Bramson Welch & Associates, Inc.

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Bramson Welch & Assoc., Inc. demonstrates Bluetooth Low Energy to Node.js Gateway/bridge at the IEEE/CPMT Wearable Technology — Seminar and Tabletop Exposition.

Santa Clara, CA. August 20, 2014. Bramson Welch demonstrated a proof of concept data communication infrastructure mechanism for connecting Wearable BTLE enabled devices to the cloud.

This communications IP was presented on Dev boards from TI and Bluegiga for the purpose of this demonstration. This IP can be implemented on a wide variety of Bluetooth and WiFi hardware systems. Modularized for easy portability, it can also be customized for numerous implementations and hardware choices. The target BTLE device could be any number of possible devices, such as heart monitor, tracking module, moving sensor, etc. The BTLE/WiFi gateway requires any BTLE device capable of operating in "Master" mode, with any WiFi-enabled microcontroller.
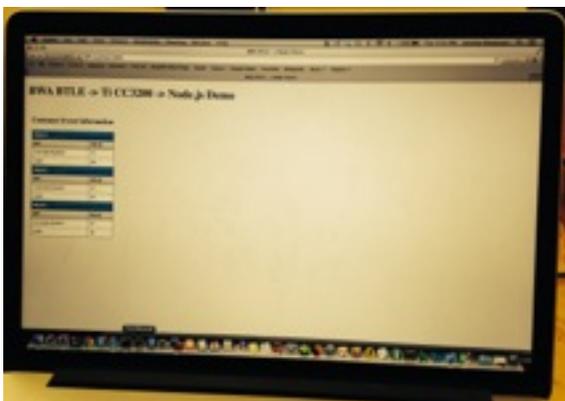
Server	BTLE/WiFi Gateway	BTLE Target Device

The demonstration is comprised of three pieces:
- A BTLE Target device,
- A BTLE/Wifi gateway, and
- A Node.js server.

The target BTLE device is implemented in firmware on a DKBLE113 Dev Board from Bluegiga, using the TI CC2540 Bluetooth radio.

The BTLE/WiFi Gateway is implemented on two Dev boards connected together, a DKBLE113 and a CC3200 Launchpad (the new TI single chip WiFi radio and microcontroller).

The Node.js server runs, in the demo, on a MacBook Pro laptop.

Here is how it works. When the target BTLE device comes into range (which range can be further restricted by using the BTLE proximity sensing capability) the BTLE/WiFi gateway connects to it and receives the specific "Characteristic" data that the device keeps. The demo was constructed around a Custom BTLE Service profile, but the system could just as easily be organized to support a standard BTLE Service, such as Heart Rate monitor, etc.

The BTLE/WiFi gateway constructs a JSON (JavaScript Object Notation) object out of the BTLE device's data, its address, the location of the BTLE/WiFi gateway and anything else that is appropriate and sends that to the Node.js server via a standard, firewall-friendly REST HTTP or HTTPS communication channel.

The server receives these JSON object messages from multiple BTLE/WiFi gateways which can service one or more BTLE devices in local proximity to the gateway.

About Bramson Welch & Associates, Inc.

Bramson Welch & Associates, Inc is a consulting and embedded engineering firm that specializes in the development of hardware, firmware, software and systems, ranging from selected phases of a project such as a highly targeted solution for a specific hard problem to complete start-to-finish product development.

Bramson Welch designs and implements many different kinds of "Internet of Things" projects including:

- A device with GPS and Cell radio that regularly reports its physical location
- A custom USB device (such as a Medical device) that supplies its host software via USB flash disk emulation
- A line of custom iPhone cable and wireless adapters
- A custom BTLE Health Sensor

Another specialty is systems engineering analysis and performance improvement including firmware implementations that didn't run fast enough, hardware design that didn't pass EMI certification, an audio system that was dropping the occasional digital sample.

BTLE/Node.js Datacomm Bridge

```
        BTLE
        Peripheral

BTLE
Peripheral
                                                          BTLE
                                                          Peripheral

                    BTLE
                    Bridge

    BTLE                                     BTLE
    Bridge                                   Bridge


              Custom
              Node.js
              Server



              Browser
```