Object Push Profile (OPP)

***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 Object Push Profile (OPP) Specification with the objective to provide a high probability of air interface interoperability between the tested implementation and other manufacturers' Bluetooth devices.

2 References, definitions, and abbreviations

2.1 References

This document incorporates provisions from other publications by dated or undated reference. These references are cited at the appropriate places in the text, and the publications are listed hereinafter. Additional definitions and abbreviations can be found in [1], [2], and [5].

[1] Specification of the Bluetooth System

[2] Object Push Profile

[3] ICS Proforma for Object Push Profile (OPP)

[4] The Internet Mail Consortium, vCard – The Electronic Business CardExchange Format, Version 2.1, September 1996

[5] Test Strategy and Terminology Overview

[6] IXIT Proforma for Object Push Profile (OPP)

[7] SDP Test Suite, SDP.TS

[8] GOEP Test Suite, GOEP.TS

2.2 Definitions

In this Bluetooth document, the definitions from [1], [2], and [5] apply.

2.3 Acronyms and abbreviations

In this Bluetooth document, the definitions, acronyms, and abbreviations from [1], [2], and [5] apply.

3 Test Suite Structure (TSS)

3.1 Overview

This Test Suite defines the test requirements to qualify Bluetooth capable devices implementing the Object Push Profile. OPP is dependent upon the Generic Object Exchange Profile (GOEP) and tests from the GOEP Test Suite are required to test parts of the OPP functionality. The GOEP tests are referred to in test case mapping table within this document.

The following test groups have been defined:

- Object Push
- Business Card Pull
- Business Card Exchange

3.2 Test Strategy

The test objectives are to verify the functionality of the Object Push Profile 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.

3.2.1 Applications, Features, Object Formats, and Roles

Each Bluetooth Profile defines a series of features and the way they should be implemented using the available protocol stack.

Within the Object Push Profile, the features are Object Push, Business Card Pull, and Business Card Exchange.

Object Push that is based on the Generic Object Exchange (OBEX) profile uses pre-defined object formats. The object formats are vcard, vcal, vmsg, and vnote.

The Object Push Profile requires the presence of SDP, L2CAP, RFCOMM, and OBEX. This is illustrated in Figure 3.1.

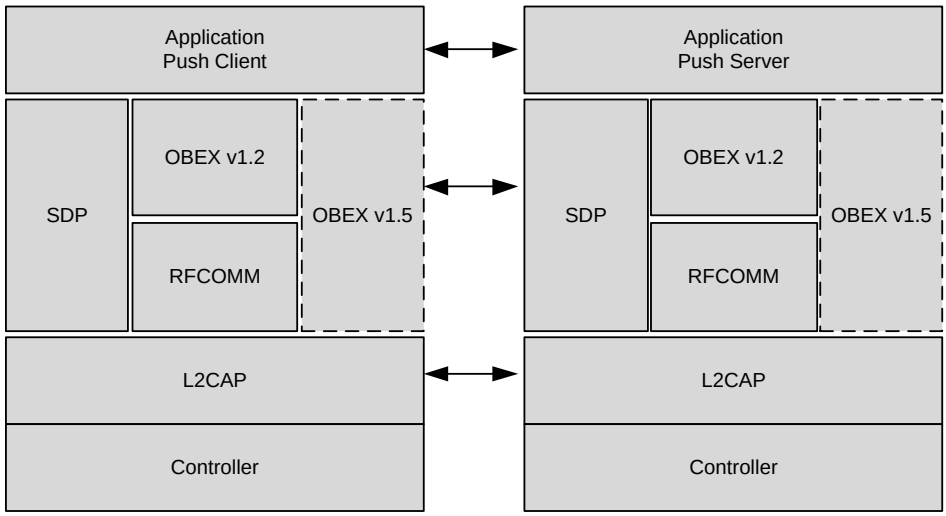

Figure 3.1: Object Push Profile test model

3.2.2 Profile procedure groups

The profile procedure groups identify the Bluetooth Object Push Profile services: Object Push, Business Card Pull, and Business Card Exchange as defined in [2]. The tables below show examples of user scenarios.

3.2.2.1 Object Push

Push Client	**Push Server**
	The user sets the device **into Object Exchange mode**.
The user of the Push Client selects the **Object Push function** on the device.	
A list of Push Servers that may support the Object Push service is displayed to the user.	
The user selects a Push Server to push the object to. If the selected device does not support the Object Push service, the user is prompted to select another device.	
	When an object is received in the Push Server it is recommended that the user of the Push Server be asked to accept or reject the object.
It is recommended that the user is notified of the result of the operation.	

3.2.2.2 Business Card Pull

Push Client	**Push Server**
	The user sets the device into **Object Exchange mode**.
The user of the Push Client selects the **Business Card Pull function** on the device.	
A list of Push Servers that may support the Object Push service is displayed to the user.	

Push Client	Push Server
The user selects a Push Server to pull the business card from. If the selected device does not support the Object Push service, the user is prompted to select another device.	
	Some devices might ask the user whether to accept the request to pull the business card from his device or not.
It is recommended that the user is notified of the result of the operation.	

3.2.2.3 Business Card Exchange

Push Client	Push Server
	The user sets the device into **Object Exchange mode**.
The user of the Push Client selects the **Business Card Exchange function** on the device.	
A list of Push Servers that may support the Object Push service is displayed to the user.	
The user selects a Push Server to exchange business cards with. If the selected device does not support the Object Push service, the user is prompted to select another device.	
	When a Push Client tries to exchange business cards with the Push Server it is recommended that the user of the Push Server is asked to accept or reject the business card offered by the Push Client. Some devices might also ask the user whether to accept the request to pull the business card from his device or not.
It is recommended that the user is notified of the result of the operation.	

4 Test cases (TC)

4.1 Introduction

4.1.1 Test case identification conventions

Test cases are assigned unique identifiers per the conventions in [5]. The convention used here is:
<spec abbreviation>/<IUT role>/<class>/**<feat>**/<func>/<subfunc>/<cap>/**<xx>-<nn>-<y>**.

Testing of this specification includes tests from the GOEP Test Suite [8]; when used, the test cases in GOEP are referred to in the TCMT using the following convention:
<spec abbreviation>/<IUT role>/GOEP/<GOEP TC Identifier>.

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

Identifier Abbreviation	**Spec Identifier <spec abbreviation>**
OPP	Object Push Profile
Identifier Abbreviation	**Role Identifier <IUT role>**
CL	Client Role
SR	Server Role
Identifier Abbreviation	**Reference Identifier <GSIT test group>**
CGSIT	Client Generic SDP Integrated Tests
SGSIT	Server Generic SDP Integrated Tests
Identifier Abbreviation	**Reference Identifier <GSIT class>**
ATTR	Attribute
OFFS	Attribute ID Offset String
SERR	Service Record
SFC	SDP Future Compatibility
Identifier Abbreviation	**Feature Identifier <feat>**
BCE	Business Card Exchange
BCP	Business Card Pull
GOEP	Generic Object Exchange Profile
OPH	Object Push

Table 4.1: OPP TC feature naming conventions

4.1.2 Conformance

When conformance is claimed for a particular specification, all capabilities are to be supported in the specified manner. The mandated tests from this Test Suite depend on the capabilities to which conformance is claimed.

The Bluetooth Qualification Program may employ tests to verify implementation robustness. The level of implementation robustness that is verified varies from one specification to another and may be revised for cause based on interoperability issues found in the market.

Such tests may verify:

- That claimed capabilities may be used in any order and any number of repetitions not excluded by the specification
- That capabilities enabled by the implementations are sustained over durations expected by the use case
- That the implementation gracefully handles any quantity of data expected by the use case
- That in cases where more than one valid interpretation of the specification exists, the implementation complies with at least one interpretation and gracefully handles other interpretations
- That the implementation is immune to attempted security exploits

A single execution of each of the required tests is required to constitute a Pass verdict. However, it is noted that to provide a foundation for interoperability, it is necessary that a qualified implementation consistently and repeatedly pass any of the applicable tests.

In any case, where a member finds an issue with the test plan generated by the Bluetooth SIG qualification tool, with the test case as described in the Test Suite, or with the test system utilized, the member is required to notify the responsible party via an erratum request such that the issue may be addressed.

4.1.3 Building of Sample Objects

When qualifying towards this Specification, each IUT requires sample objects for each of the four predefined formats.

The sample objects must include the following fields that are mandatory:

vcards	*Name*, *Version* and *Telephone Number*.
vcals	the event fields *Version*, *Description* and *Start Date/Time* OR the ToDo fields *Version*, *Categories*, *Date/Time Completed*, *Description*, *Priority*, *Status* and *Summary*
vmsgs	*Version* and *Message Body*
vnotes	*Version* and *Body*.

The sample objects that are to be used throughout the testing process must contain at least all the mandatory fields and should contain all the fields supported by the IUT to provide more complete application testing.

By building sample objects that include both mandatory supported fields and jointly supported optional fields, it can be verified that mandatory supported fields and jointly supported fields are properly processed and that optional fields that are only supported by one of the 2 devices do not cause any

malfunction upon reception by the other device, i.e., **are properly discarded**. That means for the test cases:

1. The object/item that is sent from a device, either by pushing or being pulled must contain all mandatory fields and all supported fields of the corresponding device where it is stored. If two objects/items are required, in addition all fields have a different content.
2. The object(s)/item(s) that are received by a device, either by pulling or being pushed must contain:
    - All mandatory fields with the same content as on the device from which the object was received
    - All optional fields supported by both devices with the same content as on the device from which the object was received from
    - Optional fields supported only by one device are properly discarded or erased

4.1.4 Pass/Fail verdict conventions

Each test case has an Expected Outcome section. The IUT is granted the Pass verdict when all the detailed pass criteria conditions within the Expected Outcome section are met.

The convention in this Test Suite is that, unless there is a specific set of fail conditions outlined in the test case, the IUT fails the test case as soon as one of the pass criteria conditions cannot be met. If this occurs, then the outcome of the test is a Fail verdict.

4.2 Generic SDP Integrated Tests

4.2.1 Server Generic SDP Integrated Tests

4.2.1.1 Object Push Profile – Server

Execute the Generic SDP Integrated Tests defined in Section 6.3, Server test procedures (SGSIT), in [7] using Table 4.2 below as input:

TCID	Reference	Attribute ID name	Attribute ID definition source (Universal, Profile)	Value/secondary value	Attribute presence (Present/Present for [role], Optionally present, TCMT defined)
OPP/SR/SGSIT/SERR/BV-01-C [Service record GSIT – OPP Server]	[2] 6.1	ServiceClassIDList	Universal	“OBEXObjectPush” (UUID)	Present for Server
OPP/SR/SGSIT/ATTR/BV-01-C [Attribute GSIT – Protocol Descriptor List]	[2] 6.1	ProtocolDescriptorList	Universal	“L2CAP” (UUID), “RFCOMM” (UUID): Channel – skip (Uint8), “OBEX” (UUID)	Present for Server
OPP/SR/SGSIT/ATTR/BV-02-C [Attribute GSIT – Bluetooth Profile Descriptor List, OPP 1.1]	[2] 6.1	BluetoothProfileDescriptorList	Universal	“OBEXObjectPush” (UUID): Version – “0x0100” (Uint16)	Optionally present
OPP/SR/SGSIT/ATTR/BV-03-C [Attribute GSIT – Bluetooth Profile Descriptor List, OPP 1.2]	[2] 6.1	BluetoothProfileDescriptorList	Universal	“OBEXObjectPush” (UUID): Version – “0x0102” (Uint16)	TCMT defined
OPP/SR/SGSIT/ATTR/BV-04-C [Attribute GSIT – GoepL2CapPsm]	[2] 6.1	GoepL2CapPsm	Profile	skip (Uint16)	TCMT defined
OPP/SR/SGSIT/ATTR/BV-05-C [Attribute GSIT – Supported Formats List]	[2] 6.1	Supported Formats List	Profile	skip (Data Element Sequence)	Present for Server

Table 4.2: Input for the Object Push Profile Server SGSIT SDP test procedure

4.2.1.2 Object Push Profile – Attribute ID Offset String tests

Execute the Generic SDP Integrated Tests defined in Section 6.3, Server test procedures (SGSIT), in [7] using Table 4.3 below as input:

TCID	Reference	ServiceSearchPattern	Attribute ID name	Attribute ID Offset	Attribute presence (Present/Present for [role], Optionally present, TCMT defined)
OPP/SR/SGSIT/OFFS/BV-01-C [Attribute ID Offset String GSIT – Service Name]	[2] 6.1	OBEXObjectPush	ServiceName	0x0000	Optionally present

Table 4.3: Input for the Object Push Profile SGSIT Attribute ID Offset String tests

4.2.2 Client Generic SDP Integrated Tests

Execute the Generic SDP Future Compatibility Tests defined in Section 6.4, Client test procedures (CGSIT), in [7] using Table 4.4 below as input:

TCID	Reference	Service Record Service Class UUID description	Lower Tester SDP record initial conditions
OPP/CL/CGSIT/SFC/BV-01-C [SDP Future Compatibility – IUT is OPP Client]	[2] 6.1, 7	OBEXObjectPush	The Lower Tester exposes an OPP Server SDP record. The version in the Bluetooth Profile Descriptor List is greater than the most recently adopted version.

Table 4.4: Input for the Client CGSIT SDP future compatibility tests

4.3 Bonding

- Test Purpose

  Verify whether bonding is handled correctly by the Client and the Server.

  Verify that, if requested, the PIN code is handled correctly and the next state of the application is reached.

- Reference

  [2] 3.3.1

- Initial Condition

  - It is required that either the Client or the Server has been configured to initiate Bonding.
  - The application layer feature in Table 4.5 is activated on the Client.
  - The item to be pushed, pulled, or exchanged is prepared (see Section 4.1.3).
  - Object Exchange mode is set on the Server.
  - The Server to push, pull, or exchange the item with is selectable by the Client.

- Test Case Configuration

Test Case	Application Layer Feature
OPP/CL/OPH/BV-02-C [PIN Check]	Object Push
OPP/SR/OPH/BV-02-C [PIN Check]	Object Push
OPP/CL/BCP/BV-03-C [PIN Check]	Business Card Pull
OPP/SR/BCP/BV-03-C [PIN Check]	Business Card Pull
OPP/CL/BCE/BV-03-C [PIN Check]	Business Card Exchange
OPP/SR/BCE/BV-03-C [PIN Check]	Business Card Exchange

Table 4.5: PIN Check test cases

- Test Procedure

  1. Select the Server and activate the application layer feature from Table 4.5.
  2. If a Bluetooth PIN code is requested, enter the same PIN code on both devices.

- Expected Outcome

  Pass verdict

  Bluetooth PIN exchange and subsequent bonding occurred between devices.

  If the Bluetooth PIN code is requested from the user prior to the application layer feature from Table 4.5, the entered PIN code is treated correctly and the application progresses to the next state.

- Notes

  If Bluetooth PIN exchange did not explicitly happen on both devices, verify that Bonding has happened between the devices by whatever test means available. This condition would be applicable when both devices use default PIN codes.

4.4 Object Push test cases

4.4.1 Push Object – Accepted

- Test Purpose

  Verify that a sample object is correctly sent from the Client and received in the inbox of the Server.

- Reference

  [2] 3.3.1

- Initial Condition

  - The application for Object Push is activated on the Client.
  - The object for Object Push is prepared with the content format from Table 4.6 (see Section 4.1.3).
  - Object Exchange mode is set on the Server.
  - The Server is selectable from a list on the Client.

- Test Case Configuration

Test Case	Content Format
OPP/CL/OPH/BV-03-C [Push vCard – Accepted]	vCard
OPP/SR/OPH/BV-03-C [Push vCard – Accepted]	vCard
OPP/CL/OPH/BV-07-C [Push vCal – Accepted]	vCal
OPP/SR/OPH/BV-07-C [Push vCal – Accepted]	vCal
OPP/CL/OPH/BV-11-C [Push vMsg – Accepted]	vMsg
OPP/SR/OPH/BV-11-C [Push vMsg – Accepted]	vMsg
OPP/CL/OPH/BV-15-C [Push vNote – Accepted]	vNote
OPP/SR/OPH/BV-15-C [Push vNote – Accepted]	vNote

Table 4.6: Push Object – Accepted test cases

- Test Procedure

  1. Select the Server to push the object to on the Client with the content format from Table 4.6.
  2. Perform pairing, if requested.
  3. Start the Object Push function.
  4. Accept the received object on the Server.

- Expected Outcome

  Pass verdict

  The Object Push operation is processed correctly and completed corresponding to the settings and user actions.

  The Object Push function is initiated by user action on the Client and not automatically.

  The Client may be notified that the Object Push operation was successful.

  The pushed object with the content format from Table 4.6 is in the corresponding application or the object store and is pushed correctly to the Server (see Section 4.1.3).

4.4.2 Push Two Objects – Accepted

- Test Purpose

  Verify that, if supported by the Client, two sample objects of the same content format that are sent subsequently (using one OBEX PUT operation for each object) in a single Object Push operation are correctly sent from the Client and received in the inbox of the Server.

- Reference

  [2] 3.3.1

- Initial Condition

  - The application for Object Push is activated on the Client.
  - The objects for Object Push are prepared with the content format from Table 4.7 (see Section 4.1.3).
  - Object Exchange mode is set on the Server.
  - The Server is selectable from a list by the Client.

- Test Case Configuration

Test Case	Content Format
OPP/CL/OPH/BV-04-C [Push Two vCard Items – Accepted]	vCard
OPP/SR/OPH/BV-04-C [Push Two vCard Items – Accepted]	vCard
OPP/CL/OPH/BV-08-C [Push Two vCal Items – Accepted]	vCal
OPP/SR/OPH/BV-08-C [Push Two vCal Items – Accepted]	vCal
OPP/CL/OPH/BV-12-C [Push Two vMsg Items – Accepted]	vMsg
OPP/SR/OPH/BV-12-C [Push Two vMsg Items – Accepted]	vMsg
OPP/CL/OPH/BV-16-C [Push Two vNote Items – Accepted]	vNote
OPP/SR/OPH/BV-16-C [Push Two vNote Items – Accepted]	vNote

Table 4.7: Push Two Objects – Accepted test cases

- Test Procedure

  1. Select the Server to push the objects to on the Client with the content format from Table 4.7.
  2. Perform pairing, if requested.
  3. Start the Object Push function with two subsequent objects of the same content format.
  4. Perform either alternative 4A or 4B depending on the Server's behavior.

     Alternative 4A (The Server is either the Lower Tester or the Server IUT is able to accept a second object before the first object has been processed):

     4A.1 The Server accepts the received objects.

     Alternative 4B (The IUT is a Server that is not able to accept a second object until the first object has been processed):

     4B.1 The IUT accepts the first received object successfully.
     4B.2 The IUT may respond with the response code (0xD3) "Service Unavailable" to indicate to the Push Client that there is a temporary condition that will be alleviated after some delay.

- Expected Outcome

  Pass verdict

  The Object Push operation is processed correctly and completed corresponding to the settings and user actions.

  The Object Push function is initiated by user action on the Client and not automatically.

  The Client may be notified that the Object Push operation was successful.

  The pushed objects with the content format from Table 4.7 are in the corresponding application or the object store and have been pushed correctly to the Server (see Section 4.1.3).

4.4.3 Push Object – Rejected

- Test Purpose

  Verify that, after rejecting an object on the Server, the rejection is notified correctly on the Client and the object is not stored in the corresponding application or the object store in the Server.

- Reference

  [2] 3.3.1

- Initial Condition

  - The application for Object Push is activated on the Client.
  - The object for Object Push is prepared with the content format from Table 4.8 (see Section 4.1.3).
  - Object Exchange mode is set on the Server.
  - The Server is selectable from a list on the Client.

- Test Case Configuration

Test Case	Content Format
OPP/CL/OPH/BV-05-C [Push vCard – Rejected]	vCard
OPP/SR/OPH/BV-05-C [Push vCard – Rejected]	vCard
OPP/CL/OPH/BV-09-C [Push vCal – Rejected]	vCal
OPP/SR/OPH/BV-09-C [Push vCal – Rejected]	vCal
OPP/CL/OPH/BV-13-C [Push vMsg – Rejected]	vMsg
OPP/SR/OPH/BV-13-C [Push vMsg – Rejected]	vMsg
OPP/CL/OPH/BV-17-C [Push vNote – Rejected]	vNote
OPP/SR/OPH/BV-17-C [Push vNote – Rejected]	vNote

Table 4.8: Push Object – Rejected test cases

- Test Procedure

  1. Select the Server to push the object to on the Client with the content format from Table 4.8.
  2. Perform pairing, if requested.
  3. Start the Object Push function.
  4. Reject the received object on the Server.

- Test Condition

  The Client is able to display errors to the user.

- Expected Outcome

  Pass verdict

  The Object Push operation is processed correctly and completed corresponding to the settings and user actions.

  The Object Push function is initiated by user action on the Client and not automatically.

  The Server can reject the object with the content format from Table 4.8 and it cannot be found in the corresponding application or the object store.

  The Client is notified that the object was rejected.

4.4.4 Push Object – Non Support

- Test Purpose

  Verify that if the Server does not support Object Push of items of a specific content format, this is notified correctly on the Client and handled correctly by the Server.

- Reference

  [2] 3.3.1

- Initial Condition

  - The application for Object Push is activated on the Client.
  - The object for Object Push is prepared with the content format from Table 4.9 (see Section 4.1.3).
  - Object Exchange mode is set on the Server.
  - The Server is selectable from a list on the Client.

- Test Case Configuration

Test Case	Content Format
OPP/CL/OPH/BV-10-C [Push vCal – Non Support]	vCal
OPP/SR/OPH/BV-10-C [Push vCal – Non Support]	vCal
OPP/CL/OPH/BV-14-C [Push vMsg – Non Support]	vMsg
OPP/SR/OPH/BV-14-C [Push vMsg – Non Support]	vMsg
OPP/CL/OPH/BV-18-C [Push vNote – Non Support]	vNote
OPP/SR/OPH/BV-18-C [Push vNote – Non Support]	vNote

Table 4.9: Push Object – Non Support test cases

- Test Procedure

  1. Select the Server to push the object to on the Client with the content format from Table 4.9.
  2. Perform pairing, if requested.
  3. Start the Object Push function.

- Expected Outcome

  Pass verdict

  The Client is notified that Object Push of the object with the content format from Table 4.9 is not supported on the Server.

The incoming object cannot be found in the corresponding application or the object store on the Server.

- Notes

  This test is applicable for the Server IUT only if the Server does not support Object Push of objects with the content format from Table 4.9.

4.4.5 Push other content formats – Accepted

- Test Purpose

  Verify that a sample file of other supported content format is correctly sent from the Client to the object store or corresponding application in the Server.

- Reference

  [2] 3.3.1

- Initial Condition

  - The application for Object Push is activated on the Client.
  - The item that is to be pushed for Object Push is prepared.
  - Object Exchange mode is set on the Server.
  - The Server is selectable from a list on the Client.

- Test Case Configuration

Test Case
OPP/CL/OPH/BV-19-C [Push other content formats – Accepted]
OPP/SR/OPH/BV-19-C [Push other content formats – Accepted]

Table 4.10: Push other content formats – Accepted test cases

- Test Procedure

  1. Select the Server to push the file to on the Client.
  2. Perform pairing, if requested.
  3. Start the Object Push function.

- Expected Outcome

  Pass verdict

  The Object Push operation is processed correctly and completed corresponding to the settings and user actions.

  The Object Push operation is performed by a user action on the Client and not automatically.

  The Client may be notified that the Object Push operation was successful.

  The pushed item is in the object store or corresponding application and is pushed correctly to the Server.

- Notes

  This test case is performed for each of the other formats listed as supported in the IXIT [6]; in case the IUT supports all content formats, a selection of them will be used instead: mp3, wav, jpeg, pdf, doc.

OPP/CL/OPH/BV-20-C [Push other content formats - Non Support, Client side]

- Test Purpose

  Verify that the Client IUT is correctly notified if an Object Push of unsupported content format is pushed to the Lower Tester.

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

- Reference

  [2] 3.3.1

- Initial Condition
  - The application for Object Push is activated on the IUT.
  - The item for Object Push is prepared on the IUT; use a file format that isn't listed as supported by the Lower Tester. For example, if a JPG file is not supported, it is used.
  - The Lower Tester is selectable from a list by the IUT.
  - Object Exchange mode is set on the Lower Tester.
  - The Lower Tester is set to not support the formats that the IUT claims it supports.

- Test Procedure

  1. Select the Lower Tester to push the item to on the IUT.
  2. Perform pairing, if requested.
  3. Start the Object Push function.

- Expected Outcome

  Pass verdict

  The Object Push operation is processed correctly and completed corresponding to the settings and user actions.

  The IUT is notified that the Object Push operation is not successful.

OPP/SR/OPH/BV-21-C [Push other content formats – Non Support, Server side]

- Test Purpose

  Verify that Object Push of unsupported content formats to the IUT is handled correctly.

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

- Reference

  [2] 3.3.1

- Initial Condition
  - The item for Object Push that isn't listed as supported by the IUT is available on the Lower Tester. For example, if a JPG file is not supported, it is used.
  - Object Exchange mode is set on the IUT.

- Test Procedure

  1. The Lower Tester selects the IUT to push the item to.
  2. Perform pairing, if requested.
  3. Start the Object Push function.

- Expected Outcome

  Pass verdict

  The Object Push operation is processed correctly and completed corresponding to the settings and user actions.

  The incoming item cannot be found in the object store or corresponding application on the IUT.

- Notes

  This test is applicable only for the formats the IUT does not support in Object Push.

4.4.6 Push large 2 MB other content format – Accepted

- Test Purpose

  Verify that a 2 MB file of other supported content format is correctly sent from the Client and received on the Server.

- Reference

  [2] 3.3.1

- Initial Condition

  - The application for Object Push is activated on the Client.
  - The 2 MB file (or larger) that is to be pushed is available on the Client.
  - Object Exchange mode is set on the Server.
  - The Server is selectable from a list on the Client.
  - Enough resources are free to accept a 2 MB file on the Server.

- Test Case Configuration

Test Case
OPP/CL/OPH/BV-22-C [Push large 2 MB other content format – Accepted]
OPP/SR/OPH/BV-22-C [Push large 2 MB other content format – Accepted]

Table 4.11: Push large 2 MB other content format – Accepted test cases

- Test Procedure

  1. Select the Server to push the 2 MB file to on the Client.
  2. Perform pairing, if requested.
  3. Push the 2 MB file to the Server using Object Push.

- Expected Outcome

  Pass verdict

  The Object Push operation is performed by a user action on the Client and not automatically.

  The Client may be notified that the Object Push operation was successful.

If the Server IUT does not support a 2 MB file size, then the Lower Tester will be notified of an error.

The pushed 2 MB file is pushed correctly onto the Server.

The 2 MB file is not altered in any way.

4.4.7 Push Two Objects using a single PUT operation – Accepted

- Test Purpose

  Verify that, if supported by the Client, two sample objects of the same content format that are sent subsequently (using a single OBEX PUT operation for both of them) in a single Object Push operation are correctly sent from the Client and received in the inbox of the Server.

- Reference

  [2] 3.3.1

- Initial Condition

  - The application for Object Push is activated on the Client.
  - The objects for Object Push are prepared with the content format from Table 4.12 (see Section 4.1.3).
  - Object Exchange mode is set on the Server.
  - The Server is selectable from a list by the Client.

- Test Case Configuration

Test Case	Content Format
OPP/CL/OPH/BV-23-C [Push Two vCard Items using a single PUT operation – Accepted]	vCard
OPP/SR/OPH/BV-23-C [Push Two vCard Items using a single PUT operation – Accepted]	vCard
OPP/CL/OPH/BV-24-C [Push Two vCal Items using a single PUT operation – Accepted]	vCal
OPP/SR/OPH/BV-24-C [Push Two vCal Items using a single PUT operation – Accepted]	vCal
OPP/CL/OPH/BV-25-C [Push Two vMsg Items using a single PUT operation – Accepted]	vMsg
OPP/SR/OPH/BV-25-C [Push Two vMsg Items using a single PUT operation – Accepted]	vMsg
OPP/CL/OPH/BV-26-C [Push Two vNote Items using a single PUT operation – Accepted]	vNote
OPP/SR/OPH/BV-26-C [Push Two vNote Items using a single PUT operation – Accepted]	vNote

Table 4.12: Push Two Objects using a single PUT operation – Accepted test cases

- Test Procedure

  1. Select the Server to push the objects to on the Client with the content format from Table 4.12.
  2. Perform pairing, if requested.
  3. Start the Object Push function with two subsequent objects of the same content format.
  4. Accept the received objects on the Server.

- Expected Outcome

  Pass verdict

  The Object Push operation is processed correctly and completed corresponding to the settings and user actions.

  The Object Push function is initiated by user action on the Client and not automatically.

  The Client may be notified that the Object Push operation was successful.

  A single OBEX PUT operation is used.

  The pushed objects with the content format from Table 4.12 are in the corresponding application or the object store and have been pushed correctly to the Server (see Section 4.1.3).

4.4.8 Close an OBEX Session

- Test Purpose

  Verify that a Client can terminate an OBEX session by sending an OBEX Disconnect to the Server and that the Server responds correctly.

- Reference

  [2] 5.1

- Initial Condition

  - An OBEX session is ongoing between the Client and the Server.

- Test Case Configuration

Test Case
OPP/CL/OPH/BV-34-C [Close an OBEX Session]
OPP/SR/OPH/BV-34-C [Close an OBEX Session]

Table 4.13: Close an OBEX Session test cases

- Test Procedure

  1. The Client attempts to terminate the OBEX session by sending an OBEX Disconnect command to the Server.

- Expected Outcome

  Pass verdict

  The Client sends an OBEX disconnection request to the Server.

  The Server responds with an OBEX disconnection response.

OPP/CL/OPH/BI-01-C [Prevent use of NULL characters in objects]

- Test Purpose

  Verify that NULL characters are not used by the Client IUT when pushing a vCard object to the Lower Tester.

- Reference

  [2] 3.3.1

  2.1.9: the vCard 2.1 specification

- Initial Condition

  - The application for Object Push is activated on the Client.
  - The vCard items for Object Push are prepared (see Section 4.1.3).
  - Object Exchange mode is set on the Server.
  - The Server is selectable from a list on the Client.

- Test Procedure

  1. Select the Server to push the vCard item to on the Client.
  2. Perform pairing, if requested.
  3. Start the Object Push function.
  4. Accept the received vCard items on the Server.

- Expected Outcome

  Pass verdict

  The retrieved vCard-Listing object is encoded in Base 64 (default) or Quoted-Printable encoding (alphanumeric) and does not contain any null characters.

4.5 Business Card Pull

4.5.1 Pull – Non Support

- Test Purpose

  If Business Card Pull is not supported on the Server but is supported on the Client device, verify that the Server responds with an error message on a pull request from the Client.

- Reference

  [2] 4.1

- Initial Condition

  - The application for Business Card Pull is activated on the Client.
  - Object Exchange mode is set on the Server.
  - The Server is selectable from a list on the Client.

- Test Case Configuration

Test Case
OPP/CL/BCP/BV-02-C [Pull – Non Support]
OPP/SR/BCP/BV-02-C [Pull – Non Support]

Table 4.14: Pull – Non Support test cases

- Test Procedure

1. Select the Server to pull a vCard item from on the Client.
2. Perform pairing, if requested.
3. Start the Business Card Pull function.

- Expected Outcome

Pass verdict

The Server responds with an error message on a pull request from the Client.

The Client is notified of the error.

The user may be informed to select another device for Business Card Pull.

4.5.2 Pull vCard – Accepted

- Test Purpose

Verify that a vCard is correctly pulled from the Server to the Client.

- Reference

[2] 3.3.2

- Initial Condition

  - The application for Business Card Pull is activated on the Client.
  - The vCard for Business Card Pull is prepared.
  - Object Exchange mode is set on the Server.
  - The Server is selectable from a list on the Client.

- Test Case Configuration

Test Case
OPP/CL/BCP/BV-04-C [Pull vCard – Accepted]
OPP/SR/BCP/BV-04-C [Pull vCard – Accepted]

Table 4.15: Pull vCard – Accepted test cases

- Test Procedure

1. Select the Server to pull the object from on the Client.
2. Perform pairing, if requested.
3. Start the Business Card Pull function.
4. Accept the request to pull the vCard on the Server.

- Expected Outcome

  Pass verdict

  The Business Card Pull operation is processed correctly and completed corresponding to the settings and user actions.

  The Business Card Pull function is initiated by user action on the Client and not automatically.

  The IUT may be notified that the Business Card Pull operation was successful.

  The pulled vCard item is in the corresponding application or the object store and is pulled correctly from the Server (see Section 4.1.3).

4.5.3 Pull vCard – Rejected

- Test Purpose

  Verify that, after rejecting the pull of a vCard on the Server, the rejection is notified correctly on the Client and that the vCard is not sent to the Client.

- Reference

  [2] 3.3.2

- Initial Condition

  - The application for Business Card Pull is activated on the Client.
  - The vCard item for Business Card Pull is prepared (see Section 4.1.3).
  - Object Exchange mode is set on the Server.
  - The Server is selectable from a list on the Client.

- Test Case Configuration

Test Case
OPP/CL/BCP/BV-05-C [Pull vCard – Rejected]
OPP/SR/BCP/BV-05-C [Pull vCard – Rejected]

Table 4.16: Pull vCard – Rejected test cases

- Test Procedure

  1. Select the Server to pull the object from on the Client.
  2. Perform pairing, if requested.
  3. Start the Business Card Pull function.
  4. Accept the request to pull the vCard.

- Expected Outcome

  Pass verdict

  The Business Card Pull operation is processed correctly and completed corresponding to the settings and user actions.

  The Business Card Pull function is initiated by user action on the Client and not automatically.

  The user is asked or can set to reject the vCard item on the Server.

  The Client may be notified that the pull of the vCard item was rejected on the Server.

After rejecting the pull of the vCard on the Server, the pulled vCard item cannot be found in the corresponding application or the object store on the Client.

4.6 Business Card Exchange

4.6.1 Exchange – Accept-Accept

- Test Purpose

  Verify that business cards are correctly exchanged between the Client and the Server if the push and pull operations are accepted on the Server.

- Reference

  [2] 3.3.3

- Initial Condition

  - The application for Business Card Exchange is activated on the Client.
  - The Server is selectable from a list on the Client.
  - The first business card to be exchanged is prepared on the Client (see Section 4.1.3).
  - Object Exchange mode is set on the Server.
  - The second business card to be exchanged is prepared on the Server (see Section 4.1.3).

- Test Case Configuration

Test Case
OPP/CL/BCE/BV-04-C [Exchange – Accept-Accept]
OPP/SR/BCE/BV-04-C [Exchange – Accept-Accept]

Table 4.17: Exchange – Accept-Accept test cases

- Test Procedure

  1. Select the Server to exchange the business cards with on the Client.
  2. Perform pairing, if requested.
  3. Start the Business Card Exchange function.
  4. Accept the first business card offered by the Client on the Server.
  5. Accept the request to pull the second business card from the Server.

- Expected Outcome

  Pass verdict

  The Business Card Exchange operation is processed correctly and completed corresponding to the settings and user actions.

  The Business Card Exchange function is performed by a user action and not automatically.

  The pushed first business card is in the corresponding application or the object store and pushed correctly to the Server (see Section 4.1.3).

  The pulled second business card is in the corresponding application or the object store and pulled correctly to the Client (see Section 4.1.3).

  The IUT may be notified that the Business Card Exchange operation was successful.

4.6.2 Exchange – Accept-Reject

- Test Purpose

  Verify that Business Card Exchange is correctly handled between the Client and the Server if the push operation is accepted and the pull operation is rejected on the Server.

- Reference

  [2] 3.3.3

- Initial Condition

  - The application for Business Card Exchange is activated on the Client.
  - The Server is selectable from a list on the Client.
  - The first business card to be exchanged is prepared on the Client (see Section 4.1.3).
  - Object Exchange mode is set on the Server.
  - The second business card to be exchanged is prepared on the Server (see Section 4.1.3).

- Test Case Configuration

Test Case
OPP/CL/BCE/BV-05-C [Exchange – Accept-Reject]
OPP/SR/BCE/BV-05-C [Exchange – Accept-Reject]

Table 4.18: Exchange – Accept-Reject test cases

- Test Procedure

  1. Select the Server to exchange the business cards with on the Client.
  2. Perform pairing, if requested.
  3. Start the Business Card Exchange function.
  4. Accept the first business card offered by the Client on the Server.
  5. Reject the request to pull the second business card from the Server.

- Expected Outcome

  Pass verdict

  The Business Card Exchange operation is processed correctly and completed corresponding to the settings and user actions.

  The Business Card Exchange function was initiated by user action and not automatically.

  The user is asked or can set to accept/reject the Business Card Push on a Server IUT.

  The pushed first business card can be found in the corresponding application or the object store and is pushed correctly to the Server (see Section 4.1.3).

  The user is asked or can set to accept/reject the Business Card Pull on a Server IUT.

  After rejecting the Business Card Pull on the Server, the pulled second business card cannot be found in the corresponding application or the object store on the Client.

  The IUT may be notified that the Business Card Exchange operation was not successful.

4.6.3 Exchange – Reject-Accept

- Test Purpose

  Verify that Business Card Exchange is correctly handled between the Client and the Server if the push operation is rejected and the pull operation is accepted on the Server.

- Reference

  [2] 3.3.3

- Initial Condition

  - The application for Business Card Exchange is activated on the Client.
  - The Server is selectable from a list on the Client.
  - The first business card to be exchanged is prepared on the Client (see Section 4.1.3).
  - Object Exchange mode is set on the Server.
  - The second business card to be exchanged is prepared on the Server (see Section 4.1.3).

- Test Case Configuration

Test Case
OPP/CL/BCE/BV-06-C [Exchange – Reject-Accept]
OPP/SR/BCE/BV-06-C [Exchange – Reject-Accept]

Table 4.19: Exchange – Reject-Accept test cases

- Test Procedure

  1. Select the Server to exchange the business cards with on the Client.
  2. Perform pairing, if requested.
  3. Start the Business Card Exchange function.
  4. Reject the first business card offered by the Client on the Server.
  5. Accept the request to pull the second business card from the Server.

- Expected Outcome

  Pass verdict

  The Business Card Exchange operation is processed correctly and completed corresponding to the settings and user actions.

  The Business Card Exchange function was initiated by a user action and not automatically.

  The user is asked or can set to accept/reject the Business Card Push on a Server IUT.

  The pushed first business card cannot be found in the corresponding application or the object store on the Server.

  The user is asked or can set to accept/reject the Business Card Pull on a Server IUT.

  The pulled second business card may be found in the corresponding application or the object store and is pulled correctly from the Server (see Section 4.1.3).

  The IUT may be notified that the Business Card Exchange operation was not successful.

4.6.4 Exchange – Reject-Reject

- Test Purpose

  Verify that Business Card Exchange is correctly handled between the Client and the Server if the push and operations are rejected on the Server.

- Reference

  [2] 3.3.3

- Initial Condition

  - The application for Business Card Exchange is activated on the Client.
  - The Server is selectable from a list on the Client.
  - The first business card to be exchanged is prepared on the Client (see Section 4.1.3).
  - Object Exchange mode is set on the Server.
  - The second business card to be exchanged is prepared on the Server (see Section 4.1.3).

- Test Case Configuration

Test Case
OPP/CL/BCE/BV-07-C [Exchange – Reject-Reject]
OPP/SR/BCE/BV-07-C [Exchange – Reject-Reject]

Table 4.20: Exchange – Reject-Reject test cases

- Test Procedure

  1. Select the Server to exchange the business cards with on the Client.
  2. Perform pairing, if requested.
  3. Start the Business Card Exchange function.
  4. Reject the first business card offered by the Client on the Server.
  5. Reject the request to pull the second business card from the Server.

- Expected Outcome

  Pass verdict

  The Business Card Exchange operation is processed correctly and completed corresponding to the settings and user actions.

  The Business Card Exchange function was initiated by a user action and not automatically.

  The user is asked or can set to accept/reject the Business Card Push on a Server IUT.

  The pushed first business card is not in the corresponding application or the object store on the Server.

  The user is asked or can set to accept/reject the Business Card Pull on a Server IUT.

  The pulled second business card is not in the corresponding application or the object store on the Client.

  The Client may be notified that the Business Card Exchange operation was not successful.

5 Test case mapping

The Test Case Mapping Table (TCMT) maps test cases to specific capabilities 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 Object Push Profile (OPP) [3].

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

Feature: A brief, informal description of the feature being tested.

Test Case(s): The applicable test case identifiers are required for Bluetooth Qualification if the corresponding y/x references defined in the Item column are supported. Further details about the function of the TCMT are elaborated in [5].

For the purpose and structure of the ICS/IXIT, refer to [5].

Item	Feature	Test Case(s)
SDP Service Records		
OPP 1/2	OPP Server SDP Service	OPP/SR/SGSIT/SERR/BV-01-C OPP/SR/SGSIT/ATTR/BV-01-C OPP/SR/SGSIT/ATTR/BV-05-C OPP/SR/SGSIT/OFFS/BV-01-C
OPP 2b/1 AND OPP 1/2	OPP Server SDP Service, OPP 1.1	OPP/SR/SGSIT/ATTR/BV-02-C
OPP 2b/2 AND OPP 1/2	OPP Server SDP Service, OPP 1.2	OPP/SR/SGSIT/ATTR/BV-03-C
OPP 1/2 AND OPP 3/19	OPP Server SDP attribute – GoepL2CapPsm	OPP/SR/SGSIT/ATTR/BV-04-C
OPP 2/1	Successful Connection with future SDP Record value – OPP Client	OPP/CL/CGSIT/SFC/BV-01-C
Authentication		
OPP 2/2 AND (NOT OPP 2/2a) AND OPP 2/3	Initiation of Authentication request / Bluetooth PIN exchange	OPP/CL/OPH/BV-02-C
OPP 3/2 AND OPP 3/3	Initiation of Authentication request / Bluetooth PIN exchange	OPP/SR/OPH/BV-02-C
OPP 2/2 AND (NOT OPP 2/2a) AND OPP 2/13	Initiation of Authentication request / Bluetooth PIN exchange	OPP/CL/BCP/BV-03-C
OPP 3/2 AND OPP 3/13	Initiation of Authentication request / Bluetooth PIN exchange	OPP/SR/BCP/BV-03-C
OPP 2/2 AND (NOT OPP 2/2a) AND OPP 2/15	Initiation of Authentication request / Bluetooth PIN exchange	OPP/CL/BCE/BV-03-C

Item	Feature	Test Case(s)
OPP 3/2 AND OPP 3/16	Initiation of Authentication request / Bluetooth PIN exchange	OPP/SR/BCE/BV-03-C
Object Push		
OPP 2/4	Object Push vCard	OPP/CL/OPH/BV-03-C
OPP 3/4	Object Push vCard	OPP/SR/OPH/BV-03-C
OPP 2/5	Object Push vCal	OPP/CL/OPH/BV-07-C
OPP 3/5	Object Push vCal	OPP/SR/OPH/BV-07-C
OPP 2/6	Object Push vMsg	OPP/CL/OPH/BV-11-C
OPP 3/6	Object Push vMsg	OPP/SR/OPH/BV-11-C
OPP 2/7	Object Push vNote	OPP/CL/OPH/BV-15-C
OPP 3/7	Object Push vNote	OPP/SR/OPH/BV-15-C
OPP 2/4	Object Push vCard reject	OPP/CL/OPH/BV-05-C
OPP 3/9	Object Push vCard reject	OPP/SR/OPH/BV-05-C
OPP 2/5	Object Push vCal reject	OPP/CL/OPH/BV-09-C
OPP 3/10	Object Push vCal reject	OPP/SR/OPH/BV-09-C
OPP 2/6	Object Push vMsg reject	OPP/CL/OPH/BV-13-C
OPP 3/11	Object Push vMsg reject	OPP/SR/OPH/BV-13-C
OPP 2/7	Object Push vNote reject	OPP/CL/OPH/BV-17-C
OPP 3/12	Object Push vNote reject	OPP/SR/OPH/BV-17-C
OPP 2/5	Object Push vCal not supported	OPP/CL/OPH/BV-10-C
OPP 3/3 AND (NOT OPP 3/5)	Object Push vCal not supported	OPP/SR/OPH/BV-10-C
OPP 2/6	Object Push vMsg not supported	OPP/CL/OPH/BV-14-C
OPP 3/3 AND (NOT OPP 3/6)	Object Push vMsg not supported	OPP/SR/OPH/BV-14-C
OPP 2/7	Object Push vNote not supported	OPP/CL/OPH/BV-18-C
OPP 3/3 AND (NOT OPP 3/7)	Object Push vNote not supported	OPP/SR/OPH/BV-18-C
OPP 2/8a OR OPP 2/8b	Object Push – Other content formats	OPP/CL/OPH/BV-19-C
OPP 3/8a OR OPP 3/8b	Object Push – Other content formats	OPP/SR/OPH/BV-19-C
OPP 2/8	Object Push – Other content formats – non support Client	OPP/CL/OPH/BV-20-C
OPP 3/8a	Object Push – Other content formats – non support Server	OPP/SR/OPH/BV-21-C
OPP 2/8a OR OPP 2/8b	Object Push – Other content formats	OPP/CL/OPH/BV-22-C
OPP 3/8a OR OPP 3/8b	Object Push – Other content formats	OPP/SR/OPH/BV-22-C
OPP 2/9b	Push / Receive multiple vCards using a single PUT operation	OPP/CL/OPH/BV-23-C
OPP 3/3a AND OPP 3/4	Push / Receive multiple vCards using a single PUT operation	OPP/SR/OPH/BV-23-C

Item	Feature	Test Case(s)
OPP 2/10b	Push / Receive multiple vCals using a single PUT operation	OPP/CL/OPH/BV-24-C
OPP 3/3a AND OPP 3/5	Push / Receive multiple vCals using a single PUT operation	OPP/SR/OPH/BV-24-C
OPP 2/11b	Push / Receive multiple vMsgs using a single PUT operation	OPP/CL/OPH/BV-25-C
OPP 3/3a AND OPP 3/6	Push / Receive multiple vMsgs using a single PUT operation	OPP/SR/OPH/BV-25-C
OPP 2/12b	Push / Receive multiple vNotes using a single PUT operation	OPP/CL/OPH/BV-26-C
OPP 3/3a AND OPP 3/7	Push / Receive multiple vNotes using a single PUT operation	OPP/SR/OPH/BV-26-C
OPP 4/1 AND OPP 2/4	Abort-Push Operation	OPP/CL/OPH/BV-27-I
OPP 4/1 AND OPP 3/4	Abort-Push Operation	OPP/SR/OPH/BV-27-I
OPP 1/2 AND OPP 4/3 AND OPP 3/4	Multiple vCards transferred as a single vObject	OPP/SR/OPH/BV-30-I
OPP 1/2 AND OPP 4/4 AND OPP 3/3 AND OPP 3/4	Multiple vCards transfer	OPP/SR/OPH/BV-31-I
OPP 4/5 AND OPP 3/3 AND OPP 3/4	vCards with multiple Phone Number Fields	OPP/SR/OPH/BV-32-I
OPP 1/2 AND OPP 4/6 AND OPP 3/5	Push vCal to Different Time Zone Server	OPP/SR/OPH/BV-33-I
OPP 2/3	Object Push	OPP/CL/OPH/BV-34-C
OPP 3/3	Object Push	OPP/SR/OPH/BV-34-C
OPP 2/9a	Push / Receive multiple vCards	OPP/CL/OPH/BV-04-C
OPP 3/3 AND OPP 3/4	Push / Receive multiple vCards	OPP/SR/OPH/BV-04-C
OPP 2/10a	Push / Receive multiple vCals	OPP/CL/OPH/BV-08-C
OPP 3/3 AND OPP 3/5	Push / Receive multiple vCals	OPP/SR/OPH/BV-08-C
OPP 2/11a	Push / Receive multiple vMsgs	OPP/CL/OPH/BV-12-C
OPP 3/3 AND OPP 3/6	Push / Receive multiple vMsgs	OPP/SR/OPH/BV-12-C
OPP 2/12a	Push / Receive multiple vNotes	OPP/CL/OPH/BV-16-C
OPP 3/3 AND OPP 3/7	Push / Receive multiple vNotes	OPP/SR/OPH/BV-16-C
OPP 2/4	Check for Null characters	OPP/CL/OPH/BI-01-C

Item	Feature	Test Case(s)
Business Card Pull		
OPP 2/13	Business Card Pull	OPP/CL/BCP/BV-04-C
OPP 3/13	Business Card Pull	OPP/SR/BCP/BV-04-C
OPP 2/13	Business Card Pull reject	OPP/CL/BCP/BV-05-C
OPP 3/15	Business Card Pull reject	OPP/SR/BCP/BV-05-C
OPP 2/13	Business Card Pull not supported	OPP/CL/BCP/BV-02-C
OPP 1/2 AND (NOT OPP 3/13)	Business Card Pull not supported	OPP/SR/BCP/BV-02-C
Business Card Exchange		
OPP 2/15	Business Card Exchange	OPP/CL/BCE/BV-04-C
OPP 3/16	Business Card Exchange	OPP/SR/BCE/BV-04-C
OPP 2/15	Business Card Exchange reject	OPP/CL/BCE/BV-05-C OPP/CL/BCE/BV-06-C OPP/CL/BCE/BV-07-C
OPP 3/18	Business Card Exchange reject	OPP/SR/BCE/BV-05-C OPP/SR/BCE/BV-06-C OPP/SR/BCE/BV-07-C
GOEP 2.0 or later		
OPP 2b/2 AND OPP 3/20 AND OPP 3/3	Server: OPP v1.2 or later Features backward compatibility	OPP/SR/GOEP/BC/BV-01-C
OPP 1b/2 AND OPP 2/18 AND OPP 2/3	Client: Features backward compatibility	OPP/CL/GOEP/BC/BV-02-C
OPP 2b/2 AND OPP 3/20 AND OPP 3/13	Server: GOEP v2.0 or later Backwards Compatibility	OPP/SR/GOEP/BC/BV-03-C
OPP 1b/2 AND OPP 2/18 AND OPP 2/13	Client: GOEP v2.0 or later Backwards Compatibility	OPP/CL/GOEP/BC/BV-04-C
OPP 1b/2 AND OPP 2/17 AND OPP 2/19	Client: OPP v1.2 or later, GOEP v2.0 or later, OBEX over L2CAP	OPP/CL/GOEP/CON/BV-01-C
OPP 2b/2 AND OPP 3/19 AND OPP 3/21	Server: OPP v1.2 or later, GOEP v2.0 or later, OBEX over L2CAP	OPP/SR/GOEP/SRM/BI-03-C
OPP 1b/2 AND OPP 2/20	Client: OBEX Reliable Session	OPP/CL/GOEP/RLS/BV-01-C OPP/CL/GOEP/RLS/BV-04-C OPP/CL/GOEP/RLS/BV-05-C,
OPP 1b/2 AND OPP 2/3 AND OPP 2/20	Client: OBEX Reliable Session	OPP/CL/GOEP/RLS/BV-09-C
OPP 1b/2 AND OPP 2/20 AND OPP 2/13	Client: OBEX SRM	OPP/CL/GOEP/RLS/BV-10-C

Item	Feature	Test Case(s)
OPP 2b/2 AND OPP 3/22	Server: OBEX Reliable Session	OPP/SR/GOEP/RLS/BV-02-C OPP/SR/GOEP/RLS/BV-03-C OPP/SR/GOEP/RLS/BV-06-C OPP/SR/GOEP/RLS/BV-08-C
OPP 2b/2 AND OPP 3/3 AND OPP 3/22	Server: OBEX Reliable Session	OPP/SR/GOEP/RLS/BV-11-C
OPP 2b/2 AND OPP 3/22 AND OPP 3/13	Server: OBEX Reliable Session	OPP/SR/GOEP/RLS/BV-12-C
OPP 1b/2 AND OPP 2/3 AND OPP 2/21	Client: OBEX SRM, Object Push	OPP/CL/GOEP/SRM/BV-01-C OPP/CL/GOEP/SRM/BV-03-C
OPP 1b/2 AND OPP 2/21 AND OPP 2/13	Client: Pull business card, OBEX SRM	OPP/CL/GOEP/SRM/BV-05-C
OPP 2b/2 AND OPP 3/3 AND OPP 3/23	Server: OBEX SRM	OPP/SR/GOEP/SRM/BV-04-C OPP/SR/GOEP/SRM/BI-02-C
OPP 2b/2 AND OPP 3/23 AND OPP 3/13	Server: OBEX SRM	OPP/SR/GOEP/SRM/BV-08-C OPP/SR/GOEP/SRM/BI-05-C
OPP 1b/2 AND OPP 2/21 AND OPP 2/13	Client: Pull business card, OBEX SRM	OPP/CL/GOEP/SRM/BV-07-C
OPP 1b/2 AND OPP 2/3 AND OPP 2/21 AND OPP 2/23	Client: OBEX SRM, Receive OBEX SRMP header	OPP/CL/GOEP/SRMP/BV-01-C
OPP 2b/2 AND OPP 3/3 AND OPP 3/23 AND OPP 3/24	Server: Send OBEX SRMP header	OPP/SR/GOEP/SRMP/BV-03-C
OPP 2b/2 AND OPP 3/23 AND OPP 3/25 AND OPP 3/13	Server: OBEX SRM	OPP/SR/GOEP/SRMP/BV-02-C
OPP 1b/2 AND OPP 2/21 AND OPP 2/22 AND OPP 2/13	Client: OBEX SRM, Send OBEX SRMP header	OPP/CL/GOEP/SRMP/BV-04-C
OPP 1b/2 AND OPP 2/13 AND OPP 2/21 AND OPP 2/23 AND OPP 2/22	Client: Send/Receive OBEX SRMP header	OPP/CL/GOEP/SRMP/BV-05-C
OPP 1b/2 AND OPP 2/13 AND OPP 2/21 AND OPP 2/23	Client: Receive OBEX SRMP header	OPP/CL/GOEP/SRMP/BV-06-C

Item	Feature	Test Case(s)
OPP 1b/2 AND OPP 2/21 AND OPP 2/23 AND OPP 2/13	Client: Receive OBEX SRMP header	OPP/CL/GOEP/SRMP/BI-01-C
OPP 1b/2 AND OPP 2/3 AND OPP 2/21 AND OPP 2/20	Client: OBEX Reliable Session	OPP/CL/GOEP/SRS/BV-01-C
OPP 1b/2 AND OPP 2/21 AND OPP 2/20 AND OPP 2/13	Client: OBEX Reliable Session	OPP/CL/GOEP/SRS/BV-02-C
OPP 2b/2 AND OPP 3/3 AND OPP 3/23 AND OPP 3/22	Server: OBEX reliable session	OPP/SR/GOEP/SRS/BV-03-C
OPP 2b/2 AND OPP 3/23 AND OPP 3/22 AND OPP 3/13	Server: OBEX reliable session	OPP/SR/GOEP/SRS/BV-04-C
OPP 2b/2	Server: OPP v1.2 or later	OPP/SR/GOEP/ROB/BV-01-C
OPP 2b/2 AND NOT OPP 3/22	Server: OPP v1.2 or later	OPP/SR/GOEP/ROB/BV-02-C

Table 5.1: Test case mapping

6 Annex B, supplementary interoperability tests

This section provides a supplementary set of interoperability tests. These tests are aimed at scenarios that do not have a direct specification reference. The tests are recommended by the Bluetooth SIG to be run for improved interoperability but they are not required to be executed as part of the Bluetooth Qualification program.

6.1 Object Push tests

Verify scenarios during the object push function.

6.1.1 Abort-Push Operation

- Test Purpose

  Verify that a Client can ABORT an OBEX push operation and that the Server responds to the ABORT.

- Reference and Motivation

  [2] 5.1

  Section 5.1 in [2] lists the OBEX operations which are required in Object Push Profile and lists ABORT as a mandatory command. Although other mandatory commands mentioned in this section are tested in the Test Suite, ABORT has not been included and is therefore included in the Test Suite Addendum.

  Aborting an OPP push/pull operation is a very common user scenario and is therefore tested here.

- Initial Condition

  - The application for Object Push is activated on the Client.
  - The vObject item for Object Push is prepared on the Client.
  - The Server is selectable from a list on the Client.
  - Object Exchange mode is set on the Server.

- Test Case Configuration

Test Case
OPP/CL/OPH/BV-27-I [Abort-Push Operation]
OPP/SR/OPH/BV-27-I [Abort-Push Operation]

Table 6.1: Abort-Push Operation test cases

- Test Procedure

  1. Select the Server to push the vObject item to on the Client.
  2. Perform pairing, if requested.
  3. Start the Object Push function.
  4. Initiate user action to ABORT the push operation on the Client.

- Expected Outcome

  Pass verdict

  The ABORT operation is processed correctly and completed corresponding to the settings and user actions.

  Both devices are in normal operation mode after the completion of ABORT operation.

  The Client may be notified that the Object Push operation was aborted.

  The vObject item that was being pushed is not in the corresponding application or the object store on the Server.

OPP/SR/OPH/BV-30-I [Multiple vCards transferred as a single vObject]

- Test Purpose

  Verify that a sample vObject item containing multiple vCards sent from the Client is correctly received in the inbox of the Server.

- Reference and Motivation

  [2] 3.3.1

  This test is used to verify if a Server can handle some implementations where multiple vCard entries are stored as a single vObject. When this object is pushed, only the first entry is handled by the Server.

- Initial Condition

  - The application for Object Push is activated on the Client.
  - The vObject item Object Push is prepared on the Client (see Section 4.1.3).
  - The Server is selectable from a list on the Client.
  - Object Exchange mode is set on the Server.

- Test Procedure

  1. Select the Server to push the vCard item to on the Client.
  2. Perform pairing, if requested.
  3. Start the Object Push function.
  4. Accept the received vObject item on the Server.

- Expected Outcome

  Pass verdict

  The Object Push operation is processed correctly and completed corresponding to the settings and user actions.

  The pushed vCard item is in the corresponding application or the object store and is pushed correctly on the Server.

OPP/SR/OPH/BV-31-I [Multiple vCards transfer]

- Test Purpose

  Verify that multiple sample vCard items are sent and correctly received in the inbox of the Server IUT.

- Reference and Motivation

  [2] 3.3.1

  This is a common scenario and this use case tests the robustness of a Server device.

- Initial Condition

  - The application for Object Push is activated on the Client.
  - The vCard items for Object Push are prepared. The Lower Tester contains 15 vCard items.
  - The Server is selectable from a list on the Client.
  - Object Exchange mode is set on the IUT.

- Test Procedure

  1. Select the Server to push the vCard items to on the Client.
  2. Perform pairing, if requested.
  3. Start the Object Push function where each of the 15 vCard items are pushed in single PUT operations.
  4. Accept the received vCard items, if requested on the UI.

- Expected Outcome

  Pass verdict

  The Object Push operation is processed correctly and completed corresponding to the settings and user actions.

  The pushed vCard items are in the corresponding application or the object store and have been pushed correctly.

OPP/SR/OPH/BV-32-I [vCards with multiple Phone Number Fields]

- Test Purpose

  Verify that a sample vCard item containing multiple phone number entries sent from the Client is correctly received in the inbox of the Server IUT.

- Reference and Motivation

  [2] 3.3.1

  It is very common to have vCards containing multiple phone book entries. This test is to check for this scenario.

- Initial Condition

  - The Lower Tester contains vCards that have phone number fields. The vCard specification [4] defines the following types: preferred, work, home, voice, facsimile, message cellular, pager, bulletin board service, modem, car phone, ISDN, and video phone number.
  - The Lower Tester may also use fields that are not defined by the vCard specification (e.g., office1, office 2, Default).
  - Application for Object Push is activated on the Lower Tester.

- The vCard item for Object Push is prepared.
- The Server is selectable from a list on the Client.
- Object Exchange mode is set on the IUT.

- Test Procedure

  1. Select the Server to push the vCard item to on the Client.
  2. Perform pairing, if requested.
  3. Start the Object Push function.
  4. Accept the received vObject item, if requested on the UI.

- Expected Outcome

  Pass verdict

  The Object Push operation is processed correctly and completed corresponding to the settings and user actions.

  The pushed vCard item is in the corresponding application or the object store and is pushed correctly.

OPP/SR/OPH/BV-33-I [Push vCal to Different Time Zone Server]

- Test Purpose

  Verify that a sample vCal item sent from the Client is correctly received in the inbox of the Server. The clock of the Client and the Server are set to different time zones.

- Reference and Motivation

  [2] 3.3.1

  In scenarios where a device is moved to a different time zone, the device clock is automatically adjusted. But in some cases, the clock of the Client and/or the Server may indicate the time of a different time zone. This test is to verify if a Server can handle a vCalendar pushed in this scenario.

- Initial Condition

  - The application for Object Push is activated on the Client.
  - The vCal item for Object Push is prepared (see Section 4.1.3).
  - The Server is selectable from a list on the Client.
  - The Lower Tester is set to indicate the time of a different time zone.
  - Object Exchange mode is set on the Server.

- Test Procedure

  1. Select the Server to push the vCal item to on the Client.
  2. Perform pairing, if requested.
  3. Start the Object Push function.

- Expected Outcome

  Pass verdict

  The Object Push operation is processed correctly and completed corresponding to the settings and user actions.

  The pushed vCal item is in the corresponding application or the object store and pushed correctly (see Section 4.1.3).

7 Revision history and acknowledgments

Revision History

Publication Number	Revision Number	Date	Comments
0	1.1	2001-07-02	First version for Specification 1.1
1	1.1.1	2004-12-07	Incorporated March, 2004 Addendum: TSE 441 and TSE 456 for TCMT. Incorporate TSE 572 for TP/OPH/BV-01-I. Incorporate TSE 580 for TP/OPH/BV-05, TP.OPH/BV-09, TP/OPH/BV-13, and TP/OPH/BV-17. Incorporate TCW TCWR_OPP_05_15_JLIN_Appealed_Approved for TP/BCE/BV-06-I. Incorporate editorial changes and format changes.
	1.1.2r1	2005-08-23	TSE 813: Removed TP/BCE/BV-02-I as a result of TSE 441 TSE 825: Clarified bonding for OPH/BV-02-I, BCP/BV-03, and BCE/BV-03 TSE 562 for TP/OPH/BV-10-I, TP/OPH/BV-14-I, TP/OPH/BV-18-I, TP/BCP/BV-02-I
2	1.1.2	2005-10-07	Prepare for publication.
	1.1.3r0	2006-05-12	TSE 924. Change to section 5.1.3:
3	1.1.3	2006-06-19	Prepare for publication.
	1.1.4r0-2	2006-11	TSE 1707: Global change of “object store” to “corresponding application or object store.” TSE 1765: Add TP/OPH/BV-19-I and TP/OPH/BV-20-I and two lines to TCMT Added test case TP/OP/BV-21-1 Change Tables OPP 1.2 and OPP 1.3 to Tables OPP 2 and OPP3
4	1.1.4	2007-01-08	Prepare for publication.
5	1.1.5	2007-09-04	TSE 1927 TCMT updates to OPH/BV-02-I, BCP/BV-03-I, BCE/BV-03-I TSE 1765: Correct TCMT for TP/OPH/BV-21-I and TP/OPH/BV-20-I per comment 4007
	1.1.6r0	2008-02	TSE 2417: TP/OPH/BV-02-I, TP/BCE/BV-03-I: Change initial condition. TSE 2493: TP/OPH/BV-19-I: Notes addition
6	1.1.6	2008-04	Prepare for publication.
	1.1.7r0	2008-09-17	TSE 2448: TCMT clarification TP/BCP/BV-04-I, TP/BCP/BV-05-I, TP/BCP/BV-02-I TSE 2533: New test case TP/OPH/BV-22-I TSE 2570: New test case: TP/OPH/BV-23-I, TP/OPH/BV-24-I, TP/OPH/BV-25-I, TP/OPH/BV-26-I
7	1.1.7	2008-12-05	Input reviewer’s comments (editorial)
	1.1.8r0-1	2009-04-29	TSE 2448/2777: TP/BCP/BV-02-I: TCMT correction TSE 2891: New test case TP/OPH/BI-01-C

Publication Number	Revision Number	Date	Comments
8	1.1.8	2009-08-10	Prepare for publication
	1.2.0r0	2010-07-28	TCMT additions for OBEX changes
	1.2.0r1	2010-09-08	Updated Conformance section
9	1.2.0r2	2010-09-08	Made all test case names full names in TCMT
	1.2.1r0- 1.2.1r3	2010-08-09- 2011-03-17	TSE 3330: new test case TP/OPH/BV-29-I to close an OBEX session. TSE 3330: Addressed reviewer's comments and attempted to add feature descriptions to the TCMT for entries that had none. Input reviewer's comment: Change TP/OPH/BV-29-I to TP/OPH/BV-34-I Add test cases TP/OPH/BV-28-I to TP/OPH/BV-33-I from OPP Addendum, corrected Reference numbers to align with numbered References in Section 2.1
10	1.2.1	2011-07-21	Prepare for publication.
	1.2.2r0	2011-11-12	TSE 3867; TP/OPH/BI-01-C; update TCMT TSE 3868 TP/BCE/BV-05-I, TP/BCE/BV-06-I, TP/BCE/BV-07-I: update TCMT TSE 4381: TP/SRM/BV-01-C: Remove duplicate, incorrect entry from TCMT
	1.2.2r1	2012-02-01	Merged document with OPP Addendum 1.2.2 TSE 3824: TP/OPH/BV-31-I, TP/OPH/BV-32-I: update TCMT TSE 4295: TP/OPH/BV-28-I: Remove test case body; leave TC ID
	1.2.2r2	2012-02-20	TSE 4686: Merge OPP Addendum with OPP.TS and updated TMCT
11	1.2.2	2012-03-30	Prepare for publication.
	1.2.3r0	2012-05-20	TSE 1791: Updates to TCMT for TP/OPH/BV-04-I, TOP/OPH/BV-08-I, TP/OPH/BV-12-I, TP/OPH/BV-16-I
12	1.2.3	2012-07-24	Prepare for publication.
13	1.2.4	2012-09-06	TSE 4942: Delete TP/OPH/BV-29-I, fix change history.
	1.2.4r1	2012-10-22	Keep TP/OPH/BV-29-I [Disconnect Session] and state NO LONGER USED as purpose similar to what we have done with TP/OPH/BV-28-I
	1.2.5r00	2014-05-01	TSE 5481: Updated TCMT logic for TP/BCP/BV-02-I to (OPP 2/13) OR (OPP 1/2 AND NOT OPP 3/13).
14	1.2.5	2014-07-07	TCRL 2014-1 Publication
	1.2.1.0r00	2015-10-28	Updated version numbering to align with Specification version change from 1.2 to 1.2.1 for ESR09. With the specification taking a third identifying number, the TS version identifier moves to the fourth number and starts again at 0.
15	1.2.1.0	2015-12-22	Prepared for TCRL 2015-2 publication
	1.2.1.1r00	2016-09-01	Converted to new Test Case ID conventions as defined in TSTO v4.1.

Publication Number	Revision Number	Date	Comments
	1.2.1.1r01	2016-11-14	Updated 1 Scope to align with current test case conventions. Added clarification to section 3.1 about the test strategy to use a subset of the tests in GOEP to test OPP functionality. Consequential clarifications made in section 4.1.1 about the naming conventions used to refer to GOEP tests.
16	1.2.1.1	2016-12-13	Approved by BTI. Prepared for TCRL 2016-2 publication.
	1.2.1.2r00	2017-07-21	TSE 8981: Updated to current template. Added a reference to the OPP IXIT in 2.1. Removed/Revised the outdated text in the Applications, Features, Object Formats and Roles section (use of 2 DUT assuming End Product to End Product testing). In 4.1.1 Test Case Identification Conventions, fixed copy/paste error from. The notes section of OPP/CL/OPH/BV-19-I and OPP/SR/OPH/BV-19-I revised reference to IXIT rather than ICS. TCMT – Clean up of parentheses: OPP/CL/OPH/BV-02-I, OPP/CL/BCP/BV-03-I, OPP/CL/BCE/BV-03-I, OPP/SR/OPH/BV-27-I, OPP/SR/BCP/BV-02-I. TCMT – Revise from “NOT OPP 3/x” to “OPP 3/3 AND (NOT OPP 3/x)”: OPP/SR/OPH/BV-10-I, OPP/SR/OPH/BV-14-I, OPP/SR/OPH/BV-18-I. TCMT – Replaced the symbol “&” with “AND” – OPP/SR/OPH/BV-23-I, OPP/SR/OPH/BV-24-I, OPP/SR/OPH/BV-25-I, OPP/SR/OPH/BV-26-I. TCMT – Updated a few instances of “OPP 1.2” and “GOEP v2” to “OPP v1.2 or later” and “GOEP v2.0 or later”. Fixed typo in TCMT for “OPP/CL/GOEP/SRMP/BV-06/C” to “-C” instead of “/C”.
17	1.2.1.2	2017-11-28	Approved by BTI. Prepared for TCRL 2017-2 publication.
	1.2.1.3r00	2018-04-27	TSE 10547 (rating 1): Changed test case name OPP/CL/OPH/BV-21-I to OPP/SR/OPH/BV-21-I. Added client and server test procedures. Removed Test Case Applicable from TCMT and fixed typo for item OPP 3/8a.
18	1.2.1.3	2018-07-01	Approved by BTI. Prepared for TCRL 2018-1 publication.
	p19r00–r01	2021-04-05 – 2021-05-18	TSE 15771 (rating 2): Added missing TC OPP/SR/OPH/BV-31-I to the TCMT. Template-related editorials, including assigning previous v1.2.1.3 as p18.
19	p19	2021-07-13	Approved by BTI on 2021-06-03. Prepared for TCRL 2021-1 publication.
	p19ed2r00	2021-07-26	TSE 17287 (rating 1): Corrected a typo in a TCID in the TCMT.

Publication Number	Revision Number	Date	Comments
	p19 edition 2	2021-08-20	Approved by BTI on 2021-08-19. Prepared for edition 2 publication.
	p20r00–r05	2023-10-30 – 2024-04-05	TSE 23936 (rating 1): Converted -I tests to -C tests as appropriate; updated the TCMT and TCRL accordingly. Added new GSIT section with new TCs OPP/CL/CGSIT/SFC/BV-01-C, OPP/SR/SGSIT/ATTR/BV-01-C – -05-C, OPP/SR/SGSIT/OFFS/BV-01-C, and OPP/SR/SGSIT/SERR/BV-01-C. Deleted TCs OPP/CL/OPH/BV-01-I, OPP/CL/BCP/BV-01-I, OPP/CL/BCE/BV-01-I, OPP/SR/OPH/BV-01-I, OPP/SR/BCP/BV-01-I, and OPP/SR/BCE/BV-01-I. Updated the TCMT accordingly. Removed OPP/SR/GOEP/CON/BV-02-C from the TCRL. Added references to the SDP TS and the GOEP TS. Updated the Test Groups and TC Conventions sections. Updated the document to align with current standards.
20	p20	2024-07-01	Approved by BTI on 2024-05-22. Prepared for TCRL 2024-1 publication.
	p21r00	2024-10-15	TSE 25009 (rating 2): Updated the test procedure for OPP/CL/OPH/BV-04-C, -08-C, -12-C, and -16-C and OPP/SR/OPH/BV-04-C, -08-C, -12-C, and -16-C, and updated the TCMT accordingly. TSE 25751 (rating 2): Updated the TCMT for test case OPP/SR/SGSIT/ATTR/BV-02-C.
21	p21	2025-02-18	Approved by BTI on 2024-12-25. Prepared for TCRL 2025-1 publication.

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