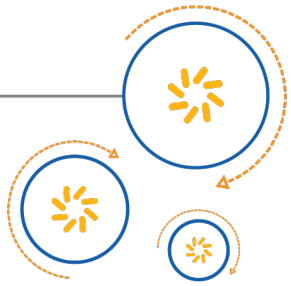
Qualcomm Technologies International, Ltd.



Qualcomm Bluetooth SDK Environment

User Guide

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Revision history

Revision	Date	Description
1	JUL 2010	Initial release. Alternative document number CS-00207480-UG.
2	JUL 2011	Updated to latest CSR™ style
3	JAN 2012	Updated to latest CSR style
4	APR 1014	Updated for ADK 2.5
5	FEB 2016	Updated to latest CSR style
6	JUL 2017	Updated to conform to QTI standards; no technical content was changed in this document revision.
7	APR 2017	Technical updates to reflect latest ADK releases.
AG	JUL 2017	Removed watermark. Updated Document Reference to use agile reference.
AH	OCT 2017	Minor administrative correction. No change to the technical content.

Contents

Figures

1 Bluetooth SDK environment – overview

The Qualcomm® Bluetooth SDK environment comprises an underlying Bluetooth SDK framework that supports fully functional application specific plug-ins and example code plug-ins.

NOTE Example plug-ins provide early visibility to latest Qualcomm® BlueCore™ technology features that can be used by engineers as a starting point to develop their own product applications.

It describes the components and resources which provide the underlying framework for the development of Bluetooth applications.

NOTE Business Unit's application SDKs (which comprise the Bluetooth SDK framework, a product-specific application and the necessary libraries and header files) provide users with fully functional product-ready software which can be readily configured to customize the final implementation.

Each individual application SDK plug-in is customized to optimize it for the intended application. Therefore, not all the Bluetooth libraries will necessarily be included and those that are may vary slightly from those in other application SDKs.

General

QTIL's Bluetooth SDKs provides a fully integrated development environment in which software engineers can amend or write, compile and debug code to run in the embedded environment provided by Qualcomm's BlueCore ICs.

Code is written in either:

- ANSI C: to run on the Virtual Machine provided by Qualcomm's BlueCore ICs.
  or
- Assembler code: to run on the IC's Digital Signal Processor (DSP) of multi-media versions of BlueCore.

Application code runs on a virtual machine (VM) provided by the firmware. The VM enables the firmware to be used as a pre-qualified component.

The example applications and tutorial code supplied, provides developers with a valuable resource. This source code can be incorporated directly into the developer's own code or can be used as a guide to the correct use of library functions and code structure to implement particular functionality.

Purpose

QTIL's Bluetooth SDK framework provides the underlying functionality, resource and toolchain that allows application and example SDK plug-ins to be implemented in a familiar development environment.

The various tools, libraries, header files that make up the Bluetooth SDK, provide developers with the opportunity to reduce the development overhead and time to market for new Bluetooth enabled products.

The application specific application SDK plug-ins provide users with a ready to use, configurable and qualified product design.

NOTE If an application specific SDK is not available the example SDK plug-ins greatly reduce the development effort required to produce a working Bluetooth application that correctly implements the required Bluetooth Profile(s).

2 Overview of SDK architecture

The SDK Framework comprises:

- xIDE, an Integrated Development Environment
- BlueCore Firmware

NOTE Each release of the Core Bluetooth SDK contains the latest available production-ready firmware. However, Qualcomm recommends checking on creatpoint to confirm no more up-to-date firmware is available.

- Tools: See Figure 2-1.

The SDK framework is used in conjunction with:

- An Application plug-in which includes as appropriate:
- Configurable product application code
- Pre-qualified Bluetooth Firmware

NOTE Each application specific release contains the latest available production-ready firmware for the particular application. Example SDKs may contain unqualified Firmware.

- The necessary library and header files
- Bluetooth Profiles
- DSP support
- Support documentation

Or

- An example plug-in

You will also need a BlueCore hardware development platform. Various hardware development platforms are available from QUALCOMM e.g. CaSiRa or the Multimedia Development Board, the type of application being developed dictates the platform required. See the ReadMes with each example.

NOTE Additional hardware may also be required and depending on the application being developed, may be available from QUALCOMM.

2.1 SDK folders architecture

This section describes the most commonly accessed folders:

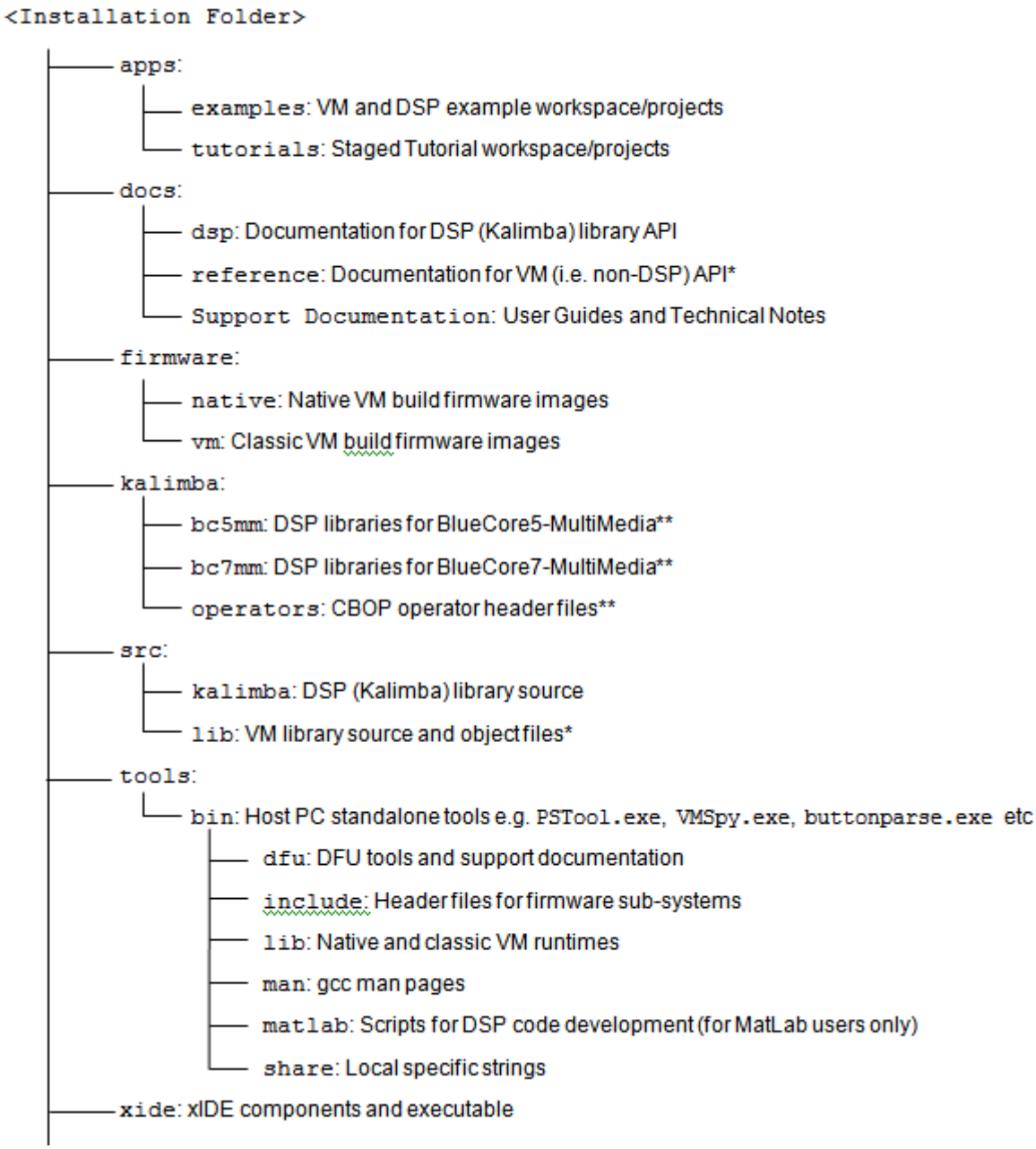


Figure 2-1 Architecture of SDK folders

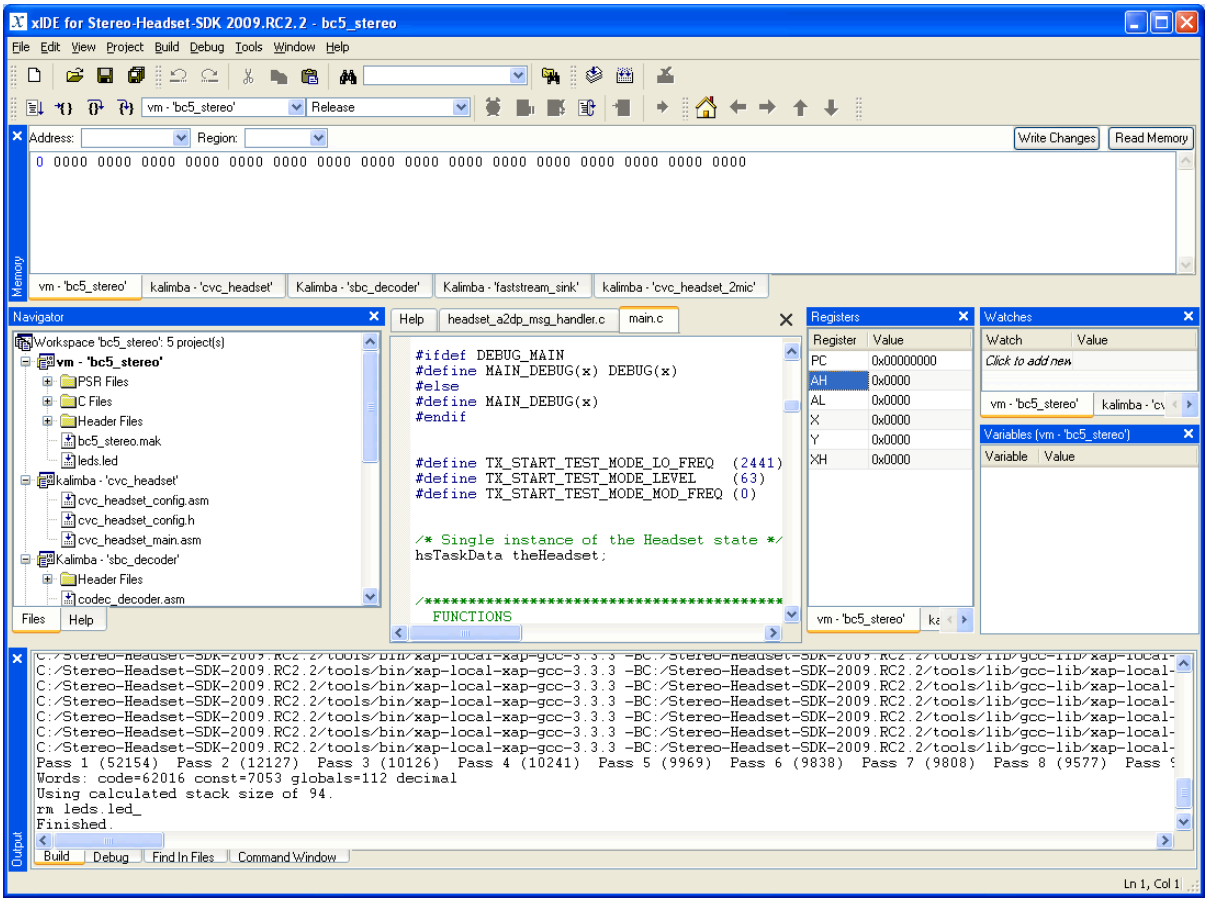
* Includes files which are generated during VM library build.

** Includes files which are generated during DSP library build

2.2 xIDE

xIDE is the Integrated Development Environment application in QTIL's Bluetooth SDKs. It runs on Windows XP and later platforms.

xIDE provides a familiar environment and set of utilities for programmers to develop Bluetooth applications:



xIDE is described in more detail in the *xIDE User Guide*.

2.3 SDK Firmware

The firmware provided in external SDKs is shipped as binary code and qualified to the Bluetooth standard.

NOTE The SDK environment also provides the following pre-qualified protocol components:

- MCAP 1.0: for HDP
- AVCTP 1.3: for AVDTP
- AVDTP 1.2: for A2DP

xIDE automatically combines the application code with the firmware when executing the **Run** facility. In application specific SDKs this produces pre-qualified product code providing the developer has not modified the code other than using the configuration options provided.

NOTE If an application developer adapts or adds library functions or rewrites code then the resultant Bluetooth design needs to be qualified to Bluetooth SIG qualification requirements.

2.4 SDK Applications

Application specific SDKs e.g. Stereo Headset SDK comprise the Bluetooth SDK framework with an appropriate application plug-in which contains the necessary firmware, code, library and header files to implement a product application.

These product applications are configurable to allow OEM customization of the product to differentiate it in the market.

2.5 SDK example applications and tutorials

Example applications and tutorial plug-ins are available and can be downloaded from the creatpoint website. Example application plug-ins require an SDK framework to be installed to provide the necessary development the necessary tools and build environment.

NOTE Product applications developed using example code must be qualified to the Bluetooth SIG requirements to be Bluetooth compliant

Example code can be used and adapted by developers to develop their own applications.

The code helps software engineers gain an understanding of the latest Bluetooth features and provides a starting point for implementing functionality not available in application specific designs.

Guidance on the use of example applications and tutorials is provided in ReadMe files within the apps folder.

2.6 SDK Libraries

SDKs ship with a set of libraries including a subset of the Standard C library. The functions included are restricted to those applicable to the embedded BlueCore environment and the application plug-in supplied.

NOTE The source code for the standard C libraries is not supplied.

The libraries provide are selected to implement the functionality required by the specific application supported. They provide access to a comprehensive range of functions that are commonly used when developing the particular type of application.

In most circumstances, it is unnecessary to alter the code called by these functions. However, wherever possible, the SDK makes the source code available so that developers can understand how they work, and can fine-tune the code if they wish.

Further information on libraries and their use is available in the separate publication *Qualcomm Bluetooth Libraries User Guide* and the Reference Guide provided as part of the xIDE on-line support documentation.

2.7 Technical support

Further information on all QTIL products can be found on the creatpoint website.

Document references

Document	Reference
Guide to Qualcomm Bluetooth Libraries	80-CT435-1/CS-00207478-UG
xIDE User Guide	80-CT405-1/CS-00101500-UG

Terms and definitions

Term	Definition
BlueCore	Group term for the QTIL range of Bluetooth wireless technology ICs
Bluetooth	Set of technologies providing audio and data transfer over short-range radio connections
Bluetooth SIG	Bluetooth Special Interest Group
CaSiRa	QTIL Bluetooth development hardware
CSR	Cambridge Silicon Radio
DSP	Digital Signal Processor: a microprocessor dedicated to real-time signal processing.
MMI	Man Machine Interface
SDK	Software Development Kit
VM	Virtual Machine
xIDE	The QTIL Integrated Development Environment