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

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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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46 Operation extensions

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81 providers, network operating systems providers, network connectivity vendors, and print management application  
82 developers. The group is chartered to make printers and the applications and operating systems supporting them  
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  
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92

93

**94 Contact information:**

95 IPP Web Page: <http://www.pwg.org/ipp/>

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99 2) leave the subject line blank

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101 subscribe ipp

102 end

103 Implementers of this specification are encouraged to join the IPP Mailing List in order to participate in any  
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  
 239 operations. The Printer copies these Operation attributes to corresponding Job Description attributes defined in this  
 240 specification.

241 **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.
<del>output-device-requested</del> <del>output-device</del> (name(127))	MAY	Allows the client to indicate a preference for output devices, for a Printer that supports more than one or more output device (see fanout in [rfc2911] section 2.1).

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

<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].



250

**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.

258

**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.

259

## 2 Terminology

260

This section defines terminology used throughout this document.

261

### 2.1 Conformance Terminology

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

264

### 2.2 Other Terminology

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This document uses the same terminology as [rfc2911], such as "client", "Printer"<sup>2</sup>, "attribute", "attribute value", "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.

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

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

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

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

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

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

## 282 Page

283 The term "Page" used throughout this document is a synonym for PDL page.

### 284 PDL Page

285 A "PDL Page" is a page according to the definition of pages in the language used to express the document data.

286 Note: If the PDL contains multiple original source pages that have been placed on a single page by the client  
287 application, then the PDL page count is one. On the other hand, if the client requests that multiple PDL Pages are  
288 placed on a single side of media, by supplying "number-up" with a value greater than 1, then the PDL page count will  
289 be more than one. [rfc2911] uses the term "print stream page" for PDL Page.

### 290 Sheet

291 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 printer  
292 may mark on one side or on both sides of a sheet.

293 ~~**Page**—a synonym for the term "print stream page" as defined in [rfc2911] section 12.2.4. A **Page** is a page~~  
294 ~~according to the definition of a page in the language used to express the document data (PDL). Usually a **Page**~~  
295 ~~contains a single page as intended by the author of the source document. However, if the application that generates~~  
296 ~~the PDL places multiple author pages on a single **Page**, they are still considered a single **Page** as far as the Printer~~  
297 ~~and this specification is concerned.~~

298 ~~**Sheet**—the unit of media that a printer puts marks on. A **Sheet** is the most basic unit of output from a Printer. A~~  
299 ~~printer may mark on one side or on both sides of a **Sheet**.~~

## 300 **3 Operation Attributes for Job Creation and Document Creation operations**

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

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

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

Operation attribute: attribute name "xxx"	Operation attribute syntax	Printer: Default Value attribute syntax "xxx-default"	Printer: Supported Values attribute syntax "xxx-supported"
document-charset	charset	charset	1setOf charset
document-digital-signature	type2 keyword	type2 keyword	1setOf type2 keyword
document-format	mimeMediaType	mimeMediaType	1setOf mimeMediaType
document-format-details	1setOf collection	1setOf collection	1setOf type2 keyword
document-source-application-name	name(MAX)	name(MAX)	-
document-source-application-version	text(127)	text(127)	-
document-source-os-name	name(40)	name(40)	-
document-source-os-version	text(40)	text(40)	-
document-format	mimeMediaType	mimeMediaType	-
document-format-device-id	text(127)	text(127)	-
document-format-version	text(127)	text(127)	-
document-natural-language	naturalLanguage	naturalLanguage	-
document-format-version	text(127)	text(127)	1setOf text(127)
document-natural-language	naturalLanguage	naturalLanguage	1setOf naturalLanguage
<del>document-message</del>	<del>Text(MAX)</del>	<del>-</del>	<del>-</del>
<del>document-natural-language</del>	<del>naturalLanguage</del>	<del>-</del>	<del>-</del>
ipp-attribute-fidelity	boolean	-	-
job-mandatory-attributes	1setOf type2 keyword	-	-
<del>output-device-requested</del> <del>output-</del> <del>device</del>	name(127)	<del>name(127)<sup>3</sup></del>	1setOf name(127) <sup>4</sup>

310 ~~DMC-ISSUE: Need to add document-message and document-name to above table, as well as other places in the~~  
 311 ~~spec.~~

312 ~~Table 5~~ **Table 5** lists the Operation attributes that clients supply in Job and Document Creation operations and  
 313 whether the Printer copies (indicated by “⇒”) the supplied value to the corresponding Job Description<sup>5</sup> attribute. The  
 314 following statements apply to all Operation attributes for Job and Document Creation operations and are *not*  
 315 repeated in each Operation attribute Description:

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

<sup>3</sup> The corresponding "xxx-default" attribute is the "output-device-default" Printer attribute (see section 1.17.44), which is the default for both the "output-device-requested" Job Description attribute and the "output-device-assigned" Job Description attribute.

<sup>4</sup> The corresponding "xxx-supported" attribute is the "output-device-supported" Printer attribute (see section 7.117.42), which is the list of supported output devices for both the "output-device-requested" Job Description attribute and the "output-device-assigned" Job Description attribute.

<sup>5</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.

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

- 320 1. support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if  
 321 defined (see [Table 4Table-4](#) and section 7). If the Printer supports either of the "xxx-default" or "xxx-  
 322 supported" Printer Description attributes, then the Printer MUST also support the corresponding  
 323 Operation attribute.
- 324 2. validate the values supplied by the client in the "xxx" Operation attribute against the values indicated  
 325 in the Printer's corresponding "xxx-supported" Printer Description attribute (see section 7). If the  
 326 values do not validate, the Printer MUST perform one of the actions indicated for that Operation  
 327 attribute, unless explicitly specified otherwise in the Description, such as (1) reject the request, (2)  
 328 accept the request and either (a) hold the job for operator intervention or (b) print the Job ignoring  
 329 the attribute. In all of these cases, the Printer MUST return the Operation attribute with the  
 330 unsupported value in the Unsupported Attributes group in the response (see [rfc2911] section 3.1.7).

Legend:	
"Operation"	column indicates the operation attribute names for Job and Document Creation requests.
"*"	Following attribute name indicates value sent on Create-Job, Print-Job and Print-Uri is the default for all the Documents in the Job.
"Creation operations"	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.
"y"	the Operation attribute is defined for use with the indicated operations.
"y⇒"	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 <a href="#">Table 4Table-4</a> 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>
"_"	the Operation attribute is <i>not</i> defined for the indicated operation.
"Conformance"	column indicates the conformance requirements for what the client supplies in a request and the Printer supports in a request. For (indented) member attributes, a <b>MUST means if the collection attribute is supplied or supported.</b>
"Section"	column indicates where the Operation attribute is defined in this spec.

331

332

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

Operation attribute name for Job and Document Creation requests	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

Operation attribute name for Job and Document Creation requests	Attribute Syntax	Creation operations			Conformance		Section
		CJ	PJ, PU	SD, SU	Client supply	Printer support	
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
output-device-requestedoutput-device*	name(127)	y⇒	y⇒	-	MAY	MAY	§1.1.13-4.3

333

334 **3.1 Operation attributes for Job Creation operations only**

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

337 **3.1.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)**

338 This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1) when the client  
339 supplies unsupported Job Template attributes<sup>6</sup> or values in a Job Creation operation. The value ‘true’ indicates that  
340 total fidelity to client-supplied Job Template attributes and values is required for this Job Creation operation. If the  
341 client supplies the value ‘false’ or omits the attribute, then the Printer MUST accept the Job Creation operation.

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

343 **3.1.1.1 Why there are no “ipp-attribute-fidelity-default” and “ipp-attribute-fidelity-supported” attributes**

344 Because [rfc2911] defines the default value to be ‘false’ there is no point to define an “ipp-attribute-fidelity-default”  
345 Printer Description attribute. Because [rfc2911] REQUIRES a Printer to support the “ipp-attribute-fidelity” Operation  
346 attribute there is no need for an “ipp-attribute-fidelity-supported” Printer Description attribute.

347 **3.1.2 job-mandatory-attributes (1setOf type2 keyword)**

348 This OPTIONAL Operation attribute permits the client to identify which Job Template attributes the Printer MUST  
349 support in this Job Creation request in order to accept the Job. The Printer MUST reject this Job Creation operation  
350 if the client supplies an unsupported Job Template attribute or value in the request that is also identified in this list.

<sup>6</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.

351 The client MAY supply the "job-mandatory-attributes" Operation attribute in a Job Creation operation or Validate-Job  
352 operation and MUST NOT supply this attribute in any other operation. If the Printer supports the "job-mandatory-  
353 attributes" Operation attribute, the Printer MUST support this attribute in all Job Creation operations that it supports  
354 and in the Validate-Job operation.

355 If the client supplies the "job-mandatory-attributes" Operation attribute and the 'ipp-attribute-fidelity' Operation  
356 attribute with the 'true' value, the Printer MUST ignore the "job-mandatory-attributes", since the client is requesting  
357 that all of the supplied Job Template attributes in the Job Creation request MUST be supported in order for the  
358 Printer to accept the Job.

359 The Printer MUST copy this attribute to the corresponding "job-mandatory-attributes" Job Description attribute (see  
360 section 5.1.3) for auditing and trouble-shooting purposes<sup>7</sup>.

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

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

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

### 378 **3.1.2.1 Why there are no "job-mandatory-attributes-default" and "job-mandatory-attributes-supported"** 379 **Printer Description attributes**

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

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

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

---

<sup>7</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.

### 391 **3.1.3output-device-requested (name(127))**

392 This OPTIONAL Operation attribute specifies the name of the target output device for a Printer that fans-out to  
393 multiple devices (see [rfc2911] section 2.1). This allows the client to control which output device the Printer selects.  
394 If this attribute is omitted, the Printer selects whichever output device seems best for the job in an implementation  
395 dependent manner. The client can discover which output devices the Printer supports by querying the Printer's  
396 "output-device-requested-supported" Printer attribute (see section 7.12).

397 If the Printer supports this Operation attribute, the Printer MUST support it only on Job Creation operations, not  
398 subsequent Document Creation operations for this Job.

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

### 401 **3.1.3.1output-device-default (name(MAX))**

402 This OPTIONAL Printer Description attribute specifies the default value for the Job's "output-device-assigned" Job  
403 Description attribute. A Printer MAY have a dynamic scheduling algorithm to assign jobs to output devices, in which  
404 case the "output-device-default" Printer attribute is not configured. If the Printer does not have a dynamic scheduling  
405 algorithm to assign Jobs to output devices, the Printer copies the value of the "output-device-default" Printer attribute  
406 to the Job's "output-device-assigned" attribute when the client omits the "output-device-requested" Operation  
407 attribute.

## 408 **3.2 Operation attributes for both Job and Document Creation operations**

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

### 412 **3.2.1 document-charset (charset)**

413 This OPTIONAL Operation attribute identifies the charset of the Document Content. This Operation attribute is  
414 intended to be supported by Printers that support a document-format in which the charset may be ambiguous in the  
415 Document content, such as 'application/vnd.hp-PCL', where the charset escape sequence MAY be omitted from the  
416 data.

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

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

423 The Printer MUST support this attribute if it supports a document format for which the Document Content can be  
424 ambiguous with respect to the charset being used to encode the data. For example, the 'application/vnd.hp-PCL'  
425 MAY omit the charset escape sequence. Although [rfc2854] strongly RECOMMENDS that 'text/html', include a "  
426 charset=charset" parameter in the MIME type itself (that is, explicitly in the value of the "document-format" attribute),  
427 often the charset= parameter is not present in the MIME type and the Printer MUST assume a charset. Thus a  
428 Printer that supports the text/html MIME type MUST support the "document-charset" operation attributes. Also many  
429 text files use the various 8-bit ISO 8859 charsets in which the lower half is US-ASCII and the upper half is various  
430 Latin sets (about 8 or 9), Greek, Cyrillic, Hebrew, and Arabic. Shift JIS is another example where the left half is US-  
431 ASCII, but the right half can be one of a number of things. But if the data doesn't contain the charset escape  
432 sequences, this attribute can help the Printer know what the charset is in the Document. Such document formats are

433 called “charset-ambiguous” document formats. Finally, even though [rfc2046] REQUIRES the “; charset=” MIME  
434 type parameter if the file contains other than US-ASCII, in practice, the “; charset=” MIME type parameter is often  
435 omitted, thus making ‘text/plain’ a charset-ambiguous document format. See the discussion in [rfc2911] section 4.1.9  
436 and [rfc2046].

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

441 Many other document formats, such as ‘application/postscript’ and ‘application/pdf’, are *not* charset-ambiguous, so  
442 that Printers that support only such formats MAY omit support of the “document-charset” Operation/ Description  
443 attributes.

444 If the Printer supports the “document-charset” Operation attribute, it MUST also support the corresponding  
445 “document-charset-default” and “document-charset-supported” Printer Description attributes as well and vice versa  
446 (see sections 7.1 and 7.2).

### 447 3.2.2 document-digital-signature (type2 keyword)

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

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

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

- 458 1. ignore the signature (and MAY indicate on the printed output some how) and MUST set the Job’s “job-state-  
459 reasons” Job Description attribute with the ‘digital-signature-did-not-verify’ value (see section 6.1).
- 460 2. put the job on hold and wait for human intervention and MUST set the Job’s “job-state-reasons” Job  
461 Description attribute with the ‘job-digital-signature-wait’ and ‘digital-signature-did-not-verify’ values (see  
462 section 6.1), OR
- 463 3. abort the job depending on implementation and/or site configuration and MUST set the Job’s “job-state-  
464 reasons” Job Description attribute with the ‘job-aborted-by-system’ and ‘digital-signature-did-not-verify’  
465 values (see section 6.1).

466 Different PDLs have different techniques of embedding the signature. If the Printer supports the “document-digital-  
467 signature” attribute and the supplied “document-format”, the Printer MUST accept the document. However, if the  
468 Printer either doesn’t support the value of the “document-digital-signature” Operation attribute or doesn’t support the  
469 technique used by the supplied “document-format” attribute, the Printer MUST either (1) ignore the signature or (2)  
470 put the job on hold and wait for human intervention, depending on implementation. If the Printer doesn’t support the  
471 supplied value, the Printer MUST return the “document-digital-signature” attribute with its value as unsupported in the  
472 Unsupported Attributes group as specified in [rfc2911] section 3.1.7.

473 The following standard keyword values are defined:



- 474 'dss': Digital Signature Standard (DSS) [dss].
- 475 'none': There is not a digital signature in the Document content. If this attribute is supported, the 'none'
- 476 value MUST be implemented but MAY be removed by the administrator.
- 477 'pgp': PGP Message Exchange Formats [rfc1991].
- 478 'smime': Enhanced Security Services for S/MIME [rfc2634].
- 479 'xmldsig' XML Digital Signature [xmldsig].

### 480 3.2.3 document-format (mimeMediaType)

481 This REQUIRED Operation attribute (see [rfc2911] section 3.2.1.1) indicates the document format of the supplied

482 Document Content. If a client supplies the “document-format” Operation attribute with a value that the Printer doesn't

483 support, the Printer MUST reject the job and return the status code 'client-error-document-format-not-supported' (see

484 [rfc2911] section 3.1.4.11), since the Printer cannot process the data.

485 The standard values for this attribute are Internet Media types (sometimes called MIME types). For some MIME

486 types, such as 'text/plain' [rfc2046], the “; charset=” parameter is defined which specifies the charset of the Document

487 content. The Printer MUST support the charset MIME parameter as well as the “document-charset” Operation

488 attribute (section 3.2.1) if the Printer supports any text MIME type, such as 'text/plain' or 'text/html'. For further

489 details see the description of the 'mimeMediaType' attribute syntax in [rfc2911] section 4.1.9 and [rfc2046] and the

490 “document-charset” Operation attribute (section 3.2.1).

491 Many printer languages in the Printer MIB do not have a MIME type registered with IANA.<sup>8</sup> It is the intent of the PWG

492 to registers all of the Printer MIB v2 XXX Printer Languages as 'application/vnd.PWG-XXX'. If a Printer Language

493 already has a registered MIME Media type or gets a registration in the future, then that MIME Type MUST be used in

494 preference to the 'application/vnd.PWG-XXX' MIME Type. For example, PostScript® has the MIME Media type:

495 'application/postscript' and PCL has the MIME Media Type: 'application/vnd.HP-PCL', so those MIME Media types

496 MUST be used instead of 'application/vnd.PWG-PS' and 'application/vnd.PWG-PCL'. For example, the NEC NPDL

497 printer language from the Printer MIB does not have a MIME type registered with IANA. Therefore, the “document-

498 format” = 'application/vnd.PWG-NPDL' MUST be used.

499 Note: CIP4 did not agree to register MIME types for other organizations and standards. Instead, CIP4 will just add

500 values to the flat file that aren't MIME types. The values will not start with any of the MIME type roots: application/,

501 audio/, image/, message/, model/, multipart/, test/, or video.

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

503 See also the “document-format-version” Operation attribute in section 3.2.5 and the “document-format-details”

504 Operation attribute in section 3.2.4.

### 505 3.2.4 document-format-details (1setOf collection)

506 This OPTIONAL Operation attribute supplied in Document Creation operations summarizes the details of the

507 Document content, including any files contained in the Document. This Operation attribute is intended to be

508 supported by Printers that support a packaging document format, such as 'application/zip' or 'multipart/related', in

509 order to detail the contents. However, this Operation attribute MAY be used with any document format. See [Table](#)

510 [6-Table-6](#) for a list of the member attributes along with the client and Printer conformance requirements.

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

<sup>8</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.

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

517 If a client supplies the "document-format-details" Operation attribute in a Document Creation request with member  
 518 attributes and/or values that the Printer doesn't support, the Printer MUST perform one of the following actions  
 519 depending on implementation: (1) reject the request OR (2) accept the request and either (a) put the Job in the  
 520 'pending-held' state or (b) process the job ignoring the attribute. See section 3 above for more details. However, if  
 521 the "document-charset" or the "document-format" member attributes are the ones in question, the Printer MUST  
 522 reject the request, same as for the "document-charset" and "document-format" Operation attributes (see sections  
 523 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-  
 524 error-document-format-not-supported' (see [rfc2911] section 13.1.4.11) status-codes, respectively.

525 For a packaging format, the "document-format-details" attribute does not provide means to associate each collection  
 526 value with particular document in the archive file, so it does not provide a "manifest"<sup>9</sup> of the packaging. One of the  
 527 packaging collection values MAY describe the packaging format itself, in which case that collection value MUST be  
 528 the first collection value. The remaining collection values provide the summary of the details of the contained files in  
 529 any order.

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

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

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

537 If a file in a packaging file is itself a packaging file, the single "document-format-details" (1setOf collection) Operation  
 538 attribute SHOULD contain the flattened distinct collection values for all files at all nested levels. Therefore, the  
 539 "document-format-details" collection attribute is not recursively defined and MUST NOT contain the "document-  
 540 format-details" attribute as a member attribute.

541 **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

<sup>9</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.

document-natural-languages	1setOf naturalLanguage	MAY	MAY	3.2.4.8	3.2.8
----------------------------	------------------------	-----	-----	---------	-------

542  
543 The client can determine which member attributes of the “document-format-details” are supported by querying the  
544 Printer’s “document-format-details-supported” (1setOf type2 keyword) Printer Description attribute (see section 7.6).

545 [Table 6](#) shows that three of the member attributes also have comparable top level Operation attributes  
546 defined with the same names. See the sections listed in the rightmost column. These three high level attributes  
547 have corresponding “xxx-default” and “xxx-supported” Printer Description attributes. These values are also for use  
548 with the corresponding three member attributes. The remaining member attributes do not have any corresponding  
549 “xxx-default” and “xxx-supported” Printer Description attribute.

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

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

554 This OPTIONAL member Operation attribute identifies the application that generated the document. The  
555 value MUST be all lowercase in order to facilitate matching. The version number MUST NOT be included  
556 (see the "document-source-application-version" attribute). Examples: “photoshop”, “microsoft word”,  
557 “unknown”.  
558

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

559 This OPTIONAL member Operation attribute identifies the version number of the application that created the  
560 document. The value MUST be all lowercase in order to facilitate matching. The intent of this attribute is for  
561 purposes of affecting the interpreting by the Printer for any formats for which the source application version  
562 might have different semantics. Examples:  
563

564 “8.1 (4331)” for Winzip®, “5.0.5 10/26/2001” for Acrobat®, “2000 (9.0.4119 sr-1)” for Microsoft® Word

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

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

567 This OPTIONAL member Operation attribute identifies the name of the operating system on which the  
568 document was generated. Valid values are the operating system names defined in the IANA Operating  
569 System name registry [os-names] with the version number portion removed (see the “document-source-os-  
570 version” attribute). IANA Operating System Names consist of up to 40 *uppercase* US-ASCII letters, hyphen  
571 (“-“), period (“.”), and slash (“/“) characters. The value MUST be all lowercase in order to facilitate matching.  
572

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

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

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

575 This OPTIONAL member Operation attribute identifies the version of the operating system on which the  
576 document was generated. Valid values include the version portion of any of the operating system names  
577 defined in the IANA Registry [os-names]. The value MUST be all lowercase in order to facilitate matching.  
578

579 The value MUST NOT include the name portion of the registered OS name (see “document-source-os-  
580 name” attribute).

581 Possible example values for the indicated “document-source-os-name” value are:  
582 for ‘linux’: ‘1.0’, ‘1.2’, ‘2.0’, ‘2.2’, ‘2.4’  
583 for ‘unix’: ‘bsd’, ‘v’, ‘v.1’, ‘v.2’, ‘v.3’, ‘pc’  
584 for ‘windows’: ‘95’, ‘98’, ‘ce’, ‘nt’, ‘nt-2’, ‘nt-3’, ‘nt-3.5’, ‘nt-3.51’, ‘nt-4’, ‘nt-5’ (windows 2000),  
585 **ACTION ITEM: Get Microsoft to register NT-5.1 (maybe NT-5.2) with IANA.**

586

### 587 **3.2.4.5 document-format (mimeMediaType)**

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

### 593 **3.2.4.6 document-format-device-id (text(127))**

594 This OPTIONAL member Operation attribute identifies the type of device for which the document was  
595 formatted, including manufacturer and model. This attribute is intended to identify document formats that are  
596 not portable, e.g., PDLs that are device dependent. The value of this variable MUST exactly match the IEEE  
597 1284-2000 Device ID string (see [IEEE1284] clause 6), except the length field MUST NOT be specified. See  
598 the Microsoft Universal Plug and Play [upnp] section 2.2.6 DeviceId parameter for details and examples.  
599 Here is an example showing only the required fields for a PostScript document:  
600 `MANUFACTURER:ACME Co.;COMMAND SET:PS;MODEL:LaserBeam 9;`

### 601 **3.2.4.7 document-format-version (text(127))**

602 This REQUIRED member Operation attribute identifies the level or version of the document format identified  
603 by the “document-format” member attribute. The client MAY supply and the Printer MUST support this  
604 member attribute if the Printer supports the “document-format-details” Operation attribute. The semantics  
605 and supported values of this “document-format-version” member attribute MUST be the same as for the top  
606 level “document-format-version” Operation attribute with the same name (see section 3.2.5 for the  
607 semantics).

### 608 **3.2.4.8 document-natural-language (1setOf naturalLanguage)**

609 This OPTIONAL member Operation attribute specifies the natural language(s) of the collection value of  
610 which it is a member. The values for this attribute are natural language codes (with optional country codes)  
611 and have the same values and semantics as for the top level “document-natural-language”  
612 (naturalLanguage) operation attribute with the same name (see section 3.2.8 for the semantics). If the  
613 document contains multiple natural languages, then the first value MUST be the primary language of the  
614 document.

### 615 **3.2.5 document-format-version (text(127))**

616 This OPTIONAL Operation attribute identifies the level or version of the document format of the Document content  
617 identified by the “document-format” Operation attribute (section 3.2.3).

618 If the client supplies this “document-format-version” Operation attribute, the client MUST also supply the “document-  
619 format” Operation attribute (section 3.2.3), so that the Printer does not need to parse the “document-format-version”  
620 string in order to determine the document format and version.

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

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

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

636 Example values:

637 ‘PS/3’: For Postscript level 3 [rfc1759].  
 638 ‘PCL/5e’: For PCL 5e [rfc1759].  
 639 ‘PDF/1.4’: For PDF version 1.4 [pdf]  
 640 ‘PDF/X-1a:2001’: For PDF/X-1a [iso15930]  
 641 ‘DCS/2.0’ For Document Color Separation (DCS), version 2.0. [dcs2.0]  
 642 ‘TIFF-IT/FP:1998’: TIFF/IT [iso12639] - Full Page - baseline.  
 643 ‘TIFF-IT/CT:1998’: TIFF/IT [iso12639] - Continuous Tone picture data - baseline  
 644 ‘TIFF-IT/FP/P1:1998’: TIFF/IT [iso12639] - Full Page - profile 1  
 645 ‘TIFF-IT/CT/P1:1998’: TIFF/IT [iso12639] - Continuous Tone picture data - profile 1  
 646 ‘Automatic’: auto sense the format [rfc1759]. Is use in combination with the ‘application/octet-stream’ (see  
 647 [rfc2911] section 4.1.9.1) value of the “document-format” attribute (section 3.2.3).  
 648

#### 649 3.2.5.1 Why no "document-format-version-default"

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

### 653 3.2.6 document-message (text(MAX))

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

### 655 3.2.7 document-name (name(MAX))

656 The Printer MUST support this Operation attribute in Print-Job, Print-URI, Send-Document, and Send-URI operations  
 657 (see [rfc2911 section 3.2.1.1) and MAY support it in the Create-Job operation. For the Print-Job, Print-URI, and  
 658 Create-Job operations, the Printer MUST copy the value to the corresponding Job Description attribute<sup>10</sup>.

---

<sup>10</sup> For the Send-Document and the Send-URI Operation attribute, the Printer copies them to the corresponding Document Description attribute defined in [ippdoc].

### 659 3.2.8 document-natural-language (naturalLanguage)

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

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

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

669 'en': for English  
670 'en-us': for US English  
671 'fr': for French  
672 'de': for German  
673

### 674 3.2.9 output-device (name(127))

675 This OPTIONAL Operation attribute specifies the name of the target output device for a Printer that fans-out to  
676 multiple devices (see [rfc2911] section 2.1). This allows the client to control which output device the Printer selects.  
677 If this attribute is omitted, the Printer selects whichever output device seems best for the job in an implementation  
678 dependent manner. The client can discover which output devices the Printer supports by querying the Printer's  
679 "output-device-supported" Printer attribute (see section 7.117-12).

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

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

## 689 4 Job Template attributes

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

693 Job Template attributes are OPTIONAL for a Printer to support and for a client to supply in a Job Creation request. If  
694 a Printer supports a Job Template attribute, then the Printer MUST copy the supplied attribute to the Job object, so  
695 that a client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs operations (see [rfc2911] section  
696 4.2). In addition, as in [rfc2911], for each "xxx" Job Template attribute supported, the Printer MUST support the  
697 corresponding "xxx-default" and "xxx-supported" Printer attributes, if defined.

698

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>1142</sup>	1setOf type2 enum
<b>job-finishings-col</b>	collection	collection <sup>11</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))

699

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

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

706

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

707 This OPTIONAL Job Template attribute specifies the number of job copies, i.e., with all of the Documents taken  
 708 together. Its interpretation is independent of the value of the "multiple-document-handling" Job Template attribute.  
 709 See the "copies" Job Template attribute defined in [rfc2911] section 4.2.5 that switches between job copies and  
 710 document copies depending on the value of the "multiple-document-handling" Job Template attribute ([rfc2911]  
 711 section 4.2.4). ~~The "job-copies" Job Template attribute is equivalent to "copies" with "multiple-document-handling" =  
 712 'single-document-new-sheet'. Issue to Pete: You know this stuff much better than I—would it be possible to add a  
 713 small example, or a few small examples, that illustrates how "job-copies" and "copies" work, especially if they were  
 714 both used at the same time? Just an idea.~~  
 715 For example assume a Job has two documents. The "copies" attribute has a value of '3' and "job-copies" has a  
 716 value of '2'. With "multiple-document-handling" set to 'separate-documents-collated-copies' the resulting printout  
 717 would have two sets (i.e. job-copies=2). The first set would be 3 copies of Document 1 and then 3 copies of  
 718 Document 2. The second set would be identical to the first. If a similar Job was run with "multiple-documents-  
 719 handling" set to 'single-document-new-sheet' it would also produce two set. In this case however each set would  
 720 contain Document 1, Document 2, Document 1, Document 2, Document 1, Document 2 (i.e copies=3). The "copies"  
 721 and "job-copies" become more interesting when Documents within the Job each have their own value of "copies".  
 722 This can be accomplished via the Document object [ippdoc] or Overrides [PWG5100.4], [ippOverride].

<sup>11</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.

#### 723 4.1.1.1 job-copies-default (integer(1:MAX))

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

#### 726 4.1.1.2 job-copies-supported (rangeOfInteger(1:MAX))

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

### 729 4.1.2 job-cover-back (collection)

730 This OPTIONAL Job Template attribute specifies the cover for the back of the job, i.e., with all of the Documents  
731 taken together and is independent of the value of the "multiple-document-handling" Job Template attribute. The  
732 member attributes are the same as "cover-back" (see [pwg5100.3] section 3.1) and with the same conformance  
733 requirements. However, the "cover-back" Job Template attribute switches between a job back cover and a document  
734 back cover depending on the value of the "multiple-document-handling" Job Template attribute ([rfc2911] section  
735 4.2.4). The "job-cover-back" Job Template attribute is equivalent to "cover-back" with "multiple-document-handling" =  
736 'single-document-new-sheet'.

#### 737 4.1.2.1 job-cover-back-default (collection)

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

#### 740 4.1.2.2 job-cover-back-supported (1setOf type2 keyword)

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

### 744 4.1.3 job-cover-front (collection)

745 This OPTIONAL Job Template attribute specifies the cover for the front of the job, i.e., with all of the Documents  
746 taken together and is independent of the value of the "multiple-document-handling" Job Template attribute. The  
747 member attributes are the same as the "cover-front" Job Template attribute (see [pwg5100.3] section 3.2) and with  
748 the same conformance requirements. However, the "cover-front" Job Template attribute switches between a job  
749 front cover and a document front cover depending on the value of the "multiple-document-handling" Job Template  
750 attribute ([rfc2911] section 4.2.4). The "job-cover-front" Job Template attribute is equivalent to "cover-front" with  
751 "multiple-document-handling" = 'single-document-new-sheet'.

#### 752 4.1.3.1 job-cover-front-default (collection)

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

#### 755 4.1.3.2 job-cover-front-supported (1setOf type2 keyword)

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



#### 759 **4.1.4 job-finishings (1setOf type2 enum)**

760 This OPTIONAL Job Template attribute specifies the job finishings, i.e., with all of the Documents taken together. Its  
761 interpretation is independent of the value of the “multiple-document-handling” Job Template attribute. See the  
762 “finishings” Job Template attribute defined in [rfc2911] section 4.2.6 that switches between job finishings and  
763 document finishings depending on the value of the “multiple-document-handling” Job Template attribute ([rfc2911]  
764 section 4.2.4). The “job-finishings” Job Template attribute is equivalent to “finishings” with “multiple-document-  
765 handling” = ‘single-document-new-sheet’.

##### 766 **4.1.4.1 job-finishings-default (1setOf type2 enum)**

767 This OPTIONAL Job Template Printer attribute specifies the default job finishings. The Printer MUST support this  
768 attribute if it supports the “job-finishings” Job Template attribute.

##### 769 **4.1.4.2 job-finishings-ready (1setOf type2 enum)**

770 This OPTIONAL Job Template Printer attribute specifies the ready job finishings, that is, the job finishings that maybe  
771 used without operator intervention. The Printer MUST support this attribute if it supports the “job-finishings” Job  
772 Template attribute.

##### 773 **4.1.4.3 job-finishings-supported (1setOf type2 keyword)**

774 This OPTIONAL Job Template Printer attribute specified the supported job finishings values. The Printer MUST  
775 support this attribute if it supports the “job-finishings” Job Template attribute.

#### 776 **4.1.5 job-finishings-col (1setOf collection)**

777 This OPTIONAL Job Template attribute specifies the job finishings collection, i.e., with all of the Documents taken  
778 together. Its interpretation is independent of the value of the “multiple-document-handling” Job Template attribute.  
779 See the “finishings-col” Job Template attribute defined in [pwg5100.3] section 3.2 that switches between job  
780 finishings collection and document finishings collection depending on the value of the “multiple-document-handling”  
781 Job Template attribute ([rfc2911] section 4.2.4). The “job-finishings-col” Job Template attribute is equivalent to  
782 “finishings-col” with “multiple-document-handling” = ‘single-document-new-sheet’.

##### 783 **4.1.5.1 job-finishings-col-default (collection)**

784 This OPTIONAL Job Template Printer attribute specifies the default job finishings collection. The Printer MUST  
785 support this attribute if it supports the “job-finishings-col” Job Template attribute.

##### 786 **4.1.5.2 job-finishings-col-ready (collection)**

787 This OPTIONAL Job Template Printer attribute specifies the ready job finishings collection, that is, the job finishings  
788 collection that maybe used without operator intervention. The Printer MUST support this attribute if it supports the  
789 “job-finishings-col” Job Template attribute.

##### 790 **4.1.5.3 job-finishings-col-supported (1setOf type2 keyword)**

791 This OPTIONAL Job Template Printer attribute specified the supported member attributes of the “job-finishings-col”  
792 Job Template collection attribute. The Printer MUST support this attribute if it supports the “job-finishings-col” Job  
793 Template attribute.

794 **5 Job Description attributes**

795 This section defines the new Job Description attributes defined in this IPP specification. Job Description attributes  
 796 are Job object attributes that are filled in by the Printer. Some Job Description attribute values are supplied by the  
 797 client in the Job operation using corresponding Operation attributes as indicated in the “Set by” column. The Printer  
 798 MUST NOT support modification of any of these Job Description attributes using the Set-Job-Attributes operation  
 799 ([rfc3380]).

800 This section divides Job Descriptions into two subsections: Section 5.1 contains Job Description attributes that  
 801 describe the Job as a whole and Section 5.2 contains Job Description attributes that are defaults for the Document(s)  
 802 in the Job<sup>12</sup>. The following legend is used in the tables in both sections:

Legend:	
<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 <a href="#">Table 5</a> <del>Table 5</del> 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.

803

804 **5.1 Job Description attributes that describe the Job as a whole**

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

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

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

808

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

<sup>12</sup> The [jobx] specification does not define any Document Description attributes. See the [ippdoc] specification.

### 817 **5.1.1 errors-count (integer(0:MAX))**

818 This OPTIONAL Job Description attribute counts the number of errors encountered processing the job as a whole.  
 819 An error where some portion of the printed output is not present, such as a glyph encountered which isn't in the  
 820 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  
 821 overall document format.

### 822 **5.1.2 ipp-attribute-fidelity (boolean)**

823 This OPTIONAL Job Description attribute indicates the value of the corresponding "ipp-attribute-fidelity" Operation  
 824 attribute ([rfc2911] section 3.2.1.1)<sup>13</sup> that the client supplied in the Job Creation operation. This Job Description  
 825 attribute has no effect on the processing of the job once the Job Creation operation has been accepted<sup>14</sup>. However,  
 826 this attribute does provide an audit capability to the user and service desk for comparing unexpected printed results  
 827 with what was submitted.

### 828 **5.1.3 job-mandatory-attributes (1setOf type2 keyword)**

829 This OPTIONAL Job Description attribute indicates which Job Template attributes that the client required that the  
 830 Printer Support in order to accept the Job Creation request. The Printer populates this attribute with the value of the  
 831 corresponding "job-mandatory-attributes" Operation attribute (see section 3.1.2) supplied by the client in the Job  
 832 Creation operation. This Job Description attribute has no effect on the processing of the job once the Job Creation  
 833 operation has been accepted<sup>14</sup><sup>15</sup>. However, this Job Description attribute does provide an audit capability of the Job  
 834 object in the Job History (see [rfc2911] section 4.3.7.2) to the user and service desk for comparing unexpected  
 835 printed results with what was submitted. See section 3.1.2 for additional details of the semantics of this "job-  
 836 mandatory-attributes" Operation attribute that are not repeated here.

### 837 **5.1.4 ~~output-device-requested~~output-device (name(127))**

838 This OPTIONAL Job Description attribute indicates the name of the output device that the client has supplied in the  
 839 "~~output-device-requested~~output-device" Operation attribute (see section 1.1.13-1.3), if any, in the Job Creation  
 840 operation. The Printer sets the Job's "output-device-assigned" Job Description attribute (see [rfc2911] section ) to  
 841 the name of the actual device assigned.

### 842 **5.1.5 warnings-count (integer(0:MAX))**

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

## 845 **5.2 Job Description attributes that are defaults for the Document(s) in the Job**

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

### 848 **5.2.1 ~~compression-supplied~~ (type3 keyword)**

849 This REQUIRED Job Description attribute specifies the *default* compression used to represent the document(s) in  
 850 the Job. The Printer sets this Job Description attribute from the corresponding Operation attribute (see [rfc2911]  
 851 §3.2.1.1) supplied by the client in the Job Creation operation.

<sup>13</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>14</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].

**852 5.2.2 document-charset-supplied (charset)**

853 This OPTIONAL Job Description attribute specifies the *default* charset used to represent this document (see section  
854 3.2.1). The Printer sets this Job Description attribute from the corresponding Operation attribute supplied by the  
855 client in the Job Creation operation.

**856 5.2.3 document-digital-signature-supplied (type2 keyword)**

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

**862 5.2.4 document-format-supplied (mimeMediaType)**

863 This REQUIRED<sup>15</sup> Job Description attribute specified the *default* document format of the Document Object content.  
864 The Printer sets this Job Description attribute from the corresponding “document-format” Operation attribute (see  
865 [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  
866 operation.

**867 5.2.5 document-format-details-supplied (1setOf collection)**

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

**873 5.2.6 document-format-version-supplied (text(127))**

874 This OPTIONAL Job Description attribute specifies the *default* version of the document format of the Document  
875 Object content. The Printer sets this Job Description attribute from the corresponding “document-format-version”  
876 Operation attribute (see section 3.2.5 for the semantics), if supplied by the client in the Job Creation operation (see  
877 section ). If a Printer supports the “document-format-version” Operation attribute, the Printer MUST support this  
878 “document-format-version” Job Description attribute.

**879 5.2.7 document-message-supplied (text(MAX))**

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

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

---

<sup>15</sup> [rfc2911] did not define a “document-format” Document Description attribute; it is a new attribute defined in this specification.

887 **5.2.8 document-name (name-supplied (MAX))**

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

891 **5.2.9 document-natural-language-supplied (naturalLanguage)**

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

895 **6 New values to existing attributes**

896 This section defines new values for existing attributes.

897 **6.1 New job-state-reasons(1setOf type2 keyword) Values**

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

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

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

908 [Table 9Table 9](#) lists the new keyword values for the "job-state-reasons" attribute defined in this specification as  
 909 indicated in the References column. In [Table 9Table 9](#) the keywords are listed in alphabetic order, while in their  
 910 descriptions following [Table 9Table 9](#), they are listed in the most likely order of occurrence to help understanding.

911 **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

912 For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely  
 913 to occur (if implemented):  
 914

- 915       **'digital-signature-type-not-supported'**: One or more documents in the Job contain a digital signature type  
 916       that is not supported. Implementation or site policy determines the state of the Job once this  
 917       condition is detected.
- 918       **'job-digital-signature-wait'**: The Job is currently being held because the Job was submitted with a  
 919       “document-digital-signature” attribute value that is not supported.
- 920       **'digital-signature-did-not-verify'**: One or more documents in the Job contains a digital signature type that is  
 921       supported (see section 3.2.2), but the signature did not verify when the Printer attempted to verify the  
 922       signature.
- 923       **'errors-detected'** : If the Printer supports this value, the Printer MUST add this value to “job-state-reasons”  
 924       when the Printer generates the first error message. That is, a single occurrence of this value is  
 925       present in the “job-state-reasons” Job Description attribute if the Printer has generated one or more  
 926       errors. An error indicates loss of information, such as a page not imaged. See also the ‘warnings-  
 927       detected’ value.
- 928       **'warnings-detected'** : If the Printer supports this value, the Printer MUST add this value to “job-state-  
 929       reasons” when the Printer generates the first warning message. That is, a single occurrence of this  
 930       value is present in the “job-state-reasons” Job Description attribute if the Printer has generated one  
 931       or more warnings. A warning indicates something did not go as expected, but there was no loss of  
 932       information. For example, a font substitution. See also the ‘errors-detected’ value.

## 933 6.2 New media (type 3 keyword | name(MAX)) Values

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

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

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

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

## 946 7 New Printer Description attributes

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

951  
 952 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 <a href="#">Table 7-Table 7</a> . 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.

953

954

**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
<del>output-device-requested</del> <b>output-device-supported</b>	1setOf name(127)		[this spec] §7.117-12

955

956 **7.1 document-charset-default (charset)**

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

961 **7.2 document-charset-supported (1setOf charset)**

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

965 **7.3 document-digital-signature-default (type2 keyword)**

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

968

## 969 7.4 document-digital-signature-supported (1setOf type2 keyword)

970 This OPTIONAL Printer Description attribute indicates the digital signature technologies that the Printer supports in  
971 Document Contents, that is, supports as values of the “document-digital-signature” Operation attribute (section  
972 3.2.2). The Printer MUST support this attribute if it supports the “document-digital-signature” Operation attribute.

## 973 7.5 document-format-details-default (collection)

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

## 978 7.6 document-format-details-supported (1setOf type2 keyword)

979 This OPTIONAL Printer Description attribute lists the type2 keyword names of the member attributes of “document-  
980 format-details” that the Printer supports. The Printer MUST support this “document-format-details” (1setOf type2  
981 keyword) Printer Description attribute, if the Printer supports the “document-format-details” (1setOf collection)  
982 Operation attribute (see section 3.2.4). [Table 11](#)[Table 11](#) lists the type2 keywords defined for use in the “document-  
983 format-details-supported” Printer attribute.

984 **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

985

## 986 7.7 document-format-version-default (text(127))

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

## 990 7.8 document-format-version-supported (1setOf text(127))

991 This OPTIONAL Printer Description attribute indicates the document format versions that the Printer supports for  
992 Document Contents, that is, supports as values of the “document-format-version” Operation attribute (section 3.2.5).  
993 The Printer MUST support this attribute if it supports the “document-format-version” Operation attribute.



## 994 7.9 document-natural-language-default (naturalLanguage)

995 This OPTIONAL Printer Description attribute indicates the default document natural language that the Printer will  
 996 assume for Document Content when the client omits the “document-natural-language” Operation attribute ([rfc2911]  
 997 section 3.2.1.1). The Printer MUST support this attribute if it supports the “document-natural-language” Operation  
 998 attribute.

## 999 7.10 document-natural-language-supported (1setOf naturalLanguage)

1000 This OPTIONAL Printer Description attribute lists the natural languages supported in any of the supported document  
 1001 formats, that is, it is the union of the natural languages. The Printer MUST support this attribute if it supports the  
 1002 “document-natural-language” Operation attribute ([rfc2911] section 3.2.1.1).

## 1003 7.11 output-device-default (name(127))

1004 This OPTIONAL Printer Description attribute is the default for both the “output-device-requested” Job Description and  
 1005 the “output-device-assigned” Job Description attribute. A Printer MAY support the “output-device-default” Printer  
 1006 attribute if the Printer’s scheduling algorithm has a default output device. On the other hand, a Printer MAY have a  
 1007 dynamic scheduling algorithm in which case this attribute is not supported.

## 1008 7.127.11 output-device-supported (1setOf name(127))

1009 This OPTIONAL Printer Description attributes lists the names of output devices that the Printer supports. The Printer  
 1010 MUST support this attribute if it supports the “~~output-device-requested~~output-device” Operation attribute (see section  
 1011 [1.1.13-1.3](#)).

## 1012 8 Conformance Requirements

1013 This specification contains a number of independent OPTIONAL attributes. This section summarizes the  
 1014 conformance requirements for Printers and clients.

### 1015 8.1 Printer conformance requirements

1016 In order to claim conformance to this specification, a Vendor MUST explicitly identify the attributes and values  
 1017 supported by the Printer implementation in any such claim of conformance. In addition, the Vendor’s Printer  
 1018 implementation:

- 1019 1. MUST meet the conformance requirements for Printers specified in [rfc2911].
- 1020 2. MAY support any OPTIONAL Operation attribute according to section 3 and the corresponding Job  
 1021 Description attributes in section 5 and corresponding Printer attributes in section 7.
- 1022 3. MAY support any Job Template attribute according to section [3.2.94](#).
- 1023 4. MAY support any of the “job-state-reasons” values according to section 6.

1024 **8.2 Client conformance requirements**

1025 In order to claim conformance to this specification, a Vendor MUST explicitly identify the attributes and values  
 1026 supported by the client implementation in any such claim of conformance. In addition, the Vendor's client:

1027 1. MUST meet the conformance requirements for clients specified in [rfc2911]

1028 2. MAY support any Operation attribute according to section 3 and the corresponding Job Description attributes  
 1029 in section 5 and corresponding Printer attributes in section 7.

1030 3. MAY support any Job Template attribute according to section [3.2.94](#).

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1125 **11 IANA Considerations**

1126 This section contains the registration information for IANA to add to the various IPP Registries according to the  
 1127 procedures defined in RFC 2911 [rfc2911] section 6 to cover the definitions in this document. The resulting  
 1128 registrations will be published in the <http://www.iana.org/assignments/ipp-registrations> registry.

1129 *Note to the PWG Editor: Replace the References below to [this spec] with the IEEE-ISTO standard number*  
 1130 *for the appropriate document, so that it accurately reflects the content of the information for the IANA Registry.*

1131 **11.1 Attribute Registrations**

1132 The following table lists all the attributes defined in this specification. These are to be registered according to the  
 1133 procedures in RFC 2911 [rfc2911] section 6.2. If the attribute has a separate sub-section definition in this  
 1134 specification, that sub-section is listed as the Reference. This table contains the reference to another specification  
 1135 that completely defines each attribute.

1136	<b>Attribute Name (attribute syntax)</b>	<b>Reference</b>	<b>Section</b>
1137	-----	-----	-----
1138			
1139			
1140	<b>Job Description attributes:</b>		
1141	compression (type3 keyword)	[this spec]	5.2.1
1142	document-charset (charset)	[this spec]	5.2.2
1143	document-digital-signature (type2 keyword)	[this spec]	5.2.3
1144	document-format (mimeMediaType)	[this spec]	5.2.4
1145	document-format-details (1setOf collection)	[this spec]	5.2.5
1146	document-source-application-name (name(MAX))	[this spec]	5.2.5
1147	document-source-application-version (text(127))		
1148		[this spec]	5.2.5
1149	document-source-os-name (name(40))	[this spec]	5.2.5
1150	document-source-os-version (text(40))	[this spec]	5.2.5
1151	document-format (mimeMediaType)	[this spec]	5.2.5
1152	document-format-device-id (text(127))	[this spec]	5.2.5
1153	document-format-version (text(127))	[this spec]	5.2.5
1154	document-natural-language (1setOf naturalLanguage)		
1155		[this spec]	5.2.5
1156	document-format-version (text(127))	[this spec]	5.2.6
1157	document-message (text(MAX))	[this spec]	5.2.7
1158	document-name (name(MAX))	[this spec]	5.2.8
1159	document-natural-language (naturalLanguage)	[this spec]	5.2.9
1160	errors-count (integer(0:MAX))	[this spec]	5.1.1
1161	job-attribute-fidelity (boolean)	[this spec]	5.1.2
1162	job-mandatory-attributes (1setOf type2 keyword)	[this spec]	5.1.3
1163	<del>output-device-requested</del> <u>output-device</u> (name(127))		[this
1164	spec] 5.1.4		
1165	warnings-count (integer(0:MAX))	[this spec]	5.1.5
1166			
1167	<b>Job Template attributes:</b>		
1168	job-copies (integer(1:MAX))	[this spec]	4.1.1

1169	job-copies-default (integer(1:MAX))	[this spec]	4.1.1.1
1170	job-copies-supported (rangeOfInteger(1:MAX))	[this spec]	4.1.1.2
1171	job-cover-back (collection)	[this spec]	4.1.2
1172	<member attributes are the same as "cover-back"[pwg5100.3]		3.1>
1173	job-cover-back-default (collection)	[this spec]	4.1.2.1
1174	<member attributes are the same as "cover-back"[pwg5100.3]		3.1>
1175	job-cover-back-supported (1setOf type2 keyword)	[this spec]	4.1.2.2
1176	job-cover-front (collection)	[this spec]	4.1.3
1177	<member attributes are the same as "cover-front"[pwg5100.3]		3.1>
1178	job-cover-front-default (collection)	[this spec]	4.1.3.1
1179	<member attributes are the same as "cover-front"[pwg5100.3]		3.1>
1180	job-cover-front-supported (1setOf type2 keyword)	[this spec]	4.1.3.2
1181	job-finishings (1setOf type2 enum)	[this spec]	4.1.4
1182	job-finishings-default (1setOf type2 enum)	[this spec]	4.1.4.1
1183	job-finishings-ready (1setOf type2 enum)	[this spec]	4.1.4.2
1184	job-finishings-supported (1setOf type2 keyword)	[this spec]	4.1.4.3
1185	job-finishings-col (1setOf collection)	[this spec]	4.1.5
1186	<member attributes are the same as "finishings-col"[pwg5100.3]		3.2>
1187	job-finishings-col-default (1setOf type2 enum)	[this spec]	4.1.5.1
1188	job-finishings-col-ready (1setOf type2 enum)	[this spec]	4.1.5.2
1189	job-finishings-col-supported (1setOf type2 keyword)		
1190		[this spec]	4.1.5.3
1191			
1192	<b>Printer Description attributes:</b>		
1193	document-charset-default (charset)	[this spec]	7.1
1194	document-charset-supported (1setOf charset)	[this spec]	7.2
1195	document-digital-signature-default (type2 keyword)	[this spec]	7.3
1196	document-digital-signature-supported (1setOf type2 keyword)		
1197		[this spec]	7.4
1198	document-format-details-default (collection)	[this spec]	7.5
1199	<member attributes are the same as "document-format-details"		
1200		[this spec]	3.2.4>
1201	document-format-details-supported (1setOf type2 keyword)		
1202		[this spec]	7.6
1203	document-format-version-default (text(127))	[this spec]	7.7
1204	document-format-version-supported (1setOf text(127))	[this spec]	7.8
1205	document-natural-language-default (naturalLanguage)	[this spec]	7.9
1206	document-natural-language-supported (1setOf naturalLanguage)		
1207		[this spec]	7.10
1208	<del>output-device-requested</del> <u>output-device</u> -supported (1setOf name(127))		
1209	[this spec]		<u>7.117.12</u>
1210			
1211			
1212	<b>Operation attributes:</b>		
1213	document-charset (charset)	[this spec]	3.2.1
1214	document-digital-signature (type2 keyword)	[this spec]	3.2.2

1215	document-format-details (1setOf collection)	[this spec]	3.2.4
1216	document-source-application-name (name(MAX))	[this spec]	3.2.4.1
1217	document-source-application-version (text(127))		
1218		[this spec]	3.2.4.2
1219	document-source-os-name (name(40))	[this spec]	3.2.4.3
1220	document-source-os-version (text(40))	[this spec]	3.2.4.4
1221	document-format (mimeMediaType)	[this spec]	3.2.4.5
1222	document-format-device-id (text(127))	[this spec]	3.2.4.6
1223	document-format-version (text(127))	[this spec]	3.2.4.7
1224	document-natural-language (1setOf naturalLanguage)		
1225		[this spec]	3.2.4.8
1226	document-format-version (text(127))	[this spec]	3.2.5
1227	document-natural-language (naturalLanguage)	[this spec]	3.2.8
1228	job-mandatory-attributes (1setOf type2 keyword)	[this spec]	3.1.2
1229	<del>output-device-requested</del> <u>output-device</u> (name(127))	[this	
1230	spec] <a href="#">1.1.13.1.3</a>		

## 1231 11.2 Keyword attribute values

1232	document-digital-signature (type2 keyword)	[this spec]	3.2.2
1233	document-digital-signature-default (type2 keyword)		
1234		[this spec]	7.3
1235	document-digital-signature-supported (1setOf type2 keyword)		
1236		[this spec]	7.4
1237	dss	[this spec]	3.2.2
1238	none	[this spec]	3.2.2
1239	pgp	[this spec]	3.2.2
1240	smime	[this spec]	3.2.2
1241	xmldsig	[this spec]	3.2.2
1242			
1243	document-format-details-supported (1setOf type2 keyword)		
1244		[this spec]	7.6
1245	document-source-application-name	[this spec]	7.6
1246	document-source-application-version	[this spec]	7.6
1247	document-source-os-name	[this spec]	7.6
1248	document-source-os-version	[this spec]	7.6
1249	document-format	[this spec]	7.6
1250	document-format-device-id	[this spec]	7.6
1251	document-format-version	[this spec]	7.6
1252	document-natural-language	[this spec]	7.6
1253			
1254	job-cover-back-supported (1setOf type2 keyword)	[this spec]	4.1.2.2
1255	<same as "cover-back-supported">	[pwg5100.3]	3.1.4
1256	job-cover-front-supported (1setOf type2 keyword)	[this spec]	4.1.2.2
1257	<same as "cover-front-supported">	[pwg5100.3]	3.1.4
1258	job-mandatory-attributes (1setOf type2 keyword)	[this spec]	3.1.2
1259	<any Job Template attribute keyword>		

1260			
1261	job-state-reasons (1setOf type2 keyword)	[rfc2911]	4.3.8
1262	digital-signature-did-not-verify	[this spec]	6.1
1263	digital-signature-type-not-supported	[this spec]	6.1
1264	errors-detected	[this spec]	6.1
1265	job-digital-signature-wait	[this spec]	6.1
1266	warnings-detected	[this spec]	6.1
1267			
1268	media (type2 keyword   name(MAX))	[rfc2911]	4.2.11
1269	choice_iso_a4_210x297mm_na_letter_8.5x11in	[this spec]	6.2
1270			

### 1271 11.3 Enum Attribute Values

1272 The following table lists all the new enum attribute values defined in this document as additional type2 enum values.  
 1273 These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.

1274			
1275	job-finishings (1setOf type2 enum)	[this spec]	4.1.4
1276	job-finishings-default (1setOf type2 enum)	[this spec]	4.1.4.1
1277	job-finishings-ready (1setOf type2 enum)	[this spec]	4.1.4.2
1278	job-finishings-supported (1setOf type2 enum)	[this spec]	4.1.4.3
1279	<enum values are the same as "finishings">		
1280			
1281	job-finishings-col-supported (1setOf type2 keyword)		
1282		[this spec]	4.1.5.3
1283	<same as for "finishing-col-supported">	[pwg5100.3]	3.2.5

### 1284 12 Internationalization Considerations

1285 The internationalization considerations for the extensions defined in this specification are the same as for handling  
 1286 the Job object in [rfc2911].

### 1287 13 Security Considerations

1288 This specification adds no more security burden on Printer implementations than does [rfc2911].

### 1289 14 Contributors

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1293 **15 Acknowledgments**1294 **16 Author's Address**

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1314 **17 Annex A: Additional requirements for a revision of the PWG IEEE/ISTO**  
 1315 **5101.1 Candidate Standard [pwg5101.1] to add the new 'choice\_xxx'**

1316 This section also generalizes the choice mechanism for inclusion in a revision to the PWG IEEE/ISTO 5101.1  
 1317 Candidate Standard [pwg5101.1]. This specification gives the *outline* of the proposed addition to [pwg5101.1] for  
 1318 information only, in order to agree to the one new value defined for use with IPPFAX, namely,  
 1319 **'choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in'**.

1320 The proposed extension to [pwg5101.1] will have the following requirements:

- 1321 1. The ABNF will be extended to define the **'choice\_'** prefix to introduce a list of choices of self describing  
 1322 names.
- 1323 2. Following the **'choice\_'** prefix will be two or more fully self describing names, including all three fields.
- 1324 3. The order of the list of fully self describing names **MUST** be in alphabetic order, so that there is only one  
 1325 canonical order for each list of choices.
- 1326 4. Printer **MAY** support dynamic combinations of supported values or **MAY** support the entire choice value as a  
 1327 conventional keyword which it simply matches for validation purposes.
- 1328 5. Printer **MUST** map the choice value to a particular supported value when selecting the actual media for  
 1329 marking.
- 1330 6. If the Printer supports a **'choice\_xxx'** "media" attribute value and the "media-ready" Printer attribute, the  
 1331 Printer **MUST** include the **'choice\_xxx'** value in its "media-ready" Printer attribute as well as the currently  
 1332 loaded value(s) when at least one of the members of a choice value is ready. For example, if

1333 'iso\_a4\_210x297mm' is loaded, then the "media-ready" Printer attribute MUST include the  
 1334 'iso\_a4\_210x297mm' and the 'choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in' values.

## 1335 18 Annex B: Change Log (informative - to be removed before publication)

1336 The following summaries of the changes in chronological order:

1337 Version 0.1, 18 May 2003:

- 1338 1. Split document out of Document Object specification.
- 1339 2. Moved "document-format-target" and "document-format-version-target" from the Job Template section to the  
 1340 Operation Attributes section so that it can be supplied with Document Creation operations and so that it  
 1341 MUST be honored, even if "job-attribute-fidelity" is 'false' or omitted.
- 1342 3. Removed all Document Description attributes and the concept of Job Level and Document Level. That  
 1343 terminology is introduced in the Document Object spec [ippdoc]. Now [ippdoc] is only an Informative  
 1344 Reference, not a Normative Reference.

1346 Version 0.2, 19 May 2003:

- 1347 1. Did *not* include the document-format-target and document-format-version-target attributes. PSI has their own  
 1348 definitions and we can avoid the discussion as to whether they should be Document Template attributes or  
 1349 Operation attributes on Document Creation operations and whether there should be a "document-format-  
 1350 target-default" and a "document-format-version-target-default".

1352 Version 0.3, 28 May 2003:

1353 Agreements reaches at the May 28, 2003 telecon:

- 1354 1. Moved the Close-Job operation to the futures specification.
- 1355 2. Added the "pages-per-subset" Job Template from [pwg5100.4]. See Appendix B section **Error! Reference**  
 1356 **source not found.** for the minor differences.
- 1357 3. Added the terms: "Best Effort, Finished Document, Page, Page Subset, and Sheet.
- 1358 4. Clarified the conformance relationships between "xxx" Operation attributes and their corresponding "xxx-  
 1359 default" and "xxx-supported" Printer attributes.
- 1360 5. Added rationale for each missing "xxx-default" and "xxx-supported" attribute.
- 1361 6. Added 'errors-detected' and 'warnings-detected' "job-state-reasons" values.
- 1362 7. Added the new 'choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in' "media" attribute value which is a choice  
 1363 of two approximately equal media.
- 1364 8. Added the requirements for choice media keyword values for inclusion in a revision of the PWG IEEE-ISTO  
 1365 5101.1.
- 1366 9. Changed the "document-format-implemented" member attribute from 1setOf mimeType to  
 1367 mimeType since it is the key attribute value.
- 1368 10. Added another "document-format-implemented" example.
- 1369 11. Updated the IANA section to agree with the additions.

1371 Version 0.4, June 4, 2003:

- 1372 1. Moved "document-format-details-implemented" Printer Description attribute to Futures.
- 1373 2. Moved "pages-per-subset" (1setOf integer(1:MAX)) Job Template attribute to Futures.
- 1374 3. Removed all CONDITIONALLY REQUIRED and CMUST statements and made them OPTIONAL and MAY.  
 1375 Added a statement of the intent for these attributes, so avoid the conformance statement problems for this  
 1376 specification which is just a list of OPTIONAL attributes.
- 1377 4. Removed the new terms "Honor" and "Best Effort", since they are synonym for "Support" and the opposite. It  
 1378 is confusing to have synonyms.
- 1379 5. Added all of the new Operation/Job Description attributes that describe Documents to be supplied in Job  
 1380 Creation operations and copied to the corresponding Job Description attributes as *default* values for the  
 1381 Document(s) of the Job.

- 1382 6. Added "output-device-default" and "output-device-supported" Printer attribute to provide the default for both  
1383 the "~~output-device-requested~~output-device" Operation attribute and the "output-device-assigned" Job  
1384 Description attribute.
- 1385 7. Added "document-message" and "document-name" as Operation/Job Description default Document  
1386 attributes for the Job.
- 1387 8. Clarified that the 'none' value of the "document-digital-signature" must be implemented, but the administrator  
1388 MAY remove the 'none' value in order to require signatures to be used.
- 1389 9. Sated that all supplied member attributes of the "document-format-details" Operation attribute MUST have a  
1390 value, i.e., MUST NOT be empty.
- 1391 10. Normalized all of the Application Names and versions and Operating System Name values from the IANA  
1392 Registry to lower case, as is done with most other IPP attributes, in order to facilitate matching.
- 1393 Moved the requirements for the new 'choice\_XXX' values to be added to PWG 5101.1.
- 1394

1395 Version 0.6, July 2, 2003:

- 1396 1. Changed "output-device-requested" to "output-device"
- 1397

1398 Version 0.5, June 9, 2003:

- 1399 ~~1. added xxx-supported as Job Description attributes for specific operational attributes that apply to documents within~~  
1400 ~~the Job~~