Beacons

MicroLocation, Context and The PhysicalWeb

A Selim Salman
plus.google.com/+ASelimSalman
aselims.github.io
twitter.com/A_SelimS

Diversified Android Engineer

Technology Evangelist

Interested about Ubiquitous Computing

selim.2k@gmail.com
aselims.github.io
@a_selims

Agenda

- Intro to Beacons
- Use Cases
- Workshop Coding
- Get the extra mile!

What is a Beacon?

- Beacons are simple devices that send one-way BLE signals.
- Estimote Beacon is a small computer. Its 32-bit ARM® Cortex M0 CPU is accompanied by accelerometer, temperature sensor, and what is most important—2.4 GHz radio using Bluetooth 4.0 Smart, also known as BLE or Bluetooth low energy.
- Google's beacon platform enables contextual experiences for your users through interactions with BLE

EcoSystem

QR code

RFID / NFC

Beacon

GPS

...

Location matters!

A Beacon

Bluetooth Smart (BLE)

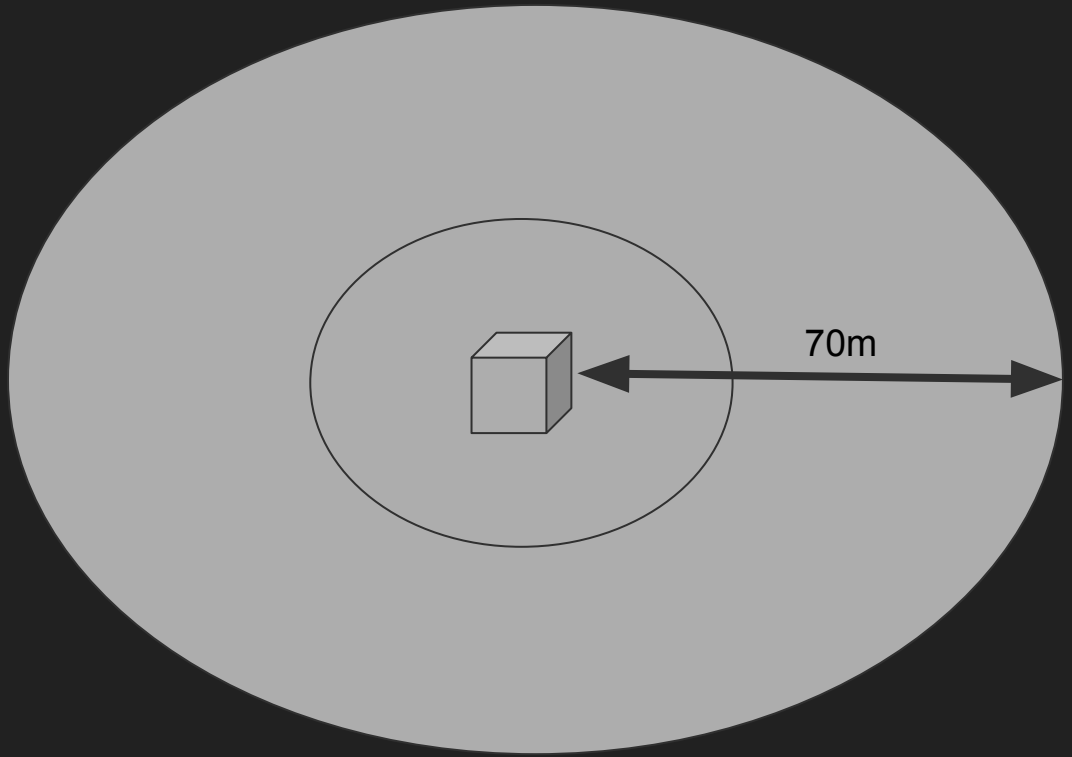
40-50m

Pairing

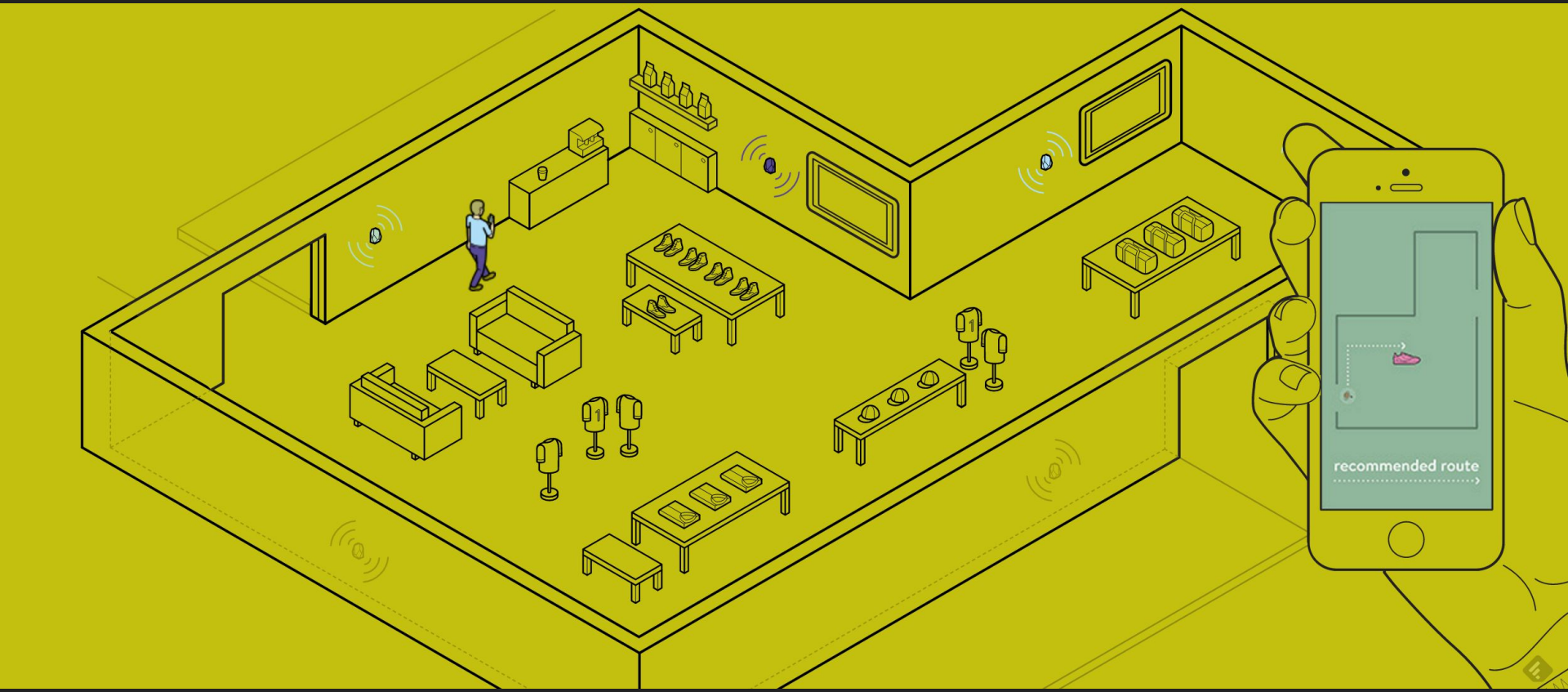
Distance:

- Transmit power (TX)
- Signal strength (RSSi)

Blinking attitude ;)

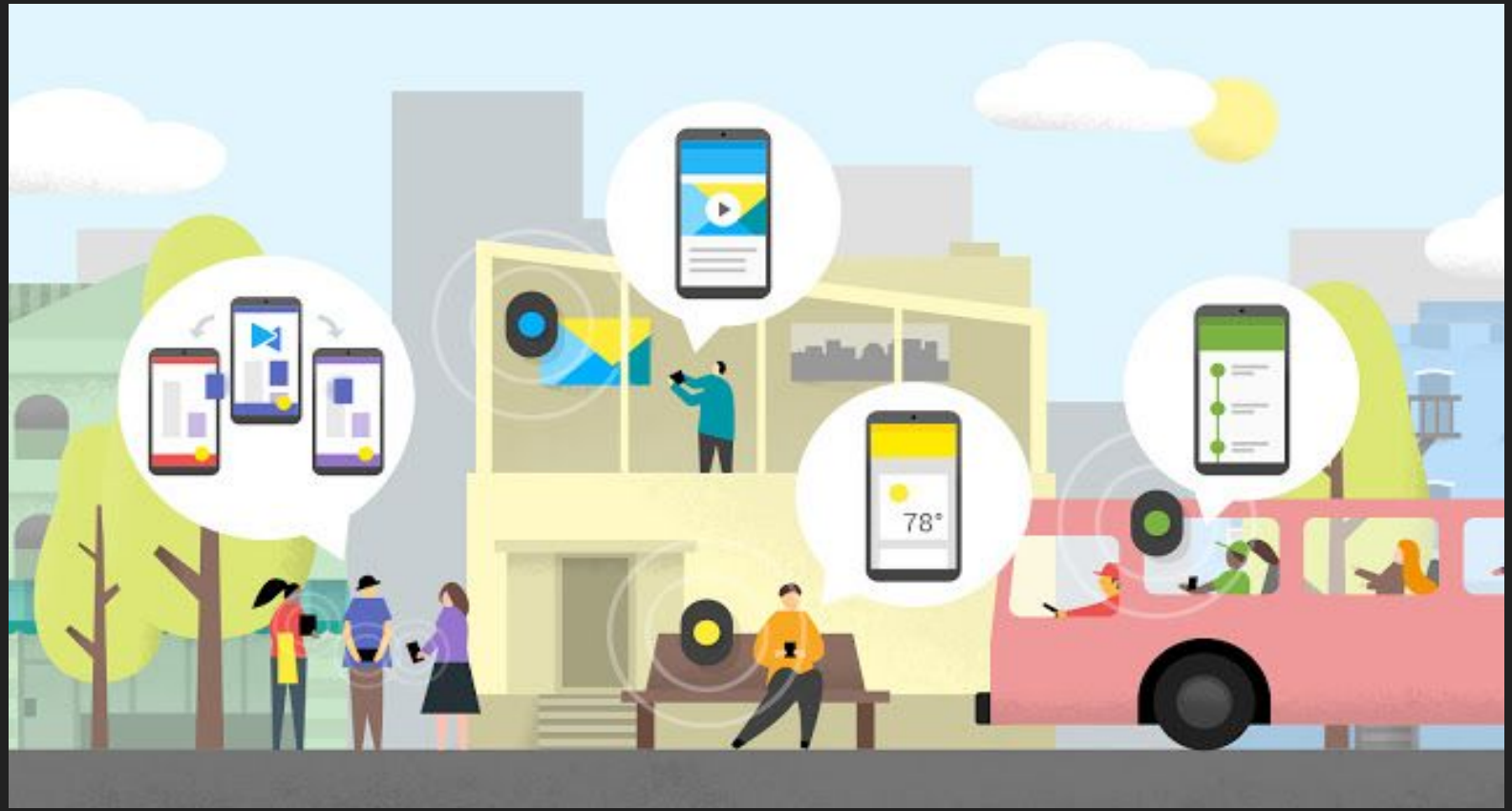


Use Case Scenarios



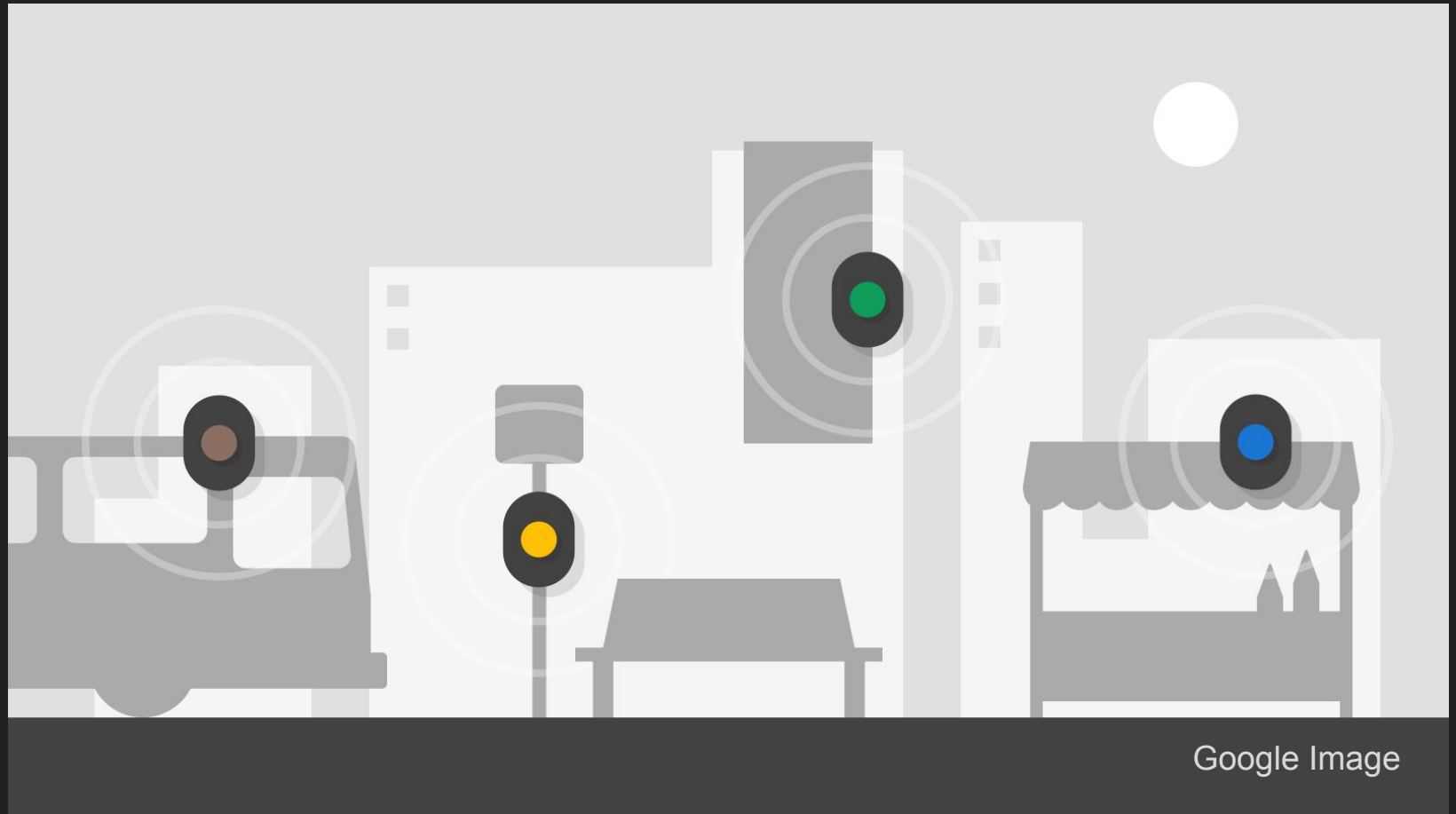
Estimote Image

Just imagine!



Google Image

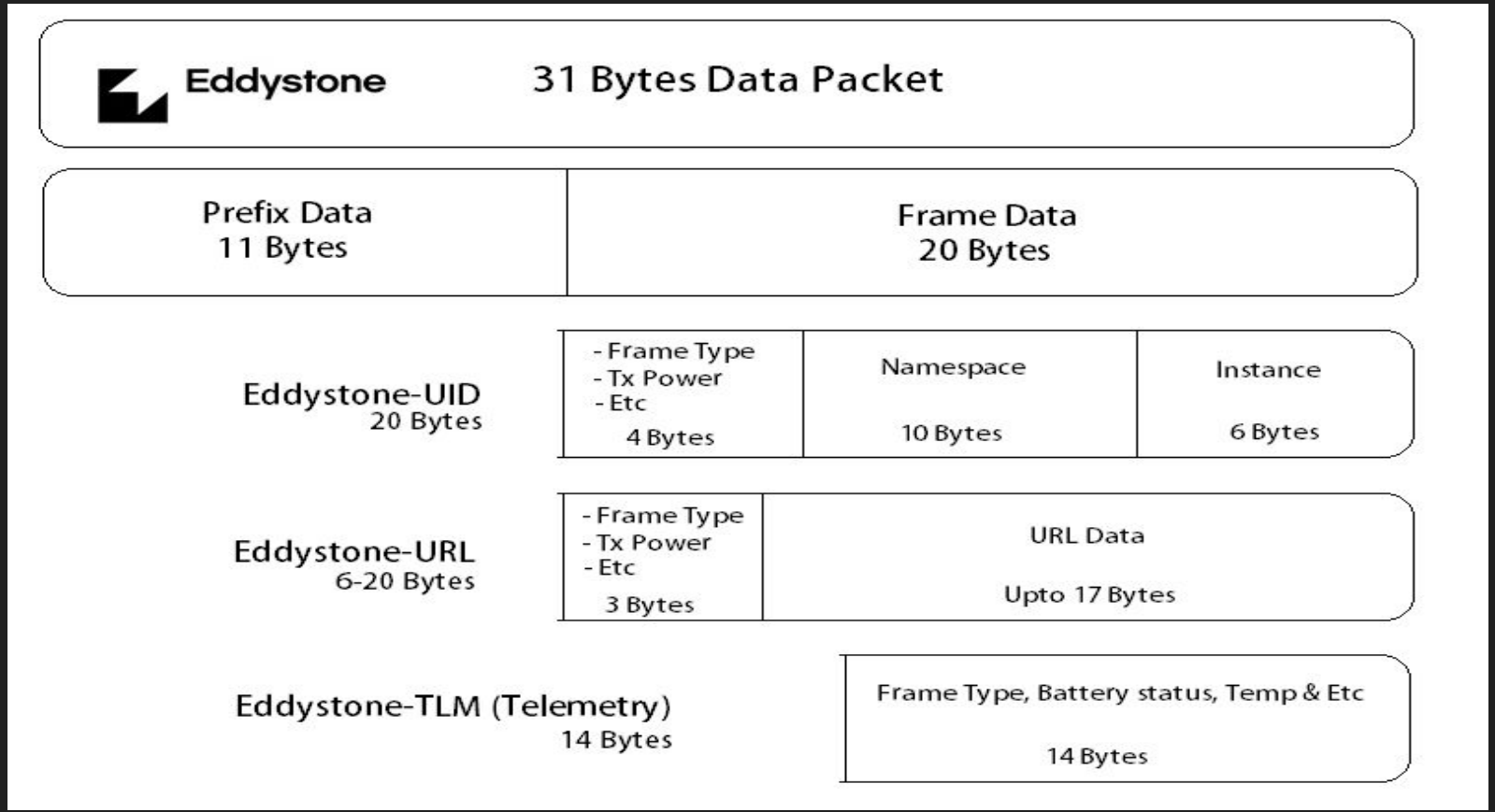
Markup the world!



Eddystone specification

- Open
- FrameType:
    a. Eddystone-UID: An opaque unique ID. 0x00
    b. Eddystone-URL: A compressed URL that, once parsed and decompressed, is directly usable by the client. 0x10
    c. Eddystone-TLM: A block of telemetry information containing beacon status and runtime values. 0x20

Eddystone specification



Eddystone Beacons Manufacturer

And more…

Estimote

The Physical Web

Every device has a url

- a wirelessly broadcasted URL
- software on a device that detects and displays the URL when requested

Analogy:IPv6

Any BLE-enabled device can receive it!

https://play.google.com/store/apps/details?id=physical_web.org.physicalweb

Demo Time

Before we start

Minimum: Android 4.3 (Jelly Bean, API Level18)

Better: Android 5.0 (Lollipop, API Level 21) “LEScanner”

Be Aware: Android 6.0 (Marshmallow, API Level 23) “Permissions!”

Permissions

```
<!– Allow any Bluetooth communication -->
<uses-permission android:name="android.permission.BLUETOOTH"/>

<!– Allow device discovery -->
<uses-permission android:name="android.permission.BLUETOOTH_ADMIN"/>

<!– Allow location access for Android 6.0 Marshmallow (API Level 23) -->
<uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION"
/>
```

Limit to BLE-capable devices (or check inside App instead):

```
<uses-feature android:name="android.hardware.bluetooth_le"
android:required="true“/>
```

Let us get it started!

Show me the Code

Links

https://developers.google.com/beacons/proximity/attachments

https://developers.google.com/nearby/

https://developers.google.com/beacons/proximity/

https://google.github.io/physical-web/

https://github.com/google/beacon-platform

https://github.com/google/beacon-platform/tree/master/samples/android

https://github.com/google/eddystone

http://developer.estimote.com/