Multi-Profile Specification (MPS)

Bluetooth® **Test Suite**

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Contents

1   Scope and introduction

1.1   Scope

This Bluetooth document contains the Test Suite Structure (TSS) and test cases to test the implementation of the Bluetooth Multi-Profile Specification (MPS) with the objective to provide a high probability of air interface interoperability between the tested implementation and other manufacturers' Bluetooth devices.

1.2   Introduction

The following configurations are distinguished in order to define the scope of this Test Suite:

1.2.1   Configurations in scope of this Test Suite

- Multiple Profiles Single Device (MPSD): In this configuration, multiple Bluetooth profiles are used concurrently between two devices.

- Multiple Profiles Multiple Devices (MPMD): In this configuration, multiple Bluetooth profiles are used concurrently among several devices. The number of devices is defined case by case.

1.2.2   Configurations out of scope of this Test Suite

- Single Profile Single Device (SPSD): In this configuration, a single profile is used between any two Bluetooth devices. No other profile is used concurrently.

- Single Profile Multiple Devices (SPMD): In this configuration, a single profile is used concurrently between several Bluetooth devices. For example, one device runs multiple instances of the same profile and each instance is connected to a separate Bluetooth device supporting that profile.

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], [2], and [3].

[1] Bluetooth Core Specification, Version 2.1 or later

[2] Test Strategy and Terminology Overview

[3] Multi-Profile Specification (MPS), Version 1.0

[4] Hands-Free Profile Specification (HFP), Version 1.5 or later

[5] Advanced Audio Distribution Profile Specification (A2DP), Version 1.2 or later

[6] Audio/Video Distribution Transport Protocol Specification (AVDTP), Version 1.0 or later

[7] Audio/Video Remote Control Profile (AVRCP), Version 1.3 or later

[8] Audio/Video Control Transport Protocol Specification (AVCTP), Version 1.0 or later

[9] Personal Area Network Profile Specification (PAN), Version 1.0 or later

[10] Dial Up Networking Profile Specification (DUN), Version 1.1 or later

[11] Generic Audio/Video Distribution Profile (GAVDP), Version 1.0 or later

[12] SDP Test Suite, SDP.TS

2.2 Definitions

In this Bluetooth document, the definitions in [1], [2], and [3] apply.

2.3 Acronyms and abbreviations

In this Bluetooth document, the definitions, acronyms, and abbreviations in [1], [2], and [3] apply.

Acronyms and abbreviations	Definition
AG	HFP Audio Gateway Role
AVP	Combination of A2DP and AVRCP profiles
CLI	Client Role (e.g., in PBAP)
CT	AVRCP Controller Role
DT	DUN Data Terminal Role
GW	DUN Gateway Role
HF	HFP Hands-free Role
MD	Multiple Devices
MPMD	Multiple Profiles Multiple Devices
MPS	Multi-Profile Specification
MPSD	Multiple Profiles Single Device
MSC	Message Sequence Chart
NAP	PAN Network Access Point role
PANU	PAN User Role

Acronyms and abbreviations	Definition
PSDM	Packet Switched Data Mode (in DUN)
SD	Single Device
SDR	Service Discovery Record
SNK	A2DP Sink Role
SPMD	Single Profile Multiple Devices
SPSD	Single Profile Single Device
SRC	A2DP Source Role
SRV	Server Role (e.g., PBAP)
TG	AVRCP Target Role

Table 2.1: Acronyms and abbreviations

3 Test Suite Structure (TSS)

3.1 Test Strategy

When qualifying MPS it is a prerequisite that the IUT passes qualification for the individual profiles and profile roles that the MPS behavior is based upon.

The test cases specified in this Test Suite verify:

- On the protocol level, that devices use the correct PDUs at the correct time as specified in the MPS document,

- On the interoperability level, that devices provide the functionality as specified in the MPS document.

- On the conformance level, that devices follow the implementation specified in the MPS document.

Multi-device scenarios are characterized by the following setup:

Device B is physically connected over Bluetooth to multiple devices (Device A and Device C). Device A and Device C do not have any physical Bluetooth connection between each other nor are they paired or otherwise aware of each other's existence. However, as they operate in a multi device environment, the presence of specific features may be required according to the use case in which they operate. This is illustrated in the Figure 3.1 below:

Device A   **Device B** ──────────── **Device C**

HFP

AVRCP

A2DP
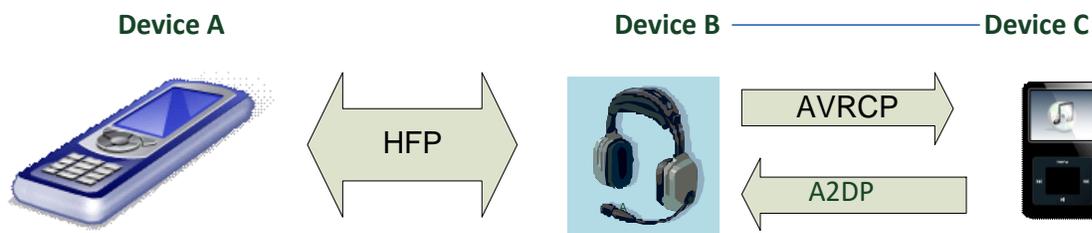
Figure 3.1: Typical setup for multi-device scenarios

A test setup with the IUT acting as Device B can be established in various ways, for example like this:

- Device C = Tester 1 (collecting test results, might give instructions to user what to do on Tester 2)

- Device B = IUT

- Device A = Tester 2 (serves as test condition, not collecting test results)

Or

- Device C = Tester

- Device B = IUT

- Device A = a complementary commercial device

Additional equipment, like protocol sniffer may be used to validate the MPS procedure requirements.

Note that depending on each test scenario, the IUT may act as Device A, Device B or Device C for that particular scenario.

The MPS 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.

The Test Suite Structure is a tree with the first level representing the interacting multi-profile groups.

Test Group	Test Scenario	MPSD/MPMD
HFP+AVP	Incoming Call during AVP Connection	MPSD + MPMD
	Outgoing Call during AVP Connection	MPSD + MPMD
	Reject/Ignore Incoming Call during Audio Streaming	MPSD + MPMD
	HFP Call termination during AVP Connection	MPSD + MPMD
	Press Play on Audio Player during active call	MPSD + MPMD
	Start Audio Streaming after AVRCP Play	MPSD + MPMD
	Suspend Audio Streaming after AVRCP Pause	MPSD + MPMD
AVP + OBEX	Phonebook download during Audio Streaming	MPSD
DUN + Other	DUN communication during active voice call	MPSD
	Outgoing voice call during DUN communication	MPSD
	Incoming voice call during DUN communication	MPSD
	Start Audio Streaming during DUN communication	MPSD + MPMD
	DUN communication establishment during Audio Streaming	MPSD + MPMD
	Terminate voice call during DUN data communication	MPSD + MPMD
PAN + Other	PAN communication during active voice call	MPSD
	Outgoing voice call during PAN communication	MPSD
	Incoming voice call during PAN communication	MPSD
	Start Audio Streaming during PAN communication	MPSD
	PAN communication establishment during Audio Streaming	MPSD
MPS Procedures	(Dis-)Connection Order/Behavior	MPSD

Figure 3.2: Multi-Profile Test Suite Structure representation

3.2   Test groups

The following test groups have been defined:

- Generic SDP Integrated Tests

- HFP + AVP

- AVP + OBEX

- DUN + Other

- PAN + Other

- MPS Procedure

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>**.

The MPS Specification deals with various profiles in different use cases; the roles vary according to the particular profiles involved in each use case. The various roles are concatenated in a string separated by hyphens, e.g.: "AG-SRC" for tests with a device that calls out HFP AG profile and A2DP Source profile support by the IUT. The various roles in the concatenated string are ordered alphabetically in the name.

Additionally, testing of this specification includes tests from the SDP Test Suite [12] referred to as Generic SDP Integrated Tests (GSIT); when used, the test cases in GSIT are referred to through a TCID string using the following convention:
<spec abbreviation>/<IUT role>/<GSIT test group>/<GSIT class>/<xx>-<nn>-<y>.

Identifier Abbreviation	Spec Identifier <spec abbreviation>
MPS	Multi-Profile Specification
Identifier Abbreviation	**Role Identifier <IUT role>**
AVO	A2DP + AVRCP + OBEX
DUN	DUN + other profiles
HFAV	HFP + A2DP + AVRCP
HFPB	HFP + PBAP
PAN	PAN + other profiles
SR	Server role (used in Service Discovery testing)
Identifier Abbreviation	**Reference Identifier <GSIT test group>**
SGSIT	Server Generic SDP Integrated Tests
Identifier Abbreviation	**Reference Identifier <GSIT class>**
ATTR	Attribute
SERR	Service Record
Identifier Abbreviation	**Features and Behaviors Identifier <feat>**
ACT	Audio Player Control
CLH	Call Handling
CTH	Connection Handling
DCT	Data Communication Control
OBT	Object Transfer
VCT	Volume Control
Identifier Abbreviation	**Features and Behaviors Identifier <func>**
MD	Multi Device
SD	Single Device

Table 4.1: MPS 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   Generic SDP Integrated Tests

4.2.1   Server Generic SDP Integrated Tests

4.2.1.1   Multi-Profile Specification

Execute the Generic SDP Integrated Tests defined in Section 6.3, Server test procedures (SGSIT), in [12] using Table 4.2 below as input:

TCID	Reference	Attribute ID Name	Attribute ID definition source (Universal, Profile)	Value/ Secondary Value	Attribute presence (Present/Present for [role], Optionally present, TCMT defined)
MPS/SR/SGSIT/SERR/BV-01-C [Service record GSIT – MPS]	[3] 6.1	ServiceClassIDList	Universal	"MPS"	Present
MPS/SR/SGSIT/ATTR/BV-01-C [Attribute GSIT – Bluetooth Profile Descriptor List]	[3] 6.1	BluetoothProfileDescriptorList	Universal	"Multi Profile Specification" (UUID): Version – "0x0100" (Uint16)	Present
MPS/SR/SGSIT/ATTR/BV-02-C [Attribute GSIT – Supported Scenarios MPSD]	[3] 6.1	Supported Scenarios MPSD	Profile	skip (Uint64)	Present
MPS/SR/SGSIT/ATTR/BV-03-C [Attribute GSIT – Supported Scenarios MPMD]	[3] 6.1	Supported Scenarios MPMD	Profile	skip (Uint64)	TCMT defined
MPS/SR/SGSIT/ATTR/BV-04-C [Attribute GSIT – Supported Profile and Protocol Dependencies]	[3] 6.1	Supported Profile and Protocol Dependencies	Profile	skip (Uint16)	Present

Table 4.2: Input for the Multi-Profile Specification SGSIT SDP test procedure

4.3   HFP + AVP

Verify the concurrent usage of A2DP, AVRCP, and HFP.

4.3.1 Incoming Call during AVP Connection

Verify that A2DP audio streaming suspends upon reception of an incoming voice call.

4.3.1.1 Incoming Call during AVP Connection – No In-band Ringing – SD

* Test Purpose

   Verify that Device B can answer an incoming call from Device A while audio is streaming and that Device A suspends the audio when no in-band ringing is used.

* Reference

   [3] 4.1.1

* Initial Condition

   - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
A2DP SRC	A2DP SNK
AVRCP TG	AVRCP CT

   - HFP Service Level Connection is established between Device A and Device B.

   - No in-band ringing is used.

   - Device A must be configured to alert Device B of an incoming call.

   - Device A streams A2DP audio over an AVDTP channel, which is in the state STREAMING, to Device B.

* Test Case Configuration

Test Case
MPS/AG-SRC-TG/HFAV/CLH/SD/BV-01-C [Incoming Call during AVP Connection – No In-band Ringing – SD]
MPS/CT-HF-SNK/HFAV/CLH/SD/BV-01-C [Incoming Call during AVP Connection – No In-band Ringing – SD]

   Table 4.3: Incoming Call during AVP Connection – No In-band Ringing – SD test cases

* Test Procedure

   Perform the following procedures as shown in Figure 4.1 below:

   1. Place a call from remote to Device A.
   2. Upon receipt of an incoming voice call indication on Device B (manufacturer specific) answer the voice call on Device B (manufacturer specific).
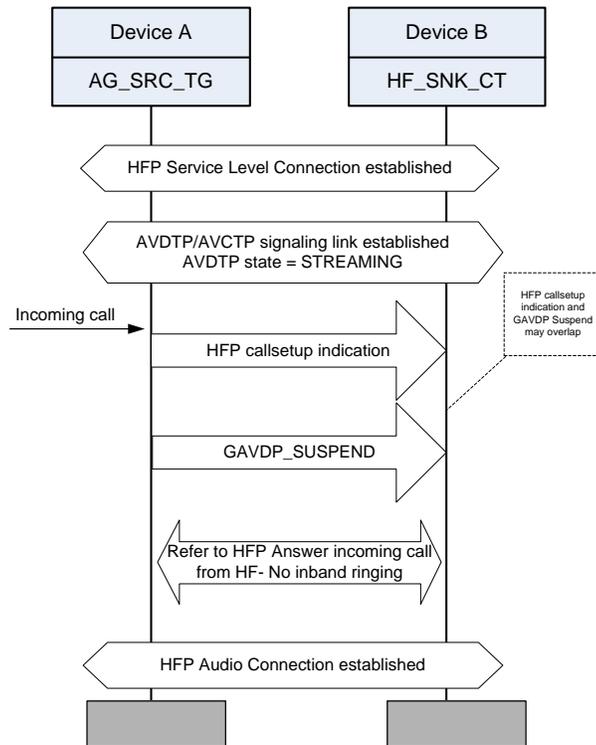
Figure 4.1: Incoming Call during AVP Connection – No In-band Ringing – SD MSC

- Test Condition

  Both devices are in communication range.

  Manual user intervention is not used to suspend the streaming of audio from Device A to Device B.

- Expected Outcome

  Pass verdict

  Device A:

  - Provides the HFP callsetup indication to Device B.

  - Executes the *GAVDP_Suspend* procedure.

  - Establishes the HFP Audio Connection.

  Device B:

  - The HFP Audio Connection is established.

4.3.1.2   Incoming Call during AVP Connection – In-band Ringing – SD

- Test Purpose

  Verify that Device B can answer an incoming call from Device A while audio is streaming and that Device A suspends the audio when in-band ringing is used.

- Reference

  [3] 4.1.1

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
A2DP SRC	A2DP SNK
AVRCP TG	AVRCP CT

  - HFP Service Level Connection is established between Device A and Device B.

  - In-band ringing is used.

  - Device A must be configured to alert Device B of an incoming call.

  - Device A streams A2DP audio over an AVDTP channel, which is in the state STREAMING, to Device B.

- Test Case Configuration

Test Case
MPS/AG-SRC-TG/HFAV/CLH/SD/BV-02-C [Incoming Call during AVP Connection – In-band Ringing – SD]
MPS/CT-HF-SNK/HFAV/CLH/SD/BV-02-C [Incoming Call during AVP Connection – In-band Ringing – SD]

  Table 4.4: Incoming Call during AVP Connection – In-band Ringing – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.2 below:

  1. Place a call from remote to Device A.
  2. Upon receipt of an incoming voice call indication on Device B (manufacturer specific) answer the voice call on Device B (manufacturer specific).
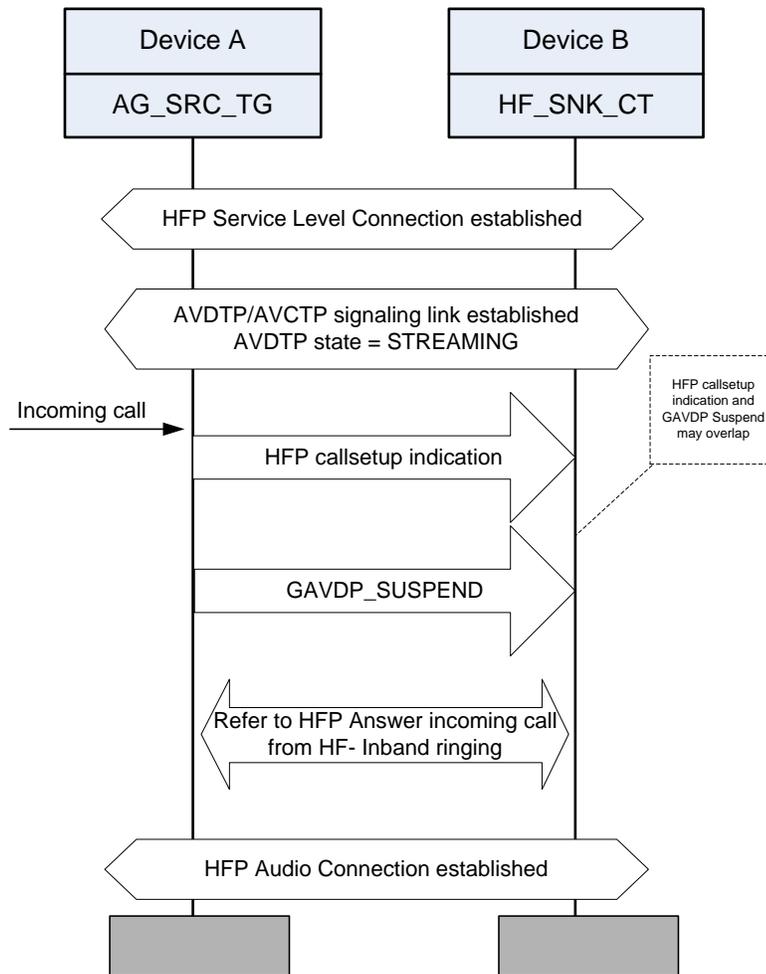
Figure 4.2: Incoming Call during AVP Connection – In-band Ringing – SD MSC

- Test Condition

  Both devices are in communication range.

  Manual user intervention is not used to suspend the streaming of audio from Device A to Device B.

- Expected Outcome

  Pass verdict

  Device A:

  - Provides the HFP callsetup notification to Device B.
  - Executes the *GAVDP_Suspend* procedure.
  - Establishes the HFP Audio Connection.

  Device B:

  - The HFP Audio Connection is established.

4.3.1.3 Incoming Call during AVP Connection – No In-band Ringing – MD

- Test Purpose

  Verify that Device B can establish a voice call upon the reception of an incoming call from Device A while audio is streaming between Device B and Device C and that Device C suspends or stops the streaming audio on request from Device B.

- Reference

  [3] 4.1.2

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B	Device C
HFP AG	HFP HF	–
–	A2DP SNK	A2DP SRC
–	AVRCP CT	AVRCP TG

  - HFP Service Level Connection is established between Device A and Device B.

  - Device A must be configured to alert Device B of an incoming voice call.

  - Device C streams A2DP audio over an AVDTP channel, which is in the state STREAMING, to Device B.

  - No in-band ringing is used.

- Test Case Configuration

Test Case
MPS/CT-HF-SNK/HFAV/CLH/MD/BV-01-C [Incoming Call during AVP Connection – No In-band Ringing – MD]
MPS/SRC-TG/HFAV/CLH/MD/BV-01-C [Incoming Call during AVP Connection – No In-band Ringing – MD]

Table 4.5: Incoming Call during AVP Connection – No In-band Ringing – MD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.3 below:

  1. Place a call from remote to Device A.
  2. Upon receipt of an incoming voice call indication on Device B (manufacturer specific), answer the call from Device A (manufacturer specific).

Figure 4.3: Incoming Call during AVP Connection – No In-band ringing – MD MSC

- Test Condition

  Devices are in communication range.

  Manual user intervention is not used to suspend the streaming of audio from Device C to Device B.

  In this test, the IUT is either Device B or Device C (as defined through the TCMT). As such the behavior noted under Expected Outcome describes required responses from the complementary device as well as the IUT.

- Expected Outcome

    Pass verdict

    Device B:

    - An *AVRCP_Pause* PASS THROUGH command is sent to Device C by Device B when Device B receives the HFP callsetup indication from Device A.

    - Audio Stream from Device C is suspended before the HFP Audio Connection is established with Device A.

    - When the user answers the call via Device B (manufacturer specific), the active call between Device B and Device A is established.

    Device C:

    - Initiates the *GAVDP_Suspend* procedure with Device B upon reception of *AVRCP_Pause* from Device B. The *GAVDP_Suspend* procedure may occur prior to the confirmation of the *AVRCP_Pause*.

4.3.1.4 Incoming Call during AVP Connection – In-band Ringing – MD

- Test Purpose

    Verify that Device B can answer an incoming call from Device A while audio is streaming between Device B and Device C and that Device C suspends or stops the streaming audio on request from Device B.

- Reference

    [3] 4.1.2

- Initial Condition

    - The following combinations of profiles exist:

Device A	Device B	Device C
HFP AG	HFP HF	–
–	A2DP SNK	A2DP SRC
–	AVRCP CT	AVRCP TG

    - HFP Service Level Connection is established between Device A and Device B.

    - Device A must be configured to alert Device B of an incoming call.

    - Device C streams A2DP audio over an AVDTP channel, which is in the state STREAMING, to Device B.

    - In-band ringing is used.

- Test Case Configuration

Test Case
MPS/CT-HF-SNK/HFAV/CLH/MD/BV-02-C [Incoming Call during AVP Connection – In-band Ringing – MD]
MPS/SRC-TG/HFAV/CLH/MD/BV-02-C [Incoming Call during AVP Connection – In-band Ringing – MD]

    Table 4.6: Incoming Call during AVP Connection – In-band Ringing – MD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.4 below:

  1. Place a call from remote to Device A.
  2. Upon receipt of an incoming call indication on Device B (manufacturer specific), answer the call from Device B (manufacturer specific).


Figure 4.4: Incoming Call during AVP Connection – In-band Ringing – MD MSC

- Test Condition

  Devices are in communication range.

  Manual user intervention is not used to suspend the streaming of audio from Device C to Device B.

In this test, the IUT is either Device B or Device C (as defined through the TCMT). As such the behavior noted under Expected Outcome describes required responses from the complementary device as well as the IUT.

- Expected Outcome

  Pass verdict

  Device B:

  - An *AVRCP_Pause* PASS THROUGH command is sent to Device C by Device B when Device B receives the HFP callsetup indication from Device A.

  - Audio Stream from Device C is suspended before the HFP Audio Connection is established with Device A.

  - When the user answers the call via Device B, the active call between the Device B and Device A is established.

  Device C:

  - Initiates the *GAVDP_Suspend* procedure with Device B upon reception of *AVRCP_Pause* from Device B. The *GAVDP_Suspend* procedure may occur prior to the confirmation of the *AVRCP_Pause.*

4.3.2 Outgoing Call during AVP Connection

Verify that A2DP audio streaming suspends or stops when an outgoing call is established.

4.3.2.1 Outgoing Call during AVP Connection – SD

- Test Purpose

  Verify that Device A can initiate an outgoing voice call while audio is streaming to Device B and Device A suspends the audio streaming.

- Reference

  [3] 4.1.3

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
A2DP SRC	A2DP SNK
AVRCP TG	AVRCP CT

  - HFP Service Level Connection is established between Device A and Device B.

  - Device A streams A2DP audio over AVDTP channel, which is in the state STREAMING, to Device B.

- Test Case Configuration

Test Case
MPS/AG-SRC-TG/HFAV/CLH/SD/BV-03-C [Outgoing Call during AVP Connection – SD]
MPS/CT-HF-SNK/HFAV/CLH/SD/BV-03-C [Outgoing Call during AVP Connection – SD]

  Table 4.7: Outgoing Call during AVP Connection – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.5 below:

  1. Initiate an outgoing call on Device A.
  2. Observe that there is an indication on Device A that an outgoing voice call is being.
 3. Answer the call on the remote party being called.
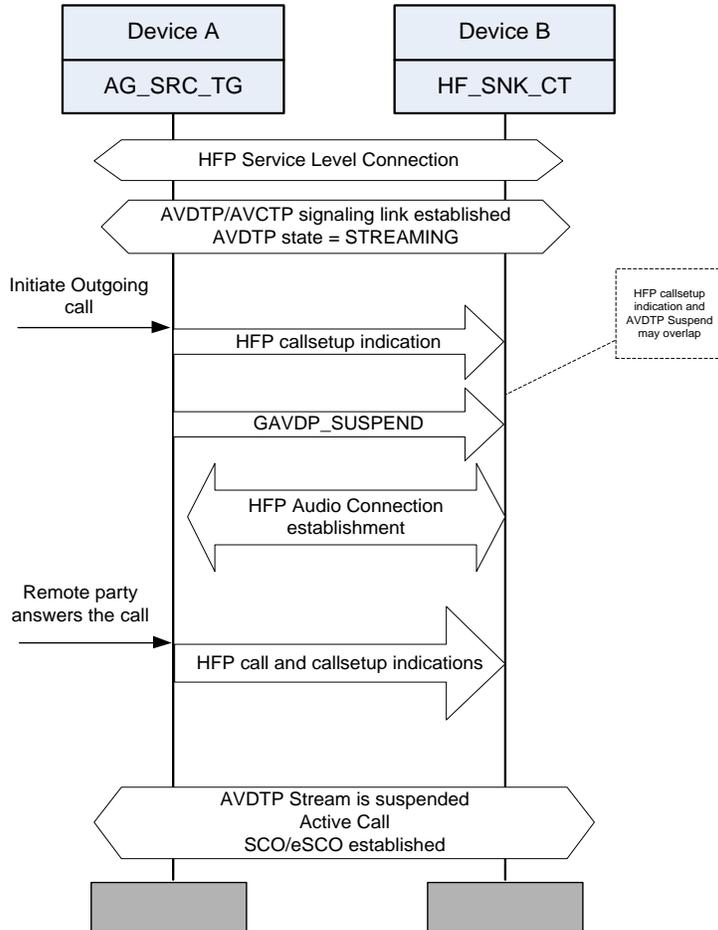
Figure 4.5: Outgoing Call during AVP Connection – SD MSC

- Test Condition

  Devices are in communication range.

  Manual user intervention is not used to suspend streaming of A2DP audio from Device A to Device B.

- Expected Outcome

  Pass verdict

  Device A:

  - Upon HFP callsetup indication of the outgoing call to Device B, the *GAVDP_Suspend* procedure is initiated.

  - Audio Stream from Device A is suspended before the HFP audio channel is established with Device B.

  Device B:

  - When the user answers the call via the remote device, the active call between Device B and Device A is established.

4.3.2.2   Outgoing Call during AVP Connection – MD

- Test Purpose

  Verify that Device A can initiate an outgoing voice call while audio is streaming from Device C to Device B.

- Reference

  [3] 4.1.4

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B	Device C
HFP AG	HFP HF	–
–	A2DP SNK	A2DP SRC
–	AVRCP CT	AVRCP TG

  - HFP Service Level Connection is established between Device A and Device B.
  - Device C streams A2DP audio over an AVDTP channel, which is in the state STREAMING, to Device B.

- Test Case Configuration

Test Case
MPS/CT-HF-SNK/HFAV/CLH/MD/BV-03-C [Outgoing Call during AVP Connection – MD]
MPS/SRC-TG/HFAV/CLH/MD/BV-03-C [Outgoing Call during AVP Connection – MD]

Table 4.8: Outgoing Call during AVP Connection – MD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.6 below:

  1. Initiate an outgoing call on Device A.
  2. Observe that there is an indication on Device A that an outgoing voice call is being placed.
 3. Answer the call on the remote number being called.
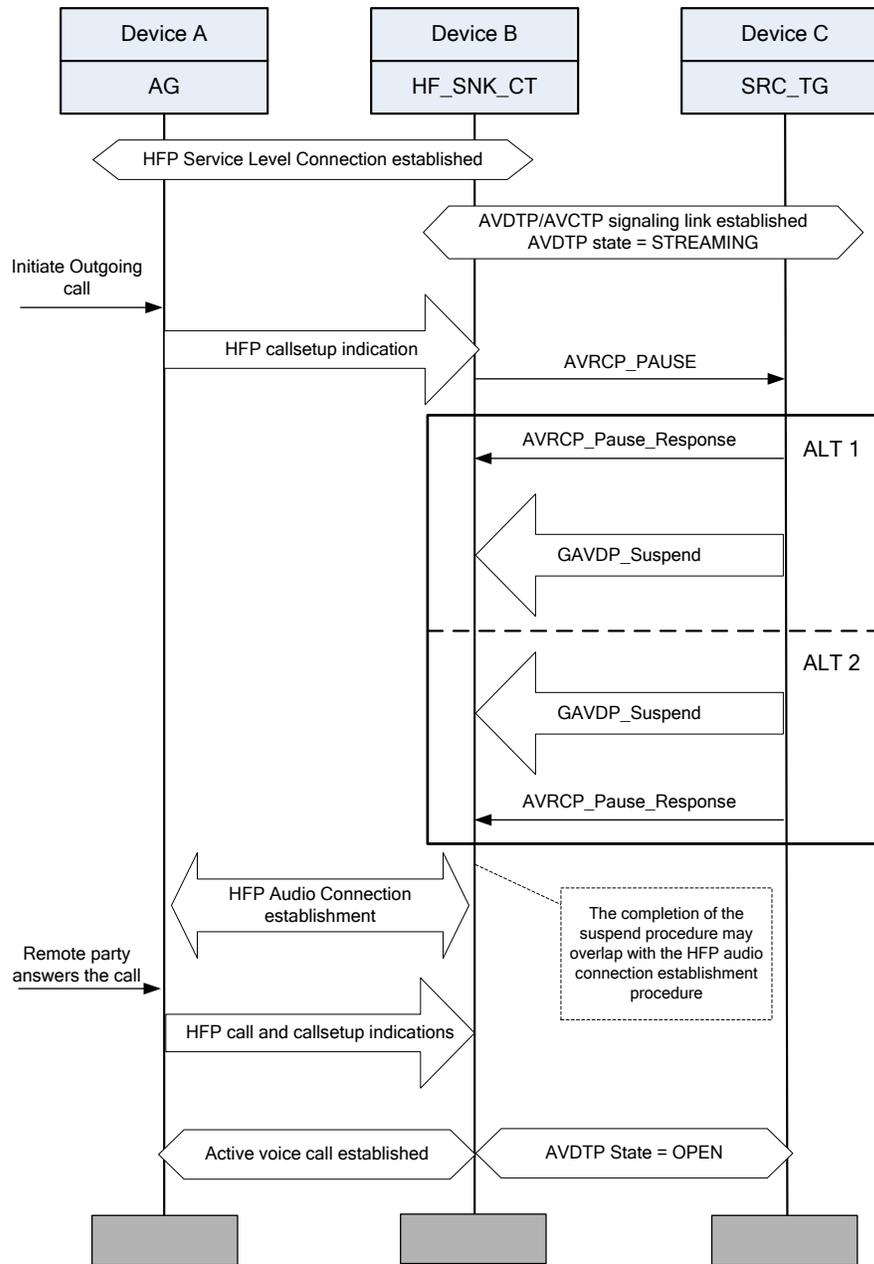
Figure 4.6: Outgoing Call during AVP Connection – MD MSC

- Test Condition

  Devices are in communication range.

  Manual user intervention is not used to suspend streaming of A2DP audio from Device C to the Device B.

  In this test, the IUT is either Device B or Device C (as defined through the TCMT). As such the behavior noted under Expected Outcome describes required responses from the complementary device as well as the IUT.

- Expected Outcome

  Pass verdict

  Device B:

  - An *AVRCP_Pause* PASS THROUGH command is sent to Device C by Device B when Device B sends the HFP ATD command with the number provided.

  - Audio Stream from Device C is suspended before the HFP Audio Connection is established with Device A.

  - When the user answers the call via the remote number, the active call between Device B and Device A is established.

  Device C:

  - After reception of *AVRCP_Pause* the *GAVDP_Suspend* procedure is initiated with Device B. The *GAVDP_Suspend* procedure may occur prior to the confirmation of the *AVRCP_Pause.*

4.3.3 Reject/Ignore Incoming Call during Audio Streaming

Verify the behavior of the A2DP audio streaming when rejecting/ignoring an incoming call.

4.3.3.1 Reject/Ignore Incoming Call during Audio Streaming – SD

- Test Purpose

  Verify that when an incoming call received on Device A is rejected/ignored from Device B, an A2DP audio stream from Device A that had been previously suspended on receipt of the incoming call on Device A is resumed.

- Reference

  [3] 4.1.5

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
A2DP SRC	A2DP SNK
AVRCP TG	AVRCP CT

  - HFP Service Level Connection is established between Device A and Device B.

  - Device A must be configured to alert Device B of an incoming call.

  - Device A streams A2DP audio over an AVDTP channel in the state STREAMING to Device B.

- Test Case Configuration

Test Case
MPS/AG-SRC-TG/HFAV/CLH/SD/BV-04-C [Reject/Ignore Incoming Call during Audio Streaming – SD]
MPS/CT-HF-SNK/HFAV/CLH/SD/BV-04-C [Reject/Ignore Incoming Call during Audio Streaming – SD]

Table 4.9: Reject/Ignore Incoming Call during Audio Streaming – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.7 below:

  1. Place a call from remote device to Device A.
  2. Upon receipt of an incoming call indication on the Device B (manufacturer specific) reject the call from Device B (manufacturer specific).
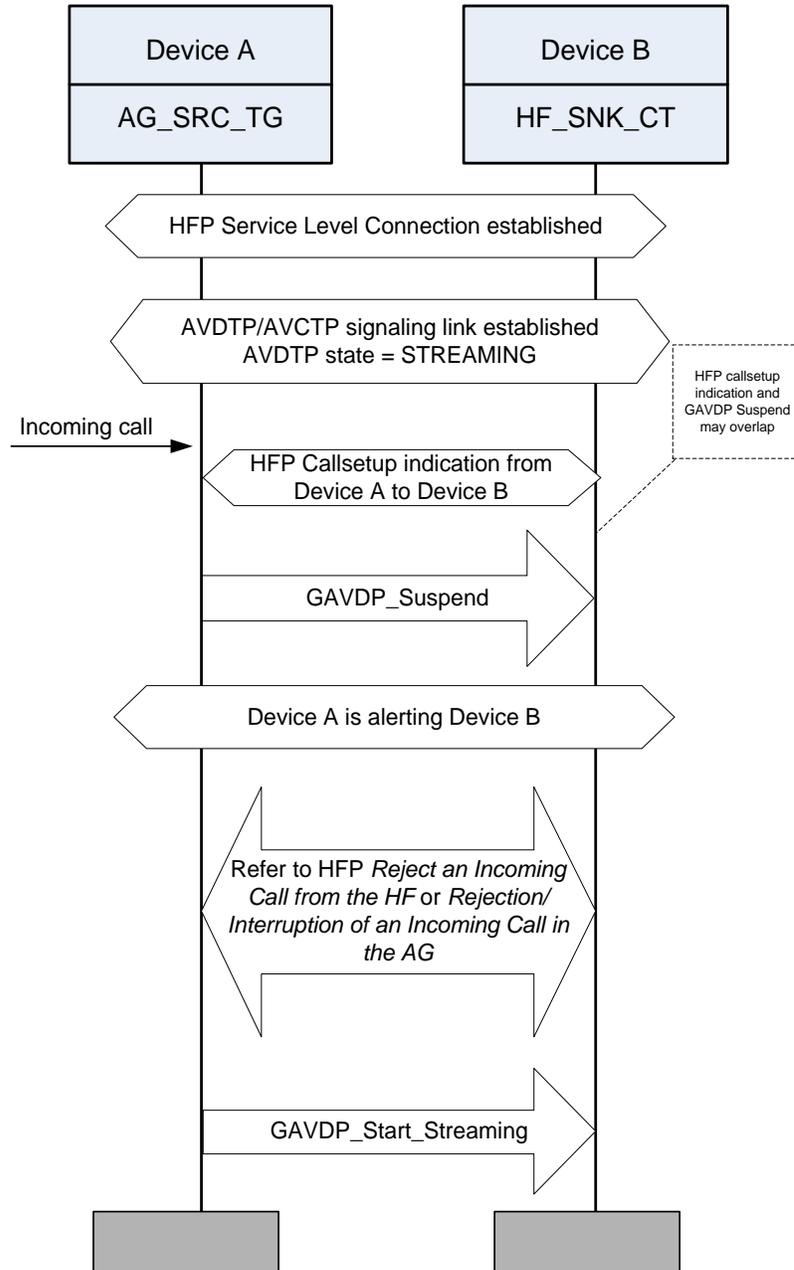

Figure 4.7: Reject/Ignore Incoming Call during Audio Streaming – SD MSC

- Test Condition

  Devices are in communication range.

  Manual user intervention is not used to suspend the streaming of A2DP audio from Device A to Device B on receipt of the incoming call indication from Device A.

Manual user intervention is not used to resume the streaming of A2DP audio from Device A to Device B after rejecting the call.

- Expected Outcome

  Pass verdict

  Device A:

  - Initiates the *GAVDP_Suspend* procedure upon HFP call indication of the incoming call to Device B.

  - Initiates the *GAVDP_Start_Streaming* procedure with Device B after reception of the HFP indication of the call rejection from Device B.

  - No HFP Audio Connection is established after the HFP call rejection.

  Device B:

  - Rejects incoming call after incoming call indication from Device A.

4.3.3.2   Reject/Ignore Incoming Call during Audio Streaming – MD

- Test Purpose

  Verify that when an incoming call received on Device A is rejected/ignored from Device B, an A2DP audio streaming from Device C that had been previously suspended on receipt of the incoming call on Device A is resumed.

- Reference

  [3] 4.1.6

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B	Device C
HFP AG	HFP HF	–
–	A2DP SNK	A2DP SRC
–	AVRCP CT	AVRCP TG

  - HFP Service Level Connection is established between Device A and Device B.

  - Device A is configured to alert Device B of an incoming call.

  - Device C streams A2DP audio over an AVDTP channel in the state STREAMING to Device B.

- Test Case Configuration

Test Case
MPS/CT-HF-SNK/HFAV/CLH/MD/BV-04-C [Reject/Ignore Incoming Call during Audio Streaming – MD]
MPS/SRC-TG/HFAV/CLH/MD/BV-04-C [Reject/Ignore Incoming Call during Audio Streaming – MD]

  Table 4.10: Reject/Ignore Incoming Call during Audio Streaming – MD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.8 below:

  1. Place a call from remote device to Device A.
  2. Upon receipt of an incoming call indication on the Device B (manufacturer specific), reject the call from Device B (manufacturer specific).
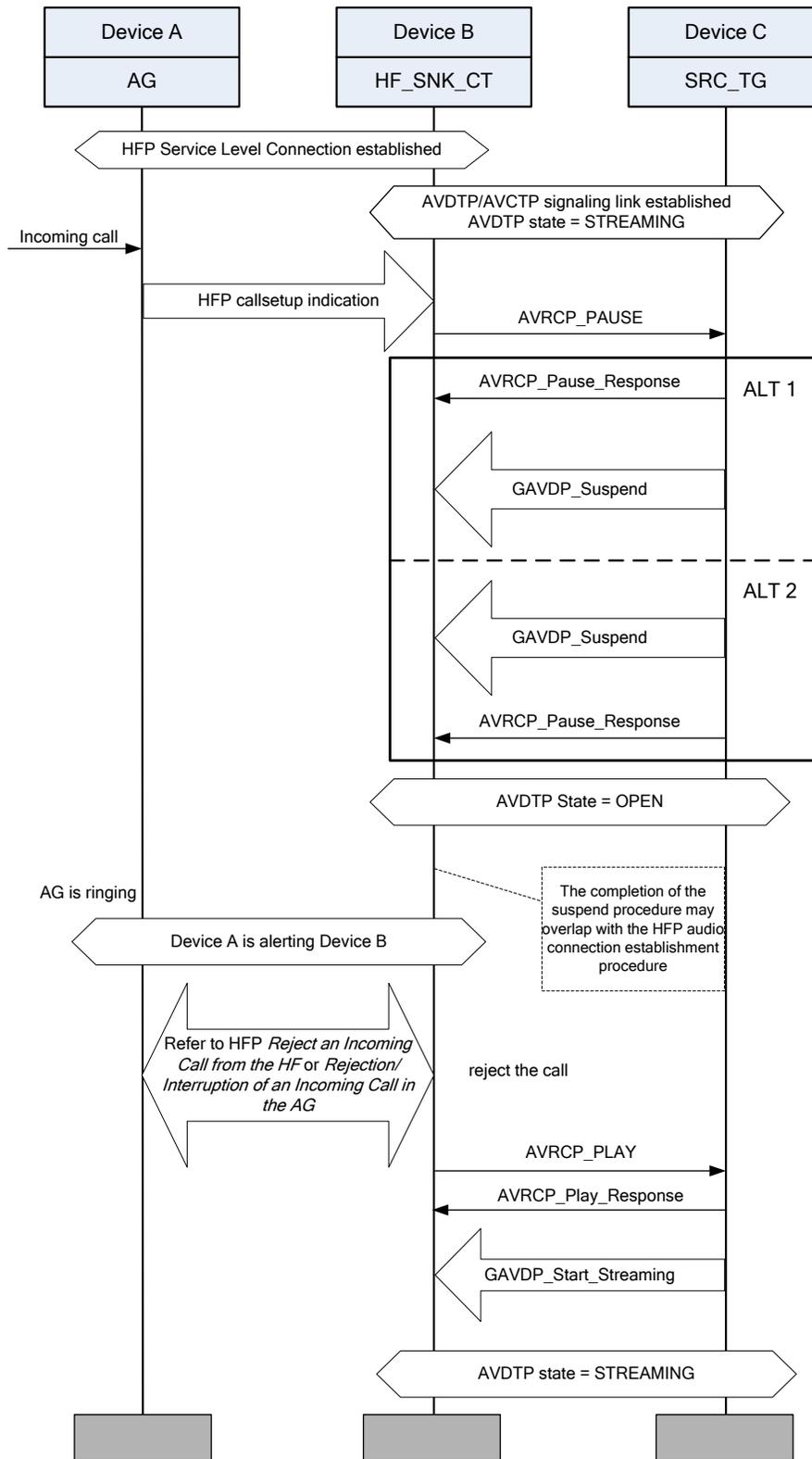
Figure 4.8: Reject/Ignore Incoming Call during Audio Streaming – MD MSC

- Test Condition

  Devices are in communication range.

  Manual user intervention is not used to suspend the streaming of audio from Device C to Device B on receipt of the incoming call indication from Device A.

  Manual user intervention is not used to resume the streaming of audio from Device C to Device B after rejecting the call.

  In this test, the IUT is either Device B or Device C (as defined through the TCMT). As such the behavior noted under Expected Outcome describes required responses from the complementary device as well as the IUT.

- Expected Outcome

  Pass verdict

  Device B:

  - An *AVRCP_Pause* PASS THROUGH command is sent to Device C by Device B when Device B receives the HFP callsetup indication of the incoming call from Device A.

  - When the user rejects the call via Device B (manufacturer specific), an *AVRCP_Play* command is sent to Device C.

  Device C:

  - Initiates the *GAVDP_Suspend* procedure with Device B upon reception of the *AVRCP_Pause*. The *GAVDP_Suspend* procedure may occur prior to the confirmation of the *AVRCP_Pause*.

  - Initiate the *GAVDP_Start_Streaming* procedure with Device B after receiving the *AVRCP_Play* command from Device B.

4.3.4   HFP Call termination during AVP connection

Verify that A2DP audio streaming resumes after HFP voice call is terminated if present before the call and does not resume any audio if no streaming had been present.

4.3.4.1   HFP Call termination during AVP Connection – SD

- Test Purpose

  Verify that Device A resumes previously streaming A2DP audio with Device B after an HFP voice call between Device A and Device B terminates.

- Reference

  [3] 4.1.7

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
A2DP SRC	A2DP SNK
AVRCP TG	AVRCP CT

  - HFP Service Level Connection is established between Device A and Device B.

  - An active voice call exists between Device A and Device B.

- A2DP media connection from Device A to Device B is in the AVDTP state IDLE or OPEN
- The A2DP media streaming had been in the AVDTP STREAMING state before the HFP voice call was established and has been suspended due to the voice call.

- Test Case Configuration

Test Case
MPS/AG-SRC-TG/HFAV/CLH/SD/BV-05-C [HFP Call termination during AVP Connection – SD]
MPS/CT-HF-SNK/HFAV/CLH/SD/BV-05-C [HFP Call termination during AVP Connection – SD]

Table 4.11: HFP Call termination during AVP Connection – SD test cases

- Test Procedure

Perform the following procedures as shown in Figure 4.9 below:

1. HFP voice call is terminated from Device B.
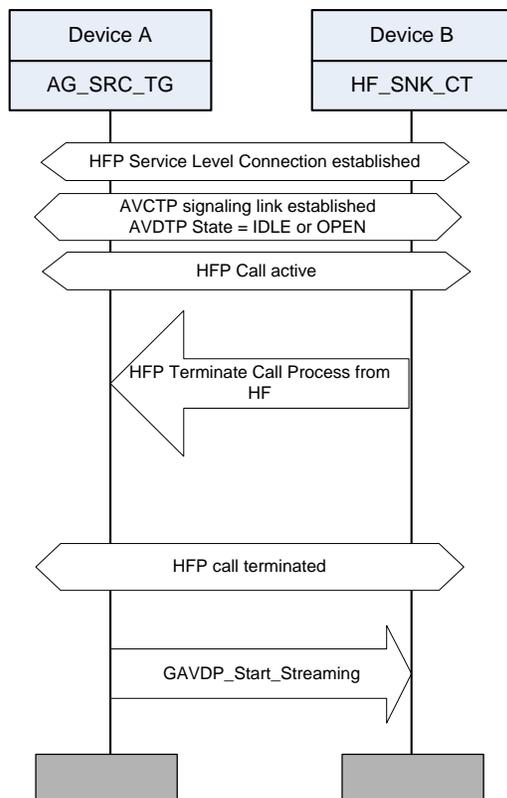
Figure 4.9: HFP Call termination during AVP connection – SD MSC

- Test Condition

Devices are in communication range.

Manual user intervention is not used to resume the streaming from Device A to Device B.

- Expected Outcome

  Pass verdict

  Device A:

  - Initiates the *GAVDP_Start_Streaming* procedure with Device B after the HFP indication of the call termination from Device B.

  Device B:

  - Initiates the HFP Terminate call Process to Device A.

4.3.4.2   HFP Call termination during AVP Connection – No Music – SD

- Test Purpose

  Verify that Device A does not resume any A2DP audio with Device B after an HFP voice call between Device A and Device B terminates and no A2DP stream had been present before the call.

- Reference

  [3] 4.1.7

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
A2DP SRC	A2DP SNK
AVRCP TG	AVRCP CT

  - HFP Service Level Connection is established between Device A and Device B.

  - An active voice call exists between Device A and Device B.

  - A2DP media connection from Device A to Device B is not in the AVDTP STREAMING state.

  - The A2DP media streaming had not been in the AVDTP STREAMING state at the time of HFP voice call establishment.

- Test Case Configuration

Test Case
MPS/AG-SRC-TG/HFAV/CLH/SD/BV-06-C [HFP Call termination during AVP Connection – No Music – SD]
MPS/CT-HF-SNK/HFAV/CLH/SD/BV-06-C [HFP Call termination during AVP Connection – No Music – SD]

  Table 4.12: HFP Call termination during AVP Connection No Music – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.10 below:

  1. HFP voice call is terminated from Device B.
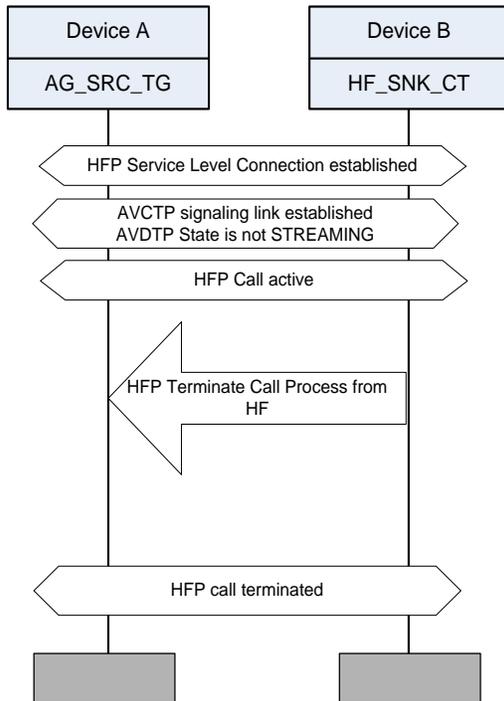
Figure 4.10: HFP Call termination during AVP Connection No Music – SD MSC

- Test Condition

  Devices are in communication range.

  Manual user intervention is not used to resume the streaming from Device A to Device B.

- Expected Outcome

  <u>Pass verdict</u>

  Device A:

  - Upon the HFP indication of the call termination from Device B, A2DP audio streaming is not started.

  Device B:

  - Initiates the HFP Terminate call Process to Device A.

  - Upon the HFP indication of the call termination, A2DP audio streaming is not started.

MPS/CT-HF-SNK/HFAV/CLH/MD/BV-05-C [HFP Call termination during AVP Connection – MD]

- Test Purpose

  Verify that an A2DP stream from Device C to Device B that has been suspended for an HFP call from Device A is resumed after call termination.

- Reference

  [3] 4.1.8

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B	Device C
HFP AG	HFP HF	–
–	A2DP SNK	A2DP SRC
–	AVRCP CT	AVRCP TG

  - HFP Service Level Connection is established between Device A and Device B.

  - An active voice call exists between Device A and Device B.

  - Streaming A2DP audio from Device C to Device B is suspended due to the active voice call and the media connection is in the AVDTP OPEN state.

- Test Procedure

  Perform the following procedures as shown in Figure 4.11 below:

  1. HFP voice call between Device A and Device B is terminated from Device A.
  2. Device B sends an *AVRCP_Play* command to Device C.
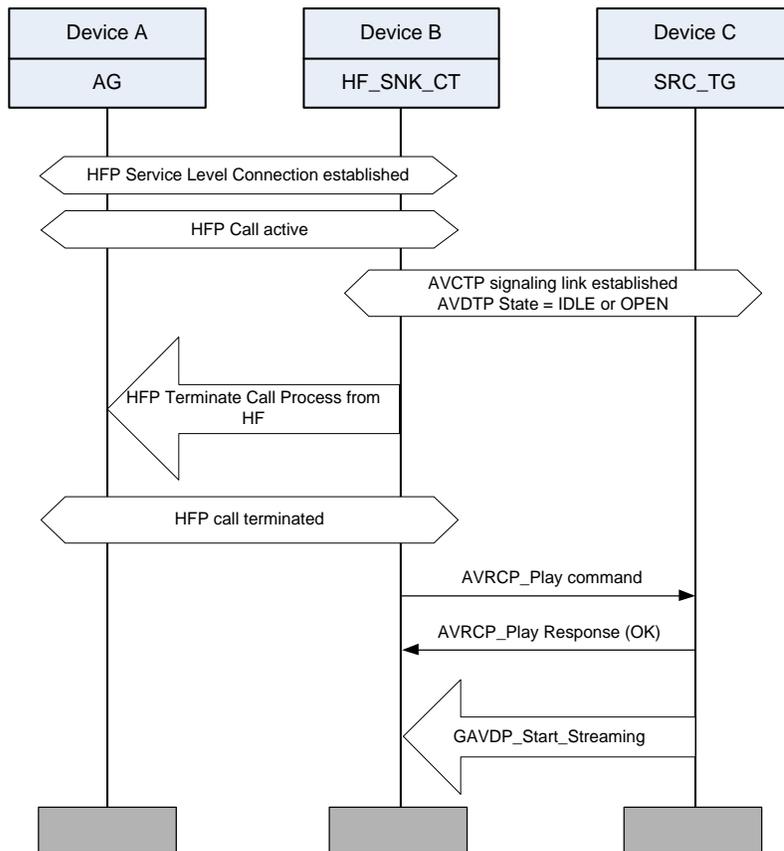
Figure 4.11: MPS/CT-HF-SNK/HFAV/CLH/MD/BV-05-C [HFP Call termination during AVP Connection – MD] MSC

- Test Condition

  Devices are in communication range.

  In this test, the IUT is Device B.

- Expected Outcome

  Pass verdict

  Device B:

  - Initiates call termination with Device A.

  - An *AVRCP_Play* command is sent to Device C after the active voice call is terminated.

4.3.4.3   HFP Call termination during AVP Connection – No Music – MD

- Test Purpose

  Verify that no A2DP stream from Device C to Device B is started upon call termination with Device A when the stream had not been present before the call.

- Reference

  [3] 4.1.8

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B	Device C
HFP AG	HFP HF	–
–	A2DP SNK	A2DP SRC
–	AVRCP CT	AVRCP TG

  - HFP Service Level Connection is established between Device A and Device B.

  - An active voice call exists between Device A and Device B.

  - The A2DP media streaming has not been in the AVDTP STREAMING state between Device C and Device B at the time of HFP voice call establishment between Device A and Device B.

- Test Case Configuration

Test Case
MPS/CT-HF-SNK/HFAV/CLH/MD/BV-06-C [HFP Call termination during AVP Connection – No Music – MD]
MPS/SRC-TG/HFAV/CLH/MD/BV-06-C [HFP Call termination during AVP Connection – No Music – MD]

  Table 4.13: HFP Call termination during AVP Connection – No Music – MD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.12 below:

  1. HFP voice call between Device A and Device B is terminated from Device A.
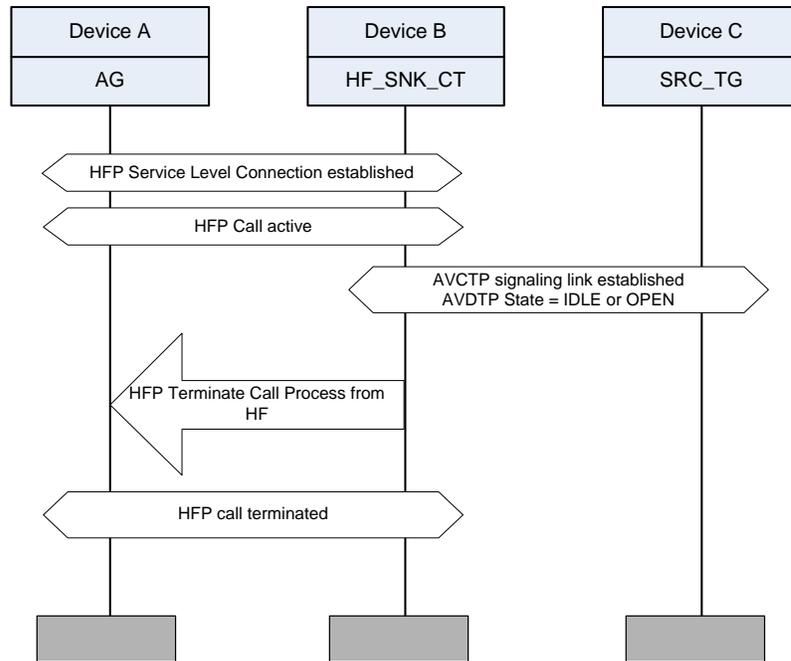
Figure 4.12 HFP Call termination during AVP Connection – No Music - MD MSC

- Test Condition

  Devices are in communication range.

  In this test, the IUT is either Device B or Device C (as defined through the TCMT). As such the behavior noted under Expected Outcome describes required responses from the complementary device as well as the IUT.

- Expected Outcome

  Pass verdict

  Device B:

  - Initiates call termination with Device A.
  - An *AVRCP_Play* command is not sent to Device C after the active voice call is terminated.
  - A2DP audio streaming with Device C is not started.

  Device C:

  - A2DP audio streaming with Device B is not started.

4.3.5 Press Play on Audio Player during active call

Verify that A2DP Audio is not streaming during an active voice call.

4.3.5.1 Press Play on Audio Player during active call – SD

- Test Purpose

  Verify that Device A does not initiate A2DP audio streaming when Play button is pressed on Device A during an active voice between Device A and Device B.

- Reference

  [3] 4.1.9

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
A2DP SRC	A2DP SNK
AVRCP TG	AVRCP CT

  - HFP Service Level Connection is established between Device A and Device B.

  - An active voice call exists between Device A and Device B.

  - A2DP media connection from Device A to Device B is in the AVDTP IDLE or OPEN state.

- Test Case Configuration

Test Case
MPS/AG-SRC-TG/HFAV/ACT/SD/BV-01-C [Press Play on Audio Player during active call – SD]
MPS/CT-HF-SNK/HFAV/ACT/SD/BV-01-C [Press Play on Audio Player during active call – SD]

  Table 4.14: Press Play on Audio Player during active call – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.13 below:

  1. Play functionality is attempted on Device A by a Manufacturer Specific means.
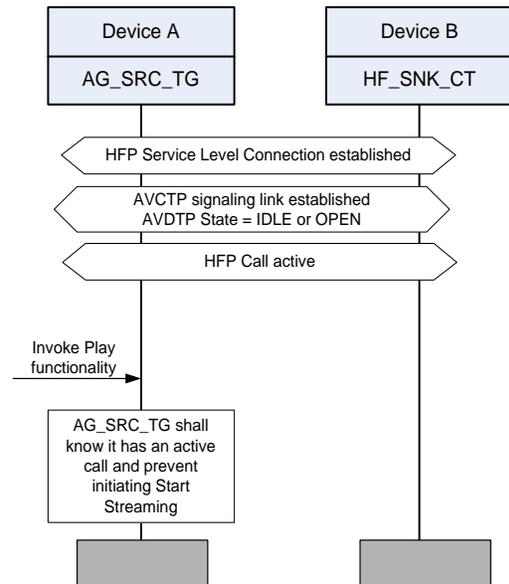
Figure 4.13: Press Play on Audio Player during active call – SD MSC

- Test Condition

  Both devices are in communication range.

- Expected Outcome

  Pass verdict

  Device A:

  - Media streaming is not started after play functionality has been attempted by Device A (the *GAVDP_Start_Streaming* procedure is not initiated with Device B).

  Device B:

  - Stays in active call after the Play button is pushed on Device A.

MPS/CT-HF-SNK/HFAV/ACT/MD/BV-01-C [Audio Player streams audio during active call – MD]

- Test Purpose

  Verify that A2DP audio streaming is successful between Device B and Device C when the *GAVDP_Start_Streaming* procedure is initiated by Device C during an active HFP call between Device A and Device B, and Device B successfully suspends the streaming media.

- Reference

  [3] 4.1.10

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B	Device C
HFP AG	HFP HF	–
–	A2DP SNK	A2DP SRC
–	AVRCP CT	AVRCP TG

  - HFP Service Level Connection is established between Device A and Device B.

  - An active HFP call exists between Device A and Device B.

  - A2DP media connection from Device B to Device C is in the AVDTP IDLE or OPEN state.

- Test Procedure

  Perform the following procedures as shown in Figure 4.14 below:

  1. Action is taken on Device C to initiate media streaming (manufacturer specific).
  2. Device C initiates the *GAVDP_Start_Streaming* procedure to Device B.
  3. Device B suspends the streaming media.
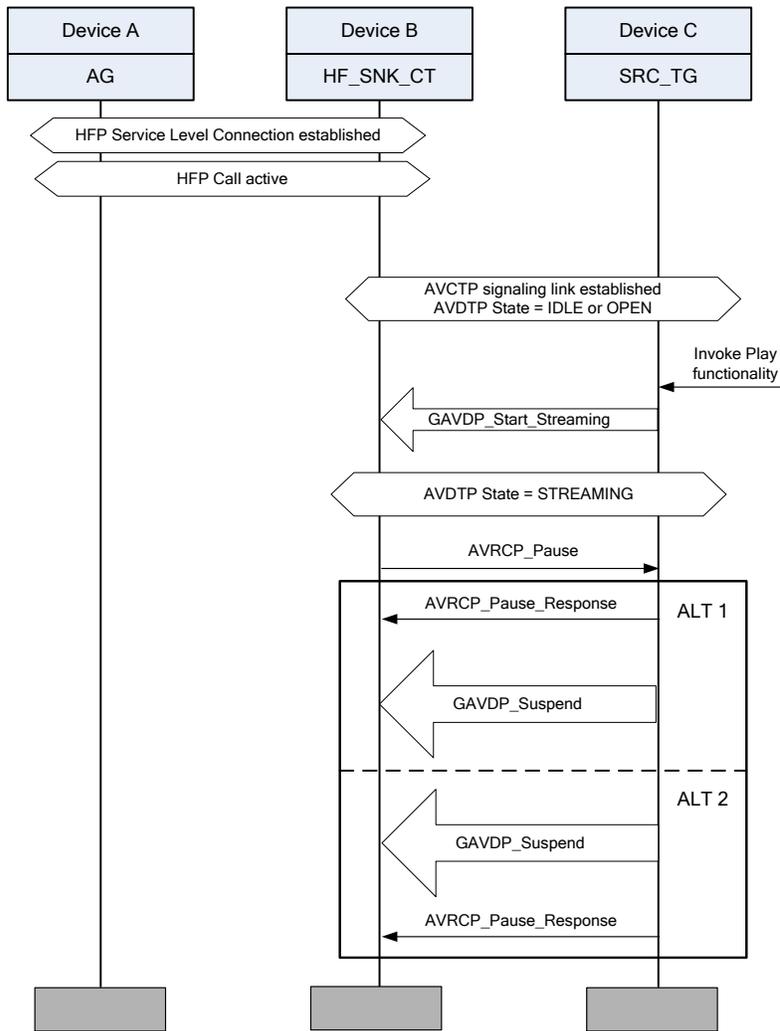
Figure 4.14: MPS/CT-HF-SNK/HFAV/ACT/MD/BV-01-C [Audio Player streams audio during active call – MD] MSC

- Test Condition

  Devices are in communication range.

- Expected Outcome

  <u>Pass verdict</u>

  Device B:

  - The *GAVDP_Start_Streaming* procedure initiated by Device C is successful.

  - Upon reaching the AVDTP state STREAMING, Device B sends the *AVRCP_Pause* PASS THROUGH command to Device C.

  - Successfully completes the *GAVDP_Suspend* procedure initiated by Device C. The *GAVDP_Suspend* procedure may occur prior to the confirmation of the *AVRCP_Pause*.

4.3.6   Start Audio Streaming after AVRCP Play

Verify that audio streaming is started after the reception of an *AVRCP_Play* PASS THROUGH command.

4.3.6.1   Start Audio Streaming after AVRCP Play – SD

- Test Purpose

    Verify that Device A starts A2DP audio streaming after receiving an *AVRCP_Play* PASS THROUGH command from Device B.

- Reference

    [3] 4.1.11

- Initial Condition

    - The following combinations of profiles exist:

Device A	Device B
A2DP SRC	A2DP SNK
AVRCP TG	AVRCP CT

    - A2DP media connection from Device A to Device B is in the AVDTP IDLE or OPEN state.

    - An AVCTP signaling connection is established between Device A and Device B.

- Test Case Configuration

Test Case
MPS/SRC-TG/HFAV/ACT/SD/BV-02-C [Start Audio Streaming after AVRCP Play – SD]
MPS/CT-SNK/HFAV/ACT/SD/BV-02-C [Start Audio Streaming after AVRCP Play – SD]

    Table 4.15: Start Audio Streaming after AVRCP Play – SD test cases

- Test Procedure

    Perform the following procedures as shown in Figure 4.15 below:

    1. Device B sends an *AVRCP_Play* PASS THROUGH command to Device A.
    2. After receiving the *AVRCP_Play* command, Device A sends an *AVDTP_Start* command to Device B.
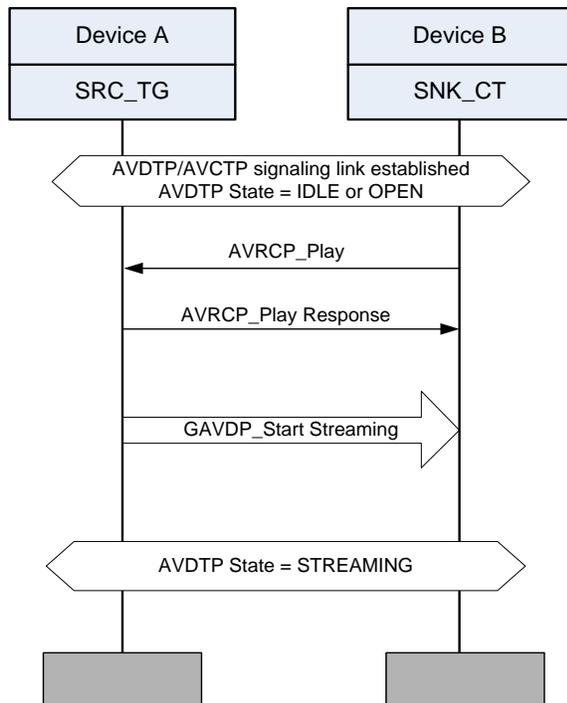
Figure 4.15: Start Audio Streaming after AVRCP Play – SD MSC

- Test Condition

  Devices are in communication range.

- Expected Outcome

  <u>Pass verdict</u>

  Device A:

  - The *AVRCP_Play* PASS THROUGH command is accepted from Device B.

  - The *GAVDP_Start_Streaming* procedure is initiated with Device B.

  Device B:

  - The *AVRCP_Play* PASS THROUGH command is successfully sent to Device A.

  - The *GAVDP_Start_Streaming* procedure initiated by Device A is successful and A2DP audio is streamed successfully.

4.3.7   Suspend Audio Streaming after AVRCP Pause

Verify that audio streaming is suspended after the reception of an *AVRCP_Pause* PASS THROUGH command.

4.3.7.1   Suspend Audio Streaming after AVRCP Pause – SD

- Test Purpose

  Verify that Device A suspends previously streaming A2DP audio after receiving an *AVRCP_Pause* PASS THROUGH command from Device B.

- Reference

  [3] 4.1.12

- Initial Condition

    - The following combinations of profiles exist:

Device A	Device B
A2DP SRC	A2DP SNK
AVRCP TG	AVRCP CT

    - A2DP media connection from Device A to Device B is in the AVDTP state STREAMING.

    - An AVCTP signaling connection is established between Device A and Device B.

- Test Case Configuration

Test Case
MPS/SRC-TG/HFAV/ACT/SD/BV-03-C [Suspend Audio Streaming after AVRCP Pause – SD]
MPS/CT-SNK/HFAV/ACT/SD/BV-03-C [Suspend Audio Streaming after AVRCP Pause – SD]

    Table 4.16: Suspend Audio Streaming after AVRCP Pause – SD test cases

- Test Procedure

    Perform the following procedures as shown in Figure 4.16 below:

    1. Device B sends an *AVRCP_Pause* PASS THROUGH command to Device A.
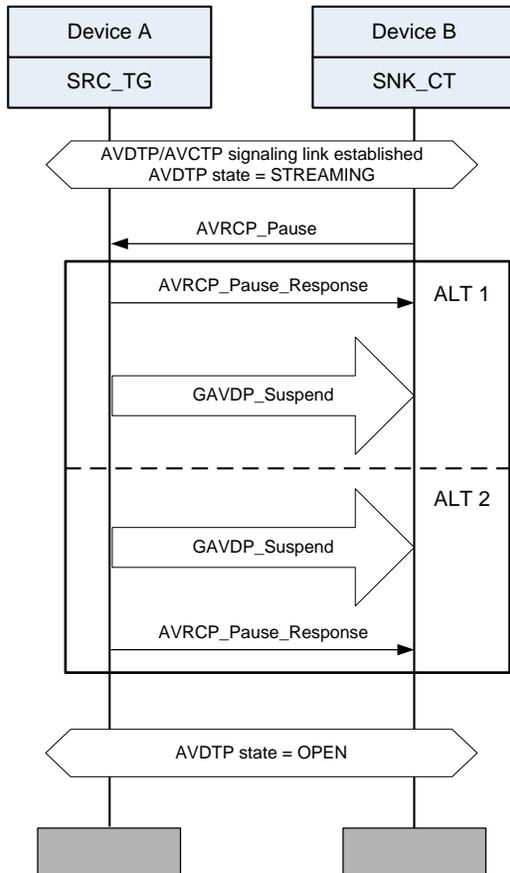
Figure 4.16: Suspend Audio Streaming after AVRCP Pause – SD MSC

- Test Condition

  Devices are in communication range.

- Expected Outcome

  <u>Pass verdict</u>

  Device A:

  - The *AVRCP_Pause* PASS THROUGH command from Device B is accepted.

  - Upon receiving the *AVRCP_Pause* PASS THROUGH command, the *GAVDP_Suspend* procedure is initiated with Device B. The *GAVDP_Suspend* procedure may occur prior to the confirmation of the *AVRCP_Pause.*

  Device B:

  - An *AVRCP_Pause* PASS THROUGH command is successfully sent to Device A.

  - The *GAVDP_Suspend* procedure initiated by Device A is successfully completed.

4.4 AVP + OBEX

Verify that streaming audio is successful during OBEX operations and the audio quality is not disturbed.

4.4.1 Receive files during A2DP connection (active streaming)

Verify that streaming music is not disturbed while a phonebook is being successfully downloaded.

4.4.1.1 Phonebook download during Audio Streaming – SD

- Test Purpose

  Verify that audio streaming is maintained throughout an active phonebook download between two devices.

- Reference

  [3] 4.5.1

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
PBAP PSE	PBAP PCE
A2DP SRC	A2DP SNK
AVRCP TG	AVRCP CT

  - A2DP media connection from Device A to Device B is in the AVDTP STREAMING state.

  - An AVCTP signaling connection is established between Device A and Device B.

  - Device A contains a Phone Book with at least 1000 entries or 80% of the maximum number of entries the device supports. This Phone Book must be of interest for Device B.

- Test Case Configuration

Test Case
MPS/PSE-SRC-TG/AVO/ACT/SD/BV-01-C [Phonebook download during Audio Streaming – SD]
MPS/CT-PCE-SNK/AVO/ACT/SD/BV-01-C [Phonebook download during Audio Streaming – SD]

  Table 4.17: Phonebook download during Audio Streaming – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.17 below:

  1. Device B establishes a PBAP session with the Device A and in this session retrieves the Phone Book objects of interest.
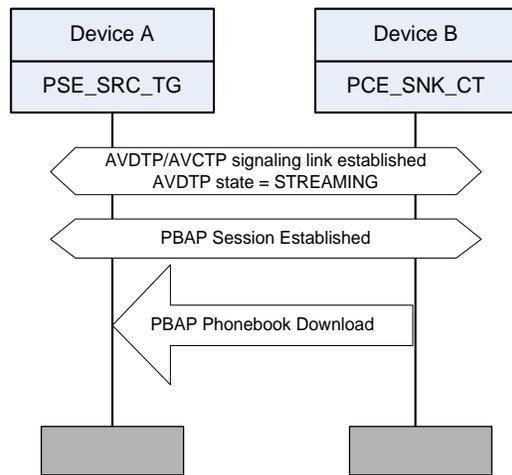

Figure 4.17: Phonebook download during Audio Streaming – SD MSC

- Test Condition

  Both devices are in communication range.

- Expected Outcome

  <u>Pass verdict</u>

  Device A:

  - The PBAP download is successful.
  - The A2DP audio stream maintains an acceptable level of audio quality and no observable changes are introduced by the PBAP download.

  Device B:

  - Device B retrieves the Phone Book objects of interest from Device A.
  - Audio streaming is maintained between Device A and Device B throughout the PBAP download.
  - The A2DP audio maintains an acceptable level of audio quality and no observable changes are introduced by the PBAP download.

4.5   DUN + Other

Verify that DUN data communication is successful during other profile operations.

4.5.1 DUN communication during active voice call

Verify that Data Communication is maintained during an active voice call.

4.5.1.1 DUN communication during active voice call – SD

- Test Purpose

  Verify that an active voice call is maintained between Device A and Device B when a data communication is initiated from Device B.

- Reference

  [3] 4.2.1

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
DUN GW	DUN DT

  - HFP Service Level Connection is established between Device A and Device B.

  - An active HFP call exists between Device A and Device B.

- Test Case Configuration

Test Case
MPS/AG-GW/DUN/CLH/SD/BV-01-C [DUN communication during active voice call – SD]
MPS/DT-HF/DUN/CLH/SD/BV-01-C [DUN communication during active voice call – SD]

  Table 4.18: DUN communication during active voice call – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.18 below:

  1. Device B sends a DUN connection request to Device A if a DUN connection does not already exist between the two devices (manufacturer specific).
  2. Device B sends the ATD command to Device A to connect to the external network.
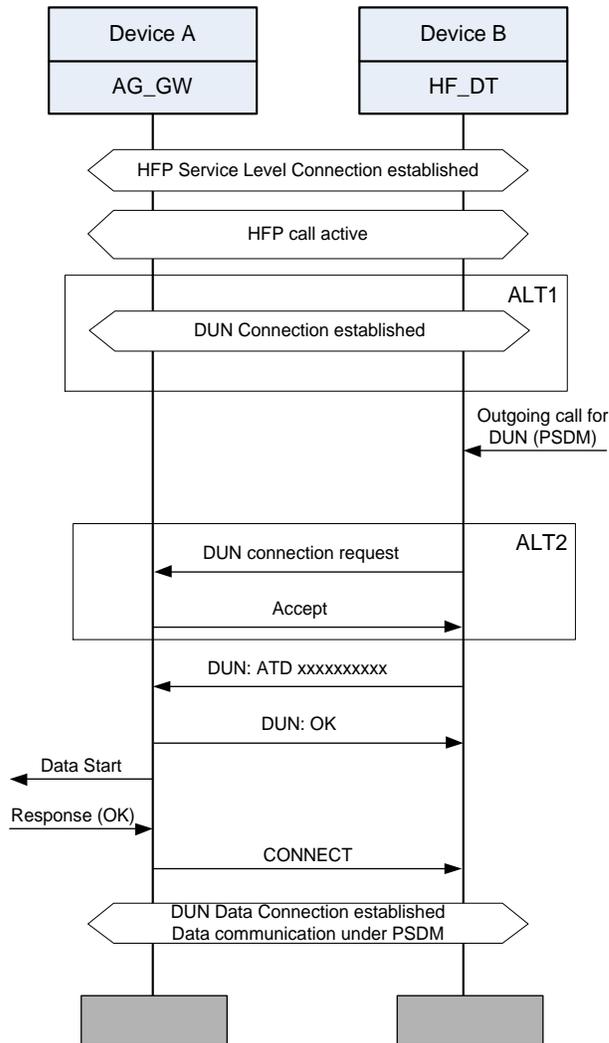
Figure 4.18: DUN communication during active voice call – SD MSC

- Test Condition

  Devices are in communication range.

  Cellular network is capable of simultaneous voice and data handling.

- Expected Outcome

  Pass verdict

  Device A:

  - Device A receives the ATD command from Device B and Data communication under PSDM with remote network is successful.

  - The active voice call is maintained during the DUN connection.

  Device B:

  - Device B successfully completes the DUN data connection to Device A.

  - The active voice call is maintained during the DUN connection.

4.5.2   Outgoing voice call during DUN communication

Verify that data communication is maintained when an outgoing call is initiated.

4.5.2.1   Outgoing voice call during DUN communication – SD

- Test Purpose

  Verify that data communication is maintained between Device A and Device B when an outgoing voice call is initiated from Device B.

- Reference

  [3] 4.2.2

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
DUN GW	DUN DT

  - HFP Service Level Connection is established between Device A and Device B.

  - Data communication under PSDM by DUN is active between Device A and Device B.

- Test Case Configuration

Test Case
MPS/AG-GW/DUN/CLH/SD/BV-02-C [Outgoing voice call during DUN communication – SD]
MPS/DT-HF/DUN/CLH/SD/BV-02-C [Outgoing voice call during DUN communication – SD]

  Table 4.19: Outgoing voice call during DUN communication – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.19 below:

  1. Initiate an outgoing call with a number provided by Device B to Device A.
  2. Observe that there is an indication on Device A that an outgoing voice call is being placed to the number provided by Device B.
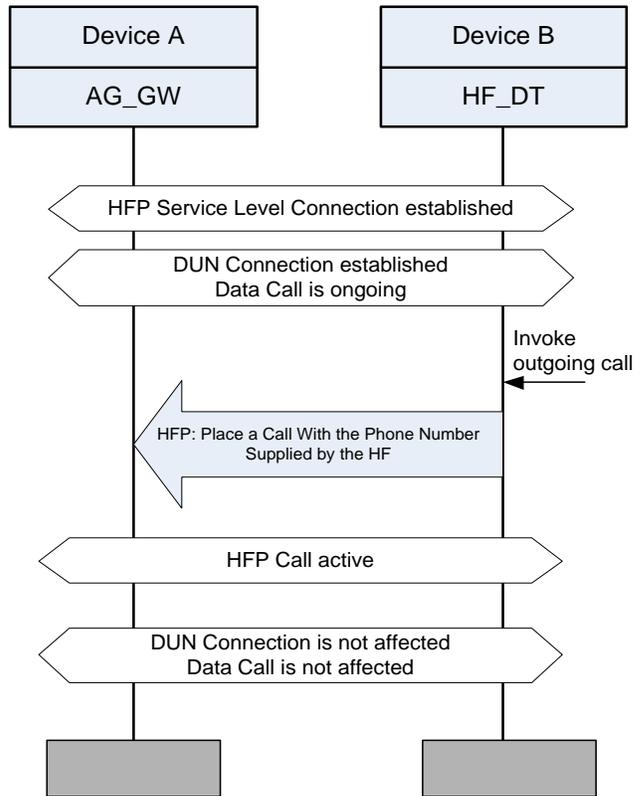
Figure 4.19: Outgoing voice call during DUN communication – SD MSC

- Test Condition

  Devices are in communication range.

  Cellular network is capable of simultaneous voice and data handling.

- Expected Outcome

  Pass verdict

  Device A:

  - Initiates and correctly completes the HFP Place a Call with the phone number supplied by the HF procedure.

  - The active HFP call is maintained during DUN connection.

  - Data communication is maintained between Device A and Device B.

  Device B:

  - The call is successfully placed to the remote party following the HFP Place a Call with the phone number supplied by the HF procedure.

  - When the remote party answers the call an active voice call between Device A and Device B is established.

  - Data communication is maintained between Device A and Device B during the active call.

4.5.3   Incoming voice call during DUN communication

Verify that Data Communication is maintained when an incoming voice call is established.

4.5.3.1   Incoming voice call during DUN communication – SD

- Test Purpose

  Verify that data communication is maintained between Device A and Device B when an incoming voice call is received on Device A.

- Reference

  [3] 4.2.3

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
DUN GW	DUN DT

  - HFP Service Level Connection is established between Device A and Device B.

  - Device A is configured to alert Device B of an incoming voice call.

  - DUN Data communication under PSDM is active between Device A and Device B.

- Test Case Configuration

Test Case
MPS/AG-GW/DUN/CLH/SD/BV-03-C [Incoming voice call during DUN communication – SD]
MPS/DT-HF/DUN/CLH/SD/BV-03-C [Incoming voice call during DUN communication – SD]

  Table 4.20: Incoming voice call during DUN communication – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.20 below:

  1. Place a call from a remote party to Device A.
  2. After receiving an incoming call indication on Device B (manufacturer specific) the call is answered by Device B (manufacturer specific).
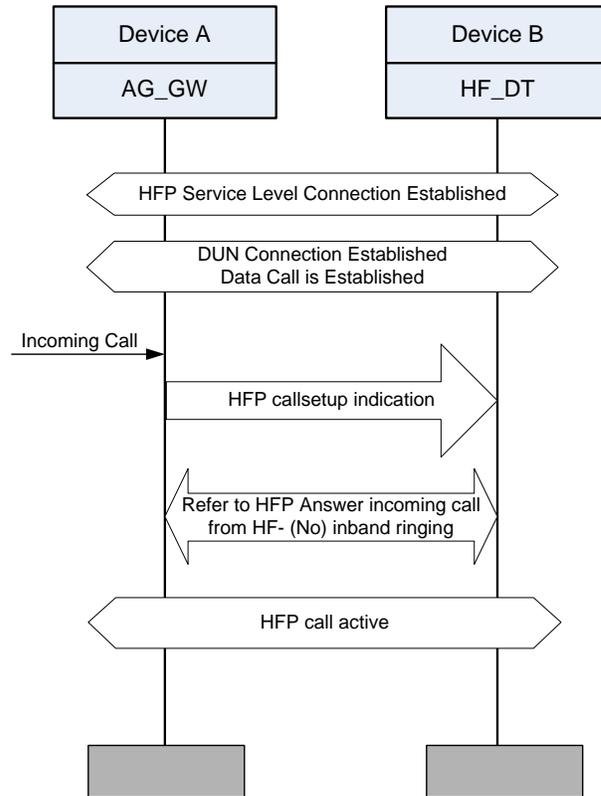
Figure 4.20: Incoming voice call during DUN communication – SD MSC

- Test Condition

  Both devices are in communication range.

  Cellular network is capable of simultaneous voice and data handling.

- Expected Outcome

  Pass verdict

  Device A:

  - Data communication is maintained between Device A and Device B throughout the active HFP call.

  Device B:

  - The HFP Audio connection is established successfully for the active HFP call.

  - Data communication is maintained between Device A and Device B throughout the active HFP call.

4.5.4 Start Audio Streaming during DUN communication

Verify that Data communication is maintained when A2DP Audio Steaming is initiated.

4.5.4.1 Start Audio Streaming under PSDM – SD

- Test Purpose

  Verify that Device A successfully streams A2DP audio to Device B while data communication under PSDM is active between Device A and Device B.

- Reference

  [3] 4.2.4

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
A2DP SRC	A2DP SNK
AVRCP TG	AVRCP CT
DUN GW	DUN DT

  - A2DP media connection from Device A to Device B is in the AVDTP IDLE or OPEN state.

  - An AVCTP signaling connection is established between Device A and Device B.

  - DUN Data communication is active between Device A and Device B.

- Test Case Configuration

Test Case
MPS/GW-SRC-TG/DUN/ACT/SD/BV-01-C [Start Audio Streaming under PSDM – SD]
MPS/CT-DT-SNK/DUN/ACT/SD/BV-01-C [Start Audio Streaming under PSDM – SD]

Table 4.21: Start Audio Streaming under PSDM – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.21 below:

  1. Device B sends an *AVRCP_Play* command to Device A.
  2. Device A initiates the *GAVDP_Start_Streaming* procedure with Device B.
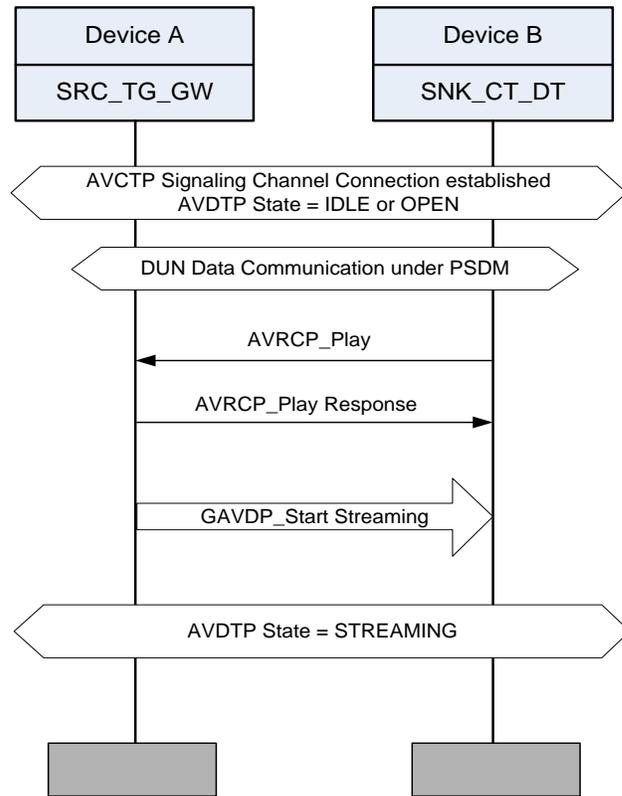
Figure 4.21: Start Audio Streaming under PSDM – SD MSC

- Test Condition

  Both devices are in communication range.

- Expected Outcome

  <u>Pass verdict</u>

  Device A:

  - The *AVRCP_Play* PASS THROUGH command is accepted from Device B.

  - The *GAVDP_Start_Streaming* procedure is initiated with Device B.

  - Data communication is maintained between Device A and Device B during A2DP audio streaming.

  - The A2DP audio stream maintains an acceptable level of audio quality.

  Device B:

  - The *GAVDP_Start_Streaming* procedure is successful with Device A and streaming audio is present.

  - Data communication is maintained between Device A and Device B during A2DP audio streaming.

  - The A2DP audio stream maintains an acceptable level of audio quality.

4.5.4.2 Start Audio Streaming under PSDM – MD

• Test Purpose

Verify that Device A can initiate A2DP audio streaming to Device B while a data communication is maintained under PSDM between Device B and Device C.

• Reference

[3] 4.2.5

• Initial Condition

- The following combinations of profiles exist:

Device A	Device B	Device C
A2DP SRC	A2DP SNK	–
AVRCP TG	AVRCP CT	–
–	DUN DT	DUN GW

- A2DP media connection from Device A to Device B is in the AVDTP IDLE or OPEN state.

- An AVCTP signaling connection is established between Device A and Device B.

- DUN Data communication is active between Device B and Device C.

• Test Case Configuration

Test Case
MPS/SRC-TG/DUN/ACT/MD/BV-01-C [Start Audio Streaming under PSDM – MD]
MPS/CT-DT-SNK/DUN/ACT/MD/BV-01-C [Start Audio Streaming under PSDM – MD]

Table 4.22: Start Audio Streaming under PSDM – MD test cases

• Test Procedure

Perform the following procedures as shown in Figure 4.22 below:

1. Device B sends an *AVRCP_Play* command to Device A.
2. Device A initiates the *GAVDP_Start_Streaming* procedure with Device B.
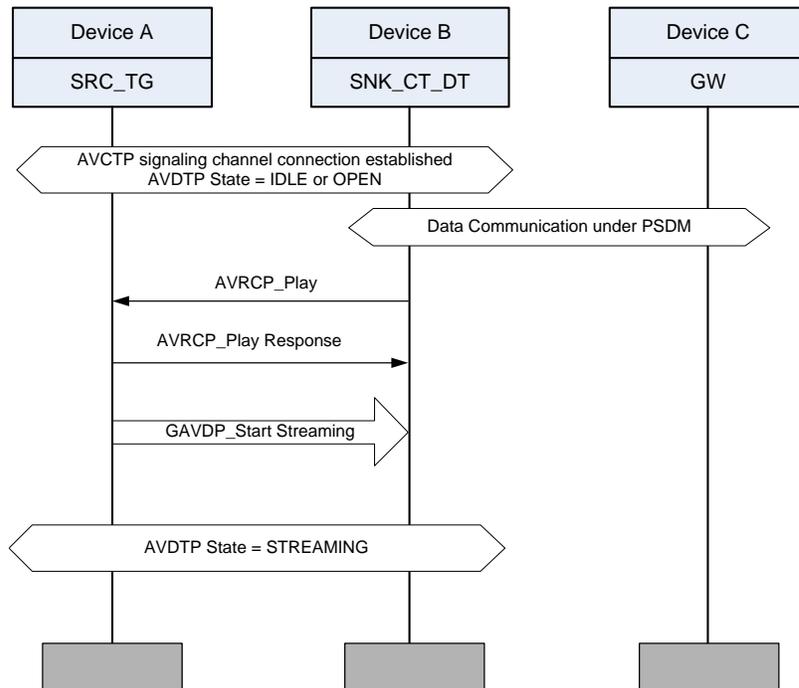
Figure 4.22: Start Audio Streaming under PSDM – MD MSC

- Test Condition

  Both devices are in communication range.

  In this test, the IUT is either Device A or Device B (as defined through the TCMT). As such the behavior noted under Expected Outcome describes required responses from the complementary device as well as the IUT.

- Expected Outcome

  Pass verdict

  Device A:

  - The *AVRCP_Play* command is accepted from Device B.
  - The *GAVDP_Start_Streaming* procedure is initiated with Device B.

  Device B:

  - The *GAVDP_Start_Streaming* procedure with Device A is successful and streaming audio is present.
  - Data communication is maintained between Device B and Device C.

4.5.5 DUN communication establishment during Audio Streaming

Verify that A2DP audio streaming is maintained when a Data communication under PSDM is initiated.

4.5.5.1 Start Data communication under PSDM during Audio Streaming – SD

- Test Purpose

  Verify that Device B can establish data communication under PSDM while A2DP audio streaming exists between Device A and Device B.

- Reference

  [3] 4.2.6

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
A2DP SRC	A2DP SNK
AVRCP TG	AVRCP CT
DUN GW	DUN DT

  - A2DP media connection from Device A to Device B is in the AVDTP STREAMING state.

  - An AVCTP signaling connection is established between Device A and Device B.

- Test Case Configuration

Test Case
MPS/GW-SRC-TG/DUN/DCT/SD/BV-01-C [Start Data communication under PSDM during Audio Streaming – SD]
MPS/CT-DT-SNK/DUN/DCT/SD/BV-01-C [Start Data communication under PSDM during Audio Streaming – SD]

  Table 4.23: Start Data communication under PSDM during Audio Streaming – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.23 below:

  1. Device B sends a DUN connection request to Device A.
  2. Device B sends the ATD command to Device A to connect to the remote network.
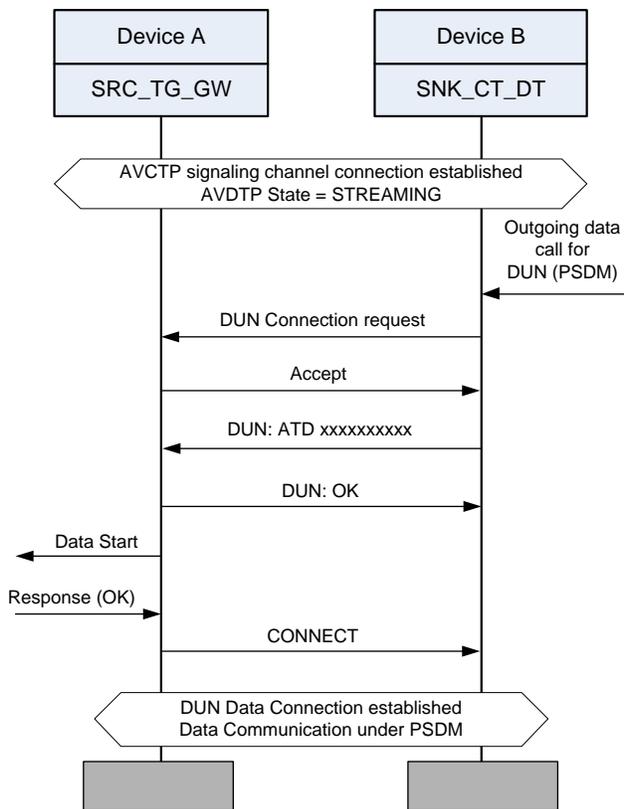

Figure 4.23: Start Data communication under PSDM during Audio Streaming – SD MSC

- Test Condition

    Both devices are in communication range.

- Expected Outcome

    <u>Pass verdict</u>

    Device A:

    - The DUN connection is accepted and Device A successfully receives the ATD command from Device B.

    - Active data communication under PSDM with the remote network is successful.

    - Audio streaming is maintained between Device A and Device B throughout the data connection.

    Device B:

    - Device B sends a successful DUN connection request to Device A.

    - Device B sends the DUN ATD command to Device A and an active data connection is established successfully.

    - Audio streaming is maintained between Device A and Device B throughout the data connection.

4.5.5.2 Start Data communication under PSDM during Audio Streaming – MD

- Test Purpose

    Verify that A2DP audio streaming between Device A and Device B is maintained while data communication is established between Device B and Device C.

- Reference

    [3] 4.2.7

- Initial Condition

    - The following combinations of profiles exist:

Device A	Device B	Device C
A2DP SRC	A2DP SNK	–
AVRCP TG	AVRCP CT	–
–	DUN DT	DUN GW

    - A2DP media connection from Device A to Device B is in the AVDTP STREAMING state.

    - An AVCTP signaling connection is established between Device A and Device B.

- Test Case Configuration

Test Case
MPS/SRC-TG/DUN/DCT/MD/BV-01-C [Start Data communication under PSDM during Audio Streaming – MD]
MPS/CT-DT-SNK/DUN/DCT/MD/BV-01-C [Start Data communication under PSDM during Audio Streaming – MD]

Table 4.24: Start Data communication under PSDM during Audio Streaming – MD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.24 below:

  1. Device B sends a DUN connection request to Device C.
  2. Device B sends the ATD command to Device C to connect to the remote network.
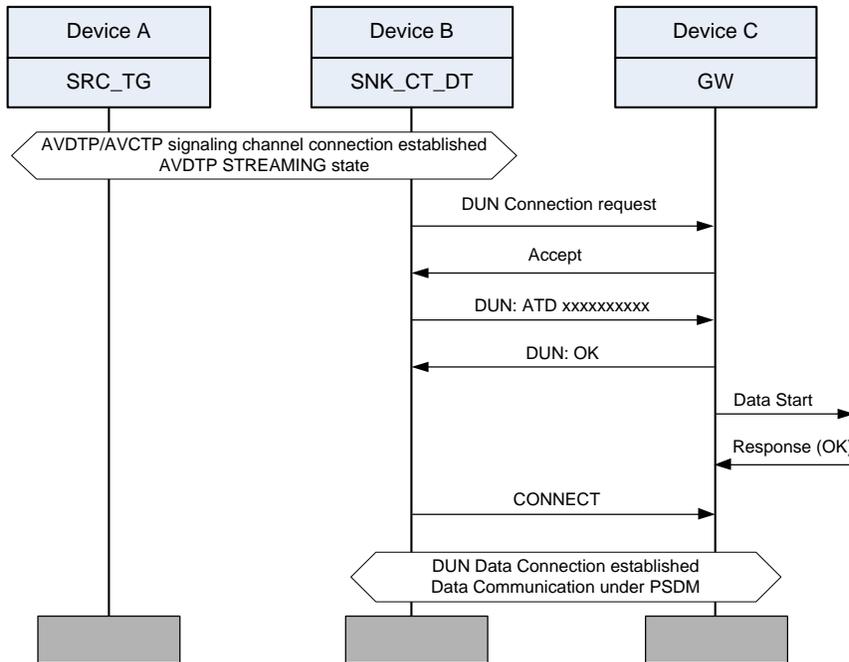

Figure 4.24: Start Data communication under PSDM during Audio Streaming – MD MSC

- Test Condition

  Both devices are in communication range.

  In this test, the IUT is either Device A or Device B (as defined through the TCMT). As such the behavior noted under Expected Outcome describes required responses from the complementary device as well as the IUT.

- Expected Outcome

  <u>Pass verdict</u>

  Device A:

  - Audio streaming is maintained between Device A and Device B.

  Device B:

  - A successful DUN connection request is sent to Device C.

  - The ATD command is sent to Device C and an active data connection is established successfully.

  - Audio streaming is maintained between Device A and Device B throughout the data connection.

  Device C:

  - Receives the ATD command from Device B.

  - Data communication under PSDM with the remote network is successful.

4.5.6 Terminate voice call during DUN data communication

Verify that when a voice call is terminated during DUN data communication the DUN connection is not affected.

4.5.6.1 Terminate voice call during data communication – SD

- Test Purpose

  Verify that a voice call can be terminated without terminating the data communication.

- Reference

  [3] 4.2.8

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
DUN GW	DUN DT

  - HFP Service Level Connection is established between Device A and Device B.

  - An active voice call exists between Device A and Device B.

  - DUN data communication under PSDM is active between Device A and Device B.

- Test Case Configuration

Test Case
MPS/AG-GW/DUN/DCT/SD/BV-02-C [Terminate voice call during data communication – SD]
MPS/DT-HF/DUN/DCT/SD/BV-02-C [Terminate voice call during data communication – SD]

  Table 4.25: Terminate voice call during data communication – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.25 below:

  1. Device B terminates the voice call (manufacturer specific) with Device A.
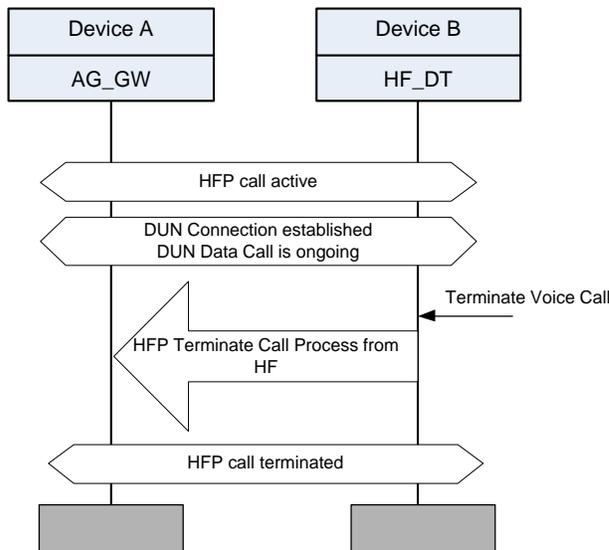
Figure 4.25: Terminate voice call during data communication – SD MSC

- Test Condition

  Both devices are in communication range.

  Cellular network is capable of simultaneous voice and data handling.

- Expected Outcome

  Pass verdict

  Device A:

  - Correctly follows the HFP Terminate Call Process from HF initiated by Device B.

  - The ongoing data communication is maintained between Device A and Device B throughout the voice call termination.

  Device B:

  - Initiates and correctly completes the HFP Terminate Call Process from HF.

  - The ongoing data communication is maintained between Device A and Device B throughout the voice call termination.

4.5.6.2 Terminate data communication during active HFP call and data communication – SD

- Test Purpose

  Verify that data communication can be terminated without terminating a voice call.

- Reference

  [3] 4.2.8

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
DUN GW	DUN DT

  - HFP Service Level Connection is established between Device A and Device B.

  - An active voice call exists between Device A and Device B.

  - DUN data communication under PSDM is active between Device A and Device B.

- Test Case Configuration

Test Case
MPS/AG-GW/DUN/DCT/SD/BV-03-C [Terminate data communication during active HFP call and data communication – SD]
MPS/DT-HF/DUN/DCT/SD/BV-03-C [Terminate data communication during active HFP call and data communication – SD]

  Table 4.26: Terminate data communication during active HFP call and data communication – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.26 below:

  1. Device B sends a data communication termination request to the Device A.
  2. The DUN communication connection is disconnected.
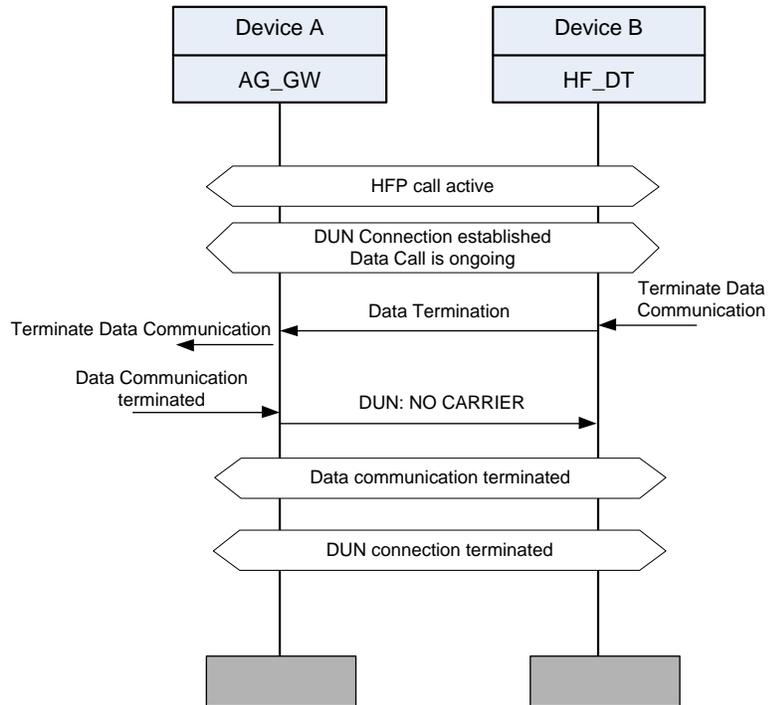
Figure 4.26: Terminate data communication during active HFP call and data communication – SD MSC

- Test Condition

  Both devices are in communication range.

  Cellular network is capable of simultaneous voice and data handling.

- Expected Outcome

  <u>Pass verdict</u>

  Device A:

  - After receiving the DUN Data Termination, Device A sends a NO CARRIER result code and the DUN connection is successfully disconnected.

  - The HFP voice call is maintained throughout the data communication termination process.

  Device B:

  - Device B initiates the DUN data termination with Device A.

  - The DUN connection is successfully disconnected.

  - The HFP voice call is maintained throughout the data communication termination process.

4.6   PAN + Other

Verify that PAN data communication is successful during other profile operations.

4.6.1 PAN communication during active voice call

Verify that the PAN communication continues during an active voice call.

4.6.1.1 Data communication in Personal Area Network during active voice call PANU connection – SD

- Test Purpose

  Verify that an active voice call between Device A and Device B is maintained while a data communication session over the PAN Network Access Point of Device A exists. The PANU device initiates the data communication.

- Reference

  [3] 4.3.1

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
PAN NAP	PANU

  - HFP Service Level Connection is established between Device A and Device B.

  - An active voice call exists between Device A and Device B.

  - Device A is configured to have a valid IP address.

- Test Case Configuration

Test Case
MPS/AG-NAP/PAN/CLH/SD/BV-01-C [Data communication in Personal Area Network during active voice call PANU connection – SD]
MPS/HF-PANU/PAN/CLH/SD/BV-01-C [Data communication in Personal Area Network during active voice call PANU connection – SD]

  Table 4.27: Data communication in Personal Area Network during active voice call PANU connection – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.27 below:

  1. Device B sends a BNEP service level connection to Device A if a BNEP connection doesn't already exist between the two devices.
  2. Data communication is possible once the BNEP connection exists between the two devices.
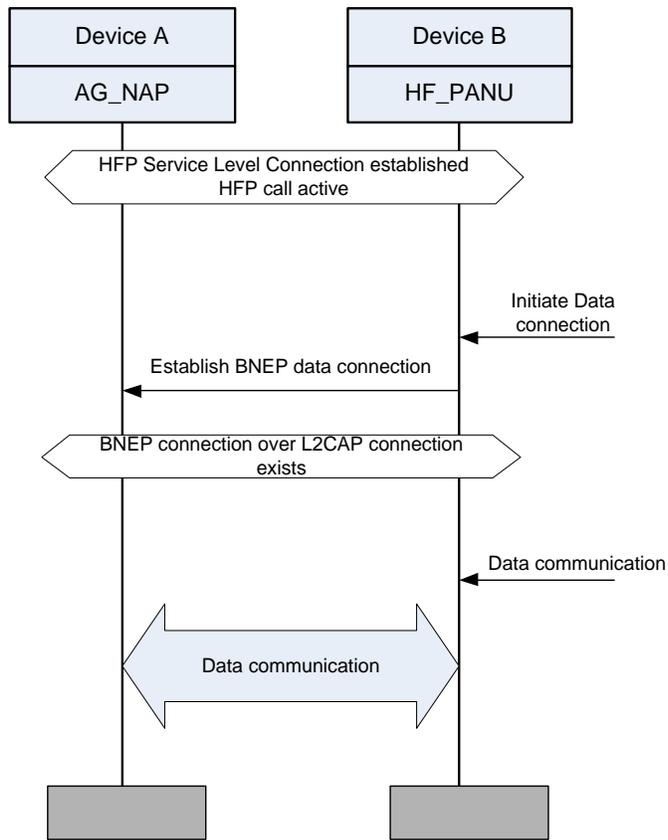
Figure 4.27: Data communication in Personal Area Network during active voice call PANU connection – SD MSC

- Test Condition

  Both devices are in communication range.

- Expected Outcome

  <u>Pass verdict</u>

  Device A:

  - Accepts the BNEP connection request from Device B.

  - Data communication is successful.

  - The active voice call is maintained during the PAN connection.

  Device B:

  - Device B sends a PAN connection request to Device A if there is not already connected to PAN.

  - Data communication is successful.

  - The active voice call is maintained during the PAN connection.

4.6.2 Outgoing voice call during PAN communication

Verify that the PAN data communication is maintained when an outgoing voice call occurs.

4.6.2.1 Outgoing voice call during PAN communication – SD

- Test Purpose

  Verify that an outgoing voice call initiated from Device B to Device A is established while Data communication over PAN is maintained.

- Reference

  [3] 4.3.2

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
PAN NAP	PANU

  - HFP Service Level Connection is established between Device A and Device B.

  - The L2CAP channel is open between Device A and Device B and configuration of the BNEP connection between Device and Device B is complete.

  - Data communication to the remote network is possible.

- Test Case Configuration

Test Case
MPS/AG-NAP/PAN/CLH/SD/BV-02-C [Outgoing voice call during PAN communication – SD]
MPS/HF-PANU/PAN/CLH/SD/BV-02-C [Outgoing voice call during PAN communication – SD]

  Table 4.28: Outgoing voice call during PAN communication – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.28 below:

  1. Initiate an outgoing call with a number provided by Device B to Device A.
  2. Observe that there is an indication on Device A that an outgoing voice call is being placed to the number provided by Device B.
  3. Answer the call on the remote number being called.
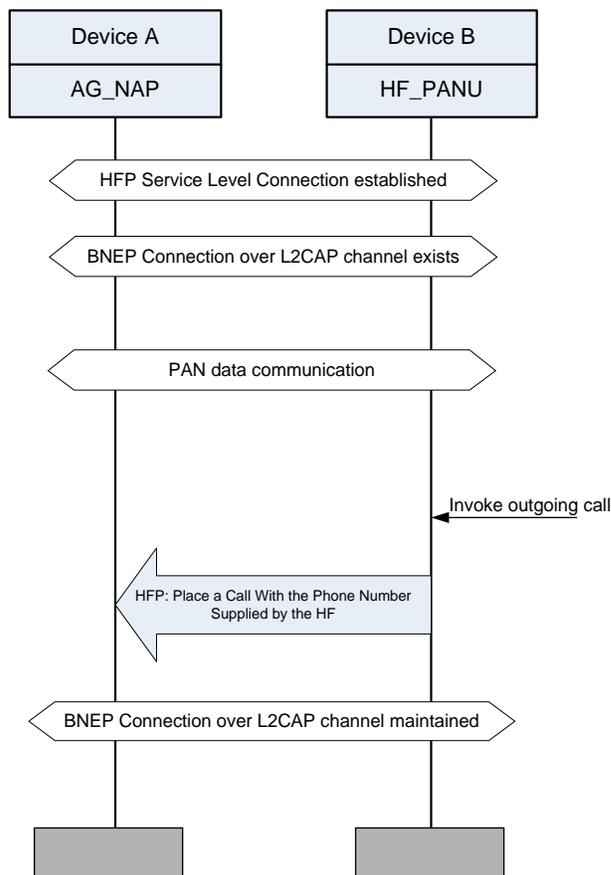
Figure 4.28: Outgoing voice call during PAN communication – SD MSC

- Test Condition

  Both devices are in communication range.

- Expected Outcome

  Pass verdict

  Device A:

  - The call is successfully placed to the remote party following the HFP Place a Call with the phone number supplied by the HF procedure.
  - PAN data communication is maintained between Device A and Device B throughout the HFP call process.

  Device B:

  - Initiates and correctly completes the HFP Place a Call with the phone number supplied by the HF procedure.
  - PAN data communication is maintained between Device A and Device B throughout the HFP call process.

4.6.3   Incoming voice call during PAN communication

Verify that the PAN data communication is maintained with an incoming voice call.

4.6.3.1   Incoming voice call during PAN communication – SD

- Test Purpose

  Verify that an incoming voice call between Device A and Device B is established while data communication over PAN is maintained.

- Reference

  [3] 4.3.3

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
PAN NAP	PANU

  - HFP Service Level Connection is established between Device A and Device B.

  - Device A is configured to alert Device B of an incoming voice call.

  - The L2CAP channel is open between Device A and Device B and configuration of the BNEP connection between Device and Device B is complete.

  - Device A is configured to have a valid IP address.

  - A network terminal must be connected to Device A by a non-Bluetooth network infrastructure.

  - A remote network terminal sends data traffic which is forwarded over BNEP to Device B.

- Test Case Configuration

Test Case
MPS/AG-NAP/PAN/CLH/SD/BV-03-C [Incoming voice call during PAN communication – SD]
MPS/HF-PANU/PAN/CLH/SD/BV-03-C [Incoming voice call during PAN communication – SD]

  Table 4.29: Incoming voice call during PAN communication – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.29 below:

  1. Place a call from a remote number to Device A.
  2. After receiving an incoming call indication on Device B (manufacturer specific), answer the call on Device B (manufacturer specific).
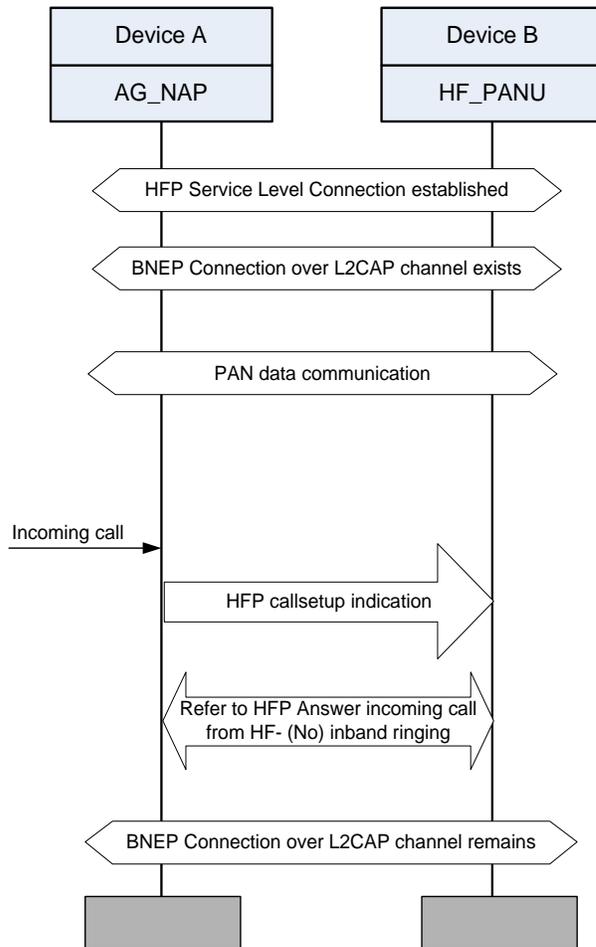
Figure 4.29: Incoming voice call during PAN communication – SD MSC

- Test Condition

  Both devices are in communication range.

- Expected Outcome

  <u>Pass verdict</u>

  Device A:

  - The incoming call is successfully connected once the HF answers the call and follows the HFP answer an incoming call process.
  - PAN data communication is maintained between Device A and Device B throughout the HFP call process.

  Device B:

  - The HFP incoming call procedure is successfully completed.
  - PAN data communication is maintained between Device A and Device B throughout the HFP call process.

4.6.4   Start Audio Streaming during PAN communication

Verify that PAN data communication is maintained when A2DP audio streaming is initiated.

4.6.4.1   Start Audio Streaming during PAN communication – SD

- Test Purpose

  Verify that audio streaming is not disturbed during data communication over PAN, and that the establishment of audio streaming does not cause the PAN connection and the underlying BNEP and L2CAP connections to terminate.

- Reference

  [3] 4.3.4

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
PAN NAP	PAN PANU
A2DP SRC	A2DP SNK
AVRCP TG	AVRCP CT

  - A2DP media connection from Device A to Device B is in the AVDTP IDLE or OPEN state.
  - An AVCTP signaling connection is established between Device A and Device B.
  - Device A and Device B have established and configured L2CAP and BNEP connections.
  - A network terminal must be connected Device A by a non-Bluetooth network infrastructure.
  - Data is sent over the PAN connection.

- Test Case Configuration

Test Case
MPS/NAP-SRC-TG/PAN/ACT/SD/BV-01-C [Start Audio Streaming during PAN communication – SD]
MPS/CT-PANU-SNK/PAN/ACT/SD/BV-01-C [Start Audio Streaming during PAN communication – SD]

  Table 4.30: Start Audio Streaming during PAN communication – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.30 below:

 1. Device B sends an *AVRCP_Play* PASS THROUGH command to Device A.
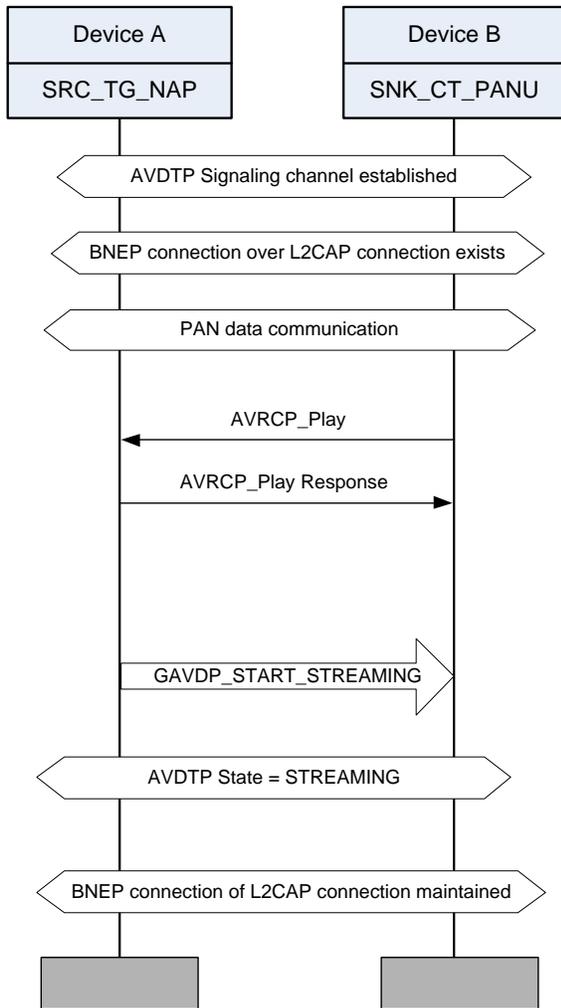
Figure 4.30: Start Audio Streaming during PAN communication – SD MSC

- Test Condition

  Both devices are in communication range.

- Expected Outcome

  <u>Pass verdict</u>

  Device A:

  - The *AVRCP_Play* PASS THROUGH command from Device B is accepted.
  - The *GAVDP_Start_Streaming* procedure is initiated with Device B.
  - PAN data communication is maintained between Device A and Device B throughout A2DP streaming.

  Device B:

  - The *GAVDP_Start_Streaming* procedure is accepted from Device A and streaming media is present.
  - PAN Data communication is maintained between Device A and Device B throughout A2DP streaming.

4.6.5 PAN communication establishment during Audio Streaming

Verify that PAN data communication can be established while A2DP audio streaming is maintained.

4.6.5.1 PAN communication establishment during Audio Streaming – SD

- Test Purpose

  Verify that Device B can establish PAN communication while A2DP audio streaming exists between Device A and Device B.

- Reference

  [3] 4.3.5

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
PAN NAP	PAN PANU
A2DP SRC	A2DP SNK

  - A2DP media connection from Device A to Device B is in the AVDTP STREAMING state.
  - An AVCTP signaling connection is established between Device A and Device B.
  - A network terminal must be connected to Device A by a non-Bluetooth network infrastructure.

- Test Case Configuration

Test Case
MPS/NAP-SRC/PAN/DCT/SD/BV-01-C [PAN communication establishment during Audio Streaming – SD]
MPS/PANU-SNK/PAN/DCT/SD/BV-01-C [PAN communication establishment during Audio Streaming – SD]

  Table 4.31: PAN communication establishment during Audio Streaming – SD test cases

- Test Procedure

  Perform the following procedures as shown in Figure 4.31 below:

  1. Device B sends a BNEP service level connection request to Device A if a BNEP connection doesn't already exist between the two devices.
  2. PAN Data traffic is sent once a BNEP connection exists between the two devices.
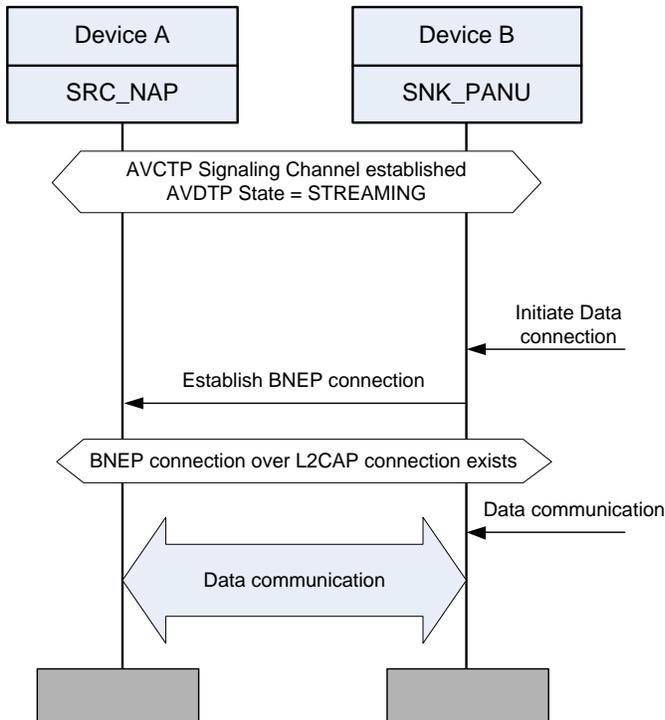
Figure 4.31: PAN communication establishment during Audio Streaming – SD MSC

- Test Condition

  Both devices are in communication range.

- Expected Outcome

  <u>Pass verdict</u>

  Device A:

  - The BNEP connection request from Device B is accepted.

  - Sends data traffic from Device B to the external network.

  - Audio streaming is maintained between Device A and Device B throughout the PAN data communication.

  Device B:

  - PAN connection with Device A is successful.

  - Data traffic is sent and received successfully with Device A.

4.7 MPS Procedure test cases

4.7.1 (Dis-)Connection Order/Behavior

Verify that the IUT follows the requirements on connection order defined in MPS.

MPS/AG-PSE/HFPB/CTH/SD/BV-01-C [Connection Behavior]

- Test Purpose

  Verify that PBAP can be connected with no HFP Service Level Connection being established.

- Reference

  [3] 5.2

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
PBAP PSE	PBAP PCE

  - Neither HFP nor PBAP is connected between Device A and Device B.

- Test Procedure

  1. Device B initiates a PBAP connection to Device A.

- Test Condition

  Devices are in communication range.

- Expected Outcome

  Pass verdict

  Device A: The PBAP connection requested from Device B is established.

MPS/AG-SRC-TG/AVP/CTH/SD/BI-01-C [Disconnection Behavior – HFP]

- Test Purpose

  Verify that a device does not disconnect an existing HFP service level connection when A2DP and AVRCP connection requests are rejected.

- Reference

  [3] 5.2

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
HFP AG	HFP HF
A2DP SRC	A2DP SNK
AVRCP TG	AVRCP CT

  - An HFP Service Level Connection is established between Device A and Device B.

- Test Procedure

  1. Device A initiates an A2DP connection and optionally an AVRCP connection to Device B.
  2. Device B rejects the A2DP connection request and any AVRCP connection requests on an L2CAP level.

- Test Condition

  Devices are in communication range.

- Expected Outcome

  <u>Pass verdict</u>

  Device A: The HFP Service Level Connection is not released due to the rejection of the A2DP or AVRCP connection request(s).

- Note

  The initiation of the AVRCP control channel by Device A is Optional. However, if this feature is supported, Device B rejects the request.

MPS/SRC-TG/AVP/CTH/SD/BI-02-C [Disconnection Behavior – A2DP]

- Test Purpose

  Verify that a device does not disconnect an existing A2DP connection when AVRCP is disconnected.

- Reference

  [3] 5.2

- Initial Condition

  - The following combinations of profiles exist:

Device A	Device B
A2DP SRC	A2DP SNK
AVRCP TG	AVRCP CT

  - A2DP and AVRCP are connected.

- Test Procedure

  - Device B disconnects the AVRCP connection.

- Test Condition

  Devices are in communication range.

- Expected Outcome

  <u>Pass verdict</u>

  Device A: The A2DP Connection is not released due to the disconnection of AVRCP.

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 Multi-Profile Specification (MPS) [3].

If a test case is mandatory within the respective layer, then the y/x reference is omitted.

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)
MPS 10/1	MPS SDP Service	MPS/SR/SGSIT/SERR/BV-01-C MPS/SR/SGSIT/ATTR/BV-01-C MPS/SR/SGSIT/ATTR/BV-02-C MPS/SR/SGSIT/ATTR/BV-04-C
MPS 4/2 AND MPS 10/1	MPS SDP attribute: Supported Scenarios MPMD	MPS/SR/SGSIT/ATTR/BV-03-C
MPS 6/1 AND MPS 3/8	Incoming Call during AVP Connection – SD	MPS/AG-SRC-TG/HFAV/CLH/SD/BV-01-C
MPS 6/2	Incoming Call during AVP Connection – SD	MPS/CT-HF-SNK/HFAV/CLH/SD/BV-01-C
MPS 6/1 AND MPS 3/7	Incoming Call during AVP Connection In-band Ringing – SD	MPS/AG-SRC-TG/HFAV/CLH/SD/BV-02-C
MPS 6/2	Incoming Call during AVP Connection In-band Ringing – SD	MPS/CT-HF-SNK/HFAV/CLH/SD/BV-02-C
MPS 7/1 AND MPS 3/8	Incoming Call during AVP Connection – No In-band ringing – MD	MPS/CT-HF-SNK/HFAV/CLH/MD/BV-01-C
MPS 7/2	Incoming Call during AVP Connection – No In-band ringing – MD	MPS/SRC-TG/HFAV/CLH/MD/BV-01-C
MPS 7/1 AND MPS 3/7	Incoming Call during AVP Connection – In-band Ringing MD	MPS/CT-HF-SNK/HFAV/CLH/MD/BV-02-C
MPS 7/2	Incoming Call during AVP Connection – In-band Ringing MD	MPS/SRC-TG/HFAV/CLH/MD/BV-02-C
MPS 6/3	Outgoing Call during AVP Connection – SD	MPS/AG-SRC-TG/HFAV/CLH/SD/BV-03-C
MPS 6/4	Outgoing Call during AVP Connection – SD	MPS/CT-HF-SNK/HFAV/CLH/SD/BV-03-C
MPS 7/3	Outgoing Call during AVP Connection – MD	MPS/CT-HF-SNK/HFAV/CLH/MD/BV-03-C

Item	Feature	Test Case(s)
MPS 7/4	Outgoing Call during AVP Connection – MD	MPS/SRC-TG/HFAV/CLH/MD/BV-03-C
MPS 6/5	Reject/Ignore Incoming Call during Audio Streaming – SD	MPS/AG-SRC-TG/HFAV/CLH/SD/BV-04-C
MPS 6/6	Reject/Ignore Incoming Call during Audio Streaming – SD	MPS/CT-HF-SNK/HFAV/CLH/SD/BV-04-C
MPS 7/5	Reject/Ignore Incoming Call during Audio Streaming – MD	MPS/CT-HF-SNK/HFAV/CLH/MD/BV-04-C
MPS 7/6	Reject/Ignore Incoming Call during Audio Streaming – MD	MPS/SRC-TG/HFAV/CLH/MD/BV-04-C
MPS 6/7	HFP Call termination during AVP connection – SD	MPS/AG-SRC-TG/HFAV/CLH/SD/BV-05-C
MPS 6/8	HFP Call termination during AVP connection – SD	MPS/CT-HF-SNK/HFAV/CLH/SD/BV-05-C
MPS 7/7	HFP Call termination during AVP connection – MD	MPS/CT-HF-SNK/HFAV/CLH/MD/BV-05-C
MPS 7/7	HFP Call termination during AVP connection (no music) – MD	MPS/CT-HF-SNK/HFAV/CLH/MD/BV-06-C
MPS 7/8	HFP Call termination during AVP connection (no music) – MD	MPS/SRC-TG/HFAV/CLH/MD/BV-06-C
MPS 6/7	HFP Call termination during AVP connection No Music – SD	MPS/AG-SRC-TG/HFAV/CLH/SD/BV-06-C
MPS 6/8	HFP Call termination during AVP connection No Music – SD	MPS/CT-HF-SNK/HFAV/CLH/SD/BV-06-C
MPS 6/9	Press Play on Audio Player during active call – SD	MPS/AG-SRC-TG/HFAV/ACT/SD/BV-01-C
MPS 6/10	Press Play on Audio Player during active call – SD	MPS/CT-HF-SNK/HFAV/ACT/SD/BV-01-C
MPS 7/9	Play on Audio Player during active call – MD	MPS/CT-HF-SNK/HFAV/ACT/MD/BV-01-C
MPS 6/11 OR MPS 7/10	Start Audio Streaming after AVRCP Play – SD	MPS/SRC-TG/HFAV/ACT/SD/BV-02-C
MPS 6/12	Start Audio Streaming after AVRCP Play – SD	MPS/CT-SNK/HFAV/ACT/SD/BV-02-C
MPS 6/13	Suspend Audio Streaming after AVRCP Pause – SD	MPS/SRC-TG/HFAV/ACT/SD/BV-03-C
MPS 6/14	Suspend Audio Streaming after AVRCP Pause – SD	MPS/CT-SNK/HFAV/ACT/SD/BV-03-C
MPS 6/37	Phonebook download during audio streaming – SD	MPS/PSE-SRC-TG/AVO/ACT/SD/BV-01-C
MPS 6/38 AND MPS 3/12	Phonebook download during audio streaming – SD	MPS/CT-PCE-SNK/AVO/ACT/SD/BV-01-C
MPS 6/15	DUN communication during active voice call – SD	MPS/AG-GW/DUN/CLH/SD/BV-01-C
MPS 6/16	DUN communication during active voice call – SD	MPS/DT-HF/DUN/CLH/SD/BV-01-C

Item	Feature	Test Case(s)
MPS 6/17	Outgoing voice call during DUN communication – SD	MPS/AG-GW/DUN/CLH/SD/BV-02-C
MPS 6/18 AND MPS 3/9	Outgoing voice call during DUN communication – SD	MPS/DT-HF/DUN/CLH/SD/BV-02-C
MPS 6/19	Incoming voice call during DUN communication – SD	MPS/AG-GW/DUN/CLH/SD/BV-03-C
MPS 6/20	Incoming voice call during DUN communication – SD	MPS/DT-HF/DUN/CLH/SD/BV-03-C
MPS 6/21	Start Audio Streaming under PSDM – SD	MPS/GW-SRC-TG/DUN/ACT/SD/BV-01-C
MPS 6/22	Start Audio Streaming under PSDM – SD	MPS/CT-DT-SNK/DUN/ACT/SD/BV-01-C
MPS 7/13	Start Data communication under PSDM during Audio Streaming – MD	MPS/SRC-TG/DUN/DCT/MD/BV-01-C
MPS 7/14	Start Data communication under PSDM during Audio Streaming – MD	MPS/CT-DT-SNK/DUN/DCT/MD/BV-01-C
MPS 6/25	Terminate voice call during data communication – SD	MPS/AG-GW/DUN/DCT/SD/BV-02-C
MPS 6/26	Terminate voice call during data communication – SD	MPS/DT-HF/DUN/DCT/SD/BV-02-C
MPS 6/25	Terminate Data Communication during active HFP call and data communication – SD	MPS/AG-GW/DUN/DCT/SD/BV-03-C
MPS 6/26	Terminate Data Communication during active HFP call and data communication – SD	MPS/DT-HF/DUN/DCT/SD/BV-03-C
MPS 7/11	Start Audio Streaming under PSDM – MD	MPS/SRC-TG/DUN/ACT/MD/BV-01-C
MPS 7/12	Start Audio Streaming under PSDM – MD	MPS/CT-DT-SNK/DUN/ACT/MD/BV-01-C
MPS 6/23	Start Data communication under PSDM during Audio Streaming – SD	MPS/GW-SRC-TG/DUN/DCT/SD/BV-01-C
MPS 6/24	Start Data communication under PSDM during Audio Streaming – SD	MPS/CT-DT-SNK/DUN/DCT/SD/BV-01-C
MPS 6/27	Data communication in Personal Area Network during active voice call – SD	MPS/AG-NAP/PAN/CLH/SD/BV-01-C
MPS 6/28	Data communication in Personal Area Network during active voice call – SD	MPS/HF-PANU/PAN/CLH/SD/BV-01-C
MPS 6/29	Outgoing voice call during PAN communication – SD	MPS/AG-NAP/PAN/CLH/SD/BV-02-C
MPS 6/30 AND MPS 3/9	Outgoing voice call during PAN communication – SD	MPS/HF-PANU/PAN/CLH/SD/BV-02-C
MPS 6/31	Incoming voice call during PAN communication – SD	MPS/AG-NAP/PAN/CLH/SD/BV-03-C
MPS 6/32	Incoming voice call during PAN communication – SD	MPS/HF-PANU/PAN/CLH/SD/BV-03-C
MPS 6/33	Start audio streaming during PAN communication – SD	MPS/NAP-SRC-TG/PAN/ACT/SD/BV-01-C

Item	Feature	Test Case(s)
MPS 6/34	Start audio streaming during PAN communication – SD	MPS/CT-PANU-SNK/PAN/ACT/SD/BV-01-C
MPS 6/35	PAN communication establishment during audio streaming – SD	MPS/NAP-SRC/PAN/DCT/SD/BV-01-C
MPS 6/36	PAN communication establishment during audio streaming – SD	MPS/PANU-SNK/PAN/DCT/SD/BV-01-C
MPS 6/39	Connection Behavior	MPS/AG-PSE/HFPB/CTH/SD/BV-01-C
MPS 8/2	Disconnection Behavior – HFP	MPS/AG-SRC-TG/AVP/CTH/SD/BI-01-C
MPS 8/2	Disconnection Behavior – A2DP	MPS/SRC-TG/AVP/CTH/SD/BI-02-C

Table 5.1: Test case mapping

6   Revision history and acknowledgments

Revision History

Publication Number	Revision Number	Date	Comments
0	1.0.0	2013-07-02	Prepare for Publication
	1.0.1r00	2014-05-01	TSE 5366: Edits to Test Conditions and Pass Verdict for TP/HFAV/CLH/MD/BV-01-I, TP/HFAV/CLH/MD/BV-02-I, TP/HFAV/CLH/MD/BV-03-I, TP/HFAV/CLH/MD/BV-04-I, TP/HFAV/CLH/MD/BV-05-I, TP/HFAV/CLH/MD/BV-06-I, TP/DUN/ACT/MD/BV-01-I and TP/DUN/DCT/MD/BV-01-I. TSE 5444: Swapped the roles in the test procedure description of TP/AVP/CTH/SD/BI-01-I and added clarification that rejection should happen at the L2CAP level.
	1.0.1r01	2014-06-21	BTI Review, Nerissa: Spelling mistake corrected.
	1.0.1r02	2014-06-24	BQRB Revew, Alicia: Update date on cover page TE Review: Prepare for Legal Review
1	1.0.1	2014-07-07	TCRL 2014-1 Publication
	1.0.2r00	2015-04-28	TSE 6353: Updated TP/HFAV/ACT/MD/BV-01-I and TP/HFAV/CLH/MD/BV-05-I and the TCMT to remove requirements for Device C as IUT.
	1.0.2r01	2015-05-21	Review by Nerissa Green. Mapped item 7/10 (deleted in change for TSE 6353) to TP/HFAV/ACT/SD/BV-02-I
2	1.0.2	2015-07-14	Prepared for TCRL 2015-1 publication
	1.0.3r00	2015-10-06	TSE 6396: Replaced MSC and expanded Pass verdict to clarify that the GAVDP_Suspend may occur prior to the confirmation of AVRCP_Pause in TP/HFAV/CLH/MD/BV-01-I, TP/HFAV/CLH/MD/BV-02-I, TP/HFAV/CLH/MD/BV-03-I, TP/HFAV/CLH/MD/BV-04-I, TP/HFAV/ACT/MD/BV-01-I, and TP/HFAV/ACT/SD/BV-03-I. TSE 6408: TP/AVP/CTH/SD/BI-01-I – Revised test procedure and Pass verdict and added a note to clarify that Device A's initiation of the AVRCP connection is dependent on support of that feature.
	1.0.3r01	2015-10-09	Integrated review from Alicia Courtney regarding TSE 6408.
3	1.0.3	2015-12-22	Prepared for TCRL 2015-2 publication
	1.04r00	2016-10-14	Converted to new Test Case ID conventions as defined in TSTO v4.1
	1.0.4r01	2016-11-21	Merge TC ID changes with new template changes.
	1.0.4r02	2016-11-21	Accepted all of Magnus' formatting changes. Modified roles to be one string separated by "-" per PTS suggestion.
	1.0.4r03	2016-11-22	Revised MPS/SDP/CTH/SD/BV-01-I to MPS/IUT/SDP/CTH/SD/BV-01-I to introduce a role for PTS test case import process.

Publication Number	Revision Number	Date	Comments
	1.0.4r04	2016-11-23	PTS suggestion to rename the TC ID roles in alphabetical order.
4	1.0.4	2016-12-13	Approved by BTI. Prepared for TCRL 2016-2 publication.
	p5r00–r03	2023-10-25 – 2024-04-29	TSE 23960 (rating 1): Converted -I tests to -C tests as appropriate; updated the TCMT and TCRL accordingly. TSE 25039 (rating 4): Added a new GSIT section with new TCs MPS/SR/SGSIT/SERR/BV-01-C and MPS/SR/SGSIT/ATTR/BV-01-C and -04-C. Deleted MPS/SDR/SDP/CTH/SD/BV-01-I. Updated the TCMT accordingly. Added the SDP TS to the references list. Updated the Test Strategy section, test groups list, TC class naming conventions table, and acknowledgments. Editorials to align the doc with the latest TS template conventions, including moving rev history and acknowledgments to the end of the doc, aligning the disclaimer and footer with the latest DNMD and logo, removing draft rev history entries, assigning p4 to previous v1.0.4, updating all boilerplate text, simplifying the test groups section, reformatting TCIDs into H8 and H9, updating the objectives to current language conventions, reformatting references sections to current conventions, making some of the capitalization more consistent, and revising "shall" language.
5	p5	2024-07-01	Approved by BTI on 2024-05-22. Prepared for TCRL 2024-1 publication.
	p6r00	2024-10-14	TSE 25556 (rating 1): For MPS/SR/SGSIT/ATTR/BV-04-C, updated the value to Uint16 for input for the Multi-Profile Specification SGSIT SDP test procedure shown in Table 4.2.
6	p6	2025-02-18	Approved by BTI on 2024-12-25. Prepared for TCRL 2025-1 publication.

Name	Company
Ahmad Nsour	Harman International
Samantha Stigleman	Harman International
Hideo Furukawa	Honda Motor Co., Ltd.
Hiroyuki Morimoto	Mitsubishi Electric
Naoki Shimizu	Mitsubishi Electric Corporation
Keith Jachim	Motorola, Inc.
Elmer Prado	The NAC
Tomoyuki Suzuki	Nissan Motor Co., Ltd.
Toshiyuki Kuwayama	OTSL Inc.
Scott Walsh	Plantronics
Tetsuya Aisaka	Qualcomm, Inc.
Takanobu Hayashi	Qualcomm, Inc.
Masahiko Seki	Sony Corporation
Hiroshi Matsuya	Toshiba Corporation
Hideki Goto	Toyota Motor Corporation
Takashi Yasuda	Toyota Motor Corporation