

Broadcast Audio URI (BAU)

Bluetooth® Test Suite

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1 Scope

This Bluetooth document contains the Test Suite Structure (TSS) and test cases to test the implementation of the Bluetooth Broadcast Audio URI specification 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 [1] and [2].

- [1] Bluetooth Core Specification, Version 5.4 or later
- [2] Test Strategy and Terminology Overview
- [3] Broadcast Audio URI
- [4] ICS Proforma for Broadcast Audio URI
- [5] Characteristic and Descriptor descriptions are accessible via the [Bluetooth SIG Assigned Numbers](#)

2.2 Definitions

In this Bluetooth document, the definitions from [1] and [2] apply.

2.3 Acronyms and abbreviations

In this Bluetooth document, the definitions, acronyms, and abbreviations from [1] and [2] apply.

3 Test Suite Structure (TSS)

3.1 Test Strategy

The test objectives are to verify the functionality of the Broadcast Audio URI 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 Broadcast Audio URI specification defines how a Bluetooth Audio Broadcast configuration is encoded/decoded so that the Lower Tester will need to generate a URI and the IUT decode it, or vice-versa.

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.

3.2 Test groups

The following test groups have been defined:

- Encode
- Decode
- Error Handling

4 Test cases (TC)

4.1 Introduction

4.1.1 Test case identification conventions

Test cases are assigned unique identifiers per the conventions in [2]. The convention used here is: **<spec abbreviation>/<IUT role>/<class>/<feat>/<func>/<subfunc>/<cap>/<xx>-<nn>-<y>**.

Identifier Abbreviation	Spec Identifier <spec abbreviation>
BAU	Broadcast Audio URI
Identifier Abbreviation	Role Identifier <IUT role>
URID	URI Decoder
URIE	URI Encoder
Identifier Abbreviation	Features and Behaviors Identifier <feat>
DEC	Decode
ENC	Encode
ERR	Error Handling

Table 4.1: BAU 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 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 Test procedures

4.2.1 URI Decoder

BAU/URID/DEC/BV-01-C [Decode Broadcast Audio URI]

- Test Purpose

Verify that an IUT can decode a scanned Broadcast Audio URI.
- Reference

[3] 3.2
- Initial Condition
 - The Lower Tester can generate a Broadcast Audio URI.
- Test Procedure

Repeat Steps 1–3 at least three times using a random selection of supported data elements, and values if appropriate, eventually targeting every supported data element in the ICS [4] and one or more unknown data elements.

 1. The Lower Tester generates a Broadcast Audio URI using the targeted parameters for this round.
 2. The IUT receives the Broadcast Audio URI and parses the data elements.
 3. The Upper Tester verifies that the IUT correctly parses the data elements.
- Expected Outcome

Pass verdict

The IUT correctly parses the data elements and values in each round.

BAU/URID/ERR/BI-01-C [Invalid URIs]

- Test Purpose

Verify that an IUT ignores invalid Broadcast Audio URIs.
- Reference

[3] 3.2, 3.5
- Initial Condition
 - The Lower Tester can generate Broadcast Audio URI.

- Test Case Configuration

Round	Parameter
1	Incorrect Prefix
2	No "UUID": element with the BASS UUID
3	Not all mandatory values present
4	Invalid tokenization
5	Invalid Mandatory Data
6	Invalid Optional Data

Table 4.2: Error Handling test cases

- Test Procedure

Repeat Steps 1–3 for each round in Table 4.2.

1. The Lower Tester generates a Broadcast Audio URI using the targeted parameters as specified in Table 4.2.
2. The IUT receives the Broadcast Audio URI and parses the data elements.
3. The IUT notifies the Upper Tester of an invalid URI and does nothing.

- Expected Outcome

Pass verdict

The IUT parses the Broadcast Audio URI in Step 2 and does not take any further actions.

4.2.2 URI Encoder

BAU/URIE/ENC/BV-01-C [Encode Broadcast Audio URI]

- Test Purpose

Verify that an IUT can generate a Broadcast Audio URI.

- Reference

[3] 3.2

- Initial Condition

- The IUT can generate a Broadcast Audio URI.

- Test Procedure

Repeat Steps 1–3 at least three times using a random selection of supported data elements, and values if appropriate, eventually targeting every supported data element in the ICS [4].

1. The Lower Tester formulates the targeted data elements and values.
2. The Upper Tester commands the IUT to generate Broadcast Audio URI using all supported parameters indicated as supported in the ICS [4].
3. The Upper Tester submits the generated URI to the Lower Tester.

- Expected Outcome

Pass verdict

The IUT correctly encoded the data elements and values in each round.

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 Broadcast Audio URI [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 [2].

For the purpose and structure of the ICS/IXIT, refer to [2].

Item	Feature	Test Case(s)
BAU 2/1	URI Decoder	BAU/URID/DEC/BV-01-C BAU/URID/ERR/BI-01-C
BAU 2/2	URI Encoder	BAU/URIE/ENC/BV-01-C

Table 5.1: Test case mapping

6 Revision history and acknowledgments

Revision History

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