

Mapping of IPP Attributes to JDF and CUPS

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Abstract

This document maps IPP/1.1 Job Creation attributes and extensions to JDF/1.1 Product Intent, JDF/1.1 Digital Printing combined process, JDF/1.0 IDPrinting combined process, and the Common Unix Printing System (CUPS). A percentage of IPP covered by each of these other printing semantics is included. Finally, each IPP attribute is also described briefly with references to the detailed descriptions.

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1 Mapping of IPP attributes to JDF and CUPS

Table 1 lists all of the IPP Job attributes that a client can supply or a Printer can return in Job Creation operations. The following explains the columns in Table 1:

Column heading	Totals	% of IPP ¹	Description
IPP Attribute	195 ² 420 = 15684 + 3936 (S)	100	The name of the IPP attribute <u>or collection member attribute</u> . “(S)” indicates an IPP attribute that represents State that is Set by the System, such as the “job-state” and “number-of-intervening-jobs” attributes, and cannot be supplied by the client in a Job Creation request.
IPP Spec	119	-	The IPP specification in which the semantics are defined. See the references section at the end of this document.
JDF/1.1 Product Intent	3029	1535%	The JDF/1.1 Product Intent Resource and <u>JDF</u> attribute using XPath notation. A blank indicates that there is no corresponding JDF/1.1 Product Intent attribute.
OSDP JDF Spec	6949	3858%	Whether or not the feature is in the “Open Source Digital Printing Job Ticket spec from Claudia Alimpich, version 1.2 [OSDP] and if it is what the feature is.
CUPS	11394 = 9068 + 2326 (S)	5884%	The version of the Common Unix Printing System (CUPS) in which the IPP attribute is supported. See “(S)” explained above.
JDF/1.0 APP F	8955	4665%	Whether or not the Appendix mapped the IPP attribute to JDF/1.0 IDPrinting combined process node

¹ The % of IPP is the percent of the 84-195 IPP attributes, including collection member attributes, that can be supplied in a Job Creation operation request.

² The total of IPP attributes includes counting the member attributes of the collection attributes.

Table 1- IPP Attribute Mapping Table

IPP Attribute	IPP Spec	JDF/1.1 Product Intent	OSDP JDF Spec	CUPS	JDF/1.0 App F
attributes-charset	RFC 2911		No	1.1	No
attributes-natural-language	RFC 2911	NodeInfo/ @NaturalLang	No	1.1	Yes
compression	RFC 2911		No	1.1	Yes
copies	RFC 2911		Yes Number of Copies	1.1	Yes
cover-back media media-col cover-type	IEEE-ISTO 5100.3		Yes Covers	1.2	Yes
cover-front media media-col cover-type	IEEE-ISTO 5100.3		Yes Covers	1.2	Yes
current-page-order (S)	IEEE-ISTO 5100.3		No	1.2	No
date-time-at-completed (S)	RFC 2911		No	1.1	No
date-time-at-creation (S)	RFC 2911		Yes Job Creation Date/Time	1.1	No
date-time-at-processing (S)	RFC 2911		No	1.1	No
document-format	RFC 2911		Yes? Document File Format	1.1	Yes
document-name	RFC 2911		No	1.1	Yes
document-natural-language	RFC 2911		No	1.1	Yes
<u>document-number (S)</u>	<u>doc-obj</u>				
document-overrides input-documents document-copies document-format document-name compression document-natural- language page-ranges finishings sides media media-col ? <u><any other document attr.></u> or output-documents document-copies finishings sides media media-col ? <u><any other document attr.></u>	IEEE-ISTO 5100.4		Yes No No Yes No No Yes No Yes Yes <u>Yes</u> <u>Yes??</u>	No ??	Yes Yes Yes Yes No Yes Yes Yes Yes Yes Yes Yes Yes
<u>document-state (S)</u>	<u>doc-obj</u>				
<u>document-state-message (S)</u>	<u>doc-obj</u>				
<u>document-state-reasons (S)</u>	<u>doc-obj</u>				
document-uri	RFC 2911		Yes Document File Name	1.1	Yes

IPP Attribute	IPP Spec	JDF/1.1 Product Intent	OSDP JDF Spec	CUPS	JDF/1.0 App F
media-col job-accounting-output-bin					No
job-accounting-user-id	IEEE-ISTO 5100.3	CustomerInfo/ @CustomerID	No	1.2	Yes
job-collation-type (S) ³	IPP: Job Progress Attributes		No	No	No
job-detailed-status-messages (S)	RFC 2911		No	1.1	No
job-document-access-errors (S)	RFC 2911		No	1.1	No
job-error-sheet job-error-sheet-type job-error-sheet-when media media-col	IEEE-ISTO 5100.3		No	1.2	Yes
job-hold-until	RFC 2911	NodeInfo/ @FirstStart, and NodeInfo/ @LastStart	Yes, for indefinite No, otherwise Hold Job	1.1	Yes
<u>job-hold-until-time</u>	<u>prod-print2</u>			<u>1.2</u>	
job-id (S)	RFC 2911		Yes Job ID	1.1	No
job-impressions	RFC 2911		No	1.1	No
job-impressions-completed (S)	RFC 2911		No	No	No
job-k-octets	RFC 2911		No	1.1	No
job-k-octets-processed (S)	RFC 2911		No	1.1	No
<u>job-mandatory-attributes</u>	<u>section 2</u>	<u>JDFResource:SettingsPolicy</u>	<u>??</u>	<u>No</u>	<u>No</u>
job-media-sheets	RFC 2911	Yes? LayoutIntent/ @Pages	No	1.1	No
job-media-sheets-completed (S)	RFC 2911		No	1.1	No
job-message-from-operator (S)	RFC 2911		No	1.1	No
job-message-to-operator	IEEE-ISTO 5100.3		No	1.2	Yes
job-more-info (S)	RFC 2911		No	1.1	No
job-name	RFC 2911	<any JDF node>/ CustomerInfo/ @CustomerJobName	Yes Job Name	1.1	Yes
job-originating-user-name (S)	RFC 2911		Yes Job Created By	1.1	No
<u>job-password</u>	<u>prod-print2</u>				
<u>job-password-encryption</u>	<u>prod-print2</u>				
<u>job-phone-number</u>	<u>prod-print2</u>				
<u>job-printer-make-and-model (S)</u>	<u>prod-print2</u>		<u>No</u>	<u>1.1?</u>	<u>No</u>
<u>job-printer-up-time (S)</u>	<u>RFC 2911</u>		<u>No</u>	<u>1.1?</u>	<u>No</u>
job-printer-uri (S)	RFC 2911		No	1.1	No
job-priority	RFC 2911	NodeInfo/ @JobPriority	Yes Job Priority	1.1	Yes
job-recipient-name	<u>prod-print2</u> <u>See Note 1 below</u>		No	??	Yes

³ The IPP "job-collation-type" Job Description attribute has values of 'none', which the Printer sets from the two Job Template attributes: "multiple-document-handling" and "sheet-collate". For the FSG Job Ticket API, the "job-collation-type" should be both the input and the Description attribute, possibly with some additional values.

IPP Attribute	IPP Spec	JDF/1.1 Product Intent	OSDP JDF Spec	CUPS	JDF/1.0 App F
<u>job-save-disposition</u> <u>save-disposition-type</u> (none, <u>save-only, print-save</u>) <u>save-info</u> <u>save-location</u> <u>save-name</u> <u>save-document-format</u>	<u>prod-print2</u>				
job-sheets	RFC 2911		Yes Start, Separator/Slip, End Sheets	1.1	Yes
job-sheets-col job-sheets media media-col	IEEE-ISTO 5100.3		Yes Start, Separator/Slip, End Sheets	1.2	Yes
job-sheet-message	IEEE-ISTO 5100.3		No	1.2	Yes
job-state (S)	RFC 2911		No	1.1	No
job-state-message (S)	RFC 2911		No	1.1	No
job-state-reasons (S)	RFC 2911		No	1.1	No
job-uri (S)	RFC 2911		No	1.1	No
job-warnings-count (S)	IEEE-ISTO 5100.4		No	No	No
<u>last-document</u>	<u>RFC 2911</u>				
media	RFC 2911	MediaIntent/ @ID	Yes Media	1.1	No
media-col	IEEE-ISTO 5100.3		Media	1.2	Yes
media-back-coating	<u>IEEE-ISTO</u> <u>5100.3</u>	MediaIntent/ @BackCoatings	Yes		
media-color	<u>IEEE-ISTO</u> <u>5100.3</u>	MediaIntent/ @MediaColor	Yes		
media-front-coating	<u>IEEE-ISTO</u> <u>5100.3</u>	MediaIntent/ @FrontCoatings	Yes		
<u>media-grain</u>	<u>prod-print2</u>				
media-hole-count	<u>IEEE-ISTO</u> <u>5100.3</u>	[MediaIntent/ @HoleCount - - Deprecated!]	Yes		
media-info	<u>IEEE-ISTO</u> <u>5100.3</u>	MediaIntent/ @DescriptiveName (?)	No		
media-key	<u>IEEE-ISTO</u> <u>5100.3</u>	MediaIntent/ @ID	Yes		
<u>media-material</u>	<u>prod-print2</u>				
media-order-count	<u>IEEE-ISTO</u> <u>5100.3</u>	MediaIntent/ @MediaSetCount	Yes		
media-pre-printed	<u>IEEE-ISTO</u> <u>5100.3</u>	MediaIntent/ @Preprinted	Yes		
media-recycled	<u>IEEE-ISTO</u> <u>5100.3</u>	MediaIntent/ @Recycled	Yes		
media-size	<u>IEEE-ISTO</u> <u>5100.3</u>	MediaIntent/ @Dimensions	Yes		
x-dimension	<u>IEEE-ISTO</u> <u>5100.3</u>				
y-dimension	<u>IEEE-ISTO</u> <u>5100.3</u>				
<u>media-tooth</u>	<u>prod-print2</u>				
<u>media-thickness</u>	<u>prod-print2</u>				
media-type	<u>IEEE-ISTO</u> <u>5100.3</u>	MediaIntent/ @UserMediaType, @MediaType ??, @MediaUnit ??, or @StockType??	Yes		

IPP Attribute	IPP Spec	JDF/1.1 Product Intent	OSDP JDF Spec	CUPS	JDF/1.0 App F
media-weight-metric	IEEE-ISTO 5100.3	MediaIntent/ @Weight	Yes		
media-input-tray-check	IEEE-ISTO 5100.3		No	1.2	No
multiple-document-handling	RFC 2911		Yes	1.1	Yes
number-of-documents (S)	RFC 2911		No	1.1	No
number-of-intervening-jobs (S)	RFC 2911		No	1.1	No
number-up	RFC 2911	LayoutIntent/ @NumberUp	Yes Number Up	1.1	Yes
notify-xxx attributes: notify-recipient-uri notify-pull-method notify-events notify-attributes notify-user-data notify-charset notify-natural-language notify-time-interval notify-lease-duration notify-subscription-id (S) notify-sequence-number (S) notify-lease-expiration-time (S) notify-printer-up-time (S) notify-printer-uri (S) notify-job-id (S) notify-subscriber-name (S)	IPP Event Notifications and Subscriptions		Notification Yes No Yes No Yes? No Yes No No No No No No No No No	No	No
operation-id	RFC 2911		No	1.1	No
orientation-requested	RFC 2911	[LayoutIntent/ @FinishedPageOrientation -- Deprecated]	Yes Rotate Page	1.1	Yes
output-bin	IEEE-ISTO 5100.2		Yes Output Bin Name	No	Yes
output-device-assigned (S)	RFC 2911		No	1.1	No
page-delivery	IEEE-ISTO 5100.3		Yes Page Delivery	1.2	Yes
page-order-received	IEEE-ISTO 5100.3		No	1.2	Yes
page-overrides input-documents document-copies pages sides media <any other document attr.> or output-documents document-copies pages sides media <any other document attr.>	IEEE-ISTO 5100.4		No	4.6.1.4 No ??	Yes
page-ranges	RFC 2911		Yes Range of Pages	1.1	Yes

IPP Attribute	IPP Spec	JDF/1.1 Product Intent	OSDP JDF Spec	CUPS	JDF/1.0 App F
pages-per-subset	IEEE-ISTO 5100.4		No	No	Yes
pdl-init-file __pdl-init-file-location __pdl-init-file-name __pdl-init-file-entry	prod-print2				
presentation-direction	RFC 2911		No	No	Yes
presentation-direction-number-up	IEEE-ISTO 5100.3		No	1.2	No ⁴
printer-resolution	RFC 2911		No	1.1	Yes
proof-print __proof-print-copies __media __media-col	prod-print2				
printer-uri	RFC 2911	<any JDF node>/ NodeInfo/ @Route	No	1.1	No
print-quality	RFC 2911		No	1.1	Yes
request-id	RFC 2910		No	No	No
requesting-user-name	RFC 2911		Yes Job Created By	1.1	Yes
separator-sheets separator-sheets-type media media-col	IEEE-ISTO 5100.3		Yes Start, Separator/Slip, End Sheets	1.2	Yes
sheet-collate	IPP: Job Progress Attributes		Yes Collate	No	Yes
sheet-completed-copy-number (S)	IPP: Job Progress Attributes		No	No	No
sheet-completed-document-number (S)	IPP: Job Progress Attributes		No	No	No
sides	RFC 2911	LayoutIntent/ @Sides (Note: Differences in coordinate systems between JDF and IPP come into play for the two-sided values.)	Yes Duplex/Simplex	1.1	Yes
time-at-completed (S)	RFC 2911		No	1.1	No
time-at-creation (S)	RFC 2911		No	1.1	No
time-at-processing (S)	RFC 2911		No	1.1	No
version-number	RFC 2910	NodeInfo/ @IPPVersion	No	1.1	Yes
x-image-position	IEEE-ISTO 5100.3		No	1.2	Yes
x-image-shift	IEEE-ISTO 5100.3		No	1.2	Yes
x-side1-image-shift	IEEE-ISTO 5100.3		Yes Image Shift Front X Offset	1.2	Yes
x-side2-image-shift	IEEE-ISTO 5100.3		Yes Image Shift Back X Offset	1.2	Yes
y-image-position	IEEE-ISTO 5100.3		No	1.2	Yes

⁴ The JDF/1.0 Appendix F incorrectly refers to "presentation-direction" which was renamed to "presentation-direction-number-up" in IEEE-ISTO 5100.3.

IPP Attribute	IPP Spec	JDF/1.1 Product Intent	OSDP JDF Spec	CUPS	JDF/1.0 App F
y-image-shift	IEEE-ISTO 5100.3		No	1.2	Yes
y-side1-image-shift	IEEE-ISTO 5100.3		Yes Image Shift Front Y Offset	1.2	Yes
y-side2-image-shift	IEEE-ISTO 5100.3		Yes Image Shift Back Y Offset	1.2	Yes

Notes:

These attributes could not be found in any of the IPP documents, but they are referred to in the JDF 1.0 Spec Appendix F. They are included in a new “Production Printing Attributes Set 2” specification being developed by the PWG IPP WG. See ftp://ftp.pwg.org/pub/pwg/ipp/new_PPE/pwg-ipp-prod-print-set2-draft-v0_1-020821.pdf.

2 Brief Description of IPP attributes that clients can supply

This section lists the IPP attributes from [Table 1](#) that clients can supply in Job Creation and Document Creation operations and gives a *brief* description. See [section 3](#) for the brief descriptions of the attributes that only Printers can generate (labeled with (S) in [Table 1](#)).

WARNING: Do not attempt to implement from these brief descriptions. You MUST refer to each cited reference.

Legend:

JD - Job Description attribute - initial value supplied by the client (in a Operation attribute of a Job Creation operation).

JT - Job Template⁵ attribute - supplied by the client in a Job Creation operation.

DD - Document Description attribute (see [doc-obj]) - initial value supplied by the client (in a Operation attribute of a Document Creation operation).

DT - Document Template attribute - supplied by the client in a Document Creation operation.

PO - Page Override - this attribute MAY also be supplied in a “page-overrides” attribute to affect ranges of pages.

Here are the IPP Attributes that clients can supply in Job Creation and Document Creation operations and their *brief* descriptions:

compression (type2 keyword) [JD, DD] Compression algorithm used on the Document Data for this Job/Document, if any. (Keywords: none, deflate, gzip, compress) [RFC2911] §4.4.32

copies (integer(1:MAX)) [JT⁶, DT] The number of copies of the Output Document(s) to be printed. [RFC2911] §4.2.5

⁵ In IPP, there are many attributes that are labeled as both Job Template (JT) and the new Document Template (DT). However, in the PWG Semantic Model [pwg-sm], an attribute is labeled either a Job Processing attribute or a Document Processing attribute, but is never labeled as both. Therefore, IPP attributes with just JT map to PWG Job Processing attributes and IPP attributes with either just DT or both JT and DT map to PWG Document Processing attributes.

⁶ The IPP “copies” attribute is an *extensive* attribute, so its effect when supplied at the job level is not always inherited by the documents in a multi-document job. Instead, its effect depends on the value of the “multiple-document-handling” Job Template attribute. The ‘single-document’ and ‘single-document-new-sheet’ values produce copies of the job as a whole with the multiple input documents concatenated into a single output document for each job copy. The ‘separate-document-uncollated-copies’ value produce N copies of the first input document followed by N copies of the second input document, etc. The ‘separate-document-collated-copies’ produce N successive job copies, each job copy consisting of 1 copy of the first document followed by 1 copy of the second document, etc. In the PWG Semantic Model [pwg-sm] there are two separate attributes: JobCopies and Copies which affect the job as a whole and individual documents, respectively, so that the MultipleDocumentHandling is no longer needed.

cover-back (collection) [JT⁷, DT] The back cover to apply to the Output Document. [prod-print] §3.1

cover-type (type2 keyword) Indicates if covers are requested and which sides will contain print stream pages. (Keywords: no-cover, print-none, print-front, print-back, print-both) [prod-print] §3.1.2

media (type3 keyword | name(MAX)) / media-col (collection) Either the name or the characteristics of the media to use for the cover [prod-print] §3.1.1

cover-front (collection) [JT, DT] The front cover to apply to the Output Document. [prod-print] §3.1

cover-type (type2 keyword) Indicates if covers are requested and which sides will contain print stream pages. (Keywords: no-cover, print-none, print-front, print-back, print-both) [prod-print] §3.1.2

media (type3 keyword | name(MAX)) / media-col (collection) Either the name or the characteristics of the media to use for the cover [prod-print] §3.1.1

document-format (mimeMediaType) [JD, DD] The Document format (i.e., PDL) for this Document. The value “application/octet-stream” has a special meaning. This value is used to indicate that a Printer is capable of auto-sensing the format of the Document. (examples: application/octet-stream, application/postscript, application/vnd.hp-PCL, “text/plain; charset=utf-8”) [RFC2911] §3.2.1.1

document-name (name(MAX)) [JD, DD] Name for the this Document to be used in an implementation specific manner. [RFC2911] §3.2.1.1

document-natural language (naturalLanguage) [JD, DD] Identifies the Natural Language of this Document [RFC2911] §3.2.1.1

document-overrides (collection) [JT] Provides for the overriding of processing instructions on a document basis. Applied to job, see PageOverrides for overrides supplied at the document level. [override] §5.1

input-documents (1setOf rangeOfInteger(MAX)) Specifies which range of Input Documents to apply document override processing. [override] §5.1.1

output-documents (1setOf rangeOfInteger(MAX)) Specifies which range of Output Documents to apply document override processing. [override] §5.1.2

document-copies (1setOf rangeOfInteger(MAX)) Specifies which Output Document copies to apply document override processing. [override] §5.1.3

document-format (mimeMediaType) Specifies the document format for the Input Document override processing. [override] §5.1.4

document-name (name (MAX)) Specifies the document name for the Input Document override processing.. [override] §5.1.5

compression (type3 keyword) Specifies the compression for the Input Document override processing. [override] §5.1.6

document-natural-language (naturalLanguage) Specifies the natural language for the Input Document override processing [override] §5.1.7

page-ranges (1setOf rangeOfInteger (1:MAX)) Specifies the range of pages to be printed in the Document sets. [override] §5.1.8

any other Job Template attributes that affect documents, such as “media” or “media-col”()

document-uri (uri) [DD] Specifies the URI reference to the document data to be printed. The Printer fetches the data subsequent to the Document Creation operation (print-by-reference). [RFC2911] §3.2.2

feed-orientation (type3 keyword) [JT, DT] Specifies the media edge which is fed into the print engine from the paper tray. (Keywords: long-edge-first, short-edge-first). [prod-print2] §5.1

finishings (1setOf type2 enum) [JT⁸, DT, PO] Identifies the finishings that the Printer uses for each copy of the Output Document. (Enums: none, staple, punch, cover, bind, saddle-stitch, edge-stitch, staple-top-left, staple-bottom-left, staple-top-right, staple-bottom-right, edge-stitch-left, edge-stitch-top, edge-stitch-right, edge-stitch-bottom, staple-dual-left, staple-dual-top, staple-dual-right, staple-dual-bottom; fold, trim, bale, booklet-maker, jog-offset, bind-left, bind-top, bind-right, bind-bottom) [RFC2911] §4.2.6, [finish] §2

⁷ The “cover-back” and “cover-front” Job Template attributes are affected by the value of “multiple-document-handling” which controls whether a multi-document job is producing a single Output Document or separate Output Documents.

⁸ The IPP “finishings” and “finishings-col” attributes are *extensive* attributes, so their effect when supplied at the job level is not always inherited by the documents in a multi-document job. Instead, their effect depends on the value of the “multiple-

finishings-col (collection) [JT, DT, PO] Enables an end user to specify detailed finishing options not possible with the “finishings” attribute for the Output Document. [prod-print] §3.2

finishing-template (name(MAX)) A string specifying some particular finishing operation for the Output Document. [prod-print] §3.2.1

stitching (collection) Provides detailed stitching parameters. [prod-print] §3.2.2

stitching-reference-edge (type2 keyword) Specifies the stitching reference edge of the output media. (keyword: bottom, top, left, right) [prod-print] §3.2.2.1

stitching-offset (integer (0:MAX)) The perpendicular distance from the reference edge to the stitching axis in hundredths of a millimeter. [prod-print] §3.2.2.2

stitching-locations (1setOf integer(0:MAX)) The distance along the stitching axis where a stitch will be placed in hundredths of a millimeter. [prod-print] §3.2.2.3

font-name-requested (name(MAX)) [JT, DT, PO] Specifies the font name if the document data is in a format that does not have inherent font information (e.g., ‘text/plain’), otherwise, this attribute is ignored. [prod-print2] §5.2

font-size-requested (integer (1:MAX)) [JT, DT, PO] Specifies the font size in points (1/72 of an inch) if the document data is in a format that does not have inherent font information (e.g., ‘text/plain’), otherwise, this attribute is ignored. [prod-print2] §5.3

force-front-side (1setOf integer(1:MAX)) [JT⁹, DT, PO] Forces the specified pages to be printed on the front side of a sheet of media. The pages of the output document start at 1. [prod-print] §3.3

imposition-template (type3 keyword | name(MAX)) [JT, DT, PO] Specifies imposition method for laying out finished page images onto the surface of output media. (Keywords: none, signature) [prod-print] §3.4

insert-sheet (1setOf collection) [JT¹⁰, DT, PO] Specifies how Insert Sheets are to be inserted into the sequence of media sheets that are produced for each copy of the documents. [prod-print] §3.5

insert-after-page-number (integer(0:MAX)) Specifies the input page after which the Insert Sheet will be placed. [prod-print] §3.5.1

insert-count (integer(0:MAX)) Specifies the number of Insert Sheet to insert. [prod-print] §3.5.2

media (type3 keyword | name(MAX)) The medium that the Printer uses for all impressions of the Job. (Keyword examples: na_letter_8.5x11in, iso_a4_210x297mm, na_monarch_3.875x7.5in. See [pwg5101.1]) [prod-print] §3.5.3

media-col (collection) Enables a client end user to submit a list of media characteristics to the Printer as a way to more completely specify the media to be used. [prod-print] §3.5.3

ipp-attribute-fidelity (boolean) [JT] Allows a user to control whether or not the Printer MUST honor *all* supplied attributes in the Job Creation operation. For a ‘true’ value the Printer MUST reject the job submission if any of the attribute values are unsupported. For a ‘false’ value the Printer MUST accept the job submission and do best effort. Default = ‘false’ See also “mandatory-job-attributes” attribute. [RFC2911] §15.1

job-account-id (name(MAX)) [JT¹¹] Account associated with the job. [prod-print] §3.6

document-handling” Job Template attribute. The ‘single-document’ and ‘single-document-new-sheet’ cause the finishing to be applied to each job copy as a whole. The ‘separate-documents-collated-copies’ and ‘separate-document-uncollated-copies’ values cause the finishing to be applied to each document. In the PWG Semantic Model [pwg-sm] there are two separate attributes: JobFinishings and Finishings and also JobFinishingsCol and FinishingsCol which affect the job as a whole and individual documents, respectively, so that the MultipleDocumentHandling attribute is no longer needed.

⁹ The effect of the IPP “force-front-side” ~~and “insert-sheet”~~ attributes when supplied at the job level of a multi-document job depends on the value of the “multiple-document-handling” Job Template attribute. For the ‘single-document’ and ‘single-document-new-sheet’ values, the pages are numbered as a single set from 1 to n for the job as a whole. For the ‘separate-documents-collated-copies’ and ‘separate-document-uncollated-copies’ values, the pages are numbered from 1 to n for each document separately.

¹⁰ The effect of the IPP “insert-sheet” attributes when supplied at the job level of a multi-document job depends on the value of the “multiple-document-handling” Job Template attribute. For the ‘single-document’ and ‘single-document-new-sheet’ values, the pages are numbered as a single set from 1 to n for the job as a whole. For the ‘separate-documents-collated-copies’ and ‘separate-document-uncollated-copies’ values, the pages are numbered from 1 to n for each document separately.

job-accounting-sheets (collection) [JT] Specifies the accounting sheet for this Job. [prod-print] §3.8

job-accounting-sheets-type (type3 keyword | name(MAX)) Specifies the accounting sheet format for a job. (keywords: none, standard) [prod-print] §3.8.1

media (type3 keyword | name(MAX)) The medium that the Printer uses for all impressions of the Job. (Keyword examples: na_letter_8.5x11in, iso_a4_210x297mm, na_monarch_3.875x7.5in. See [pwg5101.1]) [prod-print] §3.5.3

media-col (collection) Enables a client end user to submit a list of media characteristics to the Printer as a way to more completely specify the media to be used. [prod-print] §3.5.3

job-accounting-output-bin (type3 keyword | name(MAX)) Specifies the output bin where the accounting sheet is to be placed. (Keywords: top, middle, bottom, side, left, right, center, rear, face-up, face-down large-capacity, my-mailbox, stacker-N, mailbox-N, tray-N *Note: N is replaced by a cardinal number, *Note: See [PWG5100.2 §2.1 for description of keywords) [prod-print] §3.8.3

job-accounting-user-id (name(MAX)) [JT¹²] Specifies the User ID associated with the "job-account-id". [prod-print] §3.7

job-error-sheet (collection) [JT] Specifies the error sheet for a job. [prod-print] §3.9

job-error-sheet-type (type3 keyword | name(MAX)) Specifies the error sheet format for a job. (Keywords: none, standard) [prod-print] §3.9.1

job-error-sheet-when (type2 keyword) Specifies when the accounting sheet is produced for a job. (Keywords: on-error, always) [prod-print] §3.9.2

media (type3 keyword | name(MAX)) The medium that the Printer uses for all impressions of the Job. (Keyword examples: na_letter_8.5x11in, iso_a4_210x297mm, na_monarch_3.875x7.5in. See [pwg5101.1]) [prod-print] §3.5.3

media-col (collection) Enables a client end user to submit a list of media characteristics to the Printer as a way to more completely specify the media to be used. [prod-print] §3.5.3

job-hold-until (type3 keyword | name(MAX)) [JT] Specifies the named time period during which the Job must become a candidate for printing. (Keywords: no-hold, indefinite, day-time, evening, night, weekend, second-shift, third-shift) [RFC2911] §4.2.2

job-hold-until-time (dateTime) [JT] Specifies the date and time after which the Job must become a candidate for printing. (example: Fri, 03 May 2002 08:49:37 GMT) [prod-print2] §5.4

job-imp (integer(0:MAX) [JD, DT] The total size of this Job/Document in number of impressions. [RFC2911] §4.3.17.2, [doc-obj] §6

job-ink (integer(0:MAX) [JD, DT] The total size of this Job/Document in integral units of 1024 octets. [RFC2911] §4.3.17.1, [doc-obj] §6

job-mandatory-attributes (1setOf type2 keyword) [JT] Allows a user to list which attributes the Printer must honor. The Printer MUST reject the job submission if *any* of the listed attributes contain values that the Printer does not support. All of the remaining supplied attributes are best effort. (See [RFC2911] §15.1) (Keywords: none and any Job and Document Template attribute names) **NOTE: New attribute to align fidelity with FSG work.** [pwg-sm] §6.1

job-media (integer(0:MAX) [JD, DT] The total size of this Job/Document in media sheets. [RFC2911] §4.3.17.3, [doc-obj] §6

job-message-from-operator (text(MAX)) [JD] Message to the end user indicating the reasons for any management action taken on a this job. (Example: "Job canceled due to length", "Pick job up in mailbox") Note: The natural language is not localized by any recipient, since this message is generated by a human. [RFC2911] §4.3.16

job-message-to-operator (text(MAX)) [JT¹³] Message from the end user to indicate something about the processing of the job. Note: The natural language is not localized by any recipient, since this message is generated by a human. (example: "Call 555-1234 before running this job") [prod-print] §3.10

¹¹ The "job-account-id" is termed a Job Description attribute instead of a Job Processing attribute by the PWG Semantic Model [pwg-sm].

¹² The "job-accounting-user-id" is termed a Job Description attribute, instead of a Job Processing attribute, by the PWG Semantic Model [pwg-sm].

- job-name** (name(MAX)) [JD] The Printer sets this to the client-supplied end-user friendly name for the Job, else the Printer must generate a name from other information. (example: "license agreement memo") [RFC2911] §4.3.5
- job-password** (octetString (255)) [JD] Contains a password supplied by the client encrypted according to method specified by the client in the "job-password-encryption" attribute. The password provides a mechanism for the user to perform a Secure Print. The Printer places the Job in the 'pending-held' state with the 'job-password-wait' value in the Job's "job-state-reasons" attribute. Then the user enters the password locally at the Printer. If the password matches, the Printer removes the 'job-password-wait' value, moves the Job to the 'pending' state, and schedules the Job to run next. [prod-print2] §4.1
- job-password-encryption** (type3 keyword | name(MAX)) [JD] Specifies the type of encryption that the client is used for the supplied value of the JobPassword attribute. (Keywords: none, md2, md4, md5, sha) [prod-print2] §4.2
- job-phone-number** (text(127)) [JT¹⁴] Contains the contact telephone number for the job. [prod-print2] §5.5
- job-priority** (integer(1:100) [JT] Priority for scheduling the Job. A higher value specifies a higher priority. [RFC2911] §4.2.1
- job-recipient-name** (name(MAX)) [JT¹⁵] Contains the name of the person that is to receive the output of the job and is commonly printed on the job sheet. It may also be used to reference a data base containing delivery instructions for the recipient. [prod-print2] §5.6
- job-save-disposition** (collection) [JT] Specifies that the Printer is to save the job as a file that can be re-printed on demand anytime in the future using the Print-URI operation (see [RFC2911] section 3.2.2) [prod-print2] §5.7
- save-disposition** (type3 keyword) Specifies whether the Printer MUST print and/or save the job. (Keywords: none, save-only, print-save). [prod-print2] §5.7.1.1
- save-info** (1setOf collection) Contains sets of attributes that each tell the Printer how to create each copy of the saved job. [prod-print2] §5.7.1.2
- save-location** (uri) Specifies the path to the directory as a URI where the Printer saves the Document Data and other Job information. Example: 'ftp://printhost.printco.com/var/spool/jobdir/' or 'file:///job-repository/jobdir/' [prod-print2] §5.7.1.2.3.1
- save-name** (name(MAX)) Specifies the name of the saved job in the directory specified by the "save-location" member attribute. The value may be a relative path. Example: if "save-location" is 'ftp://printhost.printco.com/var/spool/jobdir/' or 'ftp://printhost.printco.com/var/spool/jobdir/' and "save-name" is 'c/d', the resulting saved job URI is 'ftp://printhost.printco.com/var/spool/jobdir/c/d'. [prod-print2] §5.7.1.2.3.2
- save-document-format** (mimeMediaType) Indicates the document format in which the Printer is to save the job content (Document Data). Values are any document format that the Printer supports, except 'application/octet-stream'. See DocumentFormat Document Description attribute. [prod-print2] §5.7.1.2.3.3
- job-sheet-message** (text(MAX)) [JT] Conveys a message that is delivered with the job. [prod-print] §3.12
- job-sheets** (type3 keyword | name(MAX)) [JT] Specifies which job start/end sheet(s), will be printed with a job. (Keywords: none, standard, job-start-sheet, job-end-sheet, job-both-sheets, first-print-stream-page) [RFC2911] §4.2.3, [PWG5100.3] §6.2
- job-sheets-col** (collection) [JT] Allows the client to specify the media for the JobSheet. [prod-print] §3.11
- job-sheets** (type3 keyword | name(MAX)) Specifies which job start/end sheet(s), will be printed with a job. (Keywords: none, standard) [prod-print] §3.11.1
- media** (type3 keyword | name(MAX)) The medium that the Printer uses for all impressions of the Job. (Keyword examples: na letter 8.5x11in, iso a4 210x297mm, na monarch 3.875x7.5in. See [pwg5101.1]) [prod-print] §3.5.3

¹³ The "job-message-to-operator" is termed a Job Description attribute, instead of a Job Processing attribute, by the PWG Semantic Model [pwg-sm].

¹⁴ The "job-phone-number" attribute is termed a Job Description attribute, instead of a Job Processing attribute, by the PWG Semantic Model [pwg-sm].

¹⁵ The "job-recipient-name" attribute is termed a Job Description attribute, instead of a Job Processing attribute, by the PWG Semantic Model [pwg-sm].

media-col (collection) Enables a client end user to submit a list of media characteristics to the Printer as a way to more completely specify the media to be used. [prod-print] §3.5.3

last-document (boolean) [DD] Has a 'true' value if this Document is the last Input Document for the Job. [RFC2911] §4.2.11

media (type3 keyword | name(MAX)) [JT, DT, PO] The name of the medium that the Printer uses for all impressions of the Job. (Keyword examples: na_letter_8.5x11in_iso_a4_210x297mm, na_monarch_3.875x7.5in. See [pwg5101.1]) [RFC2911] §4.2.11

media-col (collection) [JT, DT, PO] Enables a client end user to submit a list of media characteristics to the Printer as a way to more completely specify the media to be used than the "media" attribute. [prod-print] §3.13

media-back-coating (type3 keyword | name(MAX)) Indicates the pre-process coating applied to the back of the media. (Keywords: none, glossy, high-gloss, semi-gloss, satin, matte) [prod-print] §3.13.10

media-color (type3 keyword | name(MAX)) Indicates the desired color of the media being specified. (Keywords: no-color, white, pink, yellow, blue, green, buff, goldenrod, red, gray, ivory, orange) [prod-print] §3.13.4

media-front-coating (type3 keyword | name(MAX)) Indicates the pre-process coating applied to the front of the media. (Keywords: none, glossy, high-gloss, semi-gloss, satin, matte) [prod-print] §3.13.10

media-grain (type3 keyword | name(MAX)) Indicates the grain of the media. Note: grain affects the curl and the folding of the medium. (Keywords: x-direction, y-direction) [prod-print2] §8.4.2

media-hole-count (integer(0:MAX)) Indicates the number of pre-drilled holes in the desired media. [prod-print] §3.13.6

media-info (text(255)) Specifies information that helps describe the media instance. Intended for human consumption. [prod-print] §3.13.3

media-key (type3 keyword | name(MAX)) The name of the media represented as a keyword or name. Values are the same as the keyword and name values for the Media Document Processing attribute and represent the same media, except for media size and input tray keywords. [prod-print] §3.13.1

media-material (type3 keyword | name(MAX)) The material of the media. (Keywords: aluminum, dry-film, paper, polyester, wet-film) [prod-print2] §8.4.3

media-order-count (integer(1:MAX)) Indicates the number of sheets, within an ordered sequence of sheets; after which the sequence begins to repeat. [prod-print] §3.13.7

media-preprinted (type3 keyword | name(MAX)) Indicates the pre-printed characteristics of the desired media. (Keywords: blank, pre-printed, letter-head) [prod-print] §3.13.5

media-recycled (type3 keyword | name(MAX)) Indicates the recycled characteristics of the media. (Keywords: none, standard) [prod-print] §3.13.11

media-size (collection) Explicitly specifies the numerical media width and height dimensions. [prod-print] §3.13.8

x-dimension (integer(0:MAX)) Size of the media in hundredths of a millimeter along the bottom edge. [prod-print] §3.13.8.1

y-dimension (integer(0:MAX)) Size of the media in hundredths of a millimeter along the left edge. [prod-print] §3.13.8.2

media-thickness (integer(1:MAX)) The thickness of the media in units of one hundredth of a millimeter. This unit is equivalent to 1/2540 th of an inch. [prod-print2] §8.4.4

media-tooth (type3 keyword | name(MAX)) The tooth (or roughness) of the media. Note: the tooth of a medium is particularly important for those marking engines that use pens (e.g. plotters) to mark the medium. (Keywords: fine, medium, coarse) [prod-print2] §8.4.1

media-type (type3 keyword | name(MAX)) The medium type that the Printer uses for all impressions of the Job. (Keywords: stationery, transparency envelope, envelope-plain, envelope-window, continuous, continuous-long, continuous-short, tab-stock, pre-cut-tabs, full-cut-tabs, multi-part-forms, labels, multi-layer, screen, screen-paged, photographic, cardstock, other. See also [pwg5101.1] §3) [prod-print] §3.13.2

media-weight-metric (integer(0:MAX)) Indicates the weight of the desired media rounded to the nearest whole number of grams per square meter. [prod-print] §3.13.9

media-input-tray-check (type3 keyword | name(MAX)) [JT, DT, PO] Indicates that the characteristics of the media in the identified input tray must match the characteristics of the media identified by the "media" or "media-col" attribute. (Keywords: none, top, middle, bottom, side, large-capacity, envelope, main, manual, bypass-tray, tray-N. See [RFC2911] Appendix C) [prod-print] §3.14 and §6.3

multiple-document-handling (type2 keyword) [JT] Controls whether Input Document in multi-document jobs are combined into a single Output Document or are kept as separate Output Document. Useful in combination with "cover-back", "cover-front", "finishings", "finishings-col", and "copies" Job Template attributes and for controlling the placement of one or more print-stream pages into impressions and onto media sheets for multi-document Jobs¹⁶. (Keywords: single-document, separate-document-uncollated-copies, separate-document-collated-copies, single-document-new-sheet) [RFC2911] §4.2.4

number-up (integer(1:MAX)) [JT, DT, PO] Indicates the number of Input pages that the Printer is to image on one impression. [RFC2911] §4.2.9

operation-id (type2 enum) [] Indicates which operation this request is. [RFC2911] §3.1.2

orientation-requested (type2 enum) [JT, DT, PO] The desired orientation for printed pages for document formats that don't have a built-in orientation. (Keywords: portrait, landscape, reverse-landscape, reverse-portrait) [RFC2911] §4.2.10

output-bin (type3 keyword | name(MAX)) [JT, DT] Specifies the output bin where the job is to be delivered. (Keywords: top, middle, bottom, side, left, right, center, rear, face-up, face-down large-capacity, my-mailbox, stacker-N, mailbox-N, tray-N. *Note: N is replaced by a cardinal number) [output-bin] §2.1

page-delivery (type2 keyword) [JT, DT] Indicates whether the pages of the job are to be delivered to the output bin or finisher in the same page order as the original document and face up or face down. See the "page-order-received" Job Template attribute and the "current-page-order" Document Description attributes. (Keywords: same-order-face-up, same-order-face-down, reverse-order-face-up, reverse-order-face-down, system-specified) [prod-print] §3.15

page-order-received (type2 keyword) [JT¹⁷, DT] Indicates the order of pages in the document data as supplied with the job. (Keywords: 1-to-n-order, n-to-1-order) [prod-print] §3.16

page-overrides (1setOf collection) [JT, DT] Provides for the overriding of processing instructions on a page basis. [override] §5.2

input-documents (1setOf rangeOfInteger(MAX)) Specifies the ranges of input documents for page override processing. [override] §5.2.1

output-documents (1setOf rangeOfInteger(MAX)) Specifies the ranges of output documents for page override processing. [override] §5.2.2

document-copies (1setOf rangeOfInteger(MAX)) Specifies the ranges of output document copies for page override processing. [override] §5.2.3

pages (1setOf rangeOfInteger(MAX)) Specifies a range of pages in the document data to which the "page-overrides" are to be applied. Note: the "page-ranges" Document Template attribute may be supplied as one of the Template attributes to apply to the ranges of pages specified by "pages" in which case "page-ranges" indicates which pages are to be actually output. [override] §5.2.4

any other Job Template attributes that affect pages, such as "media" or "media-col" ()

page-ranges (1setOf rangeOfInteger(1:MAX)) [JT, DT, PO] Specifies a range of pages in the document data to be output. The remaining pages may still need to be processed, but not output, depending on document format. [RFC2911] §4.2.7

pages-per-subset (1setOf integer(1:MAX)) [JT¹⁸, DT] Partitions one or more Input-Documents into contiguous subsets of Input-Pages. Each subset is defined to be an Output-Document. [prod-print] §5.3

¹⁶ The IPP "multiple-document-handling" attribute has been made unnecessary in the PWG Semantic Model by introducing the JobFinishings, JobFinishingsCol, and JobCopies Job Processing attributes to handle the cases of combining multiple Input Documents into a single Output Document. So Finishings, FinishingsCol, and Copies are Document Processing attributes that are intended to handle the separate Output Documents cases. Need to do the same for CoverFront and CoverBack.

¹⁷ The IPP "page-order-received" Job Template attribute is mapped to the PageOrderReceived Document Description attribute in the PWG Semantic Model [pwg-sm].

¹⁸ The IPP "pages-per-subset" attribute can only be used when the "multiple-document-handling" Job Template attribute is 'separate-documents-collated-copies' or 'separate-documents-uncollated-copes', since the purpose of the "pages-per-

- pdl-init-file** (1setOf collection) [JT, DT] Controls initialization of the Printer's Page Description Language (PDL) interpreter. The Printer performs the initialization before processing each Input Document when "multiple-document-handling" is 'separate-documents-collated-copies' or 'separate-documents-uncollated-copies' and before the first Input Document when "multiple-document-handling" is 'single-document' or 'single-document-new-sheet'. [prod-print2] §5.8
- pdl-init-file-location** (uri) [JT, DT] Contains an Absolute URI [RFC 2396] that specifies the path to the directory where the initialization file to be sent to the Printer's PDL interpreter will be found. Examples: 'ftp://printhost.printco.com/var/spool/jobinitfiledir/initfile1' or 'file:///jobinitfiledir/initfile1'. [prod-print2] §5.8.1.1
- pdl-init-file-name** (name(MAX)) [JT, DT] Specifies the name of the initialization file within the directory specified by the PdlInitFileLocation member attribute that the Printer is to send to its PDL interpreter prior to processing the document. For example, if the PdlInitFileLocation is 'file:///jobinitfiledir/initfile1' or 'file:///jobinitfiledir/initfile1/' and the PdlInitFileName is 'a/b', then the URL for the saved job is 'file:///jobinitfiledir/initfile1/a/b' [prod-print2] §5.8.1.2
- pdl-init-file-entry** (name(MAX)) [JT, DT] Specifies an entry point within the init file at which the PDL interpreter starts. [prod-print2] §5.8.1.3
- presentation-direction-number-up** (type2 keyword) [JT, DT, PO] Specifies the placement order of the page images on a Finished-Page Image with the "number-up" attribute. (Keywords: toright-tobottom, tobottom-toright, toleft-tobottom, tobottom-toleft, toright-totop, totop-toright, toleft-totop) [prod-print] §3.17
- print-quality** (type2 enum) [JT, DT, PO] The print quality that the Printer uses for the Job. (keyword: draft, normal, high) [RFC2911] §4.2.13
- printer-resolution** (resolution) [JT, DT, PO] The resolution that Printer uses for the Job in cross-feed and feed direction in units of dpi or dpcm. [RFC2911] §4.2.12
- printer-uri** (uri) [JD] Specifies the URL of this Printer. The client supplies this attribute in every request. [RFC2911] §3.1.5
- proof-print** (collection) [JT] Specifies the attributes for zero or more proof prints of the job that are to be printed prior to the printing the full run of the job. (Includes Media/MediaCol and any other Job Processing attributes). [prod-print2] §5.9
- proof-print-copies** (integer (0:MAX)) [JT] Specifies the attributes for zero or more proof prints of the job that are to be printed prior to the printing the full run of the job. If the value is zero, no proof job is produced. After the proof job(s) are completed, the Printer sets ProofPrintCopies to zero. puts the Job in the 'pending-held' state, and adds the 'proof-print-wait' value to the Job's JobStateReasons. After examining the proof print job output, the user can print the full run of the job by using the Release-Job action (see [RFC2911] section 3.3.6). (Includes Media/MediaCol and any other Job Processing attributes). [prod-print2] §5.9.1.1
- media** (type3 keyword | name(MAX)) The medium that the Printer uses for all impressions of the Job. (Keyword examples: na_letter_8.5x11in, iso_a4_210x297mm, na_monarch_3.875x7.5in. See [pwg5101.1]) [prod-print] §3.5.3
- media-col** (collection) Enables a client end user to submit a list of media characteristics to the Printer as a way to more completely specify the media to be used. [prod-print] §3.5.3
- request-id** (integer(1:MAX)) [OP] Specifies an ID generated by the client to identify this request. The Printer returns this same ID in the response to each request. [RFC2911] §3.1.2
- requesting-user-name** (name(MAX)) [OP] Specifies the name of the requesting user. Used by the Printer in case there is no a more secure authentication mechanism. [RFC2911] §3.2.1.1
- separator-sheets** (collection) [JT, DT, PO] Specifies the separator sheets to be printed with the Document. [prod-print] §3.18
- separator-sheets-type** (type3 keyword | name(MAX)) Specifies the separator sheets type. (Keywords: none, slip-sheets, start-sheet, end-sheet, both-sheets) [prod-print] §3.18.1
- media** (type3 keyword | name(MAX)) The medium that the Printer uses for all impressions of the Job. (Keyword examples: na_letter_8.5x11in, iso_a4_210x297mm, na_monarch_3.875x7.5in. See [pwg5101.1]) [prod-print] §3.5.3

subset" attribute is to produce separate output documents for each subset. Otherwise, the Printer MUST ignore the "pages-per-subset" attribute.

media-col (collection) Enables a client end user to submit a list of media characteristics to the Printer as a way to more completely specify the media to be used. [prod-print] §3.5.3

sheet-collate (type2 keyword) [JT, DT] Specifies whether or not the media sheets of each copy of each printed document in a job are to be in sequence. (Keywords: uncollated, collated) [job-prog] §3.1

sides (type2 keyword) [JT, DT, PO] Indicates how an impression is to be placed upon the side(s) of the media. (Keywords: one-sided, two-sided-long-edge, two-sided-short-edge) [RFC2911] §4.2.8

version-number (type2 keyword) [OP] Indicates the version number of the protocol that the client is using in the request. (Keywords: 1.0, 1.1). [RFC2911] §3.1.8

x-image-position (type2 keyword) [JT, DT, PO] Causes the specified point of the Finished-Page Image to be positioned at a specified location. (Keywords: none, center, left, right) [prod-print] §3.19.2

x-image-shift (integer(MIN:MAX)) [JT, DT, PO] Causes the Finished-Page Image to be shifted in position with respect to the x-axis of the media. The unit of measure for this attribute is hundredths of a millimeter. The sign of the value indicates the direction of the shift. [prod-print] §3.19.3

x-side1-image-shift (integer(MIN:MAX)) [JT, DT, PO] Causes each Finished-Page Image that would be placed on the front side of a sheet to be shifted in position with respect to the x-axis of the media. The unit of measure for this attribute is hundredths of a millimeter. The sign of the value indicates the direction of the shift. [prod-print] §3.19.4

x-side2-image-shift (integer(MIN:MAX)) [JT, DT, PO] Causes each Finished-Page Image that would be placed on the back side of a sheet to be shifted in position with respect to the x-axis of the media. The unit of measure for this attribute is hundredths of a millimeter. The sign of the value indicates the direction of the shift. [prod-print] §3.19.5

y-image-position (type2 keyword) [JT, DT, PO] Causes the specified point of the Finished-Page Image to be positioned at a specified location. (Keywords: none, center, top, bottom) [prod-print] §3.19.6

y-image-shift (integer(MIN:MAX)) [JT, DT, PO] Causes the Finished-Page Image to be shifted in position with respect to the y-axis of the media. The unit of measure for this attribute is hundredths of a millimeter. The sign of the value indicates the direction of the shift. [prod-print] §3.19.7

y-side1-image-shift (integer(MIN:MAX)) [JT, DT, PO] Causes each Finished-Page Image that would be placed on the front side of a sheet to be shifted in position with respect to the y-axis of the media. The unit of measure for this attribute is hundredths of a millimeter. The sign of the value indicates the direction of the shift. [prod-print] §3.19.8

y-side2-image-shift (integer(MIN:MAX)) [JT, DT, PO] Causes each Finished-Page Image that would be placed on the back side of a sheet to be shifted in position with respect to the y-axis of the media. The unit of measure for this attribute is hundredths of a millimeter. The sign of the value indicates the direction of the shift. [prod-print] §3.19.9

3 Brief Description of IPP attributes that only Printers can generate (S)

This section lists the IPP attributes from Table 1 that only Printers can generate for the Job and Document objects and gives a *brief* description. Printers return these attributes in Job and Document query operations. Furthermore, for those attributes that have both a Job State and a Document State attribute, there is only one entry in Table 1 that represents both of them.

WARNING: Do not attempt to implement from these brief descriptions. You MUST refer to each cited reference.

Legend:

JS - Job State attribute - set by the Printer, client cannot supply. Indicated by "(S) in Table 1.

DS - Document State attribute - set by the Printer, client cannot supply. Indicated by "(S) in Table 1.

-- indicates that there is no corresponding Job State attribute or Document State attribute.

The **[job-]** indicates that the 'job-' prefix is kept for the IPP Job State attribute but is dropped for the corresponding IPP Document Description attribute. A single description serves for both using "Job/Document" to indicate that the description applies to both the Job State and the Document State attribute. The entry in Table 1 uses the form of the name with the 'job-', since that form is the one in [RFC2911].

Here are the IPP Attributes that only Printers can generate for the Job and Document objects and gives a *brief* description:

- current-page-order** (type2 keyword) [JS, DS] Indicates the page order of the pages in the document data for this Job/Document. The Printer set this value set from the supplied "page-order-received" Template attribute and updates the value if the Printer reverses the pages of the Document. See also the "page-delivery" Template attribute. (Keywords: 1-to-n-order, n-to-1-order) [prod-print] §4.1
- date-time-at-completed** (dateTime) [JS, DS] Indicates the date and time at which this Job/Document completed. (example: Fri, 03 May 2002 08:49:37 GMT) [RFC2911] §4.3.14.7
- date-time-at-creation** (dateTime) [JS, DS] Indicates the date and time at which this Job/Document was created. (example: Fri, 03 May 2002 08:49:37 GMT) [RFC2911] §4.3.14.5
- date-time-at-processing** (dateTime) [JS, DS] Indicates the date and time at which this Job/Document first began processing. (example: Fri, 03 May 2002 08:49:37 GMT) [RFC2911] §4.3.14.6
- document-number** (integer(0:MAX)) [-, DS] The order of this Document within the Job starting at a base of 1. [doc-obj] §6.1
- document-state** (type1 enum) [-, DS] The current state of this Document. See also "document-state-reasons" attribute below. (Keywords: pending, processing, canceled, aborted, completed) [doc-obj] §6.3.2
- document-state-message** (text(MAX)) [-, DS] Specifies information about the "document-state" and "document-state-reasons" attributes of this Document in human readable text. The Printer localizes the text according to the natural language supplied in the client's query request. (example: "Document completed successfully with warnings" for an English request) [doc-obj] §6.7
- document-state-reasons** (1setOf type2 keyword) [-, DS] Provides additional information about this Document's current state. (Keywords: none, aborted-by-system, canceled-at-device, canceled-by-operator, canceled-by-user, completed-successfully, completed-with-errors, completed-with-warnings, compression-error, document-access-error, document-format-error, incoming, interpreting, outgoing, printing, queued, queued-for-marker, queued-in-device, resources-are-not-ready, resources-are-not-supported, spooling, streaming, submission-interrupted, transforming, unsupported-compression, unsupported-document-format, warnings-detected) [doc-obj] §6.5
- impressions-completed-current-copy** (integer(0:MAX)) [JS, DS] The number of impressions completed for the current copy of (1) the current Document of this Job or (2) this Document. The Printer sets this value to 0 at the beginning of each Document copy and each Document. The current Document is identified by the value of the "sheet-completed-document-number" Description attribute. The current copy is identified by the value of the "sheet-completed-copy-number" Description attribute. [job-prog] §4.4
- job-collation-type** (type2 enum) [JS, -] Identifies the collation type of this Job. The Printer sets the value from the submitted "sheet-collate" and "multiple-document-handling" Job Template attributes. (Keywords: other, unknown, uncollated-sheets, uncollated-documents, collated-documents). [job-prog] §4.1
- job-detailed-status-message** (1setOf text (MAX)) [JS, DS] Specifies additional detailed and technical information about this Job/Document. Intended for use by the system administrator or other experienced technical persons and so is not localized by the Printer. (example: "PostScript error: stack overflow") [RFC2911] §4.3.10
- job-document-access-errors** (1setOf text(MAX)) [JS, DS] Information about each Document access error for this Job/Document encountered by the Printer. (example: "(404 http://www.company.com/pub/fileToPrint.pdf ") [RFC2911] §4.3.11
- job-id** (integer(1:MAX)) [JS, -¹⁹] The Printer generates and sets this attribute to the ID of this Job, which is unique for this Printer. [RFC2911] §4.3.2
- job-impressions-completed** (integer(0:MAX)) [JS, DS] The number of impressions completed for this Job/Document so far. [RFC2911] §4.3.18.2
- job-k-octets-processed** (integer(0:MAX)) [JS, DS] The total number of octets processed in integral units of 1024 octets so far for this Job/Document. [RFC2911] §4.3.18.1
- job-media-sheets-completed** (integer(0:MAX)) [JS, DS] The media-sheets completed marking and stacking for this Job/Document so far. [RFC2911] §4.3.18.3

¹⁹ The IPP ~~Document Description~~ attribute that corresponds to the "job-id" Job Description attribute ~~is~~ corresponds to the (new) "document-number" Document Description attribute.

[job-more-info] (uri) [JS, DS] URI used to obtain information intended for end user consumption about this specific Job/Document. (example: "http://www.company.com/printer/embeddedjobpage") [RFC2911] §4.3.4

job-originating-user-name (name(MAX)) [JS, -] The Printer sets this attribute to the most authenticated printable name that it can obtain (example: "John Doe", \authDomain\John Doe") [RFC2911] §4.3.6

job-printer-make-and-model (text(127)) [JS, -] Identifies the make and model of the output device which saved this Job according to the "job-save-disposition" Job Template attribute. [prod-print2] §6.1

[job-printer-up-time] (integer (1:MAX)) [JS, DS] The amount of time (in seconds) that the Printer has been up and running. These Job/Document State attributes are an alias for the "printer-up-time" Printer State attribute for use by the client in a Job/Document query response to compare with the TimeAtCreation, TimeAtProcessing, and TimeAtCompleted State attributes. [RFC2911] §4.3.14.4

job-state (type1 enum) [JS, -²⁰] The current state of this Job. See also JobStateReasons attribute below. (Keywords: pending, pending-held, processing, processing-stopped, canceled, aborted, completed) [RFC2911] §4.3.7

[job-state-message] (text(MAX)) [JS, -²¹] Specifies information about the "job-state" and "job-state-reasons" attributes in human readable text localized by the Printer according to the natural language supplied in the client's query request. (example: "Job completed successfully with warnings" for an English request) [RFC2911] §4.3.9

job-state-reasons (1setOf type2 keyword) [JS, -²²] Provides additional information about this Job's current state. (Keywords: none, aborted-by-system, canceled-at-device, canceled-by-operator, canceled-by-user, completed-successfully, completed-with-errors, completed-with-warnings, compression-error, document-access-error, document-format-error, incoming, interpreting, job-data-insufficient, job-hold-until-specified, job-password-wait, job-restartable, job-resuming, job-saved-successfully, job-save-error, job-saving, job-scheduling, job-suspended, job-suspended-by-operator, job-suspended-by-system, job-suspended-by-user, job-suspending, outgoing, printer-stopped, printer-stopped-partly, printing, processing-to-stop-point, proof-print-wait, queued, queued-for-marker, queued-in-device, resources-are-not-ready, resources-are-not-supported, service-off-line, spooling, streaming, submission-interrupted, transforming, unsupported-compression, unsupported-document-format, warnings-detected) [RFC2911] §4.3.8, [adm-ops] §9.1, [override] §7.1, [prod-print] §6.1, [prod-print2] §8.3.1

job-uri (uri) [JS, -²³] The Printer generates and sets this attribute to a globally unique URI for this Job. (Example: jpp://www.company.com/printer/jobs/22). [RFC2911] §4.3.1

[job-warnings-count] (integer(0:MAX)) [JS, DS] The total number of warnings that a Printer has generated while processing and printing this Job/Document. [override] §6.1

number-of-documents (integer(0:MAX)) [JS, -] The number of Documents in this Job. [RFC2911] §4.3.12

number-of-intervening-jobs (integer(0:MAX)) [JS, -] The number of jobs that are "ahead" of this Job assuming the current scheduled order. [RFC2911] §4.3.15

output-device-assigned (name(127)) [JS, -] Identifies the output device to which the Printer has assigned this Job (Example: "Pete's Printer") [RFC2911] §4.3.13

sheet-completed-copy-number (integer(0:MAX)) [JS, DS] The number of the copy being stacked (1) for the current Document in this Job or (2) for this Document. The copies are numbered 1, 2, 3. A 0 value means no Document is currently being stacked. The "impressions-completed-current-copy" counts the impressions as they are produced for the current copy of the current Document. [job-prog] §4.2

sheet-completed-document-number (integer(0:MAX)) [JS, -] The DocumentNumber of the Document in this Job currently being stacked. The Documents in a Job are numbered 1, 2, 3. A 0 value means no Document is currently being stacked. The "impressions-completed-current-copy" counts the impressions as they are produced for the current copy of the current Document. [job-prog] §4.3

²⁰ The IPP [Document Description attribute that corresponds to the "job-state"](#) Job Description attribute ~~is~~ corresponds to the (new) "document-state" [Document Description](#) attribute.

²¹ The IPP ~~re is no~~ [Document Description attribute that corresponds to the "job-state-message"](#) Job Description attribute corresponds to the (new) "document-state-message" [Document Description](#) attribute. ~~Printers can use the "job-state-message" to describe any document level conditions.~~

²² The IPP [Document Description attribute that corresponds to the "job-state-reasons"](#) Job Description attribute is corresponds to the (new) "document-state-reasons" [Document Description](#) attribute.

²³ The IPP "job-uri" Job Description attribute does not have a corresponding Document Description attribute. The "job-uri" has proved problematic enough and not really needed.

time-at-completed (integer (MIN:MAX)) [JS, DS] The time at which the Job/Document completed in “printer-up-time” seconds, i.e., the value of the “printer-up-time” Printer State attribute when the Job was completed, aborted, or canceled. [RFC2911] §4.3.14.3

time-at-creation (integer (MIN:MAX)) [JS, DS] The time at which the Job/Document was created in “printer-up-time” seconds, i.e., the value of the “printer-up-time” Printer State attribute when the Job was created. [RFC2911] §4.3.14.1

time-at-processing (integer (MIN:MAX)) [JS, DS] The time at which the Job/Document first began processing in “printer-up-time” seconds, i.e., the value of the “printer-up-time” Printer State attribute when the Job first began processing. [RFC2911] §4.3.14.2

4 CUPS Job Template extensions to IPP

The following attributes are listed in the “CUPS Implementation of IPP” document as CUPS extension Job Template attributes:

CUPS Attribute	OSDP JDF Spec
blackplot	No
brightness	No
columns	No
cpi	No
fitplot	No
gamma	No
hue	No
job-billing	Yes
job-hold-until (like IPP 1.1 except add HH:MM and HH:MM:SS GMT of next time)	Yes Hold Job
job-sheets (IPP 1.1 is singled valued whereas CUPS is 1setOf)	Yes Start, Separator, End Sheets
job-originating-host-name	Yes Job Created By
lpi	No
natural-scaling	No
page-bottom	No
page-label	No
page-left	No
page-right	No
page-set	No
page-top	No
penwidth	No
position	No
ppi	No
prettyprint	No
saturation	No
scaling	No
wrap	No

5 Attributes for the proposed PDC document

The following attributes are listed in the proposed PDC Document:

PDC Attribute	IPP Attribute	OSDP JDF Spec
form	media-col?	Yes Forms
media	media-col attribute's media-	Yes

PDC Attribute	IPP Attribute	OSDP JDF Spec
	key member attribute	Media
tray	media	Yes Input Tray Name
resolution	printer-resolution	No
orientation	orientation-requested	Yes Rotate Page
color/monochrome	---	No
copies	copies	Yes Number of Copies

6 References

[adm-ops]

Kugler, C, Hastings, T., Lewis, H., "Internet Printing Protocol (IPP): Job and Printer Administrative Operations", <draft-ietf-ipp-adm-ops-03.txt>, July 17, 2001.

CUPS

Common UNIX Printing System, <http://www.cups.org/>.

[doc-obj]

Hastings, T., and P. Zehler, "Internet Printing Protocol (IPP): Document Object", September 27, 2002, ftp://ftp.pwg.org/pub/pwg/ipp/new_DOC/IPP-Document-Object.doc, .pdf, .rtf work in progress to become IEEE-ISTO 5100.5-2001.

IEEE-ISTO 5100.1-2001 [finishing]

"Internet Printing Protocol (IPP): "finishings" attribute values extension", Hastings, T., and D. Fullman, February 5, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.1.pdf>

IEEE-ISTO 5100.2-2001 [output-bin]

"Internet Printing Protocol (IPP): output-bin attribute extension", Hastings, T., and R. Bergman, February 7, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.2.pdf>

IEEE-ISTO 5100.3-2001 [prod-print]

"Internet Printing Protocol (IPP): Production Printing Attributes - Set1", Ocke, K., and T. Hastings, February 12, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.3.pdf>

IEEE-ISTO 5100.4-2001 [override]

"Internet Printing Protocol (IPP): Override Attributes for Documents and Pages", Herriot, R., and K. Ocke, February 7, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.4.pdf>

[OSDP]

"Open Source Digital Printing Job Ticket", Claudia Alimpich, version 1.2.

[prod-print2]

Hastings, T., and D. Fullman, "Internet Printing Protocol (IPP): Production Printing Attributes - Set 2", to become a PWG IEEE-ISTO standard, work in progress, August 21, 2002, ftp://ftp.pwg.org/pub/pwg/ipp/new_PPE/pwg-ipp-prod-print-set2-draft-v0_1-020821.pdf.

RFC 2910 [mod]

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

RFC 2911 [pro]

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

RFC 3380 [set-ops]

Hastings, T., Herriot, R., Kugler, C., and H. Lewis, "Internet Printing Protocol (IPP): Job and Printer Set Operations", RFC 3380, September 2002.

RFC 3381 [job-prog]

Hastings, T., Lewis, H., and R. Bergman, "Internet Printing Protocol (IPP): Job Progress Attributes", RFC 3381, September 2002.

RFC 3382 [coll]

deBry, R., Hastings, T., Herriot, R., Ocke, K., and P. Zehler, "Internet Printing Protocol (IPP): The 'collection' attribute syntax", RFC 3382, September 2002.

7 Change Log

Summary of changes in reverse chronological order:

7.1 Changes to make version 0.4, September 28, 2002:

1. Added Brief Descriptions of all of the IPP attributes.
2. Added the IPP attributes in [prod-print2] and [doc-obj].
3. Re-calculated the percentages of IPP covered in the mappings by counting all collection member attributes as well as the top level attributes.

7.2 Changes to make version 0.3, September 24, 2002:

1. Added Product Intent mapping.
2. Added the percentages of IPP covered by the other mappings.