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

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

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23 Working Draft, July 28, 2003

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

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30 This version of the PWG Proposed Standard is available electronically at:
31
32 ftp://ftp.pwg.org/pub/pwg/ipp/new_JOBX/wd-ippjobx10-20030728.pdf, .doc, .rtf

33 This document is a Working Draft for an IEEE-ISTO PWG Candidate Standard. For a definition of a "PWG
34 Candidate Standard" and its transition to a "PWG Standard", see: ftp://ftp.pwg.org/pub/pwg/general/pwg-
35 process.pdf. After approval by the PWG (by a Last Call) to transition a PWG Working Draft to a PWG Candidate
36 Standard, the resulting PWG Candidate Standard will be available electronically at: ftp://ftp.pwg.org/pub/pwg/cs/.
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109 # Contents

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242 # 1 Introduction and Summary

243 This IPP specification is an assortment of attributes and values that extend the Job semantics of the IPP Model and
244 Semantics [rfc2911]. This specification defines some new Operation attributes for use in Job Creation and
245 Document Creation operations. The Printer copies these Operation attributes to the corresponding Job Description
246 attributes, which the clients may query. The Document Creation Operation attributes describe the Document Content
247 and permit the Printer to reject requests that it cannot process correctly. Some corresponding "xxx-default" and "xxx-
248 supported" Printer attributes are defined. This specification defines some Job Template attributes that apply to a
249 multi-document Job as a whole; their names start with "job-" to indicate their job-wide scope. This specification
250 defines the "output-device" Job Template attribute that can apply to Documents and to Sheets as well as Jobs This
251 specification also defines some additional values for the "job-state-reasons" Job Description attribute. Each of the
252 attributes defined in this specification are independent of each other and are OPTIONAL for a Printer to support.

253 This specification is an IPP extension referenced by the PWG Semantic Model [pwg-sm]. The purpose for these
254 extensions is so that the print industry can have a common semantic specification for use in IPP, the PWG Semantic
255 Model [pwg-sm], the PWG Print Service Interface (PSI) project [pwg-psi], the PWG IPP Fax (IPPFAX) project
256 [ippfax], and the Free Standards Group Job Ticket API [fsg-jt].

257 ## 1.1 Attributes Summary

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

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

Operation attribute	Printer support	Description
ipp-attribute-fidelity (boolean)	MUST	Allows the client to control whether or not the Printer MUST support *all* Job Template attributes supplied in Job Creation operation, else the Printer 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 the Job Creation operation, else the Printer MUST reject the job.

261
262 Table 2 summarizes the Operation attributes defined in this specification for use with Job Creation operations and
263 Send-Document and Send-URI operations. These Operation attributes allow the client to supply descriptions of the
264 Document Content to the Printer about individual Document Contents at request time. When supplied in a Job
265 Creation request, these Operation attributes provide defaults for the Document or Documents of the Job. When
266 supplied in a Document Creation operation, they describe the Document explicitly. This specification does *not* define
267 corresponding Document Description attributes, since this specification does not include or depend on a Document
268 object[1].

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

269 **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.

270
271 Table 3 summarizes the Job Template attributes defined in this specification for use with Job Creation operations.
272 The Job Template attributes that have a "job-" prefix are defined to apply to the Job as a whole, independent of the
273 value of the "multiple-document-handling" Job Template attribute ([rfc2911] section 4.2.4), whose 'separate-
274 documents-collated-copies' and 'separate-documents-uncollated-copies' values cause the Printer to produce
275 separate Output Documents. The "output-device" Job Template attribute is not restricted to be job-wide and can be
276 supplied in Document Creation operations and in the "override" attribute to override at the Sheet level (see section
277 8). When supplied in a Document Creation operation, the "output-device" Job Template attribute describes the
278 Document explicitly. This specification does *not* define corresponding Document Description attributes, since this
279 specification does not include or depend on a Document object[2].
280
281 **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.
output-device (name(127))	MAY	Allows the client to indicate a preference for output devices, for a Printer that supports one or more output device (see fan-out in [rfc2911] section 2.1).

282 # 2 Terminology

283 This section defines terminology used throughout this document.

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[2] For Document Description attributes that correspond to the Operation attributes defined for Document Creation operations, see the Document object defined in [ippdoc].

284 ## 2.1 Conformance Terminology

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

287 ## 2.2 Other Terminology

288 This document uses the same terminology as [rfc2911], such as "**client**", "**Printer**"[3], "**attribute**", "**attribute value**",
289 "**keyword**", "**Job Template attribute**", "**Operation attribute**", "**operation**", "**request**", "**response**", and "**support**"
290 (see [rfc2911] section 12.2.3) with the same meaning. In addition, the following terms are defined for use in this
291 document:

292 **Document Creation operation** - operations that accept Document Content. Specifically: Print-Job, Print-URI, Send-
293 Document and Send-URI. Note: Print-Job and Print-URI are both **Job Creation** and **Document Creation**
294 operations.

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

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

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

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

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

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

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

313 # 3   Operation Attributes for Job Creation and Document Creation operations

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

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[3] [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.

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

321 **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-message	text(MAX)	-	-
document-name	name(MAX)	-	-
document-natural-language	naturalLanguage	naturalLanguage	1setOf naturalLanguage
ipp-attribute-fidelity	boolean	-	-
job-mandatory-attributes	1setOf type2 keyword	-	-

322 Table 5 lists the Operation attributes that clients supply in Job and Document Creation operations and whether the
323 Printer copies (indicated by "⇒") the supplied value to the corresponding Job Description[4] attribute. The following
324 statements apply to all Operation attributes for Job and Document Creation operations and are *not* repeated in each
325 Operation attribute Description:

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

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

330   1. support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if
331   defined (see Table 4 and section 7). If the Printer supports either of the "xxx-default" or "xxx-
332   supported" Printer Description attributes, then the Printer MUST also support the corresponding
333   Operation attribute.

334   2. validate the values supplied by the client in the "xxx" Operation attribute against the values indicated
335   in the Printer's corresponding "xxx-supported" Printer Description attribute (see section 7). If the
336   values do not validate, the Printer MUST perform one of the actions indicated for that Operation

---

[4] 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.

337   attribute, unless explicitly specified otherwise in the Description, such as (1) reject the request, (2)
338   accept the request and either (a) hold the job for operator intervention or (b) print the Job ignoring
339   the attribute. In all of these cases, the Printer MUST return the Operation attribute with the
340   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. It has a corresponding Job Description attribute (see section 4.1.5.4) defined that the Printer MUST support and to which the Printer MUST copy this Operation attribute, if it supports the Operation attribute. See Table 4 for whether there are corresponding "xxx-default" and "xxx-supported" Printer Description attributes defined.
"**y⇒***"	The Operation attribute is defined for use with the indicated operations and has a corresponding Job Description attribute (see section 4.1.5.4). (Note that these attributes are properties of a Document but are copied to the Job.) These document related Job attributes use the naming convention of "xxx-supplied". Printer MUST support the "xxx-supplied" attributes and MUST copy this Operation attribute to it, if it supports the Operation attribute. See Table 4 for whether there are corresponding "xxx-default" and "xxx-supported" Printer Description attributes defined.
"**-**"	the Operation attribute is *not* 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 MUST means if the collection attribute is supplied or supported.
"**Section**"	column indicates where the Operation attribute is defined in this spec.

341

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

Operation attribute name	**Attribute Syntax**	**Creation operations**			**Conformance**		**Section**
		CJ	PJ, PU	SD, SU	Client supply	Printer support	
The following 10 Operation attributes have corresponding "xxx-supplied" Job Description attributes:							
compression	type2 keyword	y⇒**	y⇒**	y	MAY	MAY	§3.2.1
document-charset*	charset	y⇒**	y⇒**	y	MAY	MAY	§3.2.2
document-digital-signature*	type2 keyword	y⇒**	y⇒**	y	MAY	MAY	§3.2.3
document-format*	mimeMediaType	y⇒**	y⇒**	y	MAY	MUST	§3.2.4
document-format-details*	1setOf collection	y⇒**	y⇒**	y	MAY	MAY	§3.2.5

Operation attribute name	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	§3.2.5.1
document-source-application-version*	text(127)	y⇒	y⇒	y	MAY	MAY	§3.2.5.2
document-source-os-name*	name(40)	y⇒	y⇒	y	MAY	MAY	§3.2.5.3
document-source-os-version*	text(40)	y⇒	y⇒	y	MAY	MAY	§3.2.5.4
document-format*	mimeMediaType	y⇒	y⇒	y	MUST	MUST	§3.2.5.5
document-format-device-id*	text(127)	y⇒	y⇒	y	MAY	MAY	§3.2.5.6
document-format-version*	text(127)	y⇒	y⇒	y	SHOULD	MUST	§3.2.5.7
document-natural-language*	naturalLanguage	y⇒	y⇒	y	MAY	MAY	§3.2.5.8
document-format-version*	text(127)	y⇒**	y⇒**	y	MAY	MAY	§3.2.6
document-message*	text(MAX)	y⇒**	y⇒**	y	MAY	MAY	§3.2.7
document-name*	name(MAX)	y⇒**	y⇒**	y	MAY	MUST	§3.2.8
document-natural-language*	naturalLanguage	y⇒**	y⇒**	y	MAY	MAY	§3.2.9
ipp-attribute-fidelity	boolean	y⇒	y⇒	-	MAY	MUST	§3.1.1,
job-mandatory-attributes	1setOf type2 keyword	y⇒	y⇒	-	MAY	MAY	§3.1.2

343

344 3.1 Operation attributes for Job Creation operations only

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

347 3.1.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)

348 This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1) when the client
349 supplies unsupported Job Template attributes[5] or values in a Job Creation operation. The value 'true' indicates that
350 total fidelity to client-supplied Job Template attributes and values is required for this Job Creation operation. If the
351 client supplies the value 'false' or omits the attribute, then the Printer MUST accept the Job Creation operation.

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

353 3.1.1.1 Why there are no "ipp-attribute-fidelity-default" and "ipp-attribute-fidelity-supported" attributes

354 Because [rfc2911] defines the default value to be 'false' there is no point to define an "ipp-attribute-fidelity-default"
355 Printer Description attribute. Because [rfc2911] REQUIRES a Printer to support the "ipp-attribute-fidelity" Operation
356 attribute there is no need for an "ipp-attribute-fidelity-supported" Printer Description attribute.

357 3.1.2 job-mandatory-attributes (1setOf type2 keyword)

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

---

[5] 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.

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

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

369   The Printer MUST copy this attribute to the corresponding "job-mandatory-attributes" Job Description attribute (see
370   section 5.1.3) for auditing and trouble-shooting purposes[6].

371   The values of the "job-mandatory-attributes" attribute are the keyword attribute names that identify Job Template
372   attributes; for example, 'job-hold-until', 'job-finishings' (see section 4.1.3.3), 'copies' and 'media'. In order to identify a
373   member attribute of a collection attribute, the keyword names of both the collection attribute and the member
374   attribute are given separated by a period (.) character. For example, to make the "media" attribute of the "cover-
375   front" collection attribute mandatory, supply the keyword value: 'cover-front.media'.

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

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

388   **3.1.2.1 Why there are no "job-mandatory-attributes-default" and "job-mandatory-attributes-supported"**
389   **Printer Description attributes**

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

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

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

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[6] 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.

401 **3.2 Operation attributes for both Job and Document Creation operations**

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

405 **3.2.1 compression (type2 keyword)**

406 This REQUIRED Operation attribute identifies the compression used for the Documents in this Job and is defined in
407 [rfc2911] section . It is included in this specification, because this specification defines the corresponding
408 "compressions-supplied" Job Description attribute (see section 5.2.1.

409 **3.2.2 document-charset (charset)**

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

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

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

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

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

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

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

444 **3.2.3 document-digital-signature (type2 keyword)**

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

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

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

455   1. ignore the signature (and MAY indicate on the printed output some how) and MUST set the Job's "job-state-
456   reasons" Job Description attribute with the 'digital-signature-did-not-verify' value (see section 6.1).

457   2. put the job on hold and wait for human intervention and MUST set the Job's "job-state-reasons" Job
458   Description attribute with the 'job-digital-signature-wait' and 'digital-signature-did-not-verify' values (see
459   section 6.1), OR

460   3. abort the job depending on implementation and/or site configuration and MUST set the Job's "job-state-
461   reasons" Job Description attribute with the 'job-aborted-by-system' and 'digital-signature-did-not-verify'
462   values (see section 6.1).

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

470 The following standard keyword values are defined:

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

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

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

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

476   'xmldsig' XML Digital Signature [xmldsig].

477 **3.2.4 document-format (mimeMediaType)**

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

482 The standard values for this attribute are Internet Media types (sometimes called MIME types). For some MIME
483 types, such as 'text/plain' [rfc2046], the "; charset=" parameter is defined which specifies the charset of the Document
484 content. The Printer MUST support the charset MIME parameter as well as the "document-charset" Operation

485 attribute (section 3.2.2) if the Printer supports any text MIME type, such as 'text/plain' or 'text/html'. For further
486 details see the description of the 'mimeMediaType' attribute syntax in [rfc2911] section 4.1.9 and [rfc2046] and the
487 "document-charset" Operation attribute (section 3.2.2).

488 Many printer languages in the Printer MIB do not have a MIME type registered with IANA.[7] It is the intent of the PWG
489 to registers all of the Printer MIB v2 XXX Printer Languages as 'application/vnd.PWG-XXX'. If a Printer Language
490 already has a registered MIME Media type or gets a registration in the future, then that MIME Type MUST be used in
491 preference to the 'application/vnd.PWG-XXX' MIME Type. For example, PostScript® has the MIME Media type:
492 'application/postscript' and PCL has the MIME Media Type: 'application/vnd.HP-PCL, so those MIME Media types
493 MUST be used instead of 'application/vnd.PWG-PS' and 'application/vnd.PWG-PCL'. For example, the NEC NPDL
494 printer language from the Printer MIB does not have a MIME type registered with IANA. Therefore, the "document-
495 format" = 'application/vnd.PWG-NPDL' MUST be used.

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

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

500 See also the "document-format-version" Operation attribute in section 3.2.6 and the "document-format-details"
501 Operation attribute in section 3.2.5.

502 **3.2.5 document-format-details (1setOf collection)**

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

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

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

514 If a client supplies the "document-format-details" Operation attribute in a Document Creation request with member
515 attributes and/or values that the Printer doesn't support, the Printer MUST perform one of the following actions
516 depending on implementation: (1) reject the request OR (2) accept the request and either (a) put the Job in the
517 'pending-held' state or (b) process the job ignoring the attribute. See section 3 above for more details. However, if
518 the "document-charset" or the "document-format" member attributes are the ones in question, the Printer MUST
519 reject the request, same as for the "document-charset" and "document-format" Operation attributes (see sections
520 3.2.2 and 3.2.4) and return the 'client-error-charset-not-supported' (see [rfc2911] section 13.1.4.16) or the 'client-
521 error-document-format-not-supported' (see [rfc2911] section 13.1.4.11) status-codes, respectively.

---

[7] 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.

522 For a packaging format, the "document-format-details" attribute does not provide means to associate each collection
523 value with particular document in the archive file, so it does not provide a "manifest"[8] of the packaging. One of the
524 packaging collection values MAY describe the packaging format itself, in which case that collection value MUST be
525 the first collection value. The remaining collection values provide the summary of the details of the contained files in
526 any order.

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

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

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

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

538   **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	3.2.5.1	N/A
document-source-application-version	text(127)	MAY	MAY	3.2.5.2	N/A
document-source-os-name	name(40)	MAY	MAY	3.2.5.3	N/A
document-source-os-version	text(40)	MAY	MAY	3.2.5.4	N/A
document-format	mimeMediaType	MUST	MUST	3.2.5.5	3.2.4
document-format-device-id	text(127)	MAY	MAY	3.2.5.6	N/A
document-format-version	text(127)	SHOULD	MUST	3.2.5.7	3.2.6
document-natural-languages	1setOf naturalLanguage	MAY	MAY	3.2.5.8	3.2.9

539
540 The client can determine which member attributes of the "document-format-details" are supported by querying the
541 Printer's "document-format-details-supported" (1setOf type2 keyword) Printer Description attribute (see section 7.6).

542 Table 6 shows that three of the member attributes also have comparable top level Operation attributes defined with
543 the same names. See the sections listed in the rightmost column. These three high level attributes have
544 corresponding "xxx-default" and "xxx-supported" Printer Description attributes. These values are also for use with
545 the corresponding three member attributes. The remaining member attributes do not have any corresponding "xxx-
546 default" and "xxx-supported" Printer Description attribute.

547 If a client supplies this "document-format-details" Operation attribute with a member attribute with a value that the
548 Printer doesn't support, the Printer MUST perform one of the following actions: (1) reject the request OR (2) accept

---

[8] 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.

549 the request and either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See
550 section 3 above for more details.

3.2.5.1 document-source-application-name (name(MAX))

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

3.2.5.2 document-source-application-version (text(127))

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

561 "8.1 (4331)" for Winzip®, "5.0.5 10/26/2001" for Acrobat®, "2000 (9.0.4119 sr-1)" for Microsoft® Word

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

3.2.5.3 document-source-os-name (name(40))

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

570 Possible example IANA OS Registry values: 'linux', 'macos', 'sun-os', 'unix', "unknown", 'windows'.

571 ACTION ITEM: Get Sun to register SOLARIS with IANA.(Tom H)

3.2.5.4 document-source-os-version (text(40))

573 This OPTIONAL member Operation attribute identifies the version of the operating system on which the
574 document was generated. Valid values include the version portion of any of the operating system names
575 defined in the IANA Registry [os-names]. The value MUST be all lowercase in order to facilitate matching.
576 The value MUST NOT include the name portion of the registered OS name (see "document-source-os-
577 name" attribute).

578 Possible example values for the indicated "document-source-os-name" value are:
579   for 'linux': '1.0', '1.2', '2,0', '2.2', '2.4'
580   for 'unix': 'bsd', 'v', 'v.1', 'v.2', 'v.3', 'pc'
581   for 'windows': '95', '98', 'ce', 'nt', 'nt-2', 'nt-3', 'nt-3.5', 'nt-3.51', 'nt-4', 'nt-5' (windows 2000),
582 ACTION ITEM: Get Microsoft to register NT-5.1 (maybe NT-5.2) with IANA.(Ira M)

583

3.2.5.5 document-format (mimeMediaType)

585 This REQUIRED member Operation attribute identifies the document format (see [rfc2911] §3.2.1.1) of the
586 collection value of which it is a member. The client MUST supply and the Printer MUST support this member
587 attribute in each collection value. The values for this member attribute are Internet Media types (sometimes

588   called MIME types) and have the same values and semantics as for the top level "document-format"
589   Operation attribute with the same name (see section 3.2.4 for the semantics).

590   **3.2.5.6 document-format-device-id (text(127))**

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

598   **3.2.5.7 document-format-version (text(127))**

599   This REQUIRED member Operation attribute identifies the level or version of the document format identified
600   by the "document-format" member attribute. The client MAY supply and the Printer MUST support this
601   member attribute if the Printer supports the "document-format-details" Operation attribute. The semantics
602   and supported values of this "document-format-version" member attribute MUST be the same as for the top
603   level "document-format-version" Operation attribute with the same name (see section 3.2.6 for the
604   semantics).

605   **3.2.5.8 document-natural-language (1setOf naturalLanguage)**

606   This OPTIONAL member Operation attribute specifies the natural language(s) of the collection value of
607   which it is a member. The values for this attribute are natural language codes (with optional country codes)
608   and have the same values and semantics as for the top level "document-natural-language"
609   (naturalLanguage) operation attribute with the same name (see section 3.2.9 for the semantics). If the
610   document contains multiple natural languages, then the first value MUST be the primary language of the
611   document.

612   ## 3.2.6 document-format-version (text(127))

613   This OPTIONAL Operation attribute identifies the level or version of the document format of the Document content
614   identified by the "document-format" Operation attribute (section 3.2.4).

615   If the client supplies this "document-format-version" Operation attribute, the client MUST also supply the "document-
616   format" Operation attribute (section 3.2.4), so that the Printer does not need to parse the "document-format-version"
617   string in order to determine the document format and version.

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

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

627   The short first field before the "/" character are unique, so that the version values are self-identifying so that all the
628   versions for all document formats can be combined into a single list for the Printer's "document-format-version-
629   supported" Printer attribute. The first field also tends to be the acronym for the document format and often is also the

630 file name extension registered with IANA. The Printer MIB shows the first field in uppercase for readability.
631 However, the Printer MUST perform case-insensitive matching of supplied values with supported values. If the
632 common acronym includes a "/", such as TIFF/IT, the "/" is changed to "-" so that the first field ends with the first "/."

633 Example values:

634   'PS/3': For Postscript level 3 [rfc1759].
635   'PCL/5e': For PCL 5e [rfc1759].
636   'PDF/1.4': For PDF version 1.4 [pdf]
637   'PDF/X-1a:2001': For PDF/X-1a [iso15930]
638   'DCS/2.0' For Document Color Separation (DCS), version 2.0. [dcs2.0]
639   'TIFF-IT/FP:1998': TIFF/IT [iso12639] - Full Page - baseline.
640   'TIFF-IT/CT:1998': TIFF/IT [iso12639] - Continuous Tone picture data - baseline
641   'TIFF-IT/FP/P1:1998': TIFF/IT [iso12639] - Full Page - profile 1
642   'TIFF-IT/CT/P1:1998': TIFF/IT [iso12639] - Continuous Tone picture data - profile 1
643   'Automatic': auto sense the format [rfc1759]. Is use in combination with the 'application/octet-stream' (see
644   [rfc2911] section 4.1.9.1) value of the "document-format" attribute (section 3.2.4).
645

646 **3.2.6.1 Why no "document-format-version-default"**

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

650 ## 3.2.7 document-message (text(MAX))

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

652 ## 3.2.8 document-name (name(MAX))

653 The Printer MUST support this Operation attribute in Print-Job, Print-URI, Send-Document, and Send-URI operations
654 (see [rfc2911 section 3.2.1.1) and MAY support it in the Create-Job operation. For the Print-Job, Print-URI, and
655 Create-Job operations, the Printer MUST copy the value to the corresponding Job Description attribute[9].

656 ## 3.2.9 document-natural-language (naturalLanguage)

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

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

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

666   'en': for English
667   'en-us': for US English

---

[9] For the Send-Document and the Send-URI Operation attribute, the Printer copies them to the corresponding
Document Description attribute defined in [ippdoc].

668   'fr': for French
669   'de': for German
670

671 **4   Job Template attributes**

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

675 Job Template attributes are OPTIONAL for a Printer to support and for a client to supply in a Job Creation request. If
676 a Printer supports a Job Template attribute, then the Printer MUST copy the supplied attribute to the Job object, so
677 that a client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs operations (see [rfc2911] section
678 4.2). In addition, as in [rfc2911], for each "xxx" Job Template attribute supported, the Printer MUST support the
679 corresponding "xxx-default" and "xxx-supported" Printer attributes, if defined.

680   **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"
job-copies	integer(1:MAX)	integer(1:MAX)	rangeOfInteger(1:MAX)
job-cover-back	collection	collection	1setOf type2 keyword
cover-type	type2 keyword	-	1setOf type2 keyword
media	type3 keyword | name(MAX)	-	1setOf (type3 keyword | name(MAX))
media-col	collection	-	1setOf type2 keyword
member attributes [pwg5100.3]	*See* [pwg5100.3]	-	-
job-cover-front	collection	collection	1setOf type2 keyword
member attributes - same as **job-cover-back**	**see job-cover-back**		
job-finishings	1setOf type2 enum	1setOf type2 enum[10]	1setOf type2 enum
job-finishings-col	collection	collection[10]	1setOf type2 keyword
finishing-template	name(MAX)	-	1setOf name(MAX)
stitching	collection		1setOf type2 keyword
stitching-reference-edge	type2 keyword	-	1setOf type2 keyword
stitching-offset	integer (0:MAX)	-	1setOf (integer(0:MAX) | rangeOfInteger(0:MAX))
stitching-locations	1setOf integer(0:MAX)	-	1setOf (integer(0:MAX) | rangeOfInteger(0:MAX))
output-device	name(127)	-	1setOf name(127)
print-content-optimize	**type2 keyword**	**type2 keyword**	1setOf type2 keyword

681 **4.1 Job Template attributes defined for Job-wide effect in multi-document jobs**

682 This section defines additional Job Template attributes that have Job-wide effect and so are intended for use in the
683 creation of multi-document Jobs. These Job Template attributes have the "job-" prefix to indicate their Job wide
684 scope. When clients supply these job-wide Job Template attributes, they MUST supply these attributes in Job
685 Creation and Validate-Job operations only. Clients MUST NOT supply these Job Template attributes as Document

---

[10] 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.

686 Template attributes in the Send-Document and Send-URI operations ([ippdoc]) or in any other operations. Clients
687 MUST NOT supply these attributes as member attributes of the "overrides" Job Template attribute [ippOverride].

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

689 This OPTIONAL Job Template attribute specifies the number of job copies, i.e., with all of the Documents taken
690 together. Its interpretation is independent of the value of the "multiple-document-handling" Job Template attribute.
691 See the "copies" Job Template attribute defined in [rfc2911] section 4.2.5 that switches between job copies and
692 document copies depending on the value of the "multiple-document-handling" Job Template attribute ([rfc2911]
693 section 4.2.4).
694 For example assume a Job has two documents. The "copies" attribute has a value of '3' and "job-copies" has a
695 value of '2". With "multiple-document-handling" set to 'separate-documents-collated-copies' the resulting printout
696 would have two sets (i.e. job-copies=2). The first set would be 3 copies of Document 1 and then 3 copies of
697 Document 2. The second set would be identical to the first. If a similar Job was run with "multiple-documents-
698 handling" set to 'single-document-new-sheet' it would also produce two set. In this case however each set would
699 contain Document 1, Document 2, Document 1, Document 2, Document 1, Document 2 (i.e copies=3). The "copies"
700 and "job-copies" become more interesting when Documents within the Job each have their own value of "copies".
701 This can be accomplished via the Document object [ippdoc] or Overrides [PWG5100.4], [ippOverride].

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

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

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

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

4.1.1.3 job-copies-actual (1setof Integer(1:MAX))

709 This OPTIONAL Job Description attribute specifies the number of copies that the Printer actually printed for the job
710 as a whole. The Printer MAY support this attribute even if it does not support the "job-copies" Job Template attribute.

4.1.2 job-cover-back (collection)

712 This OPTIONAL Job Template attribute specifies the cover for the back of the job, i.e., with all of the Documents
713 taken together and is independent of the value of the "multiple-document-handling" Job Template attribute. The
714 member attributes are the same as "cover-back" (see [pwg5100.3] section 3.1) and with the same conformance
715 requirements. However, the "cover-back" Job Template attribute switches between a job back cover and a document
716 back cover depending on the value of the "multiple-document-handling" Job Template attribute ([rfc2911] section
717 4.2.4). The "job-cover-back" Job Template attribute is equivalent to "cover-back" with "multiple-document-handling" =
718 'single-document-new-sheet'.

4.1.2.1 job-cover-back-default (collection)

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

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

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

726 **4.1.2.3 job-cover-back-actual (1setOf collection)**

727 This OPTIONAL Job Description attribute specifies the "job-cover-back" that the Printer actually used in producing
728 the job. The Printer MAY support this attribute even if it does not support the "job-cover-back" Job Template
729 attribute.

4.1.3 job-cover-front (collection)

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

4.1.3.1 job-cover-front-default (collection)

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

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

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

4.1.3.3 job-cover-front-actual (1setOf collection)

746 This OPTIONAL Job Description attribute specifies the "job-cover-front" that the Printer actually used in producing
747 the job. The Printer MAY support this attribute even if it does not support the "job-cover-front" Job Template
748 attribute.

4.1.4 job-finishings (1setOf type2 enum)

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

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

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

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

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

763 **4.1.4.3 job-finishings-supported (1setOf type2 enum)**

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

766 **4.1.4.4 job-finishings-actual (1setOf type2 enum)**

767 This OPTIONAL Job Description attribute specifies the "job-finishings" that the Printer actually used in producing the
768 job. The Printer MAY support this attribute even if it does not support the "job-finishings" Job Template attribute.

769 4.1.5 job-finishings-col (1setOf collection)

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

776 **4.1.5.1 job-finishings-col-default (collection)**

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

779 **4.1.5.2 job-finishings-col-ready (collection)**

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

783 **4.1.5.3 job-finishings-col-supported (1setOf type2 keyword)**

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

787 **4.1.5.4 job-finishings-col-actual (1setOf collection)**

788 This OPTIONAL Job Description attribute specifies the "job-finishings-col" attributes that the Printer actually used in
789 producing the job. The Printer MAY support this attribute even if it does not support the "job- finishings-col " Job
790 Template attribute.

791 4.2 Job Template attributes that may have Document Scope and Override Scope

792 This section defines additional Job Template attributes that are *not* restricted to job-wide scope and MAY be supplied
793 in Document Creation operations and in the "override" attribute to override at the Sheet level (see section 8). When
794 supplied in a Document Creation operation, these Job Template attributes describes the Document explicitly. This
795 specification does *not* define corresponding Document Description attributes, since this specification does not include
796 or depend on a Document object[11].

---

[11] For Document Description attributes that correspond to the Operation attributes defined for Document Creation operations, see the Document object defined in [ippdoc].

4.2.1 output-device (name(127))

798 This OPTIONAL Job Template attribute specifies the name of the target output device for a Printer that fans-out to
799 multiple devices (see [rfc2911] section 2.1). This allows the client to control which output device the Printer selects.
800 If this Job Template attribute is omitted, the Printer selects whichever output device seems best for the job in an
801 implementation dependent manner.

802 ISSUE 01: The [rfc2911] Job Description attribute "output-device-assigned" is single-valued even though the "output-
803 device" Job Template can be supplied at the Job, Document and page Override (i.e. Sheet) level. Proposed
804 resolution: Leave the Job Description attribute single-valued. This will prevent any interoperability problems with
805 existing implementations. It will also handle the majority of uses. Add a single-valued "output-device" Job Template
806 attribute which MAY be supplied in a Document Creation operation to give it Document scope and in the "overrides"
807 attribute to give it Sheet scope.. . Implementations that allow the routing of individual sheets should be capable of
808 implementing "overrided" and "-actuals". Even if they don't support -actuals, the "overrides" Template attribute will
809 contain the requested output devices.

4.2.1.1 Why there is no output-device-default

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

4.2.1.2 output-device-ready (1setOf name(127))

819 This OPTIONAL Job Template Printer attribute specifies the output devices that are available for use without human
820 operator intervention, i.e., are accepting jobs and are not in need of attention. The Printer MAY support this attribute
821 if it supports the "output-device" Job Template attribute.

822 ISSUE: 02 - OK to define "output-device-ready" Job Template Printer attribute?

4.2.1.3 output-device-supported (1setOf name(127))

824 This OPTIONAL Job Template Printer attribute specifies the supported "output-device" values. The Printer MUST
825 support this attribute if it supports the "output-device" Job Template attribute.

4.2.1.4 output-device-actual (1setOf name(127))

827 This OPTIONAL Job Description attribute specifies the output-device(s) that the Printer actually used to produce the
828 job [ippact]. The Printer MAY support this Job Description attribute even if it does not support the "output-device "
829 Job Template attribute. Note: The "output-device-actual" attribute MAY have more than one value, while the
830 [rfc2911] "output-device-assigned" Job Description attribute has only a single name(127) value.

4.2.2   print-content-optimize (type2 keyword)

832 This OPTIONAL Job DescriptionTemplate attribute refines the value specified by the "print-quality" ([rfc2911]
833 §4.2.13) attribute. The "print-quality" attribute the level of quality. The "print-content-optimize" attribute directs the
834 type of optimization/processing that will be performed on the Document content. It does not necessarily mean the
835 value describes the content.

836 The standard keyword values are:

837 • 'photo': optimize for photographic clarity
838 • 'graphic': optimize for graphic clarity such as grapgs and line drawings
839 • 'text': optimize for text clarity
840 • 'text-and-graphic': optimize for both text and graphic clarity

841 **4.2.2.1 print-content-optimize-default (type2 keyword)**

842 This OPTIONAL Job Template Printer attribute specifies the default "print-content-optimize" value. The Printer
843 MUST support this attribute if it supports the "output-device" Job Template attribute.

844 **4.2.2.2 print-content-optimize-supported(1setOf type2 keyword)**

845 This OPTIONAL Job Template Printer attribute specifies the supported "print-content-optimize" values. The Printer
846 MUST support this attribute if it supports the "output-device" Job Template attribute.

847 **4.2.2.3 print-content-optimize-actual (1setOf type2 keyword)**

848 This OPTIONAL Job Description attribute specifies the "print-content-optimize "(s) that the Printer actually used to
849 produce the job [ippact]. The Printer MAY support this Job Description attribute even if it does not support the " print-
850 content-optimize " Job Template attribute. Note: The "print-content-optimize -actual" attribute MAY have more than
851 one value, while the "print-content-optimize" Job Description attribute has only a single value.

852

853 # 5   Job Description attributes

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

859 This section divides Job Descriptions into two subsections: Section 5.1 contains Job Description attributes that
860 describe the Job as a whole and Section 5.2 contains Job Description attributes that are defaults for the Document(s)
861 in the Job[12]. The following legend is used in the tables in both sections:

Legend:	
IPP Attribute Syntax	the attribute syntax (see [rfc2911] section 4.1).
Set by	indicates whether the value is set by the client or Printer in the Job Creation operation: **client** - means that the Printer MUST populate this Job Description attribute by copying *from* the corresponding Operation attribute that the client MAY supply in the Job Creation operation. See Table 5 for the corresponding Operation attribute. **Printer** - means that the Printer sets the value based on the state of the Printer.
Printer conformance	indicates MUST or MAY for Printer conformance.
Reference	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.

862

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

863 **5.1 Job Description attributes that describe the Job as a whole**

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

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

Job Description attribute name	IPP Attribute Syntax	Set by	Printer conformance	Reference
errors-count	integer(0:MAX)	Printer	MAY	§5.1.1
ipp-attribute-fidelity	boolean	client	MAY	§5.1.2
job-mandatory-attributes	1setOf type2 keyword	client	MAY	§5.1.3
output-device-assigned	name(127)	Printer	MAY	[rfc2911] §4.3.7.2
warnings-count	integer(0:MAX)	Printer	MAY	§5.1.4

867
868 Most of the existing "job-state" and "job-state-reasons" Job Description attribute values apply equally well to
869 individual documents in a multi-document job (with removal of the 'job-' prefix for those that apply to both Job and
870 Document). Furthermore, the job states are completely service-type neutral, so they can apply to scanning, faxing,
871 and formatting processes as well. The job state reasons have a number of reasons that are print service specific, but
872 most can apply to other types of service as well. The reason for separating state from reasons is so that the states
873 can be the fundamental states that most implementations have, while the state reasons can vary depending on the
874 sophistication of the system. The states are the ones that clients are most likely to base actions upon, and the state
875 reasons are more information, both for programs and people.

876 **5.1.1 errors-count (integer(0:MAX))**

877 This OPTIONAL Job Description attribute counts the number of errors encountered processing the job as a whole.
878 An error where some portion of the printed output is not present, such as a glyph encountered which isn't in the
879 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
880 overall document format.

881 **5.1.2 ipp-attribute-fidelity (boolean)**

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

887 **5.1.3 job-mandatory-attributes (1setOf type2 keyword)**

888 This OPTIONAL Job Description attribute indicates which Job Template attributes that the client required that the
889 Printer Support in order to accept the Job Creation request. The Printer populates this attribute with the value of the
890 corresponding "job-mandatory-attributes" Operation attribute (see section 3.1.2) supplied by the client in the Job
891 Creation operation. This Job Description attribute has no effect on the processing of the job once the Job Creation
892 operation has been accepted[14].   However, this Job Description attribute does provide an audit capability of the Job

---

[13] 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.
[14] 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].

893   object in the Job History (see [rfc2911] section 4.3.7.2) to the user and service desk for comparing unexpected
894   printed results with what was submitted. See section 3.1.2 for additional details of the semantics of this "job-
895   mandatory-attributes" Operation attribute that are not repeated here.

896   5.1.4 warnings-count (integer(0:MAX))

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

899   5.2 Job Description attributes that are defaults for the Document(s) in the Job

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

902   5.2.1 compression-supplied (type3 keyword)

903   This REQUIRED Job Description attribute specifies the *default* compression used to represent the document(s) in
904   the Job. The Printer sets this Job Description attribute from the corresponding Operation attribute (see [rfc2911]
905   §3.2.1.1) supplied by the client in the Job Creation operation.

906   5.2.2 document-charset-supplied (charset)

907   This OPTIONAL Job Description attribute specifies the *default* charset used to represent this document (see section
908   3.2.2). The Printer sets this Job Description attribute from the corresponding Operation attribute supplied by the
909   client in the Job Creation operation.

910   5.2.3 document-digital-signature-supplied (type2 keyword)

911   This OPTIONAL Job attribute specifies the *default* digital signature technology used in the Document content. The
912   Printer sets this Job Description attribute from the corresponding "document-digital-signature" Operation attribute
913   (see section 3.2.3 for the semantics), if supplied by the client in the Job Creation operation. If a Printer supports the
914   "document-digital-signature" Operation attribute, the Printer MUST support this "document-digital-signature" Job
915   Description attribute.

916   5.2.4 document-format-details-supplied (1setOf collection)

917   This OPTIONAL Job Description attribute specifies the *default* details of the document format(s) of the Document
918   Object content. The Printer sets this Job Description attribute from the corresponding "document-format-details"
919   Operation attribute (see section 3.2.5 for the semantics), if supplied by the client in the Job Creation operation. If a
920   Printer supports the "document-format-details" Operation attribute, the Printer MUST support this "document-format-
921   details" Job Description attribute.

922   5.2.5 document-format-supplied (mimeMediaType)

923   This REQUIRED[15] Job Description attribute specified the *default* document format of the Document Object content.
924   The Printer sets this Job Description attribute from the corresponding "document-format" Operation attribute (see
925   [rfc2911] section 3.2.1.1 and [this spec] section 3.2.4 for the semantics), if supplied by the client in the Job Creation
926   operation.

---

[15] [rfc2911] did not define a "document-format" Document Description attribute; it is a new attribute defined in this
specification.

927   ### 5.2.6 document-format-version-supplied (text(127))

928   This OPTIONAL Job Description attribute specifies the *default* version of the document format of the Document
929   Object content. The Printer sets this Job Description attribute from the corresponding "document-format-version"
930   Operation attribute (see section 3.2.6 for the semantics), if supplied by the client in the Job Creation operation (see
931   section). If a Printer supports the "document-format-version" Operation attribute, the Printer MUST support this
932   "document-format-version" Job Description attribute.

933   ### 5.2.7 document-message-supplied (text(MAX))

934   This OPTIONAL Job Description contains either (1) the *default* message from the user to the operator about the
935   Document(s) or (2) a message from the operator, system administrator, or "intelligent" process to indicate to the end
936   user the reasons for modification or other management action taken on the Document. The Printer populates this
937   Job Description attribute from the "document-message" (text(MAX) Operation attribute value (see section 3.2.7)
938   supplied by the client in the Job Creation operation.

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

941   ### 5.2.8 document-name-supplied (name (MAX))

942   This REQUIRED Job Description attribute specifies the *default* name of the document (see [rfc2911] §3.2.1.1). The
943   Printer sets this Job Description attribute from the corresponding Operation attribute (see section 3.2.8) supplied by
944   the client in the Job Creation operation.

945   ### 5.2.9 document-natural-language-supplied (naturalLanguage)

946   This OPTIONAL Job Description attribute specifies the *default* primary natural language of the Document content
947   (see [rfc2911] section 3.2.1.1). The Printer sets this Job Description attribute from the corresponding Operation
948   attribute (see section 3.2.9) supplied by the client in the Job Creation operation.

949   # 6 New values to existing attributes

950   This section defines new values for existing attributes.

951   ## 6.1 **New job-state-reasons(1setOf type2 keyword) Values**

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

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

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

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

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

IPP Job Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
job-state-reasons	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

966
967 For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely
968 to occur (if implemented):

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

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

974 **'digital-signature-did-not-verify'**: One or more documents in the Job contains a digital signature type that is
975 supported (see section 3.2.3), but the signature did not verify when the Printer attempted to verify the
976 signature.

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

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

987 6.2 New media (type 3 keyword | name(MAX)) Values

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

989 **'choice_iso_a4_210x297mm_na_letter_8.5x11in'**: The client has explicitly allowed a choice of media for
990 the Job. The Printer MUST choose physical media of size na_letter_8.5x11in (215.9 x 279.4 mm) or
991 iso_a4_210x297mm. The Printer MUST NOT choose physical media of any other size. The Printer
992 MAY scale the image to fit, but any scaling MUST be isomorphic scaling and without image content
993 loss, or overflow to additional sheets (so-called tiling), or truncate (and MUST notify the sending user
994 and receiving user by implementation means if truncation is performed, since that is loss of
995 information).

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

997   See Annex A (section 18) for additional requirements for a revision of the PWG IEEE/ISTO 5101.1 Candidate
998   Standard [pwg5101.1] to include the new **'choice_iso_a4_210x297mm_na_letter_8.5x11in'** and other choice
999   values.

1000   **7   New Printer Description attributes**

1001   This section lists *the new* Printer Description attributes defined in this document. These Printer attributes are "xxx-
1002   supported" and "xxx-default" Printer attributes which indicate the default and supported values that the Printer
1003   supports.. The Printer MUST support these Printers attributes if the Printer supports the corresponding "xxx"
1004   Operation attributes (see section 3) that the client can supply in a Job Creation or Document Creation request.
1005
1006   The column labels are:

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

1007

1008   **Table 10 - New Printer Description attributes**

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

1009

1010   **7.1 document-charset-default (charset)**

1011   This OPTIONAL Printer Description attribute indicates the default charset that the Printer will assume for charset-
1012   ambiguous document formats when the client omits the "document-charset" Operation attribute (section 3.2.2). The
1013   Printer MUST support this attribute if it supports the corresponding "document-charset" Operation attribute (see
1014   section 3.2.2)

1015 ## 7.2 document-charset-supported (1setOf charset)

1016 This OPTIONAL Printer Description attribute indicates the charsets that the Printer supports in Document Content,
1017 that is, supports as values of the "document-charset" Operation attribute (section 3.2.2). The Printer MUST support
1018 this attribute if it supports the corresponding "document-charset" Operation attribute (see section 3.2.2).

1019 ## 7.3 document-digital-signature-default (type2 keyword)

1020 This OPTIONAL Printer Description attribute indicates the default digital signature, if any, that the Printer will assume
1021 when the client omits the "document-digital-signature" Operation attribute (section 3.2.3). The Printer MUST support
1022 this attribute if it supports the "document-digital-signature" Operation attribute.

1023 ## 7.4 document-digital-signature-supported (1setOf type2 keyword)

1024 This OPTIONAL Printer Description attribute indicates the digital signature technologies that the Printer supports in
1025 Document Contents, that is, supports as values of the "document-digital-signature" Operation attribute (section
1026 3.2.3). The Printer MUST support this attribute if it supports the "document-digital-signature" Operation attribute.

1027 ## 7.5 document-format-details-default (collection)

1028 This OPTIONAL Printer Description attribute indicates the default document format details that the Printer will
1029 assume when the client omits the "document-format-details" Operation attribute (section §3.2.5). The member
1030 attributes are the same as "document-format-details" (see section 3.2.5). The Printer MUST support this attribute, if it
1031 supports the "document-format-details" Operation attribute (see section 3.2.5).

1032 ## 7.6 document-format-details-supported (1setOf type2 keyword)

1033 This OPTIONAL Printer Description attribute lists the type2 keyword names of the member attributes of "document-
1034 format-details" that the Printer supports. The Printer MUST support this "document-format-details" (1setOf type2
1035 keyword) Printer Description attribute, if the Printer supports the "document-format-details" (1setOf collection)
1036 Operation attribute (see section 3.2.5). Table 11 lists the type2 keywords defined for use in the "document-format-
1037 details-supported" Printer attribute.

1038 **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

1039

1040 ## 7.7 document-format-version-default (text(127))

1041 This OPTIONAL Printer Description attribute indicates the default document format version that the Printer will
1042 assume when the client omits the "document-format-version" Operation attribute (section 3.2.6). The Printer MUST
1043 support this attribute if it supports the "document-format-version" Operation attribute.

1044 ## 7.8 document-format-version-supported (1setOf text(127))

1045 This OPTIONAL Printer Description attribute indicates the document format versions that the Printer supports for
1046 Document Contents, that is, supports as values of the "document-format-version" Operation attribute (section 3.2.6).
1047 The Printer MUST support this attribute if it supports the "document-format-version" Operation attribute.

1048 ## 7.9 document-natural-language-default (naturalLanguage)

1049 This OPTIONAL Printer Description attribute indicates the default document natural language that the Printer will
1050 assume for Document Content when the client omits the "document-natural-language" Operation attribute ([rfc2911]
1051 section 3.2.1.1). The Printer MUST support this attribute if it supports the "document-natural-language" Operation
1052 attribute.

1053 ## 7.10 document-natural-language-supported (1setOf naturalLanguage)

1054 This OPTIONAL Printer Description attribute lists the natural languages supported in any of the supported document
1055 formats, that is, it is the union of the natural languages. The Printer MUST support this attribute if it supports the
1056 "document-natural-language" Operation attribute ([rfc2911] section 3.2.1.1).

1057 # 8   Override Scope of Attributes

1058 This section defines the Override Scope of the Job Template attributes. An Override Scope is only applicable when
1059 the Job Template attribute is applied as part of an Override [ippOverride]. An Override allows specifying Job
1060 Template attributes that apply to a portion of a Job. The portion of the Job that an Override can apply is referred to
1061 as its Scope. A Scope is the smallest entity to which a Job Template attribute applies. The order of Scopes is: a Job
1062 contains one or more Documents that are printed on one or more Sheets that have up to two Impressions containing
1063 one or more Pages. For a Printer to support a Job Template attribute in an Override, it MUST support the Job
1064 Template at the specified Scope. Furthermore the scope of the attribute MUST be 'Sheet', Impression' or 'Page'.
1065 Although operation attributes can not be used in an Override, their scope is of interest to determine their applicability
1066 in "Send-Document" and "Send-Uri". The various possible scopes of Operation and Job Template attributes are:

1067 **Job**   Job Template Attributes that operate on whole Jobs are not applicable as page overrides.
1068 **Document**   Job Template Attributes that operate on whole Documents are not applicable as page
1069   overrides. (The Document operations "Send-Document" and Send-Iri" as well as the
1070   Document Object [ippdoc] are used to apply overrides at this level.)
1071 **Sheet**   Job Template Attributes that operate on whole Sheets, such as "media" and "finishings".
1072   Attributes with this scope MAY be included in "overrides".
1073 **Impression**   Job Template Attributes that operate on whole Impressions, such as "number-up" or "x-
1074   side1-image-shift". Attributes with this scope MAY be included in "overrides".
1075 **Page**   Job Template Attributes that operate on whole Pages, such as "orientation-requested" or
1076   "print-quality". Attributes with this scope MAY be included in "overrides".
1077

1078 ## 8.1 Override Scope of Job Template attributes

1079 By definition only the "output-device" and "print-content-optimize" attributes from this specification can be used in an
1080 Override.

1081 **Table 12 Override Scope for Job Template Attributes**

Attribute Name	Override Scope
job-cover-back	Job
job-cover-front	Job
job-finishings	Job
job-finishings-col	Job
job-mandatory-attributes	Job
output-device	Sheet
print-content-optimize	Page

1082

1083 ## 8.2 Scope for Operation attributes

1084 Although, by definition, Operation attributes do not have an Override Scope, their Scope is applicable since the
1085 attribute may be supplied as an Operation attribute in the Send-Document or Send-URI operations. In these cases,
1086 the Operation attribute overrides the corresponding value supplied at the Job Level in the Create-Job operation.
1087 Table 13 shows the pseudo "Override Scope" of the Operation attributes referenced in this specification. Note that
1088 although these attributes may be used with a Document they can not be used as Overrides.

1089   **Table 13 Scope for Operation Attributes**

Attribute Name	Scope
compression-supplied	Document
document-charset	Document
document-digital-signature	Document
document-format-details	Document
document-format-version	Document
document-format-natural-language	Document
document-message	Document
document-name	Document
document-natural-language	Document

1090

1091 9   Conformance Requirements

1092 This specification contains a number of independent OPTIONAL attributes. This section summarizes the
1093 conformance requirements for Printers and clients.

1094 9.1 Printer conformance requirements

1095 In order to claim conformance to this specification,

1096   1.   A Vendor MUST explicitly identify the attributes and values supported by the Printer implementation in
1097   any such claim of conformance. In addition, the Vendor's Printer implementation:

1098   2.   MUST meet the conformance requirements for Printers specified in [rfc2911].

1099   3.   MUST support one or more OPTIONAL Operation attribute according to section 3 and the corresponding
1100   Job Description attributes in section 4.1.5.4 and corresponding Printer attributes in section 7. & and
1101   combine with #3

1102   4.   MAY support any Job Template attribute according to section 4.

1103   5.   MAY support any of the "job-state-reasons" values according to section 6.

1104   ## 9.2 Client conformance requirements

1105   In order to claim conformance to this specification,

1106   1. A Vendor MUST explicitly identify the attributes and values supported by the client implementation in any
1107   such claim of conformance. In addition, the Vendor's client:

1108   2. MUST meet the conformance requirements for clients specified in [rfc2911]

1109   3. MUST support at least one Operation attribute according to section 3 and the corresponding Job Description
1110   attributes in section 4.1.5.4 and corresponding Printer attributes in section 7. & combine with #3

1111   4. MAY support any Job Template attribute according to section 4.

1112   # 10 Normative References

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1115   http://www.npes.org/standards/Tools/DCS20Spec.pdf

1116   [dss]
1117   U.S. Department of Commerce, "Digital Signature Standard (DDS)", Federal Information Processing
1118   Standards Publication 186-1 (FIPS PUB 186-1), December 15, 1998.

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1120   Hastings, T., and P. Zehler, "Internet Printing Protocol (IPP): Document Object", October 14, 2002,
1121   ftp://ftp.pwg.org/pub/pwg/ipp/new_DOC/wd-ippdoc10-20030519.doc, .pdf, .rtf <work in progress>

1122   [ippOverride]
1123   Zehler, P., Herriot, R., and K. Ocke, "Internet Printing Protocol (IPP): Page Overrides", May 27, 2003,
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1128   [iso12639]
1129   ISO 12639:1998 Graphic technology -- Prepress digital data exchange -- Tag image file format for image
1130   technology (TIFF/IT), 1998.

1131   [iso15930]
1132   ISO 15930-1:2001 Graphic technology -- Prepress digital data exchange -- Use of PDF -- Part 1: Complete
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1140   by (1) a new Page Overrides specification which removes the "document-overrides" Job Template attribute
1141   and Operation attribute in favor of using the Document Object [ippdoc] and (2) a clarified definition of
1142   "pages-per-subset" Job Template attribute [ippfutures].

1143 [pwg5100.3]
1144   Ocke, K., Hastings, T., "Internet Printing Protocol (IPP): Production Printing Attributes - Set1", IEEE-ISTO
1145   5100.3-2001, February 12, 2001, ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.3.pdf.

1146 [rfc1991]
1147   D. Atkins, W. Stallings, P. Zimmermann, "PGP Message Exchange Formats", RFC 1991, August, 1996.

1148 [rfc2046]
1149   Freed, N., and N. Borenstein, "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types", RFC
1150   2046, November 1996.

1151 [rfc2634]
1152   P. Hoffman, "Enhanced Security Services for S/MIME", RFC 2634, June 1999.

1153 [rfc2854]
1154   Connolly, D., and L. Masinter, "The 'text/html' Media Type", RFC 2854, June 2000.

1155 [rfc2911]
1156   R. deBry, T. Hastings, R. Herriot, S. Isaacson, P. Powell, "Internet Printing Protocol/1.1: Model and
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1159   Hastings, T., Herriot, R., Kugler, C., and H. Lewis, "Internet Printing Protocol (IPP): Job and Printer Set
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1162   deBry, R., Hastings, T., Herriot, R., Ocke, K., and P. Zehler, "Internet Printing Protocol (IPP): The 'collection'
1163   attribute syntax", RFC 3382, September 2002.

1164 [upnp]
1165   Microsoft, "Basic *PrintBasic:1.0* Service Template Version 1.01 For Universal Plug and Play Version 1.0"

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1167   D. Eastlake, J. Reagle, D. Solo "XML-Signature Syntax and Processing", <draft-ietf-xmldsig-core-11.txt>,
1168   October 31, 2000.

1169 # 11 Informative References

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1172 [ippact]
1173   Carney, D., and H. Lewis, "Internet Printing Protocol (IPP), "-actual" attributes extension", work in progress,
1174   January 31, 2003, ftp://ftp.pwg.org/pub/pwg/ipp/new_ACT/pwg-ipp-actual-attrs-v04-030131.pdf

1175 [ippfax]
1176   Moore, P., Songer, G., Hastings, T., McDonald, Pulera, and M. Joel, "IPP FAX Protocol", July 26, 2001,
1177   ftp://ftp.pwg.org/pub/pwg/QUALDOCS/pwg-ifx-ippfax-P16-030423.pdf.

1178 [ippfutures]
1179   Work in progress to contain attributes not needed immediately. No draft is currently available.

1180 [pwg-psi]
1181   "Print Service Interface (PSI)", work in progress to become a PWG IEEE-ISTO standard. Visit
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1184   Zehler, P., and S. Albright, "PWG Semantic Model", work in progress to become a PWG IEEE-ISTO standard,
1185   version 0.11, September 27, 2002. ftp://ftp.pwg.org/pub/pwg/Semantic-Model/PWG-Semantic-Model.pdf

1186 [rfc2565]
1187   Herriot, R., Butler, S., Moore, P., and R. Turner, "Internet Printing Protocol/1.0: Encoding and Transport",
1188   RFC 2565, April 1999.

1189 [rfc2566]
1190   R. deBry, T. Hastings, R. Herriot, S. Isaacson, and P. Powell, "Internet Printing Protocol/1.0: Model and
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1193   Wright, D., "Design Goals for an Internet Printing Protocol", RFC 2567, April 1999.

1194 [rfc2568]
1195   Zilles, S., "Rationale for the Structure and Model and Protocol for the Internet Printing Protocol", RFC 2568,
1196   April 1999.

1197 [rfc2569]
1198   Herriot, R., Hastings, T., Jacobs, N., Martin, J., "Mapping between LPD and IPP Protocols", RFC 2569, April
1199   1999.

1200 [rfc3196]
1201   Hastings, T., Manros, C., Zehler, P., Kugler, C., and H. Holst, "Internet Printing Protocol/1.1: Implementer's
1202   Guide", RFC 3196, November 2001.

1203 [rfc3239]
1204   Kugler, C., Lewis, H. and T. Hastings, "Internet Printing Protocol (IPP): Requirements for Job, Printer, and
1205   Device Administrative Operations", RFC 3239, February 2002.

1206 # 12 IANA Considerations

1207 This section contains the registration information for IANA to add to the various IPP Registries according to the
1208 procedures defined in RFC 2911 [rfc2911] section 6 to cover the definitions in this document. The resulting
1209 registrations will be published in the http://www.iana.org/assignments/ipp-registrations registry.

1210 *Note to the PWG Editor: Replace the References below to [this spec] with the IEEE-ISTO standard number*
1211 *for the appropriate document, so that it accurately reflects the content of the information for the IANA Registry.*

1212 ## 12.1 Attribute Registrations

1213 The following table lists all the attributes defined in this specification. These are to be registered according to the
1214 procedures in RFC 2911 [rfc2911] section 6.2. If the attribute has a separate sub-section definition in this
1215 specification, that sub-section is listed as the Reference. This table contains the reference to another specification
1216 that completely defines each attribute.
1217

```
1218 Attribute Name (attribute syntax)              Reference     Section
1219 ----------------------------------             ----------    --------
1220
1221 Job Description attributes:
1222 compression-supplied (type3 keyword)           [this spec]   5.2.1
1223 document-charset-supplied (charset)            [this spec]   5.2.2
1224 document-digital-signature-supplied (type2 keyword)
1225                                                [this spec]   5.2.3
1226 document-format-details-supplied (1setOf collection)
1227                                                [this spec]   5.2.4
1228   document-source-application-name (name(MAX))  [this spec]   5.2.4
1229   document-source-application-version (text(127))
1230                                                [this spec]   5.2.4
1231   document-source-os-name (name(40))           [this spec]   5.2.4
1232   document-source-os-version (text(40))        [this spec]   5.2.4
1233   document-format (mimeMediaType)              [this spec]   5.2.4
1234   document-format-device-id (text(127))        [this spec]   5.2.4
1235   document-format-version (text(127)            [this spec]   5.2.4
1236   document-natural-language (1setOf naturalLanguage)
1237                                                [this spec]   5.2.4
1238 document-format-supplied (mimeMediaType)       [this spec]   5.2.5
1239 document-format-version-supplied (text(127))   [this spec]   5.2.6
1240 document-message-supplied (text(MAX))          [this spec]   5.2.7
1241 document-name-supplied (name(MAX))             [this spec]   5.2.8
1242 document-natural-language-supplied (naturalLanguage)
1243                                                [this spec]   5.2.9
1244 errors-count (integer(0:MAX))                  [this spec]   5.1.1
1245 job-attribute-fidelity (boolean)               [this spec]   5.1.2
1246 job-mandatory-attributes (1setOf type2 keyword) [this spec]  5.1.3
1247 warnings-count (integer(0:MAX))                [this spec]   5.1.4
1248
1249 Job Template attributes:
```

```
1250  job-copies (integer(1:MAX))                     [this spec]  4.1.1
1251  job-copies-default (integer(1:MAX))             [this spec]  4.1.1.1
1252  job-copies-supported (rangeOfInteger(1:MAX))    [this spec]  4.1.1.2
1253  job-copies-actual (1setOf Integer(1:MAX))       [this spec]  4.1.1.3
1254  job-cover-back (collection)                     [this spec]  4.1.2
1255    <member attributes are the same as "cover-back"[pwg5100.3]  3.1>
1256  job-cover-back-default (collection)             [this spec]  4.1.2.1
1257    <member attributes are the same as "cover-back"[pwg5100.3]  3.1>
1258  job-cover-back-supported (1setOf type2 keyword) [this spec]  4.1.2.2
1259  job-cover-back-actual (1setOf collection)       [this spec]  4.1.2.3
1260    <member attributes are the same as "cover-back"[pwg5100.3]  3.1>
1261  job-cover-front (collection)                    [this spec]
1262  4.1.34.1.2.3
1263    <member attributes are the same as "cover-front"[pwg5100.3] 3.1>
1264  job-cover-front-default (collection)            [this spec]  4.1.3.1
1265    <member attributes are the same as "cover-front"[pwg5100.3] 3.1>
1266  job-cover-front-supported (1setOf type2 keyword) [this spec] 4.1.3.2
1267  job-cover-front (1setOf collection)             [this spec]  4.1.3.3
1268    <member attributes are the same as "cover-front"[pwg5100.3] 3.1>
1269  job-finishings (1setOf type2 enum)              [this spec]  4.1.4
1270  job-finishings-default (1setOf type2 enum)      [this spec]  4.1.4.1
1271  job-finishings-ready (1setOf type2 enum)        [this spec]  4.1.4.2
1272  job-finishings-supported (1setOf type2 keyword) [this spec]  4.1.4.3
1273  job-finishings-actual (1setOf type2 enum)       [this spec]  4.1.4.4
1274  job-finishings-col (1setOf collection)          [this spec]  4.1.5
1275    <member attributes are the same as "finishings-col"[pwg5100.3] 3.2>
1276  job-finishings-col-default (1setOf type2 enum)  [this spec]  4.1.5.1
1277  job-finishings-col-ready (1setOf type2 enum)    [this spec]  4.1.5.2
1278  job-finishings-col-supported (1setOf type2 keyword)
1279                                                  [this spec]  4.1.5.3
1280  job-finishings-col-actual (1setOf collection)   [this spec]  4.1.5.4
1281    <member attributes are the same as "finishings-col"[pwg5100.3] 3.2>
1282  output-device (name(127))                       [this spec]  4.2.1
1283  output-device-ready (1setOf name(127))          [this spec]  4.2.1.2
1284  output-device-supported (1setOf name(127))      [this spec]  4.2.1.3
1285  output-device-actual (1setOf name(127))         [this spec]  4.2.1.4
1286  print-content-optimize (type2 keyword)          [this spec]  4.2.2
1287  print-content-optimize-default (type2 keyword)  [this spec]  4.2.2.1
1288  print-content-optimize-supported (1setOf type2 keyword)
1289                                                  [this spec]  4.2.2.2
1290  print-content-optimize-actual (1setOf type2 keyword)
1291                                                  [this spec]  4.2.2.3
1292
```

1293 **Printer Description attributes:**
```
1294  document-charset-default (charset)                   [this spec]  7.1
1295  document-charset-supported (1setOf charset)          [this spec]  7.2
```

```
1296   document-digital-signature-default (type2 keyword)     [this spec]  7.3
1297   document-digital-signature-supported (1setOf type2 keyword)
1298                                                          [this spec]  7.4
1299   document-format-details-default (collection)           [this spec]  7.5
1300     <member attributes are the same as "document-format-details"
1301                                                          [this spec] 3.2.5>
1302   document-format-details-supported (1setOf type2 keyword)
1303                                                          [this spec]  7.6
1304   document-format-version-default (text(127))            [this spec]  7.7
1305   document-format-version-supported (1setOf text(127))   [this spec]  7.8
1306   document-natural-language-default (naturalLanguage)    [this spec]  7.9
1307   document-natural-language-supported (1setOf naturalLanguage)
1308                                                          [this spec]  7.10
1309
```

1310   **Operation attributes:**

```
1311   document-charset (charset)                             [this spec]  3.2.2
1312   document-digital-signature (type2 keyword)       [this spec]    3.2.3
1313   document-format-details (1setOf collection)      [this spec]    3.2.5
1314     document-source-application-name (name(MAX))   [this spec]    3.2.5.1
1315     document-source-application-version (text(127))
1316                                                    [this spec]    3.2.5.2
1317     document-source-os-name (name(40))             [this spec]    3.2.5.3
1318     document-source-os-version (text(40))          [this spec]    3.2.5.4
1319     document-format (mimeMediaType)                [this spec]    3.2.5.5
1320     document-format-device-id (text(127))          [this spec]    3.2.5.6
1321     document-format-version (text(127)               [this spec]    3.2.5.7
1322     document-natural-language (1setOf naturalLanguage)
1323                                                    [this spec]    3.2.5.8
1324   document-format-version (text(127))              [this spec]    3.2.6
1325   document-natural-language (naturalLanguage)      [this spec]    3.2.9
1326   job-mandatory-attributes (1setOf type2 keyword)  [this spec]    3.1.2
```

1327   **12.2 Keyword attribute values**

```
1328   document-digital-signature (type2 keyword)       [this spec]    3.2.3
1329   document-digital-signature-default (type2 keyword)
1330                                                    [this spec]    7.3
1331   document-digital-signature-supported (1setOf type2 keyword)
1332                                                    [this spec]    7.4
1333     dss                                            [this spec]    3.2.3
1334     none                                           [this spec]    3.2.3
1335     pgp                                            [this spec]    3.2.3
1336     smime                                          [this spec]    3.2.3
1337     xmldsig                                        [this spec]    3.2.3
1338
1339   document-format-details-supported (1setOf type2 keyword)
1340                                                    [this spec]    7.6
```

```
1341    document-source-application-name                [this spec]    7.6
1342    document-source-application-version             [this spec]    7.6
1343    document-source-os-name                         [this spec]    7.6
1344    document-source-os-version                      [this spec]    7.6
1345    document-format                                 [this spec]    7.6
1346    document-format-device-id                       [this spec]    7.6
1347    document-format-version                         [this spec]    7.6
1348    document-natural-language                       [this spec]    7.6
1349
1350  job-cover-back-supported (1setOf type2 keyword) [this spec]    4.1.2.2
1351    <same as "cover-back-supported"               [pwg5100.3]    3.1.4
1352  job-cover-front-supported (1setOf type2 keyword) [this spec]   4.1.2.2
1353    <same as "cover-front-supported"              [pwg5100.3]    3.1.4
1354  job-mandatory-attributes (1setOf type2 keyword) [this spec]    3.1.2
1355    <any Job Template attribute keyword>
1356
1357  job-state-reasons (1setOf type2 keyword)        [rfc2911]      4.3.8
1358    digital-signature-did-not-verify              [this spec]    6.1
1359    digital-signature-type-not-supported          [this spec]    6.1
1360    errors-detected                               [this spec]    6.1
1361    job-digital-signature-wait                    [this spec]    6.1
1362    warnings-detected                             [this spec]    6.1
1363
1364  media (type2 keyword | name(MAX))               [rfc2911]      4.2.11
1365    choice_iso_a4_210x297mm_na_letter_8.5x11in    [this spec]    6.2
1366  print-content-optimize (type2 keyword)          [this spec]    4.2.2
1367    photo                                         [this spec]    4.2.2
1368    graphic                                       [this spec]    4.2.2
1369    text                                          [this spec]    4.2.2
1370    text-and-graphic                              [this spec]    4.2.2
1371
```

1372 12.3 Enum Attribute Values

1373 The following table lists all the new enum attribute values defined in this document as additional type2 enum values.
1374 These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.
1375

```
1376  job-finishings (1setOf type2 enum)              [this spec] 4.1.3.3
1377  job-finishings-default (1setOf type2 enum)      [this spec] 4.1.4.1
1378  job-finishings-ready (1setOf type2 enum)        [this spec] 4.1.4.2
1379  job-finishings-supported (1setOf type2 enum)    [this spec] 4.1.4.3
1380    <enum values are the same as "finishings">
1381
1382  job-finishings-col-supported (1setOf type2 keyword)
1383                                                  [this spec] 4.1.5.3
1384    <same as for "finishing-col-supported"        [pwg5100.3] 3.2.5
```

1385 # 13 Internationalization Considerations

1386 The internationalization considerations for the extensions defined in this specification are the same as for handling
1387 the Job object in [rfc2911].

1388 # 14 Security Considerations

1389 This specification adds no more security burden on Printer implementations than does [rfc2911].

1390 # 15 Contributors

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1394 # 16 Acknowledgments

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1415 # 18 Annex A: Additional requirements for a revision of the PWG IEEE/ISTO
1416 5101.1 Candidate Standard [pwg5101.1] to add the new 'choice_xxx'

1417 This section also generalizes the choice mechanism for inclusion in a revision to the PWG IEEE/ISTO 5101.1
1418 Candidate Standard [pwg5101.1]. This specification gives the *outline* of the proposed addition to [pwg5101.1] for
1419 information only, in order to agree to the one new value defined for use with IPPFAX, namely,
1420 **'choice_iso_a4_210x297mm_na_letter_8.5x11in'.**

1421 The proposed extension to [pwg5101.1] will have the following requirements:

1422　　1. The ABNF will be extended to define the `'choice_'` prefix to introduce a list of choices of self describing
1423　　　names.

1424　　2. Following the `'choice_'` prefix will be two or more fully self describing names, including all three fields.

1425　　3. The order of the list of fully self describing names MUST be in alphabetic order, so that there is only one
1426　　　canonical order for each list of choices.

1427　　4. Printer MAY support dynamic combinations of supported values or MAY support the entire choice value as a
1428　　　conventional keyword which it simply matches for validation purposes.

1429　　5. Printer MUST map the choice value to a particular supported value when selecting the actual media for
1430　　　marking.

1431　　6. If the Printer supports a **'choice_xxx'** "media" attribute value and the "media-ready" Printer attribute, the
1432　　　Printer MUST include the **'choice_xxx'** value in its "media-ready" Printer attribute as well as the currently
1433　　　loaded value(s) when at least one of the members of a choice value is ready. For example, if
1434　　　**'iso_a4_210x297mm'** is loaded, then the "media-ready" Printer attribute MUST include the
1435　　　**'iso_a4_210x297mm'** and the **'choice_iso_a4_210x297mm_na_letter_8.5x11in'** values.

1436　19　Annex B: Change Log (informative - to be removed before publication)

1437　The following summaries of the changes in chronological order:

1438　Version 0.1, 18 May 2003:
1439　　1. Split document out of Document Object specification.
1440　　2. Moved "document-format-target" and "document-format-version-target" from the Job Template section to the
1441　　　Operation Attributes section so that it can be supplied with Document Creation operations and so that it
1442　　　MUST be honored, even if "job-attribute-fidelity" is 'false' or omitted.
1443　　3. Removed all Document Description attributes and the concept of Job Level and Document Level. That
1444　　　terminology is introduced in the Document Object spec [ippdoc]. Now [ippdoc] is only an Informative
1445　　　Reference, not a Normative Reference.
1446
1447　Version 0.2, 19 May 2003:
1448　　1. Did *not* include the document-format-target and document-format-version-target attributes. PSI has their own
1449　　　definitions and we can avoid the discussion as to whether they should be Document Template attributes or
1450　　　Operation attributes on Document Creation operations and whether there should be a "document-format-
1451　　　target-default" and a "document-format-version-target-default".
1452
1453　Version 0.3, 28 May 2003:
1454　Agreements reaches at the May 28, 2003 telecon:
1455　　1. Moved the Close-Job operation to the futures specification.
1456　　2. Added the "pages-per-subset" Job Template from [pwg5100.4]. See Appendix B section **Error! Reference**
1457　　　**source not found.** for the minor differences.
1458　　3. Added the terms: "Best Effort, Finished Document, Page, Page Subset, and Sheet.
1459　　4. Clarified the conformance relationships between "xxx" Operation attributes and their corresponding "xxx-
1460　　　default" and "xxx-supported" Printer attributes.
1461　　5. Added rationale for each missing "xxx-default" and "xxx-supported" attribute.
1462　　6. Added 'errors-detected' and 'warnings-detected' "job-state-reasons" values.
1463　　7. Added the new **'choice_iso_a4_210x297mm_na_letter_8.5x11in'** "media" attribute value which is a choice
1464　　　of two approximately equal media.
1465　　8. Added the requirements for choice media keyword values for inclusion in a revision of the PWG IEEE-ISTO
1466　　　5101.1.

1467   9. Changed the "document-format-implemented" member attribute from 1setOf mimeMediaType to
1468   mimeMediaType since it is the key attribute value.
1469   10. Added another "document-format-implemented" example.
1470   11. Updated the IANA section to agree with the additions.
1471
1472   Version 0.4, June 4, 2003:
1473   1. Moved "document-format-details-implemented" Printer Description attribute to Futures.
1474   2. Moved "pages-per-subset" (1setOf integer(1:MAX)) Job Template attribute to Futures.
1475   3. Removed all CONDITIONALLY REQUIRED and CMUST statements and made them OPTIONAL and MAY.
1476   Added a statement of the intent for these attributes, so avoid the conformance statement problems for this
1477   specification which is just a list of OPTIONAL attributes.
1478   4. Removed the new terms "Honor" and "Best Effort", since they are synonym for "Support" and the opposite. It
1479   is confusing to have synonyms.
1480   5. Added all of the new Operation/Job Description attributes that describe Documents to be supplied in Job
1481   Creation operations and copied to the corresponding Job Description attributes as *default* values for the
1482   Document(s) of the Job.
1483   6. Added "output-device-default" and "output-device-supported" Printer attribute to provide the default for both
1484   the "output-device" Operation attribute and the "output-device-assigned" Job Description attribute.
1485   7. Added "document-message" and "document-name" as Operation/Job Description default Document
1486   attributes for the Job.
1487   8. Clarified that the 'none' value of the "document-digital-signature" must be implemented, but the administrator
1488   MAY remove the 'none' value in order to require signatures to be used.
1489   9. Sated that all supplied member attributes of the "document-format-details" Operation attribute MUST have a
1490   value, i.e., MUST NOT be empty.
1491   10. Normalized all of the Application Names and versions and Operating System Name values from the IANA
1492   Registry to lower case, as is done with most other IPP attributes, in order to facilitate matching.
1493   Moved the requirements for the new 'choice_xxx' values to be added to PWG 5101.1.
1494
1495   Version 0.6, July 26, 2003:
1496   1. Changed "output-device-requested" to "output-device"
1497   2. Made "output-device" a Job Template attribute, instead of an Operation attribute for the following two
1498   reasons: (1) so that it can be used at the Sheet level in "overrides" to print a Sheet containing color pages on
1499   a color printer while the other Sheets are printed on a black and white printer and (2) so that the "output-
1500   device-actual" can be used to indicate the actual device(s) used, since [rfc2911] "output-device-assigned" is
1501   only single valued.
1502   3. Updated introduction
1503   4. Added xxx-supplied to Job Description & updated table 5
1504   5. "output-device-default" explicitly prohibited & split out into its own section
1505   6. Added "output-device" multivalue issue/resolution.
1506   7. Added overrides summary and scoping of new attributes
1507   8. Added "-actual"s
1508   9. Added "output-device-ready" Job Template Printer attribute.
1509   10. Added Section 8 "Override Scope of Attributes"
1510   11. Added "print-content-optimized
1511