



Using the Flexible Build Library for MSP432

Stonestreet One

9960 Corporate Campus Drive
Suite 3300
Louisville, KY 40223

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Revision Information

Rev	Updated Areas	Date	Author
1	Initial Release	1/1/2014	M. Funk
1.1	Update from SSO	1/1/2015	SSO
1.2	Update for MSP432	3/1/2016	Kobi L.

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\fb\l" in the release can be run from the Windows command line after Perl has been installed.

2.2 IAR, CCS or Keil MSP432 Build Tools

The "fb\l_gen.pl" scripts will build the flexible library for IAR, CCS or KEIL tool-chains. Selection of the required Toolchain is done through command options (see below).

It requires that the IAR for ARM archiver utility ('iarchive') or RVMDK (KEIL) archiver ('armar') must be in the %PATH% variable.

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\fbl\objects Root directory for all FBL related Object files
 - fbl_gen.pl FBL build script.

3.2 FBL Script Options

The following FBL script options and argument are valid for both the KEIL and IAR FBL scripts. All the Bluetooth profiles options are optional and if not specified then the resultant library(ies) will not contain support for that feature. The processor type argument is mandatory and the script will not run without processor type argument. Note that SDP server support is required and will always be included in the resultant core library.

Target Toolchain Selection options:

- --IAR|KEIL|CCS The target Toolchain should be specified through this option.
Only one Toolchain should be specified when at any execution.
CCS is the default and may not be specified.

Bluetooth Profile options:

- --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.
 - Bluetopia.[a/lib] 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 “Bluetopia.a” (for IAR) or “Bluetopia.lib” (for KEIL and CCS).
 - Bluetopia_LE.[a/lib] If LE support is specified when using the FBL script (i.e. “--lemaster” or “--leslave” are specified) then the resultant core library is called “Bluetopia_LE.a” (for IAR) or “Bluetopia_LE.lib” (for KEIL and CCS).

The library is generated under the following path:

[.\generated_libs\core\\[Toolchain-Folder\]\](#)

Where *Toolchain-folder* can be one of the following:

ewarm (in case “--IAR” was selected)

rvmdk (in case “--KEIL” was selected)

ccs (in case “--CCS” was selected)

- Profiles libraries are generated according to the option selected.

The profiles libraries will be created under the following path:

[.\generated_libs\profiles\\[Profile-Name\]\\[Toolchain-Folder\]\](#)

Where *Profile-Name* can be one of the following:

hid, map, gat (GATT) and pbap.

And *Toolchain-folder* is one of the following:

ewarm (in case “--IAR” was selected)

rvmdk (in case “--KEIL” was selected)

ccs (in case “--CCS” was selected)

- 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.
 - SS1BTGAT.[a/lib] 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 both by library that supports BT LE and library with only BT Classic.
 - SS1BTHID. [a/lib] 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 KEIL script. However the usage of the IAR script is exactly the same.

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

```
Usage:      fbl_gen.pl --IAR --sco --sdpserver --sdpclient --sppserver --sppclient
Generates:  .\generated_libs\core\ewarm\Bluetopia.a
```

Generating a core library for KEIL with SPP server support. Also generating a HID library with device role support:

```
Usage:      fbl_gen.pl --KEIL --sdpserver --sppserver --hiddevice
Generates:  .\generated_libs\core\rvmdk\Bluetopia.lib
            .\generated_libs\profiles\hid\rvmdk\SS1BTHID.lib
```

Generating a core library for CCS 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_gen.pl --CCS --sdpserver --sppserver --leslave --gattserver --hiddevice`

Generates: `.\generated_libs\core\ccs\Bluetopia_LE.lib,`
`.\generated_libs\profiles\gat\ccs\SS1BTGAT.lib,`
`.\generated_libs\profiles\gat\ccs\SS1BTHID.lib`

Generating a core library for the default Toolchain (CCS) 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_gen.pl --sdpserver --sdpcient --lemaster --leslave -- gattclient --hidhost`

Generates: `.\generated_libs\core\ccs\Bluetopia_LE.lib,`
`.\generated_libs\profiles\gat\ccs\SS1BTGAT.lib,`
`.\generated_libs\profiles\gat\ccs\SS1BTHID.lib`