incube8bus app

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EXECUTIVE SUMMARY

Objective

ncube8bus is an app for viewing SMRT buses near you or any address in Singapore. incube8bus also tells an user when the buses arrive at a specific bus stop from an API. Buses tell their geolocation at any time and doesn't follow any schedule.

The system is designed such that it can handle thousands of concurrent user and is scalable.

Goals

The app is an open source web app intended for the demonstrating how to build a Laravel/PHP responsive web app hosted on AWS using Google Maps API and MySQL.

Solution

The app has been designed in Laravel/PHP, Google Maps API, MySQL, Amazon EC2, SQS, Memcached, Redis.
Visit the web app at http://ec2-52-0-153-33.compute-1.amazonaws.com/

Project Outline

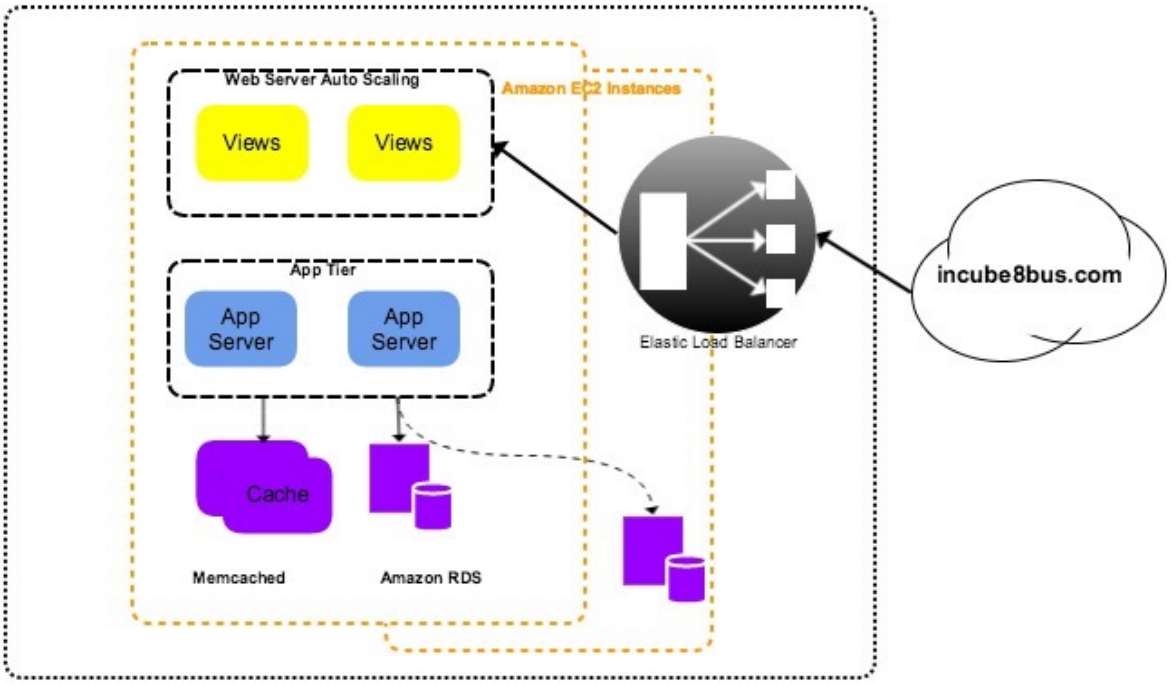
incube8bus is built on Laravel/PHP and MySQL on MVC platform and is hosted on Amazon Services

- The app uses Google Maps API and open source PHP wrappers for geolocation and getting travelling duration. It also displays user and bus location on Google Maps
- The app uses various AWS services like EC2, Redis, RDS, SQS, Memcached
- The technology used is PHP/Laravel framework, MySQL
- The architecture of the application is scalable, highly available and having high performance.
- The documentation will briefly discuss the technical architecture and guidance for modifying the code so that it can handle thousands of concurrent users

BUDGET

The prototype of the application was build in 9 days with intended 1 day of integration and system testing.

ARCHITECTURE



The web app consists of following components

- Views
- Controllers
- Models
- Lib - Business Layer Classes
- Database

To make the system scalable and handle thousands of concurrent users. We can create two instances of laravel app. One instance of the app would have the views. The another one will have controllers and eloquent models. These apps can be psr-0 ready so as to interact with each other.

EC2 instances can be created to host the laravel apps on LAMP base.

The UI/Views app can be put behind Amazon Elastic Load Balancer.

Create MySQL instances of RDS for each EC2 instance.

Use Redis to have key pair values or hash tables

Use Memcached for caching business objects. Laravel allows to cache object for forever until instance is killed. You can use Cache::forever to cache bus routes, buses, bus operators and bus service information. So that you dont have to query database for frequently used business objects which doesn't change in application lifecycle.

You can cache the bus locations in the Memcached object using Laravel API for X minutes. As the locations are ever-changing and spatial it would be wise to use cache instead of database for querying bus locations.

Use SQS queues to insert values in database after caching it. The application can offload the database operations over queue as it will save time. This application suitably use cache for immediate use and database operations can wait over reliable queue operations.

Use design patterns to refactor the procedural codes to OOPS code.