

Secure Traveler

Cumulative Design Review
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The Team



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The Problem

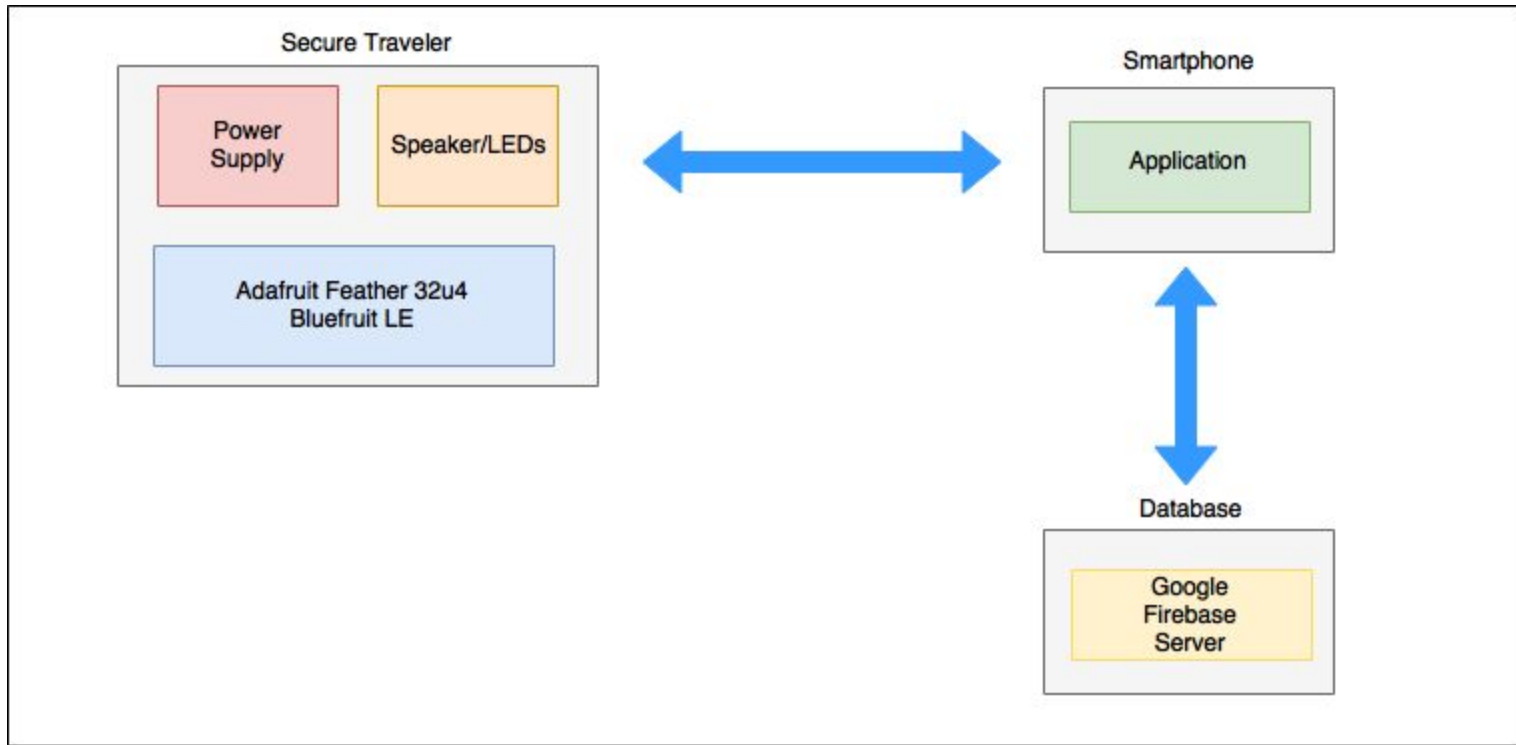
- We forget things, lose things, divide our limited attention, and make choices we later regret.
- Traveling tourists are prime suspects for theft.
- Our antiquated methods need to be improved as size decreases and price increases.
 - Retracing your steps
 - Asking others and security
 - Assuming you forgot to bring it
 - Hoping for a good samaritan to find it

Our Solution

- **Secure Traveler**
 - Device
 - Smartphone
 - iOS Application
 - Database
 - Google Firebase
- **PCB**
 - Bluetooth
 - Power
 - Audio/LEDs



Block Diagram



Secure Traveler Requirements

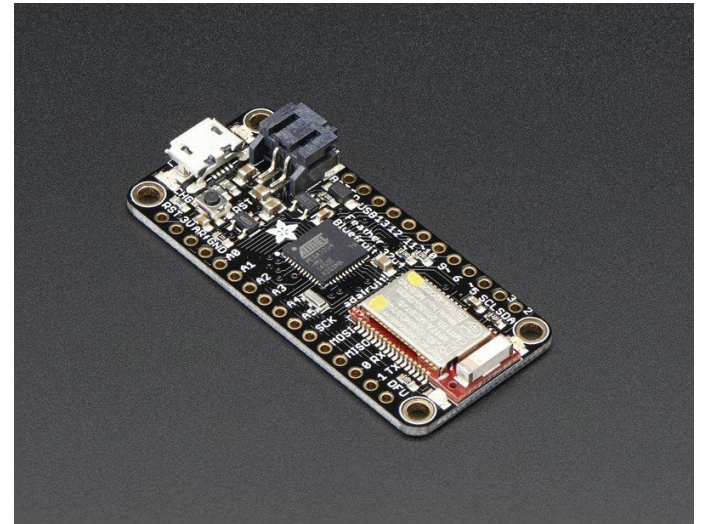
- Connection Range: greater than 30 Meters Indoors
- Audio Range: greater than 40 Meters Outdoors
- Battery life: 2 months for Secure Traveler
- Weight: < 1 ounce
- Response time: under 1 seconds
- Server: 50+ connections
- Size: < 6 square inches
- Cost: Each unit < \$25 when mass produced

Adafruit Feather 32u4 Bluefruit LE

Ideal Size of the Device: Thin and light

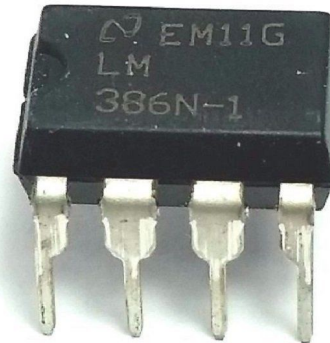
Battery: Built in USB and battery charging

Price: \$29.95



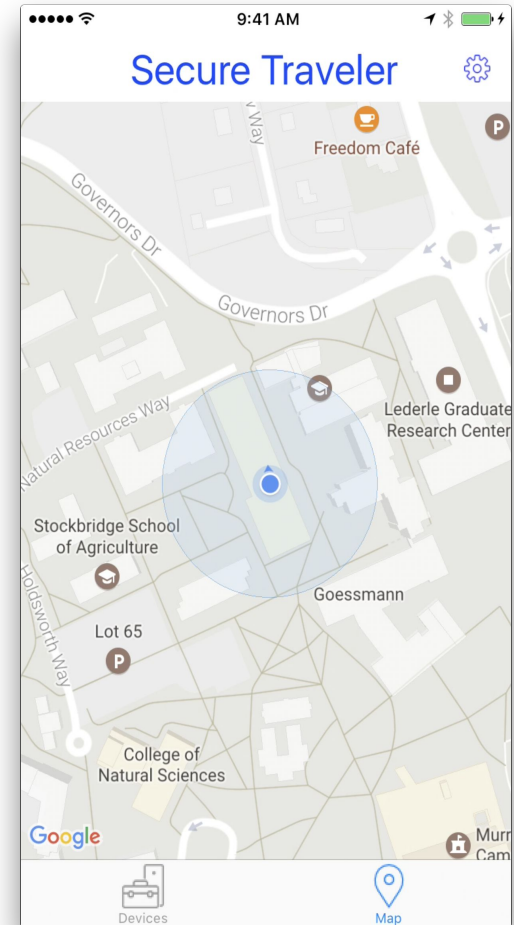
Audio Amplifier and Test Speaker

- Test Speaker- Dayton Audio CE Series CE70-30P-8
- TI LM386N-1 Audio Power Amplifier
 - Very low cost dealing with cost limitations
 - Extreme versatility
 - Widespread design knowledge
- Price: \$4 and \$2
- Paired with test Speaker until Wireless version



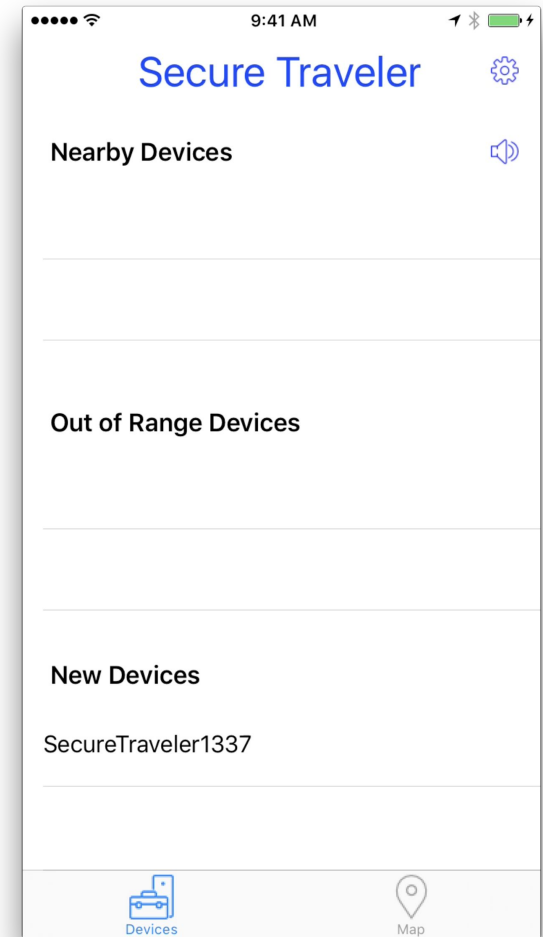
Smartphone

- Application
 - Send phone coordinates to server
 - Google Maps API
 - Determine device location
 - User Interface
 - Display device location
 - Enable/Disable device speaker
 - Push Notifications
 - Reminders
 - Settings
 - Enable/Disable push notifications



Smartphone

- Application
 - Google Sign In
 - Log in with Google email address
 - Registration and unregistration of devices
 - Device name with associated email address stored on Google Firebase server



Database

- **Firestore**
 - Store/manage data
 - User Profile
 - Location
 - Requirements
 - Fast, reliable and secure
 - Implementation
 - Swift 3.0

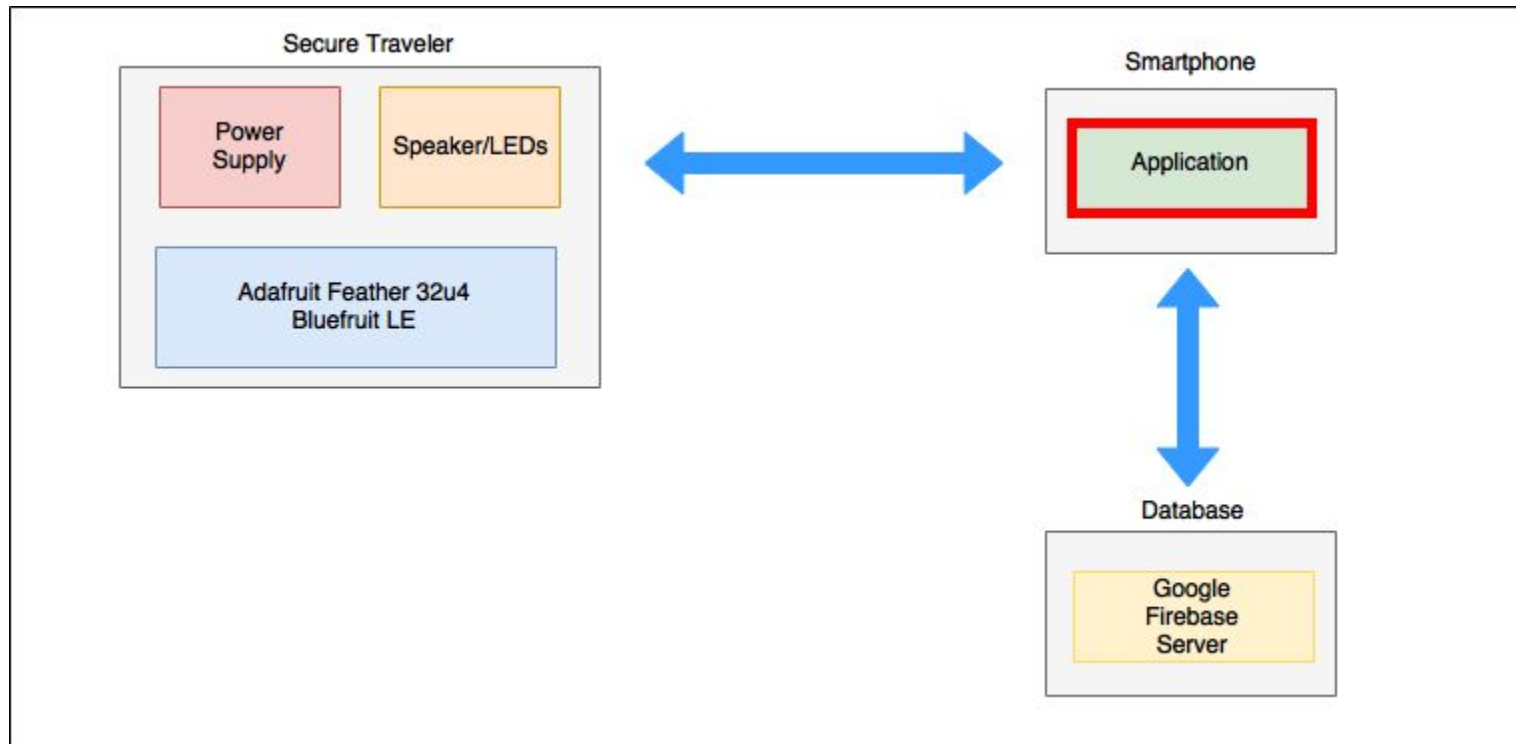


Proposed CDR Deliverables

- Demonstration of registration/unregistration of devices on server
- Demonstration of communication between device and application via Bluetooth
- Demonstration of storage and retrieval of location data on server
- Demonstration of speaker functionality

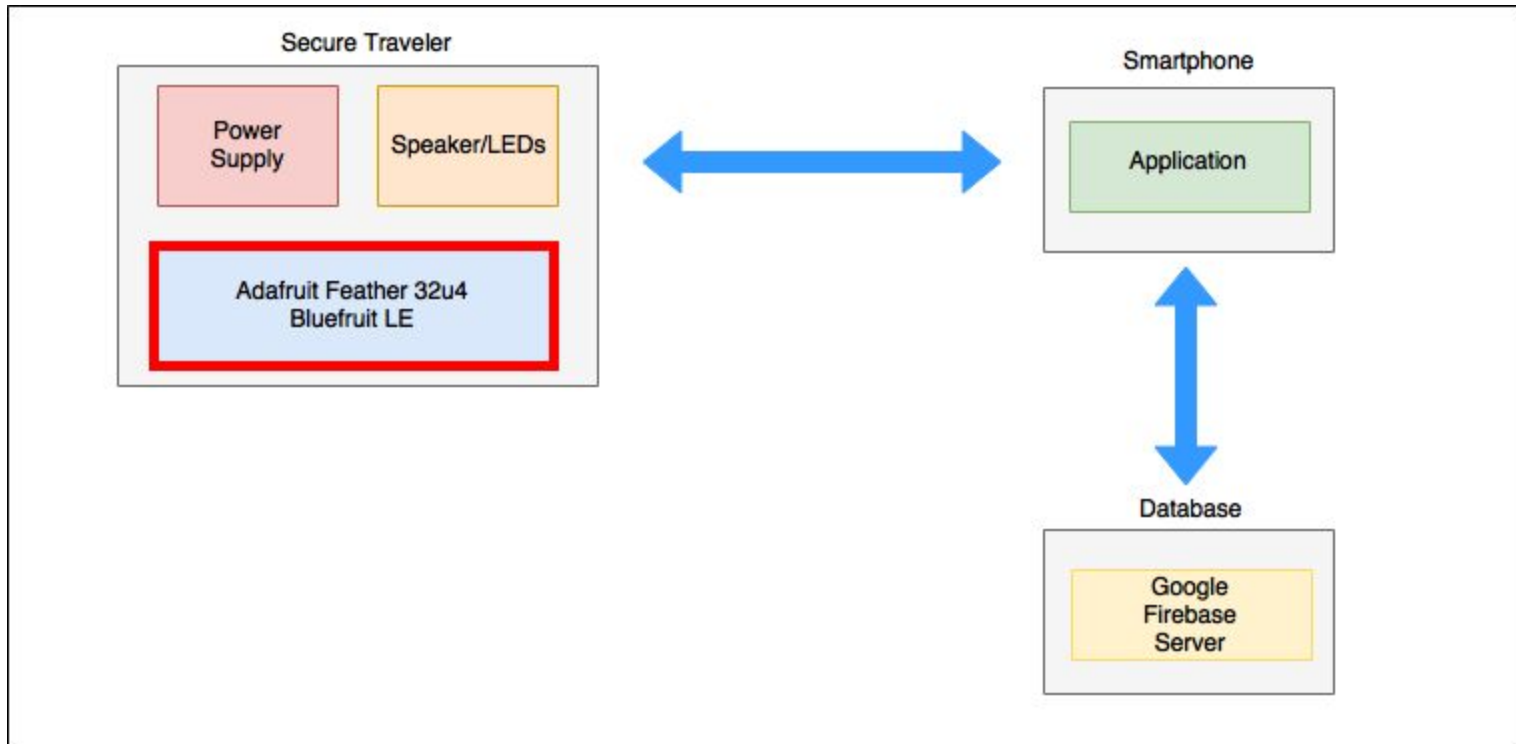
Demonstration of CDR Deliverables

Registration and unregistration of devices



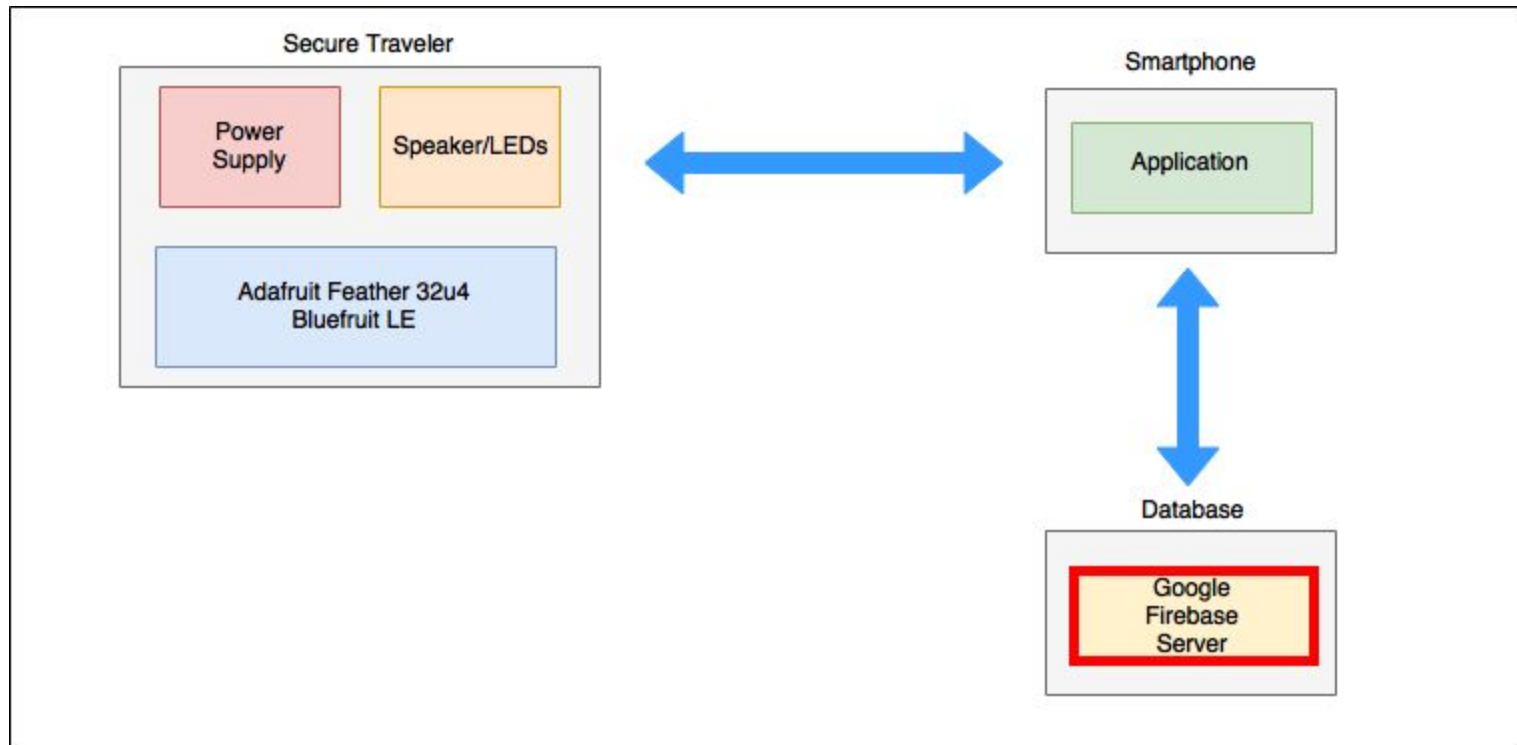
Demonstration of CDR Deliverables

Communication between device and application via Bluetooth

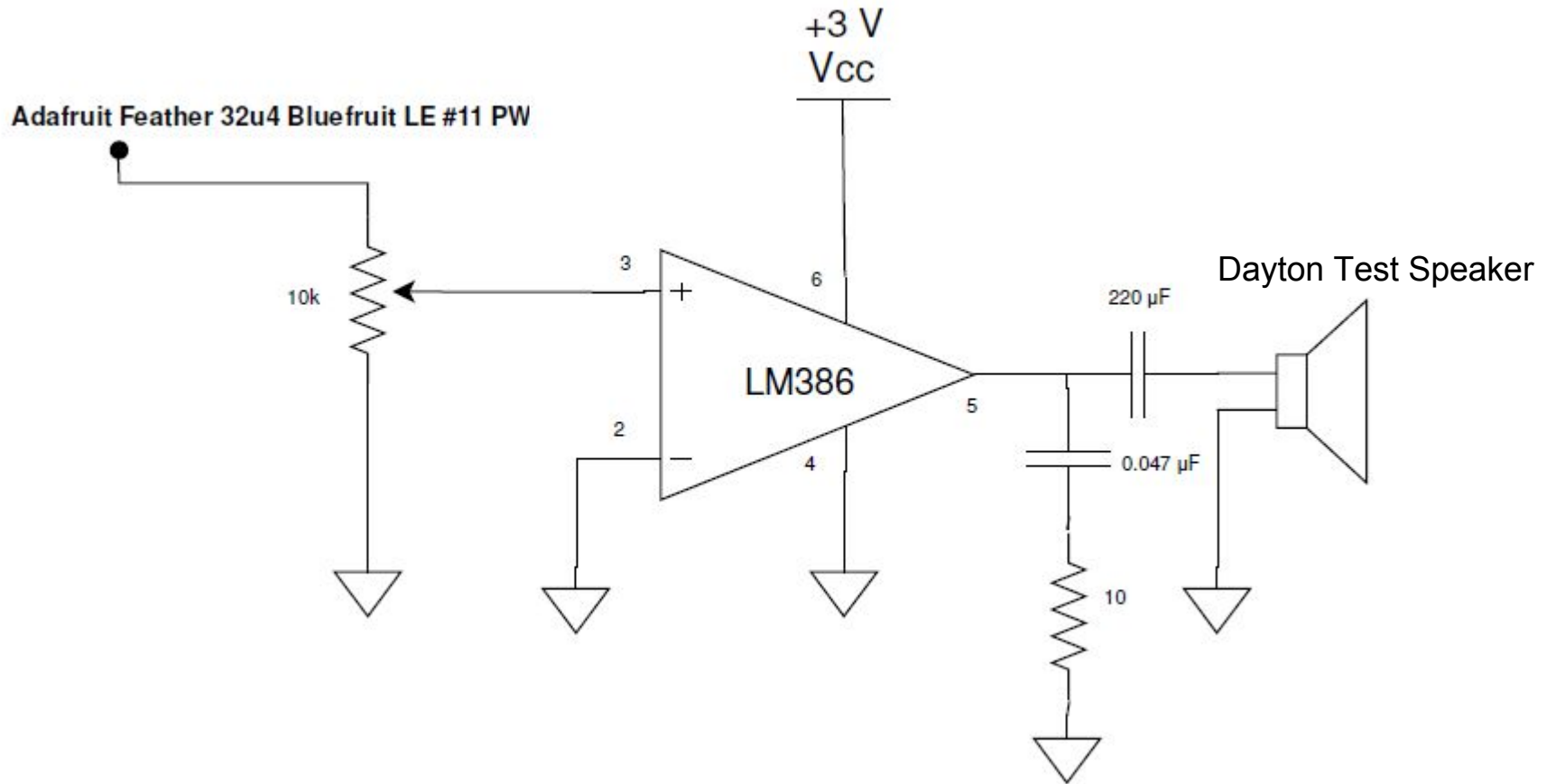


Demonstration of CDR Deliverables

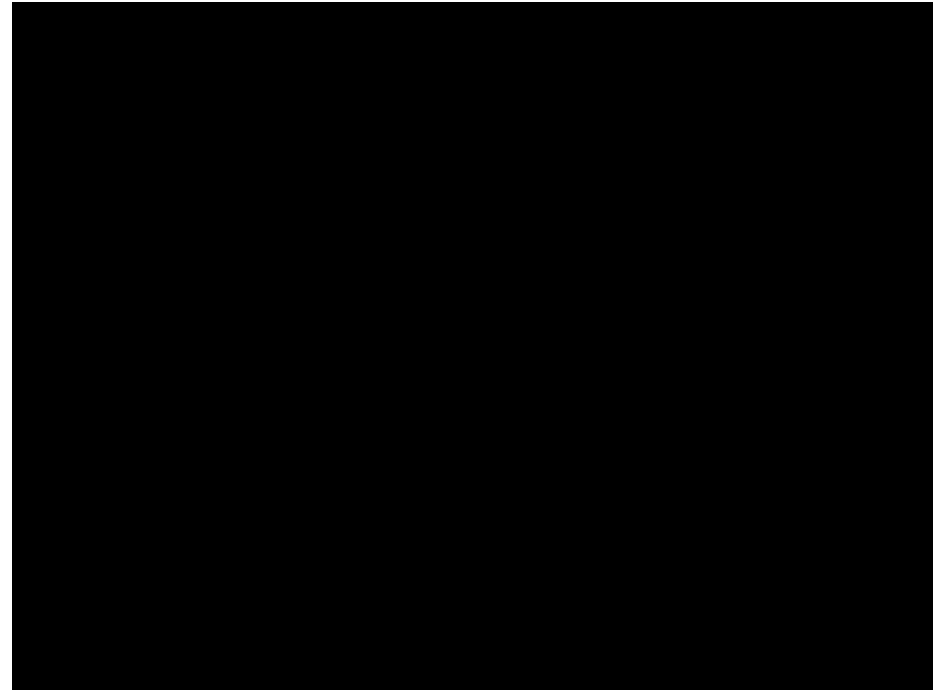
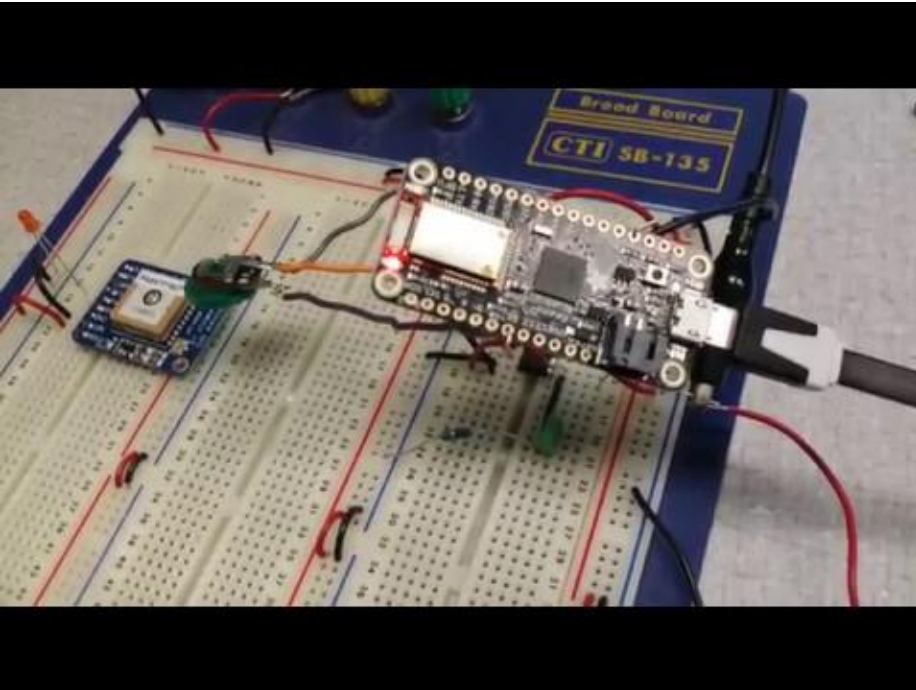
Storage and retrieval of location data on server



Audio Amplifier Diagram



Audio Demonstration



Possible Speaker Improvement

- **Goal**

- Cut the size as much as possible
- Maintaining or improving the audio range
- Keep the 3V or less power requirement

- **Possible Speakers**

- CUI Inc. CMS0201KLX
 - (Size 0.787" L x 0.787" W, \$4.93)
- CE30P-4 Mini Speaker 4 Ohm
 - (Size 1-1/4", \$5)
- RS Pro 8Ω 4W Miniature Speaker
 - (Size 80 x 31.1 x 14.9mm, \$4.50)
- Visaton 8Ω 2W Miniature Speaker
 - (Size 57 x 57 x 17mm, \$6.50)



Individual Responsibilities for CDR

- James McNaney
 - Application Design + Device Registration
- Manjot Chahal
 - Application Design + Bluetooth Communication
- Cameron Adams
 - Audio
- Sam Tang
 - Application Design + Server management

Proposed FDR Deliverables

- Completed custom PCB
 - Power supply
 - Bluetooth module
 - Speaker
- Device enclosure
- Push notifications
- Completed application
 - Settings tab
 - Google sign out, unregister devices
 - On/Off switches for bluetooth, push, GPS sharing
 - Background scanning of devices

Questions?
