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

8

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

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21 Working Draft, May 18~~13~~, 2003

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

29
30 ftp://ftp.pwg.org/pub/pwg/ipp/new_JOBX~~DOC~~/wd-ippjobx10-200305~~18~~16.pdf, .doc, .rtf

31 This document is a Working Draft for an IEEE-ISTO PWG Candidate Standard.   For a definition of a "PWG
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33 process.pdf. After approval by the PWG (by a Last Call) to transition a PWG Working Draft to a PWG Candidate
34 Standard, the resulting PWG Candidate Standard will be available electronically at: ftp://ftp.pwg.org/pub/pwg/cs/.
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220 This IPP specification extends the Job semantics of the IPP Model and Semantics [rfc2911] object model. This
221 specification by definesing the Close-Job operation and some new Operation attributes for use in Job Creation and
222 Document Creation operations. The Printer copies the Job attributes to the corresponding Job Description attributes
223 which the clients may query. The Document Creation Operation attributes that describe the contents of the
224 Document Content and permit the Printer to reject requests that it cannot process correctly. Corresponding "xxx-
225 default" and "xxx-supported" Printer attributes are defined. The Printer copies these Operation attributes to the
226 corresponding Description attributes, which clients may query.This specification also defines some additional values
227 for the "job-state-reasons" Job Description attribute. Each of the operations and attributes defined in this
228 specification are independent of each other and OPTIONAL for a Printer to support.

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

235 1.1 Scope

236 Part of the extension is to allow the client to supply printing instructions, called Document Template attributes, when
237 creating each Document object. An IPP Printer implementation MAY support most of the existing Job Template
238 attributes as Document Template attributes as well. (The PWG Semantic Model [pwg-sm] currently calls the Job
239 Template attributes and Document Template attributes simply "Job Processing" and "Document Processing"
240 attributes).

241 Table 1 summarizes the new operations defined in this specification. The new operation is summarized in Table 1.

242   **Table 1 - Summary of operations**

Operation Name	Printer support	Brief Description
Close-Job	REQUIRED OPTIONAL	Closes a multi-document Job.

243

244 Table 2 summarizes theThis specification defines new Operation attributes defined in this specification for use with
245 Job Creation operations. The Printer copies these Operation attributes to corresponding Job Description attributes
246 defined in this specification. The Printer copies these Operation attributes supplied by the client in the request to the
247 corresponding Job Description attributes.

248   **Table 2 - Summary of New Job Creation Operation/Description 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 and Document Template attributes. Defined in [rfc2911] section 3.2.1.2 and 15.
job-mandatory-attributes (1setOf	MUSTMAY	Allows the client to list which Job Template and Document

type2 keyword)		~~Template~~ attributes that the Printer MUST support.

249

250 Table 3 summarizes the Operation attributes defined in this specification for use with Document Creation operations.
251 These Operation attributes ~~that~~ allow the client to ~~provide hints[1] or~~ supply descriptions of the Document Content
252 ~~requirements~~ to the Printer about individual Document ~~Object c~~Content at request time ~~as summarized in Table 2~~.
253 This specification does *not* define corresponding Document Description attributes, since this specification does not
254 include or depend on a Document object[2].

255   **Table 3 - Summary of Document Creation Operation Attributes**

Operation attribute	Printer support	Description
document-charset (charset)	CMUST[3]	The charset of the Document content
document-digital-signature (type2 keyword)	MAY	The type of digital signature, if any used in the Document ~~Object c~~Content.
document-format-details (1setOf collection)	CMUST[4]	The details of the Document ~~Object c~~Content, including when its package of files (zip, multipart/related), such as application and operating system that created the document, the intended device type (when the format is device-dependent), the natural languages of the document.
document-format-target (documentFormat)	MAY	The document format that the Printer is to convert to for Printers that convert document formats.
document-format-version (text(127))	MAY	The version of the document format.
document-format-version-target (text(127)	MAY	The document format level or version that the Printer is to convert to for Printers that convert document formats.
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.

256 ~~* - indicates Operation attributes defined in [rfc2911] that are extended to apply to the Document Creation operations~~
257 ~~defined in this specification.~~
258 Table 4 summarizes the Job Template attributes defined in this specification for use with Job Creation operations.
259 These Job Template attributes are defined to apply to the Job as a whole, independent of the value of the "multiple-
260 document-handling" Job Template attribute ([rfc2911] section 4.2.4) whose 'separate-documents-collated-copies' and
261 'separate-documents-uncollated-copies' which cause the Printer to produce separate Output Documents.

262

263   **Table 4 - 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.

---

[1] ~~A hint is an attribute supplied by the client that the Printer can safely not support and still process the document meaningfully. An attribute like "document-format" or "compression" is not a hint, since the Printer will not be able to interpret the Document object content if the Printer doesn't support the supplied value.~~
[2] For Document Description attributes that correspond to the Operation attributes defined for Document Creation operations, see the Document object defined in [ippdoc].
[3] The Printer MUST support the "document-charset" operation~~/Document Description~~ attribute~~s~~ if the Printer supports a document-format in which the charset may be ambiguous in the Document content, such as 'application/vnd.hp-PCL' where the charset escape sequence MAY be omitted from the data (see section 4.2.1).
[4] The Printer MUST support the "document-format-details" operation~~/Document Description~~ attribute~~s~~, if the Printer supports a packaging document format, such as 'application/zip' or 'multipart/related'

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.

264

2 Terminology

266   This section defines terminology used throughout this document.

2.1 Conformance Terminology

268   Capitalized terms, such as **MUST, MUST NOT, REQUIRED, SHOULD, SHOULD NOT, MAY,** and **OPTIONAL**, have
269   special meaning relating to conformance as defined in RFC 2119 [rfc2119]. All of the operations and attributes
270   defined in the specification are independently OPTIONAL. If an implementation supports the an operation or
271   attribute extension defined in this documentdescribed in this specification, then these terms apply to the
272   implementation of that operation or attribute; otherwise, they do not. These terms define conformance to *this*
273   *document (and [rfc2911]) only; they do not affect conformance to other documents, unless explicitly stated otherwise.*
274   For example, the term REQUIRED MUST in this document means "REQUIRED MUST if this OPTIONAL Document
275   Object specificationoperation or attribute is implemented".

276   The term **CONDITIONALLY REQUIRED** means that the Printer **MUST** support the feature, if the specified condition
277   is true. The term **CMUST** means **MUST** if the specified "condition" is true.

2.2 Other Terminology

279   This document uses the same terminology as [rfc2911], such as "**client**", "**Printer**"[5], "**attribute**", "**attribute value**",
280   "**keyword**", "**Job Template attribute**", "**Operation attribute**", "**operation**", "**request**", "**response**", and "**support**"
281   with the same meaning. In addition, the following terms are defined for use in this document:

282   **Document Creation operation** - operations that create accept Document objectsContent. Specifically: Create-
283   Document, Print-Job, Print-URI, Send-Document and Send-URI. Note: the Print-Job and Print-URI are both **Job**
284   **Creation** and **Document Creation** operations.

285   **Document Level** - Operation and Template attributes supplied in the Send-Document, Send-URI, and Create-
286   Document operations are referred to as being supplied at the **Document Level**. Note: attribute supplied in the Print-
287   Job and Print-URI requests are considered as being supplied at the **Job Level** only (see Table 3).

288   **Honor** - a Printer is said to **Honor** an attribute supplied by the client, if the Printer **supports** that attribute and the
289   supplied value and performs the indicated semantics. If the client supplies the "ipp-attribute-fidelity" or "job-
290   mandatory-attributes" Operation attribute, the client is indicating which supplied Job Template and Document
291   Template attributes the Printer MUST **Honor**.

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

---

[5] [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]. None the less, the
intent is as in [rfc2911]: a Printer is an object that MAY be hosted in the device or in a server as in [rfc2911].

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

296 ~~**Job Level - Operation** and **Job Template** attributes supplied in the Print-Job, Print-URI, and Create-Job are~~
297 ~~referred to as being supplied at the **Job Level** (see~~

298 **Operation attribute** - an attribute supplied by a client in the Operation Attribute group of a request in order to affect
299 the behavior of the operation or an attributer returned by the Printer in the Operation Attributes group in an operation
300 response in order to report the results of the operation. For some Operation attributes the Printer copies the values
301 supplied by the client to corresponding Job Description ~~or Document Description~~ attributes.

302 ~~Table 3 shows this terminology as applied to the six operations. Note that Print-Job and Print-URI are both Job~~
303 ~~Creation operations and Document Creation operations, though they only create single Document jobs. In other~~
304 ~~words, for Print-Job and Print-URI, there is only one document per job, so whether the attributes are considered to be~~
305 ~~submitted at the Job Level and then inherited by the Document, is moot. Note also that for the "Level" concept, no~~
306 ~~operation supplies attributes at more than one level.[6]~~

307 ~~**Table 3 - Job Creation and Document Creation operations**~~

~~Operation~~	~~Job Creation operation~~	~~Document Creation operation~~	~~Attribute Group in Request~~		~~Level~~
			~~Job Attributes~~	~~Document Attributes~~	
~~Create-Job~~	~~yes~~		~~Job attributes and Document attributes mixed together~~		~~Job Level~~
~~Print-Job~~	~~yes~~	~~yes~~	~~Job attributes and Document attributes mixed together~~		
~~Print-URI~~	~~yes~~	~~yes~~	~~Job attributes and Document attributes mixed together~~		
~~Create-Document~~		~~yes~~		~~Document attributes~~	~~Document Level~~
~~Send-Document~~		~~yes~~		~~Document attributes~~	
~~Send-URI~~		~~yes~~		~~Document attributes~~	

308

309 # 3 New Job operations ~~and semantic extensions to Job operations~~

310 This section defines the new Close-Job operation ~~and the semantic extensions to Job creation operations~~.

---

[6] The PWG Semantic Model [pwg-sm] calls the Operation attributes supplied by the client: Job Description attributes
or Document Description attributes for the Job Creation and Document Creation operations, respectively. The [pwg-sm] also calls Job Template attributes and Document Template attributes: Job Processing and Document Processing attributes, respectively. Each Processing attribute is defined to be a Job Processing or a Document Processing attribute, but is not both. The client can supply both Job Processing and Document Processing attributes in a Job Creation operation, in which case the Document Processing attributes server as defaults for the Document objects. The Printer copies all of these client's supplied attributes to the Job or Document object. Read-only Job and Document attributes that the Printer sets are called Job Status and Document Status attributes (instead of Description attributes).

311 **3.1 Job Creation operations**

312 This section defines the extensions to Job Creation operations.

313 The following Operation attribute extensions are defined for use in all the Job Creation operations and Validate-Job:

314 **3.1 Close-Job**

315 This REQUIRED OPTIONAL operation closes the Job[7]. The Printer MUST support this operation. The client
316 SHOULD issue this operation to close the job, instead of supplying the "last-document" Operation attribute with a
317 'true' value in a Document Creation operation (or a Send-Document operation with no data - see [rfc2911] section
318 3.3.1). The Printer MUST support both means of closing jobs for backward compatibility with [rfc2911].

319 If the Job has already been closed (either by a Close-Job operation or by the client supplying the "last-document"
320 operation attribute with a 'true' value), the Printer MUST reject the request and return the 'client-error-not-possible'
321 (see [rfc2911] section 13.1.4.5) status code.

322 The Printer MUST[8] support the "multiple-operation-time-out" Printer Description attribute (see [rfc2911] section
323 4.4.31) and MUST time-out clients that do not supply Document Creation or Close-Job operations quickly enough
324 (see [rfc2911] section 3.3.1) .

325 *Access Rights:* The authenticated user (see [rfc2911] section 8.3) performing this operation must either be the job
326 owner (as determined in the Create-Job operation) or an operator or administrator of the Printer (see [rfc2911]
327 sections 1 and 8.5). Otherwise, the Printer MUST reject the operation and return: 'client-error-forbidden', 'client-error-
328 not-authenticated', or 'client-error-not-authorized' as appropriate.

329 **3.1.1 Close-Job Request**

330 The client supplies the following groups as part of the Close-Job Request:

331 **Group 1: Operation Attributes**

332 **Natural Language and Character Set:**
333 First, the client MUST supply the "attributes-charset" and "attributes-natural-language" Operation attributes
334 as described in [rfc2911] section 3.1.4.1. The Printer MUST copy these values to the corresponding Job
335 Description attributes described in [rfc2911] sections 4.3.19 and 4.3.20.

336 **Target:**
337 Next, the client MUST supply either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri"
338 (uri) Operation attribute(s) which define the target Job object for this operation as described in [rfc2911]
339 section 3.1.5. The client MAY supply the remaining Operation attributes in any order following:

340 **Requesting User Name:**
341 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
342 [rfc2911] section 8.3.

---

[7] Close-Job is a new operation defined by this Document object specification and is not defined in [rfc2911].
[8] Since this specifications REQUIRES the Printers support multiple document jobs, Printers MUST support the
"multiple-operation-time-out" Printer Description attribute, according to [rfc2911].

343 ~~Group 2: Document Template Attributes: *This Group MUST NOT be present.*~~

344 ~~Group 3: Subscription Attributes (see [ntfy] section 11.1.3.1): *This Group MUST NOT be present.*~~
345 ~~*Subscription object are defined only in Job Creation operations for job and/or document events.*~~

346 3.1.2 Close-Job Response

347 The Printer MUST return the following sets of attributes to the client as part of the Close-Job response:

348 **Group 1: Operation Attributes**

349 **Status Message:**
350 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
351 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) Operation attribute as
352 described in [rfc2911] sections 13 and 3.1.6.

353 **Natural Language and Character Set:**
354 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

355 **Group 2: Unsupported Attributes**

356 See [rfc2911] section 3.1.7 for details on returning Unsupported Attributes.

357 **Group 3: Job Object Attributes**

358 In addition, the Printer MUST return the same Job status attributes that [rfc2911] REQUIRES for the Send-
359 Document and Send-URI operation responses (which are the same as for the Print-Job response - [rfc2911]
360 section 3.2.1.2):

361 "job-uri" (uri) - see [rfc2911] section 4.3.1
362 "job-id" (integer(1:MAX)) - see [rfc2911] section 4.3.2
363 "job-state" (type1 enum) - see [rfc2911] section 4.3.7
364 "job-state-reasons" (1setOf type2 keyword) - see [rfc2911] section 4.3.8
365
366 The Printer MAY return:

367 "job-state-message" (text(MAX)) - see [rfc2911] section 4.3.9
368 "number-of-intervening-jobs" (integer(0:MAX)) - see [rfc2911] section 4.3.15
369

370 4 Operation Attributes for Job Creation and Document Creation operations

371 This section defines ~~some new~~ Operation~~/Description~~ attributes ~~and lists the Operation/Description attributes that~~
372 ~~have been defined in thisspecification that are used~~ for use in Job Creation operations and/or Document Creation
373 operations. ~~and extends their use to the Document Creation operations. In addition, some new Job Description~~
374 ~~attributes have been defined to be set from existing Operation attributes.~~ Note: As in [rfc2911] Operation attributes
375 relate to the operation and do not depend on the printing capabilities of the Printer.

376 Table 6 lists the ~~new~~ Operation attributes and their attributes syntaxes supplied in Job Creation and Document
377 Creation operations and the attribute syntaxes of their corresponding "xxx-default" and "xxx-supported" Printer
378 Description attributes, if any. A "-" indicates that there isn't a "xxx-default" or "xxx-supported" Printer Description
379 attribute.

380 **Table 6 - 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	documentFormat	documentFormat	1setOf documentFormat
document-format-details	1setOf collection	1setOf collection	1setOf type2 keyword[9]
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-target	documentFormat	documentFormat	1setOf DocumentFormat
document-format-version	text(127)	text(127)	1setOf text(127)
document-format-version-target	text(127)	text(127)	1setOf text(127)
document-natural-language	naturalLanguage	naturalLanguage	1setOf naturalLanguage
job-mandatory-attributes	1setOf type2 keyword	-	-
output-device-requested	name(127)	-	1setOf name(127)

381

382 Table 7 lists the Operation attributes that clients supply ~~at the Job Level and/or the Document Level and~~in Job and
383 Document Creation operations and whether the Printer copies (indicated by **"⇒"**) the supplied value to the
384 corresponding Job Description[10] attribute.

Legend:	
"**Creation operations**~~Level Supplied~~"	column indicates which operations the ~~whether the~~ Operation attribute can be supplied in: ~~at the Job Level (~~PJ=Print-Job, PU=Print-URI, ~~and~~ CJ=Create-Job,) ~~and at the Document Level (~~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 Table 10) defined to which the Printer ~~MUST~~ MAY copy this Operation attribute. See Table 6~~Table 8~~ for ~~the corresponding Job and Document Description attributes and~~ whether there are corresponding "xxx-default" and "xxx-supported" Printer Description attribute defined.
"**-**"	the Operation attribute is *not* defined for the indicated operation.
"**Conformance**"	column indicates the conformance requirements for what the client supplies in a request and the Printer supports in a request.
"**Section**"	column indicates where the Operation attribute is defined in this spec.

385

---

[9] There is also a "document-format-details-implemented" (1setOf collection), see section 8.7.
[10] 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.

386 **Table 7 - Operation Attributes supplied ~~at the Job and Document Levels~~ in Job and Document Creation**
387 **Requests**

Operation attribute name for Job and Document Creation *requests*	Attribute Syntax	~~Level Supplied~~Creation operations			Conformance		Section
		CJ	PJ, PU	SD, SU	Client supply	Printer support	
document-charset	charset	-	y⟹	y⟹	MAY	CMUST[11]	§4.2.1
document-digital-signature	type2 keyword	-	y⟹	y⟹	MAY	MAY	§4.2.2
document-format	documentFormat	-	y	y	MAY	MUST	§4.2.3
document-format-details	1setOf collection	-	y⟹	y⟹	MAY	CMUST[12]	§4.2.4
document-source-application-name	name(MAX)	-	y⟹	y⟹	MAY	MAY	§4.2.4.1
document-source-application-version	text(127)	-	y⟹	y⟹	MAY	MAY	§4.2.4.2
document-source-os-name	name(40)	-	y⟹	y⟹	MAY	MAY	§4.2.4.3
document-source-os-version	text(40)	-	y⟹	y⟹	MAY	MAY	§4.2.4.4
document-format	mimeMediaType	-	y⟹	y⟹	MUST	MUST	§4.2.4.5
document-format-device-id	text(127)	-	y⟹	y⟹	MAY	MAY	§4.2.4.6
document-format-version	text(127)	-	y⟹	y⟹	SHOULD	MUST	§4.2.4.7
document-natural-language	naturalLanguage	-	y⟹	y⟹	MAY	MAY	§4.2.4.8
document-format-target	documentFormat	-	y	y	MAY	MAY	§4.2.5
document-format-version	text(127)	-	y⟹	y⟹	MAY	MAY	§4.2.6
document-format-version-target	text(127)	-	y	y	MAY	MAY	§4.2.7
document-natural-language	naturalLanguage	-	y⟹	y⟹	MAY	MAY	§4.2.8
ipp-attribute-fidelity	boolean	y⟹ [13]	y⟹[13]	-	MAY	MUST	§4.1.1,
job-mandatory-attributes	1setOf type2 keyword	y⟹	y⟹		MAY	MUST	§4.1.2
output-device-requested	name(127)	y⟹-	y⟹		MAY	MAY	§4.1.3

388

4.1 Operation attributes for Job Creation operations

390 This section defines additional operation attributes that the client MAY supply in Job Creation operations (Print-Job,
391 Print-URI, and Create-Job).

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

393 This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1) when the
394 client supplies unsupported Job Template attributes[14] or value in a Job Creation operation ~~or a subsequent Document~~
395 ~~Creation operation for this job~~. The value 'true' indicates that total fidelity to client-supplied Job Template ~~and~~

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[11] The Printer MUST support the "document-charset" Operation/Document Description attributes, if the Printer supports a charset-ambiguous document format (see section 4.2.1).

[12] The Printer MUST support the "document-format-details" Operation/Document Description attributes if the Printer supports a *packaging* MIME type document format, such as 'application/zip' or 'multipart/related'.

[13] The Printer ~~MUST~~ MAY copy the "ipp-attribute-fidelity" Operation attribute to the corresponding (new) Job Description attribute defined in this specification, if supported ~~so that the Printer can remember its value for subsequent Document Creation operations~~.

[14] The value of the "ipp-attribute-fidelity" Operation attribute has no effect on other O*peration* attributes supplied by the client, only on Job Template attributes supplied by the client.

396   Document Template attributes and values is required for this Job Creation operation and all subsequent Document
397   Creation operations for this job. If the client supplies the value 'false' or omits the attribute, then the Printer MUST
398   accept the Job Creation operation and all subsequent Document Creation operations even if the client supplies
399   unsupported attributes or values in them.

400   The Printer MUST copy this attribute to the corresponding (new) Job Description attribute (see section 6.1) and use
401   its value for validating subsequent Document Creation operations for this job.

402   Note: The inheritance of the effect of the "ipp-attribute-fidelity" Operation attribute by subsequent Document Creation
403   operations is like the inheritance of Document Template attributes supplied at the Job Level but affecting the
404   behavior of the Document Level (see).

405   4.1.2 job-mandatory-attributes (1setOf type2 keyword) Operation attribute

406   This REQUIREDOPTIONAL[15] Operation attribute identifies which Job Template attributes the Printer MUST Honor in
407   this Job Creation request and all subsequent Document Creation requests for this Job. The Printer MUST reject this
408   Job Creation operation or any subsequent Document Creation operations for this job, if the client supplies an
409   unsupported Job Template or Document Template attribute or value in the request that is also identified in this list.
410   The client MAY supply this attribute in a Job Creation operation. If the Printer supports the "job-mandatory-
411   attributes" Operation attribute, Tthe Printer MUST support this attribute in Job Creation operations and the Validate-
412   Job operation.

413   A client MUST NOT supply this "job-mandatory-attributes" Operation attribute in a Document Creation operation. If a
414   client does supply the attribute in a Document Creation operation, the Printer MUST ignore and otherwise accept the
415   request and return this attribute without any values in the Unsupported Attributes Group in the response (see
416   [rfc2911] section 3.1.7). Thus the Printer only supports the "job-mandatory-attributes" Operation attribute supplied at
417   the Job level. Thus the "job-mandatory-attributes" Operation attribute controls all other Job Template and Document
418   Template attributes supplied at the Job Level and Document Level uniformly. Note: The inheritance of the effect of
419   "job-mandatory-attributes" Operation attribute supplied at the Job Level by subsequent Document Creation
420   operations is like the inheritance of Job Template attributes.

421   The Printer MUST copy this attribute to the corresponding "job-mandatory-attributes" Job Description attribute (see
422   section 6.3) for auditing and trouble shooting purposes[16] and use its value for validating subsequent Document
423   Creation operations for this job.

424   The values of the "job-mandatory-attributes" attribute are the keyword attribute names that identify Job Template
425   attributes, for example, 'job-hold-until', 'job-finishings' (see section 5.1.4), 'copies' and 'media'. In order to identify a
426   member attribute of a collection attribute, the keyword names of both the collection attribute and the member
427   attribute are given separated by a period (.) character. For example, to make the "media" attribute of the "cover-
428   front" collection attribute mandatory, supply the keyword value: 'cover-front.media'.

429   The Printer MUST accept *any* keyword values whether or not the corresponding Job Template attributes are
430   supported by the Printer and MUST NOT return those unsupported keywords in the Unsupported Attributes Group in
431   the response. If the client supplies this "job-mandatory-attributes" Operation attribute in a Job Creation operation
432   with values that represent Job Template attributes that the Printer doesn't support, the Printer MUST otherwise
433   accept the attribute anyway. The Printer MUST reject this Job Creation or a subsequent Document Creation
434   operation only if the client actually supplies any of the identified Job Template attributes that the Printer doesn't
435   support. Because the Printer doesn't reject when the "job-mandatory-attributes" Operation attribute has the

---

[15] The Printer MUST support the "job-mandatory-attributes" Operation/Job Description attributes for conformance to
this Document Object specification. However, an implementation that isn't supporting the Document Object MAY still
support the "job-mandatory-attributes" Operation attribute. See the definition of REQUIRED in section 2.1.
[16] The Printer uses the "job-mandatory-attributes" Job Description attribute for validating subsequent Document
Creation operations for this job when also supporting [ippdoc].

436 unsupported attribute keyword names, the client MAY supply all of the attribute keyword names that the client
437 supports without having to tailor the list to the particular Printer that the client is submitting the Job Creation
438 operation, thereby, simplifying client use of this attribute.

439 ISSUE 01: MUST the Printer return any supported attribute keywords in the Unsupported Attributes Group in the
440 response, even while accepting the request with the unsupported attribute keyword in the "job-mandatory-attributes"
441 list?<PZ>NO, The printer will return the unsupported attributes on a Job/Doc create attempt. The "job-mandatory-
442 attributes" should just be treated as a "filter" containing a list of keywords from the Client.</PZ>

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

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

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

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

453 If a client supplies this "output-device-requested" Operation attribute with a value that the Printer doesn't support, the
454 Printer MUST perform one of the following actions depending on implementation: (1) reject the request OR (2)
455 accept the request and either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute.
456 See section 4.2 below for more details.

457

4.2 Operation/Description attributes for Document Creation operations

459 The rest of this section defines the semantics for the Operation attributes that a client MAY supply in a Job Document
460 Creation operation (Print-Job, Print-URI, Send-Document and Send-URI) and their corresponding Description
461 attributes. Note: Print-Job and Print-URI are both Job Creation and Document Creation operations. The following
462 statements apply to all of these Operation/Description attributes and are *not* repeated in each attribute Description:

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

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

467   1.support the corresponding "xxx" Description attribute of the same name (see section 6.2) and vice versa.

468   2.copy the value of the "xxx" Operation attribute, if supplied by the client, to the corresponding "xxx" Description
469   attribute.

470   1.   support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if defined
471   (see Table 6 and section 8) and vice versa.

472   2.   validate the values supplied by the client in the "xxx" Operation attribute against the values indicated in the
473   Printer's corresponding "xxx-supported" Printer Description attribute (see section 8). If the values do not

474   validate, the Printer MUST ~~either reject the operation or accept the operation as indicated for each of the~~
475   ~~attributes described below.If the client supplies one of the "xxx" Operation/Description attributes with a value~~
476   ~~that the Printer does not support, the Printer MUST~~ perform one of the actions indicated for that Operation,
477   unless specified otherwise, such as (1) reject the request, (2) accept the request and either (a) hold the job
478   for operator intervention or (b) print the Job ignoring the attribute. In all of these cases, the Printer MUST
479   return the Operation attribute with the unsupported value in the Unsupported Attributes group in the
480   response (see [rfc2911] section 3.1.7).

481   4.2.1 document-charset (charset)

482   This CONDITIONALLY REQUIRED Operation attribute identifies the charset of the Document ~~c~~Content.

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

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

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

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

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

509   If the Printer supports the "document-charset" Operation attribute, it MUST also support the corresponding
510   ~~"document-charset" Description attribute (see section 1.1.1) and the~~ "document-charset-default" and "document-
511   charset-supported" Printer Description attributes as well and vice versa (see sections 8.1 and 8.2).

512   4.2.2 document-digital-signature (type2 keyword)

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

514   If a client supplies this "document-digital-signature" Operation attribute in a Document Creation operation with a
515   value that the Printer doesn't support, the Printer MUST perform one of the following actions depending on
516   implementation: (1) reject the request OR (2) accept the request, set the Job's "job-state-reasons" attribute to

517 'digital-signature-type-not-supported' (see section 7.1), and either (a) put the Job in the 'pending-held' state or (b)
518 process the job ignoring the attribute. See section 4.2 above for more details.

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

523   1. ignore the signature (and MAY indicate on the printed output some how) and MUST set the Job's "job-state-
524   reasons" Job Description attribute to the 'digital-signature-did-not-verify' value ~~and the Document's~~
525   ~~"document-state-reasons" Document Description attribute to the 'digital-signature-did-not-verify' value~~ (see
526   section 7.1).

527   2. put the job on hold and wait for human intervention and MUST set the Job's "job-state-reasons" Job
528   Description attribute to the 'job-digital-signature-wait' and 'digital-signature-did-not-verify' values ~~and the~~
529   ~~Document's "document-state-reasons" Document Description attribute to the 'digital-signature-did-not-verify'~~
530   ~~value~~ (see section 7.1), OR

531   3. abort the job depending on implementation and/or site configuration and MUST set the Job's "job-state-
532   reasons" Job Description attribute to the 'job-aborted-by-system' and 'digital-signature-did-not-verify' values
533   ~~and the Document's "document-state-reasons" Document Description attribute to the 'digital-signature-did-~~
534   ~~not-verify' value~~ (see section 7.1).

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

542 The following standard keyword values are defined:

543   'dss': Digital Signature Standard (DDS) [dss].

544   'none': There is not a digital signature in the Document content. If this attribute is supported, the 'none'
545   value MUST be supported.

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

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

548   'xmldsig' XML Digital Signature [xmldsig].

4.2.3 document-format (mimeMediaType)

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

554 The standard values for this attribute are Internet Media types (sometimes called MIME types). For some MIME
555 types, such as 'text/plain' [rfc2046], the "; charset=" parameter is defined which specifies the charset of the Document
556 content. The Printer MUST support the charset MIME parameter as well as the "document-charset" Operation
557 attribute (section 4.2.1) if the Printer supports any text MIME type, such as 'text/plain' or 'text/html'. For further
558 details see the description of the 'mimeMediaType' attribute syntax in [rfc2911] section 4.1.9 and [rfc2046] and the
559 "document-charset" Operation attribute (section 4.2.1).

560   Many printer languages in the Printer MIB do not have a MIME type registered with IANA.[17] ~~This specification~~ It is the
561   intent of the PWG to registers all of the Printer MIB v2 XXX Printer Languages as 'application/vnd.PWG-XXX'. If a
562   Printer Language already has a registered MIME Media type or gets a registration in the future, then that MIME Type
563   MUST be used in preference to the 'application/vnd.PWG-XXX' MIME Type. For example, PostScript® has the
564   MIME Media type: 'application/postscript' and PCL has the MIME Media Type: 'application/vnd.HP-PCL, so those
565   MIME Media types MUST be used instead of 'application/vnd.PWG-PS' and 'application/vnd.PWG-PCL'. For
566   example, the NEC NPDL printer language from the Printer MIB does not have a MIME type registered with IANA.
567   Therefore, the "document-format" = 'application/vnd.PWG-NPDL' MUST be used.

568   Note: It is proposed that CIP4 [cip4] register the YYY document formats with IANA as 'application/vnd.CIP4-YYY'
569   that CIP4 is using that don't have a registered MIME Media type. For example, TIFF/IT [iso12639] would be
570   registered as: 'application/vnd.CIP4-TIFF-IT'. Then CIP4 would keep a list of TIFF/IT versions. For example:
571   'TIFF/IT-CT/P1:1998' to use with the "document-format-version" attribute (and the CIP4 JDF equivalent
572   MimeTypeVersion attribute).

573   ACTION ITEM (Tom): Get CIP4 buy-in to use the same flat file (which will require an additional field for the
574   JDF FileType attribute. ACTION ITEM (Tom and Ira): Propose a format for the file.

575   See also the "document-format-version" Operation attribute in section 4.2.6 and the "document-format-details"
576   Operation attribute in section 4.2.4.

577   4.2.4 document-format-details (1setOf collection)

578   This CONDITIONALLY REQUIRED Operation attribute supplied in Document Creation operations summarizes the
579   details of the Document content, including any files contained in the Document. See Table 8 for a list of the member
580   attributes along with the client and Printer conformance requirements.

581   If a Printer supports a *packaging* MIME type, such as 'multipart/related' or 'application/zip', the Printer MUST support
582   this "document-format-details" Operation attribute ~~and the corresponding Description attribute (see section 1.1.1)~~. If
583   a Printer does not support a packaging MIME type, it MAY omit support of the "document-format-details" Operation
584   attribute and Description attribute. The purpose of the "document-format-details" Operation attribute is to describe
585   the details of the document format or formats in the supplied Document, including the packaging format itself, so that
586   the Printer knows what to expect.

587   If a client supplies the "document-format-details" Operation attribute in a Document Creation request with member
588   attributes and/or values that the Printer doesn't support, the Printer MUST perform one of the following actions
589   depending on implementation: (1) reject the request OR (2) accept the request and either (a) put the Job in the
590   'pending-held' state or (b) process the job ignoring the attribute. See section 4.2 above for more details. However, if
591   the "document-charset" or the "document-format" member attributes are the ones in question, the Printer MUST
592   reject the request, same as for the "document-charset" and "document-format" Operation attributes (see sections
593   4.2.1 and 4.2.3) and return the 'client-error-charset-not-supported' (see [rfc2911] section 13.1.4.16) or the 'client-
594   error-document-format-not-supported' (see [rfc2911] section 13.1.4.11), respectively.

595   For a packaging format, the "document-format-details" attribute does not provide means to associate each collection
596   value with particular document in the archive file, so it does not provide a "manifest"[18] of the packaging. One of the
597   packaging collection values MAY describe the packaging format itself, in which case that collection value MUST be
598   the first collection value. The remaining collection values provides the summary of the details of the contained files in
599   any order.

---

[17] 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.
[18] 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 as a separate Document object. Note: the client can re-
compress each file before sending, so the compression isn't lost when sending each document separately.

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

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

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

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

611   **Table 8 - "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	4.2.4.1	N/A
document-source-application-version	text(127)	MAY	MAY	4.2.4.2	N/A
document-source-os-name	name(40)	MAY	MAY	4.2.4.3	N/A
document-source-os-version	text(40)	MAY	MAY	4.2.4.4	N/A
document-format	mimeMediaType	MUST	MUST	4.2.4.5	4.2.3
document-format-device-id	text(127)	MAY	MAY	4.2.4.6	N/A
document-format-version	text(127)	SHOULD	MUST	4.2.4.7	4.2.6
document-natural-language	1setOf naturalLanguage	MAY	MAY	4.2.4.8	4.2.8

612
613 The client can determine which member attributes of the "document-format-details" are supporter by querying the
614 Printer's "document-format-details-supported" (1setOf type2 keyword) Printer Description attribute (see section 8.6).
615 The client can determine a supported set of document details by querying the Printer's "document-format-details-
616 implemented" (1setOf collection) Printer Description attribute (see section 8.7).

617 Table 8 shows that three of the member attributes also have comparable top level Operation attributes defined with
618 the same names. See the sections listed in the rightmost column. These three high level attributes have
619 corresponding "xxx-default" and "xxx-supported" Printer Description attributes. These values are also for use with
620 the corresponding three member attributes. The remaining member attributes do not have any corresponding "xxx-
621 default" and "xxx-supported" Printer Description attribute. The client MAY query the Printer's "document-format-
622 details-implemented" Printer Description attribute to determine what values the Printer has implemented. However,
623 the Printer MAY accept other values, such as later or earlier versions.

624 If a client supplies this "document-format-details" Operation attribute with a member attribute with a value that the
625 Printer doesn't support, the Printer MUST perform one of the following actions: (1) reject the request OR (2) accept
626 the request and either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See
627 section 4.2 above for more details.

628   **4.2.4.1 document-source-application-name (name(MAX))**

629   This OPTIONAL member Operation attribute identifies the application that generated the document. The
630   version number MUST NOT be included (see the "document-source-application-version" attribute).
631   Examples: "Photoshop", "Microsoft Word".

632 **4.2.4.2 document-source-application-version (text(127))**

633 This OPTIONAL member Operation attribute identifies the version number of the application that created the
634 document. The intent of this attribute is for purposes of affecting the interpreting by the Printer for any
635 formats for which the source application version might have different semantics. Examples:

636 "8.1 (4331)" for Winzip®, "5.0.5 10/26/2001" for Acrobat®, "2000 (9.0.4119 SR-1)" for Microsoft® Word

637 When populating the "document-source-application-version-implemented" member attribute of the
638 "document-format-details-implemented" Printer Description attribute, some of the trailing information MAY be
639 omitted, so that a substring match of the Printer's value with the value supplied by the client is sufficient for a
640 match. For example, the Printer's value MAY be "8.1", "5.0", and "2000", respectively, as compared to the
641 corresponding example values above that MAY be supplied by the client.

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

644 **4.2.4.3 document-source-os-name (name(40))**

645 This OPTIONAL member Operation attribute identifies the name of the operating system on which the
646 document was generated. Valid values are the operating system names defined in the IANA Operating
647 System name registry [os-names] with the version number portion removed (see the "document-source-os-
648 version" attribute). IANA Operating System Names are consist of up to 40 *uppercase* US-ASCII letters,
649 hyphen ("-"), period ("."), and slash ("/") characters. The zero length string represents unknown[19].

650 Example IANA OS Registry values: 'AIX, 'DOS', 'LINUX', 'MACOS', 'MSDOS', 'MVS', 'NETWARE', 'OS/2',
651 'SUN', 'SUN-OS', 'UNIX', 'VMS', 'WINDOWS'.

652 **4.2.4.4 document-source-os-version (text(40))**

653 This OPTIONAL member Operation attribute identifies the version of the operating system on which the
654 document was generated. Valid values include the version portion of any of the operating system names
655 defined in the IANA Registry [os-names]. The value MUST NOT include the name portion of the registered
656 OS name (see "document-source-os-name" attribute). The zero length string represents unknown[19].

657 Example values for the indicated "document-source-os-name" value are:
658 For 'AIX': '370', 'PS/2'
659 For 'LINUX': '1.0', '1.2', '2,0', '2.2', '2.4'
660 For 'MVS': 'SP'
661 For 'NETWARE': '3', '3.11', '4.0', '4.1', '5.0'
662 For 'SUN-OS': '3.5', '4.0'
663 For 'UNIX': 'BSD', 'V', 'V.1', 'V.2', 'V.3', 'PC'
664 For 'WINDOWS': '95', '98', 'CE', 'NT', 'NT-2', 'NT-3', 'NT-3.5', 'NT-3.51', 'NT-4', 'NT-5', '2000', 'XP'
665 [not registered yet]
666

667 **4.2.4.5 document-format (mimeMediaType)**

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

---

[19] The IANA Registry of OS Names does have an "UNKNOWN" value. However, that value is not being used for the "document-creator-os-name" and "document-creator-os-version" attributes. Instead, a zero length string indicates unknown, so that clients don't have to make a special case check for the UNKNOWN token and localize UNKNOWN to the language of the user while the client is not localizing any other OS name or version values.

671 called MIME types) and have the same values and semantics as for the top level "document-format"
672 ~~o~~Operation ~~/Document Description~~ attribute with the same name (see section 4.2.3 for the semantics).

4.2.4.6 document-format-device-id (text(127))

674 This OPTIONAL member Operation attribute identifies the type of device for which the document was
675 formatted, including manufacturer and model. This attribute is intended to identify document formats that are
676 not portable, e.g., PDLs that are device dependent. The value of this variable MUST exactly match the IEEE
677 1284-2000 Device ID string (see [IEEE1284] clause 6), except the length field MUST NOT be specified. See
678 the Microsoft Universal Plug and Play [upnp] section 2.2.6 DeviceId parameter for details and examples.
679 Here is an example showing only the required fields for a PostScript document:
680 `MANUFACTURER:ACME Co.;COMMAND SET:PS;MODEL:LaserBeam 9;`

4.2.4.7 document-format-version (text(127))

682 This REQUIRED member Operation attribute identifies the level or version of the document format identified
683 by the "document-format" member attribute. The client MAY supply and the Printer MUST support this
684 member attribute if the Printer supports the "document-format-details" Operation ~~/Document Description~~
685 attribute. The semantics and supported values of this "document-format-version" member attribute MUST be
686 the same as for the top level "document-format-version" Operation ~~/Document Description~~ attribute with the
687 same name (see section 4.2.6 for the semantics).

4.2.4.8 document-natural-language (naturalLanguage)

689 This OPTIONAL member Operation attribute specifies the natural language(s) of the collection value of
690 which it is a member. The values for this attribute are natural language codes (with optional country codes)
691 and have the same values and semantics as for the top level "document-natural-language"
692 (naturalLanguage) operation ~~/Document Description~~ attribute with the same name (see section 4.2.8 for the
693 semantics).

4.2.5 document-format-target (mimeMediaType)

695 This OPTIONAL Operation ~~Job Template~~ attribute specified the document format that the Printer is to produce.

696 If a client supplies the "document-format-target" Operation attribute with a value that the Printer doesn't support as
697 indicated by the Printer's "document-format-target-supported" attribute (see section 8.9), the Printer MUST reject the
698 job and return the status code: 'client-error-document-format-not-supported' (see [rfc2911] section 3.1.4.11), since
699 the Printer cannot produce the requested data. For this error, the Printer MUST also return the "document-format-
700 target" attribute with its unsupported value in the Unsupported Attributes group in the response in order to distinguish
701 this case from the "document-format" Operation attribute value being unsupported..

702 The values of this attribute are MIME Media Types as defined for the "document-format" Operation attribute (see
703 section 4.2.3). Support of this ~~Job Template~~ Operation attribute is intended for Printers that perform document
704 format conversion as part of their service.

705 ~~To force the Printer to produce the indicated document format, the client MUST either supply the "ipp-attribute-~~
706 ~~fidelity" with a 'true' value or the "job-mandatory-attributes" with the 'document-format-target' keyword value.~~

707 ISSUE 01: ~~Should we~~ OK that we defined the "document-format-target" and "document-format-version-target"
708 attributes to be Operation ~~/Description~~ attributes (SM Description attributes) instead of Job Template attributes (SM
709 Document Processing attributes), so that the Printer MUST perform the requested action without the client having to
710 use the "ipp-attribute-fidelity" or "job-mandatory-attributes" operation attribute and so the client can supply different
711 values for different documents without requiring the Document Object [ippdoc]?

712 **4.2.6 document-format-version (text(127))**

713 This OPTIONAL Operation attribute identifies the level or version of the document format of the Document content
714 identified by the "document-format" Operation attribute (section 4.2.3).

715 If the client supplies this "document-format-version" Operation attribute, the client MUST also supply the "document-
716 format" Operation attribute (section 4.2.3), so that the Printer does not need to parse the "document-format-version"
717 string in order to determine the document format and version.

718 If a client supplies this "document-format-version" Operation attribute with a value that the Printer doesn't support as
719 indicated by the Printer's "document-format-version-supported" attribute (see section 8.11), the Printer MUST
720 perform one of the following actions, depending on implementation: (1) reject the request OR (2) accept the request
721 and either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See section 4.2
722 above for more details.

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

727 The short first field before the "/" character are unique, so that the version values are self-identifying so that all the
728 versions for all document formats can be combined into a single list for the Printer's "document-format-version-
729 supported" Printer attribute. The first field also tends to be the acronym for the document format and often is also the
730 file name extension registered with IANA. The Printer MIB shows the first field in uppercase for readability.
731 However, the Printer MUST perform case-insensitive matching of supplied values with supported values.

732 Example values:

733   'PS/3': For Postscript level 3 [rfc1759].
734   'PCL/5e': For PCL 5e [rfc1759].
735   'PDF/1.4': For PDF version 1.4 [pdf]
736   'PDF/X-1a:2001': For PDF/X-1a [iso15930]
737   'TIFF/IT-FP:1998': TIFF/IT [iso12639] - Full Page - baseline.
738   'TIFF/IT-CT:1998': TIFF/IT [iso12639] - Continuous Tone picture data - baseline
739   'TIFF/IT-FP/P1:1998': TIFF/IT [iso12639] - Full Page - profile 1
740   'TIFF/IT-CT/P1:1998': TIFF/IT [iso12639] - Continuous Tone picture data - profile 1
741   'Automatic': auto sense the format [rfc1759]. Is use in combination with the 'application/octet-stream' (see
742   [rfc2911] section 4.1.9.1) value of the "document-format" attribute (section 4.2.3).

744 If a client supplies this "document-format-version" Operation attribute with a value that the Printer doesn't support as
745 indicated by the Printer's "document-format-version-supported" attribute (see section 8.11), the Printer MUST
746 perform one of the following actions, depending on implementation: (1) reject the request OR (2) accept the request
747 and either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See section 4.2
748 above for more details.   ISSUE 02: Or should we require the Printer to always reject a request for an unsupported
749 target version?

750 The Printer produces the value indicated by its "document-format-version-default" Printer attribute only if the client
751 does not supply the "document-format-version" Operation attribute and the "document-format" Operation attribute. If
752 the client supplies the "document-format" Operation attribute, but not the "document-format-version" Operation
753 attribute, the Printer applies an appropriate default version for the supplied document format.

754 ISSUE 03: OK *not* to have a "document-format-col-default" (collection) which is pairs of "document-format" and
755 "document-format-version" values, since the "document-format-version" is self-describing which includes short
756 abbreviation of the document format?

757   ISSUE 04: Or should the "document-format-version-default" be a 1setOf since the version string is self-identifying
758   with the PDL? Then the different defaults could be indicated for each document format?

4.2.7 document-format-version-target (text(127)

760   This OPTIONAL Operation ~~Job Template and Document Template~~ attribute specifie~~sd~~ the document format level or
761   version that the Printer is to produce.

762   If the client supplies this "document-format-version-target" Operation attribute, the client MUST also supply the
763   "document-format-target" Operation attribute (section 4.2.7), so that the Printer does not need to parse the
764   "document-format-version-target" string in order to determine the document format and version.

765   If a client supplies this "document-format-version-target" Operation attribute with a value that the Printer doesn't
766   support as indicated by the Printer's "document-format-version-target-supported" attribute (see section 8.13), the
767   Printer MUST perform one of the following actions, depending on implementation: (1) reject the request OR (2)
768   accept the request and either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute.
769   See section 4.2 above for more details.   ISSUE 05: Or should we require the Printer to always reject a request for
770   an unsupported target version?

771   The values are the document format version strings as defined for the "document-format-version" Operation attribute
772   (see section 4.2.6). Support of this Job Template attribute is intended for Printers that perform document format
773   conversion as part of their service.

774   The Printer produces the value indicated by its "document-format-version-target-default" Printer attribute (see section
775   8.8) only if the client does not supply the "document-format-target-version" ~~Template~~ Operation attribute and the
776   "document-format-target" ~~Template~~ Operation attribute. If the client supplies the "document-format-target" ~~Template~~
777   Operation attribute, but not the "document-format-version-target" ~~Template~~ Operation attribute, the Printer applies an
778   appropriate default version for the supplied document format.

779   ISSUE 06: Does it make sense to have a "document-format-target-default" or not?

780   ~~To force the Printer to produce the indicated document format version, the client MUST either supply the "ipp-~~
781   ~~attribute-fidelity" with a 'true' value or the "job-mandatory-attributes" with the 'document-format-version-target'~~
782   ~~keyword value.~~

4.2.8 document-natural-language (naturalLanguage)

784   This OPTIONAL Operation attribute specifies the natural language of the Document content (see [rfc2911] section
785   3.2.1.1 and section 4.1.8).

786   If the client supplies this "document-natural-language" Operation attribute with a value that the Printer doesn't
787   support, the Printer MUST perform one of the following actions: (1) reject the request OR (2) accept the request and
788   either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See section 4.2 above
789   for more details.

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

793   'en': for English
794   'en-us': for US English
795   'fr': for French
796   'de': for German
797

798 # 5 Job Template attributes

799 Table 9 lists the new Job Template attributes defined in this specification. The Job Template attributes can be
800 supplied in the Job Creation operations: Print-Job, Print-URI, and Create-Job operations.

801 ~~A subset of these Job Template attributes (e.g., "number-up" and "media", but not "job-priority") are also defined to~~
802 ~~apply to Documents and are called Document Template attributes when supplied at the Document Level. Document~~
803 ~~Template attributes can be supplied in the Create-Document, Send-Document, and Send-URI operations.~~

804 ~~These Document Template attributes can also be supplied as Document Overrides using the "document-overrides"~~
805 ~~Job Template attribute (see [pwg5100.4]).~~

806 ~~A subset of the Document Template attributes that apply to pages (e.g., "media", but not "document-format" or "job-~~
807 ~~priority") can also be supplied as Page Overrides using the "page-overrides" Job Template collection attribute (see~~
808 ~~[pwg5100.4]) or as a Document Template attribute.~~

809 Job Template ~~and Document Template~~ attributes are OPTIONAL for a Printer to support and for a client to supply in
810 a Job Creation ~~or Document Creation~~ request ~~or a Document Overrides or Page Overrides~~. If a Printer supports a
811 Job Template ~~or Document Template~~ attribute, then it MUST copy the supplied attribute to the Job ~~or Document~~
812 object, respectively so that a client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs ~~and Get-~~
813 ~~Document-Attributes/Get-Documents~~ operations~~, respectively. The effect of Job Template Attributes supplied in Job~~
814 ~~Creation requests are inherited by the Document objects, unless the Document Creation operation supplies the~~
815 ~~attribute with a different value.~~

816 If a Job Template collection attribute is supported (see [rfc3382]), then there are conformance requirements for which
817 member attributes MUST be supported and which member attributes a client MUST supply as indicated in the
818 Conformance column for each collection member attribute in Table 9.

819 ~~The "Defined for use" column indicates whether the client MAY supply and the Printer support the attribute at the~~
820 ~~Job, Document, or Page Level with the following semantics:~~

~~Supplied~~	~~Description~~
~~J=y:~~	~~Job Level: The attributes MAY be supplied as Job Template attributes at the Job Level in a Job Creation request (Print-Job, Print-URI, Create-Job) in which case each Document inherits the Job Template attribute as a default which is used unless an attribute at the document level is also supplied. Note: The "multiple-document-handling" attribute controls whether extensive attributes, such as "finishing", "copies", affect the entire job as a whole ('single-xxx' values) or affect each document separately ('separate-xxx' values).~~
~~D=y:~~	~~Document Level: The attribute MAY be supplied at the Document Level as Template attributes in a Document Creation operation (Send-Document, Send-URI), in which case the supplied Templates override any Template attributes supplied at the Job Level and any "document-overrides" supplied at the Job or Document level.~~
~~P=y:~~	~~Page Level: The attribute MAY be supplied as a member of the (1) "page-ranges" Job Template attribute at the Job Level in a Job Creation operation or (2) "page-ranges" Document Template attribute at the Document Level to affect the specified range of pages.~~

821
822 ~~"**" - Most Job Template and Document Template attributes correspond to the PWG Semantic Model Job~~
823 ~~Processing and Document Processing attributes, respectively. However, 4 of the IPP Job Template~~
824 ~~attributes are represented in the PWG Semantic Model as Job Description attributes, instead of Job~~
825 ~~Processing attributes. These are indicated in the first column with "**".~~

826   **Table 9 - Job Template attributes**

Job Template attribute name "xxx"	Attribute Syntax	Printer: Default Value attribute syntax "xxx-default"	Printer: Supported Values attribute syntax "xxx-supported"
~~document-format-target~~	~~mimeMediaType~~		
~~document-format-version-target~~	~~text(127)~~		
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-*~~front~~back	**see** job-**cover-**~~front~~back		
job-finishings	1setOf type2 enum	1setOf type2 enum[20]	1setOf type2 enum
job-finishings-col	collection	collection[20]	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))

827 5.1 Job Template attributes defined for use with multi-document jobs

828 This section defines additional Job Template attributes for use with multi-document Jobs. These Job Template
829 attributes MUST be supplied ~~at the Job Level~~ in Job Creation operations only. They have the "job-" prefix to indicate
830 this scope. ~~These Job Template attributes MUST NOT be used as Document Template attributes, because they~~
831 ~~affect the Job as a whole.~~ This Job Template attribute MUST NOT be supplied in the "page-overrides" Job Template
832 attribute [override].   Unless specified otherwise, each Job Template attribute has a corresponding "xxx-default" and
833 "xxx-supported Job Template Printer attribute. See Table 12 for the attribute syntax.

834 5.1.1 job-copies (integer(1:MAX))

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

---

[20] 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).

841 **5.1.1.1 job-copies-default (integer(1:MAX))**

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

844 **5.1.1.2 job-copies-supported (rangeOfInteger(1:MAX))**

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

847 ## 5.1.2 job-cover-back (collection)

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

854 **5.1.2.1 job-cover-back-default (collection)**

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

857 **5.1.2.2 job-cover-back-supported (1setOf type2 keyword)**

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

861 ## 5.1.3 job-cover-front (collection)

862 This OPTIONAL Job Template attribute specifies the cover for the front of the job, i.e., with all of the Documents
863 taken together and is independent of the value of the "multiple-document-handling" Job Template attribute. The
864 member attributes are the same as the "cover-front" Job Template attribute (see [pwg5100.3] section 3.2). However,
865 the "cover-front" Job Template attribute switches between a job front cover and a document front cover depending on
866 the value of the "multiple-document-handling" Job Template attribute ([rfc2911] section 4.2.4). The "job-cover-front"
867 Job Template attribute is equivalent to "cover-front" with "multiple-document-handling" = 'single-document-new-
868 sheet'.

869 **5.1.3.1 job-cover-front-default (collection)**

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

872 **5.1.3.2 job-cover-front-supported (1setOf type2 keyword)**

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

876 ## 5.1.4 job-finishings (1setOf type2 enum)

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

883 ### 5.1.4.1 job-finishings-default (1setOf type2 enum)

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

886 ### 5.1.4.2 job-finishings-ready (1setOf type2 enum)

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

890 ### 5.1.4.3 job-finishings-supported (1setOf type2 keyword)

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

893 ## 5.1.5 job-finishings-col (1setOf collection)

894 This OPTIONAL Job Template attribute specifies the job finishings collection, i.e., with all of the Documents taken
895 together. Its interpretation is independent of the value of the "multiple-document-handling" Job Template attribute.
896 See the "finishings-col" Job Template attribute defined in [rfc2911pwg5100.3] section 4.2.63.2 which switches
897 between job finishings collection and document finishings collection depending on the value of the "multiple-
898 document-handling" Job Template attribute ([rfc2911] section 4.2.4). The "job-finishings-col" Job Template attribute
899 is equivalent to "finishings-col" with "multiple-document-handling" = 'single-document-new-sheet'.

900 ### 5.1.5.1 job-finishings-col-default (collection)

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

903 ### 5.1.5.2 job-finishings-col-ready (collection)

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

907 ### 5.1.5.3 job-finishings-col-supported (1setOf type2 keyword)

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

911 ## 5.2 Addition Job Template attributes

912 This section defines Job Template attributes that are also Document attributes. These Job Template attributes MAY
913 be supplied at the Job Level or MAY be supplied at the Document Level, since they affect individual Documents.

914 Unless specified otherwise, each Job Template attribute has a corresponding "xxx-default" and "xxx-supported Job
915 Template Printer attribute. See Table 11 for the attribute syntax.

916
917

6   Job Description attributes

919 Table 10 lists the new Job Description defined in this IPP specification. Job Description attributes are Job object
920 attributes that are filled in by the Printer. Some Job Description attribute values are supplied by the client in the
921 Job/Document Creation operation using corresponding Operation attributes as flagged indicated with "⇒y". Unless
922 specified otherwise herein, tThe Printer MUST NOT support modification of any of these Job Description attributes
923 using the Set-Job-Attributes operation ([ref3380]).

924 The column labeled "attribute syntax" indicates the attribute syntax (see [rfc2911] section 4.1). The Printer
925 conformance is indicated along with the reference to the specification in which the attribute is defined.

926 Each of the Document Description attributes have a sub-section in section 1.1. The column labeled References
927 column contains references to the sub-section in this document if there is significant information there. Those
928 subsections that are only references to other specifications contain only that reference in the Reference column.
929 Those attributes that are only Job Description attributes with no subsection in this specification have a "n/a" in the
930 "Doc Desc" column.

931 Note: There are no corresponding Page Range (or Page Override) Description attributes. The Page Range is not an
932 object with a state and it cannot be queried.

Legend:	
IPP attribute syntax	the attribute syntax (see [rfc2911] section 4.1).
Printer conformance	indicates MUST or MAY for Printer conformance.
[job-]	indicates an attribute that shouldn't have had a "job-" prefix in its name in [rfc2911], so that the same attribute name could also be used for the Document object as a Document Description attribute. Note: For the PWG Semantic Model, the "job-" prefix is dropped.
"-"	indicates that the Job or Document attribute is *not* defined.
"⇒y"	the Printer MUST populate this Job or Document Description attribute by copying *from* the corresponding Operation attribute that the client MAY supply[24] in a Job or Document Creation operation. See Table 7 for the corresponding Operation attribute.
(r/w)	indicates that the Job Description or Document Description attribute is read/write, so that the client can changes its value using the Set-Job-Attributes or Set-Document-Attributes operation (see section **Error! Reference source not found.**).
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.

---

[21] Document Description attributes that the client can supply in a Job or Document operation as Operation attributes
(indicated with ⇒) comprise *all* of the Document Description attributes in the PWG Semantic Model ([pwgsm]).
Those Document Description attributes that clients cannot supply values correspond to Document Status attributes in
the PWG Semantic Model.

933 **Table 10 - Job Description attributes**

Job Description attribute name	IPP Attribute Syntax	Job	~~Doc~~	Printer conform-ance	Reference ~~Job Description Attr~~	~~Doc Desc.~~
~~document-charset~~	~~charset~~	~~-~~	~~⇒y~~	~~CMUST²²~~	~~-~~	~~§6.2.1~~
~~document-digital-signature~~	~~type2 keyword~~	~~-~~	~~⇒y~~	~~MAY~~	~~-~~	~~§6.2.2~~
~~document-format-details~~	~~1setOf collection~~	~~-~~	~~⇒y~~	~~CMUST²³~~	~~-~~	~~§6.2.3~~
~~document-source-application-name~~	~~name(MAX)~~	~~-~~	~~⇒y~~	~~MAY~~	~~-~~	~~§4.3.4.1~~
~~document-source-application-version~~	~~text(127)~~	~~-~~	~~⇒y~~	~~MAY~~	~~-~~	~~§4.3.4.2~~
~~document-source-os-name~~	~~name(40)~~	~~-~~	~~⇒y~~	~~MAY~~	~~-~~	~~§4.3.4.3~~
~~document-source-os-version~~	~~text(40)~~	~~-~~	~~⇒y~~	~~MAY~~	~~-~~	~~§4.3.4.4~~
~~document-format~~	~~mimeMediaType~~	~~-~~	~~⇒y~~	~~MUST~~	~~-~~	~~§4.3.4.5~~
~~document-format-device-id~~	~~text(127)~~	~~-~~	~~⇒y~~	~~MUST~~	~~-~~	~~§4.3.4.6~~
~~document-format-version~~	~~text(127)~~	~~-~~	~~⇒y~~	~~MAY~~	~~-~~	~~§4.3.4.7~~
~~document-natural-language~~	~~naturalLanguage~~	~~-~~	~~⇒y~~	~~MAY~~	~~-~~	~~§4.3.4.8~~
~~document-format-details-detected~~	~~1setOf collection~~	~~-~~	~~y~~	~~MAY~~	~~-~~	~~§6.2.4~~
~~document-format-detected~~	~~mimeMediaType~~	~~-~~	~~y~~	~~MAY~~	~~-~~	~~§6.2.5~~
~~document-format-version~~	~~text(127)~~	~~-~~	~~⇒y~~	~~MAY~~	~~-~~	~~§6.2.6~~
~~document-format-version-detected~~	~~text(127)~~	~~-~~	~~y~~	~~MAY~~	~~-~~	~~§6.2.7~~
ipp-attribute-fidelity	boolean	⇒y	-	~~MUST~~MAY	[this spec] §6.1	–
job-errors-count	integer(0:MAX)	y		MAY	[this spec] §6.2	
job-mandatory-attributes	1setOf type2 keyword	⇒y	-	~~MUST~~MAY	[this spec] §6.3	-
job-warnings-count	integer(0:MAX)	y	~~y~~	MAY	~~[pwg5100.4] §6.1~~[this spec] §6.4	~~§1.1.1~~
output-device-requested	name(127)	y	-	MAY	[this spec] §6.5	-
output-device-assigned	name(127)	y	~~y~~	MAY	[rfc2911] §4.3.7.2	~~§Error! Reference source not found.~~

934 "**y**", "⇒**y**", "-"   See the description in the Legend before the table.
935

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

944 ~~The descriptions of the new "document-state" and "document-state-reasons" attributes are merged in with the~~
945 ~~existing "job-state" and "job-state-reasons". Such merging shows the parallelism in the description to aid~~

---

²² The Printer MUST support the "document-charset" Operation/Document Description attributes if the Printer
supports any charset-ambiguous document formats (see section 4.2.2).
²³ The Printer MUST support the "document-format-details" Operation/Document Description attributes if the Printer
supports a packaging MIME type document format, such as 'application/zip' or 'multipart/related'.

946 understanding and implementation and so that future maintenance will continue this strong parallelism. The "/"
947 character separates the words: Job from Document so that the same description can serve for both Job and
948 Document objects.

6.1 ipp-attribute-fidelity (boolean)

950 This REQUIRED OPTIONAL Job Description attribute indicates the value of the corresponding "ipp-attribute-fidelity"
951 Operation attribute ([rfc2911] section 3.2.1.1)[24] that the client supplied in the Job Creation operation. This Job
952 Description attribute has no effect on the processing of the job once the Job Creation and Document Creation
953 operations hasve been accepted[25]. However, this attribute does provide an audit capability to the user and service
954 desk for comparing unexpected printed results with what was submitted.

6.2 job-errors-count (integer(0:MAX))

956 This OPTIONAL Job Description attribute counts the number of errors encountered processing the job as a whole.
957 An error where some portion of the printed output is not present, such as a glyph encountered which isn't in the
958 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
959 overall document format.

6.3 job-mandatory-attributes (1setOf type2 keyword)

961 This REQUIREDOPTIONAL[26] Job Description attribute indicates which Job Template and Document Template
962 attributes that the client required that the Printer Honor in order to accept the Job Creation and subsequent
963 Document Creation requests. The Printer populates this attribute with the value of the corresponding "job-
964 mandatory-attributes" Operation attribute (see section 4.1.2) supplied by the client in the Job Creation operation.
965 This Job Description attribute has no effect on the processing of the job once the Job Creation and Document
966 Creation operations hasve been accepted[25]. However, this Document Job Description attribute does provide an
967 audit capability of the Job object in the Job History (see [rfc2911] section 4.3.7.2) to the user and service desk for
968 comparing unexpected printed results with what was submitted. See section 4.1.2 for additional details of the
969 semantics of thise "job-mandatory-attributes" oOperation/Document Description attribute that are not repeated here.

6.4 job-warnings-count (integer(0:MAX))

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

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

974 This OPTIONAL Job Description attribute indicates the name of the output device that the client has supplied in the
975 "output-device-requested" Operation attribute (see section 4.1.3), if any, in the Job Creation operation. The Printer

---

[24] The "ipp-attribute-fidelity" attribute is defined only as an Operation attribute in [rfc2911]. This specification is
defining it as a Document Job Description attribute as well which the Printer MUST MAY support.
[25] 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].
[26] The Printer MUST support the "job-mandatory-attributes" Operation/Job Description attributes is REQUIRED for
conformance to this Document Object specification. However, an implementation that isn't conforming to this
specification MAY still support the "job-mandatory-attributes" Operation attribute by itself. See the definition of
REQUIRED in section 2.1.

976   sets the Job's "output-device-assigned" Job Description attribute (see [rfc2911] section) to the name of the actual
977   device assigned.

6.2 Document Description attributes

979   This section contains *all* of the Document Description attributes for use with the Document object. Most of these
980   definitions refer to the corresponding Job Template attribute semantics in other specifications. However, the
981   semantics of each Document Description attribute only applies to the Document object containing the Document
982   Description attribute.   The Printer MAY support changing these Document Description attributes with the Set-
983   Document-Attributes operation (see section **Error! Reference source not found.**), but only if indicated explicitly in
984   this section.

> *Important Implementer's note: The brief descriptions in this section are not a substitute for*
> *the detailed specification in the referenced specifications. You need to read the referenced*
> *specifications when implementing!*

985

6.2.1 document-charset (charset)

987   This REQUIRED Description attribute specifies the digital signature technology used in the Document Object
988   content. The Printer sets this Document Description attribute from the corresponding "document-digital-signature"
989   Operation attribute (section 4.3.1 for the semantics), if supplied by the client in the Document Creation operation (see
990   section **Error! Reference source not found.**).

6.2.2 document-digital-signature (type2 keyword)

992   This OPTIONAL Description attribute specifies the digital signature technology used in the Document content. The
993   Printer sets this Document Description attribute from the corresponding "document-digital-signature" Operation
994   attribute (section 4.3.2 for the semantics), if supplied by the client in the Document Creation operation (see section
995   **Error! Reference source not found.**). If a Printer supports the "document-digital-signature" Operation attribute, the
996   Printer MUST support this "document-digital-signature" Document Description attribute.

997

6.2.3 document-format-details (1setOf collection)

999   This OPTIONAL Description attribute specifies the details of the document format(s) of the Document Object content.
1000   The Printer sets this Document Description attribute from the corresponding "document-format-details" Operation
1001   attribute (section 4.3.4 for the semantics), if supplied by the client in the Document Creation operation (see section
1002   **Error! Reference source not found.**). is a copy of the corresponding "document-format-details" Operation attribute
1003   (see section 4.3.4 for the semantics) that the client supplied in the Document Creation operation. If a Printer
1004   supports the "document-format-details" Operation attribute, the Printer MUST support this "document-format-details"
1005   Document Description attribute.

6.2.4 document-format-details-detected (1setOf collection)

1007   This OPTIONAL Description attribute is generated by the Printer to indicate the actual document format details of the
1008   Document object as detected by the Printer. The member attributes are the same as the "document-format-details"
1009   Operation attribute (see section 4.3.4 for the semantics) and Document Description attribute (see section 6.2.3).
1010   Before the document format details are known, the Printer populates this attribute's member attributes with a zero
1011   length string. As the Printer processes the Document object, the Printer populates this attribute's member attributes

1012 with the actual values detected[27] whether or not the client supplied a "document-format-details" Operation attribute in
1013 the Document Creation operation. This value will differ from the value submitted by the client, if the Printer
1014 automatically senses the document format details by examining the document content, such as when the "document-
1015 format" attribute has the value: 'application/octet-stream' (see [rfc2911] section 4.1.9.1).

6.2.5 document-format-detected (mimeMediaType)

1017 This OPTIONAL Description attribute is generated by the Printer to indicate the actual document format of the
1018 Document object content as detected by the Printer. This value will differ from the value submitted by the client or
1019 defaulted by the Printer, if the Printer automatically senses the document format by examining the document content,
1020 such as when the "document-format" attribute has the value: 'application/octet-stream' (see [rfc2911] section 4.1.9.1).
1021 Before the document format is known, the Printer populates this attribute with a zero length string.

6.2.6 document-format-version (text(127))

1023 This OPTIONAL Description attribute specifies the version of the document format of the Document Object content.
1024 The Printer sets this Document Description attribute from the corresponding "document-format-version" Operation
1025 attribute (section 4.3.5 for the semantics), if supplied by the client in the Document Creation operation (see section
1026 **Error! Reference source not found.**). If a Printer supports the "document-format-version" Operation attribute, the
1027 Printer MUST support this "document-format-version" Document Description attribute.

6.2.7 document-format-version-detected (text(127))

1029 This OPTIONAL Description attribute is generated by the Printer to indicate the actual document format version of
1030 the Document content as detected by the Printer. This value will differ from the value submitted by the client or
1031 defaulted by the Printer, if the Printer automatically senses the document format by examining the document content,
1032 such as when the "document-format" attribute has the value: 'application/octet-stream' (see [rfc2911] section 4.1.9.1).
1033 Before the document format version is known, the Printer populates this attribute with a zero length string.

7   New values to existing attributes

1035 This section defines new values to existing attributes.

7.1 New job-state-reasons(1setOf type2 keyword) Values

1037 The REQUIRED "job-state-reasons" and the REQUIRED attribute Job Description attributes ([rfc2911] section 4.3.8)
1038 provide additional information about the job's current state, i.e., information that augments the value of the job's "job-
1039 state" attribute.

1040 These new values MAY be used with any job state for which the reason makes sense. When implemented, the
1041 Printer MUST return these values when the reason applies and MUST NOT return them when the reason no longer
1042 applies whether the value of the Job's "job-state" attribute attribute changed or not. When the Job does not have any
1043 reasons for being in its current state, the value of the Job's "job-state-reasons" attribute or Document's "document-
1044 state-reasons" attribute MUST be 'none'.

1045 Note: While values cannot be added to the "job-state" attributes without impacting deployed clients that take actions
1046 upon receiving "job-state" values, it is the intent that additional "job-state-reasons" values can be defined and
1047 registered without impacting such deployed clients. In other words, the "job-state-reasons" attribute are intended to
1048 be extensible.

---

[27] The "document-format-details-detected" is not named "document-format-details-actual" (see [ippact]), since it is
tracking an Operation attribute, not a Job or Document Template attribute (same as "document-format-detected").

1049   Table 11 lists the new keyword values for the "job-state-reasons" attribute defined in this specification as indicated in
1050   the References column. In Table 11 the keywords are listed in alphabetic order, while in their descriptions following
1051   Table 11, they are listed in the most likely order of occurrence to help understanding.

1052   **Table 11 - 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
~~document-state-reasons~~	~~1setOf type2 keyword~~	~~MUST~~	~~6.2.8~~
	digital-signature-did-not-verify	MAY	[this spec] §7.1
	digital-signature-type-not-supported	MAY	[this spec] §7.1
	job-digital-signature-wait	MAY	[this spec] §7.1

1053
1054   For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely
1055   to occur (if implemented):

1056   **'digital-signature-type-not-supported'**: The Job contains a digital signature type that is not supported.
1057   Implementation or site policy determines the state of the Job once this condition is detected.

1058   **'job-digital-signature-wait'**: The Job is currently being held because the Job was submitted with a
1059   "document-digital-signature" attribute value that is not supported. The operator MAY either cancel
1060   the job or release it to be processed.

1061   **'digital-signature-did-not-verify'**: The Job contains a digital signature type that is supported (see section
1062   4.2.2), but the signature did not verify when the Printer attempted to verify the signature.

1063

1064   ~~**6.2.9 warnings-count (integer(0:MAX))**~~

1065   ~~This OPTIONAL "warnings-count" Description attribute has the same semantics as the corresponding "job-warnings-~~
1066   ~~count" Job Description attribute (see [pwg5100.4] §6.1.) applied to the Document object.   See [pwg5100.4] §6.1. A~~
1067   ~~warning indicates something did not go as expected, but there was no loss of information. For example, a font~~
1068   ~~substitution. An error indicates loss of information (see section **Error! Reference source not found.**).~~

8   New Printer Description attributes

1070   This section lists *the new* Printer Description attributes defined in this document. These Printer attributes describe
1071   the Printer, such as "printer-name" and "printer-location". Some of them are "xxx-supported" and "xxx-default" for
1072   Operation attributes that the client can supply in a Job Creation request. ~~Printer attributes are divided into two disjoint~~
1073   ~~groups:~~
1074

~~Job Template attributes (JT)~~	~~These Printer attributes are related directly to the "xxx" Job Template attributes~~
	~~that a client can supply in a Job Creation request as follows:~~
	~~1. "xxx-supported" indicate the supported values~~
	~~2. "xxx-default" indicate the values that will be used if the client and the PDL~~
	~~omit the attribute.~~
	~~3. "xxx-ready" indicate the supported values that are available without human~~
	~~intervention, for those few attributes that require human intervention, such~~
	~~as "media" and possibly "job-finishing".~~
	~~These Printer attributes are also returned in a Get-Printer-Attributes response~~

	when the client supplies: "requested-attributes" = 'job-template'.
Printer Description attributes (PD)	These Printer attributes describe the Printer, such as "printer-name" and "printer-location". Some of them are "xxx-supported" and "xxx-default" for Operation attributes that the client can supply in a Job Creation request.
neither (-)	These Printer attributes describe supported and defaults for member attributes of collection Job Template attributes.

1075

1076 In a Get-Printer-Attributes request, a client can request all of the Printer attributes in the Job Template (JT) or Printer
1077 Description (PD) groups by supplying the 'job-template' or 'printer-description' group name, respectively. The client
1078 can also request "all". 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 9. Only those few Printer attribute collection attributes that do not have a corresponding Job Template attributes show the member attributes in this table.
"Grp"	the group to which the attribute belongs. "PD" = Printer Description; "JT" = Job Template as explained above.
"Printer Conf."	the IPP/1.1 Printer conformance requirements for supporting the attribute. Those attributes labeled as "MAY" may have conditional requirements that require their support, if the Printer supports a related attribute, operation, or featurethe corresponding Operation attribute. For example, all Job Template attributes are OPTIONAL for a Printer to support. However, iIf a Printer supports Job Template attributethe "xxx" Operation attribute, then it MUST also support the corresponding "xxx-default" and "xxx-supported" Printer attributes. Similarly, if Event Notification is supported, then some of the attributes indicated as "MAY" in this table become MUST.
"Reference"	the IETF or IEEE-ISTO specification section which defines the semantics of the attribute.

1079

1080 **Table 12 - New Printer Description attributes (Job Template and Printer Description)**

Printer Description attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
document-charset-default	charset	PD	CMUST[28]	[this-spec] §8.1
document-charset-supported	1setOf charset	PD	CMUST[28]	[this-spec] §8.2
document-digital-signature-default	type2 keyword	PD	MAY	[this-spec] §8.3
document-digital-signature-supported	1setOf type2 keyword	PD	MAY	[this-spec] §8.4
document-format-details-default	collection		CMUST[29]	[this-spec] §8.5
document-format-details-supported	1setOf type2 keyword	PD	CMUST[29]	[this-spec] §8.6
document-format-details-implemented	1setOf collection	PD	CMUST[29]	[this-spec] §8.7
document-format-target-default	mimeMediaType	JT,DT	MAY	[this spec] §8.8
document-format-target-supported	1setOf mimeMediaType	JT,DT	MAY	[this spec] §8.9

---

[28] The Printer MUST support the "document-charset-default" and "document-charset-supported" Printer Description attributes, if the Printer supports a charset-ambiguous document format (see section 4.2.1).

[29] The Printer MUST support the "document-format-details-default", "document-format-details-supported", and "document-format-details-implemented" Printer attributes if the Printer supports a packaging document format, such as application/zip or multipart/related.

Printer **Description** attribute name (Job Template & Printer Description)	Attribute Syntax	~~Grp~~	Printer Conf.	Reference
document-format-version-default	text(127)	~~PD~~	MAY	[this-spec] §8.10
document-format-version-supported	1setOf text(127)	~~PD~~	MAY	[this-spec] §8.11
document-format-version-target-default	mimeMediaType	~~JT,DT~~	MAY	[this spec] §8.12
document-format-version-target-supported	1setOf mimeMediaType	~~JT,DT~~	MAY	[this spec] §8.13
document-natural-language-default	naturalLanguage	~~PD~~	MAY	[this-spec] §8.14
document-natural-language-supported	1setOf naturalLanguage	~~PD~~	MAY	[this-spec] §8.15
output-device-requested-supported	1setOf name(127)	~~PD~~	MAY	[this spec] §8.16

1081
1082 The remainder of this section defines the Printer Description attributes that are not defined in other specifications.
1083 Most of these are "xxx-default" and "xxx-supported" Printer Description attributes. A Printer MUST support these
1084 Printer Description attributes, if it supports the corresponding Operation~~/Description~~ attributes, in order to indicate the
1085 default and supported values that the Printer supports.

8.1 document-charset-default (charset)

1086

1087 This CONDITIONALLY REQUIRED Printer Description attribute indicates the default charset that the Printer will
1088 assume for charset-ambiguous document formats when the client omits the "document-charset" Operation attribute
1089 (section 4.2.1). The Printer MUST support this attribute if it supports any charset-ambiguous document formats (see
1090 section 4.2.1)

8.2 document-charset-supported (1setOf charset)

1091

1092 This CONDITIONALLY REQUIRED Printer Description attribute indicates the charsets that the Printer supports in
1093 Document ~~object contents~~Content, that is, supports as values of the "document-charset" Operation attribute (section
1094 4.2.1) ~~and Document Description attribute (section 1.1.1)~~. The Printer MUST support this attribute if it supports any
1095 charset-ambiguous document formats (see section 4.2.1).

8.3 document-digital-signature-default (type2 keyword)

1096

1097 This OPTIONAL Printer Description attribute indicates the default digital signature, if any, that the Printer will assume
1098 when the client omits the "document-digital-signature" Operation attribute (section 4.2.2). The Printer MUST support
1099 this attribute if it supports the "document-digital-signature" Operation attribute.

8.4 document-digital-signature-supported (1setOf type2 keyword)

1100

1101 This OPTIONAL Printer Description attribute indicates the digital signature technologies that the Printer supports in
1102 Document ~~object c~~Contents, that is, supports as values of the "document-digital-signature" Operation attribute
1103 (section 4.2.2) ~~and Document Description attribute (section 1.1.1)~~. The Printer MUST support this attribute if it
1104 supports the "document-digital-signature" Operation ~~and Document Description~~ attribute~~s~~.

8.5 document-format-details-default (collection)

1105

1106 This CONDITIONALLY REQUIRED Printer Description attribute indicates the default document format details that
1107 the Printer will assume when the client omits the "document-format-details" Operation attribute (section §4.2.4). The
1108 Printer MUST support this attribute if it supports the "document-format-details" Operation attribute.

1109   ## 8.6 document-format-details-supported (1setOf type2 keyword)

1110   This CONDITIONALLY REQUIRED Printer Description attribute lists the type2 keyword names of the member
1111   attributes of "document-format-details" that the Printer supports. If the Printer supports the "document-format-details"
1112   (1setOf collection) Operation attribute, the Printer MUST support this "document-format-details" (1setOf type2
1113   keyword) Printer Description attribute. Table 13 lists the type2 keywords defined for use in the "document-format-
1114   details-supported" Printer attribute.

1115   **Table 13 - 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

1116

1117   ## 8.7 document-format-details-implemented (1setOf collection)

1118   This CONDITIONALLY REQUIRED[30] Printer Description attribute lists the combinations of the values of the member
1119   attributes of "document-format-details" that the Printer has implemented. If the Printer supports the "document-
1120   format-details" Operation attribute, the Printer MUST support this "document-format-details-implemented" Printer
1121   Description attribute with the same member attributes that it supports for the "document-format-details" Operation
1122   attribute (section 4.2.4) as indicated in the Printer's "document-format-details-supported" Printer Description attribute
1123   (section 8.6). Each "xxx-implemented" member attribute is multi-valued with the same attribute syntax as the
1124   corresponding "document-format-details" attribute.

1125   ISSUE 07: Bob's issue about truth in advertising. Don't penalize truth. Does allowing these Operation attribute
1126   keyword names in the "user-defined-attributes-supported" Printer attribute allow the Printer to accept any values
1127   without returning the attribute in the Unsupported Attributes group?

1128   **Table 14 - Member attributes of the "document-format-details-implemented" Printer attribute**

"document-format-details-implemented" member attributes	Reference
document-source-application-name-implemented (1setOf name(MAX))	4.2.4.1
document-source-application-version-implemented (1setOf text(127))	4.2.4.2
document-source-os-name-implemented (1setOf name(40))	4.2.4.3
document-source-os-version-implemented (1setOf text(40))	4.2.4.4
document-format-implemented (1setOf mimeMediaType)	4.2.4.5
document-format-device-id-implemented (1setOf text(127))	4.2.4.6
document-format-version-implemented (1setOf text(127))	4.2.4.7
document-natural-language-implemented (1setOf naturalLanguage)	4.2.4.8

1129

---

[30] The Printer MUST support the "document-format-details-implemented" Printer Description attribute if the Printer
supports a packaging document format, such as application/zip or multipart/related MIME types.

1130 Typically, there will only be one value for each "document-format-implemented" member attribute in each collection
1131 value. However, there MAY be more than one occurrence of a collection value with the same "document-format-
1132 implemented" member attribute value. See the following example which has two PostScript collection values.

1133 Example: Suppose that a Printer implements a PostScript™c Level 3 interpreter which also interprets Level 1 and
1134 Level 2 documents and a PCL interpreter that interprets '5' and '5e' variants. Suppose that the Printer only has fonts
1135 for French and German for PostScript™ level 3. The value of "document-format-details-implemented" would have
1136 the following three collection values:

1137 {{"document-format-implemented" = 'application/postscript', "document-format-version-implemented" = 'PS/1', 'PS/2', 'PS/3'},
1138   {"document-format-implemented" = 'application/postscript', "document-format-version-implemented" = 'PS/3',
1139   document-natural-language}=en, fr, de},
1140   {"document-format-implemented" = 'application/vnd.hp-PCL', "document-format-version-implemented" = 'PCL/5', 'PCL/5e'}}

1141 8.8 document-format-target-default (text(127))

1142 This OPTIONAL Printer Description attribute indicates the default document format version that the Printer will
1143 assume when the client omits the "document-format-target" Operation attribute (section 4.2.5). The Printer MUST
1144 support this attribute if it supports the "document-format-target" Operation attribute.

1145 ISSUE 06 repeat: Does it make sense to have a "document-format-target-default" or not?

1146 ISSUE 08: OK *not* to have a "document-format-target-col-default" (collection) which is pairs of "document-format-
1147 target" and "document-format-version-target" values, since the "document-format-version" is self-describing which
1148 includes short abbreviation of the document format?

1149 ISSUE 09: Or should the "document-format-version-target-default" be a 1setOf since the version string is self-
1150 identifying with the PDL? Then the different defaults could be indicated for each document format?

1151 8.9 document-format-target-supported (1setOf text(127))

1152 This OPTIONAL Printer Description attribute indicates the target document format that the Printer supports for
1153 converting Document Content, that is, supports as values of the "document-format-target" Operation attribute
1154 (section 4.2.5). The Printer MUST support this attribute if it supports the "document-format-target" Operation and Job
1155 Description attributes.

1156 8.10 document-format-version-default (text(127))

1157 This OPTIONAL Printer Description attribute indicates the default document format version that the Printer will
1158 assume when the client omits the "document-format-version" Operation attribute (section 4.2.6). The Printer MUST
1159 support this attribute if it supports the "document-format-version" Operation and Document Description attributes.

1160 8.11 document-format-version-supported (1setOf text(127))

1161 This OPTIONAL Printer Description attribute indicates the document format versions that the Printer supports for
1162 Document object cContents, that is, supports as values of the "document-format-version" Operation attribute (section
1163 4.2.6) and Document Description attribute (section **Error! Reference source not found.**). The Printer MUST
1164 support this attribute if it supports the "document-format-version" Operation and Document Description attributes.

1165 **8.12 document-format-version-target-default (text(127))**

1166 This OPTIONAL Printer Description attribute indicates the default document format level and version that the Printer
1167 will assume when the client omits the "document-format-version-target" Operation attribute (section 4.2.7). The
1168 Printer MUST support this attribute if it supports the "document-format-version-target" Operation attribute.

1169 **8.13 document-format-version-target-supported (1setOf text(127))**

1170 This OPTIONAL Printer Description attribute indicates the target document format levels and versions that the Printer
1171 supports for converting Document Content, that is, supports as values of the "document-format-version-target"
1172 Operation attribute (section 4.2.7). The Printer MUST support this attribute if it supports the "document-format-
1173 version-target" Operation attribute.

1174 **8.14 document-natural-language-default (naturalLanguage)**

1175 This OPTIONAL Printer Description attribute indicates the default document natural language that the Printer will
1176 assume for Document ~~Object c~~Content when the client omits the "document-natural-language" Operation attribute
1177 ([rfc2911] section 3.2.1.1). The Printer MUST support this attribute if it supports the "document-natural-language"
1178 Operation ~~and Document Description~~ attribute~~s~~.

1179 **8.15 document-natural-language-supported (1setOf naturalLanguage)**

1180 This OPTIONAL Printer Description attribute lists the natural languages supported in any of the supported document
1181 formats, that is, it is the union of the natural languages. The Printer MUST support this attribute if it supports the
1182 "document-natural-language" Operation attribute ([rfc2911] section 3.2.1.1) ~~and Document Description attribute~~
1183 ~~(section **Error! Reference source not found.**).~~ See the "document-format-details-implemented" (1setOf collection)
1184 Printer Description attribute (section 8.7) for how the Printer MAY expose the list of natural languages supported by
1185 particular document formats.

1186 **8.16 output-device-requested-supported (1setOf name(127))**

1187 This OPTIONAL Printer Description attributes lists the names of output devices that the Printer supports. The Printer
1188 MUST support this attribute if it supports the "output-device-requested" Operation attribute (see section 4.1.3).

1189 # 9   New Values for Existing Printer Description Attributes

1190 This section contains those attributes for which additional values are added.

1191 **9.1 operations-supported (1setOf type2 enum)**

1192 The following "operation-id" values are added in order to support the new operations defined in this document:

1193   **Table 15 - Operation-id assignments**

Value	Operation Name	Reference
0x000F	Close-Job	[this-spec] §3.1

1194

10 Conformance Requirements

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

10.1 Printer conformance requirements

In order to claim conformance to this specification, a Vendor MUST explicitly identify the operations and/or attributes 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 the Close-Job operation according to section 3.1 and the corresponding enum value of the "operations-supported" Printer Description attribute according to section 9.1.

3. MAY support any Operation attribute according to section 4 and the corresponding Job Description attributes in section 6 and corresponding Printer attributes in section 8.

4. MAY support any Job Template attribute according to section 5.

5. MAY support any of the "job-state-reasons" values according to section 7.

~~2.6. MUST support the Operation attributes in the Send-Document operation and, if supported, the Send-URI operation that section 4 REQUIRES a Printer to support.~~

~~3. MUST support any Operation attributes that section 4 REQUIRES a Printer to support along with the corresponding Document Description attributes that section 6 REQUIRES a Printer to support and any "xxx-default" and "xxx-supported" Printer attributes that section 8 REQUIRES a Printer to support.~~

~~4. MAY support any of the Document Template attributes in Document Creation operations as indicated in section 5 and MUST NOT support them for contexts for where they are not defined as indicated in the Table 10 with an "-".~~

~~5. MUST support the Document Description attributes that section 6 REQUIRES a Printer to support.~~

~~6. MUST support the Printer attributes that section 8 REQUIRES a Printer to support.~~

10.2 Client conformance requirements

In order to claim conformance ~~conform~~ to this specification, a Vendor MUST explicitly identify the operations and/or attributes supported by the client implementation in any such claim of conformance. In addition, the Vendor's client:

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

2. MAY support the Close-Job operation according to section 3.1.

3. MAY support any Operation attribute according to section 4 and the corresponding Job Description attributes in section 6 and corresponding Printer attributes in section 8.

4. MAY support any Job Template attribute according to section 5.

1227   2.MUST supply the Operation attributes that section 4 REQUIRES a client to supply in operation requests.

1228   3.MUST supply any Document Template attributes in the format that section 5 REQUIRES a client to supply in
1229   Document Creation operations and MUST NOT support them for contexts for where they are not defined as
1230   indicated in the Table 10 with an "n".

1231   4.SHOULD support any of the Document Description attributes that section 6 REQUIRES a Printer to support.

1232   5.MAY support any of the Printer attributes listed in section 8.

11 Normative References

1234 Note: The references in the body of this IEEE-ISTO document use the more reader-friendly mnemonic symbols
1235 below, rather than the RFC number (except for [rfc2910] and [rfc2911]). IETF RFCs and IANA registrations require
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1238   Kugler, C, Hastings, T., Lewis, H., "Internet Printing Protocol (IPP): Job and Printer Administrative
1239   Operations", <draft-ietf-ipp-ops-set2-03.txt>, July 17, 2001.

1240 [dss]
1241   U.S. Department of Commerce, "Digital Signature Standard (DDS)", Federal Information Processing
1242   Standards Publication 186-1 (FIPS PUB 186-1), December 15, 1998.

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1244   Hastings, T., and D. Fullman, "Internet Printing Protocol (IPP): Production Printing Attributes - Set 2", to
1245   become a PWG IEEE-ISTO standard, work in progress, August 21, 2002,
1246   ftp://ftp.pwg.org/pub/pwg/ipp/new_PPE/pwg-ipp pwg5100.3 set2 draft-v0_1-020821.pdf.

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1248   Carney, D., and H. Lewis, "Internet Printing Protocol (IPP), "-actual" attributes extension", work in progress,
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1252   Notifications", <draft-ietf-ipp-notify-get-08.txt>, September 5, 2002.

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1254   ISO 12639:1998 Graphic technology -- Prepress digital data exchange -- Tag image file format for image
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1256 [iso15930]
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1267   "Adobe Portable Document Format", Version 1.4, PDF Reference, Third Edition, Adobe Systems
1268   Incorporated, http://www.adobe.com, December 2001.

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1271   5100.1-2001, February 5, 2001, ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.1.pdf

1272 [pwg5100.2]
1273   Hastings, T., and R. Bergman, "Internet Printing Protocol (IPP): output-bin attribute extension", IEEE-ISTO
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1275 [pwg5100.4]
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1277   ISTO 5100.4-2001, February 7, 2001, ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.4.pdf. - being replaced
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1326   ftp://ftp.pwg.org/pub/pwg/QUALDOCS/pwg-ifx-ippfax-P16-030423.pdf.

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1358   Device Administrative Operations", RFC 3239, February 2002.

1359   13 IANA Considerations

1360 This section contains the registration information for IANA to add to the various IPP Registries according to the
1361 procedures defined in RFC 2911 [rfc2911] section 6 to cover the definitions in this document. The resulting
1362 registrations will be published in the http://www.iana.org/assignments/ipp-registrations registry.

1363   *Note to the PWG EditorRFC Editor: Replace the References below to [this spec] with the RFC numberIEEE-*
1364   *ISTO standard number for the appropriate document, so that it accurately reflects the content of the*
1365   *information for the IANA Registry.*

1366 ## 13.1 Attribute Registrations

1367 The following table lists all the attributes defined in this specification. These are to be registered according to the
1368 procedures in RFC 2911 [rfc2911] section 6.2. If the attribute has a separate sub-section definition in this
1369 specification, that sub-section is listed as the Reference. ~~This specification lists most Job Template attributes as also~~
1370 ~~being Document Template attributes. However, the definitions of these Document Template attributes are not~~
1371 ~~duplicated in this specification. Instead, the Reference column in this sub-section indicates Section 5 which contains~~
1372 ~~a table of all Job Template and corresponding Document Template attributes (including dropping the "job-" prefix).~~
1373 This table contains the reference ~~in~~ to another specification that completely defines each attribute. ~~These Document~~
1374 ~~Template attributes will also be added to the IANA IPP Registry under the Document Template attributes with a~~
1375 ~~reference to this specification and Section 5.~~
1376

```
1377  Attribute Name (attribute syntax)                  Reference      Section
1378  ----------------------------------                 ----------     --------
1379  Document Description attributes:
1380  document-charset (charset)                         [this spec]    1.1.1
1381  document-digital-signature (type2 keyword)         [this spec]    1.1.1
1382  document-format-details (collection)               [this spec]    1.1.1
1383    document-source-application-name (name(MAX))     [this spec]    4.2.4.1
1384    document-source-application-version (text(127))
1385                                                     [this spec]    4.2.4.2
1386    document-source-os-name (name(40))               [this spec]    4.2.4.3
1387    document-source-os-version (text(40))            [this spec]    4.2.4.4
1388    document-format (mimeMediaType                   [this spec]    4.2.4.5
1389    document-format-device-id (text(127))            [this spec]    4.2.4.6
1390    document-format-version (text(127)               [this spec]    4.2.4.7
1391    document-natural-language (1setOf naturalLanguage)
1392                                                     [this spec]    4.2.4.8
1393  document-format-details-detected (1setOf collection)
1394                                                     [this spec]    1.1.1
1395  document-format-detected (mimeMediaType)           [this spec]    1.1.1
1396  document-format-version (text(127))                [this spec]    1.1.1
1397  document-format-version-detected (text(127))       [this spec]    1.1.1
1398  errors-count (integer(0:MAX))                      [this spec]    1.1.1
1399  warnings-count (integer(0:MAX))                    [this spec]    1.1.1
1400
1401
1402
1403
1404  Job Description attributes:
1405  job-attribute-fidelity (boolean)                   [this spec]    6.1
1406  job-errors-count (integer(0:MAX))                  [this spec]    6.2
1407  job-mandatory-attributes (1setOf type2 keyword)    [this spec]    6.3
1408  job-warnings-count (integer(0:MAX))                [this spec]    6.4
1409  output-device-requested(name(127))                 [this spec]    6.5
1410
1411  Job Template attributes:
1412  ACTION (Tom)    Need to add the JT and DT xxx default and xxx supported.
```

```
1413  document-format-version-target-default (mimeMediaType)
1414                                              [this spec]  4.2.5
1415  document-format-version-target-supported (1setOf mimeMediaType)
1416                                              [this spec]  4.2.5
1417  document-format-version-target-default (mimeMediaType)
1418                                              [this spec]  4.2.7
1419  document-format-version-target-supported (1setOf mimeMediaType)
1420                                              [this spec]
1421  job-copies (integer(1:MAX))                 [this spec]  5.1.1
1422  job-copies-default (integer(1:MAX))         [this spec]  5.1.1.1
1423  job-copies-supported (rangeOfInteger(1:MAX))  [this spec]  5.1.1.2
1424  job-cover-back (collection)                 [this spec]  5.1.2
1425    <member attributes are the same as "cover-back">
1426  job-cover-back-default (collection)         [this spec]  5.1.2.1
1427  job-cover-back-supported (1setOf type2 keyword)  [this spec]  5.1.2.2
1428  job-cover-front (collection)                [this spec]  5.1.3
1429  job-cover-front-default (collection)        [this spec]  5.1.3.1
1430  job-cover-front-supported (1setOf type2 keyword) [this spec]  5.1.3.2
1431    <member attributes are the same as "cover-front">
1432  job-finishings (1setOf type2 enum)          [this spec]  5.1.4
1433  job-finishings-default (1setOf type2 enum)  [this spec]  5.1.4.1
1434  job-finishings-ready (1setOf type2 enum)    [this spec]  5.1.4.2
1435  job-finishings-supported (1setOf type2 keyword)  [this spec]  5.1.4.3
1436  job-finishings-col (1setOf collection)      [this spec]  5.1.5
1437    <member attributes are the same as "finishings-col">
1438  job-finishings-col-default (1setOf type2 enum)  [this spec]  5.1.5.1
1439  job-finishings-col-ready (1setOf type2 enum)    [this spec]  5.1.5.2
1440  job-finishings-col-supported (1setOf type2 keyword)
1441                                              [this spec]  5.1.5.3
1442
1443
1444  Printer Description attributes:
1445  document-charset-default (charset)                [this spec]  8.1
1446  document-charset-supported (1setOf charset)       [this spec]  8.2
1447  document-digital-signature-default (type2 keyword)  [this spec]  8.3
1448  document-digital-signature-supported (1setOf type2 keyword)
1449                                                    [this spec]  8.4
1450  document-format-details-default (collection)      [this spec]  8.5
1451  document-format-details-supported (1setOf type2 keyword)
1452                                                    [this spec]  8.6
1453  document-format-details-implemented (1setOf collection)
1454                                                    [this spec]  8.7
1455  document-format-target-default (text(127))        [this spec]  8.8
1456  document-format-target-supported (1setOf text(127))  [this spec]  8.9
1457  document-format-version-default (text(127))       [this spec]  8.10
1458  document-format-version-supported (1setOf text(127))  [this spec]  8.11
```

```
1459  document-format-version-target-default (text(127))    [this spec] 8.12
1460  document-format-version-target-supported (1setOf text(127))
1461                                          [this spec] 8.13
1462  document-natural-language-default (naturalLanguage)   [this spec] 8.14
1463  document-natural-language-supported (1setOf naturalLanguage)
1464                                          [this spec] 8.15
1465  output-device-requested-supported (1setOf name(127))  [this spec] 8.16
1466
1467
1468  Operation attributes:
1469  document-charset (charset)                     [this spec]  4.2.1
1470  document-digital-signature (type2 keyword)     [this spec]  4.2.2
1471  document-format-details (1setOf collection)    [this spec]  4.2.4
1472    document-source-application-name (name(MAX)) [this spec]  4.2.4.1
1473    document-source-application-version (text(127))
1474                                          [this spec]  4.2.4.2
1475    document-source-os-name (name(40))           [this spec]  4.2.4.3
1476    document-source-os-version (text(40))        [this spec]  4.2.4.4
1477    document-format (mimeMediaType               [this spec]  4.2.4.5
1478    document-format-device-id (text(127))        [this spec]  4.2.4.6
1479    document-format-version (text(127)           [this spec]  4.2.4.7
1480    document-natural-language (1setOf naturalLanguage)
1481                                          [this spec]  4.2.4.8
1482  document-format-target (mimeMediaType)         [this spec]  4.2.5
1483  document-format-version (text(127))            [this spec]  4.2.6
1484  document-format-version-target (text(127)      [this spec]  4.2.7
1485  document-natural-language (naturalLanguage)    [this spec]  4.2.8
1486  job-mandatory-attributes (1setOf type2 keyword) [this spec] 4.1.2
1487  output-device-requested (name(127))            [this spec]  4.1.3
```

1488 ## 13.2 Keyword attribute values

```
1489  job-state-reasons (1setOf type2 keyword)       [rfc2911]    4.3.8
1490    digital-signature-did-not-verify             [this spec]  7.1
1491    digital-signature-type-not-supported         [this spec]  7.1
1492    job-digital-signature-wait                   [this spec]  7.1
1493
```
1494 ==ACTION (Tom) - Need to list the keyword attribute values. Do so by reference to the values registered for==
1495 ==corresponding attributes.==

1496 ## 13.3 Enum Attribute Values

1497 The following table lists all the new enum attribute values defined in this document as additional type2 enum values.
1498 These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.
1499
1500

```
1501  job-finishings (1setOf type2 enum)             [this spec] 5.1.4
```

```
1502    <enum values are the same as "finishings">
1503
1504  operations-supported (type2 enum)                    [rfc2911]   4.4.15
1505    0x000F    Close-Job                                [this spec] 3.1
1506
```

1507 13.4 Operations

1508 The following table lists all of the operations defined in this document. These are to be registered according to the
1509 procedures in RFC 2911 [rfc2911] section 6.4.
1510

```
1511  Operations                                           Reference   Section
1512  --------------------------                           ---------   --------
1513  Close-Job                                            [this spec] 3.1
```


1514 14 Internationalization Considerations

1515 The internationalization considerations for the~~is~~ extensions ~~for handling the Document object~~ defined in this
1516 specification are the same as for handling the Job object in [rfc2911].

1517 15 Security Considerations

1518 ~~None~~Printer implementations MUST ensure that the Close-Job operation is being performed by a client with proper
1519 authorization. Otherwise, a malicious user could close other people's jobs, thereby denying the rightful owner from
1520 adding additional documents to his/her Job. See section 3.1.

1521 16 Contributors

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19 Annex B: Change Log (informative)

1546   The following summaries of the changes in reverse chronological order:

1547   Version 0.1, 1744 May 2003:
1548   1. Split document out of Document Object specification.
1549   2. Moved "document-format-target" and "document-format-version-target" from the Job Template section to the
1550   Operation Attributes section so that it can be supplied with Document Creation operations and so that it
1551   MUST be honored, even if "job-attribute-fidelity" is 'false' or omitted.
1552   3. Removed all Document Description attributes and the concept of Job Level and Document Level. That
1553   terminology is introduced in the Document Object spec [ippdoc]. Now [ippdoc] is only an Informative
1554   Reference, not a Normative Reference.
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