

BeaconBone

An Indoor Positioning System

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System Overview - Configuration

- Configure advertised RSSI

The screenshot shows the RadBeacon configuration application. The top bar includes 'RadBeacon Detail', 'APPLY', and 'SCAN' buttons. The interface is divided into two main sections: 'IBEACON / ALTBEACON' and 'RBDot'. The 'IBEACON / ALTBEACON' section contains fields for 'UUID' (00000000-0000-0000-0000-00000000), 'MAJOR' (31), 'MINOR' (8), and 'MEASURED POWER' (-61). The 'RBDot' section contains fields for 'UUID' (00000000-0000-0000-0000-00000000), 'MAJOR' (31), 'MINOR' (8), and 'Address' (0C:F3:EE:04:21:1E). The status bar at the top shows 3G connectivity, 82% battery, and the time 12:01 PM.

IBEACON / ALTBEACON	Unspecified Beacon
UUID	UUID e0cb235d-7ee8-4e87-8
00000000-0000-0000-0000-00000000	Major 1
	Minor 61104
	Address 4F:E0:94:DE:12:F0
MAJOR	RBDot
31	UUID 00000000-0000-0000-0000-00000000
	Major 31
MINOR	Minor 8
8	Address 0C:F3:EE:04:21:1E
MEASURED POWER	
-61	



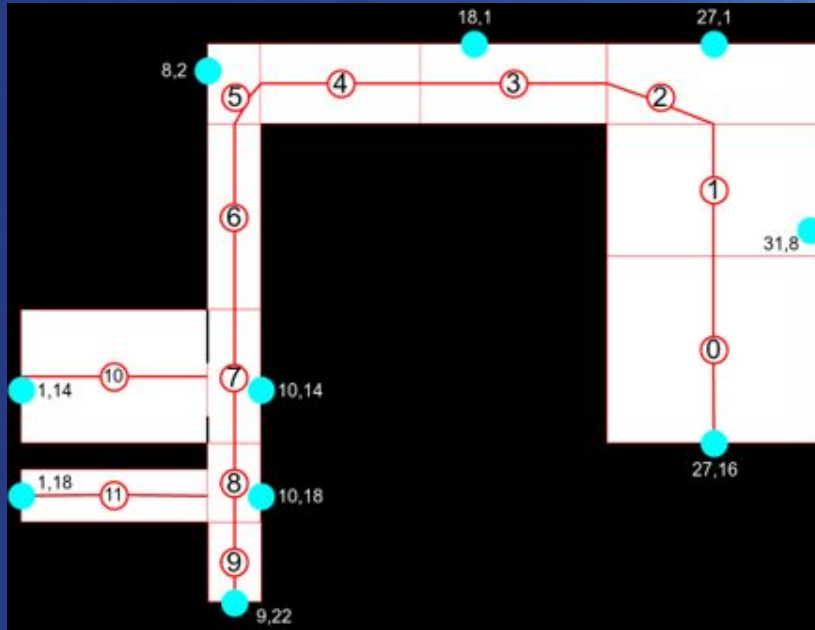
- Adjust UUID to match position

System Overview - Positioning



1. Detect two closest beacons
2. Find point in between using proportion of RSSI
3. Find closest point on predetermined path

System Overview - Mapping



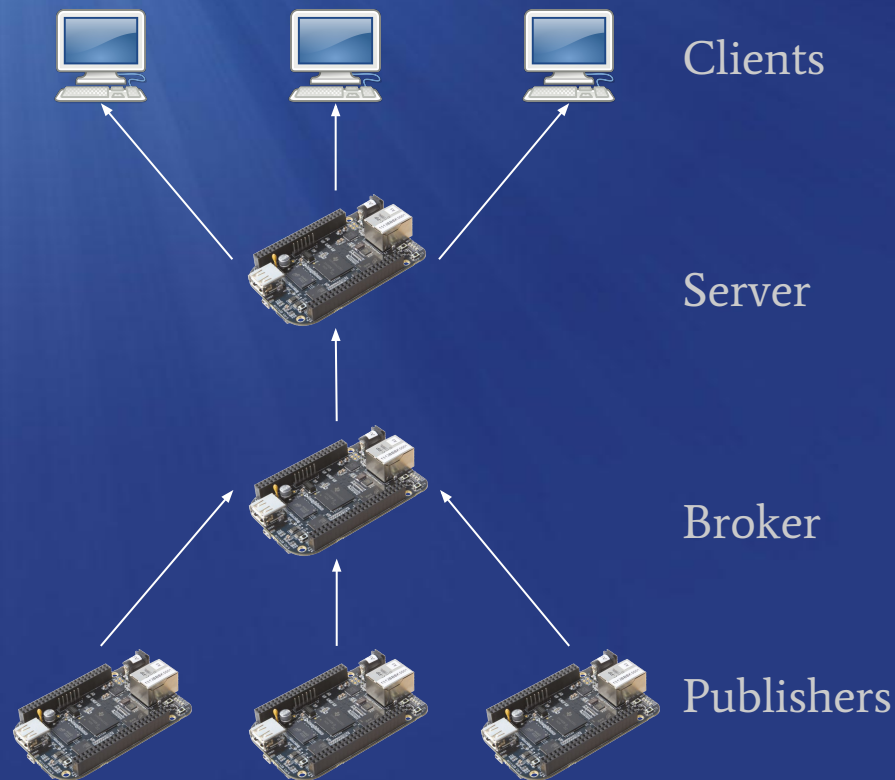
- Create graphical and spatial representations of the EB II

- Place beacons strategically



System Overview - Networking

1. MQTT broker as “middleman”
2. Publishers publish their positions to the broker
3. HTTP server subscribes to all positions published to the broker
4. Clients connect to the server over HTTP to display map of area



Scenario Walkthrough

[illegible]

```
➔ sudo coffee publisher.coffee http://localhost
➔ BeaconBone git:(master) X sudo coffee publisher.coffee http://localhost
verbose: connecting to the MQTT broker at http://localhost
info: Start scanning for MQTT
info: MAC address recorded: f0:1f:af:1f:3c:18
info: Connected to the MQTT broker at http://localhost
info: New beacon 10,18 discovered
verbose: Distance 1.3402594104128491 added to beacon 10,18
verbose: Distance 1.8464266784835408 added to beacon 10,18
verbose: Average distance 1.59334308444481949 calculated for beacon 10,18
verbose: Publishing position: 10,18
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verbose: Publishing position: 10,18
verbose: Average distance 1.8464266784835408 calculated for beacon 10,18
verbose: Publishing position: 10,18
info: Beacon 10,18 no longer in range
```

1. On first BeagleBone:
 - a. Run the MQTT broker
 - b. Run the publisher
2. On second BeagleBone:
 - a. Run the HTTP server
 - b. Run the publisher
3. Navigate to the IP address of the second BeagleBone
4. ?
5. Profit

```
➔ sudo coffee server.coffee http://localhost
➔ BeaconBone git:(master) X sudo coffee server.coffee http://localhost
verbose: Connecting to the MQTT broker at http://localhost
Info: HTTP server started
Info: Connected to the MQTT broker at http://localhost
verbose: MQTT message from topic position/f0:1f:af:1f:3c:18 10,18
Info: New Item f0:1f:af:1f:3c:18 being tracked
verbose: MQTT message from topic position/f0:1f:af:1f:3c:18 10,18
verbose: MQTT message from topic position/f0:1f:af:1f:3c:18 10,18
verbose: MQTT message from topic position/f0:1f:af:1f:3c:18 10,18
verbose: MQTT message from topic position/f0:1f:af:1f:3c:18 10,18
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verbose: MQTT message from topic position/f0:1f:af:1f:3c:18 10,18
verbose: MQTT message from topic position/f0:1f:af:1f:3c:18 10,18
Info: Item f0:1f:af:1f:3c:18 no longer being tracked
```

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➔ sudo coffee blisher.coffee http://localhost
➔ BeaconBone git:(master) X sudo coffee publisher.coffee http://localhost
verbose: Connecting to the MQTT broker at http://localhost
Info: Start scanning for beacons
Info: MAC address recorded: f0:1f:af:1f:3c:18
Info: Connected to the MQTT broker at http://localhost
Info: New beacon 10,18 discovered
verbose: Distance 1.3402594104128491 added to beacon 10,18
verbose: Publishing position: 10,18
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