Supporting Multi-Purpose Trays

Status: IPP Workgroup Approved

Abstract: This best practice document provides implementation guidance for supporting so-called "multi-purpose" trays in printers.

This is a PWG Best Practice. For a definition of a "PWG Best Practice", see:

<https://ftp.pwg.org/pub/pwg/general/pwg-process30.pdf>

This best practice is available electronically at:

<https://ftp.pwg.org/pub/pwg/ipp/whitepaper/bp-ippmptray10-20180124.docx>

<https://ftp.pwg.org/pub/pwg/ipp/whitepaper/bp-ippmptray10-20180124.pdf>

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1. Introduction

Many printers provide input trays that can serve as both a manual feed source and a source for specialty media such as labels, card stock, or photo paper. Because these trays have two semantically different uses, they are typically exposed as two logical trays to allow clients to specify the desired semantics.

This document provides IPP and SNMP implementation recommendations for such multi-purpose trays to encourage consistency and interoperability.

1. Terminology
	1. Printing Terminology

Normative definitions and semantics of printing terms are imported from IETF Printer MIB v2 [RFC3805], IETF Finisher MIB [RFC3806], and IETF Internet Printing Protocol/1.1: Model and Semantics [RFC8011].

*Document*: An object created and managed by a Printer that contains the description, processing, and status information. A Document object may have attached data and is bound to a single Job.

*End User*: A person or software process that is authorized to perform basic printing functions, including finding/locating a Printer, creating a local instance of a Printer, viewing Printer status, viewing Printer capabilities, submitting a Job, viewing Job status, and altering the attributes of a Job.

*Job*: An object created and managed by a Printer that contains description, processing, and status information. The Job also contains zero or more Document objects.

*Logical Device*: a print server, software service, or gateway that processes jobs and either forwards or stores the processed job or uses one or more Physical Devices to render output.

*Logical Media Source*: a source for media sheets with a particular semantic behavior such as auto-fed sheets, manually-fed sheets, continuous roll-fed media, etc.

*Media Source*: a single Logical or Physical Media Source

*Output Device*: a single Logical or Physical Device

*Physical Device*: a hardware implementation of a endpoint device, e.g., a marking engine, a fax modem, etc.

*Physical Media Source*: a hardware implementation of a media source, e.g., an input tray, a roll, etc.

* 1. Protocol Role Terminology

This document also defines the following protocol roles to specify unambiguous conformance requirements:

*Client*: Initiator of outgoing connections and sender of outgoing operation requests (Hypertext Transfer Protocol -- HTTP/1.1 [RFC7230] User Agent).

*Printer*: Listener for incoming connections and receiver of incoming operation requests (Hypertext Transfer Protocol -- HTTP/1.1 [RFC7230] Server) that represents one or more Physical Devices or a Logical Device.

* 1. Acronyms and Organizations

*IANA*: Internet Assigned Numbers Authority, <http://www.iana.org/>

*IETF*: Internet Engineering Task Force, <http://www.ietf.org/>

*ISO*: International Organization for Standardization, <http://www.iso.org/>

*PWG*: Printer Working Group, <http://www.pwg.org/>

1. Supporting Multi-Purpose Trays

Both IPP [RFC8011] and the SNMP Printer MIB v2 [RFC3805] have long supported this functionality, however the specific implementation of multi-purpose trays has never been documented.

As the common naming suggests, multi-purpose trays have multiple logical semantics. This document uses the term Logical Media Source to refer to the semantics of a named media source and Physical Media Source to refer to the actual (physical) media source (input tray, roll, etc.) that is associated with the semantic source.

The following sub-sections describe how to report the Logical Media Sources via IPP and SNMP.

* 1. Multi-Purpose Trays in IPP

The IPP: Job and Printer Extensions - Set 3 (JPS3) [PWG5100.13] provides several attributes for Logical Media Sources:

"media-source (type2 keyword | name(MAX))": This member attribute of the "media-col" Job Template attribute specifies the Logical Media Source for the Job;

"media-source-supported (1setOf (type2 keyword | name(MAX)))": This Printer Description attribute lists the supported Logical Media Sources;

"printer-input-tray (1setOf octetString(MAX))": This Printer Status attribute lists the SNMP Printer MIB v2 prtInputTray values associated with each Logical Media Source reported in the "media-source-supported" Printer Description attribute; and

"printer-input-tray-description (1setOf text(MAX))": This Printer Status attribute lists the human-readable names of each Logical Media Source.

A "media-source" keyword value of 'manual-feed' specifies a Logical Media Source that pauses printing until the End User loads the correct media in the multi-purpose tray.

A "media-source" keyword value of 'by-pass-tray' specifies a Logical Media Source that automatically feeds the specified media from the multi-purpose tray, pausing only when the tray is empty.

IPP implementations expose support for multi-purpose trays by:

1. Listing the values 'by-pass-tray' and 'manual-feed' in the "media-source-supported" Printer Description attribute;
2. Listing a "printer-input-tray" value with "type=sheetFeedAutoRemovableTray" or "type=sheetFeedAutoNonRemovableTray" for the 'by-pass-tray' entry;
3. Listing a "printer-input-tray" value with "type=sheetFeedManual" for the 'manual-feed' entry; and
4. Listing corresponding "printer-input-tray-description" text strings for the 'by-pass-tray' ("Multi-Purpose Tray - Auto Feed") and 'manual-feed' ("Multi-Purpose Tray - Manual Feed") entries.
	1. Multi-Purpose Trays in SNMP

The SNMP Printer MIB v2 [RFC3805] provides the Input group to describe the Logical Media Sources provided by the Printer.

SNMP Printer MIB v2 implementations expose support for multi-purpose trays by:

1. Listing one PrtInputEntry whose prtInputType value is sheetFeedAutoRemovableTray(3) or sheetFeedAutoNonRemovableTray(4); and
2. Listing a second PrtInputEntry whose prtInputType value is sheetFeedManual(5).
3. References

[PWG5100.13] M. Sweet, I. McDonald, P. Zehler, "IPP: Job and Printer Extensions - Set 3", PWG 5100.13-2012, July 2012, <https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobprinterext3v10-20120727-5100.13.pdf>

[RFC3805] R. Bergman, H. Lewis, I. McDonald, "Printer MIB v2", RFC 3805, June 2004, <https://tools.ietf.org/html/rfc3805>

[RFC8011] M. Sweet, I. McDonald, "Internet Printing Protocol/1.1: Model and Semantics", RFC 8011, January 2017, <https://tools.ietf.org/html/rfc8011>

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