IBEACONS
THE COOLEST APPLE TECHNOLOGY YOU'VE NEVER HEARD OF

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#iBeaconsXW15

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iOS app store apps

ear

beacondo

artle

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A Brief History

Bluetooth Beacons are a signal to an app on a persons device that it has arrived in a given location

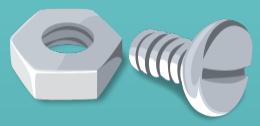
Apple's (interim) answer to NFC

iBeacons are a subset of Bluetooth Beacons that are designed for people discovering a geographic location

Originally designed to enhance the "retail" experience

Enhances the concepts of Geofencing and Microlocations

Will also find your keys



The iBeacon Specification & Protocol

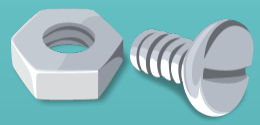
BLE Packet Payload

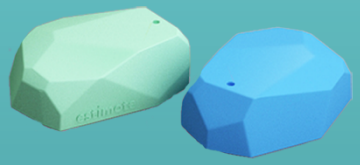
Header	MAC	PDU (Data)	Signal Strength

iBeacon Frame (31 Bytes Max)

Prefix	Proximity UUID	Major	Minor
92 bit	128 bit	32 bit	32 bit
"I am an iBeacon"	Identifies the organization and the device class (or not)	A group of related beacons (room, object type, building)	Individual beacon in a group (iPad 23, Room code)

Beacons?





Battery Powered (Estimote)

Bluetooth Enabled APN

USB Powered Dongle

(Gemtot, Radius)

"iBeacons" are devices that are compatiable with a protocol defined by Apple

Two modes, Peripheral and Central

Single direction, simplex broadcast

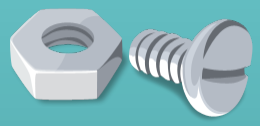
Supports smart device location awareness

Like its namesake, its job is to Get Attention

Built on Bluetooth 4.0 (BLE)

A device running an iBeacon App

An iBeacon is a device constantly broadcasting a single Bluetooth frame



Bluetooth Low Energy (BLE, Bluetooth Smart, Bluetooth 4)

Very low power requirements

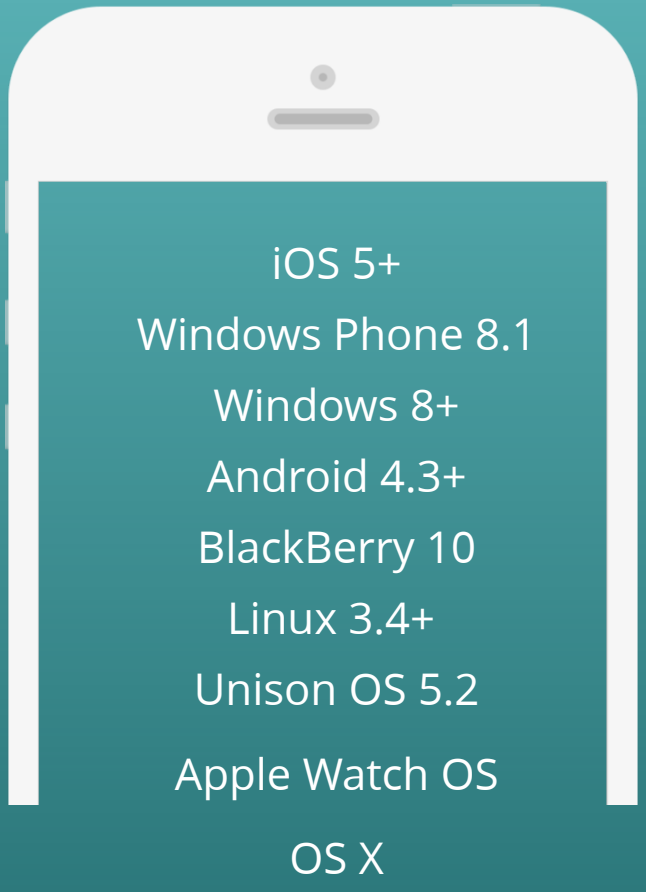
Broadcasts can be periodic or continuous

Range can be specified

Not affected by "noisy" Wifi

Highly robust, low bandwidth

Advertising & Communication (iBeacons are only Advertising)



So an iBeacon is:

A Bluetooth Low Energy device running in Central Mode

A simple protocol running on top of astandard Bluetooth 4.0 transmission

Detectable by any Bluetooth 4 compliant device

Set to Advertise only, no data exchange takes place

Designed to support location specific activities where GPS is impractical, three range modes (far, near and touching)

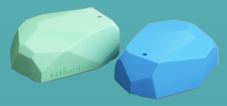
Integrated into iOS 7+

Example iBeacon Frames

0201061AFF4C000215B9407F30-F5F8-466E-AFF9-25556B57FE6D00-0f-00-23

Prefix

I Am An iBeacon 0201061AFF4C000215



UUID (Proximity)

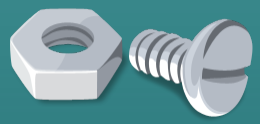
I am an Estimote B9407F30-F5F8-466E-AFF9-25556B57FE6D

Major

I Am On A Fridge 00-0f

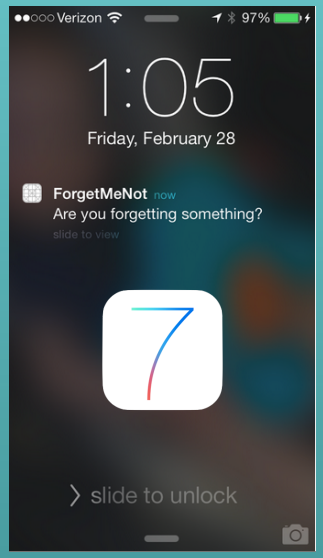
Minor

Specifically I Am On Fridge 23 00-23



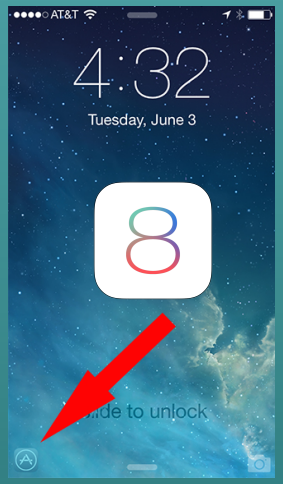
Whiteware Discovery App!

iOS 7, 8 and iBeacons

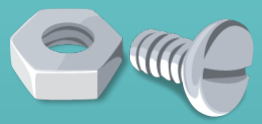


App can register iBeacons to watch out for

iOS will post a notification when it encounters (or leaves) a known beacon



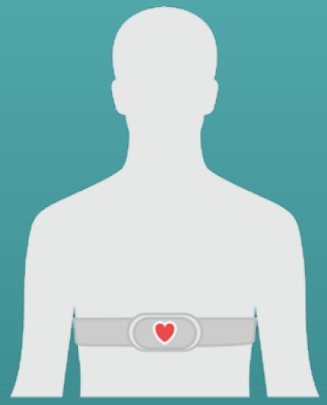
Tapable buttons on the lock screen take you directly to your App



A BLE Compliant device
operates in one of these modes

Peripheral (client)

Central (server)



A Central device *has* data, a Peripheral
wants data

Popular iBeacons

Tile

http://thetileapp.com

App/Beacon Combo

Notifies on entry/exit

Gemtot

http://passkit.com

No battery

Can broadcast multiple UUID/Maj/Min services

Programmable

Online customisation

App creation

Etimote Stickers

http://estimote.com

Colourful

Concealable

Great Free SDK

In The News

Classroom Use Cases

School map for visitors and students.

Attendance information, gathering device analytics for research.

Geocaching/scavenger hunts.

?

Monitoring entry and exit to a location. How many iPads have been removed from a room? Were they all returned?

Auto-configure a device for the use case in a specific classroom.

Space discovery app. Helping students understand which area of a library or laboratory they're in.

Time to play with some Apps!

1) Bluetooth must be turned on
2) Location services must be turned on (Settings -> Privacy -> Location Services)
3) Passbook needs to be authorized to use Location Services
4) Background App Refresh needs to be turned on (Settings -> General -> Background App Refresh)

Our First Beacon:

Dartle

Two operating modes, can act as a Beacon or identify another Dartle beacon

Good test of hardware compatibility with BLE 4.0 and your device

Allows you to experiment with range and deciding when you want to activate your beacon

Using Dartle:

An iBeacon aware "business card" in Passbook

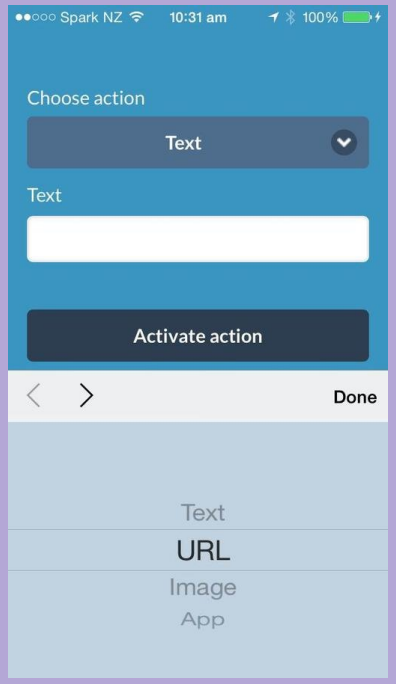
We'll download a "Pass" for Passbook that recognizes a Beacon (we'll use Dartle as our test Beacon)

```
"beacons" : [
      {
          "major" : 1234,
          "minor" : 5678,
          "relevantText" : "Paul Cowan is nearby",
          "altText" : "He'd love you to buy him a coffee",
          "proximityUUID" : "10F86430-1346-11E4-9191-0800200C9A66"
          }
      ]
```

Download the .pkpass file on your iOS device from:
http://bit.ly/pcowanpass or scan this code

Adding Actions

"near" is similar to Dartle, but allows us to also add Actions that initiate some function on the detecting (Central) device



Text: Display a message

URL: Open a web page

Image: Display a photo from the Camera Roll

App: Attempt to launch another App on the device

Be Here
A classroom use case

The teacher's iPad becomes a Beacon

Alerts the teacher that a student has entered the room

Allows a student to ask for help, showing the teacher a queue of student requests

Building an app in Beacondo

To Download the mLearning Day App

1) Open Safari on your iOS Device

2) Browse to http://bit.ly/mlearn2014app

3) Tap the link to install the App on your device

Using Casper

Example 1: Locking laptops that leave the classroom

Example 2: Performing authorised admin tasks on a Mac via specific beacons

These work, I promise!

Beacon Launcher

Lets try a simple
automation exercise using a free Mac app
and Dartle

Paul's Magic Remote

A probably useless implementation of iBeacons

Questions