Using the Flexible Build Library

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Revision Information

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1 Introduction

The Flexible Build Library (FBL) is a mechanism that allows the user to generate different versions of the Bluetopia library tailored to the specified use case. This allows the user to reduce the flash memory requirements of the Bluetopia stack by removing code that is not needed by the user's specific application. Some examples are adding or removing Low Energy support, adding or removing SPP support and adding or removing SCO audio support.

2 Prerequisites

2.1 Perl

The provided FBL scripts require that Perl has been installed. Perl for Windows can be obtained free of charge from ActiveState. The Perl build scripts which are located under "Bluetopia\Objects" in the release can be run from the Windows command line after Perl has been installed.

2.2 IAR or CCS MSP430 Build Tools

For IAR the FBL script "fbl_iar.pl" requires that the IAR MSP430 archiver utility, "xar", is in the Windows path variable. This is normally under a path like the following:

%IAR_INSTALL_PATH%\Embedded Workbench 6.4\430\bin

Where %IAR_INSTALL_PATH% is the location that the IAR embedded workbench was installed. The version on my computer is 6.4, however versions of "xar" installed with earlier versions of the workbench may work as well.

For CCS the FBL script "fbl_ccs.pl" requires that the CCS MSP430 archiver utility, "ar430", is in the Windows path variable. This can be located under a path like the following:

%CCS_INSTALL_PATH%\ccsv5\tools\compiler\msp430_4.1.1\bin

Where %CCS_INSTALL_PATH% is the location that the CCS 5 tool chain was installed. The MSP430 tool chain version is 4.1.1 here, but earlier versions should work as well.

3 Using the FBL

Once the prerequisites enumerated in Section 2 have been satisfied the FBL is ready to be used. The FBL is run on the command line and will build new libraries based on the provided options. The location of the FBL files and the script options are provided below.

3.1 File Locations

All FBL files are described below:

- Bluetopia\Objects   Root directory for all FBL related files
  - fbl_ccs.pl   FBL build script for CCS.
  - fbl_iar.pl   FBL build script for IAR.
  - CCS   Directory that contains CCS object files used by fbl_ccs.pl script.
  - IAR   Directory that contains IAR object files used by fbl_iar.pl script.

3.2 FBL Script Options

The following FBL script options are valid for both the CCS and IAR FBL scripts. All options are optional and if not specified then the resultant library(ies) will not contain support for that feature. Note that SDP server support is required and will always be included in the resultant core library.

- --sppserver   If specified resultant core library will contain SPP Server support.
- --sppclient   If specified resultant core library will contain SPP Client support.
- --sdpclient   If specified resultant core library will contain SDP Client support.
- --lemaster   If specified resultant core library will contain LE Master support.
- --leslave   If specified resultant core library will contain LE Slave support.
- --sco   If specified resultant core library will contain SCO Audio support.
- --gattserver   If specified resultant GATT library will contain GATT Server support.
- --gattclient   If specified resultant GATT library will contain GATT Client support.
- --hidhost   If specified resultant HID library will contain HID Host support.
- --hiddevice   If specified resultant HID library will contain HID Device support.
- --largemtu   If specified resultant Core library will contain support for the highest possible L2CAP MTU (required for Audio support).

3.3 Resultant Files

The FBL can generate up to three separate libraries based on the options, detailed in Section 3.2, which are specified as the arguments to the FBL script. The libraries that may be generated are described below.

- Core Library   This is the main stack library. Every application that uses the Bluetopia stack must link with this library in order to have Bluetooth functionality.

- o libBluetopia.a   If no LE support is specified when using the FBL script (i.e. "--lemaster" and "--leslave" are not specified) then the resultant core library is called "libBluetopia.a".

- o libBluetopia_LE.a   If LE support is specified when using the FBL script (i.e. either "--lemaster" or "--leslave" is specified) then the resultant core library is called "libBluetopia_LE.a" to denote that LE support is included.

- GATT Library   This library provides the support for the GATT profile. Every application that needs to use GATT must link with this library. In order for GATT to work the core library that is also linked with the application must have LE support (i.e. the core library linked with the application is called "libBluetopia_LE.a").

  - o libSS1BTGAT.a   This is the name of the GATT library. This library is only generated by the FBL script if either "--gattserver" or "--gattclient" is specified when using the FBL script.

- HID Library   This library provides support for the traditional HID profile (HID over BR/EDR). Every application needing HID support must link this library. This library can be linked with either versions of the core libraries ("libBluetopia.a" or "libBluetopia_LE.a").

  - o libSS1BTHID.a   This is the name of the HID over BR/EDR library. This library is only generated by the FBL script if either "--hidhost" or "--hiddevice" is specified when using the FBL script.

3.4 Examples

Some examples of using the FBL scripts and what the files generated by the FBL script are shown below. For this document we will show the usage for the CCS script. However the usage of the IAR script is exactly the same.

Generating a core library with SCO support, SDP server and client support, and SPP server and client support:

Usage: fbl_ccs.pl --sco --sdpserver --sdpclient --sppserver --sppclient

Generates: libBluetopia.a

Generating a core library with SDP server and SPP server support. Also generating a HID library with device role support:

Usage: fbl_ccs.pl --sdpserver --sppserver --hiddevice

Generates: libBluetopia.a, libSS1BTHID.a

Generating a core library with SDP server, SPP server and LE slave support. Also generating a GATT library with server support and a HID library with device role support.

Usage: fbl_ccs.pl --sdpserver --sppserver --leslave --gattserver --hiddevice

Generates: libBluetopia_LE.a, libSS1BTGAT.a, libSS1BTHID.a

Generating a core library with SDP server and client support and LE master and slave support. Also generating a GATT library with client support and a HID library with host role support.

Usage: fbl_ccs.pl --sdpserver --sdpclient --lemaster --leslave --gattclient --hidhost

Generates: libBluetopia_LE.a, libSS1BTGAT.a, libSS1BTHID.a