BlueBrain programming Firmware Over The Air (FOTA)

This document describes how you can set up mbed to perform BlueBrain development and then upload the resulting compiled binary over the air to the BlueBrain.

Dependencies

You need
1. a (free) [mbed login](#)
2. an iOS or Android device with Bluetooth LE support (iphone 4s +, Android 4.3+)
   a. for iOS you need: iTunes and a USB cable
   b. for Android access to a 'Drive' folder
3. the Nordic nRF Toolbox App (Apps are here: [iOS](#) or [Android](#))
4. a BlueBrain
5. A FTD232 (or compatible) USB Serial device for power and optionally serial IO
6. optionally, but usefully, a [Serial/Terminal Emulation](#)program, e.g. CoolTerm

The serial program is used to see printf debugging output.
It is also able to reset the BlueBrain when disconnecting and then (re)connecting to the serial port.
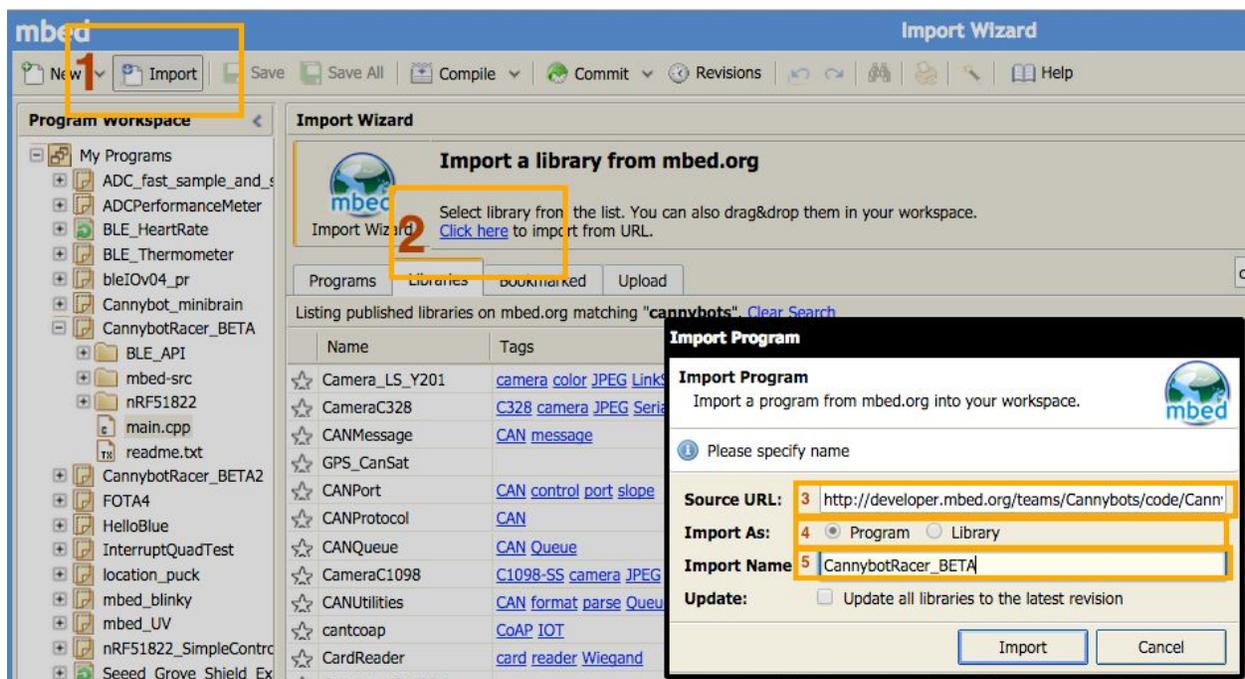
mbed

Importing the mbed test project

These steps show you how to import the current Cannybots beta application project and the nRF51822 platform into your mBed environment.

In the mBed developer Studio please follow these instructions (references diagram below):

1. Click Import and then "Click here to import from URL"
2. Import from URL
3. Use this URL: http://developer.mbed.org/teams/Cannybots/code/CannybotRacer_BETA/
4. Select 'Program'
5. Either use the default name or choose your own (it still can be renamed later)
6. You're done

Setup mbed Target Platform

Installation

Once the project is imported you need to set the target platform to the nRF51822 FOTO platform.

Whilst still logged into the mbed IDE browse to:
http://developer.mbed.org/platforms/Nordic-nRF51822-FOTA/
Then add the platform to your compiler (button on the right)

Setting the project platform

Follow these steps to set the mbed target platform to nRF511822 FOTA (references diagram below):

1. Go back to the project and in the top right select the 'Platform tab in the top right
2. Select the nRF51822 platform you just imported (list list will look different in your IDE)
3. Make sure the platform name matches this
4. Click "Select Platform"
5. Your done
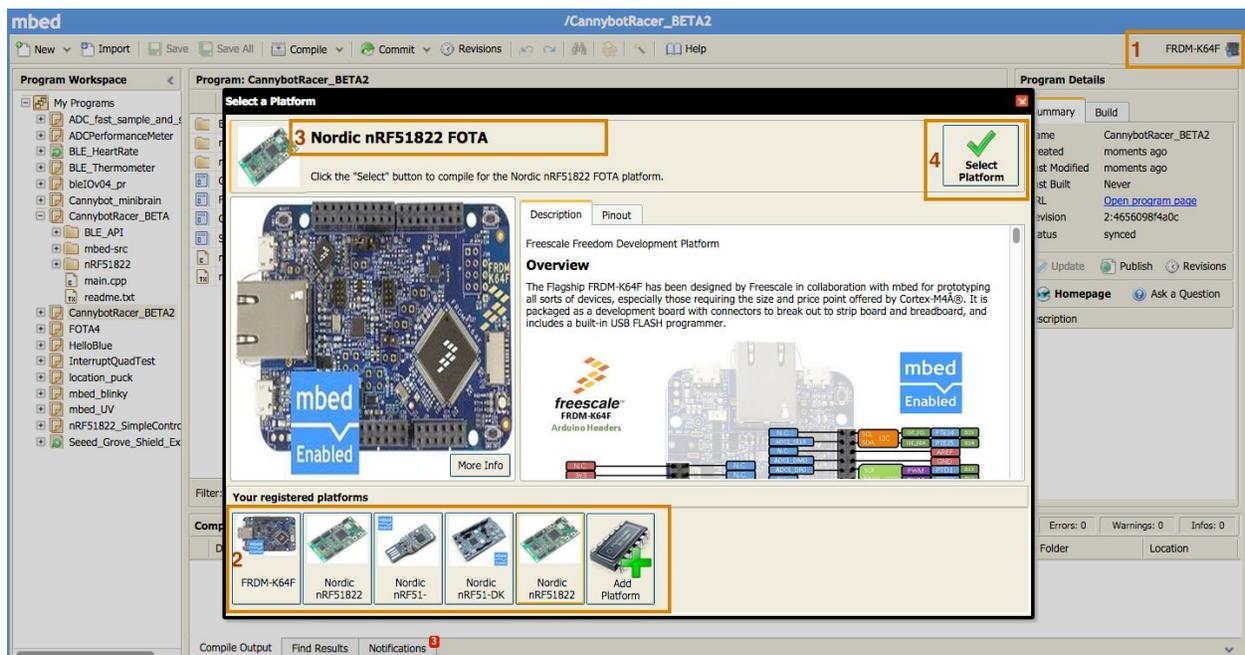
Programming OTA Method

Programming the Firmware Over The Air (FOTA) is currently via an iOS or Android device. After you hit 'compile' in the mbed IDE the compiled application will be in your downloads folder (as "<project_name>_nRF51822_OTA.hex" file).

This file needs to be transferred to the iOS or Android device in a way that the nRF toolbox app can read, which varies by mobile platform.

OTA using iOS

On iOS uploading requires copying the file from your 'Downloads' folder to the 'Documents' folder of the nRF Toolbox app in iTunes.

1. Connect your iOS device using the cable (also possibly works with iTune WiFi syncing)
2. Start iTunes
3. Clink on your phone in iTunes
4. Click Apps
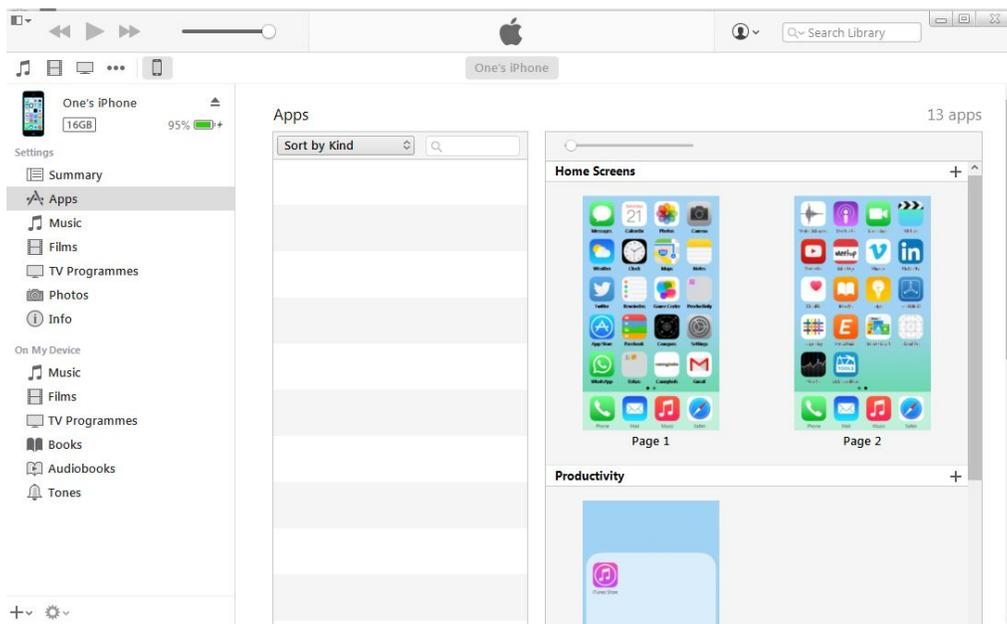
5. On the right where all the apps are scroll down to the bottom
6. Selec nRF Toolbox
7. Drag the .hex file from your Donwload folder to the "nRF Toolbox Documents" folder
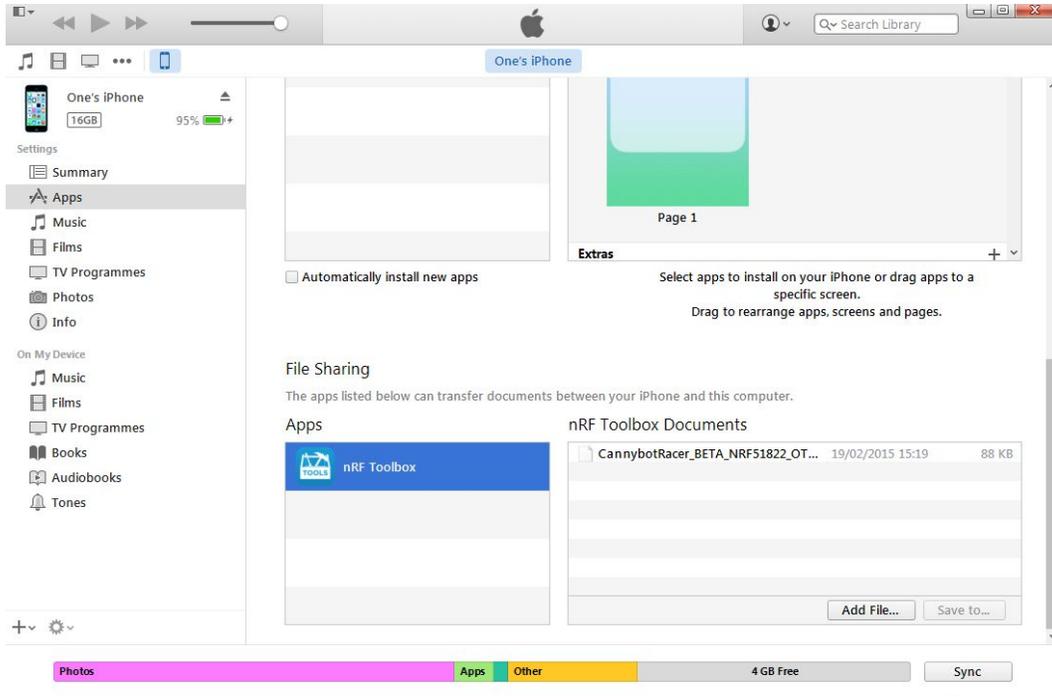
8. Now use the nRF Toolbox app on your phone to upload the binary

To upload the application from your iOS device to the Open the nRF Toolbox app on your phone follow these steps:

1. Click "DFU"

2. Click "Select Device"

3. Click "BlueBrain"
(this might be different if the value has
been changed in the application code)

4. Click "Select File"

5. Click User FIles

5. Click the Application binary
(This is the file you dropped into the
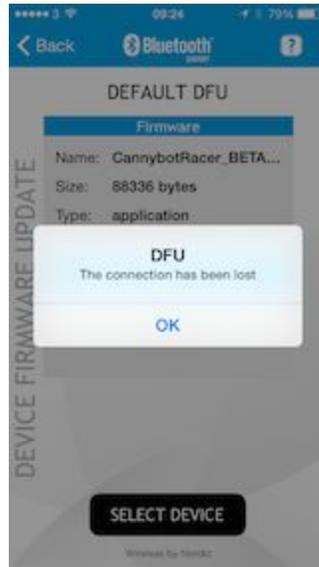"nRF Toolbox Document"area in iTunes)

6. Click "Select FileType"

7. Click "Application"

8. Click Upload, it will fail initially..

Repeat the "Select Device" steps (2 &3)
and retry the upload (it should work 2nd time)

Voila!

Your application should now be live. :)

OTA using Android

The mobile application steps are very similar to the iOS version, the only significant difference is that you upload the file to your Google Drive account and sync your phone with that. The nRF app can browse Android folders and the GDrive.

Tip: sometime the file you have uploaded to GRive wont appear in the nRF Toolbox app. So each time you upload a new file to the GDrive quit the nRFToolbox app and using the GDrive app browser to the folder you uploaded the hex file to and refresh the view. Then re-open the nRFToolbox app,