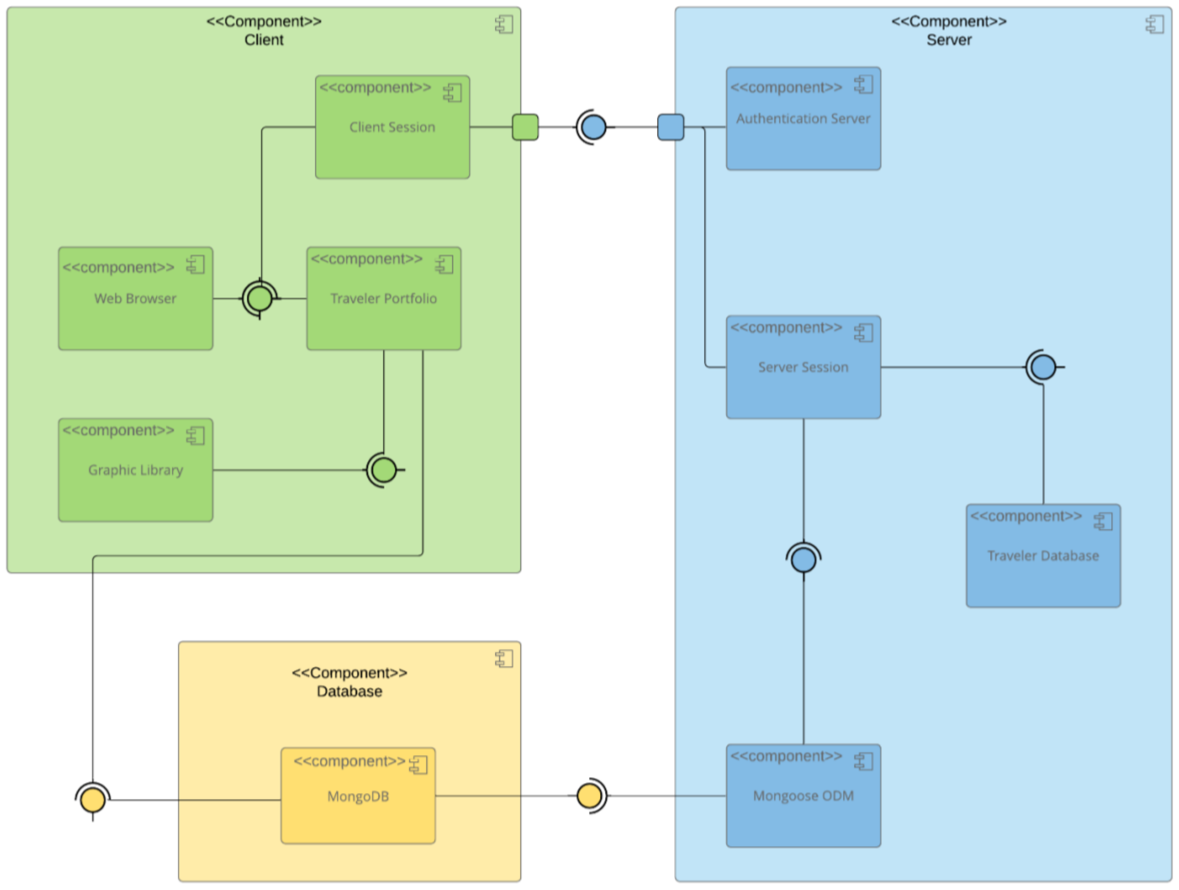
System Architecture View

Component Diagram

The Travlr Getaways web application is composed of three major components: the Client component, Server component, and Database component. Each of these components are made up of their own parts. The Client component contains components for Client Sessions, the Web Browser, the Traveler Portfolio, and Graphic library. The Web Browser and Graphic Library both provide an interface. The Client Session and Traveler Portfolio require the Web Browser interface. The Traveler Portfolio also requires the Graphic Library interface, and the interface provided by the Database component. The Client Session interacts with a port on the Client component to connect to the required Server component interface.

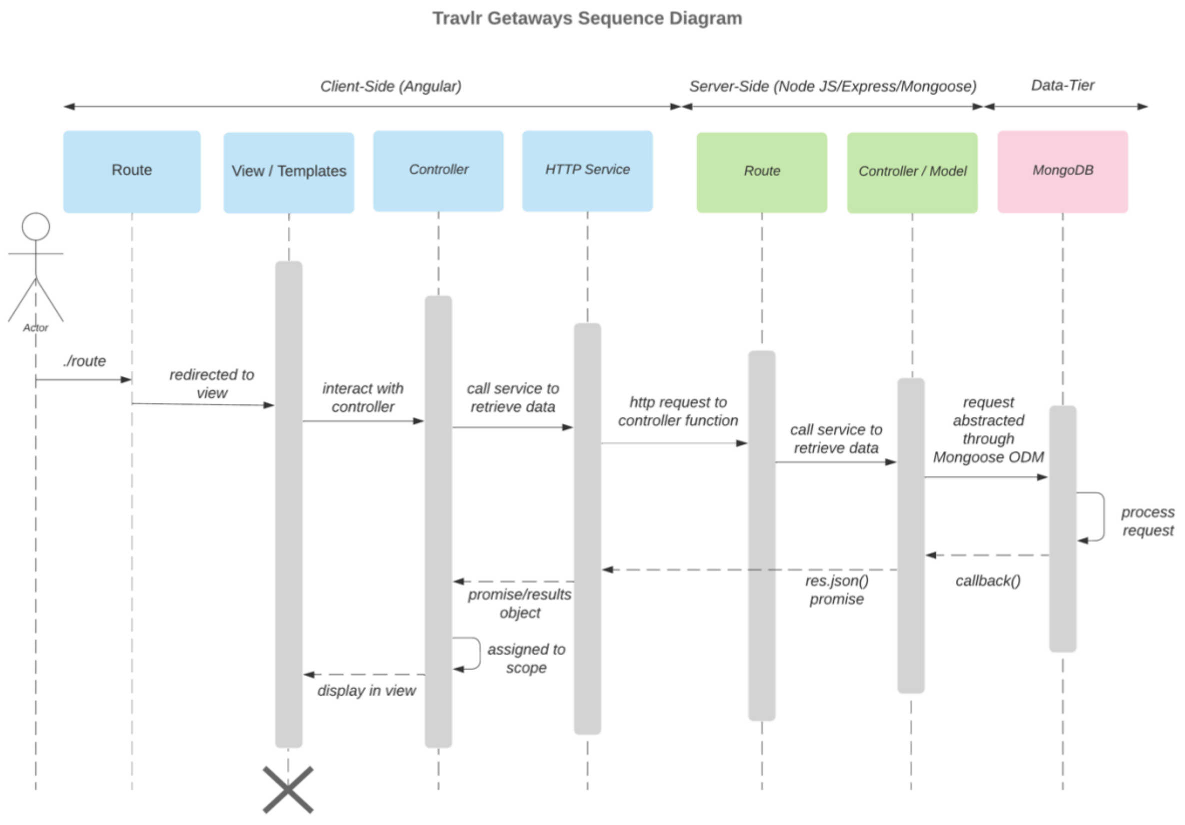
The Server component had four components including the Authentication Server, Server Session, traveler database, and Mongoose ODM components. The Mongoose ODM and Server Session both provide an interface. The Traveler Database requires the Server Session interface, and the Server session requires the Mongoose ODM interface. The Mongoose ODM component requires the interface provided by the Database component. Both the Server Session and Authentication Server components interact with a port on the Server component to provide an interface.

Lastly, the Database component has a single component for MongoDB which provides an interface to the Client and Server components.



Sequence Diagram

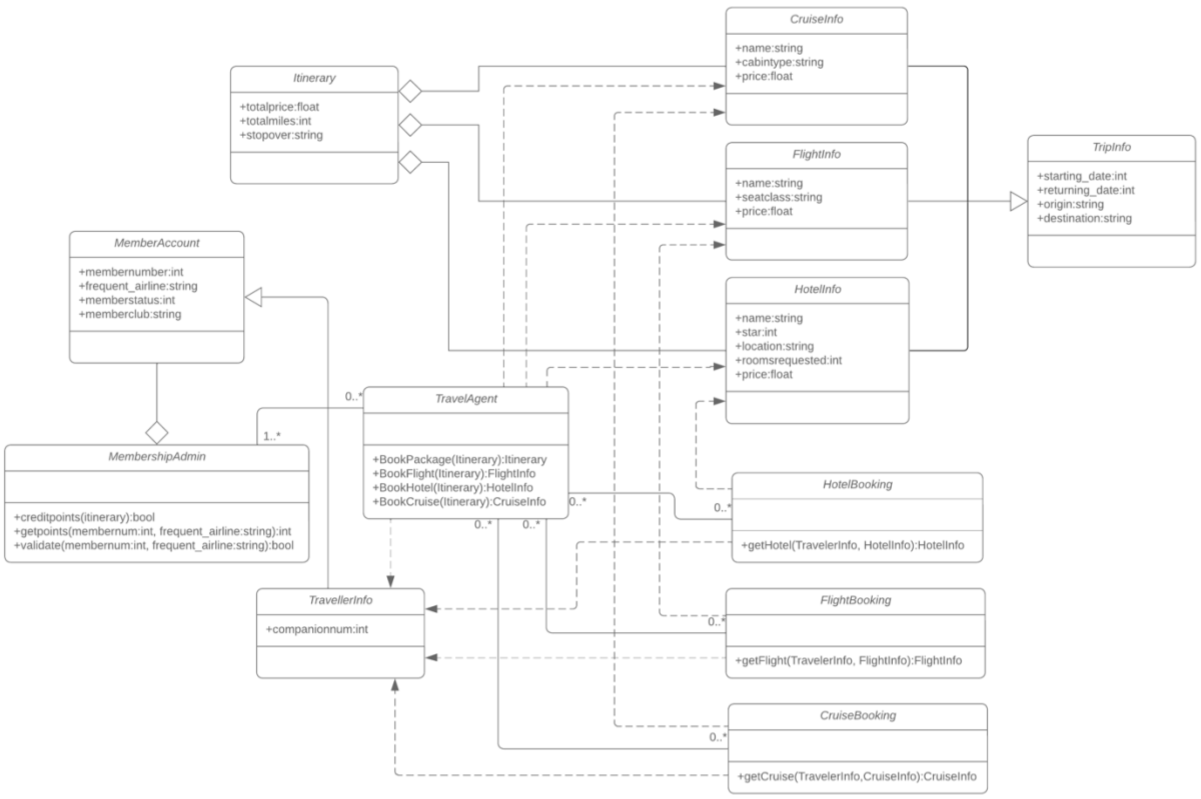
The sequence diagram starts with the actor, which in this case is the user. The actor enters a route and is directed to one of the views/templates for the site by the frontend router. The view calls the corresponding controller, which will populate the template and render and return the view to be displayed for the actor. The frontend controller makes calls to functions within the HTTP service to retrieve pieces of information. The results of that function are passed back to the controller. The HTTP service connects the frontend to the backend by making the API calls to specific routes. The router on the backend receives the route from the frontend and based that route, calls the appropriate backend controller. Once called by the router, the backend controller makes a call the database using Mongoose. The controller takes the returned data and passes the result back up to the calling frontend http service. Lastly, the MongoDB database receives the query from the backend controller, process the request, and returns the result.



Class Diagram

The CruiseInfo, FlightInfo, and HotelInfo classes all contain a name property and other fields that are unique to each mode of travel. Each one also inherits the TripInfo class which contains properties for the start and return data, as well as origin and destination locations. CruiseBooking, FlightBooking, and HotelBooking each have an association with their corresponding Info class and the TravellerInfo class. There are zero-to-many relationships between the Booking classes and the TravelAgent class in both directions. The TravelAgent class has also has associations with the CruiseInfo, FlightInfo, HotelInfo, and TravellerInfo classes and a one-to-many relationship with the MembershipAdmin class. The TravellerInfo class inherits the MemberAccount class. The MembershipAdmin class has an aggregate relationship with the MemberAccount class. The Itinerary class has an aggregate relationship with the CruiseInfo, FlightInfo, and HotelInfo classes.

Travlr Getaways Class Diagram

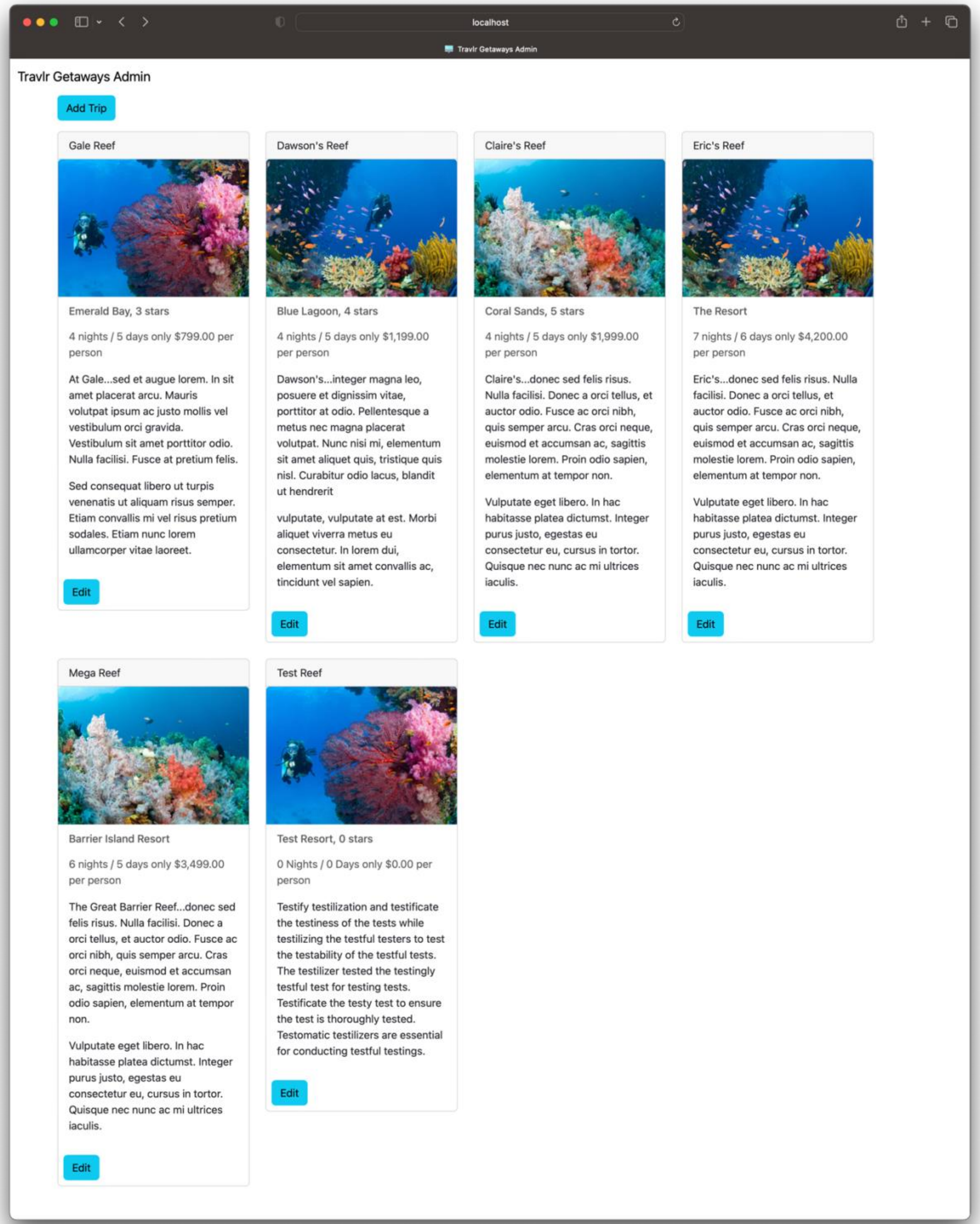


API Endpoints

Method	**Purpose**	**URL**	**Notes**
POST	Login a user	/api/login	Authenticates a user and returns a JWT
POST	Register a user	/api/register	Add a new user to the database and returns a JWT
GET	Retrieve list of meals	/api/meals	Returns all meals
GET	Retrieve single meal	/api/meals/:mealCode	Returns single meal, identified by the meal code at end of URL
GET	Retrieve list of news	/api/news	Returns all news content
GET	Retrieve single piece of news content	/api/news/:newsCode	Returns single news piece, identified by the news code at end of URL
GET	Retrieve list of rooms	/api/rooms	Returns all rooms
GET	Retrieve single room	/api/rooms/:roomCode	Returns single room, identified by the room code at end of URL
GET	Retrieve list of trips	/api/trips	Returns all trips
POST	Add a trip	/api/trips	Add a new trip to the database
GET	Retrieve single trip	/api/trips/:tripCode	Returns single trip, identified by the trip code at end of URL
PUT	Update single trip	/api/trips/:tripCode	Updates single trip, identified by the trip code at end of URL
DELETE	Delete single trip	/api/trips/:tripCode	Deletes single trip, identified by the trip code at end of URL

The User Interface

Unique Trips Added to Trip Listing Screen



Travlr Getaways Admin

Add Trip

Gale Reef

Emerald Bay, 3 stars

4 nights / 5 days only $799.00 per person

At Gale...sed et augue lorem. In sit amet placerat arcu. Mauris volutpat ipsum ac justo mollis vel vestibulum orci gravida. Vestibulum sit amet porttitor odio. Nulla facilisi. Fusce at pretium felis.

Sed consequat libero ut turpis venenatis ut aliquam risus semper. Etiam convallis mi vel risus pretium sodales. Etiam nunc lorem ullamcorper vitae laoreet.

Edit

Dawson's Reef

Blue Lagoon, 4 stars

4 nights / 5 days only $1,199.00 per person

Dawson's...integer magna leo, posuere et dignissim vitae, porttitor at odio. Pellentesque a metus nec magna placerat volutpat. Nunc nisi mi, elementum sit amet aliquet quis, tristique quis nisl. Curabitur odio lacus, blandit ut hendrerit

vulputate, vulputate at est. Morbi aliquet viverra metus eu consectetur. In lorem dui, elementum sit amet convallis ac, tincidunt vel sapien.

Edit

Claire's Reef

Coral Sands, 5 stars

4 nights / 5 days only $1,999.00 per person

Claire's...donec sed felis risus. Nulla facilisi. Donec a orci tellus, et auctor odio. Fusce ac orci nibh, quis semper arcu. Cras orci neque, euismod et accumsan ac, sagittis molestie lorem. Proin odio sapien, elementum at tempor non.

Vulputate eget libero. In hac habitasse platea dictumst. Integer purus justo, egestas eu consectetur eu, cursus in tortor. Quisque nec nunc ac mi ultrices iaculis.

Edit

Eric's Reef

The Resort

7 nights / 6 days only $4,200.00 per person

Eric's...donec sed felis risus. Nulla facilisi. Donec a orci tellus, et auctor odio. Fusce ac orci nibh, quis semper arcu. Cras orci neque, euismod et accumsan ac, sagittis molestie lorem. Proin odio sapien, elementum at tempor non.

Vulputate eget libero. In hac habitasse platea dictumst. Integer purus justo, egestas eu consectetur eu, cursus in tortor. Quisque nec nunc ac mi ultrices iaculis.

Edit

Mega Reef

Barrier Island Resort

6 nights / 5 days only $3,499.00 per person

The Great Barrier Reef...donec sed felis risus. Nulla facilisi. Donec a orci tellus, et auctor odio. Fusce ac orci nibh, quis semper arcu. Cras orci neque, euismod et accumsan ac, sagittis molestie lorem. Proin odio sapien, elementum at tempor non.

Vulputate eget libero. In hac habitasse platea dictumst. Integer purus justo, egestas eu consectetur eu, cursus in tortor. Quisque nec nunc ac mi ultrices iaculis.

Edit

Test Reef

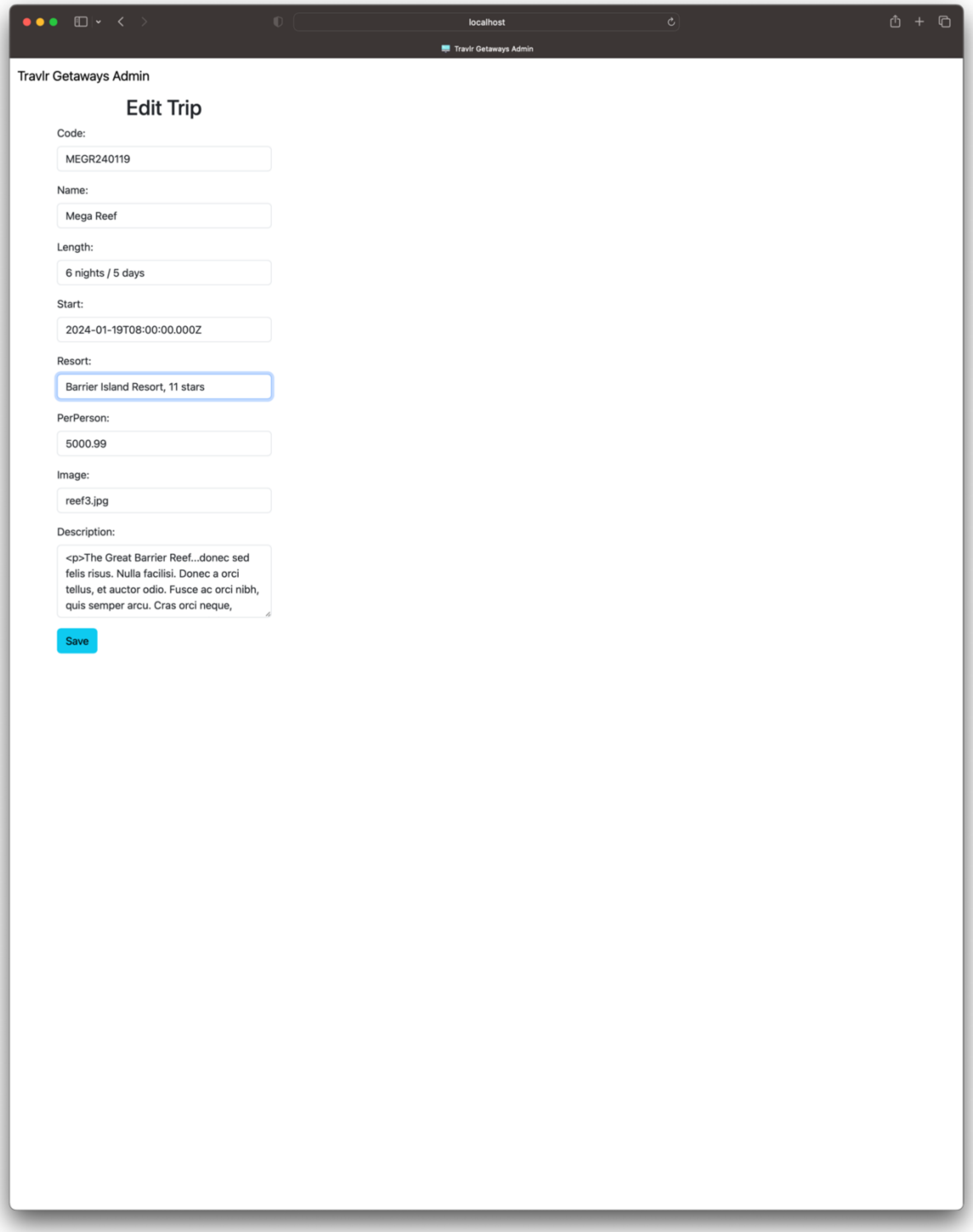
Test Resort, 0 stars

0 Nights / 0 Days only $0.00 per person

Testify testilization and testificate the testiness of the tests while testilizing the testful testers to test the testability of the testful tests. The testilizer tested the testingly testful test for testing tests. Testificate the testy test to ensure the test is thoroughly tested. Testomatic testilizers are essential for conducting testful testings.

Edit

Edit Trip Screen



Travlr Getaways Admin

Edit Trip

Code:
MEGR240119

Name:
Mega Reef

Length:
6 nights / 5 days

Start:
2024-01-19T08:00:00.000Z

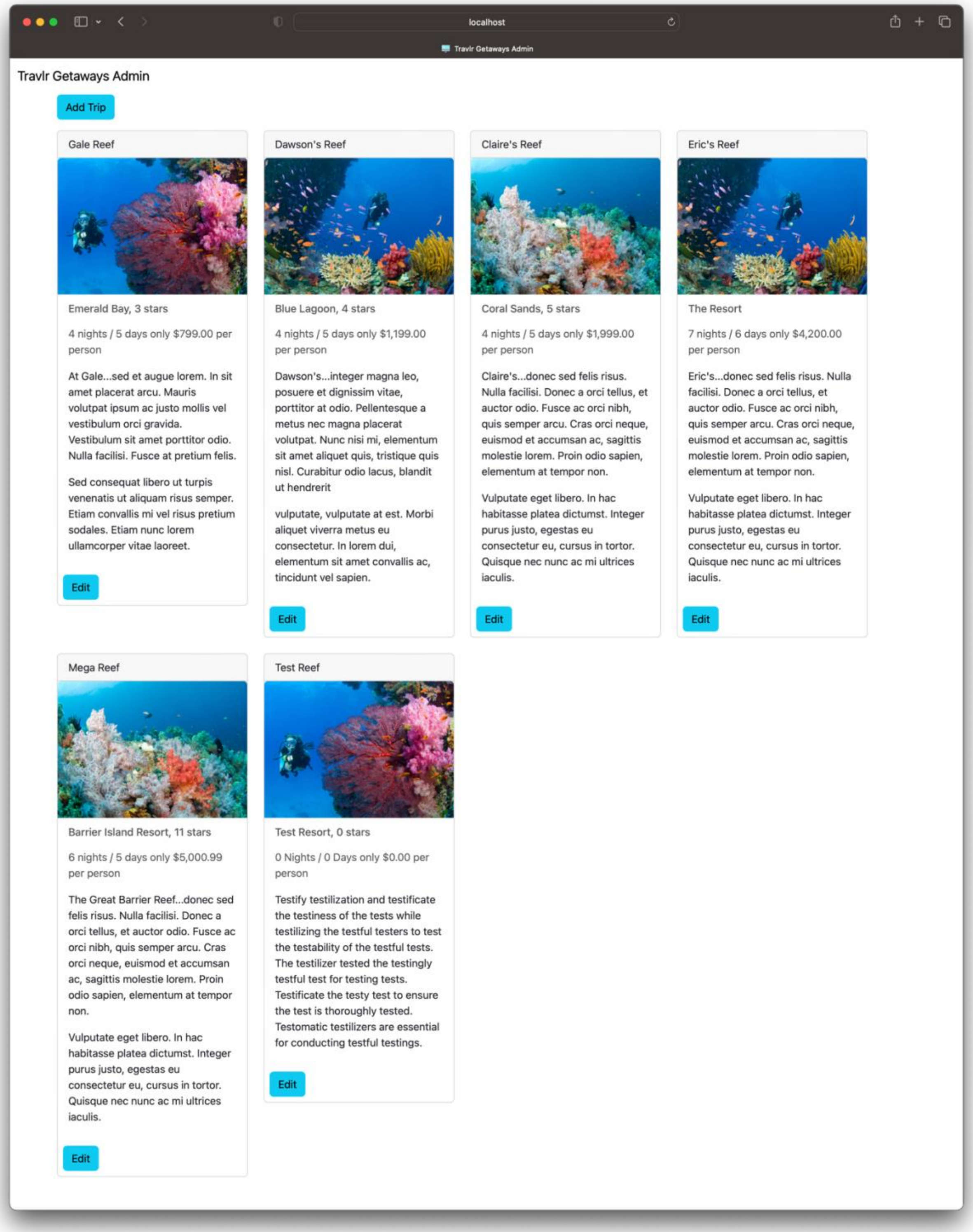
Resort:
Barrier Island Resort, 11 stars

PerPerson:
5000.99

Image:
reef3.jpg

Description:
<p>The Great Barrier Reef...donec sed felis risus. Nulla facilisi. Donec a orci tellus, et auctor odio. Fusce ac orci nibh, quis semper arcu. Cras orci neque,

Trip Listing with Updated Trips Screen



Travlr Getaways Admin

Add Trip

Gale Reef

Emerald Bay, 3 stars

4 nights / 5 days only $799.00 per person

At Gale...sed et augue lorem. In sit amet placerat arcu. Mauris volutpat ipsum ac justo mollis vel vestibulum orci gravida. Vestibulum sit amet porttitor odio. Nulla facilisi. Fusce at pretium felis.

Sed consequat libero ut turpis venenatis ut aliquam risus semper. Etiam convallis mi vel risus pretium sodales. Etiam nunc lorem ullamcorper vitae laoreet.

Edit

Dawson's Reef

Blue Lagoon, 4 stars

4 nights / 5 days only $1,199.00 per person

Dawson's...integer magna leo, posuere et dignissim vitae, porttitor at odio. Pellentesque a metus nec magna placerat volutpat. Nunc nisi mi, elementum sit amet aliquet quis, tristique quis nisl. Curabitur odio lacus, blandit ut hendrerit

vulputate, vulputate at est. Morbi aliquet viverra metus eu consectetur. In lorem dui, elementum sit amet convallis ac, tincidunt vel sapien.

Edit

Claire's Reef

Coral Sands, 5 stars

4 nights / 5 days only $1,999.00 per person

Claire's...donec sed felis risus. Nulla facilisi. Donec a orci tellus, et auctor odio. Fusce ac orci nibh, quis semper arcu. Cras orci neque, euismod et accumsan ac, sagittis molestie lorem. Proin odio sapien, elementum at tempor non.

Vulputate eget libero. In hac habitasse platea dictumst. Integer purus justo, egestas eu consectetur eu, cursus in tortor. Quisque nec nunc ac mi ultrices iaculis.

Edit

Eric's Reef

The Resort

7 nights / 6 days only $4,200.00 per person

Eric's...donec sed felis risus. Nulla facilisi. Donec a orci tellus, et auctor odio. Fusce ac orci nibh, quis semper arcu. Cras orci neque, euismod et accumsan ac, sagittis molestie lorem. Proin odio sapien, elementum at tempor non.

Vulputate eget libero. In hac habitasse platea dictumst. Integer purus justo, egestas eu consectetur eu, cursus in tortor. Quisque nec nunc ac mi ultrices iaculis.

Edit

Mega Reef

Barrier Island Resort, 11 stars

6 nights / 5 days only $5,000.99 per person

The Great Barrier Reef...donec sed felis risus. Nulla facilisi. Donec a orci tellus, et auctor odio. Fusce ac orci nibh, quis semper arcu. Cras orci neque, euismod et accumsan ac, sagittis molestie lorem. Proin odio sapien, elementum at tempor non.

Vulputate eget libero. In hac habitasse platea dictumst. Integer purus justo, egestas eu consectetur eu, cursus in tortor. Quisque nec nunc ac mi ultrices iaculis.

Edit

Test Reef

Test Resort, 0 stars

0 Nights / 0 Days only $0.00 per person

Testify testilization and testificate the testiness of the tests while testilizing the testful testers to test the testability of the testful tests. The testilizer tested the testingly testful test for testing tests. Testificate the testy test to ensure the test is thoroughly tested. Testomatic testilizers are essential for conducting testful testings.

Edit

UI Summary

Angular is a frontend framework with the views rendered on the client side, whereas Express is a backend framework with the views rendered on the server and sent to the client. The Angular project is made up of models, services, routes, and components. The Express site is made up of views, controllers, and routes. Angular consists of a single HTML page that dynamically updates the views and page content on the client. Angular uses reusable components to make up the parts of the site. Express uses a templating engine, in this case handlebars, to dynamically generate content on the server before sending to the client. Both use APIs to retrieve or send data.

Some advantages of SPA functionality include:

- Reduced server load due to only needing to send the initial page.
- SPAs can create very interactive sites with lots of functionality.
- Faster user experience due to eliminating full page reloads and only necessary data is retrieved from the server.

Some disadvantages of SPA functionality include:

- A longer initial load time due to needing to retrieve the entire JavaScript application.
- They can be difficult to optimize for SEO.

Additional SPA functionality of simple web applications include:

- Client-side routing which removes the need for additional server requests and provides a smooth transition between views.
- SPAs have the ability to offer offline support after the initial page load.

The best way to test the SPA API calls is to use the admin site. The GET API calls can be tested by loading the trip-list view. If trips show up, then the API GET call worked to retrieve the trips from the database. To test the PUT API call, one of the trips would need to be selected to update. Once you have made some edits and select save, the updated information should be displayed for the trip in the trip-listing view. This shows that the PUT API call worked correctly to change the trip data in the database. During testing I received a 404 error when attempting to test the admin SPA. This was due to forgetting to start the Express server application on the backend. Without the API controllers running on the server, there is no way for the SPA to interact with the database.