1 Working Draft, <mark>June 9, 2003</mark>   Important information to review is highlighted like this.
2 Maturity Level: Interim   <mark>There is 1 ISSUE highlighted like this.</mark>
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The Printer Working Group (PWG)
Standard for
The Internet Printing Protocol (IPP):
Job Extensions

10
11 **Abstract:** This IPP specification extends the Job semantics of the IPP Model and Semantics [rfc2911] object model.
12 This specification defines some new Operation attributes for use in Job Creation and Document Creation operations.
13 The Printer copies these Operation attributes to the corresponding Job Description attributes, which the clients may
14 query. The Document Creation Operation attributes describe the Document Content and permit the Printer to reject
15 requests that it cannot process correctly. Some corresponding "xxx-default" and "xxx-supported" Printer attributes
16 are defined. This specification defines some Job Template attributes that apply to a multi-document Job as a whole.
17 This specification also defines some additional values for the "job-state-reasons" Job Description attribute. Each of
18 the attributes defined in this specification are independent of each other and are OPTIONAL for a Printer to support.

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22 Working Draft, June 4, 2003

23 # The Printer Working Group (PWG)

24 ## Standard for

25 ## The Internet Printing Protocol (IPP):

26 ## Job Extensions

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28
29 This version of the PWG Proposed Standard is available electronically at:

30
31 ftp://ftp.pwg.org/pub/pwg/ipp/new_JOBX/wd-ippjobx10-20030604.pdf, .doc, .rtf

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

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68   **About the IEEE-ISTO**

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70   The IEEE-ISTO is a not-for-profit corporation offering industry groups an innovative and flexible operational forum
71   and support services. The IEEE-ISTO provides a forum not only to develop standards, but also to facilitate activities
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78   **About the IEEE-ISTO PWG**

79   The Printer Working Group (or PWG) is a Program of the IEEE Industry Standards and Technology Organization
80   (ISTO) with member organizations including printer manufacturers, print server developers, operating system
81   providers, network operating systems providers, network connectivity vendors, and print management application
82   developers. The group is chartered to make printers and the applications and operating systems supporting them
83   work together better. All references to the PWG in this document implicitly mean "The Printer Working Group, a
84   Program of the IEEE ISTO." In order to meet this objective, the PWG will document the results of their work as open
85   standards that define print related protocols, interfaces, procedures and conventions. Printer manufacturers and
86   vendors of printer related software will benefit from the interoperability provided by voluntary conformance to these
87   standards.

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

91   For additional information regarding the Printer Working Group visit: http://www.pwg.org

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94   **Contact information:**

95   IPP Web Page: http://www.pwg.org/ipp/
96   IPP Mailing List: ipp@pwg.org

97   To subscribe to the ipp mailing list, send the following email:
98   1) send it to majordomo@pwg.org
99   2) leave the subject line blank
100   3) put the following two lines in the message body:
101   subscribe ipp
102   end

103   Implementers of this specification are encouraged to join the IPP Mailing List in order to participate in any
104   discussions of clarifications or review of registration proposals for additional names. Requests for additional
105   extensions, for inclusion in this specification, should be sent to the IPP Mailing list for consideration. In order to
106   reduce spam the mailing list rejects mail from non-subscribers, so you must subscribe to the mailing list in order to
107   send a question or comment to the mailing list.
108

108 # **Contents**

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225 **1   Introduction and Summary**

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

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

240   **1.1 Scope**

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

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

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

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

252   **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 its 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.
job-mandatory-attributes (1setOf type2 keywords)	MAY	The Job Template attributes that the client is requesting that the Printer MUST support or reject the Job.
output-device-requested (name(127)	MAY	The output device that the client is requesting for a Printer that represents multiple output devices.

253   Table 3 summarizes the Job Template attributes defined in this specification for use with Job Creation operations.
254   These Job Template attributes are defined to apply to the Job as a whole, independent of the value of the "multiple-
255   document-handling" Job Template attribute ([rfc2911] section 4.2.4) whose 'separate-documents-collated-copies' and
256   'separate-documents-uncollated-copies' which cause the Printer to produce separate Output Documents.
257
258   **Table 3 - Summary of Job Template Attributes**

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

259

2   Terminology

261   This section defines terminology used throughout this document.

2.1 Conformance Terminology

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

265 ## 2.2 Other Terminology

266 This document uses the same terminology as [rfc2911], such as "**client**", "**Printer**"[2], "**attribute**", "**attribute value**",
267 "**keyword**", "**Job Template attribute**", "**Operation attribute**", "**operation**", "**request**", "**response**", and "**support**"
268 (see [rfc2911] section 12.2.3) with the same meaning. In addition, the following terms are defined for use in this
269 document:

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

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

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

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

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

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

288 **Sheet** - the unit of media that a printer puts marks on. A **Sheet** is the most basic unit of output from a Printer. A
289 printer may mark on one side or on both sides of a **Sheet**.

290 # 3   Operation Attributes for Job Creation and Document Creation operations

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

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

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[2] [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.

298   **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[3]
document-source-application-name	name(MAX)	name(MAX)	-
document-source-application-version	text(127)	text(127)	-
document-source-os-name	name(40)	name(40)	-
document-source-os-version	text(40)	text(40)	-
document-format	mimeMediaType	mimeMediaType	-
document-format-device-id	text(127)	text(127)	-
document-format-version	text(127)	text(127)	-
document-natural-language	naturalLanguage	naturalLanguage	-
document-format-version	text(127)	text(127)	1setOf text(127)
document-natural-language	naturalLanguage	naturalLanguage	1setOf naturalLanguage
ipp-attribute-fidelity	boolean	-	-
job-mandatory-attributes	1setOf type2 keyword	-	-
output-device-requested	name(127)	name(127) [4]	1setOf name(127)[5]

299

300   Table 5 lists the Operation attributes that clients supply in Job and Document Creation operations and whether the
301   Printer copies (indicated by **"⇒"**) the supplied value to the corresponding Job Description[6] attribute. The following
302   statements apply to all Operation attributes for Job and Document Creation operations and are *not* repeated in each
303   Operation attribute Description:

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

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

308   1.   support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if
309   defined (see Table 4 and section 7). If the Printer supports either of the "xxx-default" or "xxx-
310   supported" Printer Description attributes, then the Printer MUST also support the corresponding
311   Operation attributes.

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

---

[3] There is also a "document-format-details-implemented" (1setOf collection), see section **Error! Reference source not found.**.

[4] The corresponding "xxx-default" attribute is "output-device-default" Printer attribute (see section 7.11) which is the default for both the "output-device-requested" Job Description attribute and the "output-device-assigned" Job Description attribute.

[5] The corresponding "xxx-supported" attribute is "output-device-supported" Printer attribute (see section 7.12) which is the list of supported output devices for both the "output-device-requested" Job Description attribute and the "output-device-assigned" Job Description attribute.

[6] 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.

315   attribute, unless explicitly specified otherwise in the Description, such as (1) reject the request, (2)
316   accept the request and either (a) hold the job for operator intervention or (b) print the Job ignoring
317   the attribute. In all of these cases, the Printer MUST return the Operation attribute with the
318   unsupported value in the Unsupported Attributes group in the response (see [rfc2911] section 3.1.7).

Legend:	
"**Creation operations**"	column indicates which operations the Operation attribute can be supplied in: PJ=Print-Job, PU=Print-URI, CJ=Create-Job, SD=Send-Document, and SU=Send-URI.
"**y**"	the Operation attribute is defined for use with the indicated operations.
"**y⇒**"	the Operation attribute is defined for use with the indicated operations and has a corresponding Job Description attribute (see section 5) Job Description attributes that describe the Job as a whole This section defines those Job Description attributes that describe the Job as a whole. See section 5.2 below for those Job Description attributes that are defaults for the Document or Documents in the Job. Table 8) defined to which the Printer MUST support and 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. ISSUE 01: OK to make corresponding Job Description attributes that are *default* Document Description attributes as indicated below with **y⇒** highlighted in yellow in the CJ and PJ,PU columns?
"**-**"	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.

319

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

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

Operation attribute name for Job and Document Creation *requests*	Attribute Syntax	Creation operations			Conformance		Section
		CJ	PJ, PU	SD, SU	Client supply	Printer support	
document-natural-language	naturalLanguage	y⇒	y⇒	y	MAY	MAY	§3.2.8
ipp-attribute-fidelity	boolean	y⇒	y⇒	-	MAY	MUST	§3.1.1,
job-mandatory-attributes	1setOf type2 keyword	y⇒	y⇒	-	MAY	MAY	§3.1.2
output-device-requested	name(127)	y⇒	y⇒	-	MAY	MAY	§3.1.3

321

322 3.1 Operation attributes for Job Creation operations only

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

325 3.1.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)

326 This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1) when the client
327 supplies unsupported Job Template attributes[7] or values in a Job Creation operation. The value 'true' indicates that
328 total fidelity to client-supplied Job Template attributes and values is required for this Job Creation operation. If the
329 client supplies the value 'false' or omits the attribute, then the Printer MUST accept the Job Creation operation.

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

331 3.1.1.1 Why there are no "ipp-attribute-fidelity-default" and "ipp-attribute-fidelity-supported" attributes

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

335 3.1.2 job-mandatory-attributes (1setOf type2 keyword)

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

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

---

[7] 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.

347   The Printer MUST copy this attribute to the corresponding "job-mandatory-attributes" Job Description attribute (see
348   section 5.1.3) for auditing and trouble-shooting purposes[8].

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

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

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

366   **3.1.2.1 Why there are no "job-mandatory-attributes-default" and "job-mandatory-attributes-supported"**
367   **Printer Description attributes**

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

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

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

3.1.3 output-device-requested (name(127))

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

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

---

[8] 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.

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

389   If a client supplies this "output-device-requested" Operation attribute with a value that the Printer doesn't support, the
390   Printer MUST perform one of the following actions depending on implementation: (1) reject the request OR (2)
391   accept the request and either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute.
392   See section 3 above for more details.

393   **3.1.3.1 output-device-default (name(MAX))**

394   This OPTIONAL Printer Description attribute specifies the default value for the Job's "output-device-assigned" Job
395   Description attribute. A Printer MAY have a dynamic scheduling algorithm to assign jobs to output devices, in which
396   case the "output-device-default" Printer attribute is not configured. If the Printer does not have a dynamic scheduling
397   algorithm to assign Jobs to output devices, the Printer copies the value of the "output-device-default" Printer attribute
398   to the Job's "output-device-assigned" attribute when the client omits the "output-device-requested" Operation
399   attribute.

400   # 3.2 Operation attributes for both Job and Document Creation operations

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

404   ## 3.2.1 document-charset (charset)

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

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

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

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

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

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

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

438 3.2.2 document-digital-signature (type2 keyword)

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

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

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

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

451   2. put the job on hold and wait for human intervention and MUST set the Job's "job-state-reasons" Job
452   Description attribute to the 'job-digital-signature-wait' and 'digital-signature-did-not-verify' values (see section
453   6.1), OR

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

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

464 The following standard keyword values are defined:

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

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

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

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

470   'xmldsig' XML Digital Signature [xmldsig].

3.2.3 document-format (mimeMediaType)

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

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

482 Many printer languages in the Printer MIB do not have a MIME type registered with IANA.[9] It is the intent of the PWG
483 to registers all of the Printer MIB v2 XXX Printer Languages as 'application/vnd.PWG-XXX'. If a Printer Language
484 already has a registered MIME Media type or gets a registration in the future, then that MIME Type MUST be used in
485 preference to the 'application/vnd.PWG-XXX' MIME Type. For example, PostScript® has the MIME Media type:
486 'application/postscript' and PCL has the MIME Media Type: 'application/vnd.HP-PCL, so those MIME Media types
487 MUST be used instead of 'application/vnd.PWG-PS' and 'application/vnd.PWG-PCL'. For example, the NEC NPDL
488 printer language from the Printer MIB does not have a MIME type registered with IANA. Therefore, the "document-
489 format" = 'application/vnd.PWG-NPDL' MUST be used.

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

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

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

3.2.4 document-format-details (1setOf collection)

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

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

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

508 If a client supplies the "document-format-details" Operation attribute in a Document Creation request with member
509 attributes and/or values that the Printer doesn't support, the Printer MUST perform one of the following actions

---

[9] 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.

510 depending on implementation: (1) reject the request OR (2) accept the request and either (a) put the Job in the
511 'pending-held' state or (b) process the job ignoring the attribute. See section 3.2 above for more details. However, if
512 the "document-charset" or the "document-format" member attributes are the ones in question, the Printer MUST
513 reject the request, same as for the "document-charset" and "document-format" Operation attributes (see sections
514 3.2.1 and 3.2.3) and return the 'client-error-charset-not-supported' (see [rfc2911] section 13.1.4.16) or the 'client-
515 error-document-format-not-supported' (see [rfc2911] section 13.1.4.11), respectively.

516 For a packaging format, the "document-format-details" attribute does not provide means to associate each collection
517 value with particular document in the archive file, so it does not provide a "manifest"[10] of the packaging. One of the
518 packaging collection values MAY describe the packaging format itself, in which case that collection value MUST be
519 the first collection value. The remaining collection values provides the summary of the details of the contained files in
520 any order.

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

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

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

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

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

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

533
534 The client can determine which member attributes of the "document-format-details" are supporter by querying the
535 Printer's "document-format-details-supported" (1setOf type2 keyword) Printer Description attribute (see section 7.6).

536 Table 6 shows that three of the member attributes also have comparable top level Operation attributes defined with
537 the same names. See the sections listed in the rightmost column. These three high level attributes have
538 corresponding "xxx-default" and "xxx-supported" Printer Description attributes. These values are also for use with

_____

[10] 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.

539 the corresponding three member attributes. The remaining member attributes do not have any corresponding "xxx-
540 default" and "xxx-supported" Printer Description attribute.

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

545 **3.2.4.1 document-source-application-name (name(MAX))**

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

550 **3.2.4.2 document-source-application-version (text(127))**

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

555 "8.1 (4331)" for Winzip®, "5.0.5 10/26/2001" for Acrobat®, "2000 (9.0.4119 sr-1)" for Microsoft® Word

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

558 **3.2.4.3 document-source-os-name (name(40))**

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

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

565 ACTION ITEM: Get Sun to register SOLARIS with IANA.

566 **3.2.4.4 document-source-os-version (text(40))**

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

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

577

578   **3.2.4.5 document-format (mimeMediaType)**

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

584   **3.2.4.6 document-format-device-id (text(127))**

585   This OPTIONAL member Operation attribute identifies the type of device for which the document was
586   formatted, including manufacturer and model. This attribute is intended to identify document formats that are
587   not portable, e.g., PDLs that are device dependent. The value of this variable MUST exactly match the IEEE
588   1284-2000 Device ID string (see [IEEE1284] clause 6), except the length field MUST NOT be specified. See
589   the Microsoft Universal Plug and Play [upnp] section 2.2.6 DeviceId parameter for details and examples.
590   Here is an example showing only the required fields for a PostScript document:
591   `MANUFACTURER:ACME Co.;COMMAND SET:PS;MODEL:LaserBeam 9;`

592   **3.2.4.7 document-format-version (text(127))**

593   This REQUIRED member Operation attribute identifies the level or version of the document format identified
594   by the "document-format" member attribute. The client MAY supply and the Printer MUST support this
595   member attribute if the Printer supports the "document-format-details" Operation attribute. The semantics
596   and supported values of this "document-format-version" member attribute MUST be the same as for the top
597   level "document-format-version" Operation attribute with the same name (see section 3.2.5 for the
598   semantics).

599   **3.2.4.8 document-natural-language (1setOf naturalLanguage)**

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

606   **3.2.5 document-format-version (text(127))**

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

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

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

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

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

627   Example values:

628   'PS/3': For Postscript level 3 [rfc1759].
629   'PCL/5e': For PCL 5e [rfc1759].
630   'PDF/1.4': For PDF version 1.4 [pdf]
631   'PDF/X-1a:2001': For PDF/X-1a [iso15930]
632   'DCS/2.0' For Document Color Separation (DCS), version 2.0. [dcs2.0]
633   'TIFF-IT/FP:1998': TIFF/IT [iso12639] - Full Page - baseline.
634   'TIFF-IT/CT:1998': TIFF/IT [iso12639] - Continuous Tone picture data - baseline
635   'TIFF-IT/FP/P1:1998': TIFF/IT [iso12639] - Full Page - profile 1
636   'TIFF-IT/CT/P1:1998': TIFF/IT [iso12639] - Continuous Tone picture data - profile 1
637   'Automatic': auto sense the format [rfc1759]. Is use in combination with the 'application/octet-stream' (see
638   [rfc2911] section 4.1.9.1) value of the "document-format" attribute (section 3.2.3).
639

640   **3.2.5.1 Why no "document-format-version-default"**

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

644   ## 3.2.6 document-message (text(MAX))

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

646   ## 3.2.7 document-name (name(MAX))

647   The Printer MUST support this Operation attribute in Print-Job, Print-URI, Send-Document, and Send-URI operations
648   (see [rfc2911 section 3.2.1.1) and MAY support it in the Create-Job operation. For the Print-Job, Print-URI, and
649   Create-Job operations, the Printer MUST copy the value to the corresponding Job Description attribute[11].

650   ## 3.2.8 document-natural-language (naturalLanguage)

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

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

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

---

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

660   'en': for English
661   'en-us': for US English
662   'fr': for French
663   'de': for German
664

665   **4   Job Template attributes**

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

669 Job Template attributes are OPTIONAL for a Printer to support and for a client to supply in a Job Creation request. If
670 a Printer supports a Job Template attribute, then the Printer MUST copy the supplied attribute to the Job object, so
671 that a client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs operations (see [rfc2911] section
672 4.2). In addition, as in [rfc2911], for each "xxx" Job Template attribute supported, the Printer MUST support the
673 corresponding "xxx-default" and "xxx-supported" Printer attributes, if defined.

674   **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[12]	1setOf type2 enum
job-finishings-col	collection	collection[12]	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))

675   **4.1 Job Template attributes defined for Job-wide effect in multi-document jobs**

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

---

[12] The "job-finishings" and "job-finishings-col" Job Template attributes also include corresponding "job-finishings-ready" (1setOf enum) and "job-finishings-col-ready" (1setOf collection).

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

682   4.1.1 job-copies (integer(1:MAX))

683   This OPTIONAL Job Template attribute specifies the number of job copies, i.e., with all of the Documents taken
684   together. Its interpretation is independent of the value of the "multiple-document-handling" Job Template attribute.
685   See the "copies" Job Template attribute defined in [rfc2911] section 4.2.5 which switches between job copies and
686   document copies depending on the value of the "multiple-document-handling" Job Template attribute ([rfc2911]
687   section 4.2.4). The "job-copies" Job Template attribute is equivalent to "copies" with "multiple-document-handling" =
688   'single-document-new-sheet'.

689   4.1.1.1 job-copies-default (integer(1:MAX))

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

692   4.1.1.2 job-copies-supported (rangeOfInteger(1:MAX))

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

695   4.1.2 job-cover-back (collection)

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

703   4.1.2.1 job-cover-back-default (collection)

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

706   4.1.2.2 job-cover-back-supported (1setOf type2 keyword)

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

710   4.1.3 job-cover-front (collection)

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

718 **4.1.3.1 job-cover-front-default (collection)**

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

721 **4.1.3.2 job-cover-front-supported (1setOf type2 keyword)**

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

725 4.1.4 job-finishings (1setOf type2 enum)

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

732 **4.1.4.1 job-finishings-default (1setOf type2 enum)**

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

735 **4.1.4.2 job-finishings-ready (1setOf type2 enum)**

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

739 **4.1.4.3 job-finishings-supported (1setOf type2 keyword)**

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

742 4.1.5 job-finishings-col (1setOf collection)

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

749 **4.1.5.1 job-finishings-col-default (collection)**

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

752 **4.1.5.2 job-finishings-col-ready (collection)**

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

756 **4.1.5.3 job-finishings-col-supported (1setOf type2 keyword)**

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

760 # 5   Job Description attributes

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

765 This section divides Job Descriptions into two subsections: Section 5.1 contains Job Description attributes that
766 describe the Job as a whole and Section 5.2 contains Job Description attributes that are defaults for the Document(s)
767 in the Job[13]. 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 to the sub-section in this document if there is significant information there. Those subsections that are only references to other specifications contain only that reference in the Reference column.

768

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

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

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

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

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

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

773
774 Most of the existing "job-state" and "job-state-reasons" Job Description attribute values apply equally well to
775 individual documents in a multi-document job (with removal of the 'job-' prefix for those that apply to both Job and
776 Document). Furthermore, the job states are completely service-type neutral, so they can apply to scanning. faxing,
777 formatting processes as well. The job state reasons have a number of reasons that are print service specific, but
778 most can apply to other types of service as well. The reason for separating state from reasons, is so that the states
779 can be the fundamental states that most implementations have, while the state reasons can vary depending on the
780 sophistication of the system. The states are the ones that clients are most likely to base actions upon, and the state
781 reasons are more information, both for programs and people.

782 5.1.1 errors-count (integer(0:MAX))

783 This OPTIONAL Job Description attribute counts the number of errors encountered processing the job as a whole.
784 An error where some portion of the printed output is not present, such as a glyph encountered which isn't in the
785 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
786 overall document format.

787 5.1.2 ipp-attribute-fidelity (boolean)

788 This OPTIONAL Job Description attribute indicates the value of the corresponding "ipp-attribute-fidelity" Operation
789 attribute ([rfc2911] section 3.2.1.1)[14] that the client supplied in the Job Creation operation. This Job Description
790 attribute has no effect on the processing of the job once the Job Creation operation has been accepted[15]. However,
791 this attribute does provide an audit capability to the user and service desk for comparing unexpected printed results
792 with what was submitted.

793 5.1.3 job-mandatory-attributes (1setOf type2 keyword)

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

802 5.1.4 output-device-requested (name(127))

803 This OPTIONAL Job Description attribute indicates the name of the output device that the client has supplied in the
804 "output-device-requested" Operation attribute (see section 3.1.3), if any, in the Job Creation operation. The Printer
805 sets the Job's "output-device-assigned" Job Description attribute (see [rfc2911] section) to the name of the actual
806 device assigned.

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[14] 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.
[15] The "ipp-attribute-fidelity" and "job-mandatory-attributes" Operation attributes do have effect after the Job Creation
operation when the Document Object is supported [ippdoc].

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

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

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

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

813 **5.2.1 compression (type3 keyword)**

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

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

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

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

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

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

828 This REQUIRED[16] Job Description attribute specified the *default* document format of the Document Object content.
829 The Printer sets this Job Description attribute from the corresponding "document-format" Operation attribute (see
830 [rfc2911] section 3.2.1.1 and [this spec] section 3.2.3 for the semantics), if supplied by the client in the Job Creation
831 operation.

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

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

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

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

---

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

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

5.2.7 document-message (text(MAX))

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

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

5.2.8 document-name (name(MAX))

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

5.2.9 document-natural-language (naturalLanguage)

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

860 6   New values to existing attributes

861 This section defines new values for existing attributes.

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

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

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

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

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

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

IPP Job Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
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

877
878 For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely
879 to occur (if implemented):

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

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

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

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

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

898 ## 6.2 New media (type 3 keyword | name(MAX)) Values

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

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

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

908 See Annex A (section 17) for additional requirements for a revision of the PWG IEEE/ISTO 5101.1 Candidate
909 Standard [pwg5101.1] to include the new **'choice_iso_a4_210x297mm_na_letter_8.5x11in'** and other choice
910 values.

911 **7 New Printer Description attributes**

912 This section lists *the new* Printer Description attributes defined in this document. These Printer attributes are "xxx-
913 supported" and "xxx-default" Printer attributes which indicate the default and supported values that the Printer
914 supports.. The Printer MUST support these Printers attributes if the Printer supports the corresponding "xxx"
915 Operation attributes (see section 3) that the client can supply in a Job Creation or Document Creation request.
916
917 The column labels are:

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

918

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

Printer **Description** attribute name	Attribute Syntax		Reference
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
output-device-requested-supported	1setOf name(127)		[this spec] §7.12

920

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

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

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

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

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

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

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

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

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

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

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

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

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

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

950

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

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

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

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

7.9 document-natural-language-default (naturalLanguage)

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

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

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

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

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

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

This OPTIONAL Printer Description attributes lists the names of output devices that the Printer supports. The Printer MUST support this attribute if it supports the "output-device-requested" Operation attribute (see section 3.1.3).

8   Conformance Requirements

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

8.1 Printer conformance requirements

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

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

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

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

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

8.2 Client conformance requirements

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

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

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

994   3. MAY support any Job Template attribute according to section 4.

9   Normative References

996   [dcs2.0]
997   Document Color Separation (DCS), version 2.0. Available at:
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1089 # 11 IANA Considerations

1090 This section contains the registration information for IANA to add to the various IPP Registries according to the
1091 procedures defined in RFC 2911 [rfc2911] section 6 to cover the definitions in this document. The resulting
1092 registrations will be published in the http://www.iana.org/assignments/ipp-registrations registry.

1093 *Note to the PWG Editor: Replace the References below to [this spec] with the IEEE-ISTO standard number*
1094 *for the appropriate document, so that it accurately reflects the content of the information for the IANA Registry.*

1095 ## 11.1 Attribute Registrations

1096 The following table lists all the attributes defined in this specification. These are to be registered according to the
1097 procedures in RFC 2911 [rfc2911] section 6.2. If the attribute has a separate sub-section definition in this
1098 specification, that sub-section is listed as the Reference. This table contains the reference to another specification
1099 that completely defines each attribute.
1100
```
1101 Attribute Name (attribute syntax)              Reference      Section
1102 ----------------------------------             ----------     --------
1103
1104 Job Description attributes:
1105 compression (type3 keyword)                    [this spec]    5.2.1
1106 document-charset (charset)                     [this spec]    5.2.2
1107 document-digital-signature (type2 keyword)     [this spec]    5.2.3
1108 document-format (mimeMediaType)                [this spec]    5.2.4
1109 document-format-details (1setOf collection)    [this spec]    5.2.5
1110   document-source-application-name (name(MAX))  [this spec]     5.2.5
1111   document-source-application-version (text(127))
1112                                                 [this spec]     5.2.5
1113   document-source-os-name (name(40))           [this spec]     5.2.5
1114   document-source-os-version (text(40))        [this spec]     5.2.5
1115   document-format (mimeMediaType)              [this spec]     5.2.5
1116   document-format-device-id (text(127))        [this spec]     5.2.5
1117   document-format-version (text(127)           [this spec]     5.2.5
1118   document-natural-language (1setOf naturalLanguage)
1119                                                 [this spec]     5.2.5
1120 document-format-version (text(127))            [this spec]    5.2.6
1121 document-message (text(MAX))                   [this spec]    5.2.7
1122 document-name (name(MAX))                      [this spec]    5.2.8
1123 document-natural-language (naturalLanguage)    [this spec]    5.2.9
1124 errors-count (integer(0:MAX))                  [this spec]    5.1.1
1125 job-attribute-fidelity (boolean)              [this spec]    5.1.2
1126 job-mandatory-attributes (1setOf type2 keyword) [this spec]   5.1.3
1127 output-device-requested(name(127))            [this spec]    5.1.4
1128 warnings-count (integer(0:MAX))               [this spec]    5.1.5
1129
1130 Job Template attributes:
1131 job-copies (integer(1:MAX))                    [this spec]    4.1.1
1132 job-copies-default (integer(1:MAX))            [this spec]    4.1.1.1
```

```
1133  job-copies-supported (rangeOfInteger(1:MAX))     [this spec]  4.1.1.2
1134  job-cover-back (collection)                      [this spec]  4.1.2
1135    <member attributes are the same as "cover-back"[pwg5100.3]  3.1>
1136  job-cover-back-default (collection)              [this spec]  4.1.2.1
1137    <member attributes are the same as "cover-back"[pwg5100.3]  3.1>
1138  job-cover-back-supported (1setOf type2 keyword) [this spec]  4.1.2.2
1139  job-cover-front (collection)                     [this spec]  4.1.3
1140    <member attributes are the same as "cover-front"[pwg5100.3] 3.1>
1141  job-cover-front-default (collection)             [this spec]  4.1.3.1
1142    <member attributes are the same as "cover-front"[pwg5100.3] 3.1>
1143  job-cover-front-supported (1setOf type2 keyword) [this spec]  4.1.3.2
1144  job-finishings (1setOf type2 enum)               [this spec]  4.1.4
1145  job-finishings-default (1setOf type2 enum)       [this spec]  4.1.4.1
1146  job-finishings-ready (1setOf type2 enum)         [this spec]  4.1.4.2
1147  job-finishings-supported (1setOf type2 keyword)  [this spec]  4.1.4.3
1148  job-finishings-col (1setOf collection)           [this spec]  4.1.5
1149    <member attributes are the same as "finishings-col"[pwg5100.3] 3.2>
1150  job-finishings-col-default (1setOf type2 enum)   [this spec]  4.1.5.1
1151  job-finishings-col-ready (1setOf type2 enum)     [this spec]  4.1.5.2
1152  job-finishings-col-supported (1setOf type2 keyword)
1153                                                   [this spec]  4.1.5.3
1154
1155  Printer Description attributes:
1156  document-charset-default (charset)                         [this spec]  7.1
1157  document-charset-supported (1setOf charset)                [this spec]  7.2
1158  document-digital-signature-default (type2 keyword)    [this spec]  7.3
1159  document-digital-signature-supported (1setOf type2 keyword)
1160                                                             [this spec]  7.4
1161  document-format-details-default (collection)          [this spec]  7.5
1162    <member attributes are the same as "document-format-details"
1163                                                   [this spec] 3.2.4>
1164  document-format-details-supported (1setOf type2 keyword)
1165                                                             [this spec]  7.6
1166  document-format-version-default (text(127))          [this spec]  7.7
1167  document-format-version-supported (1setOf text(127)) [this spec]  7.8
1168  document-natural-language-default (naturalLanguage)  [this spec]  7.9
1169  document-natural-language-supported (1setOf naturalLanguage)
1170                                                             [this spec]  7.10
1171  output-device-requested-supported (1setOf name(127)) [this spec]  7.12
1172
1173
1174  Operation attributes:
1175  document-charset (charset)                           [this spec]  3.2.1
1176  document-digital-signature (type2 keyword)           [this spec]  3.2.2
1177  document-format-details (1setOf collection)          [this spec]  3.2.4
1178    document-source-application-name (name(MAX))       [this spec]  3.2.4.1
```

```
1179    document-source-application-version (text(127))
1180                                              [this spec]   3.2.4.2
1181    document-source-os-name (name(40))        [this spec]   3.2.4.3
1182    document-source-os-version (text(40))     [this spec]   3.2.4.4
1183    document-format (mimeMediaType)           [this spec]   3.2.4.5
1184    document-format-device-id (text(127))     [this spec]   3.2.4.6
1185    document-format-version (text(127)         [this spec]   3.2.4.7
1186    document-natural-language (1setOf naturalLanguage)
1187                                              [this spec]   3.2.4.8
1188  document-format-version (text(127))         [this spec]   3.2.5
1189  document-natural-language (naturalLanguage) [this spec]   3.2.8
1190  job-mandatory-attributes (1setOf type2 keyword) [this spec]   3.1.2
1191  output-device-requested (name(127))         [this spec]   3.1.3
```

1192 11.2 Keyword attribute values

```
1193  document-digital-signature (type2 keyword)    [this spec]   3.2.2
1194  document-digital-signature-default (type2 keyword)
1195                                              [this spec]   7.3
1196  document-digital-signature-supported (1setOf type2 keyword)
1197                                              [this spec]   7.4
1198    dss                                       [this spec]   3.2.2
1199    none                                      [this spec]   3.2.2
1200    pgp                                       [this spec]   3.2.2
1201    smime                                     [this spec]   3.2.2
1202    xmldsig                                   [this spec]   3.2.2
1203
1204  document-format-details-supported (1setOf type2 keyword)
1205                                              [this spec]   7.6
1206    document-source-application-name          [this spec]   7.6
1207    document-source-application-version       [this spec]   7.6
1208    document-source-os-name                   [this spec]   7.6
1209    document-source-os-version                [this spec]   7.6
1210    document-format                           [this spec]   7.6
1211    document-format-device-id                 [this spec]   7.6
1212    document-format-version                   [this spec]   7.6
1213    document-natural-language                 [this spec]   7.6
1214
1215  job-cover-back-supported (1setOf type2 keyword) [this spec]   4.1.2.2
1216    <same as "cover-back-supported"          [pwg5100.3]   3.1.4
1217  job-cover-front-supported (1setOf type2 keyword) [this spec]   4.1.2.2
1218    <same as "cover-front-supported"         [pwg5100.3]   3.1.4
1219  job-mandatory-attributes (1setOf type2 keyword) [this spec]   3.1.2
1220    <any Job Template attribute keyword>
1221
1222  job-state-reasons (1setOf type2 keyword)      [rfc2911]     4.3.8
1223    digital-signature-did-not-verify          [this spec]   6.1
```

```
1224    digital-signature-type-not-supported              [this spec]    6.1
1225    errors-detected                                   [this spec]    6.1
1226    job-digital-signature-wait                        [this spec]    6.1
1227    warnings-detected                                 [this spec]    6.1
1228
1229  media (type2 keyword | name(MAX))                   [rfc2911]      4.2.11
1230    choice_iso_a4_210x297mm_na_letter_8.5x11in        [this spec]    6.2
1231
```

1232 11.3 Enum Attribute Values

1233 The following table lists all the new enum attribute values defined in this document as additional type2 enum values.
1234 These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.
1235

```
1236  job-finishings (1setOf type2 enum)                  [this spec] 4.1.4
1237  job-finishings-default (1setOf type2 enum)          [this spec] 4.1.4.1
1238  job-finishings-ready (1setOf type2 enum)            [this spec] 4.1.4.2
1239  job-finishings-supported (1setOf type2 enum)        [this spec] 4.1.4.3
1240    <enum values are the same as "finishings">
1241
1242  job-finishings-col-supported (1setOf type2 keyword)
1243                                                      [this spec] 4.1.5.3
1244    <same as for "finishing-col-supported"            [pwg5100.3] 3.2.5
```

1245 12 Internationalization Considerations

1246 The internationalization considerations for the extensions defined in this specification are the same as for handling
1247 the Job object in [rfc2911].

1248 13 Security Considerations

1249 This specification adds no more security burden on Printer implementations than does [rfc2911].

1250 14 Contributors

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1254 15 Acknowledgments

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1274

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

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

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

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

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

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

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

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

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

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

The following summaries of the changes in chronological order:

1298   Version 0.1, 18 May 2003:
1299   1. Split document out of Document Object specification.
1300   2. Moved "document-format-target" and "document-format-version-target" from the Job Template section to the
1301   Operation Attributes section so that it can be supplied with Document Creation operations and so that it
1302   MUST be honored, even if "job-attribute-fidelity" is 'false' or omitted.
1303   3. Removed all Document Description attributes and the concept of Job Level and Document Level. That
1304   terminology is introduced in the Document Object spec [ippdoc]. Now [ippdoc] is only an Informative
1305   Reference, not a Normative Reference.
1306
1307   Version 0.2, 19 May 2003:
1308   1. Did *not* include the document-format-target and document-format-version-target attributes. PSI has their own
1309   definitions and we can avoid the discussion as to whether they should be Document Template attributes or
1310   Operation attributes on Document Creation operations and whether there should be a "document-format-
1311   target-default" and a "document-format-version-target-default".
1312
1313   Version 0.3, 28 May 2003:
1314   Agreements reaches at the May 28, 2003 telecon:
1315   1. Moved the Close-Job operation to the futures specification.
1316   2. Added the "pages-per-subset" Job Template from [pwg5100.4]. See Appendix B section **Error! Reference**
1317   **source not found.** for the minor differences.
1318   3. Added the terms: "Best Effort, Finished Document, Page, Page Subset, and Sheet.
1319   4. Clarified the conformance relationships between "xxx" Operation attributes and their corresponding "xxx-
1320   default" and "xxx-supported" Printer attributes.
1321   5. Added rationale for each missing "xxx-default" and "xxx-supported" attribute.
1322   6. Added 'errors-detected' and 'warnings-detected' "job-state-reasons" values.
1323   7. Added the new **'choice_iso_a4_210x297mm_na_letter_8.5x11in'** "media" attribute value which is a choice
1324   of two approximately equal media.
1325   8. Added the requirements for choice media keyword values for inclusion in a revision of the PWG IEEE-ISTO
1326   5101.1.
1327   9. Changed the "document-format-implemented" member attribute from 1setOf mimeMediaType to
1328   mimeMediaType since it is the key attribute value.
1329   10. Added another "document-format-implemented" example.
1330   11. Updated the IANA section to agree with the additions.
1331
1332   Version 0.4, June 4, 2003:
1333   1. Moved "document-format-details-implemented" Printer Description attribute to Futures.
1334   2. Moved "pages-per-subset" (1setOf integer(1:MAX)) Job Template attribute to Futures.
1335   3. Removed all CONDITIONALLY REQUIRED and CMUST statements and made them OPTIONAL and MAY.
1336   Added a statement of the intent for these attributes, so avoid the conformance statement problems for this
1337   specification which is just a list of OPTIONAL attributes.
1338   4. Removed the new terms "Honor" and "Best Effort", since they are synonym for "Support" and the opposite. It
1339   is confusing to have synonyms.
1340   5. Added all of the new Operation/Job Description attributes that describe Documents to be supplied in Job
1341   Creation operations and copied to the corresponding Job Description attributes as *default* values for the
1342   Document(s) of the Job.
1343   6. Added "output-device-default" and "output-device-supported" Printer attribute to provide the default for both
1344   the "output-device-requested" Operation attribute and the "output-device-assigned" Job Description attribute.
1345   7. Added "document-message" and "document-name" as Operation/Job Description default Document
1346   attributes for the Job.
1347   8. Clarified that the 'none' value of the "document-digital-signature" must be implemented, but the administrator
1348   MAY remove the 'none' value in order to require signatures to be used.
1349   9. Sated that all supplied member attributes of the "document-format-details" Operation attribute MUST have a
1350   value, i.e., MUST NOT be empty.
1351   10. Normalized all of the Application Names and versions and Operating System Name values from the IANA
1352   Registry to lower case, as is done with most other IPP attributes, in order to facilitate matching.

1353 Moved the requirements for the new 'choice_xxx' values to be added to PWG 5101.1.
1354
1355 Version 0.5, June 9, 2003:
1356   1. added xxx-supported as Job Description attributes for specific operational attributes that apply to documents
1357   within the Job