Multi-Device Test Specification

Test Suite Structure (TSS) and Test Cases (TC)

Abstract
This document defines test structures and procedures for the test of Bluetooth® products that support handling of Bluetooth link with more than one device.

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Revision History

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1 Scope

This Bluetooth document contains the Test Suite Structure (TSS) and Test Cases (TC) to test scenarios involving more than two connected Bluetooth devices concurrently operating and interacting with each other within the scopes of Hands Free Profile and Advanced Audio Distribution Profile.

The objective of this document is to provide tests to verify that the concurrent operation and interactions provide a consistent user experience. The required interaction depends on implementation decisions beyond what the Bluetooth Specifications define. The tests are therefore not required to be executed as part of the Bluetooth Qualification program. These voluntary test cases are to be treated as a supplement to those that exist in the Test Specification document of the above mentioned profiles.
2 References

This Bluetooth document incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. The most current version of the listed reference shall be used unless a specific version is noted.

[2] Bluetooth Core Specification 1.2 or later
[4] Hands Free Profile 1.5 Test Specification v1.5.10
[5] Advanced Audio Distribution Profile 1.2 Test Specification v1.1.6
[6] A/V Remote Control Profile Test Specification 1.4.2a
[7] Generic Access Profile Specification 2.1 or later

2.1 Abbreviations

For the purpose of this Bluetooth document, the abbreviations in [3], [4], [5] and [6] apply.
3 Test Cases

3.1 Introduction

1.1.1 Test Case Identification Conventions

Test cases shall be assigned unique identifiers per the conventions in [2]. The convention used here is 
<spec abbreviation>/<IUT role>/<feat>/<xx>-<nn>-<y>.

Test group abbreviations for “class,” “feature,” “function,” “sub-function” or “capability” (as applicable to this 
test specification) are defined in Table 4.1.

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<thead>
<tr>
<th>Identifier Abbreviation</th>
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<td>Multi-Device</td>
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<td>A2DP</td>
<td>Advanced Audio Distribution Profile</td>
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<td>HFP</td>
<td>Hands-Free Profile</td>
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<td>SNK</td>
<td>(A2DP) Sink Role</td>
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<tr>
<td>SRC</td>
<td>(A2DP) Source Role</td>
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<td>HF</td>
<td>Hands-Free Device Role</td>
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<td>OOR</td>
<td>Out of Range</td>
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<td>ICA</td>
<td>Incoming Call Alert</td>
</tr>
<tr>
<td>OCA</td>
<td>Out Going Call Alert</td>
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Table 4.1: TC Feature Naming Convention
3.2 Streaming to Multiple SNK devices

Verify piconet scenarios where a single source is streaming audio to multiple SNK devices

3.2.1 MD/A2DP/SRC/SET/BV-01-I [Start Streaming - SRC]

- Test Purpose
  SRC – To check the procedure involved streaming to multiple SNK devices.

- Initial Condition
  SRC and multiple SNK devices are present.

  An A2DP streaming connection exists between SRC and multiple SNK devices. The number of SNK devices that can be connected to the SRC is manufacture specific.

  An over the air sniffer is required to verify the verdict.

- Reference
  Section 5.1.1 in [1]

- Test Procedure
  Initiate user action on SRC to start streaming to all the SNK devices.

- Test Condition
  The IUT is capable of streaming to multiple SNK devices simultaneously. All devices have to be in communication range.

- Expected Outcome
  Pass verdict:

  Streaming audio is heard on all the SNK devices. The audio across all SNK devices is in sync with each other.

  The encoded media packets should conform to the configuration of all the SNK devices such as for SBC being in the allowable bit-pool range (minimum and maximum), and allowing for the smallest of the L2CAP MTUs.

3.2.2 MD/A2DP/SRC/CON/BV-01-I [Multiple SNK Establish Connection during streaming - SRC]

- Test Purpose
  SRC – To check the procedure involved in connecting the SRC to more than 1 SNK device when SRC is streaming A2DP audio to SNK device.

- Initial Condition
  SRC, SNK 1 and SNK-2 are present. SNK-1 refers to the SNK that is connected to the SRC. SNK 2 refers to the new SNK that is to be connected to the SRC.

  The SRC device has at least one compatible Stream End Point that is not marked as inUse.

  An A2DP connection exists between SRC and SNK-1. SRC is streaming audio to SNK-1.

  SNK-2 is placed in a state capable of accepting connection from the SRC device.

- Reference
  Section 5.1.1 in [1]
Recommendation 1 and 3 Section 4 in [1]

- **Test Procedure**
  The SRC and SNK-2 are paired.
  Initiate user action on the SRC to establish streaming connection to SNK-2.

- **Test Condition**
  The IUT is capable of streaming to multiple SNK devices simultaneously. All devices have to be in communication range. An over the air sniffer tool may be required to verify the pass verdict.

- **Expected Outcome**
  **Pass verdict:**
  1. The SRC device assumes mastership of the SNK devices.
  2. The SRC device may perform one of the following procedures
     a) The SRC device establishes streaming connection to SNK 2 without affecting the streaming to SNK1.
     b) The SRC may SUSPEND/RECONFIGURE/RESTART streaming to SNK 1, and SET_CONFIG/OPEN/START streaming to SNK 2.
     c) The SRC may CLOSE-SET_CONFIG-OPEN-START streaming to SNK 1, and SET_CONFIG/OPEN/START streaming to SNK 2

3.2.3 MD/A2DP/SRC/CON/BV-02-I [Multiple SNK Establish Connection during streaming - SNK]

- **Test Purpose**
  SRC – To check the procedure involved in a SNK initiated connection to a SRC that is streaming audio to a SNK.

- **Initial Condition**
  - SRC, SNK 1 and SNK-2 are present. SNK-1 refers to the SNK that is connected to the SRC. SNK 2 refers to the new SNK that is to be connected to the SRC
  - The SRC device has at least one compatible Stream End Point that is not marked as inUse.
  - An A2DP streaming connection exists between SRC and SNK-1.
  - SNK-2 is capable of initiating a streaming connection to the SRC.
  - SRC and SNK-2 are paired.
  - Recommendation 1 and 3 Section 4 in [1]

- **Reference**
  Section 5.1.3 in [1]

- **Test Procedure**
  Initiate user action on the SNK-2 to establish streaming connection to the SRC.

- **Test Condition**
  The IUT is capable of streaming to multiple SNK devices simultaneously. All devices have to be in communication range. An over the air sniffer tool may be required to verify the pass verdict.

- **Expected Outcome**
  **Pass verdict:**
  1. The SRC device assumes mastership of the piconet.
  2. The SRC device may perform one of the following procedures
a) The SRC device sets the configuration to SNK-2 and starts streaming to SNK-2. Streaming to SNK-1 is not affected.
b) If SNK-2 is not compatible with the configuration used by SRC and SNK-1 then the SRC SUSPENDS-RECONFIGURES-STARTS streaming to SNK-2

3.2.4 MD/A2DP/SRC/CON/BV-03-I [Multiple SNK Disconnection - SNK]

- **Test Purpose**
  SRC – To check the procedure involved in disconnecting a SNK from the SRC when the SRC is streaming audio to multiple SNK devices.

- **Initial Condition**
  - SRC, SNK 1 and SNK-2 are present.
  - SRC is paired, connected and streaming audio to SNK-1 and SNK-2.

- **Reference**
  Recommendation 12, Section 4 in [1]

- **Test Procedure**
  Initiate user action on SNK-2 to disconnect from SRC. SNK-2 may be powered off to disconnect from the SRC.

- **Test Condition**
  - The IUT is capable of streaming to multiple SNK devices simultaneously. All devices have to be in communication range.

- **Expected Outcome**
  Pass verdict:
  - SNK-2 is disconnected from the SRC.
  - The SRC remains connected to SNK-1.
  - The SRC continues streaming to SNK-1. Streaming to SNK-1 is unaffected.

3.2.5 MD/A2DP/SRC/CON/BV-04-I [Multiple SNK Disconnection - SRC]

- **Test Purpose**
  SRC – To check the procedure involved in disconnecting 1 SNK from the SRC when the SRC is streaming audio to multiple SNK devices.

- **Initial Condition**
  - SRC, SNK 1 and SNK-2 are present.
  - SRC is paired, connected and streaming A2DP audio to SNK-1 and SNK-2.

- **Reference**
  Recommendation 12, Section 4 in [1]

- **Test Procedure**
  Initiate user action on SRC to disconnect SNK-2. This test only applies to SRC devices that have a UI to allow disconnecting a SNK device while streaming audio.
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- Test Condition
  The IUT is capable of streaming to multiple SNK devices simultaneously. All devices have to be in communication range.

- Expected Outcome
  
  **Pass verdict:**
  
  SNK-2 is disconnected from the SRC.
  
  The SRC remains connected to SNK-1.
  
  The SRC continues streaming to SNK-1 without any glitches in the streaming audio.

3.2.6 MD/A2DP/SRC/CON/BV-05-I [Multiple SNK Volume Control - SRC]

- Test Purpose
  SRC – To check the procedure involved in controlling the A2DP volume from the SRC when the SRC is paired to multiple SNK devices.

- Initial Condition
  SRC, SNK 1 and SNK-2 are present.
  SRC is paired, connected and streaming A2DP audio to SNK-1 and SNK-2.
  The SRC and SNK devices support AVRCP Category 2 Pass through commands.

- Reference
  Recommendation 7 Section 4 in [1]

- Test Procedure
  Initiate user action on the SRC to change the volume.

- Test Condition
  The IUT is capable of streaming to multiple SNK devices simultaneously. All devices have to be in communication range.

- Expected Outcome
  
  **Pass verdict:**
  The SRC device may perform one of the following actions:
  
  a) SRC sends volume control to all attached SNK devices that support AVRCP Category 2 Target (TG).
  
  b) SRC sends volume control only to a “Primary” SNK device. Note: It is left up to the implementation to decide which device is set as “Primary”
  
  c) SRC has multiple volume controls that track the volume settings on each individual SNK device.

3.2.7 MD/A2DP/SRC/OOR/BV-01-I [SNK Link Loss Recovery – SNK Reconnects]

- Test Purpose
  SRC – To verify that the SRC can handle the link loss of one SNK, when the SRC is streaming to multiple SNKs. To verify that link loss of 1 SNK does not affect streaming to other SNKs. To verify that the SRC can accept SNK initiated reconnection.

- Initial Condition
  
  - SRC, SNK 1 and SNK 2 are present.
SRC is connected and streaming A2DP audio to SNK 1 and SNK-2.

• Reference
  Section 5.1.1 in [5]

• Test Procedure
  1. Cut off link between SRC and SNK-1 by taking SNK-1 out of Bluetooth range. Note: SRC and SNK-2 are still in Bluetooth range.
  2. Bring SRC and SNK-1 back into Bluetooth range and initiate user action on the SNK to connect to the SRC if the SNK does not connect to the SRC automatically.

• Test Condition
  The IUT is capable of streaming to multiple SNK devices simultaneously. All devices have to be in communication range.

• Expected Outcome
  Pass verdict:
  1. Step 1 does not affect streaming to SNK-2. As a result of Step 2, SNK-1 connects to SRC. The SRC may need to suspend and reconfigure streaming to SNK-2.
  2. SRC stream to SNK-1 and SNK-2

3.2.8 MD/A2DP/SRC/OOR/BV-02-I [SNK Link Loss Recovery – SRC Reconnects]

• Test Purpose
  SRC – To verify that the SRC can handle the link loss of one SNK, when the SRC is streaming to multiple SNKs. To verify that link loss of 1 SNK does not affect streaming to other SNKs. To verify that the SRC can reconnect to SNK-1 on link loss recovery.

• Initial Condition
  – SRC, SNK 1 and SNK 2 are present.
  – SRC is connected and streaming A2DP audio to SNK-1 and SNK-2.

• Reference
  Section 5.1.1 in [5]

• Test Procedure
  1. Cut off link between SRC and SNK-1 by taking SNK-1 out of Bluetooth range. Note: SRC and SNK-2 are still in Bluetooth range.
  2. Bring SRC and SNK-1 back into Bluetooth range and initiate user action on the SRC to connect to the SRC if the SNK does not connect to the SRC automatically.

• Test Condition
  The IUT is capable of streaming to multiple SNK devices simultaneously. All devices have to be in communication range.

• Expected Outcome
  Pass verdict:
  1. Step 1 does not affect streaming to SNK-2.
  2. As a result of Step 2, SRC reconnects.
  3. SRC streams to SNK-1 and SNK-2
3.2.9 MD/A2DP/SRC/OOR/BV-03-I [SRC Link Loss Recovery – SRC Reconnects]

- **Test Purpose**
  SRC – To verify that the SRC can handle link loss when the SRC is connected and streaming to multiple SNKs. To verify that the SRC can connect to multiple SNKs on link loss recovery and restart streaming to the SNKs

- **Reference**
  5.1.1 in [5]

- **Initial Condition**
  - SRC, SNK 1 and SNK 2 are present.
  - SRC is connected and streaming A2DP audio to SNK 1 and SNK-2.

- **Test Procedure**
  1. Cut off link between SRC and SNK devices by taking SRC out of Bluetooth range.
  2. Bring SRC, SNK-1 and SNK-2 back into Bluetooth range and initiate user action on the SRC to connect to the two SNKs if the SRC does not connect to the SNKs automatically.

- **Test Condition**
  The IUT is capable of streaming to multiple SNK devices simultaneously. All devices have to be in communication range.

- **Expected Outcome**
  **Pass verdict:**
  After Step 1 the SRC, SNK-1 and SNK-2 recognize the link loss and return to stand-by mode.
  After Step 2,
  a) the SRC connects to SNK-1 and SNK-2, and
  b) streaming to SNK-1 and SNK-2 is re-started by the SRC.

3.2.10 MD/A2DP/SRC/OOR/BV-04-I [SRC Link Loss Recovery – SNK Reconnects]

- **Test Purpose**
  SRC – To verify that the SRC can handle link loss when the SRC is connected and streaming to multiple SNKs. To verify the SRC can accept connection from multiple SNK on link loss recovery and restart streaming to the SNKs

- **Initial Condition**
  - SRC, SNK 1 and SNK 2 are present.
  - SRC is connected and streaming to SNK 1 and SNK-2.
  - The two SNK devices are capable of initiating a streaming connection to the SRC.

- **Test Procedure**
  1. Cut off link between SRC and SNK devices by taking SRC out of Bluetooth range.
  2. Bring SRC, SNK-1 and SNK-2 back into Bluetooth range and initiate user action on SNK-1 and SNK-2 if necessary to connect to the SRC.
  3. Restart streaming to the two SNK devices. This may require a user action on the SRC.
Test Condition
The IUT is capable of streaming to multiple SNK devices simultaneously. All devices have to be in communication range.

Expected Outcome
Pass verdict:
- The SRC, SNK-1 and SNK-2 recognize the link loss and return to stand-by mode.
- As a result of Step 2, the SRC accepts connection from the two SNK devices
- Streaming to SNK-1 and SNK-2 is re-started by the SRC.

3.3 Multiple AG Connections
To verify scenarios where a hands-free device has two HFP service level connections with two different devices.

3.3.1 MD/HFP/HF/CON/BV-01-I [Multiple AG Connection]

Test Purpose
HF – To verify that an HF can connect to a second AG when the HF is already paired and connected to another AG.

Initial Condition
- AG-1, AG-2 and HF are present and all 3 devices are in Bluetooth range.
- AG-1 is paired and connected to HF device.
- AG-2 is paired to HF device.

Test Procedure
Initiate user action on the HF device to connect to AG-2.

Test Condition
The HF device is capable of multiple simultaneous HFP service level connections. All devices have to be in communication range.

Expected Outcome
Pass verdict:
- AG-2 connects to HF device.
- HFP-SLC exists between AG-1 and HF and between AG-2 and HF

3.3.2 MD/HFP/HF/ICA/BV-01-I [Answer Incoming Call – AG-1]

Test Purpose
HF – To verify that an incoming call to AG-1 can be answered from the AG-1 and call audio transferred to HF when the HF is connected to AG-1 and AG-2. This test case applies only to HF devices that allow multiple HFP-SLCs.

Initial Condition
AG-1, AG-2 and HF are present.
AG-1 and AG-2 are paired and connected to the HF.
Test Procedure
1. From an external line initiate an incoming call to AG-1
2. Initiate user action on AG-1 to answer the incoming call.
3. Initiate user action on AG-1 to transfer call audio to HF if the call audio is not transferred automatically.

Test Condition
The IUT is capable multiple simultaneous HFP service level connections. All devices have to be in communication range.

Expected Outcome
Pass verdict:
- Upon the call establishment initiation to AG-1, the AG-1 shall alert. Note: The HF device may disconnect the HFP-SLC with AG-2.
- Upon the call establishment initiation in AG-1, the HF shall alert
- As a result of step 2 the call is answered and the HF stops alerting.
- As a result of step 2 and step 3, Full-duplex bi-directional audio with the remote party is available via the HF audio means.

3.3.3 MD/HFP/HF/ICA/BV-02-I [Answer Incoming Call - HF]

Test Purpose
HF – To verify that an incoming call to AG-1 can be answered from the HF when the HF is connected to AG-1 and AG-2. This test case applies only to HF devices that allow multiple HFP-SLCs.

Initial Condition
- AG-1, AG-2 and HF are present.
- AG-1 and AG-2 are paired and connected to the HF.

Test Procedure
1. From an external line initiate an incoming call to AG-1
2. Initiate user action on the HF to answer the incoming call.

Test Condition
The IUT is capable multiple simultaneous HFP service level connections. All devices have to be in communication range.

Expected Outcome
Pass verdict:
Upon the call establishment initiation to AG-1, the AG-1 shall alert. Note: The HF device may disconnect the HFP-SLC with AG-2.

Upon the call establishment initiation in AG-1, the HF shall alert
As a result of step 2 the call is answered and the HF stops alerting.
Full-duplex bi-directional audio with the remote party is available via the HF audio means.
3.3.4 MD/HFP/HF/ICA/BV-03-I [Incoming Call – AG-2]

- **Test Purpose**
  HF – To verify the scenario where AG-2 receives an incoming call when there is an ongoing call between AG-1 and HF. This test applies to those HFP devices that support two HFP-SLCs.

- **Initial Condition**
  - AG-1, AG-2 and HF are present.
  - AG-1 and AG-2 are paired and connected to the HF.
  - There is an ongoing call between AG-1 and HF.

- **Test Procedure**
  From an external line initiate an incoming call to AG-2

- **Test Condition**
  The IUT is capable multiple simultaneous HFP service level connections. All devices have to be in communication range.

- **Expected Outcome**
  **Pass verdict:**
  The HF device may perform one of the two following procedures.
  - Upon the call establishment initiation to AG-2 the HF device disconnects the HFP-SLC with AG-2.
  - Upon the call establishment initiation to AG-2 the HF device may alert

3.3.5 MD/HFP/HF/OOR/BV-01-I [Link Loss Recovery – AG-1 Reconnects]

- **Test Purpose**
  HF – To verify that the HF can handle AG-1 link loss recovery in the presence of an active call when the HF is connected to AG-1 and AG-2. This test case applies only to HF devices that allow multiple HFP-SLCs.

- **Initial Condition**
  AG-1, AG-2 and HF are present.
  AG-1 and AG-2 are paired and connected to the HF.
  AG-2 has an active call ongoing with the call audio routed to the HF.

- **Test Procedure**
  1. Take AG-1 out of range of HF device and wait for 30 seconds.
  2. Initiate user action on the HF device to end the call in AG-2
  3. Bring the AG-1 and HF device back into Bluetooth range and initiate user action on AG-1 to connect to HF device, if AG-1 does not connect to HF automatically.

- **Test Condition**
  The IUT is capable multiple simultaneous HFP service level connections. All devices have to be in communication range.

- **Expected Outcome**
  **Pass verdict:**
  As a result of Step 3 in the test procedure, AG-1 connects to the HF.
3.3.6 MD/HFP/HF/OOR/BV-02-I [Link Loss Recovery – HF Reconnects]

- Test Purpose
  HF – To verify that the HF can handle link loss recovery of AG-1 and AG-2 when the HF is connected to AG-1 and AG-2. This test case applies only to HF devices that allow multiple HFP-SLCs.

- Initial Condition
  AG-1, AG-2 and HF are present.
  AG-1 and AG-2 are paired and connected to the HF.

- Test Procedure
  1. Take AG-1 and AG-2 out of range of HF device and wait for at least 30 seconds.
  2. Bring the AG-1 and AG-2 within Bluetooth range of HF and initiate user action on HF device to connect to AG-1 and AG-2, if does not connect to the two AGs automatically. The order of connection is implementation specific.

- Test Condition
  The IUT is capable multiple simultaneous HFP service level connections. All devices have to be in communication range.

- Expected Outcome
  Pass verdict:
  As a result of Step 1 the HF acknowledges the link loss.
  As a result of Step 2 in the test procedure, HF device connects to AG-1 and AG-2.

3.3.7 MD/HFP/HF/ICA/BV-04-I [Reject Incoming Call – HF]

- Test Purpose
  HF – To verify that an incoming call to AG-1 can be rejected from the HF when the HF is connected to AG-1 and AG-2. This test case applies only to HF devices that allow multiple HFP-SLCs.

- Initial Condition
  - AG-1, AG-2 and HF are present.
  - AG-1 and AG-2 are paired and connected to the HF.

- Test Procedure
  1. From an external line initiate an incoming call to AG-1
  2. Initiate user action on HF to reject the incoming call.
  3. From an external line initiate an incoming call to AG-2
  4. Initiate user action on HF to reject the incoming call

- Test Condition
  The test should be performed under normal conditions. All devices have to be in communication range.

- Test Condition
  The IUT is capable multiple simultaneous HFP service level connections. All devices have to be in communication range.
3.3.8 MD/HFP/HF/OCA/BV-01-I [Initiate Outgoing Call – AG-1]

- Test Purpose
  HF – To verify that an HF device can handle a scenario where AG-1 initiates an outgoing call when the HF device is paired and connected to AG-1 and AG-2.

- Initial Condition
  AG-1, AG-2 and HF are present.
  AG-1 and AG-2 are paired and connected to the HF.

- Test Procedure
  1. Initiate an outgoing call from AG-1 to an external line.
  2. Answer the call from the external line
  3. Initiate user action on the HF device to transfer the call audio to the HF device, if the call audio does not transfer automatically.

- Test Condition
  The IUT is capable multiple simultaneous HFP service level connections. All devices have to be in communication range.

- Expected Outcome
  Pass verdict:
  - As a result of Step 1, a call is established with the external line. The HFP SLC between HF and AG-2 may be disconnected. If AG-2 is disconnected, the HF reconnects with AG-2 when the AG-1 call has ended/terminated.
  - As a result of Step 2 and Step 3, bi-directional audio is present with the remote party via the HF audio means.

3.3.9 MD/HFP/HF/ATA/BV-01-I [Audio Connection Transfer - HF]

- Test Purpose
  HF – To verify that the HF can toggle call audio between AG-1 and AG-2. Initial Condition

- Initial Condition
  - AG-1, AG-2 and HF are present.
  - AG-1 and AG-2 are paired and connected to the HF.
  - AG-1 and AG-2 are in an active call with the call audio of AG-1 routed to the HF device.
Multi-Device Test Specification

- **Test Procedure**
  1. Initiate user action on the HF device to transfer call audio to AG-2.
  2. Initiate user action on HF device to transfer call audio back to AG-1.

- **Test Condition**
  - This test only applies to HF devices that support multiple HFP-SLC connections simultaneously.
  - This test only applies to HF devices that have a UI to toggle call audio between AG devices.
  - All devices have to be in communication range.

- **Expected Outcome**
  
  **Pass verdict:**
  - As a result of step one in the procedure, the AG-2 call audio is routed to HF device.
  - As a result of step two in the procedure the AG-1 call audio is routed to the HF device.

### 3.4 Multi-profile, Multi-device Scenarios

To verify call scenarios when a device has an A2DP connection with a third party device

#### 3.4.1 MD/HFP/HF/A2DP/SNK/CON/BV-01-I [Establish HFP SLC while streaming audio from a third Device]

- **Test Purpose**
  
  IUT – To check the procedure involved in creating an HFP-SLC between the HF-SNK and AG when audio is streaming to the IUT (HF-SNK) device from a third SRC device.

- **Initial Condition**
  - AG, IUT (HF-SNK), and SRC are present.
  - SRC is paired and connected to the IUT (HF-SNK). SRC is streaming audio to the IUT (HF-SNK).
  - IUT (HF-SNK) is paired with AG

- **Reference**
  
  Section 6.2.6 in [12]

- **Test Procedure**
  
  Initiate user action on the AG to create an HFP-SLC with the IUT (HF-SNK).

- **Test Condition**
  
  The IUT is capable of connecting to multiple Bluetooth devices simultaneously. All devices have to be in communication range.

- **Expected Outcome**
  
  **Pass verdict:**
  - The AG and IUT (HF-SNK) are connected.
  - The streaming audio is not affected by the connection establishment.
# 4 Test Case Mapping

Fill out the columns "Support HF/SNK" and "Support AG/SRC" in the following way:

If the AG feature HFP 2/x (see in "Item") or SRC feature SRC 2/x (see in "item") is supported, mark it in the "Support AG/SRC" field, where x corresponds to the feature number in the AG/SRC’s ICS table.

If the HF feature HFP 3/x (see in "item") or SNK feature SNK 3/x (see in "item") is supported, mark it in the "Support HF/SNK" field, where x corresponds to the feature in the HF/SNK’s ICS table.

<table>
<thead>
<tr>
<th>Item</th>
<th>Feature</th>
<th>Support AG/SRC</th>
<th>Support HF/SNK</th>
<th>Test case(s)</th>
<th>Test Case Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A2DP 1/1)</td>
<td>Start Streaming - SRC</td>
<td>N/A</td>
<td>MD/A2DP/SRC/SET/BV-01-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A2DP 1/1)</td>
<td>Multiple SNK Establish Connection during streaming - SRC</td>
<td>N/A</td>
<td>MD/A2DP/SRC/CON/BV-01-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A2DP 1/1)</td>
<td>Multiple SNK Establish Connection during streaming - SNK</td>
<td>N/A</td>
<td>MD/A2DP/SRC/CON/BV-02-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A2DP 1/1)</td>
<td>Multiple SNK Disconnection - SNK</td>
<td>N/A</td>
<td>MD/A2DP/SRC/CON/BV-03-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A2DP 1/1)</td>
<td>Multiple SNK Disconnection - SRC</td>
<td>N/A</td>
<td>MD/A2DP/SRC/CON/BV-04-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A2DP 1/1)</td>
<td>Multiple SNK Volume Control - SRC</td>
<td>N/A</td>
<td>MD/A2DP/SRC/CON/BV-05-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A2DP 1/1)</td>
<td>SNK Link Loss Recovery – SNK Reconnects</td>
<td>N/A</td>
<td>MD/A2DP/SRC/OOR/BV-01-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A2DP 1/1)</td>
<td>SNK Link Loss Recovery – SRC Reconnects</td>
<td>N/A</td>
<td>MD/A2DP/SRC/OOR/BV-02-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A2DP 1/1)</td>
<td>SRC Link Loss Recovery – SRC Reconnects</td>
<td>N/A</td>
<td>MD/A2DP/SRC/OOR/BV-03-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A2DP 1/1)</td>
<td>SRC Link Loss Recovery – SNK Reconnects</td>
<td>N/A</td>
<td>MD/A2DP/SRC/OOR/BV-04-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(HFP 1/2)</td>
<td>Multiple AG Connection</td>
<td>N/A</td>
<td>MD/HFP/HF/CON/BV-01-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(HFP 1/2)</td>
<td>Answer Incoming Call – AG-1</td>
<td>N/A</td>
<td>MD/HFP/HF/ICA/BV-01-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(HFP 1/2)</td>
<td>Answer Incoming Call - HF</td>
<td>MD/HFP/HF/ICA/BV-02-I</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------------</td>
<td>----------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(HFP 1/2)</td>
<td>Link Loss Recovery – AG-1 Reconnects</td>
<td>N/A</td>
<td>MD/HFP/HF/OOR/BV-01-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(HFP 1/2)</td>
<td>Link Loss Recovery – HF Reconnects</td>
<td>N/A</td>
<td>MD/HFP/HF/OOR/BV-02-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(HFP 1/2)</td>
<td>Reject Incoming Call – HF</td>
<td>N/A</td>
<td>MD/HFP/HF/ICA/BV-03-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(HFP 1/2)</td>
<td>Initiate Outgoing Call – AG-1</td>
<td>N/A</td>
<td>MD/HFP/HF/OCA/BV-01-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(HFP 1/2)</td>
<td>Incoming call – AG-2</td>
<td>N/A</td>
<td>MD/HFP/HF/ICA/BV-04-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(HFP 1/2)</td>
<td>Audio connection transfer - HF</td>
<td>N/A</td>
<td>MD/HFP/HF/ATA/BV-01-I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A2DP 1/2 AND HFP 1/2)</td>
<td>Establish HFP SLC while streaming audio from a third Device</td>
<td>N/A</td>
<td>MD/HFP/HF/A2DP/SNK/CON/BV-01-I</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.1. Test Case Mapping