NHS COVID App

Discussion Diagrams
Data Storage And Submission

May 2020

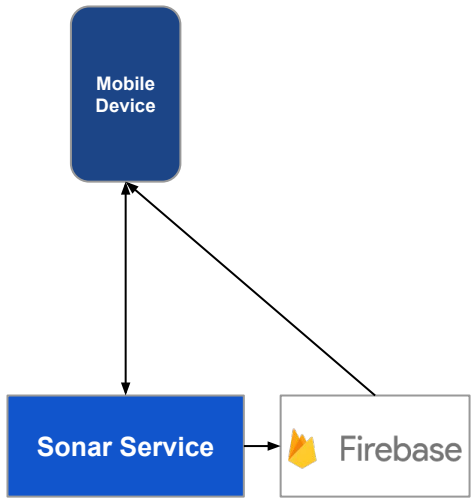
Licensing & Usage

This document describes the Bluetooth proximity contact tracing application built by VMware Pivotal Labs for the UK Government.

NHSX

Overall Flow

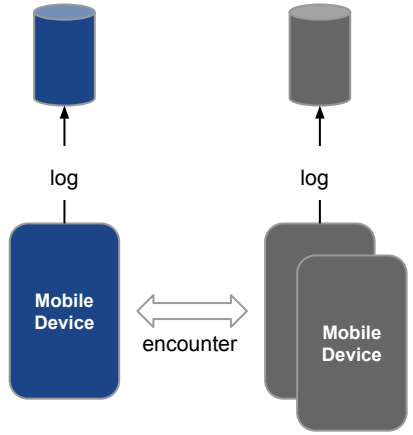
REGISTER



1. Device registers with service

IMPLEMENTED

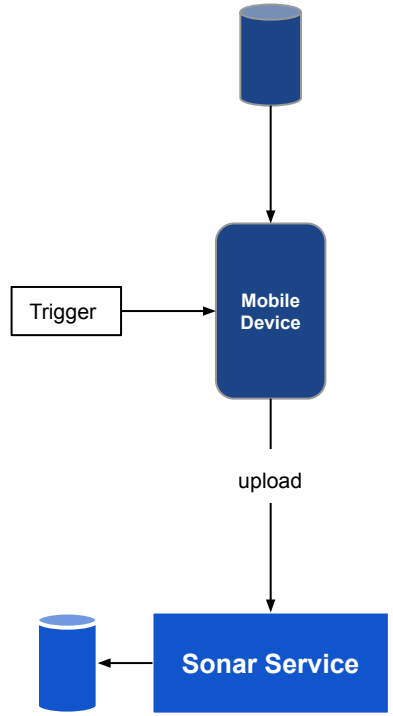
STORE



2. Device encounters other devices and stores a record of each encounter

IMPLEMENTED

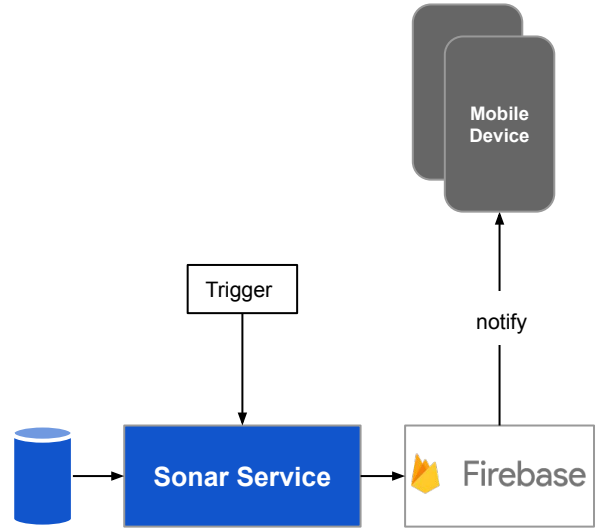
SUBMIT



3. Upload trigger causes device to ask the user to upload their stored data to the Sonar service

IMPLEMENTED

NOTIFY



4. Cascade trigger starts proximity cascade to send a notification to all encountered devices

IMPLEMENTED

What Data Is Logged And How Often on each phone?

A phone will periodically (currently 8 seconds) look for other nearby devices.

This mechanism is called GATT and is part of the BLE (Bluetooth Low Energy) specification 4.0 and above.

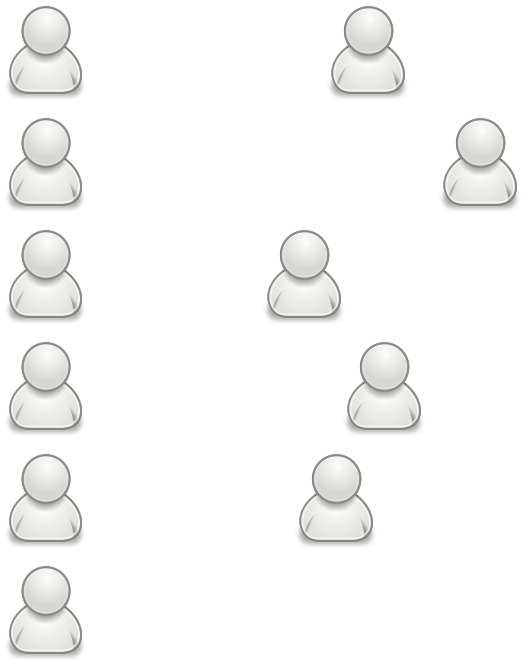
Our app advertises a ‘Service’ unique to our application. This Service has a ‘characteristic’ value for the Bluetooth ID of the user of the device.

Upon detecting a device, the app ‘connects’ to it, retrieves the Bluetooth ID (an encrypted value that only the NHS can decrypt), and stays connected whilst in close contact. A notifying characteristic is also used to identify devices to each other.

During this contact time, a series of RSSI (signal strength) readings are taken. As phones get nearer the strength increases, and farther away the strength decreases.

This series of data - called an Encounter - has a start time, Bluetooth ID of the contact, and a series of RSSI values, and a total duration of the contact. This is what is stored on each phone.

Data captured via Bluetooth on the mobile device



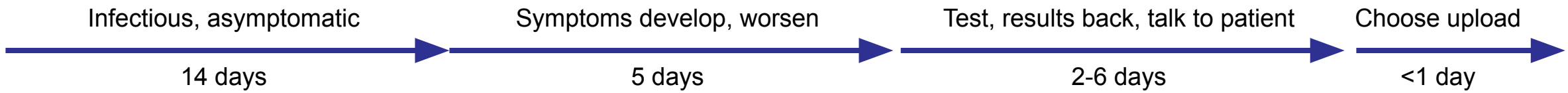
10:00:00	**Connects to BluetoothReceivedID 987, Timestamp 10:00:00, RSSI -50**
10:00:15	**Records RSSI -25**
10:00:30	**Records RSSI -60**
10:00:45	**Records RSSI -50**
10:01:00	**Records RSSI -55**
10:01:09	**Disconnects, records duration of 0:01:09**

Data Stored to Phone

BluetoothReceivedID,	DateTimeStarted,	RSSISeries,	TxPowerSeries	OffetSeries	Duration
987,	20200409T09:00:00Z,	[-50,-25,-60,-50,-55],	[8,8,12,9.15],	[15,15,15,25,09],	69
Data format:-					
Variable length binary,	ISO8601 at Zulu,	byte array,	byte array,	byte array,	long

How long does data need to be kept on the phone for?

Assumption: For the maximum time being able to infect and getting a positive test result back, and then sharing your data with the NHS



Thus minimum time we must hold: 28 days (+2 to take account of testing delay due to testing at peak capacity)

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