Faculty of Engineering & Applied Science

SOFE 4610U Design And Analysis of IoT Software Systems

Assignment 3

Github:
https://github.com/tiwaojo/IoT_Labs/tree/master/Assignment3

Deadline date: 11/27/2022

Group Number: *4*

Course Instructor: ***Ramiro Liscano***

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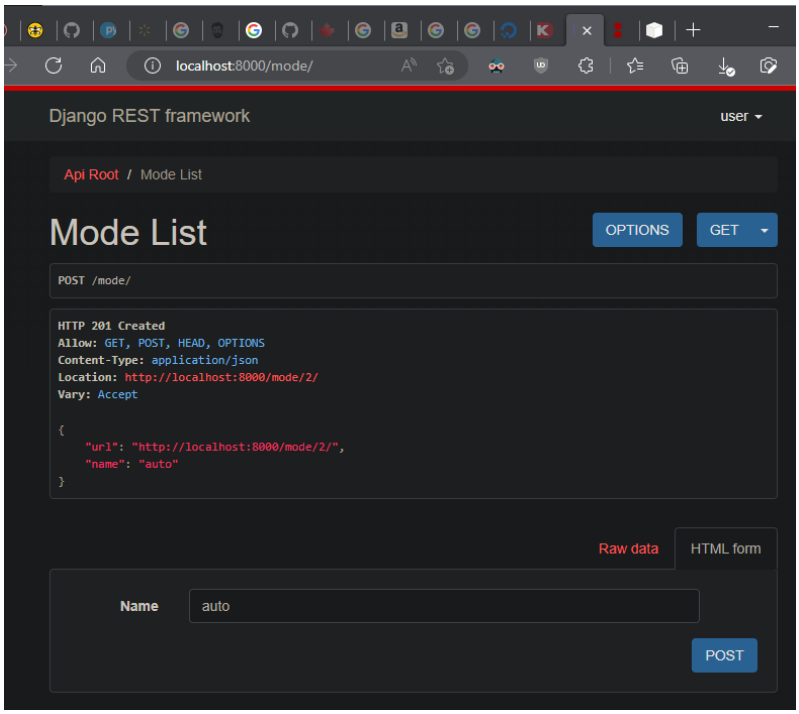
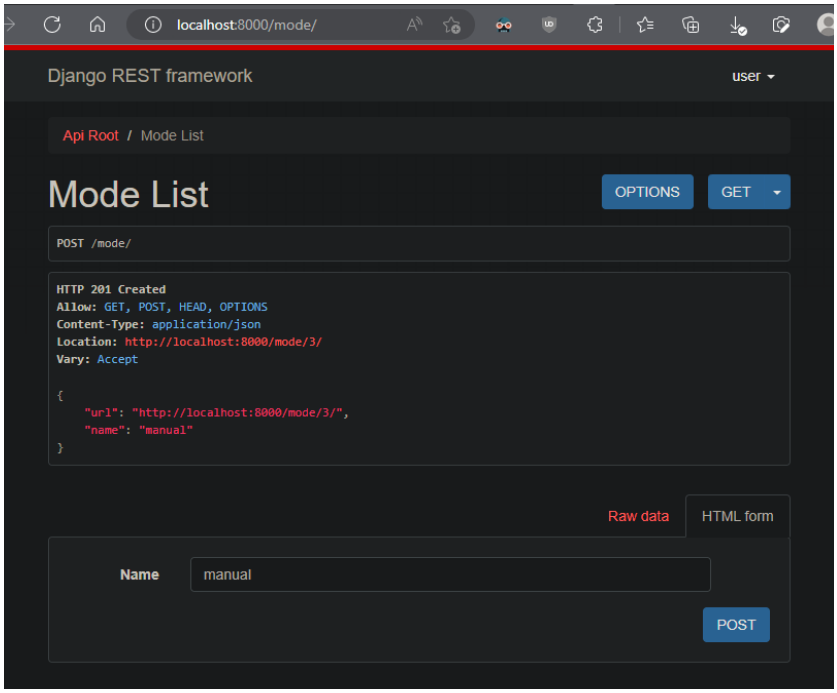
Working Application Image Dump

Mode Service API calls:

Mode = Auto

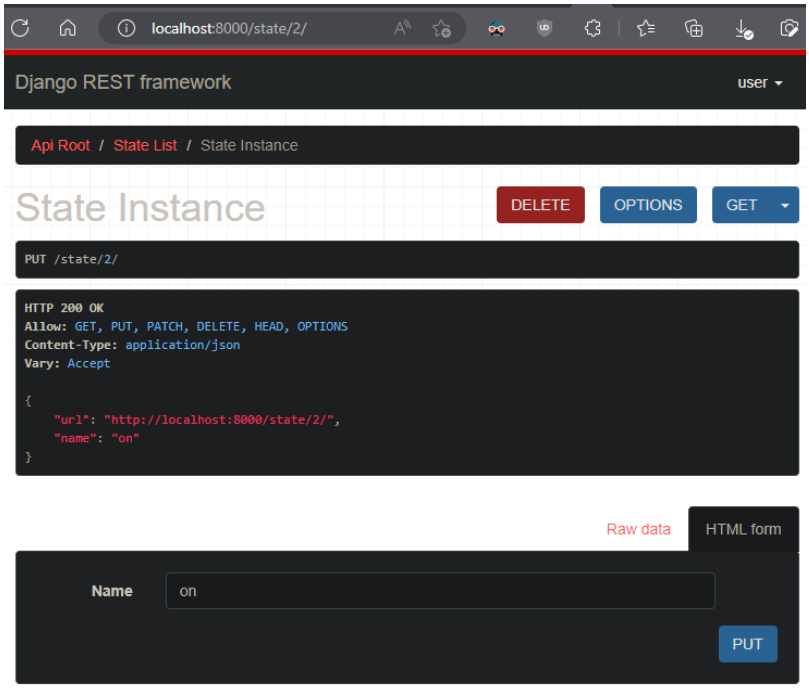


Mode = Manual

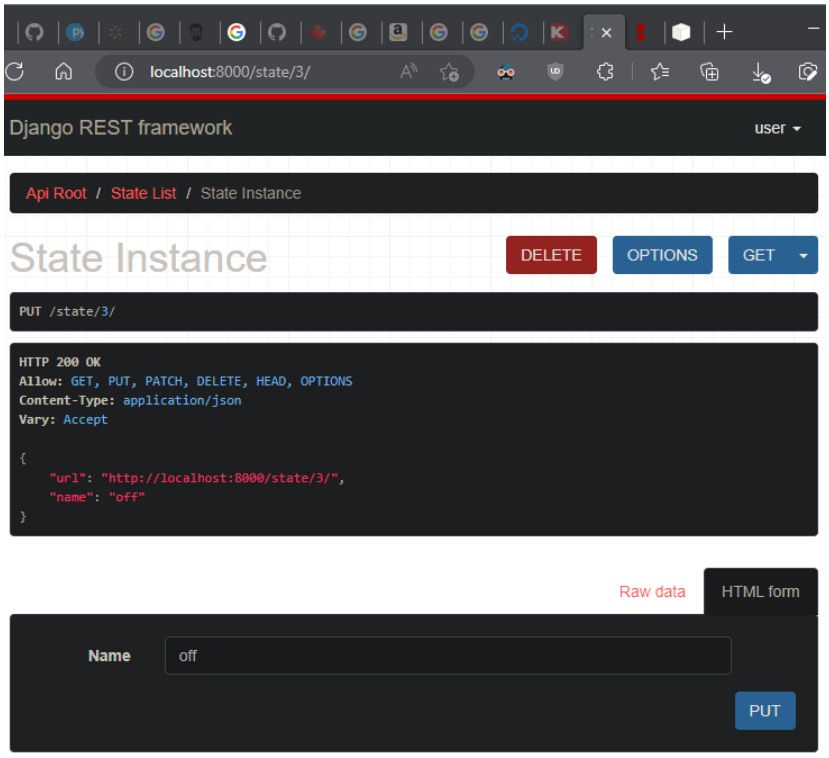


State Service API calls:

Mode = On



Mode = Off

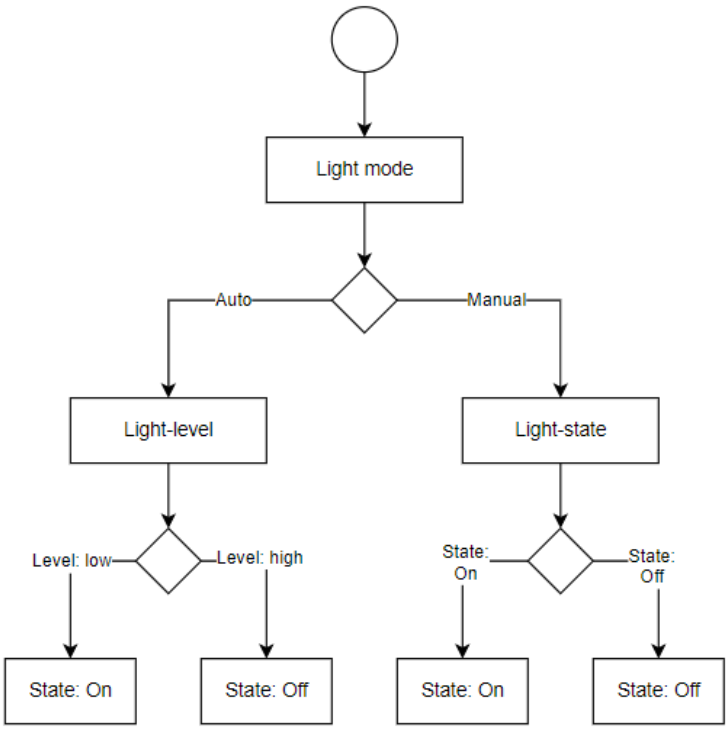


Design and Architecture

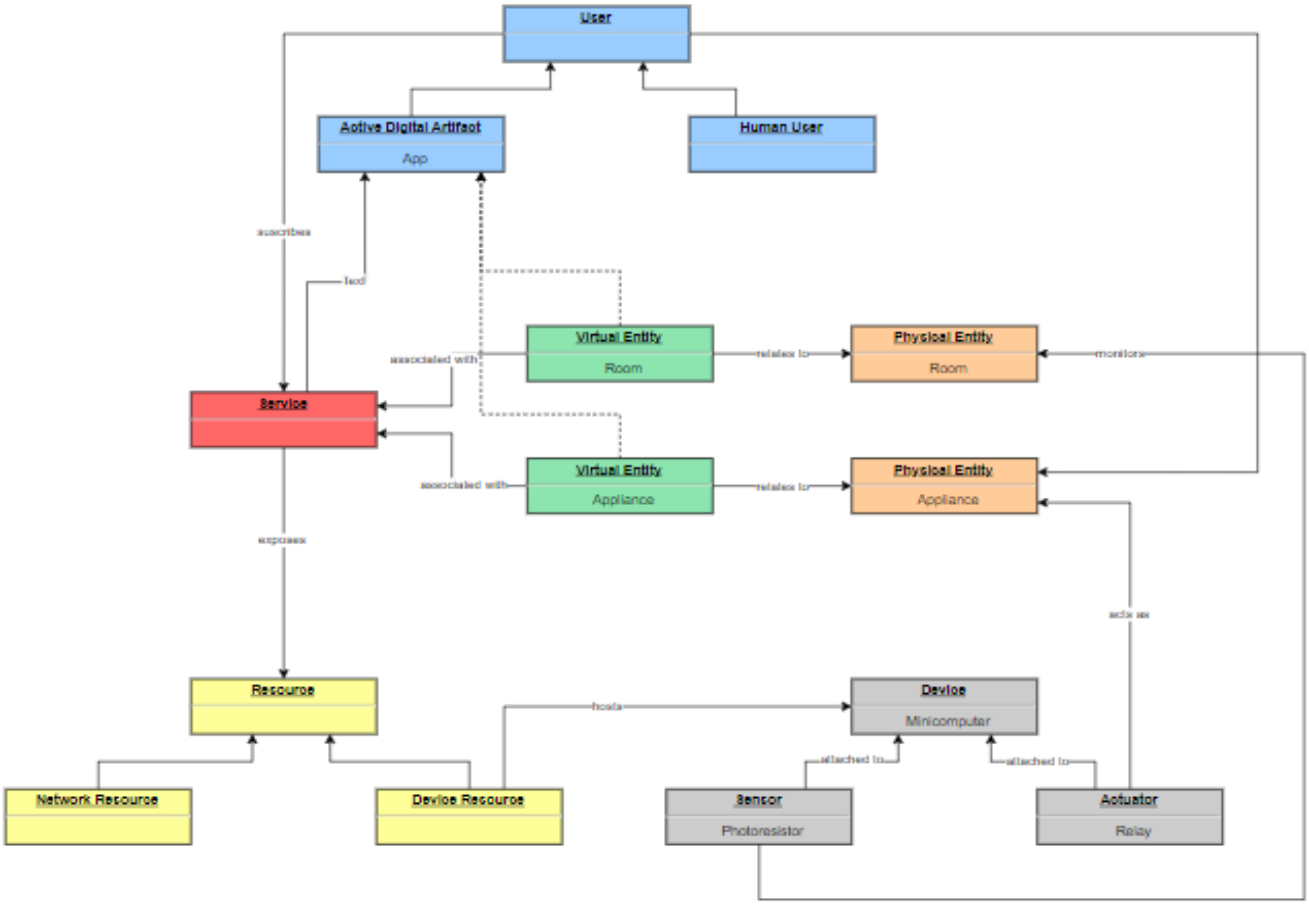
Purpose and Requirements

– Purpose : The purpose of this assignment is to create a home automation system that allows the user to control the lights remotely using an application
– Behavior : The system should have both an auto and manual mode. In Auto mode, the sensor will collect the data of the light level in the room and turn the light on/off depending on the reading. In manual mode, the system will allow the user to remotely control the lights to switch them on/off
– System Management Requirement : The system should provide remote monitoring and remote control functions.
– Data Analysis Requirement : The system should analyze the light levels locally.
– Application Deployment Requirement: The application should be deployed locally and should allow remote access.
– Security Requirement : The system should have basic user authentication.

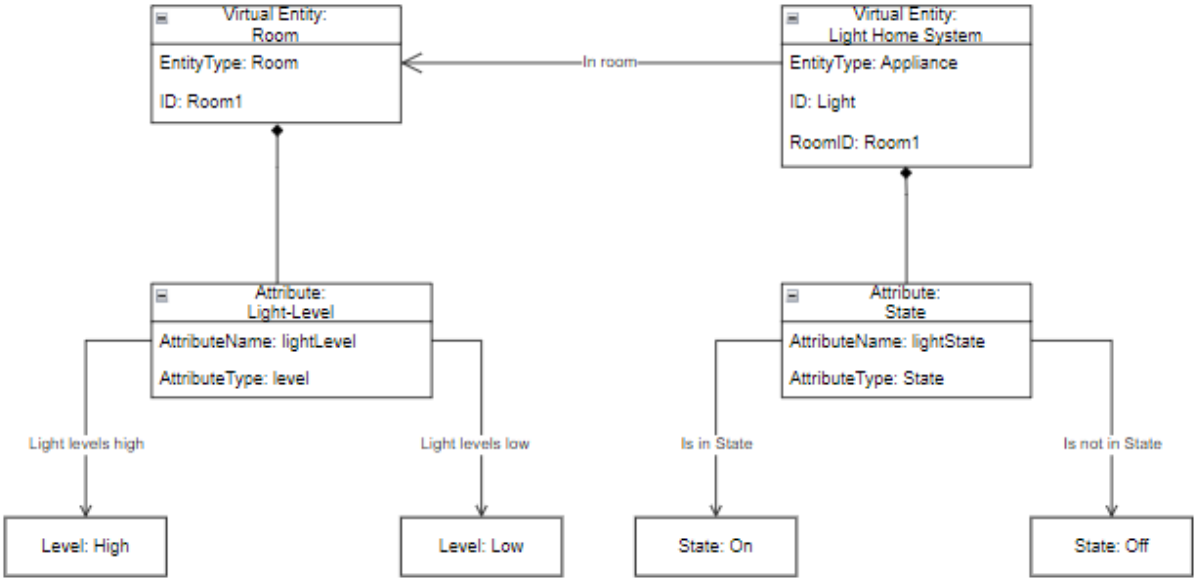
Process Specification



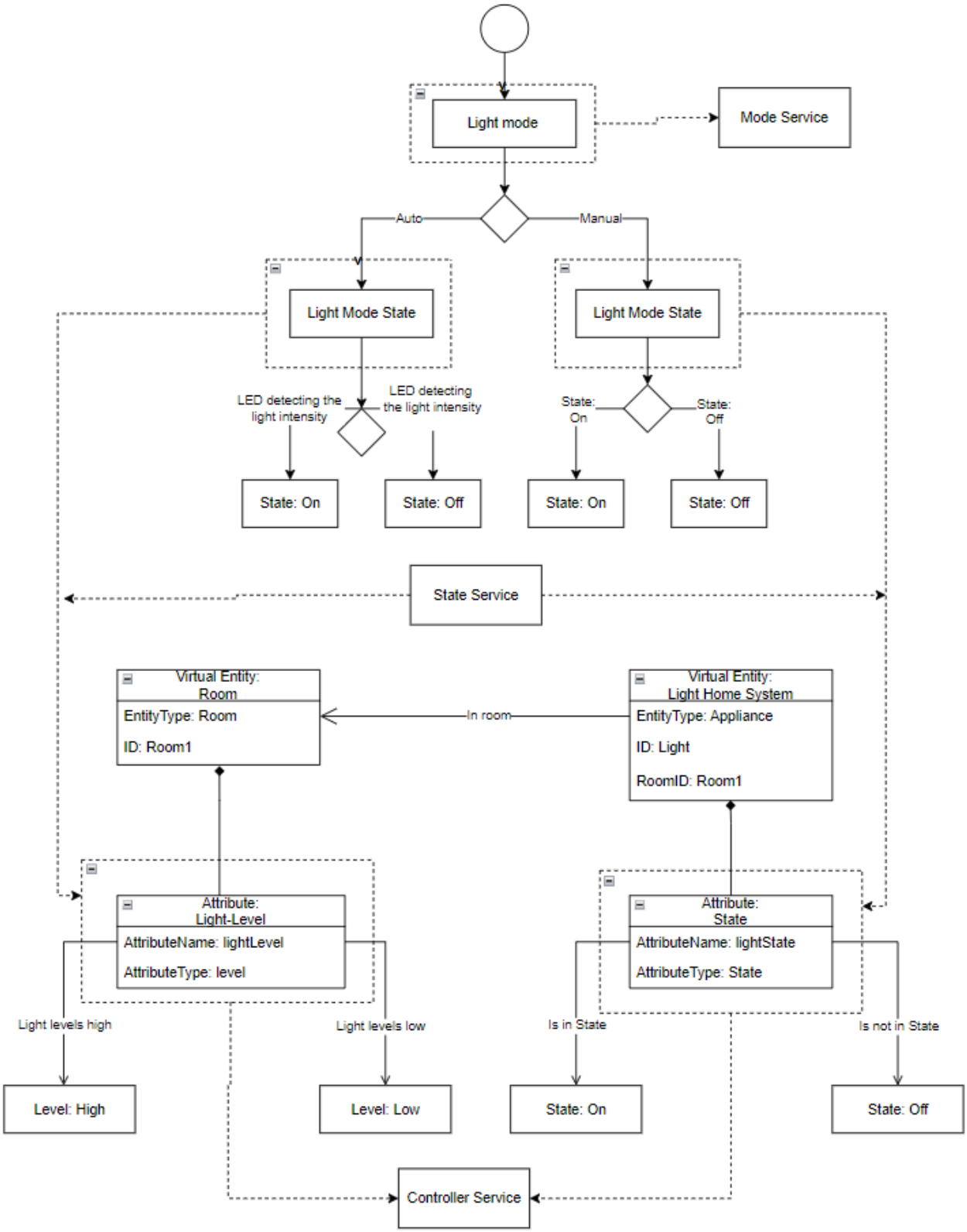
Domain Model Specification



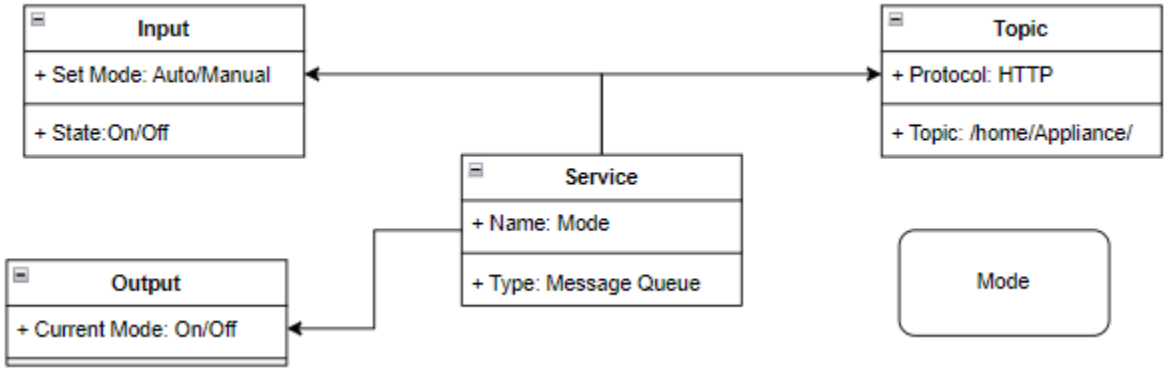
Information model specification



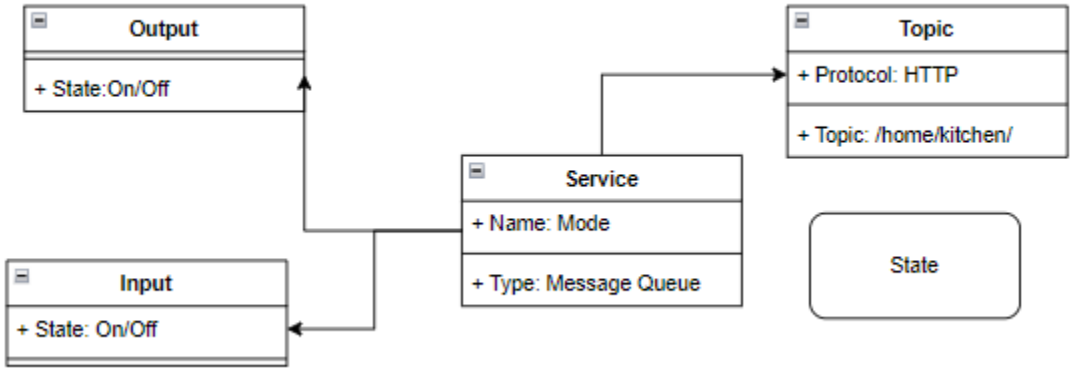
Service specification



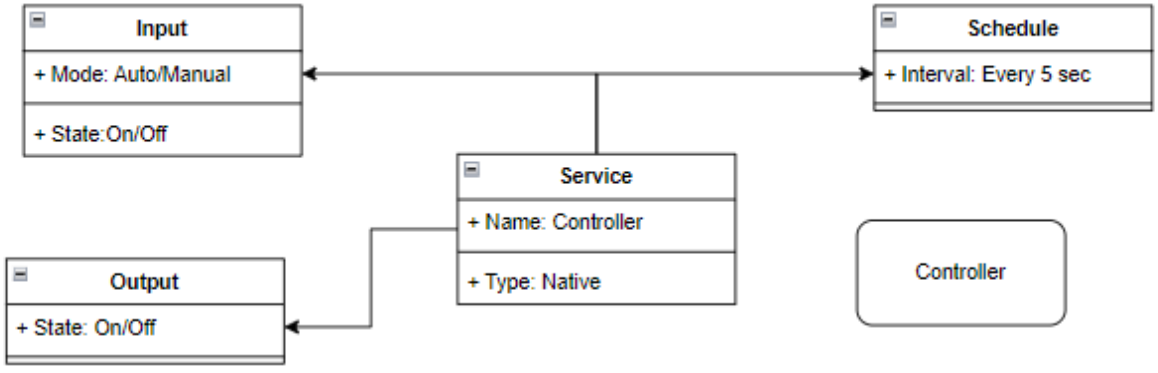
Mode Service: Set light mode to auto or manual



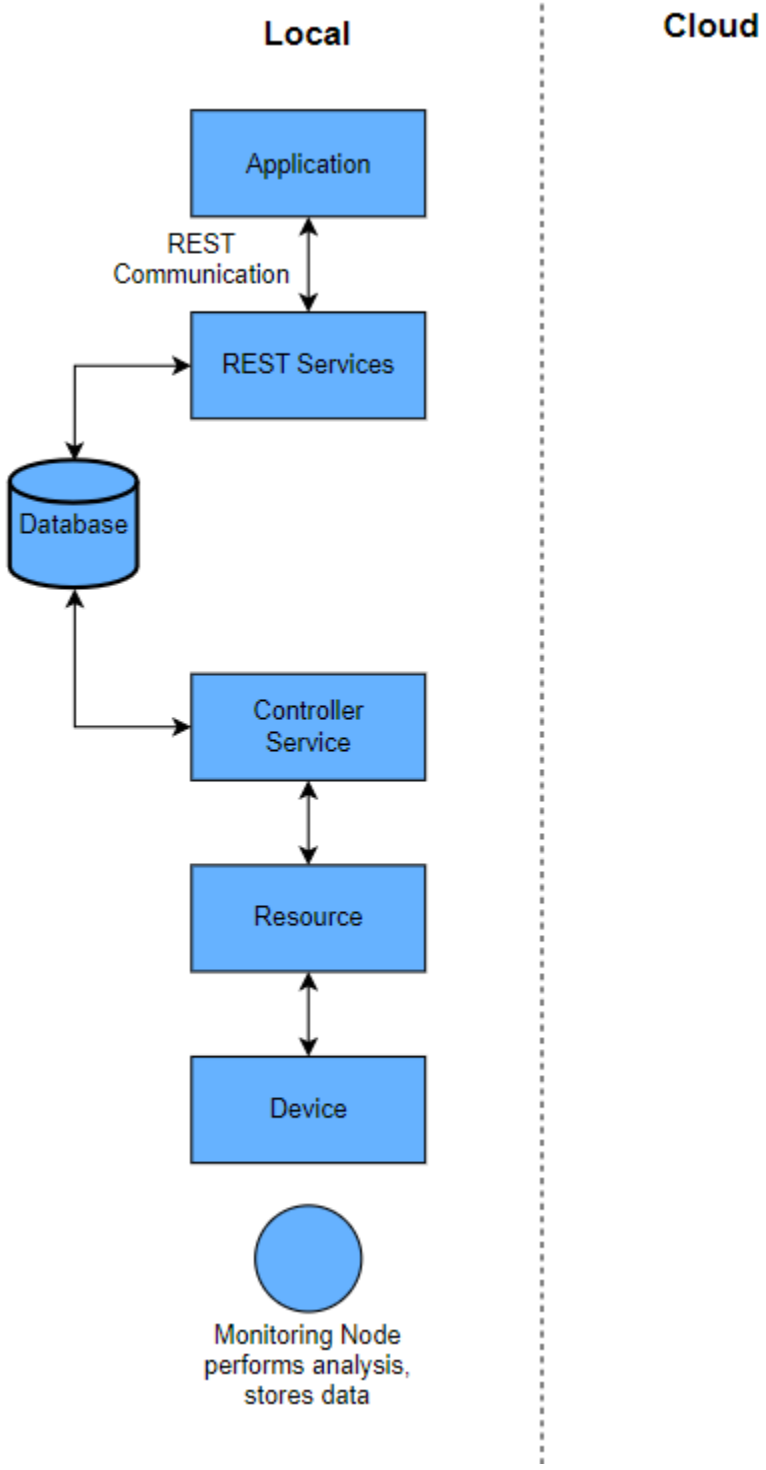
State Service: Control the state of the light appliance and set it to on/off



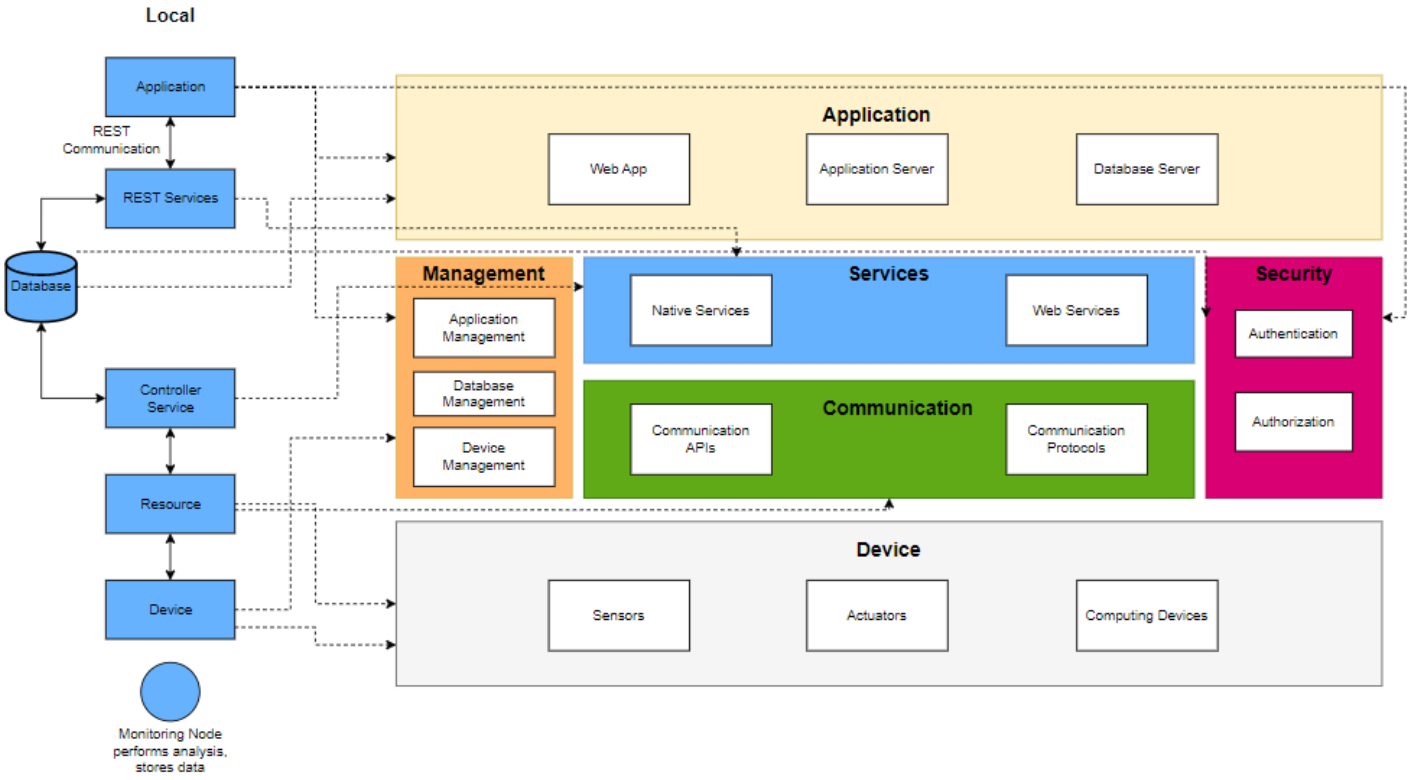
Controller Service: In auto mode, this service monitors light levels and controls the light state. In manual mode, this service retrieves the current light state and switches the light on/off



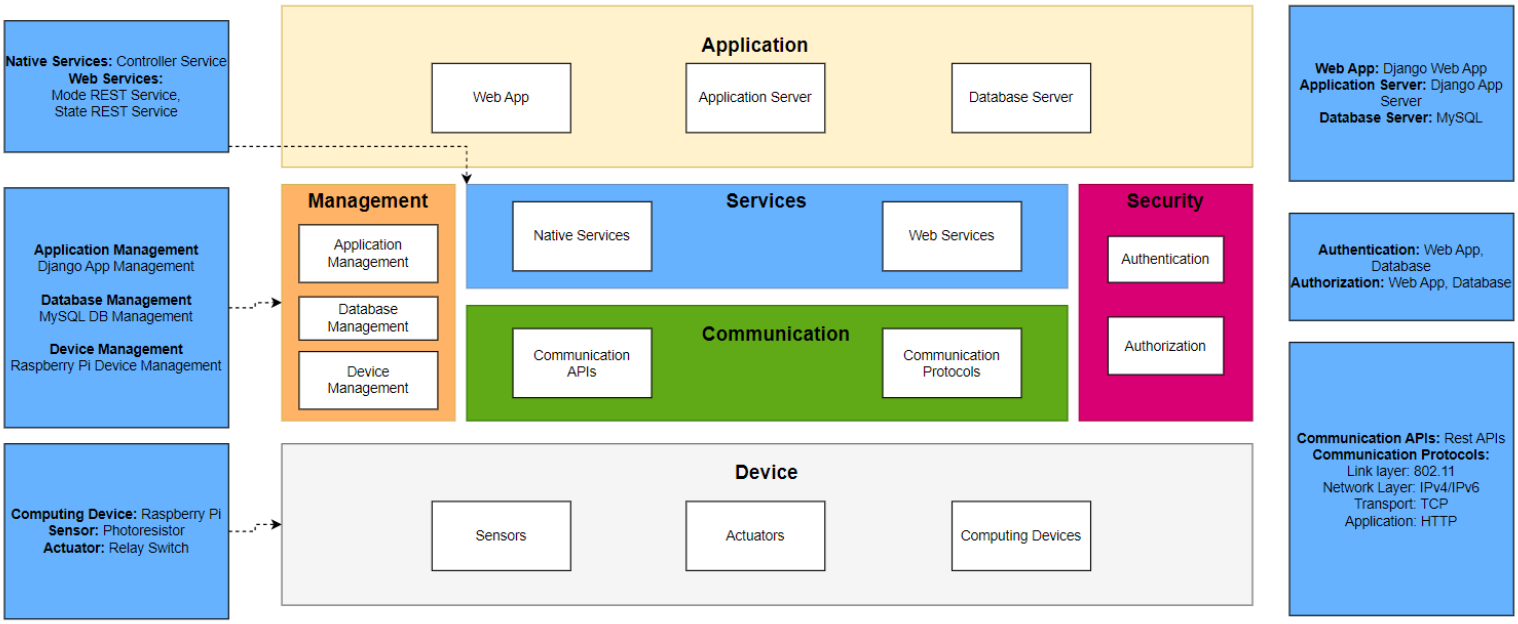
Deployment Level Specification



Functional view specification



Operational View Specification



Code Structure and Explanation

models.py:
https://github.com/tiwaojo/IoT_Labs/blob/master/Assignment3/assignment3site/dashboard/models.py

The models.py file contains the model for the mode and state data. It defines the type of data that will be stored and handled for controlling the home automation system mode and keeping track of the state of the light application.

searilizers.py:
https://github.com/tiwaojo/IoT_Labs/blob/master/Assignment3/assignment3site/dashboard/serializers.py

The serializers.py file contains the model serializers logic. Serializers help with converting the model instances to native python data types which can be rendered into various content types like JSON.

views.py:
https://github.com/tiwaojo/IoT_Labs/blob/master/Assignment3/assignment3site/dashboard/views.py

Views.py file contains the viewsets for the models. It contains the logic for a set of related views into a single class. By using viewsets we can automatically generate URL conf by registering them with a router class.

urls.py:
https://github.com/tiwaojo/IoT_Labs/blob/master/Assignment3/assignment3site/dashboard/urls.py

Urls.py contains the URL patterns for the mode and state services of our system. It contains the routing logic which determines how the URLs of an application are mapped to the logic that deals with the incoming request.

controller.py:
https://github.com/tiwaojo/IoT_Labs/blob/master/Assignment3/assignment3site/dashboard/controller.py

The controller.py contains the code for the controller service. The code is used for interacting with the database to collect the current state of the light appliance (LED light) and control the light appliance (LED light) state.

lights.html:
https://github.com/tiwaojo/IoT_Labs/blob/master/Assignment3/assignment3site/dashboard/templates/lights.html

The lights.html file contains the template for the application user interface. It defines the different components of the home automation system dashboard.