Project 1
Software Design Specification

Group 5 - 4-15-2020 - v1.02

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1. SDS Revision History

NOTE:

RED TEXT = DEFAULT TEXT

BLUE TEXT = TBD

GREEN TEXT = PROJECT 2

YELLOW HIGHLIGHTER = NEED REVISION

Date	Author	Description
4-15-2020	MF/SF/MJ	Developed the SDS skeleton @ noon meeting.

4-15-2020 group Expanded on the SDS skeleton, finalized v1.

2. System Overview

Components:

- Database + ix-dev server
    - ix-dev server communicates with the phone application, receives and stores location data
    - Outputs tab-delimited text files of the location data using PHP
    - Database is written in MySQL
    - Server will utilize script(s) to backup the database
- Phone application
    - Application communicates with database, sends user geo-spatial data every 5 minutes
    - Communicates with permissions on users phone to obtain geo-spatial data
    - Shifts location data to assist in anonymizing locations
    - Will only be available on iPhones
    - Will be written in Swift
- Backup database
    - Communicates with primary database/ix-dev server to create a backup every 12 hours
    - A script to copy the database to ensure data retention
    - Backup files will be stored in our private GitHub repository
- Website
    - Communicates with Database + ix-dev server to pull user location data
    - Displays data in a human readable format
        - The goal is to have the geo-spatial data represented on a map
    - Written using HTML and other languages

3. Software Architecture

- **Geo-spatial Database:**
    - We will write our database using MySQL.
    - The geo-spatial database holds all the location data and is connected to each component via the ix-dev server.
- **Backup Database:**
    - We will be regularly backing up our geo-spatial database file. (.mwb?)
    - Data will be backed up to our private GitHub repository.

- **ix-dev Host Server:**
    - We will be using a possible variety of languages on our host server.
    - ix-dev server will query the phone application for updated location data. This data will be formatted and then passed to the *Geo-spatial Database* to be stored.
    - The ix-dev server will host interaction between the geo-spatial database, phone application, and visualization website. It will also store the backup database file.
- **Phone Application:**
    - We will write our phone application in Swift to work on Apple Devices.
    - It will use the iOS Standard Location Service to obtain location data.
    - It will send the data to the *Geo-spatial Database* via the ix-dev server.
      EXPLAIN HOW THE APP SENDS DATA TO OUR SERVER IN V2
- **Visualization Website:**
    - We will write our website using HTML. We will most likely need to use JavaScript, PHP, or another language to visually represent our location data.
    - Data will be fetched from the *Geo-spatial Database* to be presented visually.

4. Software Modules

4.1. Geo-spatial Database

A. Host the database which is used for central data storage.
B. The database interfaces with the ix-dev server and the backup server.
C. A static model.
D. A dynamic model.
E. This is used to store and connect to other components after we obtain user geo-location. This is also where data will be fetched from in order to create the visual website.

4.2. Backup Database

A. This module's basic function is to be a backup in case the primary MySQL database goes down.
B. By running a script on the ix-dev server, the database file will be copied and uploaded to a private GitHub repository.
C. A static model.
D. A dynamic model.
E. In order to ensure we never lose more than 12 hours of data we are creating a backup of the database in case the primary database fails.

4.3. ix-dev Host Server

A. This module's primary functions are to host the primary database and run the database backup script.
B. The ix-dev server is the center of all application interaction. It processes phone application geo input and adds it to the mySQL database. It handles PHP requests from the website to display geolocation data. It interacts with GitHub via a script to upload a backup copy of the database every 12 hours.
C. A static model.
D. A dynamic model.
E. The ix-dev server was chosen because we can use it for free as UO students. We are also able to host free web pages using /public_html.

4.4. Phone Application

A. Provide a basic user interface and obtain user geo-spatial data every five minutes and upload it to ix-dev server.
B. Interfaces with ix-dev server, to upload geo-spatial data for eventual storage in the database.
C. A static model.
D. A dynamic model.
E. The project requires collecting geospatial data from the user for 7 days. The phone is the only device that people take with them when they go places. Additionally, it is not possible to get geo-spacial data in the background with a browser. Because of this, we chose to have the primary UI and data collection done via a phone application.

4.5. Visualization Website

A. This is a website to display the data stored in the database.
B. It will interface with the ix-dev server to fetch geo-spatial data from the database for display.
C. A static model.
D. A dynamic model.
E. This is used to create a way of displaying data that is easily understood, as opposed to viewing raw latitude and longitude values.

5. Dynamic Models of Operational Scenarios (Use Cases)

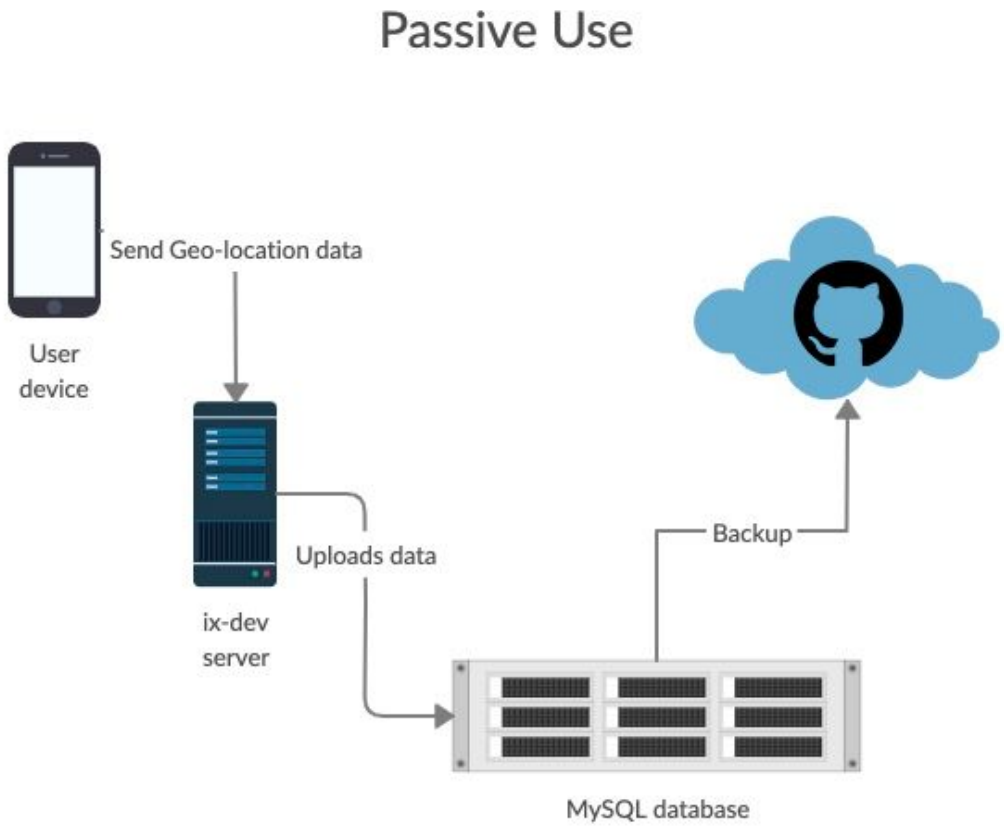

Figure 1: Diagram displaying passive use case of tracking location data.

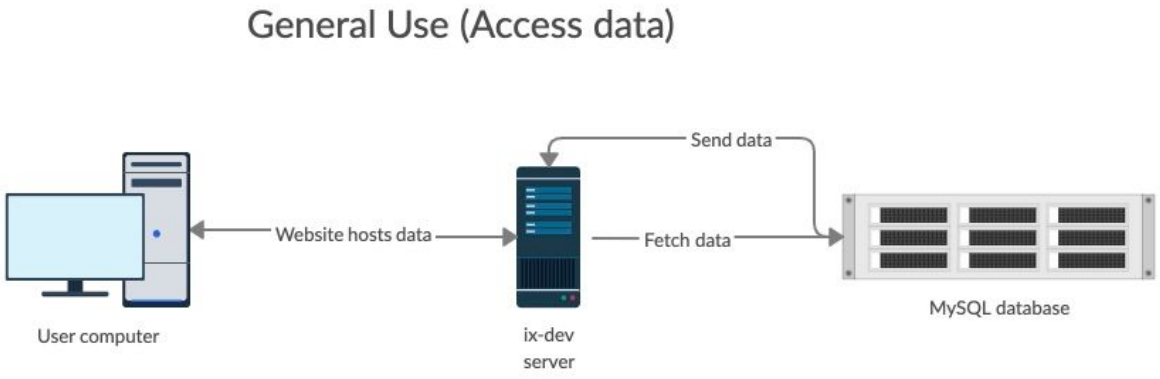

Figure 2: Diagram displaying accessing data via the website.

6. References

https://developer.apple.com/documentation/corelocation/getting_the_user_s_location/using_the_standard_location_service

https://app.creately.com/diagram/

https://www.cs.utah.edu/~jamesj/ayb2005/docs/SDS_v2.htm

https://classes.cs.uoregon.edu/20S/cis422/P1/WWeek.pdf

7. Acknowledgements