Coordinated Set Identification Profile (CSIP)

***Bluetooth*® Test Suite**

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Contents

1 Scope

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

2 References, definitions, and abbreviations

2.1 References

This document incorporates provisions from other publications by dated or undated reference. These references are cited at the appropriate places in the text, and the publications are listed hereinafter. Additional definitions and abbreviations can be found in [1] and [2].

[1] Bluetooth Core Specification, Version 4.2 or later

[2] Test Strategy and Terminology Overview

[3] Coordinated Set Identification Profile Specification, Version 1.0

[4] Coordinated Set Identification Service Specification, Version 1.0

[5] ICS Proforma for Coordinated Set Identification Profile (CSIP)

[6] Characteristic and Descriptor descriptions are accessible via the Bluetooth SIG Assigned Numbers

[7] GATT Test Suite, GATT.TS

[8] ICS Proforma for Generic Attribute Profile (GATT)

2.2 Definitions

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

2.3 Acronyms and abbreviations

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

3 Test Suite Structure (TSS)

3.1 Overview

The Coordinated Set Identification Profile [3] requires the presence of GAP, SM (when used over LE transport), SDP (when used over BR/EDR transport), L2CAP, and GATT. This is illustrated in Figure 3.1.

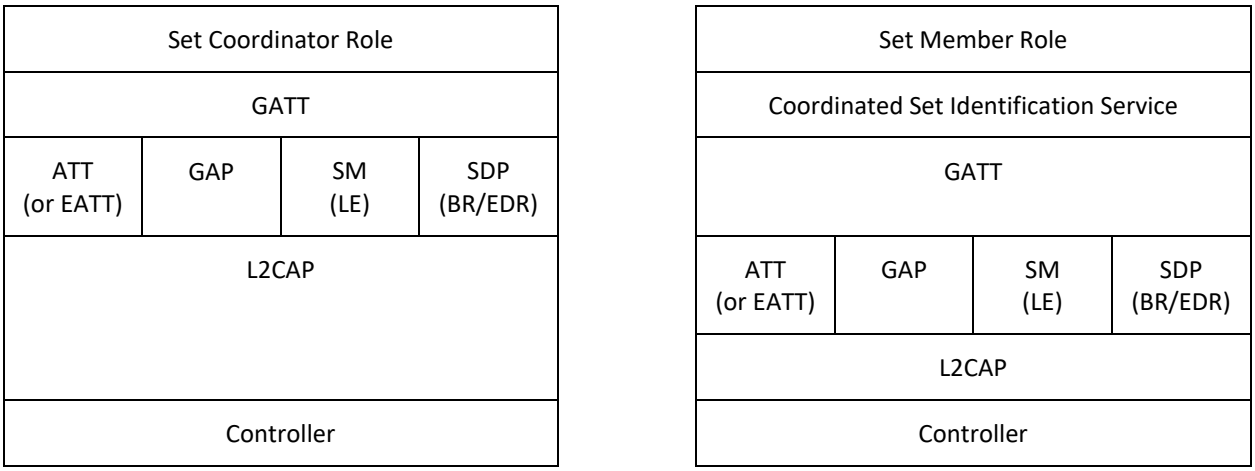

Figure 3.1: Coordinated Set Identification Profile test model

3.2 Test Strategy

The test objectives are to verify the functionality of the CSIP that enables interoperability between Set Coordinators and Set Members. 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. Test cases will also be written as to ensure forward compatibility by checking RFU values.

The Coordinated Set Identification Profile utilizes an advertising-based protocol that will introduce behavior according to the data contained in the advertising packet. Tests will be split between testing the IUT either as Set Coordinator or as a Set Member.

Conformance testing of the advertising-based protocol will be performed using two or more Lower Testers acting as Set Members and the IUT as a Set Coordinator. Conformance testing will also be performed focusing on the security procedures to ensure robustness.

Conformance testing of the IUT as a Set Member and the Lower Tester as the Set Coordinator will be limited to one Set Member.

The Coordinated Set Identification Profile specification testing will focus on ensuring that an IUT can properly perform all the procedures and interactions that are required to participate in a Coordinated Set as either a Set Coordinator or a Set Member. This includes proper handling of all mandatory features of the Coordinated Set Identification Profile, such as advertising, discovery, GATT services, and RSI usage.

The Upper Tester will be used to trigger certain actions on the IUT for a subset of test cases; however, because no fixed Upper Tester interface is defined, the exact mechanism of this interface will be implementation dependent.

CSIS allows for an OOB Procedure to retrieve the SIRK without reading of the Set Identity Resolving Key characteristic. This OOB Procedure is not defined by the CSIS specification [4], so there are no qualification tests to validate its behavior.

3.3 Test groups

The following test groups have been defined:

- Generic GATT Integrated Tests

  Verify the generic GATT behavior for discovery, characteristics, descriptors, indications, notifications, etc.

- Service Procedure

  Verify the behavior of procedures triggered by writing to the Set Member Lock characteristic.

- Service Procedure – Error Handling

  Verify that the IUT correctly handles error conditions that result from the characteristic writes or failure to perform a requested operation due to rejection of a request by a Remote Device.

- Privacy Features

  Verify the behavior when Privacy Features are enabled.

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>**.

Additionally, testing of this specification includes tests from the GATT Test Suite [7] referred to as Generic GATT Integrated Tests (GGIT); when used, the GGIT tests are referred to through a TCID string using the following convention:
<spec abbreviation>/<IUT role>/<GGIT test group>/< GGIT class >/<xx>-<nn>-<y>.

Identifier Abbreviation	**Spec Identifier <spec abbreviation>**
CSIP	Coordinated Set Identification Profile
Identifier Abbreviation	**Role Identifier <IUT role>**
CL	Client (Set Coordinator)
SR	Server (Set Member)
Identifier Abbreviation	**Feature Identifier <feat>**
CGGIT	Client Generic GATT Integrated Tests
PF	Privacy Features
SGGIT	Server Generic GATT Integrated Tests
SP	Service Procedure
SPE	Service Procedure – Error Handling

Table 4.1: CSIP TC feature naming convention

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 Launch Studio, 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 Setup Preambles

The procedures defined in this section are used by test equipment in achieving the initial conditions in certain tests.

4.2.1 ATT Bearer on LE Transport

Preamble procedure:

1. Establish an LE transport connection between the IUT and the Lower Tester.
2. Establish an L2CAP channel 0x0004 between the IUT and the Lower Tester over that LE transport.

4.2.2 ATT Bearer on BR/EDR Transport

Preamble procedure:

1. Establish a BR/EDR transport connection between the IUT and the Lower Tester.
2. Establish an L2CAP channel (PSM 0x001F) between the IUT and the Lower Tester over that BR/EDR transport.

4.2.3 EATT Bearer on LE Transport

Preamble procedure:

1. Establish an LE transport connection between the IUT and the Lower Tester.
2. Establish an L2CAP channel 0x0005 for signaling and one L2CAP channel (for ATT bearers) with EATT PSM (as defined in Assigned Numbers) between the IUT and the Lower Tester over that LE transport.

4.2.4 EATT Bearer on BR/EDR Transport

Preamble procedure:

1. Establish a BR/EDR transport connection between the IUT and the Lower Tester.
2. Establish an L2CAP channel 0x0001 for signaling and one L2CAP channel (for ATT bearers) with EATT PSM (as defined in Assigned Numbers) between the IUT and the Lower Tester over that BR/EDR transport.

4.3 Generic GATT Integrated Tests

Execute the Generic GATT Integrated Tests defined in [7], Section 6.3, Server Test Procedures, and Section 6.4, Client Test Procedures, using Table 4.2 below as input:

TCID	Service / Characteristic / Descriptor	Reference	Properties	Value Length (Octets)
CSIP/CL/CGGIT/SER/BV-01-C [Service GGIT – Coordinated Set Identification Service]	Coordinated Set Identification Service	[3] 4.2	-	-
CSIP/CL/CGGIT/CHA/BV-01-C [Characteristic GGIT – Set Identity Resolving Key]	Set Identity Resolving Key Characteristic	[3] 4.3	Mandatory: 0x02 (Read) Optional: 0x10 (Notify)	16
CSIP/CL/CGGIT/CHA/BV-02-C [Characteristic GGIT – Coordinated Set Size]	Coordinated Set Size Characteristic	[3] 4.3	Mandatory: 0x02 (Read) Optional: 0x10 (Notify)	1
CSIP/CL/CGGIT/CHA/BV-03-C [Characteristic GGIT – Set Member Lock]	Set Member Lock Characteristic	[3] 4.3	0x1A (Read, Write, Notify)	skip
CSIP/CL/CGGIT/CHA/BV-04-C [Characteristic GGIT – Set Member Rank]	Set Member Rank Characteristic	[3] 4.3	0x02 (Read)	1
CSIP/SR/SGGIT/SDPNF/BV-01-C [Not discoverable over BR/EDR – Coordinated Set Identification Service]	Coordinated Set Identification Service	[3] 4.2	-	-

Table 4.2: Input for the GGIT Client and Server test procedures

4.4 Service Procedures

4.4.1 Coordinated Set Discovery

- Test Purpose

  Verify that the IUT can discover a Set Member Lower Tester.

- Reference

  [3] 4.6.1

- Initial Condition

  - The Lower Tester exposes a SIRK as specified in the Initial Condition field in Table 4.3.
  - Establish a Bearer connection over the Transport as specified in Table 4.3 between the Lower Tester and the IUT as described in Section 4.2.1, if using ATT over an LE transport, or 4.2.2 if using ATT over a BR/EDR transport, or 4.2.3 if using EATT over an LE transport, or 4.2.4 if using EATT over a BR/EDR transport.
  - If the Lower Tester requires a bonding procedure, then perform a bonding procedure.
  - If the Lower Tester permissions for the characteristic require a specific security mode or security level, establish a connection meeting those requirements.

- The Lower Tester has two services that each include a CSIS instance with different SIRK, one with the service UUID of the TSPX_Target_Service IXIT entry.
- The Lower Tester exposes SIRK, Coordinated Set Size, and Set Member Rank Characteristics.

- Test Case Configuration

TCID	Initial Condition	Type	Transport
CSIP/CL/SP/BV-01-C [Coordinated Set Discovery – Plain Text SIRK]	Plain Text SIRK	0x01 (Plain Text)	BR/EDR or LE
CSIP/CL/SP/BV-05-C [Coordinated Set Discovery – Encrypted SIRK, BR/EDR]	Encrypted SIRK	0x00 (Encrypted)	BR/EDR
CSIP/CL/SP/BV-06-C [Coordinated Set Discovery – Encrypted SIRK, LE]	Encrypted SIRK	0x00 (Encrypted)	LE

Table 4.3: Input Table for Coordinated Set Discovery test cases

- Test Procedure

1. The Upper Tester orders the IUT to start the Coordinated Set Discovery procedure over the Transport as specified in Table 4.3.
2. The IUT executes the GATT Find Included Services procedure to find services that include the CSI Services.

For the TSPX_Target_Service IXIT service instance, execute steps 3–6:

3. The IUT executes the GATT Read Characteristic Value sub-procedure for the SIRK characteristic.
4. The IUT executes the GATT Read Characteristic Value sub-procedure for the Coordinated Set Size characteristic.
5. The IUT executes the GATT Read Characteristic Value sub-procedure for the Set Member Rank characteristic.
6. The Upper Tester verifies the un-encrypted SIRK value.

- Expected Outcome

Pass verdict

The IUT finds the CSI instance included with the TSPX_Target_Service and has read its SIRK, Coordinated Set Size, and Set Member Rank characteristics.

The IUT properly reads and decodes the SIRK value in step 3 and is verified in step 6.

4.4.2 Set Member Discovery

- Test Purpose

Verify that the Lower Tester can discover a Set Member IUT using a SIRK.

- Reference

[3] 4.6.2

- Initial Condition
  - The IUT is advertising with an RSI AD Type over the Transport as specified in Table 4.4.
  - The IUT exposes a SIRK as specified in the Initial Condition field in Table 4.4.

- Test Case Configuration

TCID	Initial Condition	Type	Transport
CSIP/SR/SP/BV-01-C [Set Member Discovery – Plain Text SIRK]	Plain Text SIRK	0x01 (Plain Text)	BR/EDR or LE
CSIP/SR/SP/BV-02-C [Set Member Discovery – Encrypted SIRK, BR/EDR]	Encrypted SIRK	0x00 (Encrypted)	BR/EDR
CSIP/SR/SP/BV-03-C [Set Member Discovery – Encrypted SIRK, LE]	Encrypted SIRK	0x00 (Encrypted)	LE

Table 4.4: Input Table for Coordinated Set Discovery test cases

- Test Procedure

  1. The Lower Tester discovers the IUT that has the PSRI AD Type using the Transport as specified in Table 4.4.
  2. The Lower Tester establishes a Bearer connection over the Transport as specified in Table 4.4 with the IUT as described in Section 4.2.1, if using ATT over an LE transport, or 4.2.2 if using ATT over a BR/EDR transport, or 4.2.3 if using EATT over an LE transport, or 4.2.4 if using EATT over a BR/EDR transport.
  3. The Lower Tester establishes a connection meeting the bonding and specific security mode or security level for the IUT.
  4. The Lower Tester discovers the included CSI service, characteristics, and descriptors on the IUT.
  5. The Lower Tester executes the GATT Read Characteristic Value sub-procedure for the SIRK characteristic.
  6. The Lower Tester decodes the SIRK characteristic value and is combined with the prand field from the RSI value to calculate the *localHash*.

- Expected Outcome

  Pass verdict

  The *localHash* calculated in step 6 is equal to the hash field in the RSI.

  The prand field in the RSI has at least one bit of the random part as 1 and another 0, and the two MSB 0b10 as specified [4] Section 3.2.3.

4.4.3 Discovery of Set Members

- Test Purpose

  Verify that the IUT can discover Lower Testers acting as Set Members using a SIRK.

- Reference

  [3] 4.6.2

- Initial Condition

  - Three Lower Testers, each configured as Set Members with the Coordinated Set Size characteristic set to 3 and unique Set Member Rank characteristic values.
  - The Lower Testers are advertising with an RSI AD Type over the Transport as specified in Table 4.5 and have the SIRK set to the TSPX_SIRK IXIT entry.
  - The IUT has discovered the SIRK by running Coordinated Set Discovery or through other means.

- Test Case Configuration

TCID	Transport
CSIP/CL/SP/BV-02-C [Discovery of Set Members, BR/EDR]	BR/EDR
CSIP/CL/SP/BV-07-C [Discovery of Set Members, LE]	LE

Table 4.5: Input Table for Discovery of Set Member test cases

- Test Procedure

  1. The Upper Tester orders the IUT to start the Set Members Discovery procedure.
  2. The IUT discovers the Lower Testers that have the RSI AD Type using the Transport as specified in Table 4.5.
  3. For each Lower Tester that has an RSI AD Type, the IUT uses the SIRK and the prand field from the RSI value and calculates those Lower Testers that have the proper *localHash* value.

  For each of the matching Set Members, execute steps 4–5.

  4. The Lower Tester establishes a Bearer connection over the as specified in Table 4.5 with the IUT as described in Section 4.2.1, if using ATT over an LE transport, or 4.2.2 if using ATT over a BR/EDR transport, or 4.2.3 if using EATT over an LE transport, or 4.2.4 if using EATT over a BR/EDR transport.
  5. The IUT discovers the CSI service, characteristics, and descriptors on the Lower Tester.

- Expected Outcome

  Pass verdict

  All three Set Members are discovered.

CSIP/CL/SP/BV-03-C [Lock Request]

- Test Purpose

  Verify that the IUT can acquire the Coordinated Set Lock from multiple Lower Testers.

- Reference

  [3] 4.6.3

- Test Configuration

  Three Lower Testers configured as Set Members with the Coordinated Set Size characteristic set to 3 and unique Set Member Rank characteristic values.

- Initial Condition

  - The IUT has discovered the relevant Set Members either through CSIP/CL/SP/BV-02-C [Discovery of Set Members, BR/EDR], CSIP/CL/SP/BV-07-C [Discovery of Set Members, LE] or or some other means.
  - Establish a Bearer connection between the Lower Tester and the IUT as described in Section 4.2.1, if using ATT over an LE transport, or 4.2.2 if using ATT over a BR/EDR transport, or 4.2.3 if using EATT over an LE transport, or 4.2.4 if using EATT over a BR/EDR transport.
  - If the Lower Tester requires a bonding procedure, then perform a bonding procedure.
  - If the Lower Tester permissions for the characteristic require a specific security mode or security level, establish a connection meeting those requirements.

- Test Procedure

  1. The Upper Tester orders the IUT to start the Lock Request procedure.

  For each Lower Tester discovered, execute steps 2–3 starting with the Lower Tester with the lowest Set Member Rank characteristic value to the highest.

  2. The IUT executes the GATT Write Characteristic Value sub-procedure for the Set Member Lock characteristic with value Locked (0x02) against the targeted Lower Tester.
  3. The Lower Tester sends a Write Response.

- Expected Outcome

  Pass verdict

  The IUT writes Locked (0x02) to the Set Member Lock characteristic on each Lower Tester in ascending order of the Set Member Rank characteristic value.

CSIP/CL/SP/BV-04-C [Lock Release]

- Test Purpose

  Verify that the IUT can release the Coordinated Set Lock from a Lower Tester.

- Reference

  [3] 4.6.4

- Test Configuration

  Three Lower Testers configured as Set Members with the Coordinated Set Size characteristic set to 3 and unique Set Member Rank characteristic values.

- Initial Condition

  - The IUT has discovered the relevant Set Members either through CSIP/CL/SP/BV-02-C [Discovery of Set Members, BR/EDR], CSIP/CL/SP/BV-07-C [Discovery of Set Members, LE] or some other means.
  - Establish a Bearer connection between the Lower Tester and the IUT as described in Section 4.2.1, if using ATT over an LE transport, or 4.2.2 if using ATT over a BR/EDR transport, or 4.2.3 if using EATT over an LE transport, or 4.2.4 if using EATT over a BR/EDR transport.
  - If the Lower Tester requires a bonding procedure, then perform a bonding procedure.
  - If the Lower Tester permissions for the characteristic require a specific security mode or security level, establish a connection meeting those requirements.
  - The IUT has acquired the Lock on the discovered Lower Testers either through CSIP/CL/SP/BV-03-C [Lock Request] or by other means.

- Test Procedure

  1. The Upper Tester orders the IUT to start the Lock Release procedure.

  For each Lower Tester discovered, execute steps 2–3 starting with the Lower Tester with the highest Set Member Rank characteristic value to the lowest.

  2. The IUT executes the GATT Write Characteristic Value sub-procedure for the Set Member Lock characteristic with value Unlocked (0x01) against the targeted Lower Tester.
  3. The Lower Tester sends a Write Response.

- Expected Outcome

  Pass verdict

  The IUT writes Unlocked (0x01) to the Set Member Lock characteristic on each Lower Tester in descending order of Rank.

4.5 Service Procedures – Error Handling

CSIP/CL/SPE/BI-01-C [Lock Denied]

- Test Purpose

  Verify that the IUT returns “Lock Denied” when a write is executed on the locked Lower Tester.

- Reference

  [3] 4.6.3

- Initial Condition

  - The IUT has discovered the relevant Set Members either through CSIP/CL/SP/BV-02-C [Discovery of Set Members, BR/EDR], CSIP/CL/SP/BV-07-C [Discovery of Set Members, LE] or some other means.
  - Establish a Bearer connection between the Lower Tester and the IUT as described in Section 4.2.1, if using ATT over an LE transport, or 4.2.2 if using ATT over a BR/EDR transport, or 4.2.3 if using EATT over an LE transport, or 4.2.4 if using EATT over a BR/EDR transport.
  - If the Lower Tester permissions for the characteristic require a specific security mode or security level, establish a connection meeting those requirements.
  - There are three Lower Testers that are unlocked.

- Test Procedure

  1. The Upper Tester orders the IUT to start the Lock Request procedure.
  2. The IUT executes the GATT Write Characteristic Value sub-procedure for the Set Member Lock characteristic with value Locked (0x02) against the first Lower Tester.
  3. Lower Tester 1 sends a Write Response.
  4. The IUT executes the GATT Write Characteristic Value sub-procedure for the Set Member Lock characteristic with value Locked (0x02) against the second Lower Tester.
  5. Lower Tester 2 sends an Error Response with error code “Lock Denied”.
  6. The IUT executes the GATT Write Characteristic Value sub-procedure for the Set Member Lock characteristic with value Unlocked (0x01) against the first Lower Tester.
  7. Lower Tester 1 sends a Write Response.

- Expected Outcome

  Pass verdict

  The IUT writes Locked (0x02) to the Set Member Lock characteristic on the first Lower Tester after step 2.

  The IUT receives a “Lock Denied” error code from the second Lower Tester after step 4.

  The IUT does not write to the third Lower Tester.

  The IUT writes Unlocked (0x01) to the Set Member Lock characteristic on the first Lower Tester after step 6.

CSIP/CL/SPE/BI-02-C [Lock Release Not Allowed]

- Test Purpose

  Verify that the IUT behaves properly when one Lower Tester returns “Lock Release Not Allowed”.

- Reference

  [3] 4.6.4

- Initial Condition

  - Establish a Bearer connection between the Lower Tester and the IUT as described in Section 4.2.1, if using ATT over an LE transport, or 4.2.2 if using ATT over a BR/EDR transport, or 4.2.3 if using EATT over an LE transport, or 4.2.4 if using EATT over a BR/EDR transport.
  - If the Lower Tester permissions for the characteristic require a specific security mode or security level, establish a connection meeting those requirements.

- Test Procedure

  1. The Upper Tester orders the IUT to execute the Lock Release procedure.
  2. The IUT executes the GATT Write Characteristic Value sub-procedure for the Set Member Lock characteristic with value Unlocked (0x01).
  3. The Lower Tester sends an Error Response with error code “Lock Release Not Allowed”.
  4. The Upper Tester orders the IUT to execute the GATT Read Characteristic Value sub-procedure for any characteristic.

- Expected Outcome

  Pass verdict

  The IUT successfully executes the GATT Read Characteristic Value sub-procedure after having received the error code.

CSIP/CL/SPE/BI-03-C [Invalid Lock Request]

- Test Purpose

  Verify that the IUT behaves properly when the Lower Tester returns “Invalid Lock Value” or “Lock Already Granted”.

- Reference

  [3] 4.6.4

- Initial Condition

  - Establish a Bearer connection between the Lower Tester and the IUT as described in Section 4.2.1, if using ATT over an LE transport, or 4.2.2 if using ATT over a BR/EDR transport, or 4.2.3 if using EATT over an LE transport, or 4.2.4 if using EATT over a BR/EDR transport.
  - If the Lower Tester permissions for the characteristic require a specific security mode or security level, establish a connection meeting those requirements.

- Test Procedure

  Repeat steps 1–4 for each round specified in Table 4.6.

  1. The Upper Tester orders the IUT to execute the Lock Request procedure.
  2. The IUT executes the GATT Write Characteristic Value sub-procedure for the Set Member Lock characteristic with any value.

3. The Lower Tester sends an Error Response with the Error Code specified in Table 4.6.
4. The Upper Tester orders the IUT to execute the GATT Read Characteristic Value sub-procedure for any characteristic.

Round	Error Code
1	Invalid Lock Value
2	Lock Already Granted

Table 4.6: Input Table for Invalid Lock Request test cases

- Expected Outcome

  Pass verdict

  The IUT successfully executes the GATT Read Characteristic Value sub-procedure after having received the error code.

4.5.1 Invalid SIRK

- Test Purpose

  Verify that the IUT behaves properly when the Lower Tester returns an OOB SIRK Only error response.

- Reference

  [3] 4.6.1

- Initial Condition

  - Establish a Bearer connection between the Lower Tester and the IUT as described in Section 4.2.1, if using ATT over an LE transport, or 4.2.2 if using ATT over a BR/EDR transport, or 4.2.3 if using EATT over an LE transport, or 4.2.4 if using EATT over a BR/EDR transport.
  - If the Lower Tester permissions for the characteristic require a specific security mode or security level, establish a connection meeting those requirements.

- Test Case Configuration

TCID	Error Code
CSIP/CL/SPE/BI-04-C [Invalid SIRK – OOB SIRK]	OOB SIRK Only

Table 4.7: Input Table for Invalid SIRK test cases

- Test Procedure

  1. The Upper Tester orders the IUT to start the Coordinated Set Discovery procedure.
  2. The IUT executes the GATT Find Included Services procedure to find services that include the CSI Services.

  For the TSPX_Target_Service IXIT service instance, execute steps 3–5.

  3. The IUT executes the GATT Read Characteristic Value sub-procedure for the SIRK characteristic.
  4. The Lower Tester returns an Error Response with the Error Code specified in Table 4.7.
  5. The Upper Tester confirms that the IUT completed without success the Coordinated Set Discovery procedure.

- Expected Outcome

  Pass verdict

  The IUT completed without success the Coordinated Set Discovery Procedure after receiving an Error Response in step 4.

4.6 Privacy Features

CSIP/SR/PF/BV-01-C [Private Address Change]

- Test Purpose

  Verify that the IUT changes the RSI when its private address changes.

- Reference

  [3] 6.1

- Initial Condition

  - The IUT is advertising with an RSI AD Type.

- Test Procedure

  1. The Lower Tester discovers the IUT and determines its RSI AD Type.
  2. The Lower Tester waits up to TSPX_Private_Addr_Int IXIT entry time interval until it discovers the IUT has started advertising with a different private address.

- Expected Outcome

  Pass verdict

  The RSI AD Type value in step 1 is different than the one in step 2.

  The IUT is not broadcasting with the private address from step 1 after step 2.

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 Coordinated Set Identification Profile [5].

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)
CSIP 1/1 AND CSIP 2/2 AND NOT CSIP 2/1 AND GAP 0/3 AND GATT 1a/4	Profile supported over LE not discoverable over BR/EDR	CSIP/SR/SGGIT/SDPNF/BV-01-C
CSIP 2/1 AND CSIP 5/1 AND CSIP 5/4	Set Member Discovery – Encrypted SIRK – BR/EDR	CSIP/SR/SP/BV-02-C
CSIP 2/2 AND CSIP 5/1 AND CSIP 5/4	Set Member Discovery – Encrypted SIRK - LE	CSIP/SR/SP/BV-03-C
CSIP 5/1 AND CSIP 5/5	Set Member Discovery – Plaintext SIRK	CSIP/SR/SP/BV-01-C
CSIP 10/1	Coordinated Set Identification Service	CSIP/CL/CGGIT/SER/BV-01-C CSIP/CL/SP/BV-01-C CSIP/CL/SP/BV-03-C CSIP/CL/SP/BV-04-C CSIP/CL/SPE/BI-01-C CSIP/CL/SPE/BI-02-C CSIP/CL/SPE/BI-03-C
CSIP 2/1 AND CSIP 10/1	Discovery of Set Member – BR/EDR	CSIP/CL/SP/BV-02-C
CSIP 2/2 AND CSIP 10/1	Discovery of Set Member – LE	CSIP/CL/SP/BV-07-C
CSIP 2/1 AND CSIP 11/1	Encrypted SIRK - BR/EDR	CSIP/CL/SP/BV-05-C
CSIP 2/2 AND CSIP 11/1	Encrypted SIRK - LE	CSIP/CL/SP/BV-06-C
CSIP 11/1	Set Identity Resolving Key Characteristic	CSIP/CL/CGGIT/CHA/BV-01-C CSIP/CL/SPE/BI-04-C

Item	Feature	Test Case(s)
CSIP 11/2	Coordinated Set Size Characteristic	CSIP/CL/CGGIT/CHA/BV-02-C
CSIP 11/3	Set Member Lock Characteristic	CSIP/CL/CGGIT/CHA/BV-03-C
CSIP 11/4	Set Member Rank Characteristic	CSIP/CL/CGGIT/CHA/BV-04-C
CSIP 5/2 AND CSIP 6/4	Private Address Change	CSIP/SR/PF/BV-01-C

Table 5.1: Test case mapping

6 Revision history and acknowledgments

Revision History

Publication Number	Revision Number	Date	Comments
0	p0	2021-03-30	Approved by BTI on 2021-02-25. CSIP v1.0 adopted by the BoD on 2021-03-23. Prepared for publication.
	p1r00–r02	2021-09-16 – 2021-09-22	TSE 14792 (rating 4): Changes in response to E17455 (Encrypted SIRK over different transports). Added CSIP/CL/SP/BV-06-C [Coordinated Set Discovery, Encrypted SIRK LE]. Added CSIP/SR/SP/BV-03-C [Set Member Discovery, Encrypted SIRK, LE]. Added CSIP/CL/SP/BV-07-C [Discovery of Set Members, LE]. Changed CSIP/CL/SP/BV-05-C, CSIP/SR/SP/BV-02-C, and CSIP/CL/SP/BV-02-C to apply to BR/EDR only and applied associated TCMT changes. Modified CSIP/CL/SP/BV-01-C and CSIP/SR/SP/BV-01-C test procedures to include the added transport column in the table. Updated Initial Conditions to reference the new test cases where applicable. Editorials to address BTI comments.
1	p1	2021-10-12	Approved by BTI on 2021-09-28. Expedited Erratum 17455 adopted by the BoD on 2021-10-05. Prepared for publication.
	p2r00	2022-08-18	TSE 19253 (rating 2): Updated an initial condition for CSIP/CL/SPE/BI-01-C. Editorials to align with the latest TS template and BTI conventions, including removing the pre-p0 (draft) entries from the rev history.
2	p2	2023-02-07	Approved by BTI on 2022-12-19. Prepared for TCRL 2022-2 publication.

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