Service Discovery Protocol (SDP)

***Bluetooth*® Test Suite**

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- **Prepared By:** BTI
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Contents

1 Scope

This Bluetooth document contains the Test Suite Structure (TSS) and test cases to test the implementation of the Bluetooth Service Discovery Protocol layer with the objective to provide a high probability of air interface interoperability between the tested implementation and other manufacturers' Bluetooth devices.

2 References, definitions, and abbreviations

2.1 References

This document incorporates provisions from other publications by dated or undated reference. These references are cited at the appropriate places in the text, and the publications are listed hereinafter. Additional definitions and abbreviations can be found in [1], [3], and [4].

[1] Specification of the Bluetooth System, Core System Package, Volume 3, Part B, Service Discovery Profile (SDP)

[2] ICS Proforma for Service Discovery Protocol (SDP)

[3] Attribute Identifiers are accessible via the Bluetooth SIG Assigned Numbers

[4] Test Strategy and Terminology Overview (TSTO)

2.2 Definitions

In this Bluetooth document, the definitions from [1], [3], and [4] apply.

2.3 Acronyms and abbreviations

In this Bluetooth document, the definitions, acronyms, and abbreviations from [1], [3], and [4] apply.

3 Test Suite Structure (TSS)

3.1 Overview

The Service Discovery Protocol is one of the Host layers in a BR/EDR Core-Host Configuration.

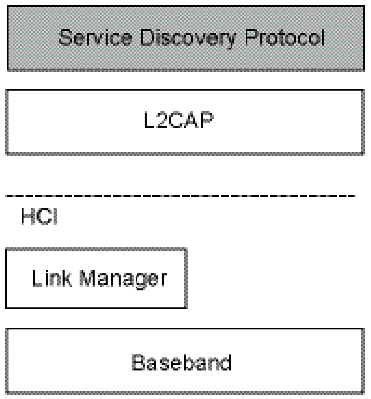


Figure 3.1: SDP test model

3.2 Test Strategy

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

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

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

3.3 Test groups

The Service Discovery Protocol specifies four groups of services; from that, this Test Suite has four test groups defined:

- Service Search

  To locate service records specified by a search pattern, the SDP_SERVICE_SEARCH_REQ and SDP_SERVICE_SEARCH_RSP PDUs are used.

- Service Attribute

  Retrieves attribute values specified by an AttributeList, the SDP_SERVICE_ATTR_REQ and SDP_SERVICE_ATTR_RSP PDUs are used.

- Service Search Attribute

  The Service Search and Service Attribute procedures, combined to one procedure, may decrease the number of messages/PDUs sent, via the SDP_SERVICE_SEARCH_ATTR_REQ and SDP_SERVICE_SEARCH_ATTR_RSP PDUs.

- Service Browse

  To verify the process of looking for any offered services described by an SDP server’s service records without any a priori information about the services.

4 Test cases (TC)

4.1 Introduction

4.1.1 Test case identification conventions

Test cases are assigned unique identifiers per the conventions in [4]. The convention used here is: **<spec abbreviation>/<IUT role>/**<class>/**<feat>/**<func>/<subfunc>/<cap>**/<xx>-<nn>-<y>**.

Identifier Abbreviation	**Spec Identifier <spec abbreviation>**
SDP	Service Discovery Protocol
Identifier Abbreviation	**Role Identifier <IUT role>**
CL	Client Role
SR	Server Role
Identifier Abbreviation	**Function Identifier <func>**
BRW	Browsing
SA	Service Attribute Request
SS	Service Search Request
SSA	Service Search Attribute Request

Table 4.1: SDP TC function 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.

4.1.4 Fields and bits reserved for future use

Unless a specific test states otherwise, all fields within packets and all bits within fields that are described as reserved for future use are set to 0 in packets sent by the Upper and Lower Testers.

4.1.5 UUIDs

All tests are to be run using 16, 32, and 128 bit UUIDs.

4.2 Service Search Request procedures

Verify the correct implementation of the Service Search Request services.

4.2.1 Server

The IUT is the Server and the Lower Tester is the Client.

4.2.1.1 Service Search Request

- Test Purpose

  Verify the correct behavior of the IUT when searching for existing service(s).

- Reference

  [1] 4.5

- Initial Condition

  - A link and channel connection with the Lower Tester is set up. A CID has been established.
  - At least the UUID 0x1000 (ServiceDiscoveryServerServiceClassID) exists.

- Test Case Configuration

Test Case	Search Feature	Search Response	Parameters
SDP/SR/SS/BV-01-C [Service Search Request]	N/A	SDP_SERVICE_SEARCH_RSP	0x03, TransactionID and ParameterLength, TotalServiceCount, CurrentServiceRecordCount, ServiceRecordHandleList
SDP/SR/SS/BV-03-C [Service Search Request, ContinuationState]	Continuation State > 0x00	SDP_SERVICE_SEARCH_RSP	0x03, TransactionID and ParameterLength, TotalServiceCount, CurrentServiceRecordCount, ServiceRecordHandleList, ContinuationState

Test Case	Search Feature	Search Response	Parameters
SDP/SR/SS/BI-01-C [Service Search Request, Invalid Search, Invalid PDU Size]	Invalid PDU size	SDP_ERROR_RSP	ErrorCode = 0x0004 (Invalid PDU Size)
SDP/SR/SS/BI-02-C [Service Search Request, Invalid Search, Invalid Syntax]	Invalid syntax	SDP_ERROR_RSP	ErrorCode = 0x0003 (Invalid request syntax)

Table 4.2: Service Search Request

- Test Procedure

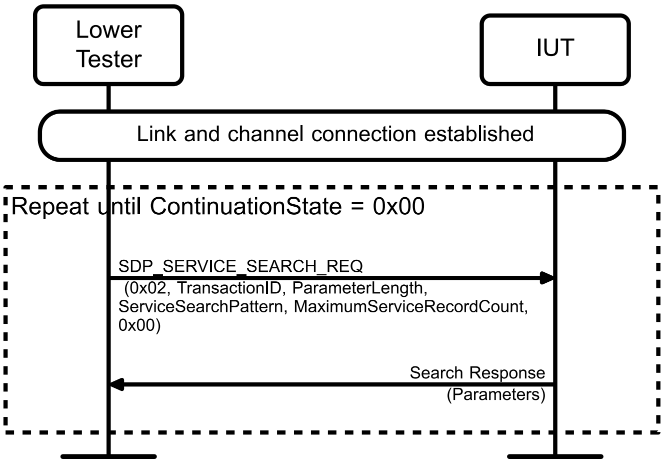

Lower Tester
IUT
Link and channel connection established
Repeat until ContinuationState = 0x00
SDP_SERVICE_SEARCH_REQ
(0x02, TransactionID, ParameterLength, ServiceSearchPattern, MaximumServiceRecordCount, 0x00)
Search Response
(Parameters)

Figure 4.1: Service Search Request

Repeat Steps 1 and 2 until the ContinuationState sent by the IUT = 0x00.

1. The Lower Tester sends an SDP_SERVICE_SEARCH_REQ to the IUT with PDU ID set to 0x02, TransactionID, ParameterLength, ServiceSearchPattern set to TSPX_sdp_service_search_pattern, MaximumServiceRecordCount, ParameterLength, and the Search Feature specified in Table 4.2.
2. The IUT responds with the Search Response and Parameters listed in Table 4.2.

- Expected Outcome

Pass verdict

In Step 2, the IUT responds with the correct Search Response from Table 4.2.

The structure of the returned records is correctly formatted and uses correct element types and sizes.

4.3 Service Attribute Request procedures

Verify the correct implementation of the Service Attribute Request services.

4.3.1 Server

The IUT is the Server and the Lower Tester is the Client.

4.3.1.1 Service Attribute Request

- Test Purpose

  Verify that the IUT can respond with attribute(s).

- Reference

  [1] 4.6, 5.1

- Initial Condition
  - A link and channel connection with the Lower Tester is set up. A CID has been established.
  - The ServiceSearchPattern value as defined in Table 4.3 is declared as an IXIT value.

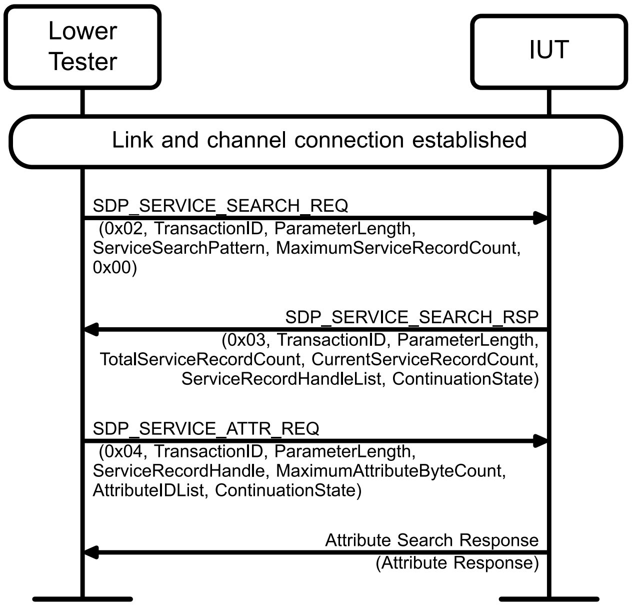
- Test Case Configuration

Test Case	Attribute Request	Attribute Search Response	Search Pattern IXIT
SDP/SR/SA/BV-01-C [Service Attribute Request]	AttributeList = Any Attribute(s)	SDP_SERVICE_ATTR_RSP	TSPX_sdp_service_search_pattern
SDP/SR/SA/BV-04-C [Service Attribute Request, ServiceID]	AttributeList = ServiceID	SDP_SERVICE_ATTR_RSP	TSPX_sdp_service_id
SDP/SR/SA/BV-05-C [Service Attribute Request, ProtocolDescriptorList]	AttributeList = ProtocolDescriptorList	SDP_SERVICE_ATTR_RSP	TSPX_sdp_protocol_descriptor_list
SDP/SR/SA/BV-06-C [Service Attribute Request, ServiceRecordState]	AttributeList = ServiceRecordState	SDP_SERVICE_ATTR_RSP	TSPX_sdp_service_record_state
SDP/SR/SA/BV-07-C [Service Attribute Request, ServiceInfoTime]	AttributeList = ServiceInfoTime	SDP_SERVICE_ATTR_RSP	TSPX_sdp_service_info_time_to_live
SDP/SR/SA/BV-08-C [Service Attribute Request, BrowseGroupList]	AttributeList = BrowseGroupList	SDP_SERVICE_ATTR_RSP	TSPX_sdp_browse_group_list
SDP/SR/SA/BV-09-C [Service Attribute Request, LanguageBaseAttributeIDList]	AttributeList = LanguageBaseAttributeIDList	SDP_SERVICE_ATTR_RSP	TSPX_sdp_language_base_attribute_id_list
SDP/SR/SA/BV-10-C [Service Attribute Request, ServiceAvailability]	AttributeList = ServiceAvailability	SDP_SERVICE_ATTR_RSP	TSPX_sdp_service_availability
SDP/SR/SA/BV-11-C [Service Attribute Request, IconURL]	AttributeList = IconURL	SDP_SERVICE_ATTR_RSP	TSPX_sdp_icon_url
SDP/SR/SA/BV-15-C [Service Attribute Request, VersionNumberList]	AttributeList = VersionNumberList	SDP_SERVICE_ATTR_RSP	TSPX_sdp_version_number_list
SDP/SR/SA/BV-16-C [Service Attribute Request, ServiceDatabaseState]	AttributeList = ServiceDatabaseState	SDP_SERVICE_ATTR_RSP	TSPX_sdp_service_data_base_state
SDP/SR/SA/BV-17-C [Service Attribute Request, BluetoothProfileDescriptorList]	AttributeList = BluetoothProfileDescriptorList	SDP_SERVICE_ATTR_RSP	TSPX_sdp_bluetooth_profile_descriptor_list
SDP/SR/SA/BV-18-C [Service Attribute Request, DocumentationURL]	AttributeList = DocumentationURL	SDP_SERVICE_ATTR_RSP	TSPX_sdp_documentation_url
SDP/SR/SA/BV-19-C [Service Attribute Request, ClientExecutableURL]	AttributeList = ClientExecutableURL	SDP_SERVICE_ATTR_RSP	TSPX_sdp_client_exe_url

Test Case	Attribute Request	Attribute Search Response	Search Pattern IXIT
SDP/SR/SA/BV-20-C [Service Attribute Request, Non-existing Attribute]	AttributeList = TSPX_sdp_unsupported_attribute_id	SDP_SERVICE_ATTR_RSP	
SDP/SR/SA/BV-21-C [Service Attribute Request, AdditionalProtocolDescriptorLists]	AttributeList = AdditionalProtocolDescriptorLists	SDP_SERVICE_ATTR_RSP	TSPX_sdp_additional_protocol_descriptor_list
SDP/SR/SA/BI-02-C [Service Attribute Request, Invalid Syntax]	AttributeList = Existing Attribute, Invalid Request Coding	SDP_ERROR_RSP	N/A
SDP/SR/SA/BI-03-C [Service Attribute Request, Invalid PDU Size]	AttributeList = Existing Attribute, Invalid PDU Size	SDP_ERROR_RSP	N/A

Table 4.3: Service Attribute Request

- Test Procedure



Lower Tester
IUT
Link and channel connection established
SDP_SERVICE_SEARCH_REQ
(0x02, TransactionID, ParameterLength, ServiceSearchPattern, MaximumServiceRecordCount, 0x00)
SDP_SERVICE_SEARCH_RSP
(0x03, TransactionID, ParameterLength, TotalServiceRecordCount, CurrentServiceRecordCount, ServiceRecordHandleList, ContinuationState)
SDP_SERVICE_ATTR_REQ
(0x04, TransactionID, ParameterLength, ServiceRecordHandle, MaximumAttributeByteCount, AttributeIDList, ContinuationState)
Attribute Search Response
(Attribute Response)

Figure 4.2: Service Attribute Request

1. The Lower Tester sends an SDP_SERVICE_SEARCH_REQ to the IUT with PDU ID set to 0x02, TransactionID and ParameterLength, and ServiceSearchPattern as specified in Table 4.3, and MaximumServiceRecordCount.
2. The IUT sends an SDP_SERVICE_SEARCH_RSP to the Lower Tester with PDU ID set to 0x03, TransactionID and ParameterLength, CurrentServiceRecordCount, ServiceRecordHandleList, and ContinuationState.
3. The Lower Tester sends an SDP_SERVICE_ATTR_REQ to the IUT with PDU ID set to 0x04, ServiceRecordHandle, MaximumAttributeByteCount, the Attribute Request specified in Table 4.3, and the rest set to valid parameters.
4. The IUT sends the Attribute Search Response listed in Table 4.3 to the Lower Tester with a valid TransactionID, ParameterLength, AttributeListByteCount, ContinuationState (if applicable), and AttributeList containing the Attribute Response listed in Table 4.3.

- Expected Outcome

Pass verdict

The IUT responds with the correct Attribute Search Response listed in Table 4.3 upon reception of the SDP_SERVICE_ATTR_REQ and SDP_SERVICE_ATTR_RSP PDUs.

The structure of the returned records is correctly formatted and uses correct element types and sizes.

The IUT's returned AttributeListsByteCount value does not exceed MaximumAttributeByteCount.

4.3.1.2 Service Attribute Request, Language

- Test Purpose

  Verify that the IUT can respond with a ServiceName attribute.

- Reference

  [1] 5.1.15

- Initial Condition
  - A link and channel connection with the Lower Tester is set up. A CID has been established.
  - The ServiceSearchPattern value as defined in Table 4.4 is declared as an IXIT value.

- Test Case Configuration

Test Case	Attribute	Search Pattern IXIT
SDP/SR/SA/BV-12-C [Service Attribute Request, ServiceName]	ServiceName	TSPX_sdp_service_name
SDP/SR/SA/BV-13-C [Service Attribute Request, ServiceDescription]	ServiceDescription	TSPX_sdp_service_description
SDP/SR/SA/BV-14-C [Service Attribute Request, ProviderName]	ProviderName	TSPX_sdp_provider_name

Table 4.4: Service Attribute Request, Language

- Test Procedure

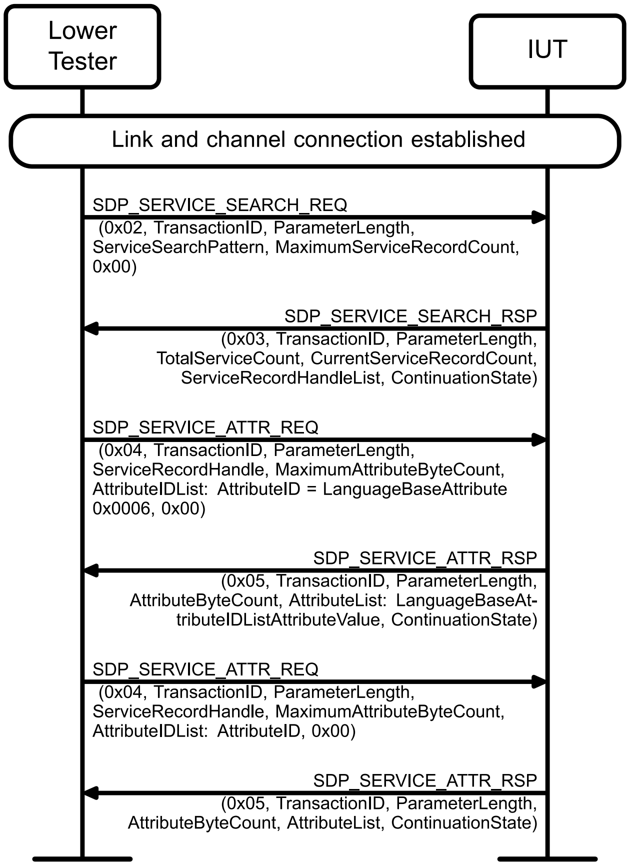

Lower Tester
IUT
Link and channel connection established
SDP_SERVICE_SEARCH_REQ
(0x02, TransactionID, ParameterLength, ServiceSearchPattern, MaximumServiceRecordCount, 0x00)
SDP_SERVICE_SEARCH_RSP
(0x03, TransactionID, ParameterLength, TotalServiceCount, CurrentServiceRecordCount, ServiceRecordHandleList, ContinuationState)
SDP_SERVICE_ATTR_REQ
(0x04, TransactionID, ParameterLength, ServiceRecordHandle, MaximumAttributeByteCount, AttributeIDList: AttributeID = LanguageBaseAttribute 0x0006, 0x00)
SDP_SERVICE_ATTR_RSP
(0x05, TransactionID, ParameterLength, AttributeByteCount, AttributeList: LanguageBaseAttributeIDListAttributeValue, ContinuationState)
SDP_SERVICE_ATTR_REQ
(0x04, TransactionID, ParameterLength, ServiceRecordHandle, MaximumAttributeByteCount, AttributeIDList: AttributeID, 0x00)
SDP_SERVICE_ATTR_RSP
(0x05, TransactionID, ParameterLength, AttributeByteCount, AttributeList, ContinuationState)

Figure 4.3: Service Attribute Request, Language

1. The Lower Tester sends an SDP_SERVICE_SEARCH_REQ to the IUT with PDU ID set to 0x02, valid TransactionID, ParameterLength, ServiceSearchPattern as specified in Table 4.4, and MaximumServiceRecordCount.
2. The IUT sends an SDP_SERVICE_SEARCH_RSP to the Lower Tester with PDU ID set to 0x03, TransactionID, ParameterLength, TotalServiceCount, CurrentServiceRecordCount, ServiceRecordHandleList, and ContinuationState.
3. The Lower Tester sends an SDP_SERVICE_ATTR_REQ to the IUT with PDU ID set to 0x04, TransactionID, ParameterLength, ServiceRecordHandle, MaximumAttributeByteCount, and AttributeList containing the TSPX_sdp_language_base_attribute_id_list AttributeID.
4. The IUT sends an SDP_SERVICE_ATTR_RSP to the Lower Tester with PDU ID set to 0x05, a valid TransactionID, ParameterLength, AttributeByteCount, ContinuationState, and containing the AttributeIDList containing the LanguageAttributeBaseIDList values.
5. The Lower Tester sends an SDP_SERVICE_ATTR_REQ to the IUT with PDU ID set to 0x04, TransactionID, ParameterLength, ServiceRecordHandle, MaximumAttributeByteCount, and AttributeIDList set to the Attribute specified in Table 4.4.
6. The IUT sends an SDP_SERVICE_ATTR_RSP to the Lower Tester with PDU ID set to 0x05, a valid TransactionID, ParameterLength, AttributeByteCount, ContinuationState, and AttributeList containing the Attribute listed in Table 4.4.

- Expected Outcome

  Pass verdict

  In Step 6, the IUT responds with the requested Attribute specified in Table 4.4.

  The structure of the returned records is correctly formatted and uses correct element types and sizes.

- Notes

  ContinuationState in response is of no interest in this test and can be disregarded.

SDP/SR/SA/BV-03-C [Service Attribute Request, ContinuationState]

- Test Purpose

  Verify that the IUT can respond with the existing Attribute(s) using ContinuationState.

- Reference

  [1] 4.6, 5.1.4

- Initial Condition

  - A link and channel connection with the Lower Tester is set up. A CID has been established.
  - The ServiceSearchPattern value (TSPX_sdp_service_search_pattern) is declared as an IXIT value.

- Test Procedure

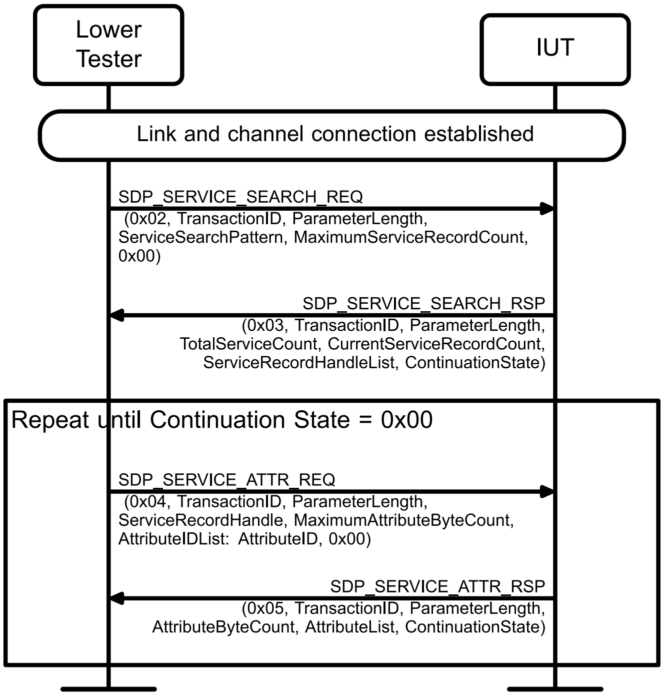

Lower Tester
IUT
Link and channel connection established
SDP_SERVICE_SEARCH_REQ
(0x02, TransactionID, ParameterLength, ServiceSearchPattern, MaximumServiceRecordCount, 0x00)
SDP_SERVICE_SEARCH_RSP
(0x03, TransactionID, ParameterLength, TotalServiceCount, CurrentServiceRecordCount, ServiceRecordHandleList, ContinuationState)
Repeat until Continuation State = 0x00
SDP_SERVICE_ATTR_REQ
(0x04, TransactionID, ParameterLength, ServiceRecordHandle, MaximumAttributeByteCount, AttributeIDList: AttributeID, 0x00)
SDP_SERVICE_ATTR_RSP
(0x05, TransactionID, ParameterLength, AttributeByteCount, AttributeList, ContinuationState)

Figure 4.4: SDP/SR/SA/BV-03-C [Service Attribute Request, ContinuationState]

1. The Lower Tester sends an SDP_SERVICE_SEARCH_REQ to the IUT with PDU ID set to 0x02, TransactionID and ParameterLength, ServiceSearchPattern set to TSPX_sdp_service_search_pattern, and MaximumServiceRecordCount.
2. The IUT sends an SDP_SERVICE_SEARCH_RSP to the Lower Tester with PDU ID set to 0x03, TransactionID and ParameterLength TotalServiceCount, CurrentServiceRecordCount count, ServiceRecordHandleList, and ContinuationState.

Repeat Steps 3 and 4 until ContinuationState = 0x00 in Step 4:

3. The Lower Tester sends an SDP_SERVICE_ATTR_REQ to the IUT with PDU ID set to 0x04, TransactionID and ParameterLength, ServiceRecordHandle, MaximumAttributeByteCount, and AttributeIDList.
4. The IUT sends an SDP_SERVICE_ATTR_RSP to the Lower Tester with PDU ID set to 0x05, a valid TransactionID and ParameterLength, AttributeByteCount, ContinuationState, and AttributeList.

- Expected Outcome

  Pass verdict

  In Step 4, the IUT responds with AttributeList upon reception of the corresponding SDP_SERVICE_ATTR_REQ PDU.

  The IUT continues sending SDP_SERVICE_ATTR_RSP PDUs to the Lower Tester until ContinuationState = 0x00.

  The structure of the returned records is correctly formatted and uses correct element types and sizes.

SDP/SR/SA/BI-01-C [Service Attribute Request, Invalid ServiceRecordHandle]

- Test Purpose

  Verify the correct behavior of the IUT when searching for an existing Attribute using an invalid ServiceRecordHandle.

- Reference

  [1] 4.4

- Initial Condition

  - A link and channel connection with the Lower Tester is set up. A CID has been established.

- Test Procedure

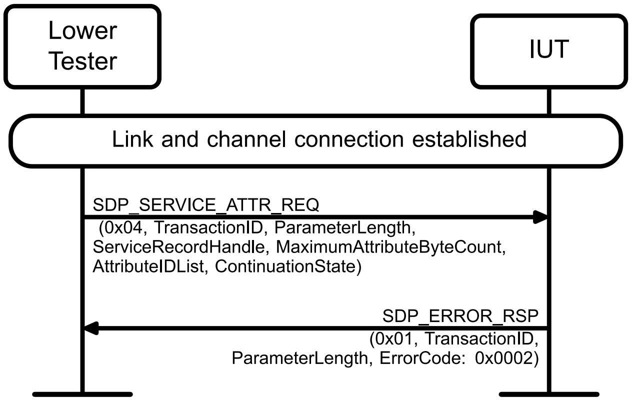

Lower Tester
IUT
Link and channel connection established
SDP_SERVICE_ATTR_REQ
(0x04, TransactionID, ParameterLength, ServiceRecordHandle, MaximumAttributeByteCount, AttributeIDList, ContinuationState)
SDP_ERROR_RSP
(0x01, TransactionID, ParameterLength, ErrorCode: 0x0002)

Figure 4.5: SDP/SR/SA/BI-01-C [Service Attribute Request, Invalid ServiceRecordHandle]

1. The Lower Tester sends an SDP_SERVICE_ATTR_REQ to the IUT with PDU ID set to 0x04, TransactionID and ParameterLength, ServiceRecordHandle, MaximumAttributeByteCount, and AttributeList with an invalid ServiceRecordHandle.
2. The IUT sends an SDP_ERROR_RSP to the Lower Tester with PDU ID set to 0x01, a valid TransactionID and ParameterLength, ErrorCode set to 0x0002.

- Expected Outcome

  Pass verdict

  In Step 2, the IUT responds with SDP_ERROR_RSP with the ErrorCode 0x0002 upon reception of the SDP_SERVICE_ATTR_REQ and SDP_SERVICE_ATTR_RSP PDUs.

  The structure of the returned records is correctly formatted and uses correct element types and sizes.

4.3.2 Client

SDP/CL/SA/BV-01-C [Service Attribute Request, Client]

- Test Purpose

  Verify that the IUT properly sends a Service Search Attribute Request.

- Reference

  [1] 4.6, 5.1.4

- Initial Condition
  - A link and channel connection with the Lower Tester is set up. A CID has been established.
- Test Procedure

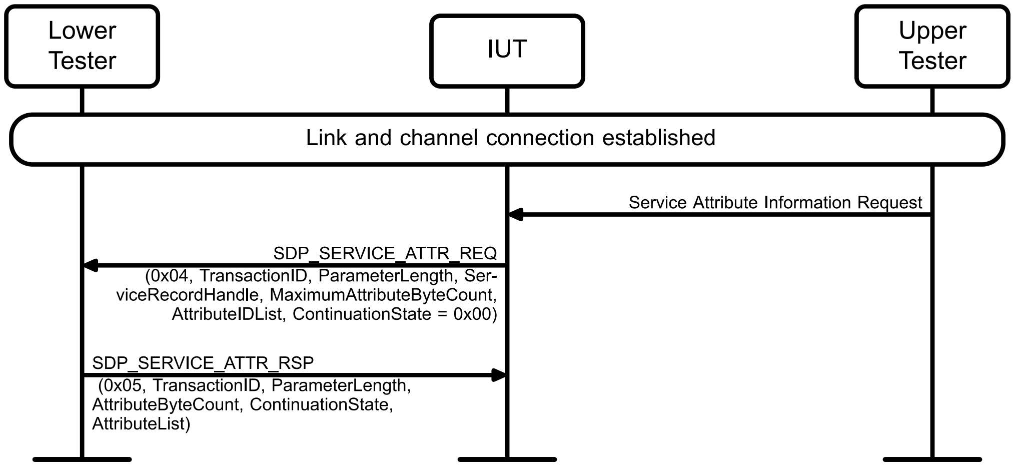

Lower Tester
IUT
Upper Tester
Link and channel connection established
Service Attribute Information Request
SDP_SERVICE_ATTR_REQ
(0x04, TransactionID, ParameterLength, ServiceRecordHandle, MaximumAttributeByteCount, AttributeIDList, ContinuationState = 0x00)
SDP_SERVICE_ATTR_RSP
(0x05, TransactionID, ParameterLength, AttributeByteCount, ContinuationState, AttributeList)

Figure 4.6: SDP/CL/SA/BV-01-C [Service Attribute Request, Client]

1. The Upper Tester commands the IUT to send an SDP_SERVICE_ATTR_REQ with valid attributes.
2. The IUT sends an SDP_SERVICE_ATTR_REQ to the Lower Tester with PDU ID set to 0x04, TransactionID and ParameterLength, ServiceRecordHandle, MaximumAttributeByteCount, and AttributeIDList and ContinuationState = 0x00.
3. The Lower Tester sends an SDP_SERVICE_ATTR_RSP to the Lower Tester with PDU ID set to 0x05, a valid TransactionID and ParameterLength, AttributeByteCount, ContinuationState, and AttributeList.

- Expected Outcome

  Pass verdict

  In Step 2, the IUT sends an SDP_SERVICE_ATTR_REQ to the Lower Tester with AttributeList UUIDs listed in ascending order with no duplicates.

4.4 Service Search Attribute Request procedures

Verify the correct implementation of the Service Search Attribute Request services.

4.4.1 Server

The IUT is the Server and the Lower Tester is the Client.

4.4.1.1 Service Search Attribute Request

- Test Purpose

  Verify the correct behavior of the IUT when searching for a non-existing Service or an existing Attribute using SDP_SERVICE_SEARCH_ATTR_REQ.

- Reference

  [1] 4.7

- Initial Condition

  - A link and channel connection with the Lower Tester is set up. A CID has been established.
  - The ServiceSearchPattern value as defined in Table 4.5 is declared as an IXIT value.

- Test Case Configuration

Test Case	Attribute	Search Pattern IXIT	Response Feature
SDP/SR/SSA/BV-01-C [Service Search Attribute Request, Non-existing Service]	AttributeIDList = ServiceClassIDList	TSPX_sdp_unsupported_service	EMPTY
SDP/SR/SSA/BV-02-C [Service Search Attribute Request, Non-existing Attribute]	AttributeIDList = TSPX_sdp_unsupported_attribute_id	TSPX_sdp_service_search_pattern	EMPTY
SDP/SR/SSA/BV-03-C [Service Search Attribute Request, Non-existing Service and Non-existing Attribute]	AttributeIDList = TSPX_sdp_unsupported_attribute_id	TSPX_sdp_unsupported_service	EMPTY
SDP/SR/SSA/BV-04-C [Service Search Attribute Request, Existing Service(s) and existing Attribute(s)]	AttributeIDList = Exisiting Attribute	TSPX_sdp_service_search_pattern	Any valid existing Attribute(s)
SDP/SR/SSA/BV-08-C [Service Search Attribute Request, ServiceDataBaseState]	AttributeIDList = ServiceDatabaseState	TSPX_sdp_service_data_base_state	ServiceDatabaseState
SDP/SR/SSA/BV-09-C [Service Search Attribute Request, ServiceInfoTimeToLive]	AttributeIDList = ServiceInfoTimeToLive	TSPX_sdp_service_info_time_to_live	ServiceInfoTimeToLive
SDP/SR/SSA/BV-10-C [Service Search Attribute Request, SDP_SERVICE_SEARCH_ATTR_REQ]	AttributeIDList = ServiceID	TSPX_sdp_service_id	ServiceID
SDP/SR/SSA/BV-11-C [Service Search Attribute Request, ProtocolDescriptorList]	AttributeIDList = ProtocolDescriptorList	TSPX_sdp_protocol_descriptor_list	ProtocolDescriptorList
SDP/SR/SSA/BV-12-C [Service Search Attribute Request, BrowseGroupList]	AttributeIDList = BrowseGroupList	TSPX_sdp_browse_group_list	BrowseGroupList
SDP/SR/SSA/BV-13-C [Service Search Attribute Request, LanguageBaseAttributeIDList]	AttributeIDList = LanguageBaseAttributeIDList	TSPX_sdp_language_base_attribute_id_list	LanguageBaseAttributeIDList
SDP/SR/SSA/BV-14-C [Service Search Attribute Request, ServiceAvailability]	AttributeIDList = ServiceAvailability	TSPX_sdp_service_availability	ServiceAvailability
SDP/SR/SSA/BV-15-C [Service Search Attribute Request, IconURL]	AttributeIDList = IconURL	TSPX_sdp_icon_url	IconURL
SDP/SR/SSA/BV-19-C [Service Search Attribute Request, VersionNumberList]	AttributeIDList = VersionNumberList	TSPX_sdp_version_number_list	VersionNumberList
SDP/SR/SSA/BV-20-C [Service Search Attribute Request, BluetoothProfileDescriptorList]	AttributeIDList = BluetoothProfileDescriptorList	TSPX_sdp_bluetooth_profile_descriptor_list	BluetoothProfileDescriptorList
SDP/SR/SSA/BV-21-C [Service Search Attribute Request, DocumentationURL]	AttributeIDList = DocumentationURL	TSPX_sdp_documentation_url	DocumentationURL
SDP/SR/SSA/BV-22-C [Service Search Attribute Request, ClientExecutableURL]	AttributeIDList = ClientExecutableURL	TSPX_sdp_client_exe_url	ClientExecutableURL

Test Case	Attribute	Search Pattern IXIT	Response Feature
SDP/SR/SSA/BV-23-C [Service Search Attribute Request, AdditionalProtocolDescriptorLists]	AttributeIDList = AdditionalProtocolDescriptorLists	TSPX_sdp_additional_protocol_descriptor_list	AdditionalProtocolDescriptorLists

Table 4.5: Service Search Attribute Request

- Test Procedure

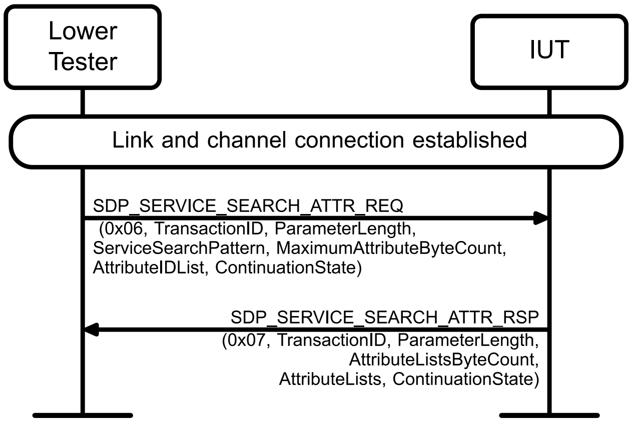

Lower Tester
IUT
Link and channel connection established
SDP_SERVICE_SEARCH_ATTR_REQ
(0x06, TransactionID, ParameterLength, ServiceSearchPattern, MaximumAttributeByteCount, AttributeIDList, ContinuationState)
SDP_SERVICE_SEARCH_ATTR_RSP
(0x07, TransactionID, ParameterLength, AttributeListsByteCount, AttributeLists, ContinuationState)

Figure 4.7: Service Search Attribute Request

1. The Lower Tester sends an SDP_SERVICE_SEARCH_ATTR_REQ to the IUT with PDU ID set to 0x06, TransactionID and ParameterLength, MaximumAttributeByteCount, ServiceSearchPattern, and AttributeIDList as specified in Table 4.5 and ContinuationState.
2. The IUT sends an SDP_SERVICE_SEARCH_ATTR_RSP to the Lower Tester with PDU ID set to 0x07, valid TransactionID and ParameterLength, AttributeListsByteCount, ContinuationState, and AttributeLists containing the Response Feature listed in Table 4.5.

- Expected Outcome

Pass verdict

In Step 2, the IUT responds with the requested Response Feature in Table 4.5.

The structure of the returned records is correctly formatted and uses correct element types and sizes.

4.4.1.2 Service Search Attribute Request, ContinuationState

- Test Purpose

Verify the correct behavior of the IUT when searching for existing Attributes using ContinuationState and SDP_SERVICE_SEARCH_ATTR_REQ.

- Reference

[1] 4.7

- Initial Condition

  - A link and channel connection with the Lower Tester is set up. A CID has been established.
  - The ServiceSearchPattern value (TSPX_sdp_service_search_pattern) is declared as an IXIT value.
  - The ServiceSearchPattern value as defined in Table 4.6 is declared as an IXIT value.

- Test Case Configuration

Test Case	Attribute	Search Pattern IXIT	Response Feature
SDP/SR/SSA/BV-06-C [Service Search Attribute Request, ContinuationState Existing Attribute]	AttributeIDList = Existing Attribute	TSPX_sdp_service_search_pattern	Any valid exisiting Attribute(s)

Test Case	Attribute	Search Pattern IXIT	Response Feature
SDP/SR/SSA/BV-07-C [Service Search Attribute Request, ContinuationState ServiceRecordState]	AttributeIDList = ServiceRecordState	TSPX_sdp_service_record_state	ServiceRecordState

Table 4.6: Service Search Attribute Request, ContinuationState

- Test Procedure

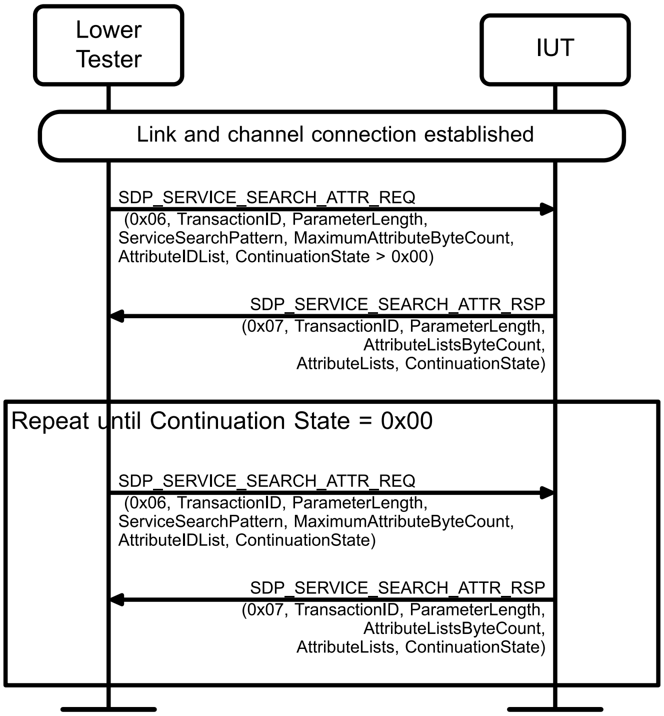

Lower Tester
IUT
Link and channel connection established
SDP_SERVICE_SEARCH_ATTR_REQ
(0x06, TransactionID, ParameterLength, ServiceSearchPattern, MaximumAttributeByteCount, AttributeIDList, ContinuationState > 0x00)
SDP_SERVICE_SEARCH_ATTR_RSP
(0x07, TransactionID, ParameterLength, AttributeListsByteCount, AttributeLists, ContinuationState)
Repeat until Continuation State = 0x00
SDP_SERVICE_SEARCH_ATTR_REQ
(0x06, TransactionID, ParameterLength, ServiceSearchPattern, MaximumAttributeByteCount, AttributeIDList, ContinuationState)
SDP_SERVICE_SEARCH_ATTR_RSP
(0x07, TransactionID, ParameterLength, AttributeListsByteCount, AttributeLists, ContinuationState)

Figure 4.8: Service Search Attribute Request, ContinuationState

1. The Lower Tester sends an SDP_SERVICE_SEARCH_ATTR_REQ to the IUT with PDU ID set to 0x06, TransactionID and ParameterLength, MaximumAttributeByteCount, ServiceSearchPattern, and AttributeList set to the Search Feature in Table 4.6, and ContinuationState greater than 0x00.
2. The IUT sends an SDP_SERVICE_SEARCH_ATTR_RSP to the Lower Tester with PDU ID set to 0x07, valid TransactionID and ParameterLength, AttributeListsByteCount, ContinuationState, and AttributeList containing the Response Feature listed in Table 4.6.

Repeat Steps 3 and 4 until ContinuationState = 0x00 in Step 4:

3. The Lower Tester sends an SDP_SERVICE_SEARCH_ATTR_REQ to the IUT with PDU ID set to 0x06, TransactionID and ParameterLength, MaximumAttributeByteCount, ServiceSearchPattern, and AttributeList set to the Search Feature in Table 4.6, and ContinuationState.
4. The IUT sends an SDP_SERVICE_SEARCH_ATTR_RSP to the Lower Tester with PDU ID set to 0x07, valid TransactionID and ParameterLength, AttributeListsByteCount, ContinuationState, and AttributeLists containing the Response Feature listed in Table 4.6.

- Expected Outcome

<u>Pass verdict</u>

In Steps 2 and 4, the IUT responds with the Response Feature in Table 4.6 upon reception of the SDP_SERVICE_SEARCH_ATTR_REQ PDU.

The structure of the returned records is correctly formatted and uses correct element types and sizes.

4.4.1.3 Service Search Attribute Request, Language

- Test Purpose

  Verify the correct behavior of the IUT when searching for existing Service(s) and Attributes using SDP_SERVICE_SEARCH_ATTR_REQ.

- Reference

  [1] 4.7, 5.1.14

- Initial Condition

  - A link and channel connection with the Lower Tester is set up. A CID has been established.
  - The ServiceSearchPattern value as defined in Table 4.7 is declared as an IXIT value, as Search Pattern IXIT.

- Test Case Configuration

Test Case	Attribute for Search Feature	Search Pattern IXIT	Attribute Response
SDP/SR/SSA/BV-16-C [Service Search Attribute Request, ServiceName]	BaseAttributeID+ 0x0000	TSPX_sdp_service_name	ServiceName
SDP/SR/SSA/BV-17-C [Service Search Attribute Request, ServiceDescription]	BaseAttributeID+ 0x0001	TSPX_sdp_service_description	ServiceDescription
SDP/SR/SSA/BV-18-C [Service Search Attribute Request, ProviderName]	BaseAttributeID+ 0x0002	TSPX_sdp_provider_name	ProviderName

Table 4.7: Service Search Attribute Request, Language

- Test Procedure

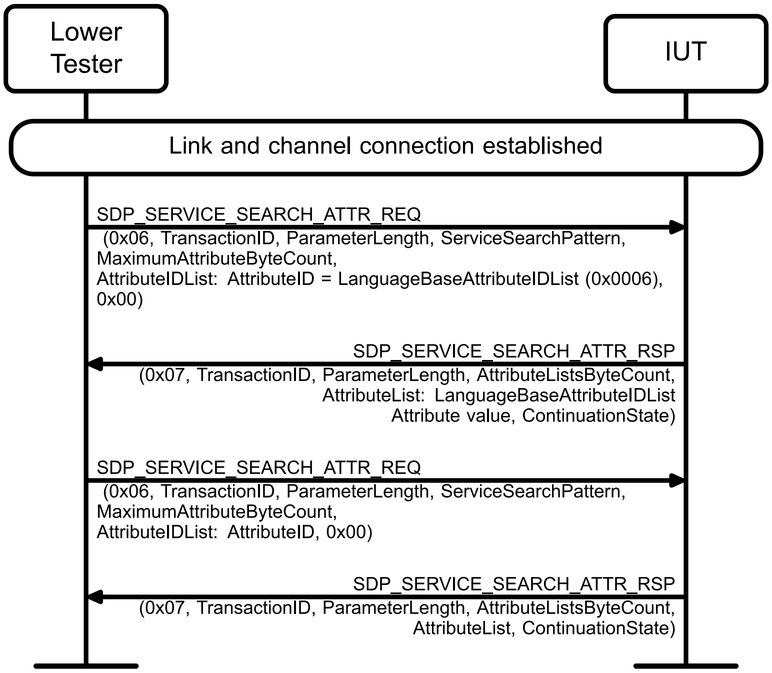

Lower Tester
IUT
Link and channel connection established
SDP_SERVICE_SEARCH_ATTR_REQ
(0x06, TransactionID, ParameterLength, ServiceSearchPattern, MaximumAttributeByteCount, AttributeIDList: AttributeID = LanguageBaseAttributeIDList (0x0006), 0x00)
SDP_SERVICE_SEARCH_ATTR_RSP
(0x07, TransactionID, ParameterLength, AttributeListsByteCount, AttributeList: LanguageBaseAttributeIDList Attribute value, ContinuationState)
SDP_SERVICE_SEARCH_ATTR_REQ
(0x06, TransactionID, ParameterLength, ServiceSearchPattern, MaximumAttributeByteCount, AttributeIDList: AttributeID, 0x00)
SDP_SERVICE_SEARCH_ATTR_RSP
(0x07, TransactionID, ParameterLength, AttributeListsByteCount, AttributeList, ContinuationState)

Figure 4.9: Service Search Attribute Request, Language

1. The Lower Tester sends an SDP_SERVICE_SEARCH_ATTR_REQ to the IUT with PDU ID set to 0x06, TransactionID, ParameterLength, ServiceSearchPattern as specified in Table 4.7, MaximumAttributeByteCount, AttributeList containing the LanguageBaseAttributeIDList AttributeID, and ContinuationState.
2. The IUT sends an SDP_SERVICE_SEARCH_ATTR_RSP to the Lower Tester with PDU ID set to 0x07, valid TransactionID and ParameterLength AttributeListsByteCount, AttributeLists containing the LanguageBaseAttributeIDList service record, and ContinuationState.
3. The Lower Tester sends an SDP_SERVICE_SEARCH_ATTR_REQ to the IUT with PDU ID set to 0x06, TransactionID, ParameterLength, ServiceSearchPattern as specified in Table 4.7, MaximumAttributeByteCount, AttributeIDList containing the Search Feature in Table 4.7, and ContinuationState.
4. The IUT sends an SDP_SERVICE_SEARCH_ATTR_RSP to the Lower Tester with PDU ID set to 0x07, valid TransactionID, ParameterLength, AttributeListsByteCount, AttributeLists containing the Attribute Response listed in Table 4.7, and ContinuationState.

- Expected Outcome

  Pass verdict

  In Step 4, the IUT responds with the Attribute Response specified in Table 4.7.

  The structure of the returned records is correctly formatted and uses correct element types and sizes.

4.4.1.4 Service Search Attribute Request, Invalid Request

- Test Purpose

  Verify the correct behavior of the IUT when the server searches for existing Attributes using the SDP_SERVICE_SEARCH_ATTR_REQ PDU with invalid request syntax.

- Reference

  [1] 4.4, 4.7

- Initial Condition

  - A link and channel connection with the Lower Tester is set up. A CID has been established.
  - The ServiceSearchPattern value (TSPX_sdp_service_search_pattern) is declared as an IXIT value.

- Test Case Configuration

Test Case	Search Feature	ErrorCode Response
SDP/SR/SSA/BI-01-C [Service Search Attribute Request, Invalid Syntax]	Invalid request syntax	0x0003
SDP/SR/SSA/BI-02-C [Service Search Attribute Request, Invalid PDU size]	Invalid PDU size	0x0004

Table 4.8: Service Search Attribute Request, Invalid Request

- Test Procedure

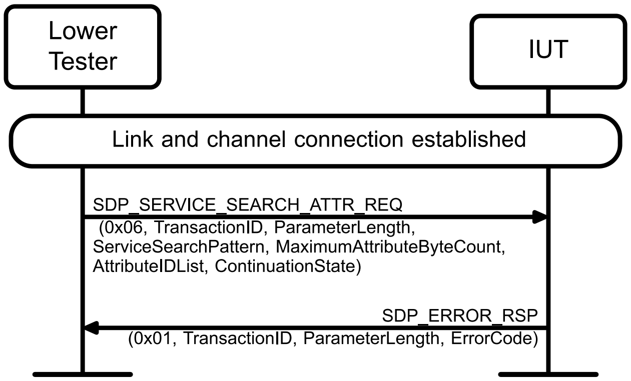

Lower Tester
IUT
Link and channel connection established
SDP_SERVICE_SEARCH_ATTR_REQ
(0x06, TransactionID, ParameterLength, ServiceSearchPattern, MaximumAttributeByteCount, AttributeIDList, ContinuationState)
SDP_ERROR_RSP
(0x01, TransactionID, ParameterLength, ErrorCode)

Figure 4.10: Service Search Attribute Request, Invalid Request

1. The Lower Tester sends an SDP_SERVICE_SEARCH_ATTR_REQ to the IUT with PDU ID set to 0x06, TransactionID and ParameterLength ServiceSearchPattern as specified in Table 4.8, MaximumAttributeByteCount, AttributeIDList containing the Search Feature in Table 4.8, and ContinuationState.
2. The IUT sends an SDP_ERROR_RSP to the Lower Tester with PDU ID set to 0x01, valid TransactionID and ParameterLength, and ErrorCode matching the Error Code Response listed in Table 4.8.

- Expected Outcome

  Pass verdict

  In Step 2, the IUT sends the SDP_ERROR_RSP PDU with the ErrorCode as specified in Table 4.8.

SDP/SR/SSA/BI-03-C [Service Search Attribute Request, Invalid ContinuationState]

- Test Purpose

  Verify the correct behavior of the IUT when the client searches for existing Attributes using the SDP_SERVICE_SEARCH_ATTR_REQ PDU with a ContinuationState that is not valid.

- Reference

  [1] 4.3

- Initial Condition

  - A link and channel connection with the Lower Tester is set up. A CID has been established.
  - The ServiceSearchPattern value, TSPX_sdp_service_search_pattern, is declared as IXIT.
  - The AttributeIDList value, TSPX_sdp_Attribute_ID_List, is declared as IXIT.
  - The IUT's SDP database must not change during the test.
  - Based on the database provided by the IUT, the Lower Tester generates a sequence of D octets of ID-value pairs where D > 7.

- Test Procedure

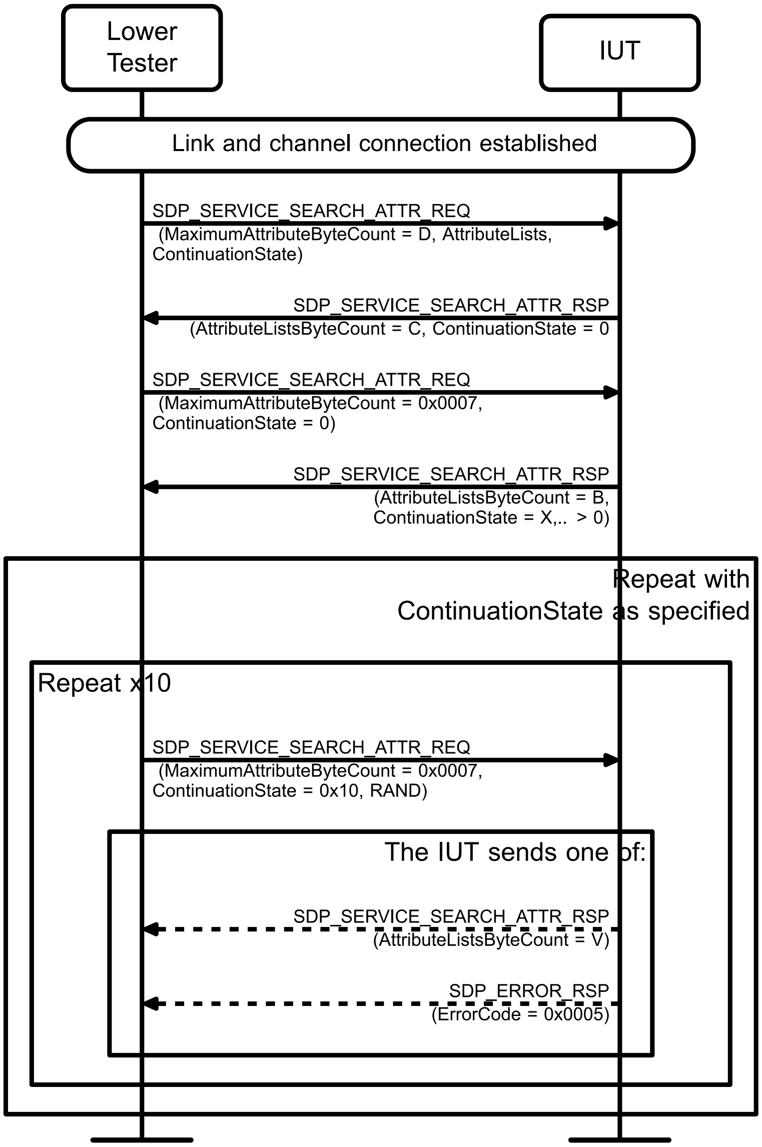

Lower Tester
IUT
Link and channel connection established
SDP_SERVICE_SEARCH_ATTR_REQ (MaximumAttributeByteCount = D, AttributeLists, ContinuationState)
SDP_SERVICE_SEARCH_ATTR_RSP (AttributeListsByteCount = C, ContinuationState = 0
SDP_SERVICE_SEARCH_ATTR_REQ (MaximumAttributeByteCount = 0x0007, ContinuationState = 0)
SDP_SERVICE_SEARCH_ATTR_RSP (AttributeListsByteCount = B, ContinuationState = X,.. > 0)
Repeat with ContinuationState as specified
Repeat x10
SDP_SERVICE_SEARCH_ATTR_REQ (MaximumAttributeByteCount = 0x0007, ContinuationState = 0x10, RAND)
The IUT sends one of:
SDP_SERVICE_SEARCH_ATTR_RSP (AttributeListsByteCount = V)
SDP_ERROR_RSP (ErrorCode = 0x0005)

Figure 4.11: SDP/SR/SSA/BI-03-C [Service Search Attribute Request, Invalid ContinuationState]

1. The Lower Tester sends an SDP_SERVICE_SEARCH_ATTR_REQ PDU to the IUT with ServiceSearchPattern and AttributeList as above, MaximumAttributeByteCount = D, and ContinuationState set to a single 0x00 octet.
2. The IUT replies with an SDP_SERVICE_SEARCH_ATTR_RSP PDU with AttributeListsByteCount equal to C, AttributeLists set to the first C octets of the ID-value pairs, and ContinuationState set to a single 0x00 octet if C = D or two or more octets, with the first one in the range 0x01 to 0x10, if C < D.
3. Repeat Step 1, but with MaximumAttributeByteCount = 0x0007.
4. The IUT replies with an SDP_SERVICE_SEARCH_ATTR_RSP PDU with AttributeListByteCount equal to a value B between 0x0002 and 0x0007, AttributeList set to the first B octets of the ID-value pairs, and ContinuationState set to two or more octets. The first octet, X, is in the range 0x01 to 0x10.
5. If the first octet X in the returned ContinuationState is 0x10, then jump to Step 9.

6. Repeat Step 3, but with ContinuationState with the first octet set to 0x10 octet followed by 16 random octets:
7. The IUT replies with either:
   a) An SDP_SERVICE_SEARCH_ATTR_RSP PDU with AttributeListByteCount equal to a value V between 0x0002 and 0x0007 and AttributeList set to V octets of data, which are the same as the V octets of data that immediately follow the first C octets of the ID-value pairs that the IUT responded with in Step 2.
   b) An SDP_ERROR_RSP PDU that has error code 0x0005 Invalid Continuation State.
8. Repeat Steps 6 and 7 10 times. The random octets in Step 6 must be different each time.
9. Repeat Steps 6–8. In Step 6, ContinuationState is set to the first octet X of the ContinuationState returned by the IUT in Step 4 followed by X random octets. The sequence of random octets must not be identical to the sequence returned in Step 4.

- Expected Outcome

  Pass verdict

  In Step 7, the IUT responds with either:

  - SDP_SERVICE_SEARCH_ATTR_RSP PDU with AttributeListByteCount equal to a value V between 0x0002 and 0x0007 and AttributeList set to V octets of data, which are the same as the V octets of data that immediately follow the first C octets of the ID-value pairs that the IUT responded with in Step 2.
  - An SDP_ERROR_RSP PDU with ErrorCode 0x0005 Invalid Continuation State.

4.4.2 Client

SDP/CL/SSA/BV-01-C [Service Search Attribute Request, Client]

- Test Purpose

  Verify that the IUT properly sends a Service Search Attribute Request.

- Reference

  [1] 4.7, 5.1.4

- Initial Condition

  - A link and channel connection with the Lower Tester is set up. A CID has been established.

- Test Procedure

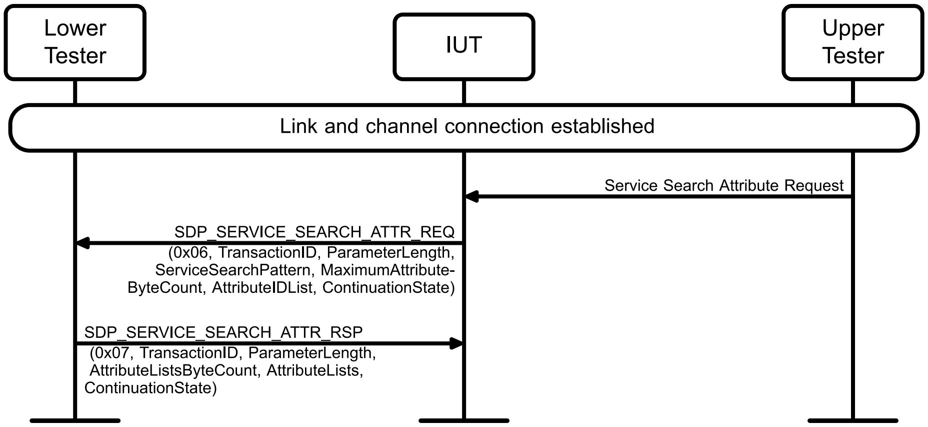

Lower Tester
IUT
Upper Tester
Link and channel connection established
Service Search Attribute Request
SDP_SERVICE_SEARCH_ATTR_REQ
(0x06, TransactionID, ParameterLength, ServiceSearchPattern, MaximumAttribute-ByteCount, AttributeIDList, ContinuationState)
SDP_SERVICE_SEARCH_ATTR_RSP
(0x07, TransactionID, ParameterLength, AttributeListsByteCount, AttributeLists, ContinuationState)

Figure 4.12: SDP/CL/SSA/BV-01-C [Service Search Attribute Request, Client]

1. The Upper Tester commands the IUT to send an SDP_SERVICE_SEARCH_ATTR_REQ with valid attribute IDs.
2. The IUT sends an SDP_SERVICE_SEARCH_ATTR_REQ to the Lower Tester with PDU ID set to 0x06, TransactionID and ParameterLength, and a valid ServiceSearchPattern.
3. The Lower Tester sends an SDP_SERVICE_SEARCH_ATTR_RSP to the IUT with PDU ID set to 0x07, a valid TransactionID and ParameterLength, AttributeListsByteCount, AttributeLists, and ContinuationState.

- Expected Outcome

  Pass verdict

  In Step 2, the IUT sends an SDP_SERVICE_SEARCH_ATTR_REQ to the Lower Tester with ContinuationState = 0x00 and AttributeLists UUIDs listed in ascending order with no duplicates.

4.5 Service Browse procedures

Verify the correct implementation of the Service Browse services.

4.5.1 Server

The IUT is the Server and the Lower Tester is the Client.

SDP/SR/BRW/BV-01-C [Service Browse]

- Test Purpose

  Verify that the IUT behaves correctly using SDP_SERVICE_SEARCH_REQ and SDP_SERVICE_ATTR_REQ for Service Browse.

- Reference

  [1] 2.8, 4.5, 4.6

- Initial Condition

  - A link and channel connection with the Lower Tester is set up. A CID has been established.

- Test Procedure

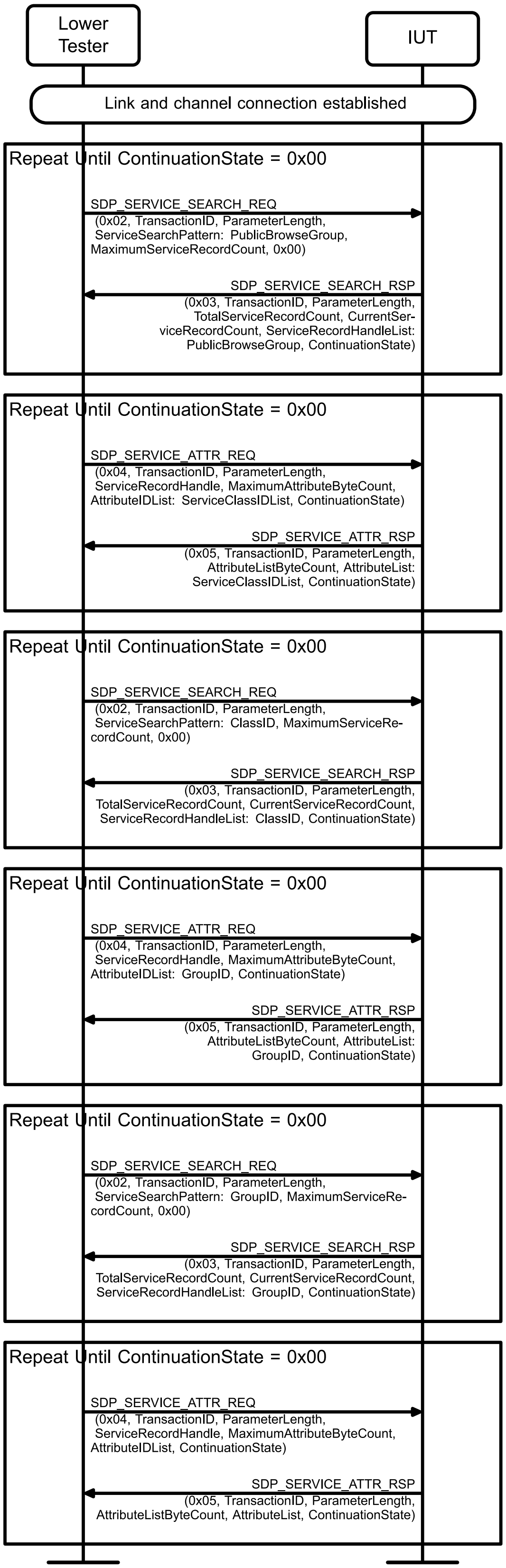

Lower Tester
IUT
Link and channel connection established
Repeat Until ContinuationState = 0x00
SDP_SERVICE_SEARCH_REQ
(0x02, TransactionID, ParameterLength, ServiceSearchPattern: PublicBrowseGroup, MaximumServiceRecordCount, 0x00)
SDP_SERVICE_SEARCH_RSP
(0x03, TransactionID, ParameterLength, TotalServiceRecordCount, CurrentServiceRecordCount, ServiceRecordHandleList: PublicBrowseGroup, ContinuationState)
Repeat Until ContinuationState = 0x00
SDP_SERVICE_ATTR_REQ
(0x04, TransactionID, ParameterLength, ServiceRecordHandle, MaximumAttributeByteCount, AttributeIDList: ServiceClassIDList, ContinuationState)
SDP_SERVICE_ATTR_RSP
(0x05, TransactionID, ParameterLength, AttributeListByteCount, AttributeList: ServiceClassIDList, ContinuationState)
Repeat Until ContinuationState = 0x00
SDP_SERVICE_SEARCH_REQ
(0x02, TransactionID, ParameterLength, ServiceSearchPattern: ClassID, MaximumServiceRecordCount, 0x00)
SDP_SERVICE_SEARCH_RSP
(0x03, TransactionID, ParameterLength, TotalServiceRecordCount, CurrentServiceRecordCount, ServiceRecordHandleList: ClassID, ContinuationState)
Repeat Until ContinuationState = 0x00
SDP_SERVICE_ATTR_REQ
(0x04, TransactionID, ParameterLength, ServiceRecordHandle, MaximumAttributeByteCount, AttributeIDList: GroupID, ContinuationState)
SDP_SERVICE_ATTR_RSP
(0x05, TransactionID, ParameterLength, AttributeListByteCount, AttributeList: GroupID, ContinuationState)
Repeat Until ContinuationState = 0x00
SDP_SERVICE_SEARCH_REQ
(0x02, TransactionID, ParameterLength, ServiceSearchPattern: GroupID, MaximumServiceRecordCount, 0x00)
SDP_SERVICE_SEARCH_RSP
(0x03, TransactionID, ParameterLength, TotalServiceRecordCount, CurrentServiceRecordCount, ServiceRecordHandleList: GroupID, ContinuationState)
Repeat Until ContinuationState = 0x00
SDP_SERVICE_ATTR_REQ
(0x04, TransactionID, ParameterLength, ServiceRecordHandle, MaximumAttributeByteCount, AttributeIDList, ContinuationState)
SDP_SERVICE_ATTR_RSP
(0x05, TransactionID, ParameterLength, AttributeListByteCount, AttributeList, ContinuationState)

Figure 4.13: SDP/SR/BRW/BV-01-C [Service Browse]

Repeat Steps 1 and 2 until ContinuationState = 0x00 in Step 2:

1. The Lower Tester sends an SDP_SERVICE_SEARCH_REQ to the IUT with the PublicBrowseGroup UUID in the ServiceSearchPattern.
2. The IUT sends an SDP_SERVICE_SEARCH_RSP to the Lower Tester with ServiceRecordHandleList containing the PublicBrowseGroup and ContinuationState.

Repeat Steps 3 and 4 until ContinuationState = 0x00 in Step 4:

3. The Lower Tester sends an SDP_SERVICE_ATTR_REQ to the IUT with the AttributeIDList containing the ServiceClassIDList.
4. The IUT sends an SDP_SERVICE_ATTR_RSP to the Lower Tester with the AttributeLists containing the ServiceClassIDList AttributeValue and ContinuationState.

Repeat Steps 5 and 6 until ContinuationState = 0x00 in Step 6:

5. The Lower Tester sends an SDP_SERVICE_SEARCH_REQ to the IUT with the BrowseGroupDescriptorClassID UUID in the ServiceSearchPattern.
6. The IUT sends an SDP_SERVICE_SEARCH_RSP to the Lower Tester with ServiceRecordHandleList containing the BrowseGroupDescriptorClassID and ContinuationState.

Repeat Steps 7 and 8 until ContinuationState = 0x00 in Step 8:

7. The Lower Tester sends an SDP_SERVICE_ATTR_REQ to the IUT with AttributeIDList containing the GroupID.
8. The IUT sends an SDP_SERVICE_ATTR_RSP to the Lower Tester with the AttributeLists containing the GroupID AttributeValue and ContinuationState.

Repeat Steps 9 and 10 until ContinuationState = 0x00 in Step 10:

9. The Lower Tester sends an SDP_SERVICE_SEARCH_REQ to the IUT with the GroupID UUID in the ServiceSearchPattern.
10. The IUT sends an SDP_SERVICE_SEARCH_RSP to the Lower Tester ServiceRecordHandleList containing the GroupID and ContinuationState.

Repeat Steps 11 and 12 until ContinuationState = 0x00 in Step 12:

11. The Lower Tester sends an SDP_SERVICE_ATTR_REQ to the IUT with AttributeIDList for every ServiceRecordHandle returned in Step 10.
12. The IUT sends an SDP_SERVICE_ATTR_RSP to the Lower Tester with the AttributeLists containing the matching AttributeValues from Step 11 and ContinuationState.

- Expected Outcome

  Pass verdict

  In Steps 2, 4, 6, 8, 10, and 12, the IUT responds with all available services and attributes.

  The structure of the returned records is correctly formatted and uses correct element types and sizes.

SDP/SR/BRW/BV-02-C [Service Browse, Search Attribute]

- Test Purpose

  Verify that the IUT correctly uses SDP_SERVICE_SEARCH_ATTR_REQ for Service Browse.

- Reference

  [1] 2.8, 4.7

- Initial Condition

  - A link and channel connection with the Lower Tester is set up. A CID has been established.
  - All relevant attribute values are declared as an IXIT value.

- Test Procedure

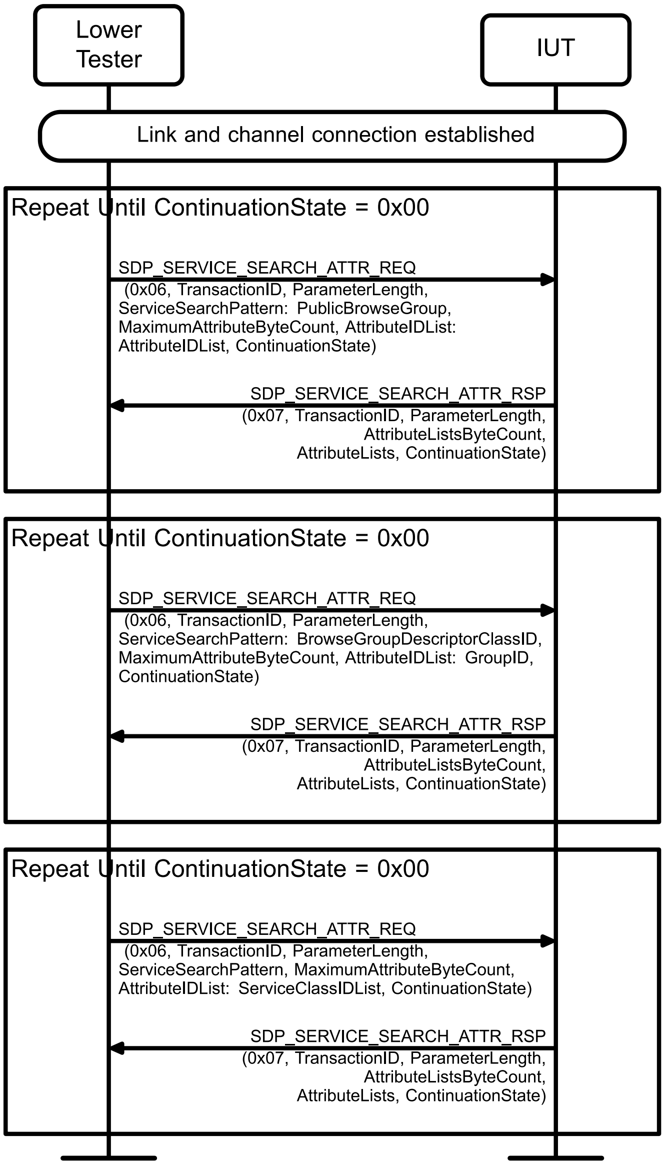

Lower Tester
IUT
Link and channel connection established
Repeat Until ContinuationState = 0x00
SDP_SERVICE_SEARCH_ATTR_REQ
(0x06, TransactionID, ParameterLength, ServiceSearchPattern: PublicBrowseGroup, MaximumAttributeByteCount, AttributeIDList: AttributeIDList, ContinuationState)
SDP_SERVICE_SEARCH_ATTR_RSP
(0x07, TransactionID, ParameterLength, AttributeListsByteCount, AttributeLists, ContinuationState)
Repeat Until ContinuationState = 0x00
SDP_SERVICE_SEARCH_ATTR_REQ
(0x06, TransactionID, ParameterLength, ServiceSearchPattern: BrowseGroupDescriptorClassID, MaximumAttributeByteCount, AttributeIDList: GroupID, ContinuationState)
SDP_SERVICE_SEARCH_ATTR_RSP
(0x07, TransactionID, ParameterLength, AttributeListsByteCount, AttributeLists, ContinuationState)
Repeat Until ContinuationState = 0x00
SDP_SERVICE_SEARCH_ATTR_REQ
(0x06, TransactionID, ParameterLength, ServiceSearchPattern, MaximumAttributeByteCount, AttributeIDList: ServiceClassIDList, ContinuationState)
SDP_SERVICE_SEARCH_ATTR_RSP
(0x07, TransactionID, ParameterLength, AttributeListsByteCount, AttributeLists, ContinuationState)

Figure 4.14: SDP/SR/BRW/BV-02-C [Service Browse, Search Attribute]

Repeat Steps 1 and 2 until ContinuationState = 0x00 in Step 2:

1. The Lower Tester sends an SDP_SERVICE_SEARCH_ATTR_REQ to the IUT with the PublicBrowseGroup UUID in the ServiceSearchPattern and ClassIDList in the AttributeIDList.
2. The IUT sends an SDP_SERVICE_SEARCH_ATTR_RSP to the Lower Tester with AttributeLists containing the PublicBrowseGroup and ClassIDList service records and ContinuationState.

Repeat Steps 3 and 4 until ContinuationState = 0x00 in Step 4:

3. The Lower Tester sends an SDP_SERVICE_SEARCH_ATTR_REQ to the IUT with the BrowseGroupDescriptorClassID and GroupID UUIDs in the ServiceSearchPattern.
4. The IUT sends an SDP_SERVICE_SEARCH_ATTR_RSP to the Lower Tester with AttributeLists containing the BrowseGroupDescriptorClassID and GroupIDList service records and ContinuationState.

Repeat Steps 5 and 6 until ContinuationState = 0x00 in Step 6:

5. The Lower Tester sends an SDP_SERVICE_SEARCH_ATTR_REQ to the IUT with every returned UUID from Step 4 and the AttributeServiceClassIDList UUID in the ServiceSearchPattern.
6. The IUT sends an SDP_SERVICE_SEARCH_ATTR_RSP to the Lower Tester with the matching service records from Step 4 and the AttributeServiceClassIDList service record and ContinuationState.

- Expected Outcome

  Pass verdict

  In Steps 2, 4, and 6, the IUT responds with all available services and attributes.

  The structure of the returned records is correctly formatted and uses correct element types and sizes.

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 SDP [2].

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 [4].

For the purpose and structure of the ICS/IXIT, refer to [4].

Item	Feature	Test Case(s)
SDP 1b/1 AND SDP 2/1	ServiceSearch with 16, 32, or 128 bit UUID	SDP/SR/SS/BV-01-C
SDP 1b/1 AND SDP 2/2	ServiceSearch with ContinuationState, 16, 32, or 128 bit UUID	SDP/SR/SS/BV-03-C
SDP 1b/1	Error response to invalid ServiceSearch, with 16, 32, or 128 bit UUID Error response to invalid AttributeSearch	SDP/SR/SS/BI-01-C SDP/SR/SS/BI-02-C SDP/SR/SA/BI-01-C SDP/SR/SA/BI-02-C SDP/SR/SA/BI-03-C SDP/SR/SSA/BI-01-C SDP/SR/SSA/BI-02-C
SDP 1b/1 AND SDP 4/1	AttributeSearch	SDP/SR/SA/BV-01-C SDP/SR/SA/BV-20-C
SDP 1b/1 AND SDP 4/2	AttributeSearch using ContinuationState	SDP/SR/SA/BV-03-C
SDP 1b/1 AND SDP 4/1 AND SDP 9/1	AttributeSearch for attribute ServiceID	SDP/SR/SA/BV-04-C
SDP 1b/1 AND SDP 4/1 AND SDP 9/2	AttributeSearch for attribute ProtocolDescriptorList	SDP/SR/SA/BV-05-C
SDP 1b/1 AND SDP 4/1 AND SDP 9/3	AttributeSearch for attribute ServiceRecordState	SDP/SR/SA/BV-06-C
SDP 1b/1 AND SDP 4/1 AND SDP 9/4	AttributeSearch for attribute ServiceInfoTimeToLive	SDP/SR/SA/BV-07-C
SDP 1b/1 AND SDP 4/1 AND SDP 9/5	AttributeSearch for attribute BrowseGroupList	SDP/SR/SA/BV-08-C

Item	**Feature**	**Test Case(s)**
SDP 1b/1 AND SDP 4/1 AND SDP 9/6	AttributeSearch for attribute LanguageBasedAttributeIDList	SDP/SR/SA/BV-09-C
SDP 1b/1 AND SDP 4/1 AND SDP 9/7	AttributeSearch for attribute ServiceAvailability	SDP/SR/SA/BV-10-C
SDP 1b/1 AND SDP 4/1 AND SDP 9/8	AttributeSearch for attribute IconURL	SDP/SR/SA/BV-11-C
SDP 1b/1 AND SDP 4/1 AND SDP 9/6 AND SDP 9/9	AttributeSearch for attribute ServiceName	SDP/SR/SA/BV-12-C
SDP 1b/1 AND SDP 4/1 AND SDP 9/6 AND SDP 9/10	AttributeSearch for attribute ServiceDescription	SDP/SR/SA/BV-13-C
SDP 1b/1 AND SDP 4/1 AND SDP 9/6 AND SDP 9/11	AttributeSearch for attribute ProviderName	SDP/SR/SA/BV-14-C
SDP 1b/1 AND SDP 4/1 AND SDP 9/12	AttributeSearch for attribute VersionNumberList	SDP/SR/SA/BV-15-C
SDP 1b/1 AND SDP 4/1 AND SDP 9/13	AttributeSearch for attribute ServiceDataBaseState	SDP/SR/SA/BV-16-C
SDP 1b/1 AND SDP 4/1 AND SDP 9/14	AttributeSearch for attribute BluetoothProfileDescriptorList	SDP/SR/SA/BV-17-C
SDP 1b/1 AND SDP 4/1 AND SDP 9/15	AttributeSearch for attribute DocumentationURL	SDP/SR/SA/BV-18-C
SDP 1b/1 AND SDP 4/1 AND SDP 9/16	AttributeSearch for attribute ClientExecutableURL	SDP/SR/SA/BV-19-C
SDP 4/3	AttributeSearch for attribute AdditionalProtocolDescriptorLists	SDP/SR/SA/BV-21-C
SDP 1b/1 AND SDP 6/1	ServiceSearchAttribute with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-01-C SDP/SR/SSA/BV-02-C SDP/SR/SSA/BV-03-C SDP/SR/SSA/BV-04-C
SDP 1b/1 AND SDP 6/2	ServiceSearchAttribute using ContinuationState with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-06-C
SDP 6/2	Service Search, invalid ContinuationState	SDP/SR/SSA/BI-03-C
SDP 1b/1 AND SDP 6/1 AND SDP 9/1	ServiceSearchAttribute for attribute ServiceID with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-10-C

Item	**Feature**	**Test Case(s)**
SDP 1b/1 AND SDP 6/1 AND SDP 9/2	ServiceSearchAttribute for attribute ProtocolDescriptorList with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-11-C
SDP 1b/1 AND SDP 6/1 AND SDP 9/3	ServiceSearchAttribute for attribute ServiceRecordState with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-07-C
SDP 1b/1 AND SDP 6/1 AND SDP 9/4	ServiceSearchAttribute for attribute ServiceInfoTimeToLive with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-09-C
SDP 1b/1 AND SDP 6/1 AND SDP 9/5	ServiceSearchAttribute for attribute BrowseGroupList with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-12-C
SDP 1b/1 AND SDP 6/1 AND SDP 9/6	ServiceSearchAttribute for attribute LanguageBasedAttributeIDList with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-13-C
SDP 1b/1 AND SDP 6/1 AND SDP 9/7	ServiceSearchAttribute for attribute ServiceAvailability with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-14-C
SDP 1b/1 AND SDP 6/1 AND SDP 9/8	ServiceSearchAttribute for attribute IconURL with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-15-C
SDP 1b/1 AND SDP 6/1 AND SDP 9/6 AND SDP 9/9	ServiceSearchAttribute for attribute ServiceName with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-16-C
SDP 1b/1 AND SDP 6/1 AND SDP 9/6 AND SDP 9/10	ServiceSearchAttribute for attribute ServiceDescription with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-17-C
SDP 1b/1 AND SDP 6/1 AND SDP 9/6 AND SDP 9/11	ServiceSearchAttribute for attribute ProviderName with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-18-C
SDP 1b/1 AND SDP 6/1 AND SDP 9/6 AND SDP 9/12	ServiceSearchAttribute for attribute VersionNumberList with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-19-C
SDP 1b/1 AND SDP 6/1 AND SDP 9/6 AND SDP 9/13	ServiceSearchAttribute for attribute ServiceDataBaseState with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-08-C
SDP 1b/1 AND SDP 6/1 AND SDP 9/6 AND SDP 9/14	ServiceSearchAttribute for attribute BluetoothProfileDescriptorList with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-20-C
SDP 1b/1 AND SDP 6/1 AND SDP 9/6 AND SDP 9/15	ServiceSearchAttribute for attribute DocumentationURL with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-21-C

Item	Feature	Test Case(s)
SDP 1b/1 AND SDP 6/1 AND SDP 9/6 AND SDP 9/16	ServiceSearchAttribute for attribute ClientExecutableURL with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-22-C
SDP 6/3	ServiceSearchAttribute for attribute AdditionalProtocolDescriptorLists with 16, 32, or 128 bit UUID	SDP/SR/SSA/BV-23-C
SDP 1b/1 AND SDP 8/1	Browsing, using ServiceSearch and AttributeSearch with 16, 32, or 128 bit UUID	SDP/SR/BRW/BV-01-C
SDP 1b/1 AND SDP 8/2	Browsing, using ServiceSearchAttribute with 16, 32, or 128 bit UUID	SDP/SR/BRW/BV-02-C
SDP 10/1	Client Service Attribute Requests	SDP/CL/SA/BV-01-C
SDP 11/1	Client Service Search Attribute Request	SDP/CL/SSA/BV-01-C

Table 5.1: Test case mapping

6 ANNEX: Generic SDP Integrated Tests (GSIT)

This annex defines generic test procedures that integrate various SDP tests that are required to be executed for each supported service record and attribute.

6.1 Identification conventions

In addition to the conventions defined in Section 4.1.1 Test case identification conventions, the following identifiers are introduced in this annex.

Identifier Abbreviation	Group Identifier <class>
ATTR	Attribute
CGSIT	Client GSIT test procedures
GSIT	Generic SDP Integrated Tests
OFFS	Attribute ID Offset String
SERR	Service Record
SFC	SDP Future Compatibility
SGSIT	Server GSIT test procedures

Table 6.1: Identification conventions

6.2 GSIT input tables

The GSIT procedures are executed with an input consisting of a table. The table format differs between the 1) SERR- and ATTR-tests and 2) SFC-tests for future SDP record compatibility.

In Test Suite documents that use the GSIT procedures, it may be a good idea to use the “landscape” page setup to achieve better readability to avoid the page width limitations the regular “portrait” page setup yields.

6.2.1 Input table for SERR- and ATTR-tests

The table lists all the service records and attributes that are being tested, as well as any additional parameters.

It is recommended to split the input table by each separately defined SDP record instance, which is typically defined by role. Multiple instances are allowed by some profiles and the assumption is that each instance will be checked according to the attributes in the input table.

The Attribute ID name column is used to list the SDP attribute being checked, where SERR tests will always verify that a ServiceClassIDList attribute list of one or more values and Attribute ID is used for ATTR tests. This descriptive name will correlate with an Attribute ID in the Assigned Numbers. For a

ServiceClassIDList, whenever there are multiple UUIDs in the Value column they are all mandatory within the same SDP record. If there is an optional UUID in the ServiceClassIDList, it needs to be defined as a separate test case.

The Attribute ID definition source column accepts either “Universal” or “Profile”.

- “Universal”: If the attribute is defined in the Core Specification [Vol 3] Part B, Section 5.1 and can be found in Assigned Numbers under Bluetooth Core Specification: Universal Attributes.
- “Profile”: If the attribute is defined locally in the profile and can be referenced in profile specific sections of the Assigned Numbers.

The Value/secondary value column accepts a specific value to be checked for in an attribute or “skip” in addition to the type in parentheses. If an attribute is expected to find a hardcoded value such as “0x0101”, it can be specified in this column; otherwise, by default, verification should be skipped. A secondary value is typically not present in the table. Secondary values are used in lists that have additional attributes with their own values contained within the list, e.g. Profile Version contained within the BluetoothProfileDescriptorList attribute.

The Attribute presence column accepts either “Present”, “Present for [role]”, “Optionally present”, or “TCMT defined”.

- “Present”: If the attribute is M in the specification and presence of the SDP record is always required. Presence of the attribute will be confirmed in testing.
- “Present for [role]”: If the attribute is M in the specification for an SDP record that is required for a specific role only. Presence of the attribute will be confirmed in testing.
- “Optionally present”: If the attribute is O or C in the specification and there are no ICS available to tie it to a TCMT entry. If the attribute is present, the values will be verified to align with the corresponding Value/secondary value column entries, but if the attribute is not present it will not yield a fail verdict.
- “TCMT defined”: Similar to Optionally present, the attribute is O or C in the specification, however there are ICS available to tie it to a TCMT entry. Presence of the attribute will be confirmed in testing.

TCID	**Reference**	**Attribute ID name**	**Attribute ID definition source (Universal, Profile)**	**Value/secondary value**	**Attribute presence (Present/Present for [role], Optionally present, TCMT defined)**
TCID (SERR) [TC description]	[SPEC] *X.Y*	ServiceClassIDList	Universal	value(s) (type(s))	
TCID (ATTR) [TC description]	[SPEC] *X.Y*	Attribute_11	Universal or Profile	skip or value (type): secondary value -skip or value (type)	
TCID (ATTR) [TC description]	[SPEC] *X.Y*	Attribute_12	Universal or Profile	skip or value (type): secondary value -skip or value (type)	
TCID (ATTR) [TC description]	[SPEC] *X.Y*	Attribute_13	Universal or Profile	skip or value (type): secondary value -skip or value (type)	
…					

Table 6.2: GSIT input table format

The recommended format for the TCID of these tests is:

<spec abbreviation>*/ROLE/***SGSIT***/<func>/BV-XX-C, (for Server Tests)*

6.2.1.1 Example usage – Device Identification (DID) TS

[This is an extract showing how the DID TS can reference the GSIT as an alternative to creating test cases for each service record and attribute-related procedure.]

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

> *[REF#] below is the reference to the related specification (in this case Device Identification Profile) as the DID.TS defines it.*

TCID	Reference	Attribute ID name	Attribute ID definition source (Universal, Profile)	Value/secondary value	Attribute presence (Present/Present for [role], Optionally present, TCMT defined)
DID/SR/SGSIT/SERR/BV-01-C [Service record GSIT – Device ID]	[REF#] 4	ServiceClassIDList	Universal	“PnPInformation” (UUID)	Present
DID/SR/SGSIT/ATTR/BV-01-C [Attribute GSIT – SpecificationID]	[REF#] 5.1	SpecificationID	Profile	skip (Uint16)	Present
DID/SR/SGSIT/ATTR/BV-02-C [Attribute GSIT – VendorID]	[REF#] 5.2	VendorID	Profile	skip (Uint16)	Present
DID/SR/SGSIT/ATTR/BV-03-C [Attribute GSIT – ProductID]	[REF#] 5.3	ProductID	Profile	skip (Uint16)	Present
DID/SR/SGSIT/ATTR/BV-04-C [Attribute GSIT – Version]	[REF#] 5.4	Version	Profile	skip (Uint16)	Present
DID/SR/SGSIT/ATTR/BV-05-C [Attribute GSIT – PrimaryRecord]	[REF#] 5.5	PrimaryRecord	Profile	skip (Boolean)	Present
DID/SR/SGSIT/ATTR/BV-06-C [Attribute GSIT – VendorIDSource]	[REF#] 5.6	VendorIDSource	Profile	skip (Uint16)	Present
DID/SR/SGSIT/ATTR/BV-07-C [Attribute GSIT – ClientExecutableURL]	[REF#] 5.11	ClientExecutableURL	Universal	skip (URL)	TCMT defined
DID/SR/SGSIT/ATTR/BV-08-C [Attribute GSIT – DocumentationURL]	[REF#] 5.11	DocumentationURL	Universal	skip (URL)	TCMT defined

Table 6.3: DID example input table for GSIT Server tests

6.2.1.2 Example usage – Hands-Free Profile (HFP) TS

[This is an extract showing how the HFP TS can reference the GSIT as an alternative to creating test cases for each service record and attribute-related procedure.]

Execute the Generic SDP Integrated Tests defined in [SDP.TS.REF#] Section 6.3, Server test procedures (SGSIT), using Table 6.4 or Table 6.5 below as input:

> *[REF#] below is the reference to the related specification (in this case Hands-Free Profile) as the HFP.TS defines it.*

TCID	Reference	Attribute ID name	Attribute ID definition source (Universal, Profile)	Value/ secondary value	Attribute presence (Present/Present for [role], Optionally present, TCMT defined)
HFP/HF/SGSIT/SERR/BV-01-C [Service record GSIT – HFP HF]	[REF#] 5.3 [REF#] 6.3	ServiceClassIDList	Universal	“Hands-Free” (UUID), “Generic Audio” (UUID)	Present for HF
HFP/HF/SGSIT/ATTR/BV-01-C [Attribute GSIT – Protocol Descriptor List]	[REF#] 5.3 [REF#] 6.3	ProtocolDescriptorList	Universal	“L2CAP” (UUID), “RFCOMM” (UUID): Server channel – skip (Uint8)	Present for HF
HFP/HF/SGSIT/ATTR/BV-02-C [Attribute GSIT – Bluetooth Profile Descriptor List, HFP 1.7]	[REF#] 5.3 [REF#] 6.3	BluetoothProfileDescriptorList	Universal	“Hands-Free” (UUID): Profile version – “0x0107” (Uint16)	TCMT defined
HFP/HF/SGSIT/ATTR/BV-03-C [Attribute GSIT – Bluetooth Profile Descriptor List, HFP 1.8]	[REF#] 5.3 [REF#] 6.3	BluetoothProfileDescriptorList	Universal	“Hands-Free” (UUID): Profile version – “0x0108” (Uint16)	TCMT defined
HFP/HF/SGSIT/ATTR/BV-04-C [Attribute GSIT – Bluetooth Profile Descriptor List, HFP 1.9]	[REF#] 5.3 [REF#] 6.3	BluetoothProfileDescriptorList	Universal	“Hands-Free” (UUID): Profile version – “0x0108” (Uint16)	TCMT defined
HFP/HF/SGSIT/ATTR/BV-05-C [Attribute GSIT – Supported Features]	[REF#] 5.3 [REF#] 6.3	SupportedFeatures	Profile	skip (Uint16)	Present for HF

Table 6.4: HFP Hands-free example input table for GSIT Server tests

TCID	Reference	Attribute ID name	Attribute ID definition source (Universal, Profile)	Value/ secondary value	Attribute presence (Present/Present for [role], Optionally present, TCMT defined)
HFP/AG/SGSIT/SERR/BV-01-C [Service record GSIT – HFP AG]	[REF#] 5.3 [REF#] 6.3	ServiceClassIDList	Universal	“AG Hands-Free” (UUID), “Generic Audio” (UUID)	Present for AG
HFP/AG/SGSIT/ATTR/BV-01-C [Attribute GSIT – Protocol Descriptor List]	[REF#] 5.3 [REF#] 6.3	ProtocolDescriptorList	Universal	“L2CAP” (UUID), “RFCOMM” (UUID): Server channel – skip (Uint8)	Present for AG
HFP/AG/SGSIT/ATTR/BV-02-C [Attribute GSIT – Bluetooth Profile Descriptor List, HFP 1.7]	[REF#] 5.3 [REF#] 6.3	BluetoothProfileDescriptorList	Universal	“Hands-Free” (UUID): Profile version – “0x0107” (Uint16)	TCMT defined
HFP/AG/SGSIT/ATTR/BV-03-C [Attribute GSIT – Bluetooth Profile Descriptor List, HFP 1.8]	[REF#] 5.3 [REF#] 6.3	BluetoothProfileDescriptorList	Universal	“Hands-Free” (UUID): Profile version – “0x0108” (Uint16)	TCMT defined
HFP/AG/SGSIT/ATTR/BV-04-C [Attribute GSIT – Bluetooth Profile Descriptor List, HFP 1.9]	[REF#] 5.3 [REF#] 6.3	BluetoothProfileDescriptorList	Universal	“Hands-Free” (UUID): Profile version – “0x0108” (Uint16)	TCMT defined

TCID	Reference	Attribute ID name	Attribute ID definition source (Universal, Profile)	Value/ secondary value	Attribute presence (Present/Present for [role], Optionally present, TCMT defined)
HFP/AG/SGSIT/ATTR/BV-05-C [Attribute GSIT – Network]	[REF#] 5.3 [REF#] 6.3	Network	Profile	skip (Uint8)	Present for AG
HFP/AG/SGSIT/ATTR/BV-06-C [Attribute GSIT – Supported Features]	[REF#] 5.3 [REF#] 6.3	SupportedFeatures	Profile	skip (Uint16)	Present for AG

Table 6.5: HFP Audio Gateway example input table for GSIT Server tests

6.2.2 Input table for OFFS-tests

The table lists all the attributes that are being tested that make use of an Attribute ID Offset, as well as any additional parameters.

The Attribute ID name column is used to list the SDP attribute being checked. This descriptive name will correlate with an Attribute ID in the Assigned Numbers.

The Attribute ID Offset column specifies the offset in hex that is added to the attribute ID base contained in the LanguageBaseAttributeIDList attribute in order to compute the attribute ID for this attribute.

The Attribute presence column accepts either “Present”, “Present for [role]”, “Optionally present”, or “TCMT defined”.

- “Present”: If the attribute is M in the specification and presence of the SDP record is always required. Presence of the attribute will be confirmed in testing.
- “Present for [role]”: If the attribute is M in the specification for an SDP record that is required for a specific role only. Presence of the attribute will be confirmed in testing.
- “Optionally present”: If the attribute is O or C in the specification and there are no ICS items available to tie it to a TCMT entry. If the attribute is present, the values will be verified to align with the corresponding Value/secondary value column entries, but if the attribute is not present, it will not yield a Fail verdict.
- “TCMT defined”: Similar to Optionally present, the attribute is O or C in the specification; however, there are ICS items available to tie it to a TCMT entry. Presence of the attribute will be confirmed in testing.

TCID	**Reference**	**ServiceSearchPattern**	**Attribute ID name**	**Attribute ID Offset**	**Attribute presence (Present/Present for [role], Optionally present, TCMT defined)**
TCID (OFFS) [TC description]	[SPEC] *X.Y*	ServiceSearch_1	Attribute_1		
TCID (OFFS) [TC description]	[SPEC] *X.Y*	ServiceSearch_1	Attribute_2		
TCID (OFFS) [TC description]	[SPEC] *X.Y*	ServiceSearch_1	Attribute_3		
TCID (OFFS) [TC description]	[SPEC] *X.Y*	ServiceSearch_2	Attribute_1		
…					

Table 6.6: GSIT OFFS input table format

The recommended format for the TCID of these tests is:

<spec abbreviation>*/ROLE/***SGSIT***/OFFS/BV-XX-C, (for Server Tests)*

6.2.2.1 Example usage – Hands-Free Profile (HFP) TS

[This is an extract showing how the HFP TS can reference the GSIT as an alternative to creating test cases for each service record and attribute-related procedure.]

Execute the Generic SDP Integrated Tests defined in [SDP.TS.REF#] Section 6.3, Server test procedures (SGSIT), using Table 6.7 below as input:

> *[REF#] below is the reference to the related specification (in this case Hands-Free Profile) as the HFP.TS defines it.*

TCID	**Reference**	**ServiceSearchPattern**	**Attribute ID name**	**Attribute ID Offset**	**Attribute presence (Present/Present for [role], Optionally present, TCMT defined)**
HFP/HF/SGSIT/OFFS/BV-01-C [Attribute ID Offset String GSIT – Service Name]	[REF#] 5.3 [REF#] 6.3	Hands-Free	ServiceName	0x0000	Optionally present
HFP/AG/SGSIT/OFFS/BV-02-C [Attribute ID Offset String GSIT – Service Name]	[REF#] 5.3 [REF#] 6.3	AG Hands-Free	ServiceName	0x0000	Optionally present

Table 6.7: HFP example input table for SGSIT Server Attribute ID Offset String tests

6.3 Server test procedures (SGSIT)

In case of SERR- and ATTR-tests, for each row of the Server GSIT input table:

- If the row defines a service record, then the test sequence in Section 6.3.1 SGSIT/SERR [Service Record GSIT] is executed.
- If the row defines an attribute, then the test sequence in Section 6.3.2 SGSIT/ATTR [Attribute GSIT] is executed.

Note: The GSIT input table may be preceded by additional initial conditions that need to be satisfied prior to executing any test sequence from the table.

Note: The GSIT input table may be followed by additional Pass verdicts, in which case the Lower Tester will cache all the SDP information collected when executing the test sequence described in this section to verify that the SDP record meets these additional Pass verdicts.

In case of OFFS-tests, for each row of the Server GSIT input table:

- If the row defines an attribute with an SDP attribute ID offset, then the test sequences in Section 6.3.3 SGSIT/ATTR [Attribute GSIT] are executed.

6.3.1 SGSIT/SERR [Service Record GSIT]

Execute all the following tests using the Service Class UUID from the current row of the input table, or until one of the referenced tests fails.

1. Execute SDP/SR/SS/BV-01-C [Service Search Request] with TSPX_sdp_service_search_pattern set to the Service Class UUID(s) in the Value/ secondary value column to verify that there is at least one service record with the specified Service Class UUID. Save the returned SDP record handles.
2. Repeat for 16 bit, 32 bit, and 128 bit versions of the UUID.

6.3.2 SGSIT/ATTR [Attribute GSIT]

Execute all the following tests using the Attribute ID from the current row of the input table, or until one of the referenced tests fails.

1. Execute SDP/SR/SA/BV-01-C [Service Attribute Request] with the handle(s) returned in the corresponding Service Record test case and with TSPX_sdp_service_search_pattern set to the Attribute ID to verify that the attribute is present in the SDP record of interest in the IUT. If there are any values specified, verify that the value returned is expected.
2. Execute SDP/SR/SSA/BV-04-C [Service Search Attribute Request, Existing Service(s) and existing Attribute(s)] with TSPX_sdp_service_search_pattern set to the Service Class UUID from the corresponding Service Record test case and the handle(s) returned in the corresponding Service Record test case and with the AttributeIDList set to the Attribute ID to verify that the attribute is present in the SDP record of interest in the IUT. If there are any values specified in the Value/ secondary value column, verify that the value returned is expected. For the ProtocolDescriptorList and BluetoothProfileDescriptorList Service records with a Version parameter, verify that the profile version number is expected using the version indicated in the ICS.

6.3.3 SGSIT/OFFS [Attribute ID Offset String GSIT]

Execute all the following tests using the Attribute ID and ServiceSearchPattern from the current row of the input table, or until one of the referenced tests fails.

1. Execute the corresponding Service Search Attribute Request, Language test case with the TSPX_sdp_service_search_pattern set to the ServiceSearchPattern given in the table:
    a. If the Attribute ID name is ServiceName, execute SDP/SR/SSA/BV-16-C [Service Search Attribute Request, ServiceName]
    b. If the Attribute ID name is ServiceDescription, execute SDP/SR/SSA/BV-17-C [Service Search Attribute Request, ServiceDescription]
    c. If the Attribute ID name is ProviderName, execute SDP/SR/SSA/BV-18-C [Service Search Attribute Request, ProviderName]
2. Verify that the attribute is present in the SDP record of interest in the IUT according to the Attribute presence parameter.
3. If the attribute is present in the SDP record, verify that the value returned is expected.

6.4 Client test procedures (CGSIT)

6.4.1 Input table for common SDP procedures (SFC-tests)

The table lists the Service Class UUIDs and parameters that are being tested.

Service Record Service Class UUID description: Service Class UUID of the SDP record with the future version on the Lower Tester that is the target of the test.

Lower Tester SDP record initial conditions: SDP record(s) exposed by the Lower Tester. Attribute values to be set by the Lower Tester including any RFA testing. Additional IXIT requirements.

TCID	Reference	Service Record Service Class UUID description	Lower Tester SDP record initial conditions
TCID (SFC) [TC description]	[SPEC] *X.Y*	Service_Record_1	SDP record(s) exposed by the Lower Tester. Attribute values to be set by the Lower Tester including any RFA testing. Additional IXIT requirements.
TCID (SFC) [TC description]	[SPEC] *X.Y*	Service_Record_2	SDP record(s) exposed by the Lower Tester. Attribute values to be set by the Lower Tester including any RFA testing. Additional IXIT requirements.

Table 6.8: GSIT input table format

The recommended format for the TCID of these tests is:

<spec abbreviation>*/ROLE/*CGSIT/**SFC**/*BV-XX-C, (for Client Tests)*

6.4.2 Example usages

[This is an extract showing how a TS can reference the GSIT as an alternative to creating test cases for each profile-related SDP procedure.]

Execute the Generic SDP Future Compatibility Tests defined in [SDP.TS.REF#] Section 6.4, Client test procedures (CGSIT), using Table 6.9 below as input:

[REF#] below is the reference to the related specification as the TS defines it.

TCID	Reference	Service Record Service Class UUID description	Lower Tester SDP record initial conditions
A2DP/SRC/CGSIT/SFC/BV-01-C [SDP Future Compatibility – IUT is A2DP Source]	[REF#] 3.1, 5.3	AudioSink	The Lower Tester exposes A2DP Sink SDP record. The version in the Bluetooth Profile Descriptor List is greater than the most recently adopted version. All bits are set in the supported features attribute, including RFU bits.
A2DP/SNK/CGSIT/SFC/BV-02-C [SDP Future Compatibility – IUT is A2DP Sink]	[REF#] 3.1, 3.3	AudioSource	The Lower Tester exposes A2DP Source SDP record. The version in the Bluetooth Profile Descriptor List is greater than the most recently adopted version. All bits are set in the supported features attribute, including RFU bits.

Table 6.9: A2DP example input table for GSIT SDP future compatibility tests

TCID	Reference	Service Record Service Class UUID description	Lower Tester SDP record initial conditions
HFP/AG/CGSIT/SFC/BV-01-I [SDP Future Compatibility – IUT is HFP AG]	[REF#] 5.3 [REF#] 6.3	Handsfree	The Lower Tester exposes HFP HF Source SDP record. The version in the Bluetooth Profile Descriptor List is greater than the most recently adopted version. All bits set in supported features attribute, including reserved bits.
HFP/HF/CGSIT/SFC/BV-01-I [SDP Future Compatibility – IUT is HFP HF]	[REF#] 5.3 [REF#] 6.3	HandsfreeAudioGateway	The Lower Tester exposes HFP AG Source SDP record. The version in the Bluetooth Profile Descriptor List is greater than the most recently adopted version. All bits set in supported features attribute, including reserved bits.

Table 6.10: HFP example input table for GSIT SDP future compatibility tests

6.4.3 CGSIT/SFC [SDP Future Compatibility GSIT]

Execute all the following test steps using the Service Class UUID from the current row of the input table, or until one of the referenced tests fails:

1. The Lower Tester is discoverable and connectable, and the Lower Tester and the IUT are not paired.
2. The Lower Tester exposes an SDP record with the initial conditions from the input table with a version that is greater than the currently published version, e.g., AVRCP v1.9. For profiles that have a Supported Features attribute, the Lower Tester has all the bits in its Supported Features SDP attributes set, including those that are RFA. The Lower Tester also includes SDP records that may be required by the IUT to establish a profile-specific connection as specified by the applicable referenced IXIT values in the input table in the Lower Tester SDP record initial conditions column.
3. If a specific CoD value is required for the IUT to establish a profile-specific connection, then that value is given by IXIT.
4. The IUT attempts to initiate a profile-specific connection with the Lower Tester. If the IUT is incapable of establishing a connection to previously unpaired devices, then the Lower Tester will initiate a connection to the IUT first while having exposed SDP records and valid values accordingly in order to create pairing between the IUT and the Lower Tester. Once the Lower Tester–initiated connection is successful and pairing is completed, the Lower Tester and the IUT are disconnected, and the Lower Tester prompts the IUT to attempt to establish a reconnection to the IUT.

<u>Pass verdict</u>

The IUT is able to establish a profile-specific connection or reconnection with the Lower Tester that has a future version in its SDP record and also includes any applicable RFA bits set in Supported Features SDP attributes.

7 Revision history and acknowledgments

Revision History

Publication Number	Revision Number	Date	Comments
	D5r3	2003-11-05	Original Release
	D10R00-1	2004-03-03	Re-partitioned to match Main Specification Volume/Part partitioning. TSE 505 incorporated. Editorial Changes
10	1.2.1	2004-03-25	Editorial changes. Changed document numbering and revision number to conform to legacy system.
11	1.2.2	2004-07-01	Change page numbering to have part start on page 1 and made editorial changes to accommodate Vol. 1, Part A.
	1.2.3r0	2005-08-31	TSE 697: Add definition for RemDev to Definitions
	1.2.3r1	2005-09-21	Added definition for LocDev. Updated Section 2.
	1.2.3r2	2005-10-12	Updated TOC, corrected reference hyperlinks, changed title
12	1.2.3	2005-10-26	Prepare for publication.
	1.2.4r0	2006-04-06	TSE 833 for all TCs in TCMT TSE 874: TP/Server/SS/BI-01-C, TP/Server/SS/BI-02-C: remove “returned records” references. -Removed “Uncertainties”
13	1.2.4	2006-06-20	Prepare for publication.
	2.1.E.0r0	2006-12-13	Change version number TSE 2004: Change “1.1 or later “to “1.2 or later” for testers
	2.1.E.0r1	2006-12-20	Changes to cross references; Removal of Section 5.5.1.4
14	2.1.E.0	2006-12-28	Prepare for publication.
15	2.1.E.1	2007-08-14	TSE 2000; (v2.0 and later) TSE 2001 (v1.2):New test cases TP/SERVER/SA/BV-21-C, TP/SERVER/SSA/BV-23-C, four rows added to TCMT
	2.1.E.2r0	2008-11-03	TSE 2661: TP/SA/BV-04, TP/SSA/BV-10: Type= UUID in MSC
16	2.1.E.2	2008-12-10	Prepare for publication.
	4.0.0r0	2011-12-14	TSE 3874: TP/SERVER/SS/BI-01-C, TP/SERVER/SS/BI-02-C: Add specific error codes to Pass/Fail verdicts. TSE 3875: TP/SERVER/SA/BI-01-C, TP/SERVER/SA/BI-02-C, TP/SERVER/SA/BI-03-C: Add specific error codes to Pass/Fail verdicts. TSE 3876: TP/SERVER/SSA/BI-01-C, TP/SERVER/SSA/BI-02-C:Add specific error codes to Pass/Fail verdicts.
17	4.0.0	2012-03-30	Remove footer. Prepare for publication.
	4.1.0	2014-11-11	Template conversion

Publication Number	**Revision Number**	**Date**	**Comments**
18	4.1.0	2013-11-11	Updated revision to 4.1.0 Updated references to include version 4.1
	4.2.0r00	2014-11-24	Revved version to align with Core 4.2 release
	4.2.0r01	2014-11-25	BTI Review, Alicia, editorial corrections
19	4.2.0	2014-12-05	Prepare for TCRL 2014-2 publication
	5.0.0r00	2016-10-18	Converted to new Test Case ID conventions as defined in TSTO v4.1.
20	5.0.0	2016-12-13	Approved by BTI. Prepared for TCRL 2016-2 publication.
	5.1.0r00	2018-11-13	Updated template. Revved version to align with Core 5.1 release.
21	5.1.0	2018-12-07	Approved by BTI. Prepared for TCRL 2018-2 publication.
	p22r00	2019-11-27	Revised document numbering convention, setting last release publication of 5.1.0 as p21; added publication number column to Revision History. Minor formatting changes.
22	p22	2020-01-07	Approved by BTI on 2019-12-22. Prepared for TCRL 2019-2 publication.
	p23r00	2022-03-01	TSE 18390 (rating 2): Added “Fields and Bits Reserved for Future Use” section. Made many template-related editorials, including aligning the copyright page with v2 of the DNMD.
23	p23	2022-06-28	Approved by BTI on 2022-05-31. Prepared for TCRL 2022-1 publication.
	p24r00–r07	2023-05-15 – 2024-05-07	TSE 24193 (rating 4): Overhauled the SDP TS. Converted most test cases to table format and aligned all test cases and MSCs with current conventions, including making wording more generic to reduce the number of IXIT values. Added two missing Client requirement tests SDP/CL/SA/BV-01-C and SDP/CL/SSA/BV-01-C and updated the TCMT accordingly. Added instructions to the preamble section for UUID (and deleted from individual tests). Incorporated continuation state changes for SDP/SR/SS/BV-03-C. TSE 24241 (rating 1): Added Annex for Generic SDP Integrated Tests (GSIT). TSE 24514 (rating 1): Per E24440, updated AdditionalProtocolDescriptorList to AdditionalProtocolDescriptorLists for TCs SDP/SR/SA/BV-21-C and SDP/SR/SSA/BV-23-C. Updated the TCMT accordingly.
24	p24	2024-07-01	Approved by BTI on 2024-05-22. Prepared for TCRL 2024-1 publication.

Publication Number	Revision Number	Date	Comments
	p25r00–r02	2025-06-30 – 2025-08-05	TSE 27439 (rating 1): Updated IXIT values to better align with how PTS consumes them. TSE 27748 (rating 4): To address changes needed to support E24560, added new TC SDP/SR/SSA/BI-03-C. Updated the TCMT accordingly. TSE 27918 (rating 2): Removed a nonsense Pass verdict from the section containing SDP/SR/SSA/BI-01-C and -02-C and corrected the TCMT entry for those TCs.
25	p25	2025-11-04	Approved by BTI on 2025-10-05. Prepared for TCRL pkg101 publication.

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Alicia Courtney	Broadcom