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The Printer Working Group (PWG) Proposed Standard Update to for the The Internet Printing Protocol (IPP): “finishings” attribute values extension



Version 0.1, 30 October 2002 ~~5 February 2001~~



IEEE

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Version 0.1, 30 October 2002

Abstract: This IPP specification extends the IPP Model and Semantics [RFC2911] by defining document specifies the additional enum values for finishing to specify which of four corners to put a single staple, which of four edges to put two staples or to edge stitch, which of four edges to bind, three types of hole punch, three types of folds, two types of signature booklet and generic values for the following: fold, trim, bale, signature booklet maker and jog-offset. 'fold', 'trim', 'bale', 'booklet maker', 'jog-offset', 'bind-left', 'bind-top', 'bind-right', and 'bind-bottom' for the IPP "finishings" Job Template attribute for use with the Internet Printing Protocol/1.0 (IPP) [RFC2566, RFC2565] and Internet Printing Protocol/1.1 (IPP) [RFC2911, RFC2910]. Extension Semantics for also include descriptions of the use of multiple values with the "finishings" Job Template Job attribute and an additional coordinate system that is relative to the document's orientation and semantics for the use of multiple values are also described. This attribute permits the client to specify additional finishing options, including values that include a specification of a coordinate system for the placement of finishing operations with respect to the corners and edges of portrait and landscape documents.

This draft is available electronically at:

[ftp://ftp.pwg.org/pwg/ipp/new VAL/pwg-ipp-finishings-v01-021030.pdf,.doc](ftp://ftp.pwg.org/pwg/ipp/new_VAL/pwg-ipp-finishings-v01-021030.pdf,.doc)

This document is an update to an IEEE-ISTO PWG Proposed standard update. For a definition of a "PWG Proposed Standard" and its transition to a "PWG Draft Standard", see: <ftp://ftp.pwg.org/pub/pwg/general/pwg-process.pdf>. After approval by the PWG (by a Last Call) to transition this Proposed Standard update to a Draft Standard, an updated IEEE-ISTO number will be assigned and this PWG Draft Standard will replace the previous version and will be available electronically at: After approval by the PWG, this document is will be available electronically at:

<ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.1.pdf,.doc,.rtf>

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1 Introduction

1.1 Problem

Need additional enum values for finishing to specify which of four corners to put a single staple, which of four edges to put two staples or to edge stitch, which of four edges to bind, three types of hole punch, three types of folds, two types of signature booklet and generic values for the following: fold, trim, bale, ~~saddle-stitch, edge-stitch~~, signature booklet maker and jog-offset. Also need semantic descriptions for the use of multiple values with the “finishings” Job Template Job attribute and an additional coordinate system that is relative to the document’s orientation.

1.2 Solution

The coordinate system scheme agrees with the Finisher MIB which in turn follows the ISO DPA approach of using a coordinate system as if the document were portrait. The approach for coordinate system being relative to the intended reading direction depends on the device being able to understand the orientation embedded in the PDL, which is too problematic for many PDLs. The approach for the coordinate system of being relative to the media feed direction is too dependent on the way the device is currently set up, i.e., pulling short edge first vs. long edge first, and can vary between different output-bins in the same device.

Additional (new) symbolic names of these enum values are:

fold	<u>punch-2-hole</u>
trim	<u>punch-3-hole</u>
bale	<u>punch-4-hole</u>
booklet-maker	<u>booklet-fold-staple</u>
jog-offset	<u>booklet-fold</u>
bind-left	<u>fold-c-short-in-thirds-sheet</u>
bind-top	<u>fold-z-short-in-thirds-sheet</u>
bind-right	<u>fold-z-short-sheet</u>
bind-bottom	

Although a coordinate system relative to the intended reading direction was deemed problematic, the ability to specify finishing operations for such a coordinate system are required; thus extension semantics include a description of an additional coordinate system that is relative to the document’s orientation, and the additional (new) symbolic names of these enum values are:

<u>'staple-top-left-rel'</u>	<u>'staple-bottom-left-rel'</u>
<u>'staple-top-right-rel'</u>	<u>'staple-bottom-right-rel'</u>
<u>'edge-stitch-left-rel'</u>	<u>'edge-stitch-top-rel'</u>
<u>'edge-stitch-right-rel'</u>	<u>'edge-stitch-bottom-rel'</u>
<u>'staple-dual-left-rel'</u>	<u>'staple-dual-top-rel'</u>
<u>'staple-dual-right-rel'</u>	<u>'staple-dual-bottom-rel'</u>

Extension semantics also include a description of the use of multiple values with the “finishings” Job Template Job attribute.

Although not a part of this specification, more specific values for saddle-stitch and fold could be considered once adequate definitions have been developed. Some examples are:

saddle-stitch-single-long	fold-in-half-short
saddle-stitch-single-short	fold-in-thirds-long
saddle-stitch-dual-long	fold-in-thirds-short
saddle-stitch-dual-short	fold-z-long
fold-in-half-long	fold-z-short

1.3 Summary of the “finishings” Job Template attribute values

This specification defines only the new enum values and the new semantic descriptions as described above in the Solution. This specification does not change any of the semantics in the original definition of the “finishings” attribute in [RFC2911] or in the previous version of this extension specification. The “finishings” Job Template attribute is summarized below, as originally defined in [RFC2911].

<u>Job Attribute</u>	<u>Printer: Default Value Attribute</u>	<u>Printer: Supported Values Attribute</u>
<u>finishings (1setOf type2 enum)</u>	<u>finishings-default (1setOf type2 enum)</u>	<u>finishings-supported (1setOf type2 enum)</u>

2 Terminology

This section defines terminology used throughout this document.

2.1 Conformance Terminology

Capitalized terms, such as **MUST**, **MUST NOT**, **REQUIRED**, **SHOULD**, **SHOULD NOT**, **MAY**, **NEED NOT**, and **OPTIONAL**, have special meaning relating to conformance as defined in RFC 2119 [RFC2119] and [RFC2911] section 12.1. If an implementation supports the extension defined in this document, then these terms apply; otherwise, they do not. These terms define conformance to *this document (and [RFC2911]) only*; they do not affect conformance to other documents, unless explicitly stated otherwise. To be more specific:

REQUIRED - an adjective used to indicate that a conforming IPP Printer implementation **MUST** support the indicated operation, object, attribute, attribute value, status code, or out-of-band value in requests and responses. See [RFC2911] “Appendix A - Terminology for a definition of “support”. *Since support of this entire Document Object specification is OPTIONAL for conformance to IPP/1.1, the use of the term REQUIRED in this document means “REQUIRED if this OPTIONAL Document Object specification is implemented”.*

RECOMMENDED - an adjective used to indicate that a conforming IPP Printer implementation is recommended to support the indicated operation, object, attribute, attribute value, status code, or out-of-band value in requests and responses. *Since support of this entire Document Object specification is OPTIONAL for conformance to IPP/1.1, the use of the term RECOMMENDED in this document means “RECOMMENDED if this OPTIONAL Document Object specification is implemented”.*

OPTIONAL - an adjective used to indicate that a conforming IPP Printer implementation **MAY**, but is **NOT REQUIRED** to, support the indicated operation, object, attribute, attribute value, status code, or out-of-band value in requests and responses.

2.2 Other Terminology

This document uses the same terminology as [RFC2911], such as “client”, “Printer”, “attribute”, “attribute value”, “keyword”, “operation”, “request”, “response”, “support”, and “Job Template attribute” with the same meaning.

No additional terms are defined for use in this document at this time.

3 Complete “finishings” Job Template attribute definition

Note: [RFC2911] defines generic enum values: 3-9 and more-specific stitching and stapling enum values: 20-31. This document defines generic enum values: 10-14, and more specific binding enum values: 50-53, more specific punch enum values: 90-92, more specific booklet maker enum values: 110-111, more specific stapling and stitching values relative to the document’s orientation: 120-131, and more specific fold enum values: 1000-1002. The entire definition of “finishings” from [RFC2911] section 4.2.6 and from the previous version of this document dated February 5, 2001, is reproduced here verbatim with the addition of the new enum values for the convenience of the reader.

4.2.6 finishings (1setOf type2 enum)

This “finishings” Job Template Job attribute identifies the finishing operations that the Printer uses for each copy of each printed document in the Job. For Jobs with multiple documents, the “multiple-document-handling” attribute determines what constitutes a “copy” for purposes of finishing.

Standard enum values are:

Value	Symbolic Name and Description
‘3’	‘none’: Perform no finishing
‘4’	‘staple’: Bind the document(s) with one or more staples. The exact number and placement of the staples is site-defined.
‘5’	‘punch’: This value indicates that holes are required in the finished document. The exact number and placement of the holes is site-defined. The punch specification MAY be satisfied (in a site- and implementation-specific manner) either by drilling/punching, or by substituting pre-drilled media.
‘6’	‘cover’: This value is specified when it is desired to select a non-printed (or pre-printed) cover for the document. This does not supplant the specification of a printed cover (on cover stock medium) by the document itself.
‘7’	‘bind’: This value indicates that a binding is to be applied to the document; the type and placement of the binding is site-defined.
‘8’	‘saddle-stitch’: Bind the document(s) with one or more staples (wire stitches) along the middle fold. The exact number and placement of the staples and the middle fold is implementation and/or site-defined.

- '9' 'edge-stitch': Bind the document(s) with one or more staples (wire stitches) along one edge. The exact number and placement of the staples is implementation and/or site-defined.
- '10' 'fold': Fold the document(s) with one or more folds. The exact number and orientations of the folds is implementation and/or site-defined.
- '11' 'trim': Trim the document(s) on one or more edges. The exact number of edges and the amount to be trimmed is implementation and/or site-defined.
- '12' 'bale': Bale the document(s). The type of baling is implementation and/or site-defined.
- '13' 'booklet-maker': Deliver the document(s) to the signature booklet maker. This value is a short cut for specifying a job that is to be folded, trimmed and then saddle-stitched. [See also 'booklet-fold-staple'\(110\) and 'booklet-fold'\(111\).](#)
- '14' 'jog-offset': Shift each copy of an output document from the previous copy by a small amount which is device dependent. This value has no effect on the "job-sheet". This value SHOULD NOT have an effect if each copy of the job consists of one sheet.
- '15'-'19' reserved for future generic finishing enum values.

The following values are more specific stapling, stitching and binding values; they indicate a corner or an edge as if the document were a portrait document (see section 4.2.6.1):

- '20' 'staple-top-left': Bind the document(s) with one or more staples in the top left corner.
- '21' 'staple-bottom-left': Bind the document(s) with one or more staples in the bottom left corner.
- '22' 'staple-top-right': Bind the document(s) with one or more staples in the top right corner.
- '23' 'staple-bottom-right': Bind the document(s) with one or more staples in the bottom right corner.
- '24' 'edge-stitch-left': Bind the document(s) with one or more staples (wire stitches) along the left edge. The exact number and placement of the staples is implementation and/or site-defined.
- '25' 'edge-stitch-top': Bind the document(s) with one or more staples (wire stitches) along the top edge. The exact number and placement of the staples is implementation and/or site-defined.
- '26' 'edge-stitch-right': Bind the document(s) with one or more staples (wire stitches) along the right edge. The exact number and placement of the staples is implementation and/or site-defined.

- '27' 'edge-stitch-bottom': Bind the document(s) with one or more staples (wire stitches) along the bottom edge. The exact number and placement of the staples is implementation and/or site-defined.
- '28' 'staple-dual-left': Bind the document(s) with two staples (wire stitches) along the left edge assuming a portrait document (see above).
- '29' 'staple-dual-top': Bind the document(s) with two staples (wire stitches) along the top edge assuming a portrait document (see above).
- '30' 'staple-dual-right': Bind the document(s) with two staples (wire stitches) along the right edge assuming a portrait document (see above).
- '31' 'staple-dual-bottom': Bind the document(s) with two staples (wire stitches) along the bottom edge assuming a portrait document (see above).
- '32'-'49' reserved for future specific stapling and stitching enum values.
- '50' 'bind-left': Bind the document(s) along the left edge; the type of the binding is site-defined.
- '51' 'bind-top': Bind the document(s) along the top edge; the type of the binding is site-defined.
- '52' 'bind-right': Bind the document(s) along the right edge; the type of the binding is site-defined.
- '53' 'bind-bottom': Bind the document(s) along the bottom edge; the type of the binding is site-defined.
- '54'-'89' reserved for future specific binding enum values and other groups of enum values, such as folding, trimming, and baling.
- '90' 'punch-2-hole': Punch two holes in the document. The exact location and size of the holes to be punched is implementation and/or site-defined. See figure 1 below.
- '91' 'punch-3-hole': Punch three holes in the document. The exact location and size of the holes to be punched is implementation and/or site-defined. See figure 2 below.
- '92' 'punch-4-hole': Punch four holes in the document. The exact location and size of the holes to be punched is implementation and/or site-defined. See figure 3 below.
- '93'-'109' reserved for future specific hole punch enum values.
- '110' 'booklet-fold-staple': Apply booklet making with fold and staples. No trimming shall be applied. The exact number and placement of the staples is implementation and/or site-defined. See figure 7 below. See also 'booklet-maker'(13) and 'booklet-fold'(111).
- '111' 'booklet-fold': Apply booklet making with only fold. No stapling or trimming shall be applied. See also 'booklet-maker'(13) and 'booklet-fold-staple'(110).

'112'-119' reserved for future specific booklet making enum values.

The following values are more specific stapling and stitching values; they indicate a corner or an edge relative to the document's orientation (see description of "Enum Values Relative to the Orientation" below):

'120' 'staple-top-left-rel': Bind the document(s) with one or more staples in the top left corner relative to the orientation.

'121' 'staple-bottom-left-rel': Bind the document(s) with one or more staples in the bottom left corner relative to the orientation.

'122' 'staple-top-right-rel': Bind the document(s) with one or more staples in the top right corner relative to the orientation.

'123' 'staple-bottom-right-rel': Bind the document(s) with one or more staples in the bottom right corner relative to the orientation.

'124' 'edge-stitch-left-rel': Bind the document(s) with one or more staples (wire stitches) along the left edge relative to the orientation. The exact number and placement of the staples is implementation and/or site-defined.

'125' 'edge-stitch-top-rel': Bind the document(s) with one or more staples (wire stitches) along the top edge relative to the orientation. The exact number and placement of the staples is implementation and/or site-defined.

'126' 'edge-stitch-right-rel': Bind the document(s) with one or more staples (wire stitches) along the right edge relative to the orientation. The exact number and placement of the staples is implementation and/or site-defined.

'127' 'edge-stitch-bottom-rel': Bind the document(s) with one or more staples (wire stitches) along the bottom edge relative to the orientation. The exact number and placement of the staples is implementation and/or site-defined.

'128' 'staple-dual-left-rel': Bind the document(s) with two staples (wire stitches) along the left edge relative to the orientation.

'129' 'staple-dual-top-rel': Bind the document(s) with two staples (wire stitches) along the top edge relative to the orientation.

'130' 'staple-dual-right-rel': Bind the document(s) with two staples (wire stitches) along the right edge relative to the orientation.

'131' 'staple-dual-bottom-rel': Bind the document(s) with two staples (wire stitches) along the bottom edge relative to the orientation.

'132'-149' reserved for future specific (relative) stapling and stitching enum values that indicate a corner or an edge relative to the document's orientation.

The following values are more specific binding values; they indicate an edge relative to the document's orientation (see description of "Enum Values Relative to the Orientation" below):

'150' 'bind-left-rel': Bind the document(s) along the left edge relative to the orientation; the type of the binding is site-defined.

'151' 'bind-top-rel': Bind the document(s) along the top edge relative to the orientation; the type of the binding is site-defined.

'152' 'bind-right-rel': Bind the document(s) along the right edge relative to the orientation; the type of the binding is site-defined.

'153' 'bind-bottom-rel': Bind the document(s) along the bottom edge relative to the orientation; the type of the binding is site-defined.

'154'-'219' reserved for future specific (relative) binding enum values that indicate a corner or an edge relative to the document's orientation.

'220'-'999' reserved for future specific enum values of other groups, such as stapling, stitching, binding, folding, punching, trimming, and baling for the document as a whole.

The following values are more specific fold values; they indicate a fold to be performed separately on each sheet of each copy of each printed document in the Job, as opposed to each copy of each printed document:

'1000' 'fold-c-short-in-thirds-sheet': Apply C Tri-Fold to each individual sheet of the document, consisting of two folds per sheet (toward each other, i.e. the 'C' name) across the short dimension of each sheet that are equally-spaced along the long dimension of the sheet. See figure 4 below.

'1001' 'fold-z-short-in-thirds-sheet': Apply Z Tri-Fold to each individual sheet of the document, consisting of two folds (away from each other - 'Z' name) across the short dimension of each sheet that are equally-spaced along the long dimension of the sheet. See figure 5 below.

'1002' 'fold-z-short-sheet': Apply Large Z Fold to each individual sheet of the document, consisting of two folds (away from each other - 'Z' name) across the short dimension of each sheet that are not equally-spaced along the long dimension of the sheet. The exact location of the folds is implementation and/or site-defined. See figure 6 below.

'1003'-MAX reserved for future specific enum values for sheet fold and other groups of enum values that apply to each sheet of each copy of each printed document in the Job.

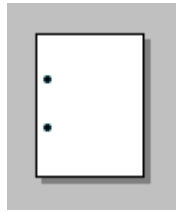


Figure 1 - punch-2-hole

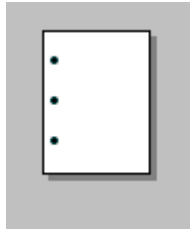


Figure 2 - punch-3-hole

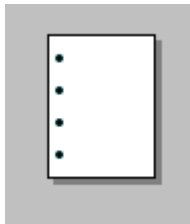


Figure 3 - punch-4-hole

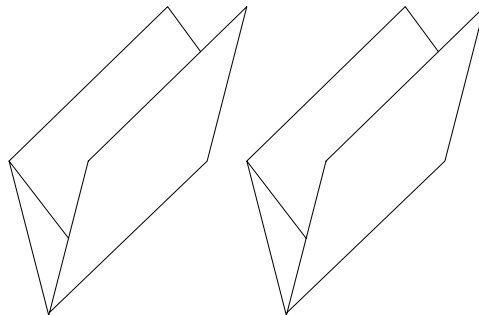


Figure 4 - fold-c-short-in-thirds-sheet

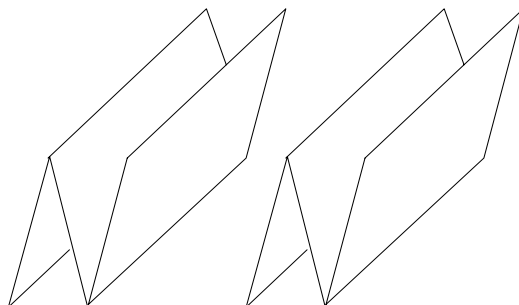


Figure 5 - fold-z-short-in-thirds-sheet

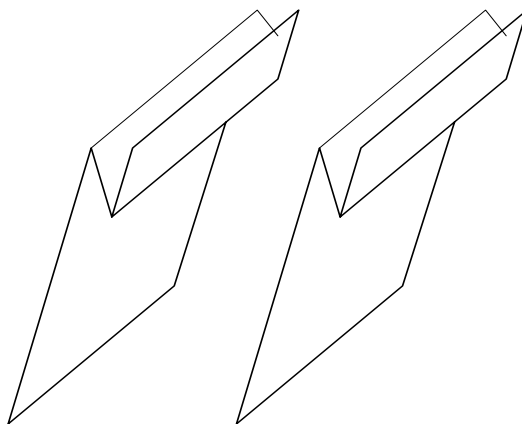


Figure 6 - fold-z-short-sheet

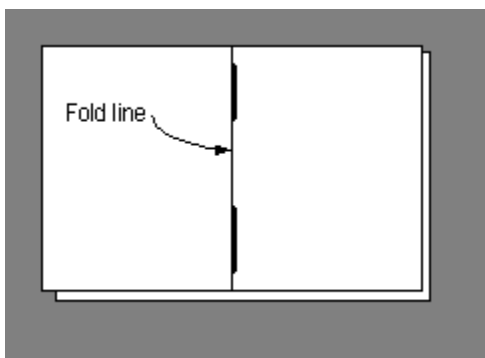


Figure 7 - booklet-fold-staple

Note: The effect of this attribute on jobs with multiple documents is controlled by the “multiple-document-handling” job attribute (section 4.2.4) and the relationship of this attribute and the other attributes that control document processing is described in section 15.3.

If the client supplies a value of 'none' along with any other combination of values, it is the same as if only that other combination of values had been supplied (that is the 'none' value has no effect).

Coordinate system for enum values

The '~~staple-xxx~~' values, for which the symbolic name contains "top", "bottom", "left" and "right", are specified with respect to the document as if the document were a portrait document. If the document is actually a landscape or a reverse-landscape document, the client supplies the appropriate transformed value. This applies to values such as 'staple-xxx', 'edge-stitch-xxx' and 'bind-xxx'. -For example, to position a staple in the upper left hand corner of a landscape document when held for reading, the client supplies the 'staple-bottom-left' value (since landscape is defined as a +90 degree rotation of the image with respect to the media from portrait, i.e., anti-clockwise). On the other hand, to position a staple in the upper left hand corner of a reverse-landscape document when held for reading, the client supplies the 'staple-top-right' value (since reverse-landscape is defined as a -90 degree rotation of the image with respect to the media from portrait, i.e., clockwise).

The angle (vertical, horizontal, angled) of each staple with respect to the document depends on the implementation which may in turn depend on the value of the attribute.

Enum values relative to the orientation

For each finishing style that refers to the coordinate system, there is a value specified for finishing relative to the orientation and a value specified for finishing as absolute to a portrait orientation. These new relative values end with the '-rel' suffix and are applied relative to the orientation of the resulting print-stream pages. Although the client may supply the "orientation-requested" attribute when the orientation is known, the '-rel' value is useful when the orientation is not known to the client and when the orientation is intrinsic to the document data or supplied through a mechanism other than the client-supplied attributes.

These additional relative values are defined for the "finishings" attribute. These new values with the '-rel' suffix are applied relative to the value of "orientation-requested". The enumeration value associated with the '-rel' keyword value is incremented by 100 from the previous defined absolute keyword's enumeration value.

Multiple enum values in request

Multiple values for this attribute apply to the entire job, the document, the exception page(s) or subset. Multiple values for this attribute assume no order of processing based on the order of value specification. Should such order be required, new enum values will be defined that specify the required order.

Multiple values of the same type of supported enum value SHOULD NOT be combined, e.g., multiple 'staple-xxx' values, or multiple 'edge-xxx' values, or multiple 'bind-xxx' values, since each of these are considered the same type of keyword. Different types may be combined, e.g. a 'staple-xxx' value and a 'bind-xxx' value, but it may not be known before the Job Creation operation what the legal combinations are. Regardless, the Printer will indicate illegal combinations by returning those values as unsupported in the Unsupported Attributes group (see [RFC2911]).

The only currently supported combinations of multiple values involve 'jog-offset', i.e. 'jog-offset' may be combined with any other "finishings" value.

4 Conformance Requirements

The Printer and client conformance requirements for supporting this attribute are the same as for any Job Template attribute values (see [RFC2911]).

5 Normative References

[RFC2910]

Herriot, R., Butler, S., Moore, P., Turner, R., and J. Wenn, "Internet Printing Protocol/1.1: Encoding and Transport", RFC 2910, September 2000.

[RFC2911]

Hastings, T., Herriot, R., deBry, R., Isaacson, S., and P. Powell, "Internet Printing Protocol/1.1: Model and Semantics", RFC 2911, September 2000.

6 Informative References

[ipp-iig]

Hastings, T., Manros, C., "Internet Printing Protocol/1.1: <draft-ietf-ipp-implementers-guide-v11-02.txt>, work in progress, January 25, 2001.

[RFC2565]

Herriot, R., Butler, S., Moore, P., Turner, R., "Internet Printing Protocol/1.0: Encoding and Transport", RFC 2565, April 1999.

[RFC2566]

R. deBry, T. Hastings, R. Herriot, S. Isaacson, P. Powell, "Internet Printing Protocol/1.0: Model and Semantics", RFC 2566, April 1999.

[RFC2567]

Wright, D., "Design Goals for an Internet Printing Protocol", RFC 2567, April 1999.

[RFC2568]

Zilles, S., "Rationale for the Structure and Model and Protocol for the Internet Printing Protocol", RFC 2568, April 1999.

[RFC2639]

Hastings, T., Manros, C., "Internet Printing Protocol/1.0: Implementer's Guide", RFC 2639, July 1999.

7 IANA Considerations

7.1 Enum Attribute Value Registrations

The following table lists all the The “finishings” enum attribute values defined in this document. These are to be registered will be published by IANA according to the procedures in RFC 2911 [RFC2911] section 6.1 in the following file:

Attribute

Value	Name:	Reference:	Section:
finishings (1setOf type2 enum):			
10	fold	5100.1	3
11	trim	5100.1	3
12	bale	5100.1	3
13	booklet-maker	5100.1	3
14	job-offset	5100.1	3
50	bind-left	5100.1	3
51	bind-top	5100.1	3
52	bind-right	5100.1	3
53	bind-bottom	5100.1	3
90	punch-2-hole	5100.1	3
91	punch-3-hole	5100.1	3
92	punch-4-hole	5100.1	3
110	booklet-fold-staple	5100.1	3
111	booklet-fold	5100.1	3
120	staple-top-left-rel	5100.1	3
121	staple-bottom-left-rel	5100.1	3
122	staple-top-right-rel	5100.1	3
123	staple-bottom-right-rel	5100.1	3
124	edge-stitch-left-rel	5100.1	3
125	edge-stitch-top-rel	5100.1	3
126	edge-stitch-right-rel	5100.1	3
127	edge-stitch-bottom-rel	5100.1	3
128	staple-dual-left-rel	5100.1	3
129	staple-dual-top-rel	5100.1	3
130	staple-dual-right-rel	5100.1	3
131	staple-dual-bottom-rel	5100.1	3
1000	fold-c-short-in-thirds-sheet	5100.1	3
1001	fold-z-short-in-thirds-sheet	5100.1	3
1002	fold-z-short-sheet	5100.1	3

8 Internationalization Considerations

The IPP extensions defined in this document require the same internationalization considerations as any of the Job Template attributes defined in IPP/1.1 [RFC2911]. Normally, a client will provide localization of the enum values of this attribute to the language of the user.

9 Security Considerations

This extension poses no additional security threats or burdens than those in IPP/1.0 [RFC2566, RFC2565] and IPP/1.1 [RFC2911, RFC2910]. However, implementations MAY support different access control to various finishing features, depending on the identity of the job submitting user.

10 Acknowledgments

Other Participants were as follows:

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Appendix A Description of Base IPP documents (Informative)

The base set of IPP documents includes:

Design Goals for an Internet Printing Protocol [RFC2567]
Rationale for the Structure and Model and Protocol for the Internet Printing Protocol [RFC2568]
Internet Printing Protocol/1.1: Model and Semantics [RFC2911]
Internet Printing Protocol/1.1: Encoding and Transport [RFC2910]
Internet Printing Protocol/1.1: Implementer's Guide [[RFC3196]]
Mapping between LPD and IPP Protocols [RFC2569]

The "Design Goals for an Internet Printing Protocol" document takes a broad look at distributed printing functionality, and it enumerates real-life scenarios that help to clarify the features that need to be included in a printing protocol for the Internet. It identifies requirements for three types of users: end users, operators, and administrators. It calls out a subset of end user requirements that are satisfied in IPP/1.0. A few OPTIONAL operator operations have been added to IPP/1.1.

The "Rationale for the Structure and Model and Protocol for the Internet Printing Protocol" document describes IPP from a high level view, defines a roadmap for the various documents that form the suite of IPP specification documents, and gives background and rationale for the IETF working group's major decisions.

The "Internet Printing Protocol/1.1: Model and Semantics" document describes a simplified model with abstract objects, their attributes, and their operations that are independent of encoding and transport. It introduces a Printer and a Job object. The Job object optionally supports multiple documents per Job. It also addresses security, internationalization, and directory issues.

The "Internet Printing Protocol/1.1: Encoding and Transport" document is a formal mapping of the abstract operations and attributes defined in the model document onto HTTP/1.1 [RFC2616]. It defines the encoding rules for a new Internet MIME media type called "application/ipp". This document also defines the rules for transporting over HTTP a message body whose Content-Type is "application/ipp". This document defines the 'ipp' scheme for identifying IPP printers and jobs.

The "Internet Printing Protocol/1.1: Implementer's Guide" document gives insight and advice to implementers of IPP clients and IPP objects. It is intended to help them understand IPP/1.1 and some of the considerations that may assist them in the design of their client and/or IPP object implementations. For example, a typical order of processing requests is given, including error checking. Motivation for some of the specification decisions is also included.

The "Mapping between LPD and IPP Protocols" document gives some advice to implementers of gateways between IPP and LPD (Line Printer Daemon) implementations.

Appendix B Changes to create Updated 5100.1 (Informative)

The following changes have been made to IEEE-ISTO 5100.1-2001, February 5, 2001 to make the updated IEEE-ISTO 5100.1-2002:

1. Added the following generic enum values: 'fold', 'trim', 'bale', 'booklet-maker', 'jog-offset'.

2. Added the following more specific enum values: 'bind-left', 'bind-top', 'bind-right', 'bind-bottom', 'punch-2-hole', 'punch-3-hole', 'punch-4-hole', 'booklet-fold-staple', 'booklet-fold', 'fold-c-short-in-thirds-sheet', 'fold-z-short-in-thirds-sheet', 'fold-z-short-sheet'.
3. Added a semantic description for the use of multiple values with the "finishings" Job Template Job attribute.
4. Added a semantic description for an additional coordinate system that is relative to the document's orientation, and added the following enum values that used this new coordinate system: 'staple-top-left-rel', 'staple-bottom-left-rel', 'staple-top-right-rel', 'staple-bottom-right-rel', 'edge-stitch-left-rel', 'edge-stitch-top-rel', 'edge-stitch-right-rel', 'edge-stitch-bottom-rel', 'staple-dual-left-rel', 'staple-dual-top-rel', 'staple-dual-right-rel' and 'staple-dual-bottom-rel'.
5. Corrected the IANA Registrations.

Appendix C Change Log (Informative)

The following changes have been made to versions of this document, in reverse chronological order:

C.1 Changes to make version 0.1, October 30, 2002

Initial version.