

Mapping of IPP Attributes to JDF, JTAPI, and CUPS

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30 September 2002
File: ippjdf-mapping-30-Sep-2002.doc
Version 0.4

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, Job Ticket API (JTAPI), and the Common Unix Printing System (CUPS).

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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	120 ² = 84 + 36 (S)	100	The name of the IPP attribute. “(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	9	-	The IPP specification in which the semantics are defined. See the references section at the end of this document.
JDF 1.1 Product Intent	29	35%	The JDF Spec version 1.1 Product Intent Resource and attribute using XPath notation. A blank indicates that there is no corresponding JDF 1.1 Product Intent attribute.
OSDP JDF Spec	49	58%	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.
JTAPI			Whether or not the feature is in the JTAPI and if so the version of JTAPI and the corresponding JTAPI attribute. x.x is a future release fo the JTAPI that is not yet defined.
CUPS	94 = 68 + 26 (S)	81%	The version of the Common Unix Printing System (CUPS) in which the IPP attribute is supported. See “(S)” explained above.

¹ The % of IPP is the percent of the 84 IPP attributes that can be supplied in a Job Creation operation request.

² The IPP and other totals don't include the member attributes of collections, except for “media-col”, since it is so important.

Column heading	Totals	% of IPP ¹	Description
JDF 1.0 APP F	55	65%	Whether or not the Appendix mapped the IPP attribute to JDF/1.0 IDPrinting combined process node

Table 1- IPP Attribute Mapping Table

IPP Attribute	IPP Spec	JDF 1.1 Product Intent	OSDP JDF Spec	JTAPI	CUPS	JDF 1.0 App F
attributes-charset	RFC 2911		No	1.0 jt-charset	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	1.0 job-copies	1.1	Yes
cover-back media media-col cover-type	IEEE-ISTO 5100.3		Yes Covers Media Sides Start First Page	1.0 job-media 1.0 job-sides 1.0 job-start-pages	1.2	Yes
cover-front media media-col cover-type	IEEE-ISTO 5100.3		Yes Covers Media Sides Start First Page	1.0 job-media 1.0 job-sides 1.0 job-start-pages	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	1.0 job-created-on	1.1	No
date-time-at-processing (S)	RFC 2911		No		1.1	No
document-format	RFC 2911		Yes? Document File Format	1.0 job-document- format x.x document-format	1.1	Yes
document-name	RFC 2911		No		1.1	Yes
document-natural-language	RFC 2911		No		1.1	Yes

IPP Attribute	IPP Spec	JDF 1.1 Product Intent	OSDP JDF Spec	JTAPI	CUPS	JDF 1.0 App F
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 Yes No No No Yes No Yes?? Yes?? <u>Yes?</u> <u>Yes??</u>	x.x document-format x.x document-output-pages x.x document-copies see finishings see sides see media see media-col	No ??	Yes Yes Yes Yes No Yes Yes Yes Yes Yes Yes Yes Yes
document-uri	RFC 2911		Yes Document File Name	1.0 document-file-name	1.1	Yes
finishings staple, saddle-stitch, edge-stitch, staple-top-left, staple-bottom-left, staple-top-right, staple-bottom-right, edge-stitch-left, edge-stitch-right, edge-stitch-bottom, edge-stitch-top, staple-dual-left, staple-dual-right, staple-dual-bottom, staple-dual-top	RFC 2911	BindingIntent/ @SaddleStitching, @SideStitching	Yes Stapling & Stitching	1.0 job-stitching x.x document-stitching x.x po-stitching 1.0 stitching-count 1.0 stitching-reference-edge 1.0 stitching-stitch-type	1.1	Yes
punch	RFC 2911	HoleMakingIntent/ @HoleReference Edge, @HoleType	Yes Punching & Hole Making	1.0 job-hole-making x.x document-hole-making x.x po-hole-making 1.0 hole-making-count 1.0 hole-making-reference-edge	1.1	Yes
cover	RFC 2911		Yes Covers	1.0 job-start-pages	1.1	Yes
bind	RFC 2911	BindingIntent/	Yes Binding	1.0 job-binding	1.1	Yes

IPP Attribute	IPP Spec	JDF 1.1 Product Intent	OSDP JDF Spec	JTAPI	CUPS	JDF 1.0 App F
		@BindingType (for 2 values)				
fold	IEEE-ISTO 5100.1	FoldingIntent/ @FoldingCatalog	Yes Folding	1.0 job-folding x.x document-folding x.x po-folding	1.1	Yes
trim	IEEE-ISTO 5100.1		Yes Trimming		1.1	Yes
bale	IEEE-ISTO 5100.1		No		1.1	Yes
booklet-maker	IEEE-ISTO 5100.1	LayoutIntent/ @NumberUp BindingIntent/ @SaddleStitching FoldingIntent/ @FoldingCatalog	Yes NumberUp Stapling & Stitching Folding	see xxx-number-up see xxx-stitching see xxx-folding	No	Yes
jog-offset	IEEE-ISTO 5100.1		Yes Jog Offset	1.0 job-jog-offset	No	Yes
bind-left, bind-right, bind-bottom, bind-top	IEEE-ISTO 5100.1	BindingIntent/ @BindingType (for 2 values)	Yes Binding	1.0 job-binding x.x document- binding x.x po-binding x.x binding-side x.x binding-type	No	Yes
finishings-col finishing-template stitching stitching-reference-edge stitching-offset stitching-locations	IEEE-ISTO 5100.3		No Yes Stitching No No	1.0 job-stitching 1.0 stitching- reference-edge	1.2	No Yes
force-front-side	IEEE-ISTO 5100.3		Yes Start First Page	1.0 job-start-pages x.x document-start- pages	1.2	Yes
image-rotation	See Note 1 below		Yes Rotate Page	1.0 job-rotation x.x document- rotation x.x po-rotation	??	Yes
imposition-template	IEEE-ISTO 5100.3		No		1.2	Yes
impressions-completed-current-copy (S)	IPP: Job Progress Attributes		No		No	No
insert-sheet	IEEE-ISTO	Yes ?	Yes Insert	1.0 job-insert-sheets	1.2	Yes

IPP Attribute	IPP Spec	JDF 1.1 Product Intent	OSDP JDF Spec	JTAPI	CUPS	JDF 1.0 App F
insert-after-page-number insert-count media media-col	5100.3	InsertSheet/ @Folio, et. Al.? ?	Sheet	x.x document-insert-sheets 1.0 insert-sheet-pages 1.0 insert-sheet-position 1.0 insert-sheet-copies 1.0 insert-sheet-media 1.0 insert-sheet-media		
ipp-attribute-fidelity	RFC 2911	<any JDF node>/ @SettingsPolicy	No	1.0 jt-mandatory-attributes	1.1	Yes
job-account-id	IEEE-ISTO 5100.3	CustomerInfo/ @BillingCode	Yes Billing Code	1.0 job-billing-code	1.2	Yes
job-accounting-sheets job-accounting-sheets-type media media-col job-accounting-output-bin	IEEE-ISTO 5100.3		No		1.2	Yes Yes Yes No
job-accounting-user-id	IEEE-ISTO 5100.3	CustomerInfo/ @CustomerID	No		1.2	Yes
job-collation-type (S)	IPP: Job Progress Attributes		No	1.0 job-collate	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	1.0 job-hold	1.1	Yes
job-id (S)	RFC 2911		Yes Job ID	x.x 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

IPP Attribute	IPP Spec	JDF 1.1 Product Intent	OSDP JDF Spec	JTAPI	CUPS	JDF 1.0 App F
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	1.0 job-name	1.1	Yes
job-originating-user-name (S)	RFC 2911		Yes Job Created By	1.0 job-created-by	1.1	No
job-printer-uptime (S)	RFC 2911		No		1.1?	No
job-printer-uri (S)	RFC 2911		No		1.1	No
job-priority	RFC 2911	NodeInfo/ @JobPriority	Yes Job Priority	1.0 job-priority	1.1	Yes
job-recipient-name	See Note 1 below		No		??	Yes
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	1.0 job-separator-sheets 1.0 separator-sheet-media 1.0 separator-sheet-type	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
media	RFC 2911	MediaIntent/ @ID	Yes Input Tray Name	1.0 media-input-tray-name	1.1	No
media-col	IEEE-ISTO 5100.3		Yes Media	1.0 job-media x.x document-media x.x po-media	1.2	Yes
media-key	IEEE-ISTO 5100.3	MediaIntent/ @ID	Yes	1.0 media-name	1.2	Yes

IPP Attribute	IPP Spec	JDF 1.1 Product Intent	OSDP JDF Spec	JTAPI	CUPS	JDF 1.0 App F
media-type	IEEE-ISTO 5100.3	MediaIntent/ @UserMediaType, @MediaType ??, @MediaUnit ??, or @StockType??	Yes	1.0 media-type	1.2	Yes
media-info	IEEE-ISTO 5100.3	MediaIntent/ @DescriptiveName (?)	Yes		1.2	Yes
media-color	IEEE-ISTO 5100.3	MediaIntent/ @MediaColor	Yes	1.0 media-color	1.2	Yes
media-pre-printed	IEEE-ISTO 5100.3	MediaIntent/ @Preprinted	Yes		1.2	Yes
media-hole-count	IEEE-ISTO 5100.3	[MediaIntent/ @HoleCount – Deprecated!]	Yes	1.0 media-hole-count	1.2	Yes
media-order-count	IEEE-ISTO 5100.3	MediaIntent/ @MediaSetCount	Yes	1.0 media-set-count	1.2	Yes
media-size	IEEE-ISTO 5100.3	MediaIntent/ @Dimensions	Yes		1.2	Yes
x-dimension	IEEE-ISTO 5100.3			1.0 media-x-dimension	1.2	Yes
y-dimension	IEEE-ISTO 5100.3			1.0 media-y-dimension	1.2	Yes
media-weight-metric	IEEE-ISTO 5100.3	MediaIntent/ @Weight	Yes	1.0 media-weight	1.2	Yes
media-back-coating	IEEE-ISTO 5100.3	MediaIntent/ @BackCoatings	Yes		1.2	Yes
media-front-coating	IEEE-ISTO 5100.3	MediaIntent/ @FrontCoatings	Yes		1.2	Yes
media-recycled	IEEE-ISTO 5100.3	MediaIntent/ @Recycled	Yes		1.2	Yes
media-input-tray-check	IEEE-ISTO 5100.3		No		1.2	No
multiple-document-handling	RFC 2911		Yes	1.0 job-collate	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	1.0 job-number-up x.x document- number-up x.x po-number-up	1.1	Yes
notify-xxx attributes: notify-recipient-uri	IPP Event Notifications and Subscriptions		Notification Yes	1.0 job-notifications 1.0 notification- send-to	No	No
notify-pull-method			No			

IPP Attribute	IPP Spec	JDF 1.1 Product Intent	OSDP JDF Spec	JTAPI	CUPS	JDF 1.0 App F
notify-events			Yes	1.0 notification-events		
notify-attributes			No			
notify-user-data			Yes?	1.0 notification-comment		
notify-charset			No			
notify-natural-language			Yes	1.0 notification-language		
notify-time-interval			No			
notify-lease-duration			No			
notify-subscription-id (S)			No			
notify-sequence-number (S)			No			
notify-lease-expiration-time (S)			No			
notify-printer-up-time (S)			No			
notify-printer-uri (S)			No			
notify-job-id (S)			No			
notify-subscriber-name (S)			No			
operation-id	RFC 2911		No		1.1	No
orientation-requested	RFC 2911	[LayoutIntent/ @FinishedPageOrientation -- Deprecated]	Yes Rotate Page	1.0 job-rotation x.x document-rotation x.x po-rotation	1.1	Yes
output-bin	IEEE-ISTO 5100.2		Yes Output Bin Name	1.0 job-output-bin-name x.x document-output-bin-name x.x po-output-bin-name	No	Yes
output-device-assigned (S)	RFC 2911		No		1.1	No
page-delivery	IEEE-ISTO 5100.3		Yes Page Delivery	1.0 job-page-delivery	1.2	Yes
page-order-received	IEEE-ISTO 5100.3		No		1.2	Yes
page-overrides	IEEE-ISTO 5100.4		No	x.x job-page-overrides x.x document-page-overrides	No??	Yes
input-documents						
document-copies						
pages						
sides						
media						
<any other document attr.>						
or						

IPP Attribute	IPP Spec	JDF 1.1 Product Intent	OSDP JDF Spec	JTAPI	CUPS	JDF 1.0 App F
output-documents document-copies pages sides media <any other document attr.>				x.x po-pages see sides see media		
page-ranges	RFC 2911		Yes Range of Pages to Process	1.0 job-output-pages x.x document-output-pages	1.1	Yes
pages-per-subset	IEEE-ISTO 5100.4		No		No	Yes
presentation-direction	RFC 2911		No		No	Yes
presentation-direction-number-up	IEEE-ISTO 5100.3		No		1.2	No Yes ³
printer-resolution	RFC 2911		No		1.1	Yes
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	1.0 job-submit-id	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	1.0 job-separator-sheets 1.0 separator-sheet-type 1.0 separator-sheet-media	1.2	Yes
sheet-collate	IPP: Job Progress Attributes		Yes Collate	1.0 job-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	Yes Sides	1.0 job-sides x.x document-sides x.x po-sides	1.1	Yes

³ 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	JTAPI	CUPS	JDF 1.0 App F
		two-sided values.)				
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		Yes Fit Policy		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 Side	1.0 job-image-shift- front-x x.x document- image-shift- front-x x.x po-image-shift- front-x	1.2	Yes
x-side2-image-shift	IEEE-ISTO 5100.3		Yes Image Shift Back Side	1.0 job-image-shift- back-x x.x document- image-shift- back-x x.x po-image-shift- back-x	1.2	Yes
y-image-position	IEEE-ISTO 5100.3		Yes Fit Policy		1.2	Yes
y-image-shift	IEEE-ISTO 5100.3		No		1.2	Yes
y-side1-image-shift	IEEE-ISTO 5100.3		Yes Image Shift Front Side	1.0 job-image-shift- front-y x.x document- image-shift- front-y x.x po-image-shift- front-y	1.2	Yes
y-side2-image-shift	IEEE-ISTO 5100.3		Yes Image Shift Back Side	1.0 job-image-shift- back-y x.x document- image-shift- back-y x.x po-image-shift- back-y	1.2	Yes
			Yes Comment/ Description of	1.0 job-comment		

IPP Attribute	IPP Spec	JDF 1.1 Product Intent	OSDP JDF Spec	JTAPI	CUPS	JDF 1.0 App F
			Job			
			Yes Notification (osdp:Locator)	1.0 notification-delivery-type		
			Yes Range of Pages	1.0 job-include-pages x.x document-include-pages		
			Yes Destination or Physical Printer Requested	1.0 job-destination-name x.x document-destination-name x.x po-destination-name		
			Yes Folding	x.x folding-amount-to-fold x.x folding-direction-to-fold x.x folding-edge-to-fold x.x folding-fold-type		

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 \[ftp://ftp.pwg.org/pub/pwg/ipp/new_PPE/pwg-ipp-prod-print-set2-draft-v0_1-020821.pdf\]\(ftp://ftp.pwg.org/pub/pwg/ipp/new_PPE/pwg-ipp-prod-print-set2-draft-v0_1-020821.pdf\).](#)

2 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 Billing Code

CUPS Attribute	OSDP JDF Spec
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

3 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-key member attribute	Yes 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

4 References

CUPS

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

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.

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", 3382, September 2002.

RFC

Job Ticket API (JTAPI)

Free Standards Group (FSG) Open Print Job Ticket Working Group – September 2002 work in progress