Introduction to Connected Devices Project Proposal
Android Lampi Client
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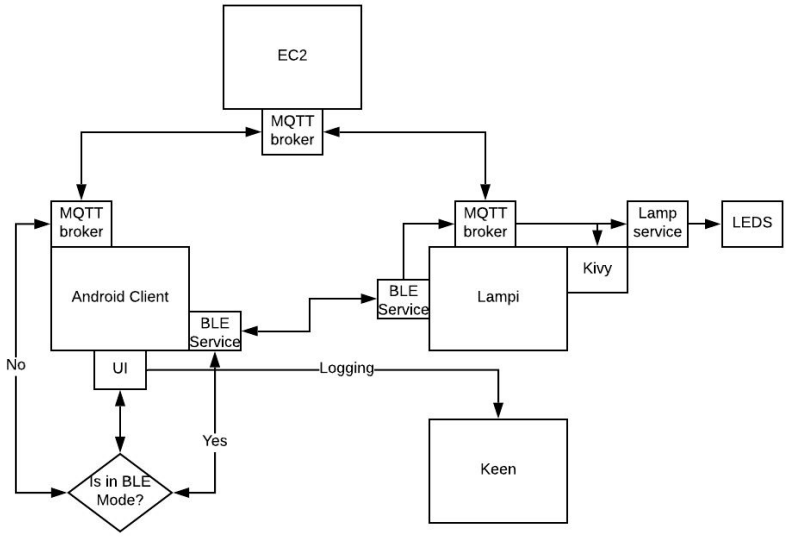
Our project involves creating an android BLE client for the LAMPI. The UI will mirror the UIs designed for kivy, web, and iOS.

- Project Title: Android Lampi client
- Names of Team Member(s)
    - Ellis Saupe, Welf Saupe
- Description of Proposed Project (1-2 paragraphs, images/figures if appropriate)
    - Our project will involve creating a LAMPI client for android systems. The UI will mirror the UIs designed for kivy, web, and iOS. The android client will have the same functionality as the iOS client and communicate with the Lampi using BLE. If further localization than android is required, our app will be targeted for the Alcatel One Touch Idol 3 (my phone). We do not expect to require any modifications to the Lampi's bluetooth service.
    - If time permits, we will add a BLE/internet toggle to the android UI. When in BLE mode, the device will function as described above and control the lamp over bluetooth low energy. When switched to internet mode, the android device will use the Eclipse Paho mqtt client to control the lamp through our EC2 instance. This will require some sort of authentication to determine which lampi to control. For simplicity, this will be done through a simple text field where the user inputs the device ID.
    - Controlling the LAMPI through either method will log analytics events to Keen. We will create UI events identical to those for web and iOS. Ideally, these will include location info similar to the iOS analytics.
    - A diagram of the architecture is shown below.



- Scope - what is in scope? what is out of scope?
    - Creating an android UI, BLE service, and MQTT service is in scope. Any edits to the lamp bluetooth service or EC2 are out of scope.
    - Unless we are forced to drop the BLE portion of the project, sophisticated authentication and validation for publishing messages to a Lamp's topic through the MQTT client is out of scope.
- Learning Goals - what do you hope to learn from completing this project?
    - I have never worked in android development before. As someone with some experience in iOS, I strongly believe that I should be well rounded and able to develop on each platform. I am very interested in BLE and am excited to see Android's BLE framework.
- Hardware and Software Required (particularly what you need that you don't already have access to)
    - None
- Project Plan - Briefly describe your project plan (tasks, etc.), including a minimal "walking skeleton"
    - Install android SDK and create a hello world application
    - Create a functioning GUI (3 sliders and a power button)
    - Implement BLE client that can connect to and read from our lamp service using a hardcoded device ID
        - This point is the minimal walking skeleton
    - Add write and notify functionality to the BLE client
    - Add a view/dropdown to the app for selecting a device from a list of discovered BLE peripherals.

    - Add a BLE/internet toggle button to the UI that will disconnect or reconnect the bluetooth service when desired
    - Implement an MQTT connection to our ec2 with a hardcoded device ID
    - Add UI functionality to type a device ID for MQTT

- Risks and Mitigation Plans
    - If the BLE task proves to be very difficult, we will discontinue development on the Android MQTT client. If we are unable to get BLE working at all, we will begin adding features to our MQTT interface. We would add authentication using our ec2 database rather than a hardcoded ID, and we would disable the UI when a LAMPI we're sending messages to is not bridged.
- Midpoint - Proof of Feasibility
    - Having a "walking skeleton" of minimal functionality to prove out the feasibility of your project that can be completed in 1-2 weeks?
        - The primary goal for this skeleton will be a UI that can successfully connect to our bluetooth service. BLE may be our biggest technical hurdle as support for bluetooth may vary between different Android devices.