Basic Printing Profile (BPP)

***Bluetooth*® Test Specification**

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Abstract:

This document defines the TSS and TC for the Bluetooth® Basic Printing Profile. The document is intended for product interoperability testing.

Revision History

Revision Number	Date	Comments
0.9	2001-10-23	Raised release to 0.9.
Draft 1.0	2002-08-15	Raised release to draft 1.0
Draft 1.01	2002-10-15	Changed “Direct Printing Services” to Job-Based Transfer to be consistent with spec. Clarified issues about supported job attributes in tests 5.4.1.2 and 5.4.2.2. Added information for handling spooling printers in test 5.4.5.1. Section 5.5.1, listed tests explicitly where appropriate. XHTML-Print tests changed to include version information. Clarified authentication challenge specification in 5.9.1.5.
Draft 1.02	2003-05-06	Added OBEX authentication test (new section 5.4). (More on this to come with test case mapping table and other stuff).
Draft 1.03	2003-05-27	Section 5.4.1 – indicated action for senders without UIs, minor corrections.
Draft 1.04	2003-06-10	Updated normative references for XHTML-Print and OBEX test specification. Added OBEX Authentication to Test Case Mapping table.
Draft 1.0	2003-09-18	Renumbered back to draft 1.0 for consistency with SIG request. Fixed table of contents.
D10r01	2004-06-29	Removed references to Sender’s UI where not appropriate. Corrected references to OBEX test specification and XHTML Print test cases in normative references list. Added invalid OBEX authentication test. Added stipulation to Basic Text test for specific CRLF requirements.
1.0.2	2005-10-03	TSE 819 for TP/OA/BI-01-I in TMCT entry Correct Document no. and prepare for publication.
1.0.3	2006-04-06	TSE 905 for TP/DPS/BV-01-I in TCMT Editorial updates: formatting, removed ‘Uncertainties’
1.2.0	2006-06-14	Prepare for publication.
1.2.1	2007-08-27	TSE 2006: TP/DCS/BV-11-I; publish.
1.2.2r0	2008-02-01	TSE 2350: TP/DPS/BV-06-I, TCMT
1.2.2	2008-04-01	Prepare for publication.
1.2.3r0	2009-04-28	TSE 2780: TP/DPS/BV-09-I: update Pass Verdict
1.2.3	2009-07-29	Prepare for publication.
1.2.4r0	2011-10-14	TSE 3301: TP/OA/BV-01-I: Delete paragraph in test purpose.
1.2.4	2012-03-30	Prepare for publication
1.2.5r00	2016-09-30	Converted to new Test Case ID conventions as defined in TSTO v4.1
1.2.5r01	2016-11-15	Added overlooked conventions (sections 4.2 and 4,3) from the TSTO when 1.2.5r00 version was created.
1.2.5	2016-12-13	Approved by BTI. Prepared for TCRL 2016-2 publication.
1.2.6r00	2017-04-06	TSE 8664: Updated Test Spec Template and updated test file names used in BPP/PR/OF/BV-01-I, BPP/PR/OF/BV-02-I and BPP/PR/OF/BV-05-I to match XHTML zip (used dashes instead of slashes).
1.2.6r01	2017-05-10	TSE 8664: Applied TCID5 heading styles to Test Case IDs and updated TOC to show level 5 headings.
1.2.6r02	2017-05-17	Editorial review and corrections throughout by Magnus
1.2.6	2017-07-03	Approved by BTI. Prepared for TCRL 2017-1 publication.

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Contents

1 Scope

This Bluetooth document contains the Test Suite Structure (TSS) and Test Cases (TC) to test the Bluetooth Basic Printing Profile (BPP).

The objective of this test specification is to provide a basis for interoperability tests for Bluetooth devices giving a high probability of air interface interoperability between different manufacturers' Bluetooth devices.

2 References, Definitions, and Abbreviations

2.1 References

This Bluetooth document incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter.

[1] Bluetooth Core Specification v2.0 or later

[2] Bluetooth Profile Specification: Basic Printing Profile

[3] Bluetooth Profile Specification: Generic Access Profile

[4] Bluetooth Profile Specification: Generic Object Exchange Profile

[5] Infrared Data Association® (IrDA®) Object Exchange Protocol (OBEX™) Test Specification

[6] http://www.irda.org/associations/2494/files/Specifications/OBEX_Test_Spec_V1p0p1.pdf

[7] XHTML-Print, http://www.pwg.org/xhtml-print/W3C-Version/XHTML-Print.html

[8] XHTML-Print Test Documents. Obtainable from www.bluetooth.org/qualification. See "External to the Core" requirements under BPP and select XHTML

[9] Bluetooth Test Strategy and Terminology Overview

[10] BPP ICS

[11] BPP Implementation eXtra Information for Testing (IXIT)

2.2 Definitions

For the purpose of this Bluetooth document, the definitions from [1], [2], and [9] apply.

Term	Definition
Idle Mode	As seen from a remote device, a Bluetooth device is idle, or is in Idle mode, when there is no link established between them.
Online Mode	For the purposes of this document Online mode means Public or Private Online mode.
Ready State	Not in an error state, and device is able to continue receiving and processing commands.

2.3 Abbreviations

For the purpose of this Bluetooth document, the abbreviations from [1], [2], and [9] apply.

Abbreviation or Acronym	Meaning
CSS	Cascading Style Sheets
CRLF	Carriage Return Line Feed
DPS	Direct Printing Service
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
PBR	Print-by-Reference or Reference Printing option of BPP
RUI	Reflected User Interface option of BPP
XHTML	Extensible HyperText Markup Language
XML	Extensible Markup Language

3 Test Suite Structure (TSS)

3.1 Overview

The Basic Printing Profile specifies two typical configurations of devices and their roles for this profile:

Printer	This device receives and/or retrieves printable data, including optional formatting information, and prints formatted output onto print media.
Sender	This device sends printable data or URLs pointing to printable data, along with optional formatting information, to the Printer.

3.2 Test Groups

The following test groups have been defined:

- Discovery and Connection Setup
  - Public Online
  - Private Online
  - Offline
  - Bonding
- Service Discovery
  - Service Discovery
- OBEX Authentication
  - OBEX Authentication
  - OBEX Invalid Authentication
- Direct Printing Services
  - CreateJob
  - GetJobAttributes
  - Cancel Job
  - GetPrinterAttributes
  - GetEvent
- Object Formats
  - XHTML-Print
  - Other Document Formats
  - vCard

    - vCalendar
    - vMessage
    - Basic Text
    - International
- Simple Push
- Enhanced Layout Capability
    - CreatePreciseJob
    - GetMargins
- Reflected UI (RUI)
    - Administrative Control
    - Transactional Control
    - RUI -- CancelJob
    - RUI – Media Empty
- Print-by-Reference
    - Reference Printing – various reference types
    - CreateJob with SendReference
    - Error Cases

Figure 3.1: *TSS for the Basic Printing Profile*

4 Test Cases (TC)

4.1 Introduction

4.1.1 Test Case Identification Conventions

Test cases shall be assigned unique identifiers per the conventions in [9]. The convention used here is **<spec abbreviation>/<IUT role>/**<class>/<feat>/<func>/<subfunc>**/<cap>/<xx>-<nn>-<y>**.

Bolded ID parts shall appear in the order prescribed. Non-bolded ID parts (if applicable) shall appear between the bolded parts. The order of the non-bolded parts may vary from test specification to test specification, but shall be consistent within each individual test specification.

Identifier Abbreviation	**Spec Identifier <spec abbreviation>**
BPP	Basic Printing Profile
Identifier Abbreviation	**Role Identifier <IUT role>**
PR	Printer Role
SD	Sender Device Role
Identifier Abbreviation	**Feature Identifier <feat>**
DCS	Discovery and Connection Setup
DPS	Direct Printing Services
EL	Enhanced Layout
OF	Object Formats
PBR	Print-by-Reference
RUI	Reflected UI
SP	Simple Push

Table 4.1: BPP TC Feature Naming Conventions

4.1.2 Conformance

When conformance is claimed, all capabilities indicated as mandatory for this Specification shall be supported in the specified manner (process-mandatory).This also applies for all optional and conditional capabilities for which support is indicated. All mandatory capabilities, and optional and conditional capabilities for which support is indicated, are subject to verification as part of the Bluetooth Qualification Program.

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 that is not excluded by the Specification, OR
- That capabilities enabled by the implementations are sustained over durations expected by the use case, OR
- That the implementation gracefully handles any quantity of data expected by the use case, OR
- That in cases where more than one valid interpretation of the Specification exist, the implementation complies with at least one interpretation and gracefully handles other interpretations OR
- That the implementation is immune to attempted security exploits.

A single execution of each of the required tests is required in order to constitute a pass verdict. However, it is noted that in order 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 Generator, the Test Case as described in the Test Specification, or with the Test System utilized, the Member is required to notify the responsible party via an errata request such that the issue may be addressed.

4.1.3 Pass/Fail Verdict Conventions

Each test case has an Expected Outcome section, which outlines all the detailed pass criteria conditions that shall be met by the IUT to merit a Pass Verdict.

The convention in this test specification is that, unless there are 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 the outcome of the test shall be the Fail Verdict.

For those test cases that specify as a Pass condition that the Printer or Sender is able to process its next task, it is left to the discretion of the test operator to verify this condition, as appropriate. Example procedures include executing the next test or processing a predetermined test file.

4.2 Discovery and Connection Setup

Test Group Objectives:

- To verify the discovery and connection setup capabilities.

4.2.1 Public Online mode

Test Sub Group Objectives:

- To verify that the Printer supports Public Online mode and can be discovered by and connected to the Sender using the General and Limited Inquiry, and Device Discovery procedures.

4.2.1.1 BPP/PR/DCS/BV-01-I [General Inquiry – Public Online]

- Test Purpose

  Printer:
  To verify that the Printer is in Public Online mode and can be discovered by the Sender using the General Inquiry procedure.

- Reference

[2] 3

- Initial Condition

Printer:
Offline mode or Public Online mode.

Sender:
Idle mode.

- Test Procedure

Printer:
Set the Printer to Public Online mode, if it is in a different mode.

Sender:
After the Printer is set to Public Online mode, perform a General Inquiry procedure to get a list of devices in the vicinity.

- Test Condition

Printer can be put into Public Online mode.

- Expected Outcome

Pass verdict:

A list of discovered devices is available from the Sender and the Printer is included in the list.

4.2.1.2 BPP/PR/DCS/BV-02-I [Limited Inquiry – Public Online]

- Test Purpose

Printer: To verify that the Printer is in Public Online mode and can be discovered by the Sender using the Limited Inquiry procedure.

- Reference

[2] 3

- Initial Condition

Printer: Offline mode or Public Online mode.

Sender: Idle mode.

- Test Procedure

Printer: Set the Printer to Public Online mode, if it is in a different mode.
Set the Printer to Limited Discoverable mode, if it is in a different mode.

Sender: After the Printer is set to Public Online mode, perform a Limited Inquiry procedure to get a list of devices in the vicinity.

- Expected Outcome

Pass verdict:

A list of discovered devices is available from the Sender and the Printer is included in the list.

- Notes

The Printer must be in both Public Online mode and in Limited Discoverable mode to be discovered with a Limited Inquiry.

4.2.1.3 BPP/PR/DCS/BV-03-I [Device Discovery – Public Online]

- Test Purpose

Printer: To verify that the Printer is in Public Online mode and can be discovered and connected by the Sender using the Device Discovery procedure.

- Reference

[2] 3

- Initial Condition

Printer: Offline mode or Public Online mode.

Sender: Idle mode.

- Test Procedure

Printer: Set the Printer to Public Online mode, if it is in a different mode.

Sender: After the Printer is set to Public Online mode, perform a Device Discovery to get a list of devices in the vicinity.

- Expected Outcome

Pass verdict:

A list of discovered devices is available from the Sender and the Printer is included in the list.

4.2.2 Private Online mode

Test Sub Group Objectives:

- To verify that the Printer supports Private Online mode and cannot be discovered by the Sender using General Inquiry or Limited Inquiry.

4.2.2.1 BPP/PR/DCS/BV-05-I [Inquiry – Private Online]

- Test Purpose

Printer:
To verify that the Printer is in Private Online mode (not discoverable) and cannot be discovered by the Sender using the General or Limited Inquiry procedure.

- Reference

[2] 3

- Initial Condition

Printer: Offline mode or Private Online mode.

Sender: Idle mode.

- Test Procedure

General: If the Sender supports Limited Inquiry, then the test shall be performed for both General and Limited Inquiry, otherwise, only General Inquiry.

Printer: Set the Printer to Private Online mode if it is in a different mode.

Sender: 1. Perform a General Inquiry to get a list of devices in the vicinity.
2. If supported, perform a Limited Inquiry to get a list of devices in the vicinity.

- Expected Outcome

Pass verdict:

- After the General Inquiry a list of discovered devices is available from the Sender and the Printer under test is not included in the list.
- After the Limited Inquiry, if performed, a list of discovered devices is available from the Sender and the Printer under test is not included in the list.

4.2.3 Offline mode

Test Sub Group Objectives:

- To verify that the Printer supports Offline mode and can neither be discovered by nor connected to the Sender using General Inquiry or Limited Inquiry.

4.2.3.1 BPP/PR/DCS/BV-07-I [Inquiry – Offline]

- Test Purpose

Printer: To verify that the Printer is in Bluetooth Offline mode (not discoverable) and cannot be discovered by the Sender using the General Inquiry and/or Limited Inquiry procedure.

- Reference

[2] 3

- Initial Condition

Printer: Offline mode.

Sender: Idle mode.

- Test Procedure

Printer: Set the Printer to Offline mode if it is in a different mode.

Sender: 1. Perform a General Inquiry to get a list of devices in the vicinity.
2. Perform a Limited Inquiry to get a list of devices in the vicinity, if supported.

- Expected Outcome

  Pass verdict:

  - After the General Inquiry a list of discovered devices is available from the Sender and the Printer under test is not included in the list.
  - After the Limited Inquiry a list of discovered devices is available from the Sender and the Printer under test is not included in the list. (Not required if Limited Inquiry not supported by Sender.)

4.2.4 Bonding mode

Test Sub Group Objectives:

- To verify that the Printer and Sender support Bonding mode and can be paired.

4.2.4.1 Bonding

- Test Case ID(s)

  BPP/PR/DCS/BV-11-I

  BPP/SD/DCS/BV-11-I

- Test Purpose

  Printer: To verify that the Printer can be bonded with the Sender and the PIN codes are exchanged correctly.

  Sender: To verify that the Sender can be bonded with the Printer and the PIN codes are exchanged correctly.

- Reference

  [2] 3

- Initial Condition

  Printer: Public Online mode and not currently bonded with the Sending device.

  Sender: Ready.

- Test Procedure

  Sender and Printer:

  1. Configure at least one of the devices (Sender or Printer) to require authentication. (See Notes, below.)
  2. Enter PIN codes (if required) (maximum of 16 digits) on both the Sender and the Printer, unless a fixed PIN code is used.
  3. After the bonding procedure executes, disconnect the Bluetooth baseband link (this can be accomplished by powering down, a disconnect function, or walking out of range). Note that some Senders may automatically disconnect the link after successful execution of the bonding function.
  4. Re-establish Bluetooth connection.
  5. Send a job from the Sender to the Printer, and verify that no PIN is requested by either device as part of the transaction.

- Test Condition

Printer can be made bondable.

Sender provides a mechanism to enter a PIN in the case of a variable PIN.

- Expected Outcome

  Pass verdict:

  - Bonding was successful between the Printer and Sender device.
  - Once the second connection is established (following bonding and disconnecting), no request for a PIN code is made by either the Sender or the Printer.

4.3 Service Discovery

Test Group Objectives:

- To verify that the Service Discovery Protocol is employed in the determination of device characteristics.

4.3.1 Service Discovery

Test Sub Group Objectives:

- To verify that as a result of the appropriate action, a Sender issues a Service Discovery query and properly interprets the SDP record returned by the Printer.

4.3.1.1 Service Discovery – BPP Device

- Test Case ID(s)

  BPP/PR/SD/BV-01-I

  BPP/SD/SD/BV-01-I

- Test Purpose

  Printer: To verify that the Printer can be recognized as a BPP compatible device and contains a sufficient SDP record to enable printing/scanning functionality.

  Sender: To verify that SDP records can be obtained from the Printer and correctly interpreted by the Sender to allow printing or scanning.

- Reference

  [2] 3

- Initial Condition

  Printer: Public Online mode.

  Sender: Ready mode and has the Bluetooth Device Address of the Printer under test.

- Test Procedure

  Printer: Set the Printer to Public Online mode, if it was in a different mode.

  Sender:

- Execute a procedure that will allow the Sender to initiate Service Discovery in order to identify the Printer as a BPP-capable device.
- Activate a printing application.

- Expected Outcome

  Pass verdict:

  - It is possible from the Upper Tester on the Sender to activate Service Discovery.
  - The specific parameters and their values retrieved via Service Discovery are correct. Explicit parameter/value information shall be supplied by the manufacturer via the IXIT [11].

- Notes

  Note that Service Discovery is, generally, transparent to the User. It is invoked as a part of the Device Discovery procedure, and, generally, not directly specified through the UI of the querying device. Without a UI that allows a Service Discovery invocation or that displays specific values obtained during Service Discovery, verification must be done using special tools.

  An example procedure for executing the test for Service Discovery might work as follows. Specify a print job for the Operator to execute. Through a manufacturer provided mechanism, have the Operator change a mandatory field in the Printer's service record (e.g., Job Channel). Have the Operator send a second print job. The second job can only be successful if the sender obtained from the service discovery record, the value for the changed Job Channel over which to send the job.

4.4 OBEX Authentication

Test Group Objectives:

- To verify that OBEX Authentication is employed correctly by the Printer and Sender when the OBEX Printer is configured to issue an OBEX Authentication challenge to the Sender.

4.4.1 OBEX Authentication

Test Sub Group Objectives:

- To verify that the Printer (an OBEX Server) can successfully authenticate the Sender (an OBEX Client) during an OBEX Connect, Get, or Put operation. (Note that support for OBEX authentication is optional on the Printer and mandatory on the Sender.)

4.4.1.1 OBEX Authentication – Printer Initiated

- Test Case ID(s)

  BPP/PR/OA/BV-01-I

  BPP/SD/OA/BV-01-I

- Test Purpose

  Printer: To verify that the Printer can successfully authenticate the OBEX client during an OBEX Connect (or Put or Get) operation when the Printer has been configured to do so.

  Sender: To verify that the Sender (Client) can be authenticated by the OBEX server.

- Reference

[2] 11.4.1.2

[5] Test S-AU-3

- Initial Condition

  Printer: Is in Online mode, and is configured to respond to an OBEX Connect, Get, or Put (See note 1) operation with an OBEX authentication challenge.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  - Establish active connection with target printer, if not already connected.
  - Transmit an OBEX Connect/Get/Put as normal when sending a print job.

  Printer:

  - Receive OBEX Connect Request from Sender.
  - Respond to Sender and issue an OBEX Authentication Challenge.

  Sender:

  - Indicate through the Upper Tester that the Printer is requesting Authentication, and accept Authentication Password from user through the Upper Tester.
  - Send the requested Authentication information to the Printer.

  Printer:

  - Verify that the information from the Sender is correct and allow Connect/Get/Put to proceed.

- Test Condition

  Printer configured to issue an OBEX Authentication challenge.

- Expected Outcome

  Pass verdict:

  - Sender accepts and transmits Authentication information to Printer.
  - Print job completes as expected.

- Notes

  This will require a printer that can be configured, through a user interface or some other means, to enable an OBEX authentication challenge.

  The sending device (client) must have a user interface that allows the entry of authentication information (password, etc.)

4.4.2 OBEX Invalid Authentication

4.4.2.1 BPP/PR/OA/BI-01-I [OBEX Authentication, Invalid – Printer Initiated]

- Test Purpose

  Printer: To verify that the Printer can successfully reject OBEX client that enters an invalid authentication code during an OBEX Connect (or Put or Get) operation when the Printer has been configured to do OBEX authentication.

- Reference

  [2] 8.7

  [5] Test S-AU-3

- Initial Condition

  Printer: Is in Online mode, and is configured to respond to an OBEX Connect, Get, or Put (See note 1) operation with an OBEX authentication challenge.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish active connection with target printer, if not already connected.

  Transmit an OBEX Connect/Get/Put as normal when sending a print job.

  Printer:

  Receive OBEX Connect Request from Sender.

  Respond to Sender and issue an OBEX Authentication Challenge.

  Sender:

  Indicate through the UI that the Printer is requesting Authentication, and accept Invalid Authentication Password from user through the UI.

  Send the Invalid Authentication information to the Printer.

  Printer:

  Verify that the information from the Sender is invalid and disallow Connect/Get/Put to proceed.

- Test Condition

  Printer can be configured to perform an OBEX Authentication challenge.

  If a sender has no User Interface and a Printer initiates OBEX authentication, interoperability cannot be guaranteed. The BPP specification recommends that in this case OBEX authentication be disabled on the Printer.

- Expected Outcome

  Pass verdict:

  Server does not allow Connect/Get/Put to proceed.

- Notes

  (1) This will require a printer that can be configured, through a user interface or some other means, to enable an OBEX authentication challenge.

  (2) The sending device (client) must have a user interface that allows the entry of authentication information (password, etc.)

4.5 Direct Printing Services

Test Group Objectives:

- To verify the Direct Printing Services and Job-Based Transfer features of the profile.

4.5.1 CreateJob

Test Sub Group Objectives:

- To verify that a print job is correctly configured.

4.5.1.1 Default Attributes, CreateJob

- Test Case ID(s)

  BPP/PR/DPS/BV-01-I

  BPP/SD/DPS/BV-01-I

- Test Purpose

  Printer: To verify that the Printer correctly prints a single document using its default settings when a CreateJob is used and no attributes are included in the CreateJob operation.

  Sender: To verify that the Sender properly configures and prints a default job using the CreateJob operation.

- Reference

  [2] 7

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender: Establish active connection with target printer, if not already connected.
  Send single XHTML-Print document using default printer settings.

  Printer: Receive document from Sender, and print using default printer configuration.

- Expected Outcome

  Pass verdict:

  - The document is printed according to the Printer's default configuration.
  - Sender and Printer return to the Ready State.

- Notes

  It might not be possible to distinguish Simple Push printing and CreateJob with defaults, from a user perspective.

4.5.1.2 Supported Attributes, CreateJob

- Test Case ID(s)

  BPP/PR/DPS/BV-02-I

  BPP/SD/DPS/BV-02-I

- Test Purpose

  Printer: To verify that the Printer correctly prints a document with printer-supported job attributes defined via a CreateJob operation.

  Sender: To verify that the Sender can configure and print a job using the CreateJob operation.

- Reference

  [2] 7

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish active connection with target printer, if not already connected.

  Set some or all job attributes that are known to be fully supported by the printer (see Notes, below) to values different from their default setting and then send plaintext (XHTML print job can override attribute values set by sender) document to Printer.

  Printer:

  Receive document from Sender and print using printer configuration set by Sender.

- Expected Outcome

  Pass verdict:

  - Document is to be printed according to the configuration attributes set at the Sender.
  - Sender and Printer return to the Ready State.

- Notes

  All attributes of the CreateJob request are mandatory for the Printer to, at minimum, parse and interpret. However, the Printer manufacturer can choose which attributes are fully supported, in that they can be assigned values other than their default.

4.5.1.3 Unsupported Attributes, CreateJob

- Test Case ID(s)

  BPP/PR/DPS/BV-03-I

  BPP/SD/DPS/BV-03-I

- Test Purpose

  Printer: To verify that the Printer correctly prints a document when job Attributes not supported by the Printer are included in a CreateJob operation.

  Sender: To verify that the Sender can configure and print a job using the CreateJob operation with any job parameters defined.

- Reference

  [2] 7

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  - Establish active connection with target printer, if not already connected.
  - Send single XHTML-Print document to the Printer.
  - Set at least one of the job parameters to a value different from the default value supported by the Printer. Include parameters (if any) that represent capabilities not fully supported by the Printer under test (See Notes, below).

  Printer:

  Receive document from Sender and print using as much of the job configuration set by Sender, as possible.

- Expected Outcome

  Pass verdict:

  - Sender and Printer return to the Ready State.
  - Document shall be printed according to the configuration parameters set at the Sender, which are supported by the Printer.

- Notes

  All attributes of the CreateJob request are mandatory for the Printer to, at minimum, parse and interpret. However, the Printer manufacturer can choose which attributes are fully supported, in that they can be assigned values other than their default.

  If all parameters are fully supported by the Printer, then this test can be omitted.

4.5.2 GetJobAttributes

Test Sub Group Objectives:

- To verify that the status of print jobs is correctly requested and reported.

4.5.2.1 During printing-GetJobAttributes

- Test Case ID(s)

  BPP/PR/DPS/BV-04-I

  BPP/SD/DPS/BV-04-I

- Test Purpose

  Printer: To verify that the Printer correctly reports a complete job status while a job is printing.

  Sender: To verify that the Sender correctly reports complete job status while a job is printing.

- Reference

  [2] 7

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish active connection with target printer, if not already connected.

  Send a multi-page XHTML-Print document to the Printer using default job configuration parameters.

  While Printer is printing, request default job status from Printer.

  Printer:

  Receive document from Sender and print using printer configuration set by Sender.

- Expected Outcome

  Pass verdict:

- Sender and Printer return to the Ready State.
- The Printer completes the print job correctly.
- Job status returned by the Printer shall accurately report the observed status of the job.

4.5.2.2 Requested Attributes-GetJobAttributes

- Test Case ID(s)

  BPP/PR/DPS/BV-05-I

  BPP/SD/DPS/BV-05-I

- Test Purpose

  Printer: To verify that the Printer correctly reports only job status attributes that are explicitly requested by the Sender.

  Sender: To verify that the Sender correctly requests and reports job status while a job is printing.

- Reference

  [2] 7

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish active connection with target printer, if not already connected. Send multi-page XHTML-Print document to Printer using default job configuration attributes.

  While Printer is printing, use Sender Upper Tester to request one or more job status attributes.

  Printer:

  Receive document from Sender and print using printer configuration set by Sender.

- Expected Outcome

  Pass verdict:

  - Sender and Printer return to the Ready State.
  - Job status returned by the Printer shall include only those status attributes requested by the Sender.
  - The Printer completes the print job correctly.
  - Each attribute returned shall be an accurate report of the observed status of the job.

- Notes

The Sender must make available, either via its UI or through a manufacturer-provided procedure, ALL the attributes that are returned.

The Printer's IXIT [11] shall supply the list of attributes that it supports and the specific values of those attributes that it maintains and reports. All attributes of the GetJobAttributes request are mandatory for the Printer to the extent that the Printer shall respond with correctly formed and valid information. However, the Printer manufacturer can choose which values of specific attributes are supported and in what form they are reported.

The Sender's IXIT [11] shall supply the list of attributes that it can request.

4.5.3 CancelJob

Test Sub Group Objectives:

- To verify the Sender can cancel a print job via the JobID, and to verify that the Printer returns the correct status-response attributes to the Sender under specific circumstances.

4.5.3.1 Normal Request-CancelJob

- Test Case ID(s)

  BPP/PR/DPS/BV-06-I

  BPP/SD/DPS/BV-06-I

- Test Purpose

  Printer: To verify that the Sender device can cancel a specific job, identified by its JobID, while the job is printing.

  Sender: To verify that the Sender makes correct use of the CancelJob request while the Printer is printing the job.

- Reference

  [2] 7

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish an active connection with target printer, if not already connected.

  Initiate large multi-page XHTML-Print print job.

  Send CancelJob request to Printer within a period of time following the initiation of the print job such that the Printer still has the ability to cancel the job. For example, do not send the CancelJob request while the last page is printing, since the Printer may not then be able to act on the request.

It is recommended that the Printer manufacturer indicate in the IXIT [11] the minimum number of pages that are still to be printed before which a CancelJob shall be sent for it to be successful.

Printer:

Print large multi-page text job.

- Expected Outcome

Pass verdict:

- Printer cancels job.
- Sender and Printer return to the Ready State.

4.5.4 GetPrinterAttributes

Test Sub Group Objectives:

- To verify that Printer attributes are correctly passed to the Sender.

4.5.4.1 All Attributes -GetPrinterAttributes

- Test Case ID(s)

BPP/PR/DPS/BV-07-I

BPP/SD/DPS/BV-07-I

- Test Purpose

Printer: To verify that the Printer correctly responds to a GetPrinterAttributes request.

Sender: To verify that the Sender properly configures a GetPrinterAttributes request operation.

- Reference

[2] 7

- Initial Condition

Printer: Is in Online mode, and is prepared to print.

Sender: Is in Idle mode or connected to target printer.

- Test Procedure

Sender:

Establish active connection with target printer, if not already connected.

Request all printer parameters by the Sender's Upper Tester or through a manufacturer-provided procedure.

Printer:

No specific test actions necessary at Printer.

- Expected Outcome

  Pass verdict:

  - The Sender gets a complete list of Printer Attributes.
  - Sender and Printer return to the Ready State.

4.5.4.2 RequestedAttributes-GetPrinterAttributes

- Test Case ID(s)

  BPP/PR/DPS/BV-08-I

  BPP/SD/DPS/BV-08-I

- Test Purpose

  Printer: To verify that the Printer correctly responds to a GetPrinterAttributes request with the attributes requested by the Sender.

  Sender: To verify that the Sender properly configures a GetPrinterAttributes request operation and requests one or more arbitrarily selected attributes.

- Reference

  [2] 7

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish active connection with target printer, if not already connected.

  Request one or more printer parameters.

  Printer:

  No specific test actions necessary on the Printer.

- Expected Outcome

  Pass verdict:

  - Sender and Printer return to the Ready State.
  - The partial list of Printer attributes is returned to the Sender. The contents of the partial list shall correspond to those selected by the Sender.

- Notes

This test can only be performed if the Sender can request, via its UI or a manufacturer-provided procedure, selected attributes that are supported by the Printer, and the Sender must make available, via its UI or manufacturer-provided procedure, all the attributes that are returned.

The Printer's IXIT [11] shall supply the list of attributes that it supports.

The Sender's IXIT [11] shall supply the list of attributes that it can request.

It may not be possible to differentiate between the results of this test and test BPP/PR/DPS/BV-07-1 or BPP/SD/DPS/BV-07-1 in Section 4.5.4.1 - All Attributes -GetPrinterAttributes, if, for example, a request for attributes will always return a predetermined set.

It is possible that Sender will only be able to request a predetermined set of attributes.

4.5.5 GetEvent

Test Sub Group Objectives:

- To verify the Printer can provide notification of changes in its status to the Sender. In the Basic Printing Profile this is supported using a separate OBEX channel, the Status Channel.

4.5.5.1 Media Empty - GetEvent

- Test Case ID(s)

BPP/PR/DPS/BV-09-I

BPP/SD/DPS/BV-09-I

- Test Purpose

Printer: To verify that the Printer can provide the status of a specific print job as Stopped when the Sender device provides a JobID and the Printer runs out of media.

Sender: To verify that the Sender makes correct use of the GetEvent request while the job is stopped.

- Reference

[2] 7

- Initial Condition

When testing an IUT that is a sender, a Spooling printer shall not be used.

Printer: Online mode with paper in the printer input bins, but less than that which will be required for the job to be printed.

Sender: Is in Idle mode or connected to target printer.

- Test Procedure

Sender:

Establish active connection with target printer, if not already connected.

Send XHTML-Print document to the Printer that requires more pages to print than there is paper in the input medium for the Printer.

Printer:

Print simple, text-only XHTML-Print document.

When printer runs out of paper, add sufficient paper to the input medium to allow completion of the print job, and indicate to the printer that it should continue.

- Expected Outcome

  Pass verdict:

  - Printer indicates that it is out of media
  - Job prints correctly after media is supplied, but sender is allowed to disconnect job channel when sender receive "media empty" message from printer.
  - Sender and Printer return to the Ready State.

4.6 Object Formats

Test Group Objectives:

- This test group will verify that specified object formats are correctly printed.

  For submitting the different document formats, either the Simple Push Transfer Model or the Job Based Method may be chosen.

4.6.1 XHTML-Print

Test Sub Group Objectives:

- To verify that compliant devices correctly print objects formatted using XHTML-Print. Each of the tests below addresses a reasonable subset of the XHTML-Print tags in such a way as to keep the number of tests down and still allow the ability to identify causes of test failure. The set of tests is the primary vehicle for establishing printer compliance to XHTML-Print [6].
- In support of the test procedures defined in sections 4.6.1.1 - 4.6.1.5, below, specific tests have been designed and are available through the Bluetooth SIG [8]. These may not be applicable to all printers, in which case the manufacturer may generate comparable files for conformance testing. Tests are self-documented; that is, each test provides a mechanism for determining, through visual inspection, whether the test succeeds or fails. Note: Because of the indeterminate nature of XHTML formatting, pass/fail for interoperability is subjective.

4.6.1.1 Printer – XHTML-Print: Print Tags

- Test Case ID(s)

  BPP/PR/OF/BV-01-I

  BPP/SD/OF/BV-01-I

- Test Purpose

  Printer: To verify that a Printer can correctly print an XHTML-Print object that makes use of most of the tags and constructs defined in the XHTML-Print specification under Print Tags.

Sender: The purpose of the Sender is to transmit the specified test file to the Printer. This test is not intended to test the Sender's ability to generate XHTML-Print data.

- Reference

  [2] 10

  [6] 3.1, XHTML-Print

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Is in Idle mode or connected to target printer. The documents to be printed are stored on the Sender device and have been generated manually on the Sender or retrieved from an external source.

- Test Procedure

  Sender:

  Establish an active connection with target printer, if not already connected.

  Send these test files to the printer:

  OF-BV-01-I-A-v1.0

  OF-BV-01-I-B-v1.0

  OF-BV-01-I-C-v1.0

  Printer:

  Receive and print test files.

- Expected Outcome

  Pass verdict:

  All printed documents from the test will be evaluated, both from the standpoint of the stated expected results incorporated into a document itself, as well as external descriptions or samples of expected output or behavior. The test will be said to have passed if all documents conform, within reason, to the expected output or behavior, as described.

- Notes

  When qualifying a Printer, a Sender with the ability to conform to the Test Procedure laid out above shall be employed.

4.6.1.2 Printer – XHTML-Print: CSS

- Test Case ID(s)

BPP/PR/OF/BV-02-I

BPP/SD/OF/BV-02-I

- Test Purpose

Printer: To verify that a Printer can correctly print an XHTML-Print object that makes use of most constructs defined in the XHTML-Print specification under Cascading Style Sheets (CSS).

Sender: The purpose of the Sender is to transmit the specified test files to the Printer. This test is not intended to test the Sender's ability to generate XHTML-Print data.

- Reference

[2] 10

[6] 5.3.2, XHTML-Print

- Initial Condition

Printer: Is in Online mode, and is prepared to print.

Sender: Is in Idle mode or connected to target printer. The documents to be printed are stored on the Sender device and have been generated manually on the Sender or retrieved from an external source.

- Test Procedure

Sender:

Establish an active connection with target printer, if not already connected.

Send these test files to the printer:

OF-BV-02-I-A-v1.0

OF-BV-02-I-B-v1.0

OF-BV-02-I-C-v1.0

OF-BV-02-I-D-v1.0

OF-BV-02-I-E-v1.0

OF-BV-02-I-F-v1.0

OF-BV-02-I-G-v1.0

OF-BV-02-I-H-v1.0

Printer:

Receive and print the files from the Sender.

- Expected Outcome

  Pass verdict:

  All printed documents from the test will be evaluated based on the stated expected results incorporated into the document itself. The test will be said to have passed if it conforms to the expected output or behavior, as described.

- Notes

  When qualifying a Printer, a Sender with the ability to conform to the Test Procedure laid out above shall be employed.

4.6.1.3 Printer – XHTML-Print

- Test Case ID(s)

  BPP/PR/OF/BV-03-I

  BPP/SD/OF/BV-03-I

- Test Purpose

  Printer: The purpose of the Printer is to receive and print the specified test file.

  Sender: Demonstrate that acceptable printed output is generated from Sender applications that produce XHTML-Print files. This is the primary test of Sender compliance with XHTML-Print.

- Reference

  [2] 10

  [6] XHTML-Print

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish an active connection with target printer, if not already connected.

  For one Sender application that produces XHTML-Print files, prepare and send a print object to the Printer.

  Printer:

  Accept, render, and print XHTML-Print files from the Sender.

- Expected Outcome

  Pass verdict:

Each printed document is judged to correspond in form and intent to the object sent by the sending application.

- Notes

This test shall attempt to verify the full range of XHTML-Print capability that is supported by the Sender. Several generated objects using different settings or configurations of the Sender for each application may be required to cover all of the supported features of the Sender. The Printer is assumed to correctly render and print XHTML-Print files.

4.6.1.4 XHTML-Print: Referenced Images

- Test Case ID(s)

BPP/PR/OF/BV-04-I

BPP/SD/OF/BV-04-I

- Test Purpose

Printer: To verify that a Printer can lay out and print XHTML-Print files that contain referenced images in JPEG format.

Sender: To verify that a Sender can correctly construct and cause to print a document that contains a referenced JPEG image.

- Reference

[2] 10

- Initial Condition

Printer: Is in Online mode, and is prepared to print.

Sender: Is in Idle mode or connected to target printer.

- Test Procedure

Sender:

Establish an active connection with target printer, if not already connected.

Send Printer a file containing more than one referenced JPEG image.

Printer:

Accept, render, and print the file and its referenced images sent from the Sender.

- Expected Outcome

Pass verdict:

Printed output from tests contains the rendered images in a format consistent with the intent, given the constraints imposed by the particular printer. In other words, the images that should be printed are printed.

4.6.1.5 XHTML-Print: Enhanced Layout Extension

- Test Case ID(s)

BPP/PR/OF/BV-05-I

BPP/SD/OF/BV-05-I

- Test Purpose

Printer: To verify that a Printer can correctly print an XHTML-Print object that makes use of the additional style sheet properties and image formats required by the Enhanced Layout Extension of the XHTML-Print specification.

Sender: The purpose of the Sender is to transmit the specified test file to the Printer. This test is not intended to test the Sender's ability to generate XHTML-Print data.

- Reference

[2] 10

[6] XHTML-Print, 6.4

- Initial Condition

Printer: Is in Online mode, and is prepared to print.

Sender: Idle mode or connected to target printer. The documents to be printed are stored on the Sender device and have been generated manually on the Sender or retrieved from an external source.

- Test Procedure

Sender:

Send test files to the printer:

OF-BV-05-I-A-v1.0

OF-BV-05-I-B-v1.0

OF-BV-05-I-C-v1.0

OF-BV-05-I-D-v1.0

OF-BV-05-I-E-v1.0

OF-BV-05-I-F-v1.0

OF-BV-05-I-G-v1.0

OF-BV-05-I-H-v1.0

Printer:

Receive and print the files from the Sender.

- Expected Outcome

  Because of the indeterminate nature of XHTML formatting, pass/fail for interoperability is subjective.

  Pass verdict:

  All printed documents from the test will be evaluated, both from the standpoint of the stated expected results incorporated into a document itself, as well as external descriptions or samples of expected output or behavior. The test will be said to have passed if it conforms, within reason, to the expected output or behavior, as described.

4.6.2 Other Document Formats

4.6.2.1 Document – Non-XHTML-Print

- Test Case ID(s)

  BPP/PR/OF/BV-06-I

  BPP/SD/OF/BV-06-I

- Test Purpose

  Printer: To verify that the Printer correctly prints documents using formats that it claims to support, other than XHTML-Print.

  Sender: To verify that the Sender correctly sends non-XHTML-Print documents to the Printer.

- Reference

  [2] 6, 10

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish active connection with target printer, if not already connected,

  Send single document using one or more of the formats, other than XHTML-Print, offered by the Printer.

  Printer:

  Receive document from Sender and print.

- Expected Outcome

  Pass verdict:

  - The document is printed correctly according to the Printer's default configuration.

- Sender and Printer return to the Ready State.

- Notes

  This test shall be performed once for at least one of the document types (other than XHTML-Print documents) supported by both the Printer and Sender. Each document format to be tested shall be separately itemized in the ICS document.

4.6.3 vCard

Test Sub Group Objectives:

- To verify that compliant devices correctly print vCard version 2.1 objects.

4.6.3.1 Default - vCard

- Test Case ID(s)

  BPP/PR/OF/BV-07-I

  BPP/SD/OF/BV-07-I

- Test Purpose

  Printer: To verify that a Printer can correctly print vCard objects using default settings.

  Sender: To verify that a Sender can correctly create and cause a vCard to be printed using default settings.

- Reference

  [2] 10

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish an active connection with target printer, if not already connected.

  Select a single vCard object and transmit it to the Printer.

  Printer:

  Accept and print the vCard object sent.

- Expected Outcome

  Pass verdict:

  The output from the Printer is a recognizable representation of the selected vCard.

4.6.3.2 Cards per Page - vCard

- Test Case ID(s)

  BPP/PR/OF/BV-08-I

  BPP/SD/OF/BV-08-I

- Test Purpose

  Printer: To verify that a Printer can correctly print several vCard objects per page when requested to do so by the Sender.

  Sender: To verify that a Sender can correctly designate a set or category of vCards, specify the number of vCards to print per page, and send the designated vCards to the printer.

- Reference

  [2] 10

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish an active connection with target printer, if not already connected.

  Select a set of vCards or a category of vCards to send to the Printer.

  Specify, if the Sender's Upper Tester allows, the desired number of vCards to print per page.

  Send the selected vCards to the Printer. (This step is not required if the Sender has no Upper Tester or the Upper Tester does not allow the number of vCards to be selected.)

  Printer:

  The Printer receives and prints the specified set of vCards.

- Expected Outcome

  Pass verdict:

  - The selected set or category of vCards is printed.
  - The number of vCards per printed page is equal to the number of vCards per page selected, if selection was allowed. Subsequent to the first vCard printed on a page, any succeeding vCards that can fit on that page shall be printed on that page, taking margins into account. (Note that some variation here can occur and shall be allowed, based on whether the printer's selection of fonts and symbols will allow the printer to lay out a page with the requisite number of vCards.)
  - The number of vCards printed is equal to the number selected or in the category.
  - The output from the printer is a reasonable representation of the selected set of vCards.

- Uncertainties

  vCards can include nested image references. Whether to support such nesting is at the discretion of the manufacturer.

- Notes

  How a set of vCards is selected depends on the application supplied by the Sender. In some cases it is possible to select a series of individual cards, in others only a category of vCards can be selected.

4.6.3.3 Card Layout - vCard

- Test Case ID(s)

  BPP/PR/OF/BV-09-I

  BPP/SD/OF/BV-09-I

- Test Purpose

  Printer: To verify that a Printer can correctly print vCard object(s) using an alternate layout when requested by the Sender.

  Sender: To verify that a Sender can correctly create and request vCard object(s) to be printed using an alternate layout.

- Reference

  [2] 10

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish an active connection with target printer, if not already connected.

  Selects an alternate layout, as specified in the ICS, e.g., business card, and one or more vCard objects and causes them to be sent to the Printer.

  If it is possible to send more than one vCard object from the sender with a single operation, then more than one vCard object shall be sent.

  Printer:

  Printer receives vCard object(s) and prints it (them) with the specified layout.

- Expected Outcome

  Pass verdict:

The requisite number of vCard objects is printed in a form that preserves the intent of the layout selection, and the data values are correct.

- Notes

vCards can include image references. Whether to support such nesting is at the discretion of the manufacturer.

There is an underlying assumption that the header of an OBEX Put will be used to specify layout parameters.

4.6.4 vCalendar

Test Sub Group Objectives:

- To verify that compliant devices correctly print vCalendar version 1.0 objects.

4.6.4.1 Default - vCalendar

- Test Case ID(s)

BPP/PR/OF/BV-10-I

BPP/SD/OF/BV-10-I

- Test Purpose

Printer: To verify that a Printer can correctly print one vCalendar object using default print parameter settings.

Sender: To verify that a Sender can correctly create and cause to print a vCalendar object using default print parameter settings.

- Reference

[2] 10

- Initial Condition

Printer: Is in Online mode, and is prepared to print.

Sender: Idle mode or connected to target printer.

- Test Procedure

Sender:

Establish an active connection with target printer, if not already connected.

Sender selects a vCalendar entry (event) from a vCalendar display and causes it to be transmitted to the Printer. Alternately, an application on the sending device can send a predefined vCalendar file to the Printer.

Printer:

The Printer receives and prints the specified vCalendar file.

- Expected Outcome

  Pass verdict:

  The selected vCalendar event is printed and all relevant information is intact and recognizable.

4.6.4.2 Alternate View - vCalendar

- Test Case ID(s)

  BPP/PR/OF/BV-11-I

  BPP/SD/OF/BV-11-I

- Test Purpose

  Printer: To verify that a Printer can correctly print a vCalendar object using a calendar layout (Single, Daily, Weekly or Monthly) that is different from the default layout, when requested to do so by the Sender.

  Sender: To verify that a Sender can correctly create and cause to print a vCalendar object with a layout (Single, Daily, Weekly or Monthly) that is different from the default layout.

- Reference

  [2] 10

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish an active connection with target printer, if not already connected.

  Select a daily, weekly, or monthly view from the calendar interface and send it to the Printer. Transmit all events in the range of the selected view to ensure that all objects for that view are printed.

  Printer:

  The Printer receives and prints the specified vCalendar view.

- Expected Outcome

  Pass verdict:

  The selected calendar format is printed so that the intent of the selection is observed and the data values are correct.

- Notes

This test is highly dependent on the manufacturer's description of what the Printer will do when receiving this test. For example, a month view can come out as just a list of events from the beginning to the end of the month, or it could be in a formatted table. The starting day may vary, as well as the language in which the information is presented.

4.6.4.3 Several per page - vCalendar

- Test Case ID(s)

  BPP/PR/OF/BV-12-I

  BPP/SD/OF/BV-12-I

- Test Purpose

  Printer: To verify that a Printer can correctly print multiple vCalendar objects per page when requested to do so by the Sender. That is, given a particular layout (e.g., "Weekly"), a starting point, and the number of such objects to print, verify that the specified number of successive instances of the specified object will be printed on a page (assuming they will all fit).

  Sender: To verify that a Sender can correctly create and cause to print several vCalendar objects per page.

- Reference

  [2] 10

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish an active connection with target printer, if not already connected.

  Select a layout and the number of objects per page to be printed, if possible, then send the calendar data to the Printer.

  Printer:

  The Printer receives and prints the specified vCalendar data.

- Expected Outcome

  Pass verdict:

  The requisite number of selected calendar objects is printed on a page in a form that preserves the intent of the selection, and the data values are correct. Subsequent to the first vCalendar object printed on a page, any succeeding vCalendar objects that can fit on that page shall be printed on that page, taking margins into account.

- Notes

  Printer constraints may necessitate violating the page boundary to accommodate the number of objects requested.

4.6.5 vMessage

Test Sub Group Objectives:

- To verify that compliant devices correctly print vMessages (version 1.1).

4.6.5.1 Default - vMessage

- Test Case ID(s)

  BPP/PR/OF/BV-13-I

  BPP/SD/OF/BV-13-I

- Test Purpose

  Printer: To verify that the Printer can correctly print a vMessage (version 1.1) object.

  Sender: To verify that the Sender can correctly create and cause a vMessage (version 1.1) to be printed.

- Reference

  [2] 10

- Initial Condition

  Printer: Online mode, and prepared to print.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish an active connection with target printer, if not already connected.

  Selects a message to be transmitted to the Printer and sends it.

  Printer:

  The Printer receives and prints the specified vMessage to the Printer.

- Expected Outcome

  Pass verdict:

  The message is printed as expected on the receiving Printer.

- Uncertainties

  vMessages may contain nested vCards. If the vMessage to be printed contains nested vCards, they may or may not be printed; however, the message content shall always be printed.

4.6.6 Basic text

Test Sub Group Objectives:

- To verify that compliant devices correctly print Basic Text.

4.6.6.1 Default – Basic Text

- Test Case ID(s)

  BPP/PR/OF/BV-14-I

  BPP/SD/OF/BV-14-I

- Test Purpose

  Printer: To verify that a Printer correctly prints a document formatted using only Basic Text as defined in the Bluetooth Basic Printing profile.

  Sender: To verify that a Sender can correctly send a document formatted using only Basic Text as defined in the Bluetooth Basic Printing profile.

- Reference

  [2] 10

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish an active connection with target printer, if not already connected.

  User selects an appropriate application on the Sender that supports basic text, constructs a document, and sends it to the Printer. The document shall contain at least one paragraph with CRLF characters and at least one without CRLF characters.

  Printer:

  The Printer receives and prints the specified document.

- Expected Outcome

  Pass verdict:

  - The text entered into the application and sent to the Printer is printed.
  - Word boundaries are preserved.
  - Text is wrapped in the paragraph without CRLF characters and there is no missing text.
  - The paragraph with CRLF characters is formatted in compliance with the CRLF characters.

- Notes

The BPP states that CRLF characters shall be processed by the Printer to output preformatted text. In the absence of the CRLF characters in a data stream, the Printer shall appropriately wrap the text. Basic Text tests shall test these requirements by including at least one paragraph with CRLF characters and at least one without CRLF characters.

4.6.7 International

Test Sub Group Objectives:

- To verify that devices correctly print alternate character repertoires.

4.6.7.1 International

- Test Case ID(s)

  BPP/PR/OF/BV-15-I

  BPP/SD/OF/BV-15-I

- Test Purpose

  Printer: To verify that a Printer correctly prints a document formatted using any character repertoire it claims to support.

  Sender: To verify that a Sender can correctly cause to print a document formatted using any character repertoire it claims to support.

- Reference

  [2] 10, 12.2.3

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish an active connection with target printer, if not already connected.

  Sender is configured to communicate in a language not supported by ISO 8859-1. User selects an appropriate application on the Sender, constructs a document, and sends the document to the Printer under test.

  Printer:

  The Printer receives the document from the Sender and prints it.

- Expected Outcome

  Pass verdict:

  The document sent to the Printer is printed in the language sent by the Sender.

- Notes

  Selected character repertoires shall be supported by both Printer and Sender for this test to be executed.

4.7 Simple Push Transfer Model

Test Group Objectives:

- To verify the Simple Push Transfer Model for printing.

4.7.1 Simple Push

Test Sub Group Objectives:

- To verify that documents are correctly printed using the Simple Push model of printing.

4.7.1.1 XHTML-Print: Simple Push

- Test Case ID(s)

  BPP/PR/SP/BV-01-I

  BPP/SD/SP/BV-01-I

- Test Purpose

  Printer: To verify that the Printer correctly prints a single XHTML-Print document using its default settings when no CreateJob precedes the sending of print data to the Printer.

  Sender: To verify that the Sender properly uses the Simple Push for printing an XHTML-Print Document.

- Reference

  [2] 6

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish an active connection with target printer, if not already connected.

  Select Printer and send single document using the Simple Push method.

  Printer:

  Receive document from Sender and print using default printer configuration.

- Expected Outcome

  Pass verdict:

- The document is printed correctly according to the Printer's default configuration.
- Sender and Printer return to the Ready State.

- Notes

  It might not be possible to distinguish Simple Push printing and CreateJob with defaults from the user perspective.

4.8 Enhanced-Layout

Test Group Objectives:

- To verify the enhanced layout capabilities.

4.8.1 CreatePreciseJob

Test Sub Group Objectives:

- To verify that an enhanced-layout print job is correctly processed.

4.8.1.1 BPP/PR/EL/BV-01-I [CreatePreciseJob, Supported Attributes]

- Test Purpose

  Printer: To verify that the Printer correctly processes a job initiated with a CreatePreciseJob operation. If all supplied attributes in the CreatePreciseJob request are fully supported by the Printer, the document is printed correctly (See Notes, below).

- Reference

  [2] 7.2

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish active connection with target printer, if not already connected.

  Select at least one of the attributes supported by the Printer for printing the document (see Notes).

  Send an enhanced-layout document to the Printer.

  Printer:

  Receive document from Sender and process using printer configuration set by Sender.

- Expected Outcome

  Pass verdict:

- Document shall be printed according to the configuration attributes specified by the Sender.
- Sender and Printer return to the Ready State.

- Notes

All attributes of the CreatePreciseJob request are mandatory for the Printer to, at minimum, parse and interpret. However, the Printer manufacturer can choose which attributes are fully supported, in that they can be assigned values other than their default.

The manufacturer of the Printer shall provide via the IXIT [11] information as to which attribute values the Printer supports.

4.8.1.2 CreatePreciseJob, Unsupported Attributes

- Test Case ID(s)

BPP/PR/EL/BV-02-I

BPP/SD/EL/BV-02-I

- Test Purpose

Printer: To verify that the Printer correctly aborts printing a document when job attributes not fully supported by the Printer are included in a CreatePreciseJob operation (See Notes, below).

Sender: The purpose of the Sender is to transmit a CreatePreciseJob with attributes known not to be fully supported by the Printer.

- Reference

[2] 7.2

- Initial Condition

Printer: Is in Online mode, and is prepared to print.

Sender: Is in Idle mode or connected to target printer.

- Test Procedure

Sender:

Establish active connection with target printer, if not already connected.

Send a job to the Printer which includes non-fully supported attributes in the CreatePreciseJob operation.

Printer:

Receive document from Sender and process using printer configuration set by Sender.

- Expected Outcome

Pass verdict:

- Printer does not print the document.

- Sender and Printer return to the Ready State.

- Notes

  All attributes of the CreatePreciseJob request are mandatory for the Printer to, at minimum, parse and interpret. However, the Printer manufacturer can choose which attributes are fully supported, in that they can be assigned values other than their default.

  When qualifying a Printer, a Sender with the ability to conform to the Test Procedure laid out above shall be employed.

4.8.2 GetMargins

Test Sub Group Objectives:

- To verify that margin information is correctly communicated from Printer to Sender.

4.8.2.1 Request, GetMargins

- Test Case ID(s)

  BPP/PR/EL/BV-03-I

  BPP/SD/EL/BV-03-I

- Test Purpose

  Printer: To verify that the Printer correctly reports margin information upon receipt of a GetMargins operation.

  Sender: To verify that the Sender can request margin information from a Printer and display that information to the user.

- Reference

  [2] 7.2

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish active connection with target printer, if not already connected.

  Using the Sender's User Interface, request margin information from the Printer.

  Printer:

  Printer responds automatically (without user intervention) to the GetMargins request.

- Expected Outcome

  Pass verdict:

- No document is printed.
- The Sender's User Interface correctly reports the Printer's margin information.
- Sender and Printer return to the Ready State.

4.8.3 XHTML-Print Enhanced Layout

Test Sub Group Objectives:

- To verify that XHTML-Print Enhanced Layout documents are correctly created and interpreted.

4.8.3.1 XHTML-Print Enhanced Layout

- Test Case ID(s)

  BPP/PR/EL/BV-04-I

  BPP/SD/EL/BV-04-I

- Test Purpose

  Printer: To verify that a Printer can correctly print an XHTML-Print object that makes use of the additional style sheet properties and image formats required by the Enhanced Layout Extension of the XHTML-Print specification.

  Sender: To verify that a Sender can correctly generate an XHTML-Print object that makes use of the additional style sheet properties and image formats required by the Enhanced Layout Extension of the XHTML-Print specification.

- Reference

  [2] 7.2

- Initial Condition

  Printer: Is in Online mode, and is prepared to print.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender: Establish active connection with target printer, if not already connected. Send the Printer an XHTML-Print job utilizing Enhanced Layout constructs.

  Printer: Render the Enhanced Layout XHTML-Print job.

- Expected Outcome

  Pass verdict:

  - The document is correctly printed.
  - Sender and Printer return to the Ready State.

4.9 Reflected User Interface (RUI)

Test group objectives:

- To verify Reflected User Interface (RUI) capabilities.

  The RUI test cases can only be performed if the sender and the printer support the same mark-up language (HTML, WML etc). These test cases shall be performed for one markup language that is supported.

A sender with the ability to conform to the procedures shall be employed in this set of tests.

The ability for a sender to recognize that RUI is available from a Printer, perform a request for an RUI, and other RUI commands or procedures is product dependent.

4.9.1 Administrative Control

Test Sub Group Objectives:

- To verify that the Printer can present a user interface to the Sender and accept any control response provided by the Sender.

4.9.1.1 Administrative Reflected UI Service

- Test Case ID(s)

  BPP/PR/RUI/BV-01-I

  BPP/SD/RUI/BV-01-I

- Test Purpose

  Printer: To verify that the Printer can send an Administrative RUI to the Sender and can be controlled by the options selected.

  Sender: To verify that the Sender can request and display an Administrative RUI and is able to return the form with selected options.

- Reference

  [2] 9

- Initial Condition

  Printer: Public Online mode and able to deliver an Administrative RUI.

  Sender: Is in Idle mode or connected to target printer.

  Able to display an RUI and accept RUI input.

- Test Procedure

  Sender:

  Establish active connection with target printer, if not already connected.

  Discover that the Printer supports RUI. Request the administrative RUI in a format that the Sender is able to understand and display.

  Printer:

Return the administrative RUI to the Sender.

Sender:

Display the RUI and allow the user to make a selection. Send the result of the selection to the Printer.

Printer:

Perform the action selected through the RUI.

- Expected Outcome

  Pass verdict:

  - Administrative RUI is displayed on the Sender.
  - The controlled feature on the printer has changed to the expected state or the action requested has been executed.

- Notes

  That the administrative RUI page will contain an element whose selection will be verifiable.

4.9.2 Transactional Control

Test Sub Group Objectives:

- To verify that the Printer can present a user interface to the Sender and accept any control response provided by the Sender.
- To verify that the Printer can forward a user interface generated by the Print Service (if supported).
- To verify RUI works for both Bluetooth Print-by-Reference (PBR) and Bluetooth Direct Printing Service (DPS).

4.9.2.1 PBR Reflected UI Service

- Test Case ID(s)

  BPP/PR/RUI/BV-02-I

  BPP/SD/RUI/BV-02-I

- Test Purpose

  Printer: To verify that the Printer can send a User Interface and forward to the Sender RUIs submitted by a Print Service. Once the RUI selections have been passed between the Printer, Printer Service and Sender, the Printer will print the job offered by the Print Service.

  Sender: To verify that the Sender can interactively control a print job when presented with an RUI submitted by the Printer and by a Print Service.

- Reference

  [2] 9

- Initial Condition

  Printer: Public Online mode and able to deliver an RUI.

  Active connection to a network.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish active connection with target printer, if not already connected.

  Discover that the Printer supports RUI. Submit a PBR job that can be controlled by an RUI that also requires an RUI from the Print Service, e.g., authentication.

  Printer:

  Return the PBR RUI to the Sender.

  Sender:

  Display the RUI and allow the user to make a selection. Send the result of the selection to the Printer.

  Printer:

  Forward the request to the Print Service. Accept the Print Service RUI and forward it to the Sender.

  Sender:

  Display the RUI and allow the user to make a selection.

  Send the result of the selection to the Printer.

  Printer:

  Forward the RUI form to the Print Service.

  Accept the Print Job from the Print Service and send status to the Sender.

- Expected Outcome

  Pass verdict:

  The job configuration RUI followed by the print service RUI are displayed, appropriately, on the Sender.

  The information indicated by the reference is printed according to the job configuration selected in the job configuration RUI.

4.9.2.2 DPS Reflected UI Service

- Test Case ID(s)

  BPP/PR/RUI/BV-03-I

  BPP/SD/RUI/BV-03-I

- Test Purpose

  Printer:
  To verify that the Printer can send an RUI and accept a print job generated by the Sender.

  Sender:
  To verify that the Sender can initiate a print request for a local file. This is controlled by an RUI presented by the Printer.

- Reference

  [2] 9

- Initial Condition

  Printer: Public Online mode and able to deliver an RUI.

  Sender: Is in Idle mode or connected to target printer.

  Able to display an RUI and accept RUI input.

- Test Procedure

  Sender:

  Establish active connection with target printer, if not already connected. Discover that the Printer supports RUI. Submit a DPS job that is controlled by an RUI.

  Printer:

  Return the DPS RUI to the Sender.

  Sender:

  Display the RUI and allow the user to make a selection. Send the result of the selection to the Printer.

  Printer:

  Accept the RUI form. Retrieve the data and generate a printout.

- Expected Outcome

  Pass verdict:

  The RUI is displayed on the Sender

  The job is printed according to the job control parameters selected in the RUI.

4.9.3 RUI - CancelJob

Test Sub Group Objectives:

- Verify that the Sender can cancel a job through an RUI.

4.9.3.1 RUI Normal Request - CancelJob

- Test Case ID(s)

  BPP/PR/RUI/BV-04-I

  BPP/SD/RUI/BV-04-I

- Test Purpose

  Printer: Verify that a job initiated through an RUI on the Sender can be cancelled by the Sender through the RUI.

  Sender: Confirm that the Sender can issue a job cancellation through a printer-generated RUI.

- Reference

  [2] 9

- Initial Condition

  Printer:

  Online mode and able to deliver an RUI.

  Active connection to a network.

  Sender:

  Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish active connection with target printer, if not already connected. Discover that the Printer supports RUI. Submit a multiple page DPS job that is controlled by an RUI.

  Printer:

  Return the DPS RUI to the Sender.

  Sender:

  Display the RUI and allow the user to make a selection. Send the result of the selection to the Printer. Once the Printer begins to print, issue a CancelJob from the RUI.

  Printer:

  Accept the RUI form. Receive the data and generate a printout. Upon receiving the CancelJob indication, cease printing. Send status back to the Sender.

- Expected Outcome

  Pass verdict:

  The RUI is displayed on the Sender.

  The job starts to print according to the job control parameters selected in the RUI.

  The job does not complete, the current page is ejected, and the Printer returns to its normal Ready State.

- Notes

  This test assumes that the RUI presented to the User is capable of accepting and processing job control commands issued during the execution of a job.

4.9.4 RUI – Media Empty

Test Sub Group Objectives:

- Verify that the Printer can provide the status of a specific print job as Stopped through an RUI on the Sender.

4.9.4.1 RUI Media Empty

- Test Case ID(s)

  BPP/PR/RUI/BV-05-I

  BPP/SD/RUI/BV-05-I

- Test Purpose

  Printer: Verify that upon detecting a Media Empty condition on the Printer during the execution of a print job, the Printer can indicate a Printer Stopped condition on the Sender RUI, and that after the Media Empty condition has been corrected, the job completes printing, appropriately.

  Sender: Confirm that the Sender can display a status condition notification by the Printer on the Sender's printer-generated RUI.

- Reference

  [2] 9

- Initial Condition

  Printer: Online mode, able to deliver an RUI, and with paper in the input bins, but less than that which will be required for the job to be printed.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish active connection with target printer, if not already connected.

Discover that the Printer supports RUI. Submit a DPS job that is controlled by an RUI and that consists of more pages than are in the Printer's input bins.

Printer:

Return the DPS RUI to the Sender.

Sender:

Display the RUI and allow the user to make a selection. Send the result of the selection to the Printer.

Printer:

Accept the RUI form. Receive the data and generate a printout. Upon determining that the paper in the input bins is depleted, cease printing. Send status back to the Sender.

Sender:

Display the status returned from the Printer in the RUI. Allow user to make a selection and send result to Printer, as necessary.

Printer:

Repeat Accept RUI Form and send new RUI to Sender, as necessary. After correction of the Media Empty condition, complete printing the job.

- Expected Outcome

  Pass verdict:

  - The DPS job configuration RUI is displayed on the Sender
  - The job starts to print according to the job control parameters selected in the RUI.
  - The job does not complete because the Printer has run out of paper.
  - The RUI on the Sender indicates that the Printer is stopped.
  - After Media Empty condition is corrected, the job completes printing.

4.10 Print-by-Reference (PBR)

Test Group Objectives:

- To verify that the Print-by-Reference features of the profile interoperate correctly.

The ability for the Sender to perform certain PBR actions may require product-dependent configuration settings.

4.10.1 Reference printing – various reference types

Test Sub Group Objectives:

- To verify that the target content of a reference is printed appropriately, using various styles of reference.

Either Simple Push or Job-based printing can be used by the Sender in the execution of this test.

4.10.1.1 Simple Reference, Default Parameters

- Test Case ID(s)

  BPP/PR/PBR/BV-01-I

  BPP/SD/PBR/BV-01-I

- Test Purpose

  Printer: To verify that the Printer correctly prints the target of a simple reference using its default settings. The document shall be accessible over HTTP and reside on a different physical machine from the Printer.

  Sender: To verify that the Sender properly transmits a simple reference to the Printer.

- Reference

  [2] 8

- Initial Condition

  Printer:

  Online mode, PBR and Internet capability enabled and prepared to print. A document pointed to by the simple reference shall be accessible over HTTP and reside on a different physical machine from the Printer. The target document shall be in a format that the Printer supports.

  Sender:

  Is in Idle mode or connected to target printer.

- Test Procedure

  Sender:

  Establish active connection with target printer, if not already connected. Configure to send a simple reference pointing to the test document referred to above. Send the reference to the Printer.

  Printer:

  Receive simple reference from Sender and print the target document using default Printer configuration.

- Expected Outcome

  Pass verdict:

  The document pointed to by the reference is correctly printed. After the completed job the Printer shall be able to accept a new print job.

4.10.1.2 XML Reference, Default Parameters

- Test Case ID(s)

BPP/PR/PBR/BV-02-I

BPP/SD/PBR/BV-02-I

- Test Purpose

  Printer: To verify that the Printer correctly prints the target of an XML reference using its default settings. The document shall be accessible over HTTP and reside on a different physical machine from the Printer.

  Sender: To verify that the Sender properly transmits an XML reference to the Printer.

- Reference

  [2] 8

- Initial Condition

  Printer: Online mode, Internet and PBR enabled, and prepared to print. A document pointed to by the XML reference shall be accessible over HTTP. The target document shall be in a format that the Printer supports.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender: Establish active connection with target printer, if not already connected. Configure to send an XML reference pointing to the target document. Send the XML reference to the Printer.

  Printer: Receive XML reference from Sender and print the target document using default Printer configuration.

- Expected Outcome

  Pass verdict:

  The document pointed to by the reference is correctly printed. After the completed job the Printer shall be able to accept a new print job.

4.10.1.3 Reference List, Default Parameters

- Test Case ID(s)

BPP/PR/PBR/BV-03-I

BPP/SD/PBR/BV-03-I

- Test Purpose

  Printer: To verify that the Printer correctly prints all target documents in the reference list using its default settings. Each document in the list shall be accessible over HTTP and reside on a different physical machine from the Printer.

  Sender: To verify that the Sender properly transmits a list of references to the Printer.

- Reference

[2] 8

- Initial Condition

  Printer: Online mode, PBR and Internet enabled and prepared to print. The documents pointed to by the references shall be accessible over HTTP and reside on a different physical machine from the Printer. The target documents shall be in a format that the Printer supports.

  Sender: Is in Idle mode or connected to target printer.

- Test Procedure

  Sender: Establish active connection with target printer, if not already connected. above. Printer shall be selectable. Send the list of references to the Printer.

  Printer: Receive list of references from Sender and print the target documents using default Printer configuration.

- Expected Outcome

  Pass verdict:

  The documents pointed to by the references are correctly printed. After the completed job the Printer shall be able to accept a new print job.

4.10.1.4 Simple Reference, HTTP Authentication Challenge

- Test Case ID(s)

  BPP/PR/PBR/BV-04-I

  BPP/SD/PBR/BV-04-I

- Test Purpose

  Printer: To verify that the Printer correctly prints the target document of a simple reference that points to a document that requires HTTP authentication to be retrieved. This test is done using default Printer settings. The document shall be accessible over HTTP and reside on a different physical machine from the Printer.

  Sender: To verify that the Sender properly handles an HTTP authentication challenge received in the initial response from the Printer and retransmits a simple reference containing the authentication credentials. (See Notes.)

- Reference

  [2] 8

- Initial Condition

  Printer: Online mode, PBR enabled and prepared to print. A test document pointed to by the simple reference shall, after authentication, be accessible over HTTP and reside on a different physical machine from the Printer. The target document shall be in a format that the Printer supports.

Sender: Is in Idle mode or connected to target printer.

- Test Procedure

Sender:

Establish active connection with target printer, if not already connected. Configure to send a simple reference pointing to the test document. Send the reference to the Printer with no credentials. Credentials may be submitted in the initial request or in a subsequent request pursuant to a challenge by the Printer.

It is assumed that the credentials for the reference are either known by the Sender or entered by the User at the time of challenge.

Printer:

Receive simple reference from Sender, and retrieve the document using HTTP, responding to the Simple Reference submission with the HTTP header for authentication challenge, if necessary.

- Expected Outcome

Pass verdict:

The document pointed to by the reference is correctly printed. After the completed job the Printer shall be able to accept a new print job.

- Notes

The Sender may not provide the capability for the User to enter authentication credentials and resubmit the job with those credentials. Therefore, it is assumed that the Sender is either pre-programmed with the necessary authentication information, and submits it with the initial print request or provides a sufficient UI for the user to enter the required authentication information.

It is sufficient to run this test with a non-proxy content provider authentication (on401) challenge.

4.10.1.5 XML Reference, HTTP Authentication Challenge

- Test Case ID(s)

BPP/PR/PBR/BV-05-I

BPP/SD/PBR/BV-05-I

- Test Purpose

Printer: To verify that the Printer correctly prints the target document of an XML reference that points to a document requiring HTTP authentication to be retrieved (See Notes). This test is done using default Printer settings. The document shall be accessible over HTTP and reside on a different physical machine from the Printer.

Sender: To verify that the Sender properly handles an HTTP authentication challenge in the initial response from the Printer and retransmits an XML reference containing the authentication credentials.

- Reference

[2] 8

- Initial Condition

Printer: Online mode, Internet and PBR enabled and prepared to print. A document pointed to by the XML reference shall, after authentication, be accessible over HTTP and reside on a different physical machine from the Printer. The target document shall be in a format that the Printer supports.

Sender: Is in Idle mode or connected to target printer.

- Test Procedure

Sender:

Establish active connection with target printer, if not already connected.

Configure to send an XML reference pointing to the test document referred to above. Initiate sending of the XML reference to the Printer. If service discovery is done, a Printer shall be selected from the presented list of available printers. Send the reference to the Printer.

When the authentication challenge is received, the Sender shall resubmit the XML Reference together with the HTTP credentials. It is assumed that the credentials for the reference are either known by the Sender or entered by the user at the time of challenge.

Printer:

Receive XML reference from Sender and try to retrieve the target document using HTTP. When receiving the HTTP authentication challenge from the web server, the Printer shall respond to the sender of the initial XML reference with an OBEX-HTTP header for authentication Challenge.

Receive the same XML reference in a new request with the credentials for the reference supplied in the XML encoded reference. Retrieve and print the target document.

- Expected Outcome

Pass verdict:

The document pointed to by the reference is fully printed. After the completed job the Printer shall be able to accept a new print job.

- Notes

The Sender may not provide the capability for the User to enter authentication credentials and resubmit the job with those credentials. Therefore, it is assumed that the Sender is either preprogrammed with the necessary authentication information, and submits it with the initial print request or provides a sufficient UI for the user to enter the required authentication information.

It is sufficient to run this test with a non-proxy content provider authentication (on401) challenge.

4.10.1.6 Reference List, HTTP Authentication Challenge

- Test Case ID(s)

BPP/PR/PBR/BV-06-I

BPP/SD/PBR/BV-06-I

- Test Purpose

Printer: To verify that the Printer correctly prints all target documents of the reference list (HTTP) when more than one of the reference requires authentication. This test is done using default printer settings.

Sender: To verify that the Sender properly handles HTTP authentication challenges in the initial response from the Printer and retransmits the reference list containing the authentication credentials for each reference that required authentication in the XML encoding.

- Reference

[2] 8

- Initial Condition

Printer: Online mode, PBR and Internet enabled, and prepared to print. Each document pointed to by the XML references shall, after authentication, be accessible over HTTP and reside on a different physical machine from the Printer. The target documents shall be in a format that the Printer supports.

Sender: Is in Idle mode or connected to target printer.

- Test Procedure

Sender:

Establish active connection with target printer, if not already connected.

Enable PBR and configure to send a list of XML references pointing to the test documents referred to above.

Initiate sending of the reference list to the Printer. If service discovery is done, a Printer shall be selected from the presented list of available printers. Send the reference list to the Printer.

When the first authentication challenge is received, the Sender shall resubmit the request with the reference list and the HTTP credentials in the XML encoding for the challenged reference. It is assumed that the credentials for the challenged reference is either known by the Sender or entered by the user at the time of challenge.

Repeat the procedures above until no more references are challenged. The last transmitted request shall contain the credentials for all the challenged references.

Printer:

Receive reference list from Sender and try to retrieve the first target document, using HTTP. When receiving the HTTP authentication challenge from the web server, the Printer shall respond to the request with the OBEX-HTTP header for authentication challenge for the challenged reference.

Receive the same reference list in a new request with the credentials for the challenged reference supplied in the XML encoding. Test the provided credentials for the challenged reference but do not print the document until the other references in the list have been challenged and provided with credentials from the Sender.

When all of the references in the list requiring authentication have supplied credentials the target documents shall be downloaded and printed.

- Expected Outcome

Pass verdict:

The documents pointed to by the references are fully printed. After the completed job the Printer shall be able to accept a new print job.

- Notes

The Sender may not provide the capability for the User to enter authentication credentials and resubmit the job with those credentials. Therefore, it is assumed that the Sender is either pre-programmed with the necessary authentication information for those documents requiring it, and submits it with each such document in the initial print request or provides a sufficient UI for the user to enter the required authentication information, as needed.

It is sufficient to run this test with a non-proxy content provider authentication (on401) challenge.

4.10.2 CreateJob with SendReference

4.10.2.1 Any Reference Type, CreateJob

- Test Case ID(s)

BPP/PR/PBR/BV-07-I

BPP/SD/PBR/BV-07-I

- Test Purpose

Printer: To verify that the Printer correctly prints the target of a reference using a preceding CreateJob operation. The document shall be accessible over HTTP and reside on a different physical machine from the Printer.

Sender: To verify that the Sender properly transmits a reference to the Printer with a preceding CreateJob operation.

- Reference

[2] 8

- Initial Condition

Printer: Online mode, PBR enabled, and prepared to print. A document pointed to by the simple reference shall be accessible over HTTP and reside on a different physical machine from the Printer. The target document shall be in a format that the Printer supports.

Sender: Is in Idle mode or connected to target printer.

- Test Procedure

Sender:

Establish active connection with target printer, if not already connected.

Configure to send a simple reference pointing to the test document referred to above.

Initiate a Print-by-Reference session by sending a CreateJob operation with a subsequent SendReference operation to the Printer. If service discovery is done, a Printer shall be selected from the presented list prior to initiating any operations. Note that at least one parameter shall be specified in the CreateJob that is different from the default value.

Printer:

Receive CreateJob operation with parameters and SendReference with reference from Sender and print the target document using the specified parameters in CreateJob.

- Expected Outcome

Pass verdict:

The document pointed to by the reference is fully printed according to the parameter(s) specified in the CreateJob operation. After the completed job the Printer shall be able to accept a new print job.

4.10.3 Error Cases

4.10.3.1 Any Reference Type, Target Not Present

- Test Case ID(s)

BPP/PR/PBR/BI-01-I

BPP/SD/PBR/BI-01-I

- Test Purpose

Printer: To verify that the Printer correctly reports an error message when the reference target does not exist.

Sender: To verify that the Sender correctly processes the error condition, as reported by the Printer.

- Reference

[2] 8

- Initial Condition

Printer: Online mode, PBR enabled, and prepared to print. A document pointed to by the simple reference shall not be accessible over HTTP.

Sender: Is in Idle mode or connected to target printer.

- Test Procedure

Sender:

Establish active connection with target printer, if not already connected. PBR enabled and configured to send an invalid simple reference. Initiate sending of the invalid reference to the Printer. If service discovery is done, a Printer shall be selected from the presented list of available printers. Send the reference to the Printer.

Printer:

Receive invalid simple reference from Sender and try to retrieve it from the web server. When this fails, an error message shall be sent back to the Sender in the response.

- Expected Outcome

Pass verdict:

- No document is printed.
- The error condition is reported by the Sender.
- The error condition is reported by the Printer.
- The Printer and Sender are able to return to the ready state.

4.10.3.2 Any Reference Type, General Error

- Test Case ID(s)

BPP/PR/PBR/BI-02-I

BPP/SD/PBR/BI-02-I

- Test Purpose

Printer: To verify that the Printer correctly reports an error message when something goes wrong, for which there is no specific error message, e.g., the network connection disappears during a print job.

Sender: To verify that the Sender correctly processes a general error, as reported by the Printer.

- Reference

[2] 8

- Initial Condition

Printer:

Online mode, PBR enabled, and prepared to print. A document shall be accessible over HTTP and reside on a different physical machine from the Printer. The target document shall be in a format that the Printer supports. The document shall be of sufficient length to allow time for the test operator to establish the error condition while the document is still being downloaded. The Printer manufacturer shall specify in the IXIT [11] the document length required for its printer.

Sender:

Is in Idle mode or connected to target printer.

- Test Procedure

Sender:

Establish active connection with target printer, if not already connected.

Enable PBR and configure to send a reference pointing the test document referred to above.

Initiate sending of the reference to the Printer. If service discovery is done, a Printer shall be selected from the presented list of available printers. Send the reference to the Printer.

Printer:

Receive reference from Sender and start to print the target document. While the Printer is downloading the document from the web server, the network connection shall be broken, e.g., by pulling out the network cable from the Printer. When the Printer realizes that the network connection is gone, it shall report a general error in the response.

- Expected Outcome

Pass verdict:

- The document is not printed in full.
- The Printer and the Sender are able to return to the ready state.

5 Test Case Mapping

The Test Case Mapping Table (TCMT) maps test cases to specific requirements in the ICS. The product shall be 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 y/x reference, where y corresponds to the table number and x corresponds to the feature number as defined in the ICS Proforma for Basic Printing Profile (BPP) [10]. If the item is defined with Protocol, Profile or Service abbreviation before y/x, the table and feature number referenced are defined in the abbreviated ICS Proforma document.

Feature: Recommended to be the primary feature defined in the ICS being tested or may be the test case name.

Test Case(s): The applicable test case identifiers required for Bluetooth Qualification if the corresponding y/x references defined in the Item column are supported.

Test Case Applicable: May be used to note if a test is required based on the supported features.

For purpose and structure of the ICS/IXIT Proforma and instructions for completing the ICS/IXIT Proforma refer to the Bluetooth ICS and IXIT Proforma document.

Item	Feature	Test Case(s)	Test Case Applicable
BPP (2/1 AND 2/2a)	Public Online mode and General Inquiry	BPP/PR/DCS/BV-01-I	
BPP (2/1 AND 2/2b)	Public Online mode and Limited Inquiry	BPP/PR/DCS/BV-02-I	
BPP 2/1	Public Online mode and Device discovery	BPP/PR/DCS/BV-03-I	
BPP 2/2	Private Online mode and General Inquiry or Limited Inquiry	BPP/PR/DCS/BV-05-I	
BPP 2/3	Offline mode and General Inquiry or Limited Inquiry	BPP/PR/DCS/BV-07-I	
BPP (2/4 OR 2/5)	Bonding	BPP/PR/DCS/BV-11-I	
BPP (3/5 OR 3/6)	Bonding	BPP/SD/DCS/BV-11-I	
BPP 2/6	Service Discovery	BPP/PR/SD/BV-01-I	
BPP 3/7	Service Discovery	BPP/SD/SD/BV-01-I	
BPP 2/7	OBEX Authentication	BPP/PR/OA/BV-01-I	
BPP 3/8	OBEX Authentication	BPP/SD/OA/BV-01-I	

Item	Feature	Test Case(s)	Test Case Applicable
BPP 2/7	OBEX Authentication, Invalid	BPP/PR/OA/BI-01-I	
BPP (2/9 AND 2/9a)	CreateJob	BPP/PR/DPS/BV-01-I	
BPP 3/11	CreateJob	BPP/SD/DPS/BV-01-I	
BPP (2/9 AND 2/9a)	CreateJob, supported attributes	BPP/PR/DPS/BV-02-I	
BPP 3/12	CreateJob, supported attributes	BPP/SD/DPS/BV-02-I	
BPP (2/9 AND 2/9a)	CreateJob, unsupported attributes	BPP/PR/DPS/BV-03-I	
BPP 3/12	CreateJob, unsupported attributes	BPP/SD/DPS/BV-03-I	
BPP 2/10	Job attributes while printing	BPP/PR/DPS/BV-04-I	
BPP 3/13	Job attributes while printing	BPP/SD/DPS/BV-04-I	
BPP 2/10	Specific job attributes	BPP/PR/DPS/BV-05-I	
BPP 3/13a	Specific job attributes	BPP/SD/DPS/BV-05-I	
BPP 2/12	Cancel job while printing	BPP/PR/DPS/BV-06-I	
BPP (3/15 OR 3/15a)	Cancel job while printing	BPP/SD/DPS/BV-06-I	
BPP 2/11	Complete set of printer attributes	BPP/PR/DPS/BV-07-I	
BPP (3/14 OR 3/14a)	Complete set of printer attributes	BPP/SD/DPS/BV-07-I	
BPP 2/11	Specific printer attributes	BPP/PR/DPS/BV-08-I	
BPP (3/14b OR 3/14c)	Specific printer attributes	BPP/SD/DPS/BV-08-I	
BPP 2/13	Error on media empty	BPP/PR/DPS/BV-09-I	
BPP 3/16	Error on media empty	BPP/SD/DPS/BV-09-I	
BPP 2/15	Printer compliance to XHTML-Print	BPP/PR/OF/BV-01-I BPP/PR/OF/BV-02-I	

Item	Feature	Test Case(s)	Test Case Applicable
BPP 3/19	Printer compliance to XHTML-Print	BPP/SD/OF/BV-01-I BPP/SD/OF/BV-02-I	
BPP 2/15	Sender compliance to XHTML-Print	BPP/PR/OF/BV-03-I	
BPP 3/18	Sender compliance to XHTML-Print	BPP/SD/OF/BV-03-I	
BPP 2/14	Support for referenced images	BPP/PR/OF/BV-04-I	
BPP (3/17 AND 3/20)	Support for referenced images	BPP/SD/OF/BV-04-I	
BPP 2/29	Support for Enhanced Layout Extension	BPP/PR/OF/BV-05-I	
BPP 3/19	Support for Enhanced Layout Extension	BPP/SD/OF/BV-05-I	
BPP 2/27	Print documents in formats other than XHTML-Print	BPP/PR/OF/BV-06-I	
BPP 3/32	Print documents in formats other than XHTML-Print	BPP/SD/OF/BV-06-I	
BPP 2/16	Support for vCard	BPP/PR/OF/BV-07-I	
BPP 3/21	Support for vCard	BPP/SD/OF/BV-07-I	
BPP 2/17	Ability to print several vCards per page	BPP/PR/OF/BV-08-I	
BPP 3/22	Ability to print several vCards per page	BPP/SD/OF/BV-08-I	
BPP 2/18	Ability to support alternate vCard layout	BPP/PR/OF/BV-09-I	
BPP 3/23	Ability to support alternate vCard layout	BPP/SD/OF/BV-09-I	
BPP 2/19	Support for vCalendar	BPP/PR/OF/BV-10-I	
BPP 3/24	Support for vCalendar	BPP/SD/OF/BV-10-I	
BPP (2/20 OR 2/21 OR 2/22 OR 2/23)	Support for alternate vCalendar views	BPP/PR/OF/BV-11-I	
BPP (3/25 OR 3/26 OR 3/27 OR 3/28)	Support for alternate vCalendar views	BPP/SD/OF/BV-11-I	
BPP 2/24	Several vCalendar layouts per page	BPP/PR/OF/BV-12-I	
BPP 3/29	Several vCalendar layouts per page	BPP/SD/OF/BV-12-I	

Item	Feature	Test Case(s)	Test Case Applicable
BPP 2/25	Support for vMessage	BPP/PR/OF/BV-13-I	
BPP 3/30	Support for vMessage	BPP/SD/OF/BV-13-I	
BPP 2/26	Support for Basic Text format	BPP/PR/OF/BV-14-I	
BPP 3/31	Support for Basic Text format	BPP/SD/OF/BV-14-I	
BPP 2/28	Support for other character repertoires	BPP/PR/OF/BV-15-I	
BPP 3/33	Support for other character repertoires	BPP/SD/OF/BV-15-I	
BPP 2/8	Simple push of XHTML-Print document	BPP/PR/SP/BV-01-I	
BPP 3/9	Simple push of XHTML-Print document	BPP/SD/SP/BV-01-I	
BPP 2/29	CreatePreciseJob	BPP/PR/EL/BV-01-I	
BPP 2/29	CreatePreciseJob, Unsupported Attributes.	BPP/PR/EL/BV-02-I	
BPP 3/34a	CreatePreciseJob, Unsupported Attributes.	BPP/SD/EL/BV-02-I	
BPP 2/29	Request printer margin information	BPP/PR/EL/BV-03-I	
BPP 3/35	Request printer margin information	BPP/SD/EL/BV-03-I	
BPP 2/29	XHTML-Print Enhanced Layout	BPP/PR/EL/BV-04-I	
BPP 3/35a	XHTML-Print Enhanced Layout	BPP/SD/EL/BV-04-I	
BPP (2/31 AND 2/32 AND (2/37 OR 2/38 OR 2/39))	Administrative RUI control	BPP/PR/RUI/BV-01-I	
BPP (3/43 AND 3/44 AND (3/47 OR 3/48 OR 3/49))	Administrative RUI control	BPP/SD/RUI/BV-01-I	
BPP (2/31 AND 2/33 AND (2/37 OR 2/38 OR 2/39))	PBR reflected UI	BPP/PR/RUI/BV-02-I	
BPP (3/43 AND 3/45 AND (3/47 OR 3/48 OR 3/49))	PBR reflected UI	BPP/SD/RUI/BV-02-I	

Item	Feature	Test Case(s)	Test Case Applicable
BPP (2/31 AND 2/34 AND (2/37 OR 2/38 OR 2/39))	DPS reflected UI	BPP/PR/RUI/BV-03-I	
BPP (3/43 AND 3/46 AND (3/47 OR 3/48 OR 3/49))	DPS reflected UI	BPP/SD/RUI/BV-03-I	
BPP (2/35 AND (2/37 OR 2/38 OR 2/39))	Cancel Job RUI	BPP/PR/RUI/BV-04-I	
BPP (3/46 AND 3/50 AND (3/47 OR 3/48 OR 3/49))	Cancel Job RUI	BPP/SD/RUI/BV-04-I	
BPP (2/36 AND (2/37 OR 2/38 OR 2/39))	Media empty RUI	BPP/PR/RUI/BV-05-I	
BPP (3/46 AND (3/47 OR 3/48 OR 3/49))	Media empty RUI	BPP/SD/RUI/BV-05-I	
BPP 2/30	Simple reference print	BPP/PR/PBR/BV-01-I	
BPP (3/37 AND 3/36 AND (3/41 OR 3/42))	Simple reference print	BPP/SD/PBR/BV-01-I	
BPP 2/30	XML reference print	BPP/PR/PBR/BV-02-I	
BPP (3/38 AND 3/36 AND (3/41 OR 3/42))	XML reference print	BPP/SD/PBR/BV-02-I	
BPP 2/30	List reference print	BPP/PR/PBR/BV-03-I	
BPP (3/39 AND 3/36 AND (3/41 OR 3/42))	List reference print	BPP/SD/PBR/BV-03-I	
BPP 2/30	Simple reference, HTTP Authentication	BPP/PR/PBR/BV-04-I	
BPP (3/37 AND 3/40 AND (3/41 OR 3/42))	Simple reference, HTTP Authentication	BPP/SD/PBR/BV-04-I	
BPP 2/30	XML reference, HTTP Authentication	BPP/PR/PBR/BV-05-I	
BPP (3/38 AND 3/40 AND (3/41 OR 3/42))	XML reference, HTTP Authentication	BPP/SD/PBR/BV-05-I	
BPP 2/30	List reference, HTTP Authentication	BPP/PR/PBR/BV-06-I	
BPP (3/39 AND 3/40 AND (3/41 OR 3/42))	List reference, HTTP Authentication	BPP/SD/PBR/BV-06-I	
BPP 2/30	Any Reference, CreateJob	BPP/PR/PBR/BV-07-I	
BPP (3/42 AND (3/37 OR 3/38 OR 3/39))	Any Reference, CreateJob	BPP/SD/PBR/BV-07-I	

Item	Feature	Test Case(s)	Test Case Applicable
BPP 2/30	Reference print, no target	BPP/PR/PBR/BI-01-I	
BPP ((3/37 OR 3/38 OR 3/39) AND (3/41 OR 3/42))	Reference print, no target	BPP/SD/PBR/BI-01-I	
BPP 2/30	Reference print, general error	BPP/PR/PBR/BI-02-I	
BPP ((3/37 OR 3/38 OR 3/39) AND (3/41 OR 3/42))	Reference print, general error	BPP/SD/PBR/BI-02-I	

Table 5.1: *Test Case Mapping*