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CAAMBus

A. Domain Description - *University Transportation*

- The transportation services of the university, specifically the trolley service, takes passengers (primarily students and staff) throughout the different buildings inside and outside the campus.
- The Department of Transportation is in charge of authorizing and dispatching each trolley trip.
    - Specifically, the department of transportation creates a new itinerary ticket with basic details pertaining to the driver, vehicle and route.
    - Each time a new itinerary is created, it is saved to the database.
- While on the road, the trolley follows the route that was specifically assigned. The only exception is when there are obstacles (traffic jams, closed roads, etc.). The driver documents when and where they were "off-route".
- Driver aren't assigned a specific vehicle, but rather are tied to one on a day-by-day basis through the itinerary assigned to them,

B. User Stories

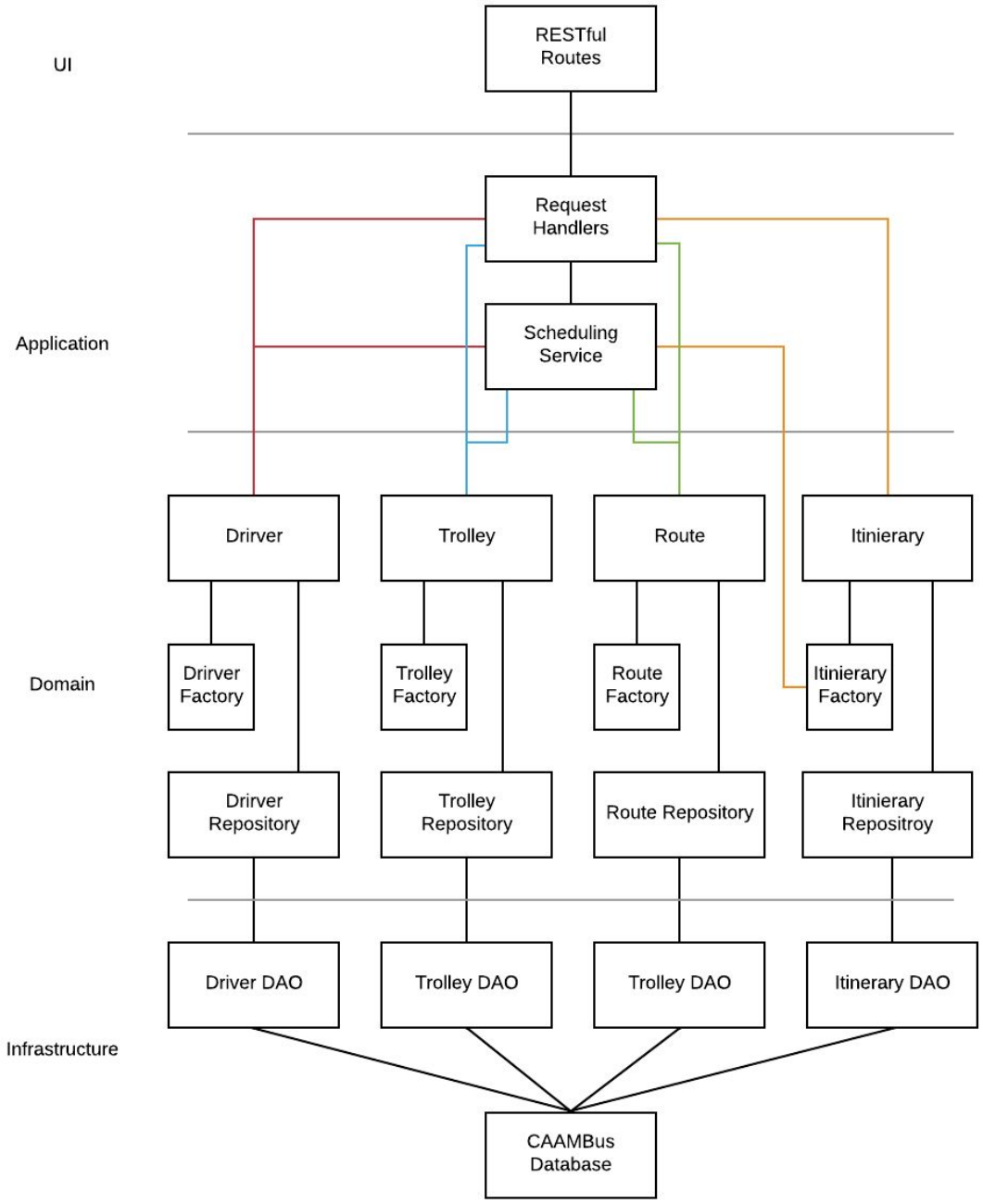
- As an administrator, I want to be able to assign a driver a vehicle so that they can carry out trolley routes.
- As an administrator, I want to be able to assign a tracker to a vehicle so that I can track the vehicles location and be able to determine when it goes off route, as well as track mileage.
- As an administrator, I want to be able to issue an itinerary for a specific route so that the system can keep track of the driver, vehicle and the respective tracker assigned to that route.
- As an administrator, I want to be able to create, edit or delete routes in the system so that I can create, edit or delete routes based on unexpected circumstances such as an event on campus or a road block.
- As a driver, I want to be able to view the itinerary I've been assigned so that I may carry out my day's work.
- As an administrator, I want to be able to manage itineraries so that I can deal with unexpected circumstances.

C. Requirements

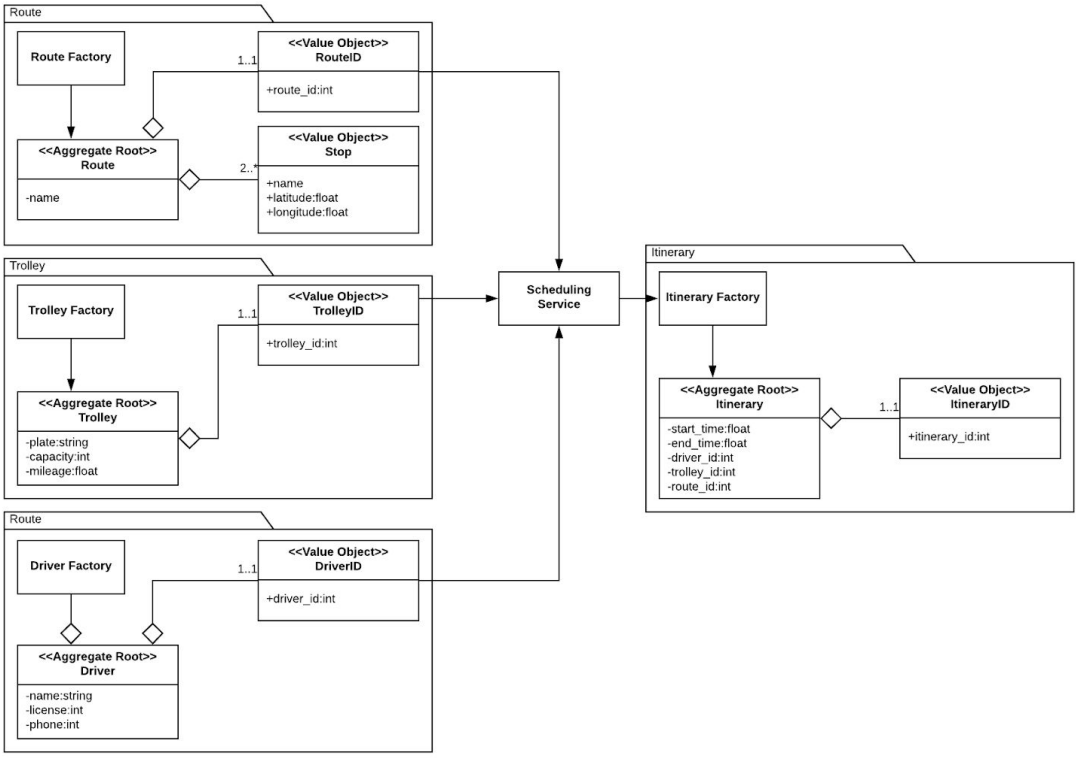
- The system has to aid the workers of the Department of Transportation to create an itinerary.
    - The itinerary must be associated with a specific driver, vehicle, & route. Within it, there is also the departure time and arrival time, which are automatically computed when the trip starts and ends, respectively.
- Once the trip ends, the system must:

    - update the arrival time associated to the trip and the mileage of the associated vehicle,
    - gather the relevant information to generate a complete trip report.
- Whenever the administration needs to create a monthly report, the system must gather all the trips taken in a certain month and generate a report that calculates important statistics like: mileage driven for each driver and vehicle, passenger count per route, etc.

D. Layered Architecture



E. Diagram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Route Factory
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RouteID
+route_id:int
<<Aggregate Root>>
Route
-name
2..*
<<Value Object>>
Stop
+name
+latitude:float
+longitude:float
Trolley
Trolley Factory
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TrolleyID
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Trolley
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<<Aggregate Root>>
Driver
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-license:int
-phone:int
Scheduling
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Itinerary
Itinerary Factory
<<Aggregate Root>>
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-end_time:float
-driver_id:int
-trolley_id:int
-route_id:int
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<<Value Object>>
ItineraryID
+itinerary_id:int