[個人實驗報告]hw4 BLE programming

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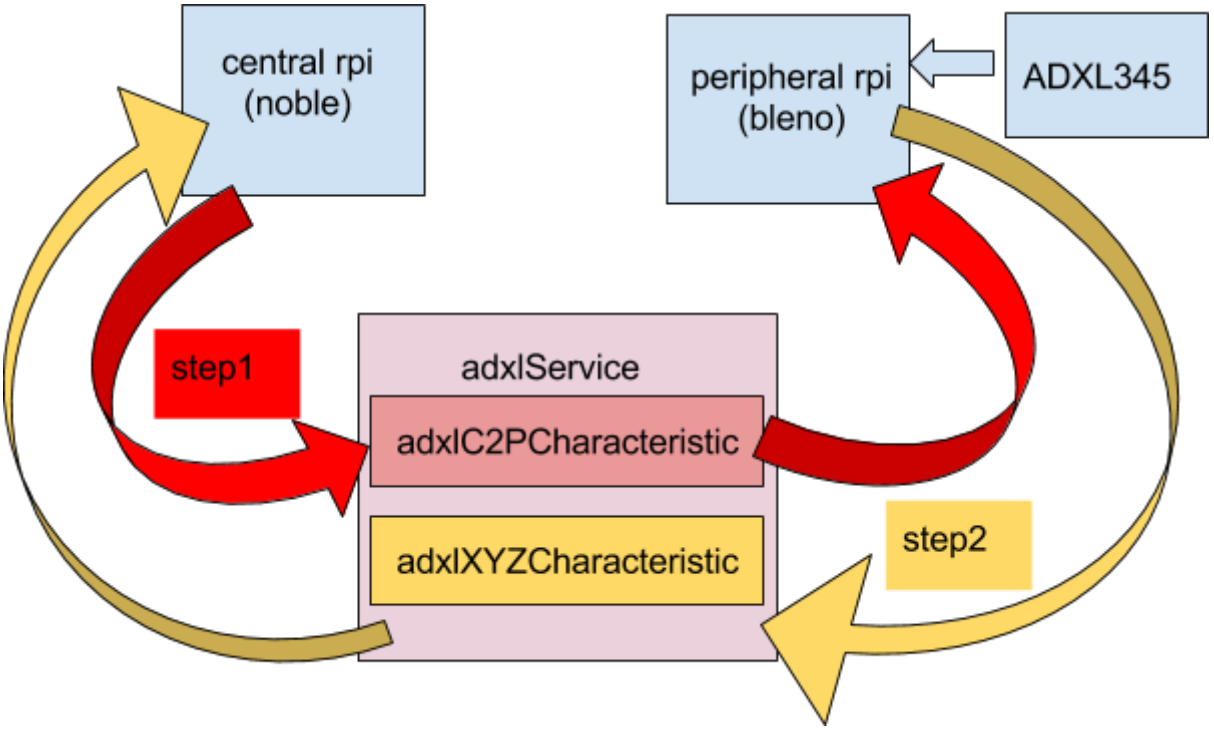
github link:https://github.com/shex2016/embeddingSysHw4Ble/

一、BLE裝置基本程式架構

1. Central rpi is implemented with Node noble package.
2. Peripheral rpi is implemented with Node bleno package. And on peripheral rpi AXDL345 sensor is installed and the acceleration data is accessed via npm adxl345-sensor package.

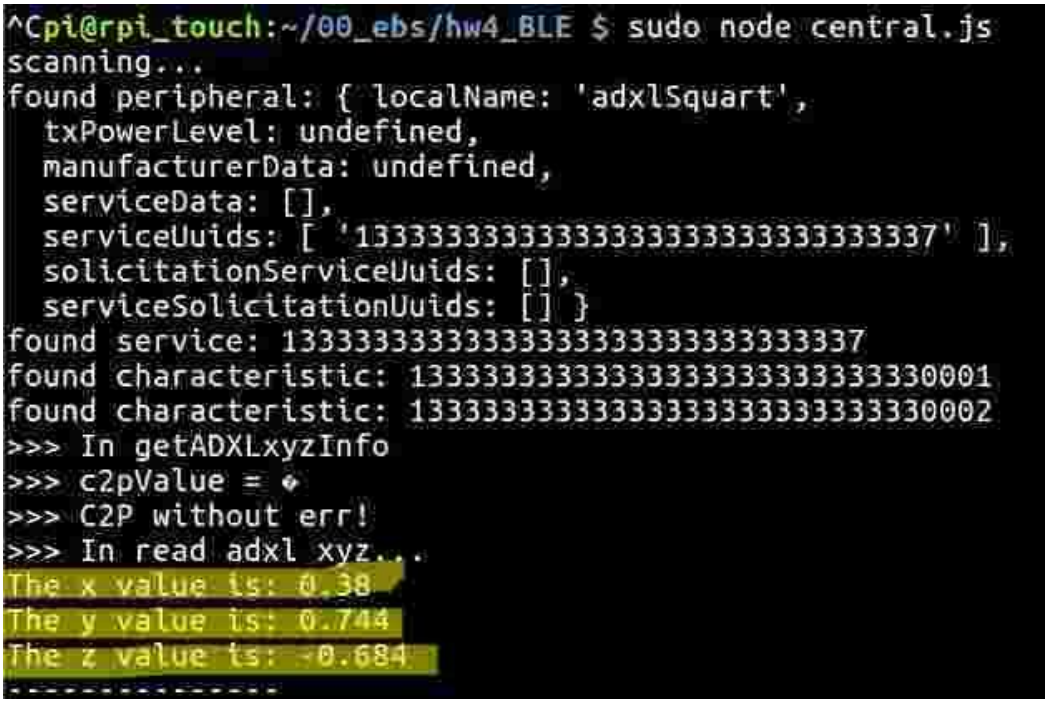
二、收集資料流程

1. step1: The central rpi scans and connects to a peripheral rpi. Then send a number to peripheral rpi via adxlC2PCharacteristic. This step is for debugging purpose. That is, to ensure the two rpis can communicate to each other.
2. step2: Once the peripheral rpi receives the number, it starts to ask ADXL345 for xyz acceleration data, and write the data of xyz axises to a 24-byte Buffer with double memory storing format, using writeDoubleBE(value, offset) method. Later the peripheral rpi write the content of buffer to the adxlXYZCharacteristic, and the central rpi will be notified the changed adxlXYZCharacteristic.

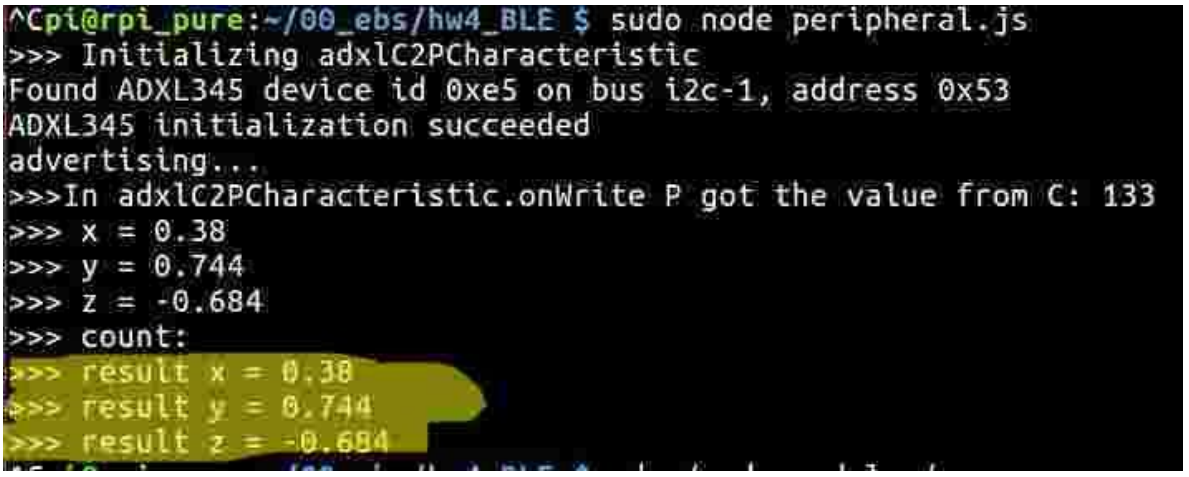


三、執行結果

（1）central.js



（2）peripheral.js



四、心得感想

這是我第一次使用node程式語言。原本我習慣用python寫程式，但後來上網找python的ble套件功能好像都不太完整，像是我原本打算用的bluepy就只有central端（它的peripheral端還在開發中的樣子）。所以後來就死心了，打算從頭學node，但沒有接觸過javascript的我對node中的callback、event-driven寫法很不能接受！加上這作業要用bleno的method 操作陌生的BLE傳訊讓我感到很崩潰。幸好後來發現noble package源碼裡面有example 可以看，於是我就有信心先看懂example在寫什麼，然後把此次作業會用到的功能一個一個分析、拆解成很多小部份的程式碼，上網找資料學習，並把結果兜出來！這過程雖然很辛苦、無法理解為什麼node要這樣寫的時候也曾感到很絕望，但經歷過這些過程後，看到三軸加速度數值傳送成功的那一刻，卻讓我蠻有成就感的！