Generic Audio/Video Profile (GAVDP)

***Bluetooth*® Test Suite**

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Contents

1 Scope

This Bluetooth document contains the Test Suite Structure (TSS) and test cases to test the implementation of the Bluetooth Generic Audio/Video Distribution Profile (GAVDP) with the objective to provide a high probability of air interface interoperability between the tested implementation and other manufacturers' Bluetooth devices.

2 References, definitions, and abbreviations

2.1 References

This document incorporates provisions from other publications by dated or undated reference. These references are cited at the appropriate places in the text, and the publications are listed hereinafter. Additional definitions and abbreviations can be found in [3], [15], and [16].

[1] OSI Conformance testing methodology and framework for protocol recommendations for ITU-T applications - General Concepts ITU-T Recommendation X.290 (04/95)

[2] OSI Conformance testing methodology and framework for protocol recommendations for ITU-T applications - Abstract Test Suite Specification ITU-T Recommendation X.291 (04/95)

[3] Generic Audio/Video Distribution Profile

[4] ICS Proforma for Generic Audio/Video Distribution Profile

[5] ICS Proforma for Audio/Video Distribution Transport Protocol

[6] Audio/Video Distribution Transport Protocol Test Suite, AVDTP.TS

[7] ICS Proforma for L2CAP

[8] L2CAP Test Suite, L2CAP.TS

[9] ICS Proforma for Link Manager

[10] Link Manager Test Suite, LMP.TS

[11] ICS Proforma for Baseband

[12] Baseband Test Suite, BB.TS

[13] ICS Proforma for Generic Access Profile

[14] Generic Access Profile Test Suite, GAP.TS

[15] Bluetooth Specification, Version 2.0 or later

[16] Test Strategy and Terminology Overview

[17] GAVDP Implementation eXtra Information for Testing (IXIT)

2.2 Definitions

In this Bluetooth document, the definitions from [3], [15], and [16] apply.

2.3 Acronyms and abbreviations

In this Bluetooth document, the definitions, acronyms, and abbreviations from [3], [15], and [16] apply.

3 Test Suite Structure (TSS)

3.1 Overview

The Test Suite is composed of the following test groups:

- Application Connection
  - Verify that connection establishment procedures are performed according to their specification in GAVDP.
- Application Transfer Control
  - Verify that the Stream suspend and the Change parameters procedures are performed according to their specification in GAVDP and AVDTP.

3.2 Test Strategy

The test objectives are to verify the functionality of the GAVDP within a Bluetooth Host and enable interoperability between Bluetooth Hosts on different devices. The testing approach covers mandatory and optional requirements in the specification and matches these to the support of the IUT as described in the ICS. Any defined test herein is applicable to the IUT if the ICS logical expression defined in the Test Case Mapping Table (TCMT) evaluates to true.

The test equipment provides an implementation of the Radio Controller and the parts of the Host needed to perform the test cases defined in this Test Suite. A Lower Tester acts as the IUT's peer device and interacts with the IUT over-the-air interface. The configuration, including the IUT, needs to implement similar capabilities to communicate with the test equipment. For some test cases, it is necessary to stimulate the IUT from an Upper Tester. In practice, this could be implemented as a special test interface, a Man Machine Interface (MMI), or another interface supported by the IUT.

This Test Suite contains Valid Behavior (BV) tests complemented with Invalid Behavior (BI) tests where required. The test coverage mirrored in the Test Suite Structure is the result of a process that started with catalogued specification requirements that were logically grouped and assessed for testability enabling coverage in defined test purposes.

4 Test cases (TC)

4.1 Introduction

4.1.1 Test case identification conventions

Test cases are assigned unique identifiers per the conventions in [16]. The convention used here is: **<spec abbreviation>/<IUT role>/**<class>/**<feat>**/<func>/<subfunc>/<cap>/**<xx>-<nn>-<y>.**

Identifier Abbreviation	Feature Identifier <feat>
ACP	Acceptor role
APP	Application
CON	Connection
GAVDP	Generic Audio/Video Distribution Profile
INT	Initiator role
TRC	Transfer Control

Table 4.1: GAVDP TC feature naming conventions

4.1.2 Conformance

When conformance is claimed for a particular specification, all capabilities are to be supported in the specified manner. The mandated tests from this Test Suite depend on the capabilities to which conformance is claimed.

The Bluetooth Qualification Program may employ tests to verify implementation robustness. The level of implementation robustness that is verified varies from one specification to another and may be revised for cause based on interoperability issues found in the market.

Such tests may verify:

- That claimed capabilities may be used in any order and any number of repetitions not excluded by the specification
- That capabilities enabled by the implementations are sustained over durations expected by the use case
- That the implementation gracefully handles any quantity of data expected by the use case
- That in cases where more than one valid interpretation of the specification exists, the implementation complies with at least one interpretation and gracefully handles other interpretations
- That the implementation is immune to attempted security exploits

A single execution of each of the required tests is required to constitute a Pass verdict. However, it is noted that to provide a foundation for interoperability, it is necessary that a qualified implementation consistently and repeatedly pass any of the applicable tests.

In any case, where a member finds an issue with the test plan generated by the Bluetooth SIG qualification tool, with the test case as described in the Test Suite, or with the test system utilized, the member is required to notify the responsible party via an erratum request such that the issue may be addressed.

4.1.3 General assumptions

No more than one ACL link exists between the Lower Tester and the IUT.

Only one point-to-point configuration is considered.

The secondary role of Source/Sink taken on by the IUT does not matter to achieve a pass verdict for the test cases for this Profile and is not specified explicitly in the test case identifier, but the secondary role is specified in the IXIT [17] in order to enable the correct test environment conditions to provoke the Lower Tester.

4.1.4 Pass/Fail verdict conventions

Each test case has an Expected Outcome section. The IUT is granted the Pass verdict when all the detailed pass criteria conditions within the Expected Outcome section are met.

The convention in this Test Suite is that, unless there is a specific set of fail conditions outlined in the test case, the IUT fails the test case as soon as one of the pass criteria conditions cannot be met. If this occurs, then the outcome of the test is a Fail verdict.

4.2 Application

Verify the correct implementation of the Application services.

4.2.1 Connection Establishment

Verify that the following procedures are performed according to their specification in GAVDP:

- Stream establishment
- Start streaming
- Connection release

4.2.1.1 Connection Establishment

- Test Purpose

  Verify that the INT requests the ACP to establish a stream connection to start streaming and release the connection further to internal events or user actions.

- Reference

  [3] 4.1.1, 4.1.2, 4.1.3

- Initial Condition
  - INT: Standby mode
  - ACP: Standby mode

- Test Case Configuration

Test Case
GAVDP/INT/APP/CON/BV-01-C [Connection Establishment]
GAVDP/ACP/APP/CON/BV-01-C [Connection Establishment]

Table 4.2: Connection Establishment test cases

- Test Procedure

  The sequence of procedures may vary as long as the rules outlined in Figure 4.1 of Section 4.1 in GAVDP [3] are adhered to.

  1. Initiate the required user actions (e.g., press button) on INT to establish a connection.
  2. A Stream connection is established
  3. Streaming of dummy data starts automatically or on user action.
  4. Streaming stops automatically at end of data or on user action.

- Expected Outcome

  Pass verdict

  If there is a corresponding indicator, establishment of connection is indicated.

  When data starts and there is a corresponding indicator streaming indication is provided.

  Streaming stops as expected (end of data or appropriate user action).

  If there is an indication of the release of the connection this indication is provided.

4.2.2 Transfer Control

Verify that the following procedures are performed according to their specification in GAVDP and AVDTP:

- Stream suspend
- Change parameters

4.2.2.1 Transfer Control – Change Parameters

- Test Purpose

  Verify that after a stream is established but not initiated, the INT changes the application service parameters (stream reconfigure procedure of AVDTP) by a user action or an internal event.

- Reference

  [3] 4.1.5

- Initial Condition

  - INT: A Stream Connection has been established. Depending on the user interface the device starts streaming dummy data automatically or manually: if streaming has to be started manually the test will be performed twice: once before the user action to start streaming, once after streaming has started.
  - ACP: A Stream connection has been established.

- Test Case Configuration

Test Case
GAVDP/INT/APP/TRC/BV-01-C [Transfer Control – Change Parameters]
GAVDP/ACP/APP/TRC/BV-01-C [Transfer Control – Change Parameters]

Table 4.3: Transfer Control – Change Parameters test cases

- Test Procedure

  The sequence of procedures may vary as long as the rules outlined in Figure 4.1 of Section 4.1 in GAVDP [3] are adhered to.

  1. Initiate the required user actions (e.g., press button) on INT to perform the change parameters operation.
  2. If the INT has the capability to change parameters (automatically or manually, depending on the user interface), this is performed using valid parameters for the ACP.
  3. Streaming is (re)started to verify that the operational mode of streaming is still possible.

- Expected Outcome

  Pass verdict

  On parameters changes and if corresponding indicator exists then indication of parameter change(s) is verified.

  When (re)started if there is a streaming indicator this indication is provided.

4.2.2.2 Transfer Control – Suspend

- Test Purpose

  Verify that it is possible to suspend streaming by a user action or an internal event.

- Reference

  [3] 4.1.4

- Initial Condition

  - INT: Streaming is ongoing.
  - ACP: Streaming is ongoing.

- Test Case Configuration

Test Case
GAVDP/INT/APP/TRC/BV-02-C [Transfer Control – Suspend]
GAVDP/ACP/APP/TRC/BV-02-C [Transfer Control – Suspend]

Table 4.4: Transfer Control – Suspend test cases

- Test Procedure

  The sequence of procedures may vary as long as the rules outlined in Figure 4.1 of Section 4.1 in GAVDP [3] are adhered to.

  1. Initiate the required user actions (e.g., press button) on INT to perform the suspend operation.
  2. Streaming is restarted to verify that the operational mode of streaming is still possible.

- Expected Outcome

  Pass verdict

  The stream is suspended and restarted.

5 Test case mapping

The Test Case Mapping Table (TCMT) maps test cases to specific requirements in the ICS. The IUT is tested in all roles for which support is declared in the ICS document.

The columns for the TCMT are defined as follows:

Item: Contains a logical expression based on specific entries from the associated ICS document. Contains a logical expression (using the operators AND, OR, NOT as needed) based on specific entries from the applicable ICS document(s). The entries are in the form of y/x references, where y corresponds to the table number and x corresponds to the feature number as defined in the ICS document for Generic Audio/Video Profile (GAVDP) [4].

Feature: A brief, informal description of the feature being tested.

Test Case(s): The applicable test case identifiers are required for Bluetooth Qualification if the corresponding y/x references defined in the Item column are supported. Further details about the function of the TCMT are elaborated in [16].

For the purpose and structure of the ICS/IXIT, refer to [16].

Item	Feature	Test Case(s)
Initiator role		
GAVDP 2/1	Connection Establishment	GAVDP/INT/APP/CON/BV-01-C
GAVDP 2/2	Transfer Control – Suspend	GAVDP/INT/APP/TRC/BV-02-C
GAVDP 2/3	Transfer Control – Change Parameters	GAVDP/INT/APP/TRC/BV-01-C
Acceptor role		
GAVDP 3/1	Connection Establishment	GAVDP/ACP/APP/CON/BV-01-C
GAVDP 3/2	Transfer Control – Suspend	GAVDP/ACP/APP/TRC/BV-02-C
GAVDP 3/3	Transfer Control – Change Parameters	GAVDP/ACP/APP/TRC/BV-01-C

Table 5.1: Test case mapping

6 Revision history and acknowledgments

Revision History

Publication Number	Revision Number	Date	Comments
0	Version 1.0	2003-05-01	Updated title and header
1	Version 1.2	2004-04-14	Updated Disclaimer and Copyright Notice. Clerical changes.
	Version 1.2 R01	2004-10-12	Included errata 607, added some contributors.
	1.1.1r1	2004-12-21	Editing and format changes. Incorporated TSE 607 and TSE 609 for TCMT Initiator Features and Acceptor Features tables.
2	1.1.1	2004-12-30	Incorporate review comments.
	1.1.2r1	2005-01-18	Incorporate V1.2 editorial updates/review comments and added TP/APP/TRC/BV-02-I for TSE 607.
3	1.1.2	2005-02-16	Prepare for final publication.
4	1.1.3	2005-03-07	Corrected Revision History for revision 1.1.2r1.
	1.1.4r0	2010-07-09	TSE 2969: TP/APP/CON/BV-01-I, TP/APP/TRC/BV-01-I: Delete “IUT”
5	1.1.4	2011-07-21	Prepare for publication.
	1.1.5r0	2011-10-28	TSE 4495: Rename test cases from –I to –C throughout
	1.1.4d0	2009-12-01	Release for Synchronization Voting Draft
	1.3.0r0	2011-02-01	Prepare for publication
	1.3.0r1	2011-03-01	Update after AV F2F
	1.3.0r2	2011-12-01	Merge changes from Core Spec 2.1+EDR updates
	1.3.0r3	2012-06-01	Applied BTI comments to TCMT
	1.3.0r4	2012-06-15	Added Conformance section to 4.1.1 with the current text
	1.3.0r5	2012-07-01	Editorial updates to Section 2 and test cases to comply with published TS template.
6	1.3.0	2012-07-24	Prepare for publication.
	1.3.1r00	2016-10-11	Converted to new Test Case ID conventions as defined in TSTO v4.1
	1.3.1r01	2016-11-05	Updated to current template
7	1.3.1	2016-12-13	Approved by BTI. Prepared for TCRL 2016-2 publication.
	p8r00–r02	2024-01-04 – 2024-01-18	TSE 24741 (rating 1): Performed various editorials to align the document with the latest TS conventions, including conversion to the publication numbering scheme by setting previous v1.3.1 to publication number 7, aligning the copyright page with the latest DNMD, and removing the draft (pre-p0) revision history entries. TSE 24822 (rating 1): Revised TCMT to align with existing ICS mappings.

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