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## 5 6 The Printer Working Group (PWG) 7 Standard for 8 The Internet Printing Protocol (IPP): 9 Job Extensions 10

11 **Abstract:** This IPP specification extends the Job semantics of the IPP Model and Semantics [rfc2911] object model.  
12 This specification defines some new Operation attributes for use in Job Creation and Document Creation operations.  
13 The Printer copies these Operation attributes to the corresponding Job Description attributes, which the clients may  
14 query. The Document Creation Operation attributes describe the Document Content and permit the Printer to reject  
15 requests that it cannot process correctly. Some corresponding "xxx-default" and "xxx-supported" Printer attributes  
16 are defined. This specification defines some Job Template attributes that apply to a multi-document Job as a whole.  
17 This specification also defines some additional values for the "job-state-reasons" Job Description attribute. Each of  
18 the attributes defined in this specification are independent of each other and are OPTIONAL for a Printer to support.  
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Working Draft, June 4, 2003

# The Printer Working Group (PWG) Standard for The Internet Printing Protocol (IPP): Job Extensions

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[ftp://ftp.pwg.org/pub/pwg/ipp/new\\_JOBX/wd-ippjobx10-20030604.pdf](ftp://ftp.pwg.org/pub/pwg/ipp/new_JOBX/wd-ippjobx10-20030604.pdf), .doc, .rtf

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83 work together better. All references to the PWG in this document implicitly mean "The Printer Working Group, a  
84 Program of the IEEE ISTO." In order to meet this objective, the PWG will document the results of their work as open  
85 standards that define print related protocols, interfaces, procedures and conventions. Printer manufacturers and  
86 vendors of printer related software will benefit from the interoperability provided by voluntary conformance to these  
87 standards.

88 In general, a PWG standard is a specification that is stable, well understood, and is technically competent, has  
89 multiple, independent and interoperable implementations with substantial operational experience, and enjoys  
90 significant public support.

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92

93

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99 2) leave the subject line blank

100 3) put the following two lines in the message body:

101 subscribe ipp

102 end

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104 discussions of clarifications or review of registration proposals for additional names. Requests for additional  
105 extensions, for inclusion in this specification, should be sent to the IPP Mailing list for consideration. In order to  
106 reduce spam the mailing list rejects mail from non-subscribers, so you must subscribe to the mailing list in order to  
107 send a question or comment to the mailing list.

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## 223 1 Introduction and Summary

224 This IPP specification extends the Job semantics of the IPP Model and Semantics [rfc2911] object model. This  
 225 specification defines some new Operation attributes for use in Job Creation and Document Creation operations. The  
 226 Printer copies these Operation attributes to the corresponding Job Description attributes, which the clients may  
 227 query. The Document Creation Operation attributes describe the Document Content and permit the Printer to reject  
 228 requests that it cannot process correctly. Some corresponding "xxx-default" and "xxx-supported" Printer attributes  
 229 are defined. This specification defines some Job Template attributes that apply to a multi-document Job as a whole.  
 230 This specification also defines some additional values for the "job-state-reasons" Job Description attribute. Each of  
 231 the attributes defined in this specification are independent of each other and are OPTIONAL for a Printer to support.

232 The intent is to propose this specification as an IPP extension and which will be referenced as part of the PWG  
 233 Semantic Model. The purpose for these extensions is so that the print industry can have a common semantic  
 234 specification for use in IPP, the PWG Semantic Model [pwg-sm], the PWG Print Service Interface (PSI) project [pwg-  
 235 psi], the PWG IPP Fax (IPPFAX) project [ippfax], and the Free Standards Group Job Ticket API [fsg-jt]. Note: There  
 236 are a number of footnotes that relate this IPP specification to the IPP Document Object extension [ippdoc].

### 237 1.1 Scope

238 Table 1 summarizes the Operation attributes defined in this specification for use with Job Creation operations. The  
 239 Printer copies these Operation attributes to corresponding Job Description attributes defined in this specification.

240 **Table 1 - Summary of Job Creation Operation attributes**

Operation attribute	Printer support	Description
ipp-attribute-fidelity (boolean)	MUST	Allows the client to indicate whether or not the Printer MUST support all Job Template attributes supplied in Job Creation operations or MUST reject the job. Defined in [rfc2911] section 3.2.1.2 and 15.
job-mandatory-attributes (1setOf type2 keyword)	MAY	Allows the client to list the Job Template attributes that the Printer MUST support when supplied in Job Creation operations or MUST reject the job.
output-device (name(127))	MAY	Allows the client to indicate a preference for output devices, for a Printer that supports one or more output device (see fanout in [rfc2911] section 2.1).

241 Table 2 summarizes the Operation attributes defined in this specification for use with Job Creation operations and  
 242 Send-Document and Send-URI operations. These Operation attributes allow the client to supply descriptions of the  
 243 Document Content to the Printer about individual Document Contents at request time. When supplied in a Job  
 244 Creation request, these Operation attributes provide defaults for the Document or Documents of the Job. When  
 245 supplied in a Document Creation operation, they describe the Document explicitly. This specification does *not* define  
 246 corresponding Document Description attributes, since this specification does not include or depend on a Document  
 247 object<sup>1</sup>.  
 248

<sup>1</sup> For Document Description attributes that correspond to the Operation attributes defined for Document Creation operations, see the Document object defined in [ippdoc].



249

**Table 2 - Summary of Job and Document Creation Operation attributes**

Operation attribute	Printer support	Description
document-charset (charset)	MAY	The charset of the Document content
document-digital-signature (type2 keyword)	MAY	The type of digital signature, if any, used in the Document Content.
document-format-details (1setOf collection)	MAY	The details of the Document Content, including when it's a package of files (e.g., zip, multipart/related). The details include information, such as the application and the operating system that created the document, the intended device type (when the format is device-dependent), and the natural languages of the document.
document-format-version (text(127))	MAY	The version of the document format.
document-format-natural-language (naturalLanguage)	MAY	The primary natural language of the Document Content.

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Table 3 summarizes the Job Template attributes defined in this specification for use with Job Creation operations. These Job Template attributes are defined to apply to the Job as a whole, independent of the value of the "multiple-document-handling" Job Template attribute ([rfc2911] section 4.2.4), whose 'separate-documents-collated-copies' and 'separate-documents-uncollated-copies' values cause the Printer to produce separate Output Documents.

256

**Table 3 - Summary of Job Template Attributes**

Job Template attribute	Printer support	Description
job-copies (integer(1:MAX))	MAY	The number of copies of the entire Job.
job-cover-back (collection)	MAY	The cover for the back of the entire Job.
job-cover-front (collection)	MAY	The cover for the front of the entire Job.
job-finishings (1setOf type2 enum)	MAY	The finishing for the entire Job.
job-finishings-col (1setOf collection)	MAY	The finishing characteristics for the entire Job.

## 257 **2 Terminology**

258 This section defines terminology used throughout this document.

### 259 **2.1 Conformance Terminology**

260 Capitalized terms, such as **MUST**, **MUST NOT**, **REQUIRED**, **SHOULD**, **SHOULD NOT**, **MAY**, and **OPTIONAL**, have  
261 special meaning relating to conformance as defined in RFC 2119 [rfc2119].

### 262 **2.2 Other Terminology**

263 This document uses the same terminology as [rfc2911], such as "client", "Printer"<sup>2</sup>, "attribute", "attribute value",  
264 "keyword", "Job Template attribute", "Operation attribute", "operation", "request", "response", and "support"

<sup>2</sup> [rfc2911] uses the terms "Printer object" and "Printer" interchangeably to mean the same thing. For simplicity, this document uses the term "Printer" exclusively, except for definitions copied directly from [rfc2911]. Nonetheless, the intent is as in [rfc2911]: a Printer is an object that MAY be hosted in the device or in a server.

265 (see [rfc2911] section 12.2.3) with the same meaning. In addition, the following terms are defined for use in this  
266 document:

267 **Document Creation operation** - operations that accept Document Content. Specifically: Print-Job, Print-URI, Send-  
268 Document and Send-URI. Note: Print-Job and Print-URI are both **Job Creation** and **Document Creation**  
269 operations.

270 **Finished Document** - the result that the Printer produces on **Sheets** after the operations of printing, folding, cutting,  
271 finishing, etc. are completed.

272 **Job Attribute** - an **Operation attribute** or a **Job Template** attribute that applies to the Job (object) as a whole. For  
273 example, "job-name" is an **Operation attribute** and "job-priority" is a **Job Template attribute**.

274 **Job Creation operation** - operations that create Job objects, specifically: Print-Job, Print-URI, and Create-Job as  
275 defined in [rfc2911].

276 **Operation attribute** - an attribute supplied by a client in the Operation Attribute group of a request in order to affect  
277 the behavior of the operation or an attribute returned by the Printer in the Operation Attributes group in an operation  
278 response in order to report the results of the operation. For some Operation attributes, the Printer copies the values  
279 supplied by the client to corresponding Job Description attributes.

280 **Page** - The term "Page" used throughout this document is a synonym for PDL page.

281 **PDL Page** - A "PDL Page" is a page according to the definition of pages in the language used to express the  
282 document data. Note: If the PDL contains multiple original source pages that have been placed on a single page by  
283 the client application, then the PDL page count is one. On the other hand, if the client requests that multiple PDL  
284 Pages are placed on a single side of media, by supplying "number-up" with a value greater than 1, then the PDL  
285 page count will be more than one. [rfc2911] uses the term "print stream page" for PDL Page.

286 **Sheet** - A Sheet is the unit of media that a printer puts marks on. It is the most basic unit of output from a printer. A  
287 printer may mark on one side or on both sides of a sheet.

### 288 3 Operation Attributes for Job Creation and Document Creation operations

289 This section defines Operation attributes for use in Job Creation operations and/or Document Creation operations  
290 and as such describe characteristics of the Job and Document, rather than instructions to the Printer. For some of  
291 these Operation attributes there are corresponding "xxx-default" and "xxx-supported" Printer Description attributes  
292 (see section 7).

293 Table 4 lists the Operation attributes and their attribute syntaxes supplied in Job Creation and Document Creation  
294 operations and the attribute syntaxes of their corresponding "xxx-default" and "xxx-supported" Printer Description  
295 attributes, if any. A "-" indicates that there isn't an "xxx-default" or "xxx-supported" Printer Description attribute.

296 **Table 4 - Operation, Default, and Supported Attributes**

<b>Operation attribute:</b> attribute name "xxx"	Operation attribute syntax	Printer: Default Value attribute syntax "xxx-default"	Printer: Supported Values attribute syntax "xxx-supported"
<b>document-charset</b>	charset	charset	1setOf charset
<b>document-digital-signature</b>	type2 keyword	type2 keyword	1setOf type2 keyword
<b>document-format</b>	mimeMediaType	mimeMediaType	1setOf mimeMediaType

<b>Operation attribute: attribute name "xxx"</b>	Operation attribute syntax	Printer: Default Value attribute syntax "xxx-default"	Printer: Supported Values attribute syntax "xxx-supported"
<b>document-format-details</b>	1setOf collection	1setOf collection	1setOf type2 keyword
<b>document-source-application-name</b>	name(MAX)	name(MAX)	-
<b>document-source-application-version</b>	text(127)	text(127)	-
<b>document-source-os-name</b>	name(40)	name(40)	-
<b>document-source-os-version</b>	text(40)	text(40)	-
<b>document-format</b>	mimeMediaType	mimeMediaType	-
<b>document-format-device-id</b>	text(127)	text(127)	-
<b>document-format-version</b>	text(127)	text(127)	-
<b>document-natural-language</b>	naturalLanguage	naturalLanguage	-
<b>document-format-version</b>	text(127)	text(127)	1setOf text(127)
<b>document-natural-language</b>	naturalLanguage	naturalLanguage	1setOf naturalLanguage
<b>document-message</b>	Text(MAX)	-	-
<b>document-natural-language</b>	naturalLanguage	-	-
<b>ipp-attribute-fidelity</b>	boolean	-	-
<b>job-mandatory-attributes</b>	1setOf type2 keyword	-	-
<b>output-device</b>	name(127)	-	1setOf name(127)

297 Table 5 lists the Operation attributes that clients supply in Job and Document Creation operations and whether the  
 298 Printer copies (indicated by "⇒") the supplied value to the corresponding Job Description<sup>3</sup> attribute. The following  
 299 statements apply to all Operation attributes for Job and Document Creation operations and are *not* repeated in each  
 300 Operation attribute Description:

301 If the Printer doesn't support the "xxx" Operation attribute, the Printer MUST ignore the "xxx" attribute (as  
 302 with any OPTIONAL Operation attribute) and return the "xxx" attribute with the supplied value as  
 303 unsupported in the Unsupported Attributes group as specified in [rfc2911] section 3.1.7.

304 If the Printer supports the "xxx" Operation attribute, the Printer MUST also:

- 305 1. support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if  
 306 defined (see Table 4 and section 7). If the Printer supports either of the "xxx-default" or "xxx-  
 307 supported" Printer Description attributes, then the Printer MUST also support the corresponding  
 308 Operation attribute.
- 309 2. validate the values supplied by the client in the "xxx" Operation attribute against the values indicated  
 310 in the Printer's corresponding "xxx-supported" Printer Description attribute (see section 7). If the  
 311 values do not validate, the Printer MUST perform one of the actions indicated for that Operation  
 312 attribute, unless explicitly specified otherwise in the Description, such as (1) reject the request, (2)  
 313 accept the request and either (a) hold the job for operator intervention or (b) print the Job ignoring  
 314 the attribute. In all of these cases, the Printer MUST return the Operation attribute with the  
 315 unsupported value in the Unsupported Attributes group in the response (see [rfc2911] section 3.1.7).

<sup>3</sup> The operations defined for Document Creation operations do not have corresponding Document Description attributes defined in this specification, since this specification does not assume that there is a Document object. See [ippdoc] for the corresponding Document Description attributes.

<b>Legend:</b>	
<b>“Operation”</b>	column indicates the operation attribute names for Job and Document Creation requests.
<b>“*”</b>	Following attribute name indicates value sent on Create-Job, Print-Job and Print-Uri is the default for all the Documents in the Job.
<b>“Creation operations”</b>	column indicates which operations the Operation attribute can be supplied in: PJ=Print-Job, PU=Print-URI, CJ=Create-Job, SD=Send-Document, and SU=Send-URI.
<b>“y”</b>	the Operation attribute is defined for use with the indicated operations.
<b>“y⇒”</b>	the Operation attribute is defined for use with the indicated operations and has a corresponding Job Description attribute (see section 5) defined that the Printer MUST support and to which the Printer MUST copy this Operation attribute, if it supports the Operation attribute. See Table 4 for whether there are corresponding “xxx-default” and “xxx-supported” Printer Description attributes defined. <b>ISSUE 01: OK to make corresponding Job Description attributes that are default Document Description attributes as indicated below with y⇒ highlighted in yellow in the CJ and PJ,PU columns?</b>
<b>“-”</b>	the Operation attribute is <i>not</i> defined for the indicated operation.
<b>“Conformance”</b>	column indicates the conformance requirements for what the client supplies in a request and the Printer supports in a request. <b>For (indented) member attributes, a MUST means if the collection attribute is supplied or supported.</b>
<b>“Section”</b>	column indicates where the Operation attribute is defined in this spec.

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**Table 5 - Operation Attributes supplied in Job and Document Creation Requests**

Operation attribute name	Attribute Syntax	Creation operations			Conformance		Section
		CJ	PJ, PU	SD, SU	Client supply	Printer support	
document-charset*	charset	y⇒	y⇒	y	MAY	MAY	§3.2.1
document-digital-signature*	type2 keyword	y⇒	y⇒	y	MAY	MAY	§3.2.2
document-format*	mimeMediaType	y⇒	y⇒	y	MAY	MUST	§3.2.3
document-format-details*	1setOf collection	y⇒	y⇒	y	MAY	MAY	§3.2.4
document-source-application-name*	name(MAX)	y⇒	y⇒	y	MAY	MAY	§3.2.4.1
document-source-application-version*	text(127)	y⇒	y⇒	y	MAY	MAY	§3.2.4.2
document-source-os-name*	name(40)	y⇒	y⇒	y	MAY	MAY	§3.2.4.3
document-source-os-version*	text(40)	y⇒	y⇒	y	MAY	MAY	§3.2.4.4
document-format*	mimeMediaType	y⇒	y⇒	y	MUST	MUST	§3.2.4.5
document-format-device-id*	text(127)	y⇒	y⇒	y	MAY	MAY	§3.2.4.6
document-format-version*	text(127)	y⇒	y⇒	y	SHOULD	MUST	§3.2.4.7
document-natural-language*	naturalLanguage	y⇒	y⇒	y	MAY	MAY	§3.2.4.8
document-format-version*	text(127)	y⇒	y⇒	y	MAY	MAY	§3.2.5
document-message*	text(MAX)	y⇒	y⇒	y	MAY	MAY	§3.2.6
document-name*	name(MAX)	y⇒	y⇒	y	MAY	MUST	§3.2.7
document-natural-language*	naturalLanguage	y⇒	y⇒	y	MAY	MAY	§3.2.8
ipp-attribute-fidelity	boolean	y⇒	y⇒	-	MAY	MUST	§3.1.1,
job-mandatory-attributes	1setOf type2 keyword	y⇒	y⇒	-	MAY	MAY	§3.1.2

Operation attribute name	Attribute Syntax	Creation operations			Conformance		Section
		CJ	PJ, PU	SD, SU	Client supply	Printer support	
output-device*	name(127)	y⇒	y⇒	-	MAY	MAY	§Error! Reference source not found.

318

319 **3.1 Operation attributes for Job Creation operations only**

320 This section defines additional operation attributes that the client MAY supply in Job Creation operations (Print-Job,  
321 Print-URI, and Create-Job) and Validate-Job, but not in Send-Document or Send-URI operations.

322 **3.1.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)**

323 This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1) when the client  
324 supplies unsupported Job Template attributes<sup>4</sup> or values in a Job Creation operation. The value 'true' indicates that  
325 total fidelity to client-supplied Job Template attributes and values is required for this Job Creation operation. If the  
326 client supplies the value 'false' or omits the attribute, then the Printer MUST accept the Job Creation operation.

327 The Printer MUST copy this attribute to the corresponding (new) Job Description attribute (see section 5.1.2).

328 **3.1.1.1 Why there are no “ipp-attribute-fidelity-default” and “ipp-attribute-fidelity-supported” attributes**

329 Because [rfc2911] defines the default value to be 'false' there is no point to define an “ipp-attribute-fidelity-default”  
330 Printer Description attribute. Because [rfc2911] REQUIRES a Printer to support the “ipp-attribute-fidelity” Operation  
331 attribute there is no need for an “ipp-attribute-fidelity-supported” Printer Description attribute.

332 **3.1.2 job-mandatory-attributes (1setOf type2 keyword)**

333 This OPTIONAL Operation attribute permits the client to identify which Job Template attributes the Printer MUST  
334 support in this Job Creation request in order to accept the Job. The Printer MUST reject this Job Creation operation  
335 if the client supplies an unsupported Job Template attribute or value in the request that is also identified in this list.  
336 The client MAY supply the “job-mandatory-attributes” Operation attribute in a Job Creation operation or Validate-Job  
337 operation and MUST NOT supply this attribute in any other operation. If the Printer supports the “job-mandatory-  
338 attributes” Operation attribute, the Printer MUST support this attribute in all Job Creation operations that it supports  
339 and in the Validate-Job operation.

340 If the client supplies the “job-mandatory-attributes” Operation attribute and the ‘ipp-attribute-fidelity’ Operation  
341 attribute with the ‘true’ value, the Printer MUST ignore the “job-mandatory-attributes”, since the client is requesting  
342 that all of the supplied Job Template attributes in the Job Creation request MUST be supported in order for the  
343 Printer to accept the Job.

---

<sup>4</sup> The value of the “ipp-attribute-fidelity” Operation attribute has no effect on other *Operation* attributes supplied by the client, only on Job Template attributes supplied by the client.

344 The Printer MUST copy this attribute to the corresponding "job-mandatory-attributes" Job Description attribute (see  
345 section 5.1.3) for auditing and trouble-shooting purposes<sup>5</sup>.

346 The values of the "job-mandatory-attributes" attribute are the keyword attribute names that identify Job Template  
347 attributes; for example, 'job-hold-until', 'job-finishings' (see section 4.1.4), 'copies' and 'media'. In order to identify a  
348 member attribute of a collection attribute, the keyword names of both the collection attribute and the member  
349 attribute are given separated by a period (.) character. For example, to make the "media" attribute of the "cover-  
350 front" collection attribute mandatory, supply the keyword value: 'cover-front.media'.

351 The Printer MUST accept *any* keyword values for the "job-mandatory-attributes" attribute itself whether or not the  
352 corresponding Job Template attributes are supported by the Printer and MUST NOT return any unsupported  
353 keywords in the Unsupported Attributes Group in the response. If the client supplies this "job-mandatory-attributes"  
354 Operation attribute in a Job Creation operation with values that represent Job Template attributes that the Printer  
355 doesn't support, the Printer MUST otherwise accept the attribute anyway. The Printer MUST reject this Job Creation  
356 only if the client *actually supplies* any of the identified Job Template attributes that the Printer doesn't support.  
357 Because the Printer doesn't reject when the "job-mandatory-attributes" Operation attribute has unsupported attribute  
358 keyword names, the client MAY supply all of the attribute keyword names that the client supports without having to  
359 tailor the list to the particular Printer to which the client is submitting the Job Creation operation, thereby simplifying  
360 client use of this attribute.

361 Note: The "job-mandatory-attributes" has nothing to do with whether the Printer overrides the PDL with the identified  
362 Job Template attributes (see [rfc2911] sections 4.4.28 and 15).

### 363 **3.1.2.1 Why there are no "job-mandatory-attributes-default" and "job-mandatory-attributes-supported"** 364 **Printer Description attributes**

365 By definition, omission of the "job-mandatory-attributes" Operation attribute (and the "ipp-attribute-fidelity" Operation  
366 attribute with a 'false' value or omitted) means that the client is requesting that none of the supplied Job Template  
367 attributes need to be supported in order to accept the Job, i.e., the Printer MUST NOT reject the job because of any  
368 unsupported Job Template attributes. So the default is an empty list, so there is no point to have a "job-mandatory-  
369 attributes-default" Printer attribute.

370 By definition, the client can supply any Job Template attribute in the value list of the "job-mandatory-attributes"  
371 Operation attribute, whether or not the Printer actually supports that Job Template attribute. Therefore, it is not  
372 possible to have a "job-mandatory-attributes-supported" list, since all possible keywords would have to be expressed.

373 Note: the client MAY query the Printer's "job-creation-attributes-supported" (see [ippsave] section 7.1) and  
374 "document-creation-attributes-supported" (see [ippdoc] section 10.1) to see which Job Template and Document  
375 Template attributes the Printer actually supports.

## 376 **3.2 Operation attributes for both Job and Document Creation operations**

377 This section defines the semantics for the Operation attributes that a client MAY supply in a Job Creation operation  
378 (Print-Job, Print-URI, Create-Job) or a Document Creation operation (Print-Job, Print-URI, Send-Document and  
379 Send-URI). Note: Print-Job and Print-URI are both Job Creation and Document Creation operations.

### 380 **3.2.1 document-charset (charset)**

381 This OPTIONAL Operation attribute identifies the charset of the Document Content. This Operation attribute is  
382 intended to be supported by Printers that support a document-format in which the charset may be ambiguous in the

---

<sup>5</sup> The Printer uses the "job-mandatory-attributes" Job Description attribute for validating subsequent Document Template attributes supplied in Send-Document and Send-URI operations for this job when also supporting [ippdoc], where the client can supply Document Template attributes.

383 Document content, such as 'application/vnd.hp-PCL', where the charset escape sequence MAY be omitted from the  
384 data.

385 If a client supplies the "document-charset" Operation attribute in a Document Creation operation with a value that the  
386 Printer doesn't support, the Printer MUST reject the job and return the status code: 'client-error-charset-not-  
387 supported' (see [rfc2911] section 3.1.4.14), since the interpretation of the content will be mis-understood by the  
388 Printer.

389 The standard values for these attributes are Internet Media types (sometimes called MIME types). For further details  
390 see the description of the 'mimeMediaType' attribute syntax in [rfc2911] section 4.1.9.

391 The Printer MUST support this attribute if it supports a document format for which the Document Content can be  
392 ambiguous with respect to the charset being used to encode the data. For example, the 'application/vnd.hp-PCL'  
393 MAY omit the charset escape sequence. Although [rfc2854] strongly RECOMMENDS that 'text/html', include a ";  
394 charset=charset" parameter in the MIME type itself (that is, explicitly in the value of the "document-format" attribute),  
395 often the charset= parameter is not present in the MIME type and the Printer MUST assume a charset. Thus a  
396 Printer that supports the text/html MIME type MUST support the "document-charset" operation attributes. Also many  
397 text files use the various 8-bit ISO 8859 charsets in which the lower half is US-ASCII and the upper half is various  
398 Latin sets (about 8 or 9), Greek, Cyrillic, Hebrew, and Arabic. Shift JIS is another example where the left half is US-  
399 ASCII, but the right half can be one of a number of things. But if the data doesn't contain the charset escape  
400 sequences, this attribute can help the Printer know what the charset is in the Document. Such document formats are  
401 called "charset-ambiguous" document formats. Finally, even though [rfc2046] REQUIRES the "; charset=" MIME  
402 type parameter if the file contains other than US-ASCII, in practice, the "; charset=" MIME type parameter is often  
403 omitted, thus making 'text/plain' a charset-ambiguous document format. See the discussion in [rfc2911] section 4.1.9  
404 and [rfc2046].

405 The Printer MAY also check the Document content while processing to see that the document data meets the coding  
406 requirements for the supplied charset. If the data contains something that is outside the charset encoding, the  
407 Printer MUST either (1) hold the job or (2) abort, and SHOULD NOT continue printing square boxes for encoded  
408 characters that are outside the charset supplied by the client.

409 Many other document formats, such as 'application/postscript' and 'application/pdf', are *not* charset-ambiguous, so  
410 that Printers that support only such formats MAY omit support of the "document-charset" Operation/ Description  
411 attributes.

412 If the Printer supports the "document-charset" Operation attribute, it MUST also support the corresponding  
413 "document-charset-default" and "document-charset-supported" Printer Description attributes as well and vice versa  
414 (see sections 7.1 and 7.2).

### 415 **3.2.2 document-digital-signature (type2 keyword)**

416 This OPTIONAL Operation attribute identifies the technology of digital signature in the Document content.

417 If a client supplies this "document-digital-signature" Operation attribute in a Document Creation operation with a  
418 value that the Printer doesn't support, the Printer MUST perform one of the following actions depending on  
419 implementation: (1) reject the request OR (2) accept the request, set the Job's "job-state-reasons" attribute to  
420 'digital-signature-type-not-supported' (see section 6.1), and either (a) put the Job in the 'pending-held' state or (b)  
421 process the job ignoring the attribute. See section 3 above for more details.

422 If the Printer supports this attribute and the value supplied by the client, the Printer MAY verify the signature  
423 according to the rule for that signature format and "document-format". If the signature does not verify, then the  
424 Printer MUST perform one of the following actions depending on implementation (which MAY depend on the  
425 "document-format" and a site-established policy):

- 426 1. ignore the signature (and MAY indicate on the printed output some how) and MUST set the Job's "job-state-  
427 reasons" Job Description attribute with the 'digital-signature-did-not-verify' value (see section 6.1).
- 428 2. put the job on hold and wait for human intervention and MUST set the Job's "job-state-reasons" Job  
429 Description attribute with the 'job-digital-signature-wait' and 'digital-signature-did-not-verify' values (see  
430 section 6.1), OR
- 431 3. abort the job depending on implementation and/or site configuration and MUST set the Job's "job-state-  
432 reasons" Job Description attribute with the 'job-aborted-by-system' and 'digital-signature-did-not-verify'  
433 values (see section 6.1).

434 Different PDLs have different techniques of embedding the signature. If the Printer supports the "document-digital-  
435 signature" attribute and the supplied "document-format", the Printer MUST accept the document. However, if the  
436 Printer either doesn't support the value of the "document-digital-signature" Operation attribute or doesn't support the  
437 technique used by the supplied "document-format" attribute, the Printer MUST either (1) ignore the signature or (2)  
438 put the job on hold and wait for human intervention, depending on implementation. If the Printer doesn't support the  
439 supplied value, the Printer MUST return the "document-digital-signature" attribute with its value as unsupported in the  
440 Unsupported Attributes group as specified in [rfc2911] section 3.1.7.

441 The following standard keyword values are defined:

442 'dss': Digital Signature Standard (DSS) [dss].

443 'none': There is not a digital signature in the Document content. If this attribute is supported, the 'none'  
444 value MUST be implemented but MAY be removed by the administrator.

445 'pgp': PGP Message Exchange Formats [rfc1991].

446 'smime': Enhanced Security Services for S/MIME [rfc2634].

447 'xmldsig' XML Digital Signature [xmldsig].

### 448 3.2.3 document-format (mimeMediaType)

449 This REQUIRED Operation attribute (see [rfc2911] section 3.2.1.1) indicates the document format of the supplied  
450 Document Content. If a client supplies the "document-format" Operation attribute with a value that the Printer doesn't  
451 support, the Printer MUST reject the job and return the status code 'client-error-document-format-not-supported' (see  
452 [rfc2911] section 3.1.4.11), since the Printer cannot process the data.

453 The standard values for this attribute are Internet Media types (sometimes called MIME types). For some MIME  
454 types, such as 'text/plain' [rfc2046], the "; charset=" parameter is defined which specifies the charset of the Document  
455 content. The Printer MUST support the charset MIME parameter as well as the "document-charset" Operation  
456 attribute (section 3.2.1) if the Printer supports any text MIME type, such as 'text/plain' or 'text/html'. For further  
457 details see the description of the 'mimeMediaType' attribute syntax in [rfc2911] section 4.1.9 and [rfc2046] and the  
458 "document-charset" Operation attribute (section 3.2.1).

459 Many printer languages in the Printer MIB do not have a MIME type registered with IANA.<sup>6</sup> It is the intent of the PWG  
460 to registers all of the Printer MIB v2 XXX Printer Languages as 'application/vnd.PWG-XXX'. If a Printer Language  
461 already has a registered MIME Media type or gets a registration in the future, then that MIME Type MUST be used in  
462 preference to the 'application/vnd.PWG-XXX' MIME Type. For example, PostScript® has the MIME Media type:  
463 'application/postscript' and PCL has the MIME Media Type: 'application/vnd.HP-PCL', so those MIME Media types  
464 MUST be used instead of 'application/vnd.PWG-PS' and 'application/vnd.PWG-PCL'. For example, the NEC NPDL  
465 printer language from the Printer MIB does not have a MIME type registered with IANA. Therefore, the "document-  
466 format" = 'application/vnd.PWG-NPDL' MUST be used.

<sup>6</sup> Companies are urged to register there Printer languages with IANA using the 'application/vnd.XX-yyy vendor tree. There has also been a long standing PWG proposal to register all of these as 'application/vnd.pwg-yyy'.



467 Note: CIP4 did not agree to register MIME types for other organizations and standards. Instead, CIP4 will just add  
 468 values to the flat file that aren't MIME types. The values will not start with any of the MIME type roots: application/  
 469 audio/, image/, message/, model/, multipart/, test/, or video.

470 **ACTION ITEM (Tom and Ira): Propose a format for the file.**

471 See also the "document-format-version" Operation attribute in section 3.2.5 and the "document-format-details"  
 472 Operation attribute in section 3.2.4.

### 473 3.2.4 document-format-details (1setOf collection)

474 This OPTIONAL Operation attribute supplied in Document Creation operations summarizes the details of the  
 475 Document content, including any files contained in the Document. This Operation attribute is intended to be  
 476 supported by Printers that support a packaging document format, such as 'application/zip' or 'multipart/related', in  
 477 order to detail the contents. However, this Operation attribute MAY be used with any document format. See Table 6  
 478 for a list of the member attributes along with the client and Printer conformance requirements.

479 All member attributes, if supplied, MUST have contents. The value MUST NOT be omitted.

480 If a Printer supports a *packaging* MIME type, such as 'multipart/related' or 'application/zip', the Printer MUST support  
 481 this "document-format-details" Operation attribute. If a Printer does not support a packaging MIME type, it MAY omit  
 482 support of the "document-format-details" Operation attribute and Description attribute. The purpose of the  
 483 "document-format-details" Operation attribute is to describe the details of the document format or formats in the  
 484 supplied Document, including the packaging format itself, so that the Printer knows what to expect.

485 If a client supplies the "document-format-details" Operation attribute in a Document Creation request with member  
 486 attributes and/or values that the Printer doesn't support, the Printer MUST perform one of the following actions  
 487 depending on implementation: (1) reject the request OR (2) accept the request and either (a) put the Job in the  
 488 'pending-held' state or (b) process the job ignoring the attribute. See section 3 above for more details. However, if  
 489 the "document-charset" or the "document-format" member attributes are the ones in question, the Printer MUST  
 490 reject the request, same as for the "document-charset" and "document-format" Operation attributes (see sections  
 491 3.2.1 and 3.2.3) and return the 'client-error-charset-not-supported' (see [rfc2911] section 13.1.4.16) or the 'client-  
 492 error-document-format-not-supported' (see [rfc2911] section 13.1.4.11) status-codes, respectively.

493 For a packaging format, the "document-format-details" attribute does not provide means to associate each collection  
 494 value with particular document in the archive file, so it does not provide a "manifest"<sup>7</sup> of the packaging. One of the  
 495 packaging collection values MAY describe the packaging format itself, in which case that collection value MUST be  
 496 the first collection value. The remaining collection values provide the summary of the details of the contained files in  
 497 any order.

498 There MUST NOT be any duplicate collection values, that is, no collection values with all the same member attribute  
 499 values; it's a set, not a sequence. So 100 PostScript files with the same details in a .zip file:

500 (1) MAY have one collection value with the "document-format" member attribute = 'application/zip' MIME type  
 501 value and MAY have additional member attributes that give details about the .zip file itself and

502 (2) MUST have one collection value containing a "document-format" member attribute =  
 503 'application/postscript' and MAY have additional member attributes that give the details about the PostScript  
 504 files.

---

<sup>7</sup> If the client wants to achieve a "manifest", that is a complete list of each file in a packaging, then the client needs to extract each file from the package and submit each one in a separate Document Creation operation. Note: the client can re-compress each file before sending, so the compression isn't lost when sending each document separately.

505 If a file in a packaging file is itself a packaging file, the single “document-format-details” (1setOf collection) Operation  
 506 attribute SHOULD contain the flattened distinct collection values for all files at all nested levels. Therefore, the  
 507 “document-format-details” collection attribute is not recursively defined and MUST NOT contain the “document-  
 508 format-details” attribute as a member attribute.

509 **Table 6 - "document-format-details" member Operation attributes**

Member Attribute Name	Attribute Syntax	Client supplies	Printer Support	Member Attribute Section	Top Level Attribute Section
document-source-application-name	name(MAX)	MAY	MAY	3.2.4.1	N/A
document-source-application-version	text(127)	MAY	MAY	3.2.4.2	N/A
document-source-os-name	name(40)	MAY	MAY	3.2.4.3	N/A
document-source-os-version	text(40)	MAY	MAY	3.2.4.4	N/A
document-format	mimeMediaType	MUST	MUST	3.2.4.5	3.2.3
document-format-device-id	text(127)	MAY	MAY	3.2.4.6	N/A
document-format-version	text(127)	SHOULD	MUST	3.2.4.7	3.2.5
document-natural-languages	1setOf naturalLanguage	MAY	MAY	3.2.4.8	3.2.8

510  
 511 The client can determine which member attributes of the “document-format-details” are supported by querying the  
 512 Printer’s “document-format-details-supported” (1setOf type2 keyword) Printer Description attribute (see section 7.6).

513 Table 6 shows that three of the member attributes also have comparable top level Operation attributes defined with  
 514 the same names. See the sections listed in the rightmost column. These three high level attributes have  
 515 corresponding “xxx-default” and “xxx-supported” Printer Description attributes. These values are also for use with  
 516 the corresponding three member attributes. The remaining member attributes do not have any corresponding “xxx-  
 517 default” and “xxx-supported” Printer Description attribute.

518 If a client supplies this “document-format-details” Operation attribute with a member attribute with a value that the  
 519 Printer doesn’t support, the Printer MUST perform one of the following actions: (1) reject the request OR (2) accept  
 520 the request and either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See  
 521 section 3 above for more details.

#### 522 **3.2.4.1 document-source-application-name (name(MAX))**

523 This OPTIONAL member Operation attribute identifies the application that generated the document. The  
 524 value MUST be all lowercase in order to facilitate matching. The version number MUST NOT be included  
 525 (see the “document-source-application-version” attribute). Examples: “photoshop”, “microsoft word”,  
 526 “unknown”.

#### 527 **3.2.4.2 document-source-application-version (text(127))**

528 This OPTIONAL member Operation attribute identifies the version number of the application that created the  
 529 document. The value MUST be all lowercase in order to facilitate matching. The intent of this attribute is for  
 530 purposes of affecting the interpreting by the Printer for any formats for which the source application version  
 531 might have different semantics. Examples:

532 “8.1 (4331)” for Winzip®, “5.0.5 10/26/2001” for Acrobat®, “2000 (9.0.4119 sr-1)” for Microsoft® Word

533 If the client omits this member attribute, that matches with any version. Similarly, the Printer’s member  
 534 attribute MAY be omitted or be a zero length string to indicate any.

535 **3.2.4.3 document-source-os-name (name(40))**

536 This OPTIONAL member Operation attribute identifies the name of the operating system on which the  
 537 document was generated. Valid values are the operating system names defined in the IANA Operating  
 538 System name registry [os-names] with the version number portion removed (see the “document-source-os-  
 539 version” attribute). IANA Operating System Names consist of up to 40 *uppercase* US-ASCII letters, hyphen  
 540 (“-“), period (“.”), and slash (“/”) characters. The value MUST be all lowercase in order to facilitate matching.

541 Possible example IANA OS Registry values: ‘linux’, ‘macos’, ‘sun-os’, ‘unix’, “unknown”, ‘windows’.

542 **ACTION ITEM: Get Sun to register SOLARIS with IANA.**

543 **3.2.4.4 document-source-os-version (text(40))**

544 This OPTIONAL member Operation attribute identifies the version of the operating system on which the  
 545 document was generated. Valid values include the version portion of any of the operating system names  
 546 defined in the IANA Registry [os-names]. The value MUST be all lowercase in order to facilitate matching.  
 547 The value MUST NOT include the name portion of the registered OS name (see “document-source-os-  
 548 name” attribute).

549 Possible example values for the indicated “document-source-os-name” value are:  
 550 for ‘linux’: ‘1.0’, ‘1.2’, ‘2.0’, ‘2.2’, ‘2.4’  
 551 for ‘unix’: ‘bsd’, ‘v’, ‘v.1’, ‘v.2’, ‘v.3’, ‘pc’  
 552 for ‘windows’: ‘95’, ‘98’, ‘ce’, ‘nt’, ‘nt-2’, ‘nt-3’, ‘nt-3.5’, ‘nt-3.51’, ‘nt-4’, ‘nt-5’ (windows 2000),

553 **ACTION ITEM: Get Microsoft to register NT-5.1 (maybe NT-5.2) with IANA.**

554

555 **3.2.4.5 document-format (mimeMediaType)**

556 This REQUIRED member Operation attribute identifies the document format (see [rfc2911] §3.2.1.1) of the  
 557 collection value of which it is a member. The client MUST supply and the Printer MUST support this member  
 558 attribute in each collection value. The values for this member attribute are Internet Media types (sometimes  
 559 called MIME types) and have the same values and semantics as for the top level “document-format”  
 560 Operation attribute with the same name (see section 3.2.3 for the semantics).

561 **3.2.4.6 document-format-device-id (text(127))**

562 This OPTIONAL member Operation attribute identifies the type of device for which the document was  
 563 formatted, including manufacturer and model. This attribute is intended to identify document formats that are  
 564 not portable, e.g., PDLs that are device dependent. The value of this variable MUST exactly match the IEEE  
 565 1284-2000 Device ID string (see [IEEE1284] clause 6), except the length field MUST NOT be specified. See  
 566 the Microsoft Universal Plug and Play [upnp] section 2.2.6 DeviceId parameter for details and examples.  
 567 Here is an example showing only the required fields for a PostScript document:  
 568 MANUFACTURER:ACME Co.;COMMAND SET:PS;MODEL:LaserBeam 9;

569 **3.2.4.7 document-format-version (text(127))**

570 This REQUIRED member Operation attribute identifies the level or version of the document format identified  
 571 by the “document-format” member attribute. The client MAY supply and the Printer MUST support this  
 572 member attribute if the Printer supports the “document-format-details” Operation attribute. The semantics  
 573 and supported values of this “document-format-version” member attribute MUST be the same as for the top  
 574 level “document-format-version” Operation attribute with the same name (see section 3.2.5 for the  
 575 semantics).

### 576 **3.2.4.8 document-natural-language (1setOf naturalLanguage)**

577 This OPTIONAL member Operation attribute specifies the natural language(s) of the collection value of  
 578 which it is a member. The values for this attribute are natural language codes (with optional country codes)  
 579 and have the same values and semantics as for the top level "document-natural-language"  
 580 (naturalLanguage) operation attribute with the same name (see section 3.2.8 for the semantics). If the  
 581 document contains multiple natural languages, then the first value MUST be the primary language of the  
 582 document.

### 583 **3.2.5 document-format-version (text(127))**

584 This OPTIONAL Operation attribute identifies the level or version of the document format of the Document content  
 585 identified by the "document-format" Operation attribute (section 3.2.3).

586 If the client supplies this "document-format-version" Operation attribute, the client MUST also supply the "document-  
 587 format" Operation attribute (section 3.2.3), so that the Printer does not need to parse the "document-format-version"  
 588 string in order to determine the document format and version.

589 If a client supplies this "document-format-version" Operation attribute with a value that the Printer doesn't support as  
 590 indicated by the Printer's "document-format-version-supported" attribute (see section 7.8), the Printer MUST perform  
 591 one of the following actions, depending on implementation: (1) reject the request OR (2) accept the request and  
 592 either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See section 3 above for  
 593 more details.

594 The defined values are taken from the Printer MIB [rfc1759] langTC values (after removing the "lang") used in the  
 595 prtInterpreterLangFamily and the prtInterpreterLangLevel attributes (SNMP calls them "objects") separated by the "/"  
 596 character. If there is no version, just the langTC prefix without the "/" is used. Note: the Printer MIB  
 597 prtInterpreterLangVersion attribute is not used, since no standard values are given in the Printer MIB.

598 The short first field before the "/" character are unique, so that the version values are self-identifying so that all the  
 599 versions for all document formats can be combined into a single list for the Printer's "document-format-version-  
 600 supported" Printer attribute. The first field also tends to be the acronym for the document format and often is also the  
 601 file name extension registered with IANA. The Printer MIB shows the first field in uppercase for readability.  
 602 However, the Printer MUST perform case-insensitive matching of supplied values with supported values. If the  
 603 common acronym includes a "/", such as TIFF/IT, the "/" is changed to "-" so that the first field ends with the first "/".

604 Example values:

605 'PS/3': For Postscript level 3 [rfc1759].  
 606 'PCL/5e': For PCL 5e [rfc1759].  
 607 'PDF/1.4': For PDF version 1.4 [pdf]  
 608 'PDF/X-1a:2001': For PDF/X-1a [iso15930]  
 609 'DCS/2.0' For Document Color Separation (DCS), version 2.0. [dcs2.0]  
 610 'TIFF-IT/FP:1998': TIFF/IT [iso12639] - Full Page - baseline.  
 611 'TIFF-IT/CT:1998': TIFF/IT [iso12639] - Continuous Tone picture data - baseline  
 612 'TIFF-IT/FP/P1:1998': TIFF/IT [iso12639] - Full Page - profile 1  
 613 'TIFF-IT/CT/P1:1998': TIFF/IT [iso12639] - Continuous Tone picture data - profile 1  
 614 'Automatic': auto sense the format [rfc1759]. Is use in combination with the 'application/octet-stream' (see  
 615 [rfc2911] section 4.1.9.1) value of the "document-format" attribute (section 3.2.3).  
 616

#### 617 **3.2.5.1 Why no "document-format-version-default"**

618 There is no "document-format-version-default" since to meaningful, the default would have to depend on the  
 619 "document-format". Currently, there are no "xxx-default" attributes whose values depend on the value of other  
 620 attributes. Thus an implementation is free to supply its own defaults the depend on the "document-format".

### 621 3.2.6 document-message (text(MAX))

622 This OPTIONAL Operation attribute contains a message from the user to the operator about the Document.

### 623 3.2.7 document-name (name(MAX))

624 The Printer MUST support this Operation attribute in Print-Job, Print-URI, Send-Document, and Send-URI operations  
625 (see [rfc2911 section 3.2.1.1) and MAY support it in the Create-Job operation. For the Print-Job, Print-URI, and  
626 Create-Job operations, the Printer MUST copy the value to the corresponding Job Description attribute<sup>8</sup>.

### 627 3.2.8 document-natural-language (naturalLanguage)

628 This OPTIONAL Operation attribute specifies the primary natural language of the Document content (see [rfc2911]  
629 section 3.2.1.1 and section 4.1.8).

630 If the client supplies this "document-natural-language" Operation attribute with a value that the Printer doesn't  
631 support, the Printer MUST perform one of the following actions: (1) reject the request OR (2) accept the request and  
632 either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See section 3 above for  
633 more details.

634 The values MAY include region as well as the language according to [rfc2911 section 4.1.8]. If the document  
635 contains more than one language, the value is the first or primary language of the document. The Printer MAY use  
636 this value to select fonts or other Globalization processing. As indicated in [rfc2911] section 4.1.8, example include:

637           'en': for English  
638           'en-us': for US English  
639           'fr': for French  
640           'de': for German  
641

### 642 3.2.9 output-device (name(127))

643 This OPTIONAL Operation attribute specifies the name of the target output device for a Printer that fans-out to  
644 multiple devices (see [rfc2911] section 2.1). This allows the client to control which output device the Printer selects.  
645 If this attribute is omitted, the Printer selects whichever output device seems best for the job in an implementation  
646 dependent manner. The client can discover which output devices the Printer supports by querying the Printer's  
647 "output-device-supported" Printer attribute (see section 7.11).

648 If the Printer supports this Operation attribute, the Printer MUST support the "output-device-assigned" Job  
649 Description attribute with the same values (see [rfc2911] section 4.3.13).

650 There is no "output-device-default". A Printer MAY have a dynamic scheduling algorithm to assign jobs to output  
651 devices, in which case the "output-device-supported" Printer attribute would have multiple values. A client that did  
652 not supply an explicit "output-device" is asking the Printer to choose the most appropriate output device(s) (i.e.  
653 physical printer(s)) to print the Job. If "output-device-default" was allowed there would be no way to request this  
654 since the default output device would be assigned when it was not supplied by the client. If the Printer does not have  
655 a dynamic scheduling algorithm to assign Jobs to output devices, the Printer would populate "output-device-  
656 supported" with only one value..

---

<sup>8</sup> For the Send-Document and the Send-URI Operation attribute, the Printer copies them to the corresponding Document Description attribute defined in [ippdoc].

## 657 4 Job Template attributes

658 Table 7 lists the new Job Template attributes defined in this specification. These Job Template attributes can be  
659 supplied in the Job Creation operations: Print-Job, Print-URI, and Create-Job operations and the Validate-Job  
660 operation.

661 Job Template attributes are OPTIONAL for a Printer to support and for a client to supply in a Job Creation request. If  
662 a Printer supports a Job Template attribute, then the Printer MUST copy the supplied attribute to the Job object, so  
663 that a client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs operations (see [rfc2911] section  
664 4.2). In addition, as in [rfc2911], for each "xxx" Job Template attribute supported, the Printer MUST support the  
665 corresponding "xxx-default" and "xxx-supported" Printer attributes, if defined.

666 **Table 7 - Job Template attributes**

Job Template attribute name "xxx"	Attribute Syntax	Printer: Default Value attribute syntax "xxx-default"	Printer: Supported Values attribute syntax "xxx-supported"
<b>job-copies</b>	integer(1:MAX)	integer(1:MAX)	rangeOfInteger(1:MAX)
<b>job-cover-back</b>	collection	collection	1setOf type2 keyword
<b>cover-type</b>	type2 keyword	-	1setOf type2 keyword
<b>media</b>	type3 keyword   name(MAX)	-	1setOf (type3 keyword   name(MAX))
<b>media-col</b>	collection	-	1setOf type2 keyword
<i>member attributes [pwg5100.3]</i>	See [pwg5100.3]	-	-
<b>job-cover-front</b>	collection	collection	1setOf type2 keyword
<i>member attributes - same as job-cover-back</i>	see job-cover-back		
<b>job-finishings</b>	1setOf type2 enum	1setOf type2 enum <sup>9</sup>	1setOf type2 enum
<b>job-finishings-col</b>	collection	collection <sup>9</sup>	1setOf type2 keyword
<b>finishing-template</b>	name(MAX)	-	1setOf name(MAX)
<b>stitching</b>	collection		1setOf type2 keyword
<b>stitching-reference-edge</b>	type2 keyword	-	1setOf type2 keyword
<b>stitching-offset</b>	integer (0:MAX)	-	1setOf (integer(0:MAX)   rangeOfInteger(0:MAX))
<b>stitching-locations</b>	1setOf integer(0:MAX)	-	1setOf (integer(0:MAX)   rangeOfInteger(0:MAX))

### 667 4.1 Job Template attributes defined for Job-wide effect in multi-document jobs

668 This section defines additional Job Template attributes that have Job-wide effect and so are intended for use in the  
669 creation of multi-document Jobs. These Job Template attributes have the "job-" prefix to indicate their Job wide  
670 scope. When clients supply these job-wide Job Template attributes, they MUST supply these attributes in Job  
671 Creation and Validate-Job operations only. Clients MUST NOT supply these Job Template attributes as Document  
672 Template attributes in the Send-Document and Send-URI operations ([ippdoc]) or in any other operations. Clients  
673 MUST NOT supply these attributes as member attributes of the "overrides" Job Template attribute [ippOverride].

#### 674 4.1.1 job-copies (integer(1:MAX))

675 This OPTIONAL Job Template attribute specifies the number of job copies, i.e., with all of the Documents taken  
676 together. Its interpretation is independent of the value of the "multiple-document-handling" Job Template attribute.  
677 See the "copies" Job Template attribute defined in [rfc2911] section 4.2.5 that switches between job copies and

<sup>9</sup> The "job-finishings" and "job-finishings-col" Job Template attributes also include corresponding "job-finishings-ready" (1setOf type 2 enum) and "job-finishings-col-ready" (1setOf collection) attributes.

678 document copies depending on the value of the “multiple-document-handling” Job Template attribute ([rfc2911]  
679 section 4.2.4).  
680 For example assume a Job has two documents. The “copies” attribute has a value of ‘3’ and “job-copies” has a  
681 value of ‘2’. With “multiple-document-handling” set to ‘separate-documents-collated-copies’ the resulting printout  
682 would have two sets (i.e. job-copies=2). The first set would be 3 copies of Document 1 and then 3 copies of  
683 Document 2. The second set would be identical to the first. If a similar Job was run with “multiple-documents-  
684 handling” set to ‘single-document-new-sheet’ it would also produce two set. In this case however each set would  
685 contain Document 1, Document 2, Document 1, Document 2, Document 1, Document 2 (i.e copies=3). The “copies”  
686 and “job-copies” become more interesting when Documents within the Job each have their own value of “copies”.  
687 This can be accomplished via the Document object [ippdoc] or Overrides [PWG5100.4], [ippOverride].

#### 688 **4.1.1.1 job-copies-default (integer(1:MAX))**

689 This OPTIONAL Job Template Printer attribute specifies the default number of copies for the job as a whole. The  
690 Printer MUST support this attribute if it supports the "job-copies" Job Template attribute.

#### 691 **4.1.1.2 job-copies-supported (rangeOfInteger(1:MAX))**

692 This OPTIONAL Job Template Printer attribute specifies the supported range of the number of copies for the job as a  
693 whole. The Printer MUST support this attribute if it supports the "job-copies" Job Template attribute.

#### 694 **4.1.2 job-cover-back (collection)**

695 This OPTIONAL Job Template attribute specifies the cover for the back of the job, i.e., with all of the Documents  
696 taken together and is independent of the value of the “multiple-document-handling” Job Template attribute. The  
697 member attributes are the same as “cover-back” (see [pwg5100.3] section 3.1) and with the same conformance  
698 requirements. However, the “cover-back” Job Template attribute switches between a job back cover and a document  
699 back cover depending on the value of the “multiple-document-handling” Job Template attribute ([rfc2911] section  
700 4.2.4). The “job-cover-back” Job Template attribute is equivalent to “cover-back” with “multiple-document-handling” =  
701 ‘single-document-new-sheet’.

#### 702 **4.1.2.1 job-cover-back-default (collection)**

703 This OPTIONAL Job Template Printer attribute specifies the default the cover for the back of the job. The Printer  
704 MUST support this attribute if it supports the "job-cover-back" Job Template attribute.

#### 705 **4.1.2.2 job-cover-back-supported (1setOf type2 keyword)**

706 This OPTIONAL Job Template Printer attribute specified the supported member attributes of the "job-cover-back"  
707 Job Template collection attributes. The Printer MUST support this attribute if it supports the "job-cover-back" Job  
708 Template attribute.

#### 709 **4.1.3 job-cover-front (collection)**

710 This OPTIONAL Job Template attribute specifies the cover for the front of the job, i.e., with all of the Documents  
711 taken together and is independent of the value of the “multiple-document-handling” Job Template attribute. The  
712 member attributes are the same as the “cover-front” Job Template attribute (see [pwg5100.3] section 3.2) and with  
713 the same conformance requirements. However, the “cover-front” Job Template attribute switches between a job  
714 front cover and a document front cover depending on the value of the “multiple-document-handling” Job Template  
715 attribute ([rfc2911] section 4.2.4). The “job-cover-front” Job Template attribute is equivalent to “cover-front” with  
716 “multiple-document-handling” = ‘single-document-new-sheet’.

**717 4.1.3.1 job-cover-front-default (collection)**

718 This OPTIONAL Job Template Printer attribute specifies the default the cover for the front of the job. The Printer  
719 MUST support this attribute if it supports the "job-cover-front" Job Template attribute.

**720 4.1.3.2 job-cover-front-supported (1setOf type2 keyword)**

721 This OPTIONAL Job Template Printer attribute specified the supported member attributes of the "job-cover-front" Job  
722 Template attributes. The Printer MUST support this attribute if it supports the "job-cover-front" Job Template  
723 collection attribute.

**724 4.1.4 job-finishings (1setOf type2 enum)**

725 This OPTIONAL Job Template attribute specifies the job finishings, i.e., with all of the Documents taken together. Its  
726 interpretation is independent of the value of the "multiple-document-handling" Job Template attribute. See the  
727 "finishings" Job Template attribute defined in [rfc2911] section 4.2.6 that switches between job finishings and  
728 document finishings depending on the value of the "multiple-document-handling" Job Template attribute ([rfc2911]  
729 section 4.2.4). The "job-finishings" Job Template attribute is equivalent to "finishings" with "multiple-document-  
730 handling" = 'single-document-new-sheet'.

**731 4.1.4.1 job-finishings-default (1setOf type2 enum)**

732 This OPTIONAL Job Template Printer attribute specifies the default job finishings. The Printer MUST support this  
733 attribute if it supports the "job-finishings" Job Template attribute.

**734 4.1.4.2 job-finishings-ready (1setOf type2 enum)**

735 This OPTIONAL Job Template Printer attribute specifies the ready job finishings, that is, the job finishings that maybe  
736 used without operator intervention. The Printer MUST support this attribute if it supports the "job-finishings" Job  
737 Template attribute.

**738 4.1.4.3 job-finishings-supported (1setOf type2 keyword)**

739 This OPTIONAL Job Template Printer attribute specified the supported job finishings values. The Printer MUST  
740 support this attribute if it supports the "job-finishings" Job Template attribute.

**741 4.1.5 job-finishings-col (1setOf collection)**

742 This OPTIONAL Job Template attribute specifies the job finishings collection, i.e., with all of the Documents taken  
743 together. Its interpretation is independent of the value of the "multiple-document-handling" Job Template attribute.  
744 See the "finishings-col" Job Template attribute defined in [pwg5100.3] section 3.2 that switches between job  
745 finishings collection and document finishings collection depending on the value of the "multiple-document-handling"  
746 Job Template attribute ([rfc2911] section 4.2.4). The "job-finishings-col" Job Template attribute is equivalent to  
747 "finishings-col" with "multiple-document-handling" = 'single-document-new-sheet'.

**748 4.1.5.1 job-finishings-col-default (collection)**

749 This OPTIONAL Job Template Printer attribute specifies the default job finishings collection. The Printer MUST  
750 support this attribute if it supports the "job-finishings-col" Job Template attribute.



751 **4.1.5.2 job-finishings-col-ready (collection)**

752 This OPTIONAL Job Template Printer attribute specifies the ready job finishings collection, that is, the job finishings  
 753 collection that maybe used without operator intervention. The Printer MUST support this attribute if it supports the  
 754 "job-finishings-col" Job Template attribute.

755 **4.1.5.3 job-finishings-col-supported (1setOf type2 keyword)**

756 This OPTIONAL Job Template Printer attribute specified the supported member attributes of the "job-finishings-col"  
 757 Job Template collection attribute. The Printer MUST support this attribute if it supports the "job-finishings-col" Job  
 758 Template attribute.

759 **5 Job Description attributes**

760 This section defines the new Job Description attributes defined in this IPP specification. Job Description attributes  
 761 are Job object attributes that are filled in by the Printer. Some Job Description attribute values are supplied by the  
 762 client in the Job operation using corresponding Operation attributes as indicated in the "Set by" column. The Printer  
 763 MUST NOT support modification of any of these Job Description attributes using the Set-Job-Attributes operation  
 764 ([rfc3380]).

765 This section divides Job Descriptions into two subsections: Section 5.1 contains Job Description attributes that  
 766 describe the Job as a whole and Section 5.2 contains Job Description attributes that are defaults for the Document(s)  
 767 in the Job<sup>10</sup>. The following legend is used in the tables in both sections:

<b>Legend:</b>	
<b>IPP Attribute Syntax</b>	the attribute syntax (see [rfc2911] section 4.1).
<b>Set by</b>	indicates whether the value is set by the client or Printer in the Job Creation operation: <b>client</b> - means that the Printer MUST populate this Job Description attribute by copying <i>from</i> the corresponding Operation attribute that the client MAY supply in the Job Creation operation. See Table 5 for the corresponding Operation attribute. <b>Printer</b> - means that the Printer sets the value based on the state of the Printer.
<b>Printer conformance</b>	indicates MUST or MAY for Printer conformance.
<b>Reference</b>	references either to a sub-section of this specification or to a section in another specification, where further information about this attributes can be found.

768

769 **5.1 Job Description attributes that describe the Job as a whole**

770 This section defines those Job Description attributes that describe the Job as a whole. See section 5.2 below for  
 771 those Job Description attributes that are defaults for the Document or Documents in the Job.

772 **Table 8 - Job Description attributes that describe the Job as a whole**

Job Description attribute name	IPP Attribute Syntax	Set by	Printer conformance	Reference
errors-count	integer(0:MAX)	Printer	MAY	§5.1.1
ipp-attribute-fidelity	boolean	client	MAY	§5.1.2
job-mandatory-attributes	1setOf type2 keyword	client	MAY	§5.1.3
output-device	name(127)	client	MAY	§5.1.4

<sup>10</sup> The [jobx] specification does not define any Document Description attributes. See the [ippdoc] specification.

Job Description attribute name	IPP Attribute Syntax	Set by	Printer conformance	Reference
<b>output-device-assigned</b>	name(127)	Printer	MAY	[rfc2911] §4.3.7.2
<b>warnings-count</b>	integer(0:MAX)	Printer	MAY	§5.1.5

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Most of the existing “job-state” and “job-state-reasons” Job Description attribute values apply equally well to individual documents in a multi-document job (with removal of the ‘job-’ prefix for those that apply to both Job and Document). Furthermore, the job states are completely service-type neutral, so they can apply to scanning, faxing, and formatting processes as well. The job state reasons have a number of reasons that are print service specific, but most can apply to other types of service as well. The reason for separating state from reasons is so that the states can be the fundamental states that most implementations have, while the state reasons can vary depending on the sophistication of the system. The states are the ones that clients are most likely to base actions upon, and the state reasons are more information, both for programs and people.

782

### 5.1.1 errors-count (integer(0:MAX))

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This OPTIONAL Job Description attribute counts the number of errors encountered processing the job as a whole. An error where some portion of the printed output is not present, such as a glyph encountered which isn't in the Printer's font or an image in a page was in a format that the Printer didn't support, though the Printer did support the overall document format.

787

### 5.1.2 ipp-attribute-fidelity (boolean)

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This OPTIONAL Job Description attribute indicates the value of the corresponding “ipp-attribute-fidelity” Operation attribute ([rfc2911] section 3.2.1.1)<sup>11</sup> that the client supplied in the Job Creation operation. This Job Description attribute has no effect on the processing of the job once the Job Creation operation has been accepted<sup>12</sup>. However, this attribute does provide an audit capability to the user and service desk for comparing unexpected printed results with what was submitted.

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### 5.1.3 job-mandatory-attributes (1setOf type2 keyword)

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This OPTIONAL Job Description attribute indicates which Job Template attributes that the client required that the Printer Support in order to accept the Job Creation request. The Printer populates this attribute with the value of the corresponding “job-mandatory-attributes” Operation attribute (see section 3.1.2) supplied by the client in the Job Creation operation. This Job Description attribute has no effect on the processing of the job once the Job Creation operation has been accepted<sup>12</sup>. However, this Job Description attribute does provide an audit capability of the Job object in the Job History (see [rfc2911] section 4.3.7.2) to the user and service desk for comparing unexpected printed results with what was submitted. See section 3.1.2 for additional details of the semantics of this “job-mandatory-attributes” Operation attribute that are not repeated here.

802

### 5.1.4 output-device (name(127))

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806

This OPTIONAL Job Description attribute indicates the name of the output device that the client has supplied in the “output-device” Operation attribute (see section **Error! Reference source not found.**), if any, in the Job Creation operation. The Printer sets the Job's “output-device-assigned” Job Description attribute (see [rfc2911] section ) to the name of the actual device assigned.

<sup>11</sup> The “ipp-attribute-fidelity” attribute is defined only as an Operation attribute in [rfc2911]. This specification is defining it as a Job Description attribute as well which the Printer MAY support.

<sup>12</sup> The “ipp-attribute-fidelity” and “job-mandatory-attributes” Operation attributes do have effect after the Job Creation operation when the Document Object is supported [ippdoc].

**807 5.1.5 warnings-count (integer(0:MAX))**

808 This OPTIONAL Job Description attribute counts the number of warnings encountered processing the job as a whole.  
809 A warning is where no information is lost, but the appearance of the printed output MAY not be as expected.

**810 5.2 Job Description attributes that are defaults for the Document(s) in the Job**

811 This section defines those Job Description attributes that provide defaults for the Document Or Documents in the  
812 Job. See section 5.1 above for those Job Description attributes that describe the Job as a whole.

**813 5.2.1 compression-supplied (type3 keyword)**

814 This REQUIRED Job Description attribute specifies the *default* compression used to represent the document(s) in  
815 the Job. The Printer sets this Job Description attribute from the corresponding Operation attribute (see [rfc2911]  
816 §3.2.1.1) supplied by the client in the Job Creation operation.

**817 5.2.2 document-charset-supplied (charset)**

818 This OPTIONAL Job Description attribute specifies the *default* charset used to represent this document (see section  
819 3.2.1). The Printer sets this Job Description attribute from the corresponding Operation attribute supplied by the  
820 client in the Job Creation operation.

**821 5.2.3 document-digital-signature-supplied (type2 keyword)**

822 This OPTIONAL Job attribute specifies the *default* digital signature technology used in the Document content. The  
823 Printer sets this Job Description attribute from the corresponding “document-digital-signature” Operation attribute  
824 (see section 3.2.2 for the semantics), if supplied by the client in the Job Creation operation. If a Printer supports the  
825 “document-digital-signature” Operation attribute, the Printer MUST support this “document-digital-signature” Job  
826 Description attribute.

**827 5.2.4 document-format-supplied (mimeMediaType)**

828 This REQUIRED<sup>13</sup> Job Description attribute specified the *default* document format of the Document Object content.  
829 The Printer sets this Job Description attribute from the corresponding “document-format” Operation attribute (see  
830 [rfc2911] section 3.2.1.1 and [this spec] section 3.2.3 for the semantics), if supplied by the client in the Job Creation  
831 operation.

**832 5.2.5 document-format-details-supplied (1setOf collection)**

833 This OPTIONAL Job Description attribute specifies the *default* details of the document format(s) of the Document  
834 Object content. The Printer sets this Job Description attribute from the corresponding “document-format-details”  
835 Operation attribute (see section 3.2.4 for the semantics), if supplied by the client in the Job Creation operation. If a  
836 Printer supports the “document-format-details” Operation attribute, the Printer MUST support this “document-format-  
837 details” Job Description attribute.

**838 5.2.6 document-format-version-supplied (text(127))**

839 This OPTIONAL Job Description attribute specifies the *default* version of the document format of the Document  
840 Object content. The Printer sets this Job Description attribute from the corresponding “document-format-version”  
841 Operation attribute (see section 3.2.5 for the semantics), if supplied by the client in the Job Creation operation (see

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<sup>13</sup> [rfc2911] did not define a “document-format” Document Description attribute; it is a new attribute defined in this specification.

842 section ). If a Printer supports the “document-format-version” Operation attribute, the Printer MUST support this  
843 “document-format-version” Job Description attribute.

#### 844 **5.2.7 document-message-supplied (text(MAX))**

845 This OPTIONAL Job Description contains either (1) the *default* message from the user to the operator about the  
846 Document(s) or (2) a message from the operator, system administrator, or "intelligent" process to indicate to the end  
847 user the reasons for modification or other management action taken on the Document. The Printer populates this  
848 Job Description attribute from the “document-message” (text(MAX) Operation attribute value (see section 3.2.6)  
849 supplied by the client in the Job Creation operation.

850 In addition, the user and the operator can set the value of this Job Description attribute explicitly using the Set-Job-  
851 Attributes operation (see [rfc3380]).

#### 852 **5.2.8 document-name (name-supplied (MAX))**

853 This REQUIRED Job Description attribute specifies the *default* name of the document (see [rfc2911] §3.2.1.1). The  
854 Printer sets this Job Description attribute from the corresponding Operation attribute (see section 3.2.7) supplied by  
855 the client in the Job Creation operation.

#### 856 **5.2.9 document-natural-language-supplied (naturalLanguage)**

857 This OPTIONAL Job Description attribute specifies the *default* primary natural language of the Document content  
858 (see [rfc2911] section 3.2.1.1). The Printer sets this Job Description attribute from the corresponding Operation  
859 attribute (see section 3.2.8) supplied by the client in the Job Creation operation.

## 860 **6 New values to existing attributes**

861 This section defines new values for existing attributes.

### 862 **6.1 New job-state-reasons(1setOf type2 keyword) Values**

863 The REQUIRED “job-state-reasons” Job Description attributes ([rfc2911] section 4.3.8) provide additional information  
864 about the job's current state, i.e., information that augments the value of the job's "job-state" attribute.

865 These new values MAY be used with any job state for which the reason makes sense. When implemented, the  
866 Printer MUST return these values when the reason applies and MUST NOT return them when the reason no longer  
867 applies whether the value of the Job's "job-state" attribute changed or not. When the Job does not have any reasons  
868 for being in its current state, the value of the Job's "job-state-reasons" attribute MUST be 'none'.

869 Note: While values cannot be added to the “job-state” attributes without impacting deployed clients that take actions  
870 upon receiving "job-state" values, it is the intent that additional "job-state-reasons" values can be defined and  
871 registered without impacting such deployed clients. In other words, the "job-state-reasons" attribute are intended to  
872 be extensible.

873 Table 9 lists the new keyword values for the “job-state-reasons” attribute defined in this specification as indicated in  
874 the References column. In Table 9 the keywords are listed in alphabetic order, while in their descriptions following  
875 Table 9, they are listed in the most likely order of occurrence to help understanding.

876

**Table 9 - New "job-state-reasons" attribute values**

IPP Job Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
<b>job-state-reasons</b>	1setOf type2 keyword	MUST	[rfc2911] §4.3.8
	digital-signature-did-not-verify	MAY	[this spec] §6.1
	digital-signature-type-not-supported	MAY	[this spec] §6.1
	errors-detected	MAY	[this spec] §6.1
	job-digital-signature-wait	MAY	[this spec] §6.1
	warnings-detected	MAY	[this spec] §6.1

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879

For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely to occur (if implemented):

880

881

882

**'digital-signature-type-not-supported'**: One or more documents in the Job contain a digital signature type that is not supported. Implementation or site policy determines the state of the Job once this condition is detected.

883

884

**'job-digital-signature-wait'**: The Job is currently being held because the Job was submitted with a "document-digital-signature" attribute value that is not supported.

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**'digital-signature-did-not-verify'**: One or more documents in the Job contains a digital signature type that is supported (see section 3.2.2), but the signature did not verify when the Printer attempted to verify the signature.

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**'errors-detected'** : If the Printer supports this value, the Printer MUST add this value to "job-state-reasons" when the Printer generates the first error message. That is, a single occurrence of this value is present in the "job-state-reasons" Job Description attribute if the Printer has generated one or more errors. An error indicates loss of information, such as a page not imaged. See also the 'warnings-detected' value.

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**'warnings-detected'** : If the Printer supports this value, the Printer MUST add this value to "job-state-reasons" when the Printer generates the first warning message. That is, a single occurrence of this value is present in the "job-state-reasons" Job Description attribute if the Printer has generated one or more warnings. A warning indicates something did not go as expected, but there was no loss of information. For example, a font substitution. See also the 'errors-detected' value.

898

**6.2 New media (type 3 keyword | name(MAX)) Values**

899

This section specifies one new value for the "media" Job Template attribute:

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**'choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in'**: The client has explicitly allowed a choice of media for the Job. The Printer MUST choose physical media of size na\_letter\_8.5x11in (215.9 x 279.4 mm) or iso\_a4\_210x297mm. The Printer MUST NOT choose physical media of any other size. The Printer MAY scale the image to fit, but any scaling MUST be isomorphic scaling and without image content loss, or overflow to additional sheets (so-called tiling), or truncate (and MUST notify the sending user and receiving user by implementation means if truncation is performed, since that is loss of information).

907

**Rationale:** If printing by reference, the size of the document isn't known by the submitter.

908

909

910

See Annex A (section 17) for additional requirements for a revision of the PWG IEEE/ISTO 5101.1 Candidate Standard [pwg5101.1] to include the new 'choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in' and other choice values.

## 911 7 New Printer Description attributes

912 This section lists *the new* Printer Description attributes defined in this document. These Printer attributes are “xxx-  
 913 supported” and “xxx-default” Printer attributes which indicate the default and supported values that the Printer  
 914 supports.. The Printer MUST support these Printers attributes if the Printer supports the corresponding “xxx”  
 915 Operation attributes (see section 3) that the client can supply in a Job Creation or Document Creation request.

916  
 917 The column labels are:

Column Heading	
“Attribute Syntax”	the attribute syntax (see [rfc2911] section 4.1). Many “xxx-default” and “xxx-supported” attributes have the ‘collection’ syntax which consists of a number of member attributes. These member attributes are not listed in this table when they are the same as the corresponding “xxx” attribute in Table 7. Only those few Printer attribute collection attributes that do not have a corresponding Job Template attributes show the member attributes in this table.
“Reference”	the section which defines the semantics of the attribute.

918

919

Table 10 - New Printer Description attributes

Printer Description attribute name	Attribute Syntax		Reference
<b>document-charset-default</b>	charset		[this-spec] §7.1
<b>document-charset-supported</b>	1setOf charset		[this-spec] §7.2
<b>document-digital-signature-default</b>	type2 keyword		[this-spec] §7.3
<b>document-digital-signature-supported</b>	1setOf type2 keyword		[this-spec] §7.4
<b>document-format-details-default</b>	collection		[this-spec] §7.5
<b>document-format-details-supported</b>	1setOf type2 keyword		[this-spec] §7.6
<b>document-format-version-default</b>	text(127)		[this-spec] §7.7
<b>document-format-version-supported</b>	1setOf text(127)		[this-spec] §7.8
<b>document-natural-language-default</b>	naturalLanguage		[this-spec] §7.9
<b>document-natural-language-supported</b>	1setOf naturalLanguage		[this-spec] §7.10
<b>output-device-supported</b>	1setOf name(127)		[this spec] §7.11

920

### 921 7.1 document-charset-default (charset)

922 This OPTIONAL Printer Description attribute indicates the default charset that the Printer will assume for charset-  
 923 ambiguous document formats when the client omits the “document-charset” Operation attribute (section 3.2.1). The  
 924 Printer MUST support this attribute if it supports the corresponding “document-charset” Operation attribute (see  
 925 section 3.2.1)

### 926 7.2 document-charset-supported (1setOf charset)

927 This OPTIONAL Printer Description attribute indicates the charsets that the Printer supports in Document Content,  
 928 that is, supports as values of the “document-charset” Operation attribute (section 3.2.1). The Printer MUST support  
 929 this attribute if it supports the corresponding “document-charset” Operation attribute (see section 3.2.1).

930 **7.3 document-digital-signature-default (type2 keyword)**

931 This OPTIONAL Printer Description attribute indicates the default digital signature, if any, that the Printer will assume  
 932 when the client omits the “document-digital-signature” Operation attribute (section 3.2.2). The Printer MUST support  
 933 this attribute if it supports the “document-digital-signature” Operation attribute.

934 **7.4 document-digital-signature-supported (1setOf type2 keyword)**

935 This OPTIONAL Printer Description attribute indicates the digital signature technologies that the Printer supports in  
 936 Document Contents, that is, supports as values of the “document-digital-signature” Operation attribute (section  
 937 3.2.2). The Printer MUST support this attribute if it supports the “document-digital-signature” Operation attribute.

938 **7.5 document-format-details-default (collection)**

939 This OPTIONAL Printer Description attribute indicates the default document format details that the Printer will  
 940 assume when the client omits the “document-format-details” Operation attribute (section §3.2.4). The member  
 941 attributes are the same as “document-format-details” (see section 3.2.4). The Printer MUST support this attribute, if it  
 942 supports the “document-format-details” Operation attribute (see section 3.2.4).

943 **7.6 document-format-details-supported (1setOf type2 keyword)**

944 This OPTIONAL Printer Description attribute lists the type2 keyword names of the member attributes of “document-  
 945 format-details” that the Printer supports. The Printer MUST support this “document-format-details” (1setOf type2  
 946 keyword) Printer Description attribute, if the Printer supports the “document-format-details” (1setOf collection)  
 947 Operation attribute (see section 3.2.4). Table 11 lists the type2 keywords defined for use in the “document-format-  
 948 details-supported” Printer attribute.

949 **Table 11 - Keyword values of “document-format-details-supported” Printer attribute**

Type2 keyword values	Printer conformance
document-source-application-name	MAY
document-source-application-version	MAY
document-source-os-name	MAY
document-source-os-version	MAY
document-format	MUST
document-format-device-id	MAY
document-format-version	MUST
document-natural-language	MAY

950  
 951 **7.7 document-format-version-default (text(127))**

952 This OPTIONAL Printer Description attribute indicates the default document format version that the Printer will  
 953 assume when the client omits the “document-format-version” Operation attribute (section 3.2.5). The Printer MUST  
 954 support this attribute if it supports the “document-format-version” Operation attribute.

## 955 **7.8 document-format-version-supported (1setOf text(127))**

956 This OPTIONAL Printer Description attribute indicates the document format versions that the Printer supports for  
 957 Document Contents, that is, supports as values of the "document-format-version" Operation attribute (section 3.2.5).  
 958 The Printer MUST support this attribute if it supports the "document-format-version" Operation attribute.

## 959 **7.9 document-natural-language-default (naturalLanguage)**

960 This OPTIONAL Printer Description attribute indicates the default document natural language that the Printer will  
 961 assume for Document Content when the client omits the "document-natural-language" Operation attribute ([rfc2911]  
 962 section 3.2.1.1). The Printer MUST support this attribute if it supports the "document-natural-language" Operation  
 963 attribute.

## 964 **7.10 document-natural-language-supported (1setOf naturalLanguage)**

965 This OPTIONAL Printer Description attribute lists the natural languages supported in any of the supported document  
 966 formats, that is, it is the union of the natural languages. The Printer MUST support this attribute if it supports the  
 967 "document-natural-language" Operation attribute ([rfc2911] section 3.2.1.1).

## 968 **7.11 output-device-supported (1setOf name(127))**

969 This OPTIONAL Printer Description attributes lists the names of output devices that the Printer supports. The Printer  
 970 MUST support this attribute if it supports the "output-device" Operation attribute (see section **Error! Reference**  
 971 **source not found.**).

# 972 **8 Conformance Requirements**

973 This specification contains a number of independent OPTIONAL attributes. This section summarizes the  
 974 conformance requirements for Printers and clients.

## 975 **8.1 Printer conformance requirements**

976 In order to claim conformance to this specification, a Vendor MUST explicitly identify the attributes and values  
 977 supported by the Printer implementation in any such claim of conformance. In addition, the Vendor's Printer  
 978 implementation:

- 979 1. MUST meet the conformance requirements for Printers specified in [rfc2911].
- 980 2. MAY support any OPTIONAL Operation attribute according to section 3 and the corresponding Job  
 981 Description attributes in section 5 and corresponding Printer attributes in section 7.
- 982 3. MAY support any Job Template attribute according to section 3.2.9.
- 983 4. MAY support any of the "job-state-reasons" values according to section 6.

## 984 **8.2 Client conformance requirements**

985 In order to claim conformance to this specification, a Vendor MUST explicitly identify the attributes and values  
 986 supported by the client implementation in any such claim of conformance. In addition, the Vendor's client:



- 987 1. MUST meet the conformance requirements for clients specified in [rfc2911]
- 988 2. MAY support any Operation attribute according to section 3 and the corresponding Job Description attributes  
989 in section 5 and corresponding Printer attributes in section 7.
- 990 3. MAY support any Job Template attribute according to section 3.2.9.

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## 1085 11 IANA Considerations

1086 This section contains the registration information for IANA to add to the various IPP Registries according to the  
1087 procedures defined in RFC 2911 [rfc2911] section 6 to cover the definitions in this document. The resulting  
1088 registrations will be published in the <http://www.iana.org/assignments/ipp-registrations> registry.

1089 *Note to the PWG Editor: Replace the References below to [this spec] with the IEEE-ISTO standard number*  
1090 *for the appropriate document, so that it accurately reflects the content of the information for the IANA Registry.*

1091 **11.1 Attribute Registrations**

1092 The following table lists all the attributes defined in this specification. These are to be registered according to the  
 1093 procedures in RFC 2911 [rfc2911] section 6.2. If the attribute has a separate sub-section definition in this  
 1094 specification, that sub-section is listed as the Reference. This table contains the reference to another specification  
 1095 that completely defines each attribute.  
 1096

1097	<b>Attribute Name (attribute syntax)</b>	<b>Reference</b>	<b>Section</b>
1098	-----	-----	-----
1099	<b>Job Description attributes:</b>		
1100	compression (type3 keyword)	[this spec]	5.2.1
1101	document-charset (charset)	[this spec]	5.2.2
1102	document-digital-signature (type2 keyword)	[this spec]	5.2.3
1103	document-format (mimeMediaType)	[this spec]	5.2.4
1104	document-format-details (1setOf collection)	[this spec]	5.2.5
1105	document-source-application-name (name(MAX))	[this spec]	5.2.5
1106	document-source-application-version (text(127))	[this spec]	5.2.5
1107		[this spec]	5.2.5
1108	document-source-os-name (name(40))	[this spec]	5.2.5
1109	document-source-os-version (text(40))	[this spec]	5.2.5
1110	document-format (mimeMediaType)	[this spec]	5.2.5
1111	document-format-device-id (text(127))	[this spec]	5.2.5
1112	document-format-version (text(127))	[this spec]	5.2.5
1113	document-natural-language (1setOf naturalLanguage)	[this spec]	5.2.5
1114		[this spec]	5.2.5
1115	document-format-version (text(127))	[this spec]	5.2.6
1116	document-message (text(MAX))	[this spec]	5.2.7
1117	document-name (name(MAX))	[this spec]	5.2.8
1118	document-natural-language (naturalLanguage)	[this spec]	5.2.9
1119	errors-count (integer(0:MAX))	[this spec]	5.1.1
1120	job-attribute-fidelity (boolean)	[this spec]	5.1.2
1121	job-mandatory-attributes (1setOf type2 keyword)	[this spec]	5.1.3
1122	output-device (name(127))	[this spec]	5.1.4
1123	warnings-count (integer(0:MAX))	[this spec]	5.1.5
1124		[this spec]	5.1.5
1125	<b>Job Template attributes:</b>		
1126	job-copies (integer(1:MAX))	[this spec]	4.1.1
1127	job-copies-default (integer(1:MAX))	[this spec]	4.1.1.1
1128	job-copies-supported (rangeOfInteger(1:MAX))	[this spec]	4.1.1.2
1129	job-cover-back (collection)	[this spec]	4.1.2
1130	<member attributes are the same as "cover-back" [pwg5100.3]		3.1>
1131	job-cover-back-default (collection)	[this spec]	4.1.2.1
1132	<member attributes are the same as "cover-back" [pwg5100.3]		3.1>
1133	job-cover-back-supported (1setOf type2 keyword)	[this spec]	4.1.2.2
1134	job-cover-front (collection)	[this spec]	4.1.3
1135	<member attributes are the same as "cover-front" [pwg5100.3]		3.1>
1136			

1137	job-cover-front-default (collection)	[this spec]	4.1.3.1
1138	<member attributes are the same as "cover-front"[pwg5100.3] 3.1>		
1139	job-cover-front-supported (1setOf type2 keyword)	[this spec]	4.1.3.2
1140	job-finishings (1setOf type2 enum)	[this spec]	4.1.4
1141	job-finishings-default (1setOf type2 enum)	[this spec]	4.1.4.1
1142	job-finishings-ready (1setOf type2 enum)	[this spec]	4.1.4.2
1143	job-finishings-supported (1setOf type2 keyword)	[this spec]	4.1.4.3
1144	job-finishings-col (1setOf collection)	[this spec]	4.1.5
1145	<member attributes are the same as "finishings-col"[pwg5100.3] 3.2>		
1146	job-finishings-col-default (1setOf type2 enum)	[this spec]	4.1.5.1
1147	job-finishings-col-ready (1setOf type2 enum)	[this spec]	4.1.5.2
1148	job-finishings-col-supported (1setOf type2 keyword)		
1149		[this spec]	4.1.5.3
1150			
1151	<b>Printer Description attributes:</b>		
1152	document-charset-default (charset)	[this spec]	7.1
1153	document-charset-supported (1setOf charset)	[this spec]	7.2
1154	document-digital-signature-default (type2 keyword)	[this spec]	7.3
1155	document-digital-signature-supported (1setOf type2 keyword)		
1156		[this spec]	7.4
1157	document-format-details-default (collection)	[this spec]	7.5
1158	<member attributes are the same as "document-format-details"		
1159		[this spec]	3.2.4>
1160	document-format-details-supported (1setOf type2 keyword)		
1161		[this spec]	7.6
1162	document-format-version-default (text(127))	[this spec]	7.7
1163	document-format-version-supported (1setOf text(127))	[this spec]	7.8
1164	document-natural-language-default (naturalLanguage)	[this spec]	7.9
1165	document-natural-language-supported (1setOf naturalLanguage)		
1166		[this spec]	7.10
1167	output-device-supported (1setOf name(127))	[this spec]	7.11
1168			
1169			
1170	<b>Operation attributes:</b>		
1171	document-charset (charset)	[this spec]	3.2.1
1172	document-digital-signature (type2 keyword)	[this spec]	3.2.2
1173	document-format-details (1setOf collection)	[this spec]	3.2.4
1174	document-source-application-name (name(MAX))	[this spec]	3.2.4.1
1175	document-source-application-version (text(127))		
1176		[this spec]	3.2.4.2
1177	document-source-os-name (name(40))	[this spec]	3.2.4.3
1178	document-source-os-version (text(40))	[this spec]	3.2.4.4
1179	document-format (mimeMediaType)	[this spec]	3.2.4.5
1180	document-format-device-id (text(127))	[this spec]	3.2.4.6
1181	document-format-version (text(127))	[this spec]	3.2.4.7
1182	document-natural-language (1setOf naturalLanguage)		

1183		[this spec]	3.2.4.8
1184	document-format-version (text(127))	[this spec]	3.2.5
1185	document-natural-language (naturalLanguage)	[this spec]	3.2.8
1186	job-mandatory-attributes (1setOf type2 keyword)	[this spec]	3.1.2
1187	output-device (name(127))	[this spec]	<b>Error! Reference</b>
1188	<b>source not found.</b>		
1189	<b>11.2 Keyword attribute values</b>		
1190	document-digital-signature (type2 keyword)	[this spec]	3.2.2
1191	document-digital-signature-default (type2 keyword)		
1192		[this spec]	7.3
1193	document-digital-signature-supported (1setOf type2 keyword)		
1194		[this spec]	7.4
1195	dss	[this spec]	3.2.2
1196	none	[this spec]	3.2.2
1197	pgp	[this spec]	3.2.2
1198	smime	[this spec]	3.2.2
1199	xmldsig	[this spec]	3.2.2
1200			
1201	document-format-details-supported (1setOf type2 keyword)		
1202		[this spec]	7.6
1203	document-source-application-name	[this spec]	7.6
1204	document-source-application-version	[this spec]	7.6
1205	document-source-os-name	[this spec]	7.6
1206	document-source-os-version	[this spec]	7.6
1207	document-format	[this spec]	7.6
1208	document-format-device-id	[this spec]	7.6
1209	document-format-version	[this spec]	7.6
1210	document-natural-language	[this spec]	7.6
1211			
1212	job-cover-back-supported (1setOf type2 keyword)	[this spec]	4.1.2.2
1213	<same as "cover-back-supported">	[pwg5100.3]	3.1.4
1214	job-cover-front-supported (1setOf type2 keyword)	[this spec]	4.1.2.2
1215	<same as "cover-front-supported">	[pwg5100.3]	3.1.4
1216	job-mandatory-attributes (1setOf type2 keyword)	[this spec]	3.1.2
1217	<any Job Template attribute keyword>		
1218			
1219	job-state-reasons (1setOf type2 keyword)	[rfc2911]	4.3.8
1220	digital-signature-did-not-verify	[this spec]	6.1
1221	digital-signature-type-not-supported	[this spec]	6.1
1222	errors-detected	[this spec]	6.1
1223	job-digital-signature-wait	[this spec]	6.1
1224	warnings-detected	[this spec]	6.1
1225			
1226	media (type2 keyword   name(MAX))	[rfc2911]	4.2.11
1227	choice_iso_a4_210x297mm_na_letter_8.5x11in	[this spec]	6.2

1228

1229 **11.3 Enum Attribute Values**

1230 The following table lists all the new enum attribute values defined in this document as additional type2 enum values.  
 1231 These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.

1232

1233	job-finishings (1setOf type2 enum)	[this spec]	4.1.4
1234	job-finishings-default (1setOf type2 enum)	[this spec]	4.1.4.1
1235	job-finishings-ready (1setOf type2 enum)	[this spec]	4.1.4.2
1236	job-finishings-supported (1setOf type2 enum)	[this spec]	4.1.4.3
1237	<enum values are the same as "finishings">		
1238			
1239	job-finishings-col-supported (1setOf type2 keyword)		
1240		[this spec]	4.1.5.3
1241	<same as for "finishing-col-supported">	[pwg5100.3]	3.2.5

1242 **12 Internationalization Considerations**

1243 The internationalization considerations for the extensions defined in this specification are the same as for handling  
 1244 the Job object in [rfc2911].

1245 **13 Security Considerations**

1246 This specification adds no more security burden on Printer implementations than does [rfc2911].

1247 **14 Contributors**

1248 Don Fullman, Xerox  
 1249 Ira McDonald, High North  
 1250 Dennis Carney, IBM

1251 **15 Acknowledgments**1252 **16 Author's Address**

1253 Tom Hastings  
 1254 Xerox Corporation  
 1255 737 Hawaii St.  
 1256 El Segundo, CA 90245  
 1257  
 1258 Phone: 310 333-6413  
 1259 Fax: 310 333-5514  
 1260 e-mail: [hastings@cp10.es.xerox.com](mailto:hastings@cp10.es.xerox.com)  
 1261  
 1262 Peter Zehler

1263 Xerox Corporation  
 1264 MS: 0128-30E  
 1265 800 Phillips Road  
 1266 Webster, NY 14580-9701  
 1267  
 1268 Phone: 1+585+2658755  
 1269 Fax:  
 1270 e-mail: PZehler@crt.xerox.com  
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## 1272 **17 Annex A: Additional requirements for a revision of the PWG IEEE/ISTO** 1273 **5101.1 Candidate Standard [pwg5101.1] to add the new 'choice\_xxx'**

1274 This section also generalizes the choice mechanism for inclusion in a revision to the PWG IEEE/ISTO 5101.1  
 1275 Candidate Standard [pwg5101.1]. This specification gives the *outline* of the proposed addition to [pwg5101.1] for  
 1276 information only, in order to agree to the one new value defined for use with IPPFAX, namely,  
 1277 **'choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in'**.

1278 The proposed extension to [pwg5101.1] will have the following requirements:

- 1279 1. The ABNF will be extended to define the **'choice\_'** prefix to introduce a list of choices of self describing  
 1280 names.
- 1281 2. Following the **'choice\_'** prefix will be two or more fully self describing names, including all three fields.
- 1282 3. The order of the list of fully self describing names MUST be in alphabetic order, so that there is only one  
 1283 canonical order for each list of choices.
- 1284 4. Printer MAY support dynamic combinations of supported values or MAY support the entire choice value as a  
 1285 conventional keyword which it simply matches for validation purposes.
- 1286 5. Printer MUST map the choice value to a particular supported value when selecting the actual media for  
 1287 marking.
- 1288 6. If the Printer supports a **'choice\_xxx'** "media" attribute value and the "media-ready" Printer attribute, the  
 1289 Printer MUST include the **'choice\_xxx'** value in its "media-ready" Printer attribute as well as the currently  
 1290 loaded value(s) when at least one of the members of a choice value is ready. For example, if  
 1291 **'iso\_a4\_210x297mm'** is loaded, then the "media-ready" Printer attribute MUST include the  
 1292 **'iso\_a4\_210x297mm'** and the **'choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in'** values.

## 1293 **18 Annex B: Change Log (informative - to be removed before publication)**

1294 The following summaries of the changes in chronological order:

1295 Version 0.1, 18 May 2003:

- 1296 1. Split document out of Document Object specification.
- 1297 2. Moved "document-format-target" and "document-format-version-target" from the Job Template section to the  
 1298 Operation Attributes section so that it can be supplied with Document Creation operations and so that it  
 1299 MUST be honored, even if "job-attribute-fidelity" is 'false' or omitted.
- 1300 3. Removed all Document Description attributes and the concept of Job Level and Document Level. That  
 1301 terminology is introduced in the Document Object spec [ippdoc]. Now [ippdoc] is only an Informative  
 1302 Reference, not a Normative Reference.



1303

1304

Version 0.2, 19 May 2003:

1305

1. Did *not* include the document-format-target and document-format-version-target attributes. PSI has their own definitions and we can avoid the discussion as to whether they should be Document Template attributes or Operation attributes on Document Creation operations and whether there should be a "document-format-target-default" and a "document-format-version-target-default".

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Version 0.3, 28 May 2003:

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Agreements reaches at the May 28, 2003 telecon:

1312

1. Moved the Close-Job operation to the futures specification.

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2. Added the "pages-per-subset" Job Template from [pwg5100.4]. See Appendix B section **Error! Reference source not found.** for the minor differences.

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1315

3. Added the terms: "Best Effort, Finished Document, Page, Page Subset, and Sheet.

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4. Clarified the conformance relationships between "xxx" Operation attributes and their corresponding "xxx-default" and "xxx-supported" Printer attributes.

1317

5. Added rationale for each missing "xxx-default" and "xxx-supported" attribute.

1318

6. Added 'errors-detected' and 'warnings-detected' "job-state-reasons" values.

1319

7. Added the new 'choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in' "media" attribute value which is a choice of two approximately equal media.

1320

8. Added the requirements for choice media keyword values for inclusion in a revision of the PWG IEEE-ISTO 5101.1.

1321

9. Changed the "document-format-implemented" member attribute from 1setOf mimeType to mimeType since it is the key attribute value.

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10. Added another "document-format-implemented" example.

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11. Updated the IANA section to agree with the additions.

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Version 0.4, June 4, 2003:

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1. Moved "document-format-details-implemented" Printer Description attribute to Futures.

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2. Moved "pages-per-subset" (1setOf integer(1:MAX)) Job Template attribute to Futures.

1331

3. Removed all CONDITIONALLY REQUIRED and CMUST statements and made them OPTIONAL and MAY. Added a statement of the intent for these attributes, so avoid the conformance statement problems for this specification which is just a list of OPTIONAL attributes.

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4. Removed the new terms "Honor" and "Best Effort", since they are synonym for "Support" and the opposite. It is confusing to have synonyms.

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5. Added all of the new Operation/Job Description attributes that describe Documents to be supplied in Job Creation operations and copied to the corresponding Job Description attributes as *default* values for the Document(s) of the Job.

1336

6. Added "output-device-default" and "output-device-supported" Printer attribute to provide the default for both the "output-device" Operation attribute and the "output-device-assigned" Job Description attribute.

1337

7. Added "document-message" and "document-name" as Operation/Job Description default Document attributes for the Job.

1338

8. Clarified that the 'none' value of the "document-digital-signature" must be implemented, but the administrator MAY remove the 'none' value in order to require signatures to be used.

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9. Sated that all supplied member attributes of the "document-format-details" Operation attribute MUST have a value, i.e., MUST NOT be empty.

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10. Normalized all of the Application Names and versions and Operating System Name values from the IANA Registry to lower case, as is done with most other IPP attributes, in order to facilitate matching.

1341

Moved the requirements for the new 'choice\_xxx' values to be added to PWG 5101.1.

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Version 0.6, July 2, 2003:

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1. Changed "output-device-requested" to "output-device"

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