Advanced Audio Distribution Profile (A2DP)

Application Programming Interface Reference Manual

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1.   Introduction

Bluetopia®, the Bluetooth Protocol Stack by Stonestreet One provides a software architecture that encapsulates the upper functionality of the Bluetooth Protocol Stack. More specifically, this stack is a software solution that resides above the Physical HCI (Host Controller Interface) Transport Layer and extends through the L2CAP (Logical Link Control and Adaptation Protocol) and the SCO (Synchronous Connection-Oriented) Link layers. In addition to basic functionality at these layers, the Bluetooth Protocol Stack by Stonestreet One provides implementations of the Service Discovery Protocol (SDP), RFCOMM (the Radio Frequency serial COMMunications port emulator), and several of the Bluetooth Profiles. Program access to these layers, services, and profiles is handled via Application Programming Interface (API) calls.

This document focuses on the description of all programming interfaces for the Bluetooth Advanced Audio Distribution Profile provided by Bluetopia. Chapter 2 contains a description of the programming interfaces for this profile. And, Chapter 3 contains the header file name list for the Bluetooth Advanced Audio Distribution Profile library.

1.1   Scope

This reference manual provides information on the Advanced Audio Distribution Profile API. This API is available on the full range of platforms supported by Stonestreet One:

- Windows
- Windows Mobile
- Windows CE
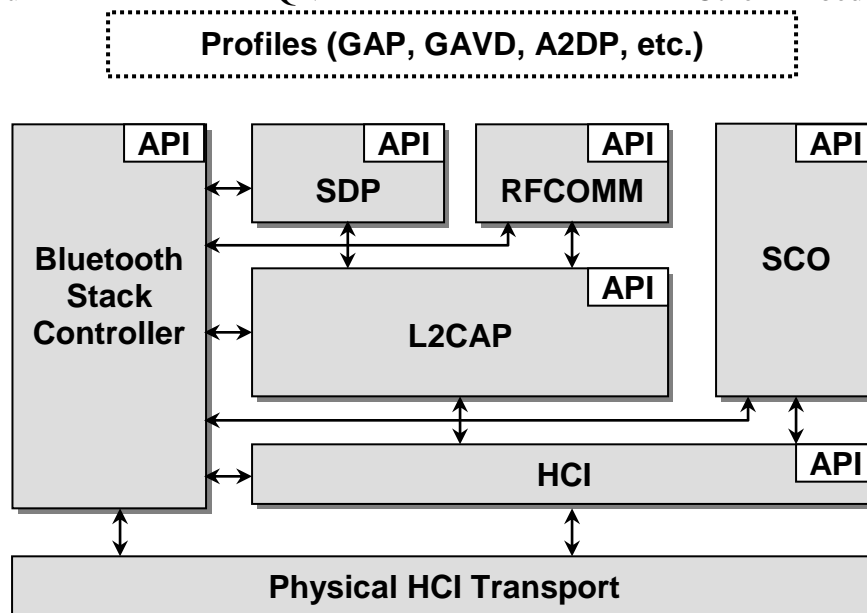- Linux
- QNX
- Other Embedded OS

Figure 1-1   The Stonestreet One Bluetooth Protocol Stack

1.2   Applicable Documents

The following documents may be used for additional background and technical depth regarding the Bluetooth technology.

1. *Specification of the Bluetooth System, Volume 1, Core*, version 1.1, February 22, 2001.

2. *Specification of the Bluetooth System, Volume 2, Profiles*, version 1.1, February 22, 2001.

3. *Specification of the Bluetooth System, Volume 1, Architecture and Terminology Overview*, version 1.2, November 5, 2003.

4. *Specification of the Bluetooth System, Volume 2, Core System Package*, version 1.2, November 5, 2003.

5. *Specification of the Bluetooth System, Volume 3, Core System Package*, version 1.2, November 5, 2003.

6. *Specification of the Bluetooth System, Volume 1, Architecture and Terminology Overview*, version 2.0 + EDR, November 4, 2004.

7. *Specification of the Bluetooth System, Volume 2, Core System Package*, version 2.0 + EDR, November 4, 2004.

8. *Specification of the Bluetooth System, Volume 3, Core System Package*, version 2.0 + EDR, November 4, 2004.

9. *Specification of the Bluetooth System, Volume 0, Master Table of Contents & Compliance Requirements*, version 2.1+EDR, July 26, 2007.

10. *Specification of the Bluetooth System, Volume 1, Architecture and Terminology Overview*, version 2.1+EDR, July 26, 2007.

11. *Specification of the Bluetooth System, Volume 2, Core System Package [Controller Volume]*, version 2.1+EDR, July 26, 2007.

12. *Specification of the Bluetooth System, Volume 3, Core System Package [Host Volume]*, version 2.1+EDR, July 26, 2007.

13. *Specification of the Bluetooth System, Volume 4, Host Controller Interface [Transport Layer]*, version 2.1+EDR, July 26, 2007.

14. *Specification of the Bluetooth System, Bluetooth Core Specification Addendum 1*, June 26, 2008.

15. *Specification of the Bluetooth System, Volume 0, Master Table of Contents & Compliance Requirements*, version 3.0+HS, April 21, 2009.

16. *Specification of the Bluetooth System, Volume 1, Architecture and Terminology Overview*, version 3.0+HS, April 21, 2009.

17. *Specification of the Bluetooth System, Volume 2, Core System Package [Controller Volume]*, version 3.0+HS, April 21, 2009.

18. *Specification of the Bluetooth System, Volume 3, Core System Package [Host Volume]*, version 3.0+HS, April 21, 2009.

19. *Specification of the Bluetooth System, Volume 4, Host Controller Interface [Transport Layer]*, version 3.0+HS, April 21, 2009.

20. *Specification of the Bluetooth System, Volume 5, Core System Package [AMP Controller Volume]*, version 3.0+HS, April 21, 2009.

21. *Specification of the Bluetooth System, Volume 0, Master Table of Contents & Compliance Requirements*, version 4.0, June 30, 2010.

22. *Specification of the Bluetooth System, Volume 1, Architecture and Terminology Overview*, version 4.0, June 30, 2010.

23. *Specification of the Bluetooth System, Volume 2, Core System Package [BR/EDR Controller Volume]*, version 4.0, June 30, 2010.

24. *Specification of the Bluetooth System, Volume 3, Core System Package [Host Volume]*, version 4.0, June 30, 2010.

25. *Specification of the Bluetooth System, Volume 4, Host Controller Interface [Transport Layer]*, version 4.0, June 30, 2010.

26. *Specification of the Bluetooth System, Volume 5, Core System Package [AMP Controller Volume]*, version 4.0, June 30, 2010.

27. *Specification of the Bluetooth System, Volume 6, Core System Package [Low Energy Controller Volume]*, version 4.0, June 30, 2010.

28. *Bluetooth Assigned Numbers,* version 1.1, February 22, 2001.

29. *Audio/Video Distribution Transport Protocol Specification*, version 1.2, April 16, 2007.

30. *Generic Audio/Video Distribution Profile*, version 1.2, April 16, 2007.

31. *Advanced Audio Distribution Profile*, version 1.2, April 16, 2007.

32. *Bluetopia® Protocol Stack, Application Programming Interface Reference Manual,* version 4.0.1, January 10, 2013.

33. *Bluetopia® Generic Audio/Video Distribution Profile, Application Programming Interface Reference Manual,* version 4.0.1, January 10, 2013.

34. *Bluetopia® Subband CODEC, Application Programming Interface Reference Manual,* version 4.0.1, January 10, 2013.

Possible error returns are listed for each API function call. These are the *most likely* errors, but in fact programmers should allow for the possibility of any error listed in the BTerrors.h header file to occur as the value of a function return.

1.3   Acronyms and Abbreviations

Acronyms and abbreviations used in this document and other Bluetooth specifications are listed in the table below.

Term	Meaning
A2DP	Advance Audio Distribution Profile (Bluetooth Profile)
API	Application Programming Interface
BD_ADDR	Bluetooth Device Address
BR	Basic Rate
BT	Bluetooth
EDR	Enhanced Data Rate
GAP	Generic Access Profile (Bluetooth Profile)
GAVD	Generic Audio/Video Distribution (Bluetooth Profile)
HS	High Speed
LE	Low Energy
LSB	Least Significant Bit
MSB	Most Significant Bit
PCM	Pulse Code Modulation
SBC	Subband CODEC

2.   A2DP Programming Interface

The Advanced Audio Distribution Profile programming interface defines the protocols and procedures to be used to implement A2DP capabilities. Because the Advanced Audio Distribution Profile is so heavily dependent on the Generic Audio/Video Distribution (GAVD) Profile which uses the Audio/Video Distribution Protocol (AVDTP), there are no additional functions required to implement this profile. The application programmer can simply use the GAVD Profile API in conjunction with the constants and MACROs that are defined in the Advanced Audio Distribution Profile API header file to implement the Advanced Audio Distribution Profile. It should be noted that most of the A2DP Specification deals with the implementation of the Subband CODEC (SBC). Stonestreet One provides a Subband CODEC library that can be used by application developers to manager SBC stream encoding and decoding. The programmer should consult the GAVD and SBC documentation, in addition to the core Bluetopia® documentation, when implementing Bluetooth applications that conform to the Advanced Audio Distribution Profile Specification.

The actual constants and MACROs that can be used to aid in the implementation of the Advanced Audio Distribution Profile can be found in the **A2DPAPI.H** header file in the Bluetopia distribution.

3.   File Distributions

The header files that are distributed with the Bluetooth Advanced Audio Distribution Profile Library are listed in the table below.

File	Contents/Description
A2DPAPI.h	Bluetooth Advanced Audio Distribution Profile API definitions
SS1BTA2D.h	Bluetooth Advanced Audio Distribution Profile Include file