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important information to review is highlighted like this.

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

11 **Abstract:** This IPP specification extends the Job semantics of the IPP Model and Semantics [rfc2911] object model.
12 This specification defines some new Operation attributes for use in Job Creation and Document Creation operations.
13 The Printer copies these Operation attributes to the corresponding Job Description attributes, which the clients may
14 query. The Document Creation Operation attributes describe the Document Content and permit the Printer to reject
15 requests that it cannot process correctly. Some corresponding "xxx-default" and "xxx-supported" Printer attributes
16 are defined. This specification defines some Job Template attributes that apply to a multi-document Job as a whole
17 and the "output-device" Job Template attribute that can apply to Documents and to Sheets as well as Jobs. This
18 specification also defines some additional values for the "job-state-reasons" Job Description attribute. Each of the
19 attributes defined in this specification are independent of each other and are OPTIONAL for a Printer to support.
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Working Draft, August 8, 2003

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

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

ftp://ftp.pwg.org/pub/pwg/ipp/new_JOBX/wd-ippjobx10-20030808.pdf, .doc, .rtf

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88 standards.

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103 end

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

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243

244 1 Introduction and Summary

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

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

259 1.1 Attributes Summary

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

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

Operation attribute	Printer support	Description
ipp-attribute-fidelity (boolean)	MUST	Allows the client to control whether or not the Printer MUST support <i>all</i> Job Template attributes supplied in Job Creation operation, else the Printer MUST reject the job. Defined in [rfc2911] section 3.2.1.2 and 15.
job-mandatory-attributes (1setOf type2 keyword)	MAY	Allows the client to list the Job Template attributes that the Printer MUST support when supplied in the Job Creation operation, else the Printer MUST reject the job.

263 Table 2 summarizes the Operation attributes defined in this specification for use with Job Creation operations and
 264 Send-Document and Send-URI operations. These Operation attributes allow the client to supply descriptions of the
 265 Document Content to the Printer about individual Document Contents at request time. When supplied in a Job
 266 Creation request, these Operation attributes provide defaults for the Document or Documents of the Job. When
 267 supplied in a Document Creation operation, they describe the Document explicitly. This specification does *not* define
 268 corresponding Document Description attributes, since this specification does not include or depend on a Document
 269 object¹.
 270

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

271

Table 2 - Summary of Job and Document Creation Operation attributes

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

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Table 3 summarizes the Job Template attributes defined in this specification for use with Job Creation operations. The Job Template attributes that have a "job-" prefix are defined to apply to the Job as a whole, independent of the value of the "multiple-document-handling" Job Template attribute ([rfc2911] section 4.2.4), whose 'separate-documents-collated-copies' and 'separate-documents-uncollated-copies' values cause the Printer to produce separate Output Documents. The "output-device" Job Template attribute is not restricted to be job-wide and can be supplied in Document Creation operations and in the "override" attribute to override at the Sheet level (see section 9). When supplied in a Document Creation operation, the "output-device" Job Template attribute describes the Document explicitly. This specification does *not* define corresponding Document Description attributes, since this specification does not include or depend on a Document object².

Table 3 - Summary of Job Template Attributes

Job Template attribute	Printer support	Description
job-copies (integer(1:MAX))	MAY	The number of copies of the entire Job.
job-cover-back (collection)	MAY	The cover for the back of the entire Job.
job-cover-front (collection)	MAY	The cover for the front of the entire Job.
job-finishings (1setOf type2 enum)	MAY	The finishing for the entire Job.
job-finishings-col (1setOf collection)	MAY	The finishing characteristics for the entire Job.
output-device (name(127))	MAY	Allows the client to indicate a preference for output devices, for a Printer that supports one or more output device (see fan-out in [rfc2911] section 2.1).

284

2 Terminology

285

This section defines terminology used throughout this document.

286

2.1 Conformance Terminology

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288

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

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

289 2.2 Other Terminology

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

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

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

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

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

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

307 **Page** - The term “Page” used throughout this document is a synonym for PDL page.

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

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

315 3 Operation Attributes for Job Creation and Document Creation operations

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

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

³ [rfc2911] uses the terms “Printer object” and “Printer” interchangeably to mean the same thing. For simplicity, this document uses the term “Printer” exclusively, except for definitions copied directly from [rfc2911]. Nonetheless, the intent is as in [rfc2911]: a Printer is an object that MAY be hosted in the device or in a server.

323

Table 4 - Operation, Default, and Supported Attributes

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

324 Table 5 lists the Operation attributes that clients supply in Job and Document Creation operations and whether the
 325 Printer copies (indicated by "? ") the supplied value to the corresponding Job Description⁴ attribute. The following
 326 statements apply to all Operation attributes for Job and Document Creation operations and are *not* repeated in each
 327 Operation attribute Description:

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

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

- 332 1. support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if
 333 defined (see Table 4 and section 7). If the Printer supports either of the "xxx-default" or "xxx-
 334 supported" Printer Description attributes, then the Printer MUST also support the corresponding
 335 Operation attribute.
- 336 2. validate the values supplied by the client in the "xxx" Operation attribute against the values indicated
 337 in the Printer's corresponding "xxx-supported" Printer Description attribute (see section 7). If the
 338 values do not validate, the Printer MUST perform one of the actions indicated for that Operation
 339 attribute, unless explicitly specified otherwise in the Description, such as (1) reject the request, (2)
 340 accept the request and either (a) hold the job for operator intervention or (b) print the Job ignoring
 341 the attribute. In all of these cases, the Printer MUST return the Operation attribute with the
 342 unsupported value in the Unsupported Attributes group in the response (see [rfc2911] section 3.1.7).

⁴ The operations defined for Document Creation operations do not have corresponding Document Description attributes defined in this specification, since this specification does not assume that there is a Document object. See [ippdoc] for the corresponding Document Description attributes.

Legend:	
“Operation”	Column indicates the operation attribute names for Job and Document Creation requests.
“*”	Following attribute name indicates value sent on Create-Job, Print-Job and Print-Uri is the default for all the Documents in the Job.
“Creation operations”	Column indicates which operations the Operation attribute can be supplied in: PJ=Print-Job, PU=Print-URI, CJ=Create-Job, SD=Send-Document, and SU=Send-URI.
“y”	The Operation attribute is defined for use with the indicated operations.
“y? ”	The Operation attribute is defined for use with the indicated operations. It has a corresponding Job Description attribute (see section 4.1.5.4) defined that the Printer MUST support and to which the Printer MUST copy this Operation attribute, if it supports the Operation attribute. See Table 4 for whether there are corresponding “xxx-default” and “xxx-supported” Printer Description attributes defined.
“y? **”	Same as above except the corresponding Job Description attribute has an “-supplied” suffix appended to the Operational attribute name.
“-”	the Operation attribute is <i>not</i> defined for the indicated operation.
“Conformance”	column indicates the conformance requirements for what the client supplies in a request and the Printer supports in a request. For (indented) member attributes, a MUST means if the collection attribute is supplied or supported.
“Section”	column indicates where the Operation attribute is defined in this spec.

343

344

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

Operation attribute name	Attribute Syntax	Creation operations			Conformance		Section
		CJ	PJ, PU	SD, SU	Client supply	Printer support	
The following 10 Operation attributes have corresponding “xxx-supplied” Job Description attributes:							
compression	type2 keyword	y? **	y? **	y	MAY	MAY	§3.2.1
document-charset*	charset	y? **	y? **	y	MAY	MAY	§3.2.2
document-digital-signature*	type2 keyword	y? **	y? **	y	MAY	MAY	§3.2.3
document-format*	mimeMediaType	y? **	y? **	y	MAY	MUST	§3.2.4
document-format-details*	1setOf collection	y? **	y? **	y	MAY	MAY	§3.2.5
document-source-application-name*	name(40)	y?	y?	y	MAY	MAY	§3.2.5.1
document-source-application-version*	text(127)	y?	y?	y	MAY	MAY	§3.2.5.2
document-source-os-name*	name(40)	y?	y?	y	MAY	MAY	§3.2.5.3
document-source-os-version*	text(40)	y?	y?	y	MAY	MAY	§3.2.5.4
document-format*	mimeMediaType	y?	y?	y	MUST	MUST	§3.2.5.5
document-format-device-id*	text(127)	y?	y?	y	MAY	MAY	§3.2.5.6
document-format-version*	text(127)	y?	y?	y	SHOULD	MUST	§3.2.5.7
document-natural-language*	naturalLanguage	y?	y?	y	MAY	MAY	§3.2.5.8
document-format-version*	text(127)	y? **	y? **	y	MAY	MAY	§3.2.6
document-message*	text(MAX)	y? **	y? **	y	MAY	MAY	§3.2.7
document-name*	name(MAX)	y? **	y? **	y	MAY	MUST	§3.2.8
document-natural-language*	naturalLanguage	y? **	y? **	y	MAY	MAY	§3.2.9
ipp-attribute-fidelity	boolean	y?	y?	-	MAY	MUST	§3.1.1,
job-mandatory-attributes	1setOf type2 keyword	y?	y?	-	MAY	MAY	§3.1.2

345

346 **3.1 Operation attributes for Job Creation operations only**

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

349 **3.1.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)**

350 This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1) when the client
351 supplies unsupported Job Template attributes⁵ or values in a Job Creation operation. The value 'true' indicates that
352 total fidelity to client-supplied Job Template attributes and values is required for this Job Creation operation. If the
353 client supplies the value 'false' or omits the attribute, then the Printer MUST accept the Job Creation operation.

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

355 **3.1.1.1 Why there are no “ipp-attribute-fidelity-default” and “ipp-attribute-fidelity-supported” attributes**

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

359 **3.1.2 job-mandatory-attributes (1setOf type2 keyword)**

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

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

371 The Printer MUST copy this attribute to the corresponding “job-mandatory-attributes” Job Description attribute (see
372 section 5.1.3) for auditing and trouble-shooting purposes⁶.

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

378 The Printer MUST accept *any* keyword values for the “job-mandatory-attributes” attribute itself whether or not the
379 corresponding Job Template attributes are supported by the Printer and MUST NOT return any unsupported
380 keywords in the Unsupported Attributes Group in the response. If the client supplies this “job-mandatory-attributes”
381 Operation attribute in a Job Creation operation with values that represent Job Template attributes that the Printer

⁵ The value of the “ipp-attribute-fidelity” Operation attribute has no effect on other *Operation* attributes supplied by the client, only on Job Template attributes supplied by the client.

⁶ The Printer uses the “job-mandatory-attributes” Job Description attribute for validating subsequent Document Template attributes supplied in Send-Document and Send-URI operations for this job when also supporting [ippdoc], where the client can supply Document Template attributes.

382 doesn't support, the Printer MUST otherwise accept the attribute anyway. The Printer MUST reject this Job Creation
383 only if the client *actually supplies* any of the identified Job Template attributes that the Printer doesn't support.
384 Because the Printer doesn't reject when the "job-mandatory-attributes" Operation attribute has unsupported attribute
385 keyword names, the client MAY supply all of the attribute keyword names that the client supports without having to
386 tailor the list to the particular Printer to which the client is submitting the Job Creation operation, thereby simplifying
387 client use of this attribute.

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

390 **3.1.2.1 Why there are no "job-mandatory-attributes-default" and "job-mandatory-attributes-supported"** 391 **Printer Description attributes**

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

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

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

403 **3.2 Operation attributes for both Job and Document Creation operations**

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

407 **3.2.1 compression (type2 keyword)**

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

411 **3.2.2 document-charset (charset)**

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

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

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

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

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

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

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

446 **3.2.3 document-digital-signature (type2 keyword)**

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

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

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

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

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

472 The following standard keyword values are defined:

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

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

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

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

478 'xmldsig' XML Digital Signature [xmldsig].

479 3.2.4 document-format (mimeMediaType)

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

484 The standard values for this attribute are Internet Media types (sometimes called MIME types). For some MIME
 485 types, such as 'text/plain' [rfc2046], the "; charset=" parameter is defined which specifies the charset of the Document
 486 content. The Printer MUST support the charset MIME parameter as well as the "document-charset" Operation
 487 attribute (section 3.2.2) if the Printer supports any text MIME type, such as 'text/plain' or 'text/html'. For further
 488 details see the description of the 'mimeMediaType' attribute syntax in [rfc2911] section 4.1.9 and [rfc2046] and the
 489 "document-charset" Operation attribute (section 3.2.2).

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

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

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

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

⁷ Companies are urged to register their 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'.

504 **3.2.5 document-format-details (1setOf collection)**

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

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

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

516 If a client supplies the "document-format-details" Operation attribute in a Document Creation request with member
 517 attributes and/or values that the Printer doesn't support, the Printer MUST perform one of the following actions
 518 depending on implementation: (1) reject the request OR (2) accept the request and either (a) put the Job in the
 519 'pending-held' state or (b) process the job ignoring the attribute. See section 3 above for more details. However, if
 520 the "document-charset" or the "document-format" member attributes are the ones in question, the Printer MUST
 521 reject the request, same as for the "document-charset" and "document-format" Operation attributes (see sections
 522 3.2.2 and 3.2.4) and return the 'client-error-charset-not-supported' (see [rfc2911] section 13.1.4.16) or the 'client-
 523 error-document-format-not-supported' (see [rfc2911] section 13.1.4.11) status-codes, respectively.

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

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

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

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

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

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

Member Attribute Name	Attribute Syntax	Client supplies	Printer Support	Member Attribute	Top Level Attribute
-----------------------	------------------	-----------------	-----------------	------------------	---------------------

⁸ If the client wants to achieve a "manifest", that is a complete list of each file in a packaging, then the client needs to extract each file from the package and submit each one in a separate Document Creation operation. Note: the client can re-compress each file before sending, so the compression isn't lost when sending each document separately.

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

541
542 The client can determine which member attributes of the “document-format-details” are supported by querying the
543 Printer’s “document-format-details-supported” (1setOf type2 keyword) Printer Description attribute (see section 7.6).

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

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

553 **3.2.5.1 document-source-application-name (name(MAX))**

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

558 **3.2.5.2 document-source-application-version (text(127))**

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

563 “8.1 (4331)” for Winzip? , “5.0.5 10/26/2001” for Acrobat? , “2000 (9.0.4119 sr-1)” for Microsoft? Word

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

566 **3.2.5.3 document-source-os-name (name(40))**

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

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

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

574 **3.2.5.4 document-source-os-version (text(40))**

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

580 Possible example values for the indicated "document-source-os-name" value are:

581 for 'linux': '1.0', '1.2', '2.0', '2.2', '2.4'

582 for 'unix': 'bsd', 'v', 'v.1', 'v.2', 'v.3', 'pc'

583 for 'windows': '95', '98', 'ce', 'nt', 'nt-2', 'nt-3', 'nt-3.5', 'nt-3.51', 'nt-4', 'nt-5' (windows 2000),

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

585

586 **3.2.5.5 document-format (mimeMediaType)**

587 This REQUIRED member Operation attribute identifies the document format (see [rfc2911] §3.2.1.1) of the
588 collection value of which it is a member. The client MUST supply and the Printer MUST support this member
589 attribute in each collection value. The values for this member attribute are Internet Media types (sometimes
590 called MIME types) and have the same values and semantics as for the top level "document-format"
591 Operation attribute with the same name (see section 3.2.4 for the semantics).

592 **3.2.5.6 document-format-device-id (text(127))**

593 This OPTIONAL member Operation attribute identifies the type of device for which the document was
594 formatted, including manufacturer and model. This attribute is intended to identify document formats that are
595 not portable, e.g., PDLs that are device dependent. The value of this variable MUST exactly match the IEEE
596 1284-2000 Device ID string (see [IEEE1284] clause 6), except the length field MUST NOT be specified. See
597 the Microsoft Universal Plug and Play [upnp] section 2.2.6 DeviceId parameter for details and examples.

598 Here is an example showing only the required fields for a PostScript document:

599 `MANUFACTURER:ACME Co.;COMMAND SET:PS;MODEL:LaserBeam 9;`

600 **3.2.5.7 document-format-version (text(127))**

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

607 **3.2.5.8 document-natural-language (1setOf naturalLanguage)**

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

614 **3.2.6 document-format-version (text(127))**

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

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

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

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

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

635 Example values:

636 'PS/3': For Postscript level 3 [rfc1759].
637 'PCL/5e': For PCL 5e [rfc1759].
638 'PDF/1.4': For PDF version 1.4 [pdf]
639 'PDF/X-1a:2001': For PDF/X-1a [iso15930]
640 'DCS/2.0' For Document Color Separation (DCS), version 2.0. [dcs2.0]
641 'TIFF-IT/FP:1998': TIFF/IT [iso12639] - Full Page - baseline.
642 'TIFF-IT/CT:1998': TIFF/IT [iso12639] - Continuous Tone picture data - baseline
643 'TIFF-IT/FP/P1:1998': TIFF/IT [iso12639] - Full Page - profile 1
644 'TIFF-IT/CT/P1:1998': TIFF/IT [iso12639] - Continuous Tone picture data - profile 1
645 'Automatic': auto sense the format [rfc1759]. Is use in combination with the 'application/octet-stream' (see
646 [rfc2911] section 4.1.9.1) value of the "document-format" attribute (section 3.2.4).
647

648 **3.2.6.1 Why no "document-format-version-default"**

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

652 **3.2.7 document-message (text(MAX))**

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

654 **3.2.8 document-name (name(MAX))**

655 The Printer MUST support this Operation attribute in Print-Job, Print-URI, Send-Document, and Send-URI operations
 656 (see [rfc2911 section 3.2.1.1) and MAY support it in the Create-Job operation. For the Print-Job, Print-URI, and
 657 Create-Job operations, the Printer MUST copy the value to the corresponding Job Description attribute⁹.

658 **3.2.9 document-natural-language (naturalLanguage)**

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

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

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

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

673 **4 Job Template attributes**

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

677 Job Template attributes are OPTIONAL for a Printer to support and for a client to supply in a Job Creation request. If
 678 a Printer supports a Job Template attribute, then the Printer MUST copy the supplied attribute to the Job object, so
 679 that a client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs operations (see [rfc2911] section
 680 4.2). In addition, as in [rfc2911], for each "xxx" Job Template attribute supported, the Printer MUST support the
 681 corresponding "xxx-default" and "xxx-supported" Printer attributes, if defined.

682 **Table 7 - Job Template attributes**

Job Template attribute name "xxx"	Attribute Syntax	Printer: Default Value attribute syntax "xxx-default"	Printer: Supported Values attribute syntax "xxx-supported"
job-copies	integer(1:MAX)	integer(1:MAX)	rangeOfInteger(1:MAX)

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

Job Template attribute name "xxx"	Attribute Syntax	Printer: Default Value attribute syntax "xxx-default"	Printer: Supported Values attribute syntax "xxx-supported"
job-cover-back	collection	collection	1setOf type2 keyword
cover-type	type2 keyword	-	1setOf type2 keyword
media	type3 keyword name(MAX)	-	1setOf (type3 keyword name(MAX))
media-col	collection	-	1setOf type2 keyword
member attributes [pwg5100.3]	See [pwg5100.3]	-	-
job-cover-front	collection	collection	1setOf type2 keyword
member attributes - same as job-cover-back	see job-cover-back		
job-finishings	1setOf type2 enum	1setOf type2 enum ¹⁰	1setOf type2 enum
job-finishings-col	collection	collection ¹⁰	1setOf type2 keyword
finishing-template	name(MAX)	-	1setOf name(MAX)
stitching	collection		1setOf type2 keyword
stitching-reference-edge	type2 keyword	-	1setOf type2 keyword
stitching-offset	integer (0:MAX)	-	1setOf (integer(0:MAX) rangeOfInteger(0:MAX))
stitching-locations	1setOf integer(0:MAX)	-	1setOf (integer(0:MAX) rangeOfInteger(0:MAX))
output-device	name(127)	-	1setOf name(127)
print-content-optimize	type2 keyword	type2 keyword	1setOf type2 keyword

683 4.1 Job Template attributes defined for Job-wide effect in multi-document jobs

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

690 4.1.1 job-copies (integer(1:MAX))

691 This OPTIONAL Job Template attribute specifies the number of job copies, i.e., with all of the Documents taken
692 together. Its interpretation is independent of the value of the "multiple-document-handling" Job Template attribute.
693 See the "copies" Job Template attribute defined in [rfc2911] section 4.2.5 that switches between job copies and
694 document copies depending on the value of the "multiple-document-handling" Job Template attribute ([rfc2911]
695 section 4.2.4).

696 For example assume a Job has two documents. The "copies" attribute has a value of '3' and "job-copies" has a
697 value of '2'. With "multiple-document-handling" set to 'separate-documents-collated-copies' the resulting printout
698 would have two sets (i.e. job-copies=2). The first set would be 3 copies of Document 1 and then 3 copies of
699 Document 2. The second set would be identical to the first. If a similar Job was run with "multiple-documents-
700 handling" set to 'single-document-new-sheet' it would also produce two set. In this case however each set would
701 contain Document 1, Document 2, Document 1, Document 2, Document 1, Document 2 (i.e copies=3). The "copies"
702 and "job-copies" become more interesting when Documents within the Job each have their own value of "copies".
703 This can be accomplished via the Document object [ippdoc] or Overrides [PWG5100.4], [ippOverride].

¹⁰ The "job-finishings" and "job-finishings-col" Job Template attributes also include corresponding "job-finishings-ready" (1setOf type 2 enum) and "job-finishings-col-ready" (1setOf collection) attributes.

704 4.1.1.1 job-copies-default (integer(1:MAX))

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

707 4.1.1.2 job-copies-supported (rangeOfInteger(1:MAX))

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

710 4.1.1.3 job-copies-actual (1setof Integer(1:MAX))

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

713 4.1.2 job-cover-back (collection)

714 This OPTIONAL Job Template attribute specifies the cover for the back of the job, i.e., with all of the Documents
715 taken together and is independent of the value of the "multiple-document-handling" Job Template attribute. The
716 member attributes are the same as "cover-back" (see [pwg5100.3] section 3.1) and with the same conformance
717 requirements. However, the "cover-back" Job Template attribute switches between a job back cover and a document
718 back cover depending on the value of the "multiple-document-handling" Job Template attribute ([rfc2911] section
719 4.2.4). The "job-cover-back" Job Template attribute is equivalent to "cover-back" with "multiple-document-handling" =
720 'single-document-new-sheet'.

721 4.1.2.1 job-cover-back-default (collection)

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

724 4.1.2.2 job-cover-back-supported (1setOf type2 keyword)

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

728 4.1.2.3 job-cover-back-actual (1setOf collection)

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

732 4.1.3 job-cover-front (collection)

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

740 **4.1.3.1 job-cover-front-default (collection)**

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

743 **4.1.3.2 job-cover-front-supported (1setOf type2 keyword)**

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

747 **4.1.3.3 job-cover-front-actual (1setOf collection)**

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

751 **4.1.4 job-finishings (1setOf type2 enum)**

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

758 **4.1.4.1 job-finishings-default (1setOf type2 enum)**

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

761 **4.1.4.2 job-finishings-ready (1setOf type2 enum)**

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

765 **4.1.4.3 job-finishings-supported (1setOf type2 enum)**

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

768 **4.1.4.4 job-finishings-actual (1setOf type2 enum)**

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

771 **4.1.5 job-finishings-col (1setOf collection)**

772 This OPTIONAL Job Template attribute specifies the job finishings collection, i.e., with all of the Documents taken
773 together. Its interpretation is independent of the value of the "multiple-document-handling" Job Template attribute.
774 See the "finishings-col" Job Template attribute defined in [pwg5100.3] section 3.2 that switches between job
775 finishings collection and document finishings collection depending on the value of the "multiple-document-handling"

776 Job Template attribute ([rfc2911] section 4.2.4). The "job-finishings-col" Job Template attribute is equivalent to
777 "finishings-col" with "multiple-document-handling" = 'single-document-new-sheet'.

778 4.1.5.1 job-finishings-col-default (collection)

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

781 4.1.5.2 job-finishings-col-ready (collection)

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

785 4.1.5.3 job-finishings-col-supported (1setOf type2 keyword)

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

789 4.1.5.4 job-finishings-col-actual (1setOf collection)

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

793 4.2 Job Template attributes that may have Document Scope and Override Scope

794 This section defines additional Job Template attributes that are *not* restricted to job-wide scope and MAY be supplied
795 in Document Creation operations and in the "override" attribute to override at the Sheet level (see section 9). When
796 supplied in a Document Creation operation, these Job Template attributes describes the Document explicitly. This
797 specification does *not* define corresponding Document Description attributes, since this specification does not include
798 or depend on a Document object¹¹.

799 4.2.1 output-device (name(127))

800 This OPTIONAL Job Template attribute specifies the name of the target output device for a Printer that fans-out to
801 multiple devices (see [rfc2911] section 2.1). This allows the client to control which output device the Printer selects.
802 If this Job Template attribute is omitted, the Printer selects whichever output device seems best for the job in an
803 implementation dependent manner. Note that "output-device" can be applied at the Job, Document, Document-Copy
804 or Page level.

805 4.2.1.1 Why there is no output-device-default

806 There is no "output-device-default" Printer attribute. A Printer MAY have a dynamic scheduling algorithm to assign
807 jobs to output devices, in which case the "output-device-supported" Printer attribute would have multiple values. A
808 client that did not supply an explicit "output-device" is asking the Printer to choose the most appropriate output
809 device(s) (i.e. physical printer(s)) to print the Job. If "output-device-default" was allowed there would be no way to
810 request this since the default output device would be assigned when it was not supplied by the client. If the Printer

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

811 does not have a dynamic scheduling algorithm to assign Jobs to output devices, the Printer would populate "output-
812 device-supported" with only one value.

813 **4.2.1.2 output-device-supported (1setOf name(127))**

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

816 **4.2.1.3 output-device-actual (1setOf name(127))**

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

821 For example printers that automatically splits Jobs between OutputDevices can indicate the location of the pages of
822 the Job via this element This can occur if the Printer automatically routes Pages to the appropriate output device or
823 "output-device" is included in an "override" or applied to individual Documents within the Job.

824 **4.2.2 print-content-optimize (type2 keyword)**

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

829 The standard keyword values are:

- 830 ? 'photo': optimize for photographic clarity
- 831 ? 'graphic': optimize for graphic clarity such as graphs and line drawings
- 832 ? 'text': optimize for text clarity
- 833 ? 'text-and-graphic': optimize for both text and graphic clarity

834 **4.2.2.1 print-content-optimize-default (type2 keyword)**

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

837 **4.2.2.2 print-content-optimize-supported(1setOf type2 keyword)**

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

840 **4.2.2.3 print-content-optimize-actual (1setOf type2 keyword)**

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

845

846 **5 Job Description attributes**

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

852 This section divides Job Descriptions into two subsections: Section 5.1 contains Job Description attributes that
 853 describe the Job as a whole and Section 5.2 contains Job Description attributes that are defaults for the Document(s)
 854 in the Job¹². The following legend is used in the tables in both sections:

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

855

856 **5.1 Job Description attributes that describe the Job as a whole**

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

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

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

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

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

869 **5.1.1 errors-count (integer(0:MAX))**

870 This OPTIONAL Job Description attribute counts the number of errors encountered processing the job as a whole.
 871 An error where some portion of the printed output is not present, such as a glyph encountered which isn't in the
 872 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
 873 overall document format.

874 **5.1.2 ipp-attribute-fidelity (boolean)**

875 This OPTIONAL Job Description attribute indicates the value of the corresponding "ipp-attribute-fidelity" Operation
 876 attribute ([rfc2911] section 3.2.1.1)¹³ that the client supplied in the Job Creation operation. This Job Description
 877 attribute has no effect on the processing of the job once the Job Creation operation has been accepted¹⁴. However,
 878 this attribute does provide an audit capability to the user and service desk for comparing unexpected printed results
 879 with what was submitted.

880 **5.1.3 job-mandatory-attributes (1setOf type2 keyword)**

881 This OPTIONAL Job Description attribute indicates which Job Template attributes that the client required that the
 882 Printer Support in order to accept the Job Creation request. The Printer populates this attribute with the value of the
 883 corresponding "job-mandatory-attributes" Operation attribute (see section 3.1.2) supplied by the client in the Job
 884 Creation operation. This Job Description attribute has no effect on the processing of the job once the Job Creation
 885 operation has been accepted¹⁴. However, this Job Description attribute does provide an audit capability of the Job
 886 object in the Job History (see [rfc2911] section 4.3.7.2) to the user and service desk for comparing unexpected
 887 printed results with what was submitted. See section 3.1.2 for additional details of the semantics of this "job-
 888 mandatory-attributes" Operation attribute that are not repeated here.

889 **5.1.4 warnings-count (integer(0:MAX))**

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

892 **5.2 Job Description attributes that are defaults for the Document(s) in the Job**

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

895 **5.2.1 compression-supplied (type3 keyword)**

896 This REQUIRED Job Description attribute specifies the *default* compression used to represent the document(s) in
 897 the Job. The Printer sets this Job Description attribute from the corresponding Operation attribute (see [rfc2911]
 898 §3.2.1.1) supplied by the client in the Job Creation operation.

899 **5.2.2 document-charset-supplied (charset)**

900 This OPTIONAL Job Description attribute specifies the *default* charset used to represent this document (see section
 901 3.2.2). The Printer sets this Job Description attribute from the corresponding Operation attribute supplied by the
 902 client in the Job Creation operation.

¹³ The "ipp-attribute-fidelity" attribute is defined only as an Operation attribute in [rfc2911]. This specification is defining it as a Job Description attribute as well which the Printer MAY support.

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

903 5.2.3 document-digital-signature-supplied (type2 keyword)

904 This OPTIONAL Job attribute specifies the *default* digital signature technology used in the Document content. The
905 Printer sets this Job Description attribute from the corresponding “document-digital-signature” Operation attribute
906 (see section 3.2.3 for the semantics), if supplied by the client in the Job Creation operation. If a Printer supports the
907 “document-digital-signature” Operation attribute, the Printer MUST support this “document-digital-signature” Job
908 Description attribute.

909 5.2.4 document-format-details-supplied (1setOf collection)

910 This OPTIONAL Job Description attribute specifies the *default* details of the document format(s) of the Document
911 Object content. The Printer sets this Job Description attribute from the corresponding “document-format-details”
912 Operation attribute (see section 3.2.5 for the semantics), if supplied by the client in the Job Creation operation. If a
913 Printer supports the “document-format-details” Operation attribute, the Printer MUST support this “document-format-
914 details” Job Description attribute.

915 5.2.5 document-format-supplied (mimeMediaType)

916 This REQUIRED¹⁵ Job Description attribute specified the *default* document format of the Document Object content.
917 The Printer sets this Job Description attribute from the corresponding “document-format” Operation attribute (see
918 [rfc2911] section 3.2.1.1 and [this spec] section 3.2.4 for the semantics), if supplied by the client in the Job Creation
919 operation.

920 5.2.6 document-format-version-supplied (text(127))

921 This OPTIONAL Job Description attribute specifies the *default* version of the document format of the Document
922 Object content. The Printer sets this Job Description attribute from the corresponding “document-format-version”
923 Operation attribute (see section 3.2.6 for the semantics), if supplied by the client in the Job Creation operation (see
924 section). If a Printer supports the “document-format-version” Operation attribute, the Printer MUST support this
925 “document-format-version” Job Description attribute.

926 5.2.7 document-message-supplied (text(MAX))

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

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

934 5.2.8 document-name-supplied (name (MAX))

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

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

938 5.2.9 document-natural-language-supplied (naturalLanguage)

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

942 6 New values to existing attributes

943 This section defines new values for existing attributes.

944 6.1 New job-state-reasons(1setOf type2 keyword) Values

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

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

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

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

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

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

959 For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely
 960 to occur (if implemented):
 961

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

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

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

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

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

980 **6.2 New media (type 3 keyword | name(MAX)) Values**

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

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

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

990 See Annex A (section 19) for additional requirements for a revision of the PWG IEEE/ISTO 5101.1 Candidate
 991 Standard [pwg5101.1] to include the new **'choice_iso_a4_210x297mm_na_letter_8.5x11in'** and other choice
 992 values.

993 **7 New Printer Description attributes**

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

998 The column labels are:
 999

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

1000

1001

Table 10 - New Printer Description attributes

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

1002

1003 **7.1 document-charset-default (charset)**

1004 This OPTIONAL Printer Description attribute indicates the default charset that the Printer will assume for charset-
 1005 ambiguous document formats when the client omits the “document-charset” Operation attribute (section 3.2.2). The
 1006 Printer MUST support this attribute if it supports the corresponding “document-charset” Operation attribute (see
 1007 section 3.2.2)

1008 **7.2 document-charset-supported (1setOf charset)**

1009 This OPTIONAL Printer Description attribute indicates the charsets that the Printer supports in Document Content,
 1010 that is, supports as values of the “document-charset” Operation attribute (section 3.2.2). The Printer MUST support
 1011 this attribute if it supports the corresponding “document-charset” Operation attribute (see section 3.2.2).

1012 **7.3 document-digital-signature-default (type2 keyword)**

1013 This OPTIONAL Printer Description attribute indicates the default digital signature, if any, that the Printer will assume
 1014 when the client omits the “document-digital-signature” Operation attribute (section 3.2.3). The Printer MUST support
 1015 this attribute if it supports the “document-digital-signature” Operation attribute.

1016 **7.4 document-digital-signature-supported (1setOf type2 keyword)**

1017 This OPTIONAL Printer Description attribute indicates the digital signature technologies that the Printer supports in
 1018 Document Contents, that is, supports as values of the “document-digital-signature” Operation attribute (section
 1019 3.2.3). The Printer MUST support this attribute if it supports the “document-digital-signature” Operation attribute.

1020 **7.5 document-format-details-default (collection)**

1021 This OPTIONAL Printer Description attribute indicates the default document format details that the Printer will
 1022 assume when the client omits the “document-format-details” Operation attribute (section §3.2.5). The member
 1023 attributes are the same as “document-format-details” (see section 3.2.5). The Printer MUST support this attribute, if it
 1024 supports the “document-format-details” Operation attribute (see section 3.2.5).

1025 **7.6 document-format-details-supported (1setOf type2 keyword)**

1026 This OPTIONAL Printer Description attribute lists the type2 keyword names of the member attributes of “document-
 1027 format-details” that the Printer supports. The Printer MUST support this “document-format-details” (1setOf type2
 1028 keyword) Printer Description attribute, if the Printer supports the “document-format-details” (1setOf collection)
 1029 Operation attribute (see section 3.2.5). Table 11 lists the type2 keywords defined for use in the “document-format-
 1030 details-supported” Printer attribute.

1031 **Table 11 - Keyword values of "document-format-details-supported Printer attribute**

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

1032

1033 **7.7 document-format-version-default (text(127))**

1034 This OPTIONAL Printer Description attribute indicates the default document format version that the Printer will
 1035 assume when the client omits the “document-format-version” Operation attribute (section 3.2.6). The Printer MUST
 1036 support this attribute if it supports the “document-format-version” Operation attribute.

1037 **7.8 document-format-version-supported (1setOf text(127))**

1038 This OPTIONAL Printer Description attribute indicates the document format versions that the Printer supports for
 1039 Document Contents, that is, supports as values of the “document-format-version” Operation attribute (section 3.2.6).
 1040 The Printer MUST support this attribute if it supports the “document-format-version” Operation attribute.

1041 **7.9 document-natural-language-default (naturalLanguage)**

1042 This OPTIONAL Printer Description attribute indicates the default document natural language that the Printer will
 1043 assume for Document Content when the client omits the “document-natural-language” Operation attribute ([rfc2911]
 1044 section 3.2.1.1). The Printer MUST support this attribute if it supports the “document-natural-language” Operation
 1045 attribute.

1046 **7.10 document-natural-language-supported (1setOf naturalLanguage)**

1047 This OPTIONAL Printer Description attribute lists the natural languages supported in any of the supported document
 1048 formats, that is, it is the union of the natural languages. The Printer MUST support this attribute if it supports the
 1049 “document-natural-language” Operation attribute ([rfc2911] section 3.2.1.1).

1050 8 Status codes

1051 This section defines additional status codes.

1052 8.1 server-error-too-many-jobs (0x050B)

1053 The client has attempted to create a Job using any of the Job Creation operations which would exceed the capacity
1054 of the Printer. The client MAY try the unmodified request again at some later point in time with an expectation that
1055 the capacity condition may have changed.

1056 8.2 server-error-too-many-documents (0x050C)

1057 The client has attempted to create a Document using any of the Document Creation operations which would exceed
1058 the capacity of the Printer for this Job. The client MAY try the unmodified request again at some later point in time
1059 with an expectation that the capacity condition may have changed.

1060 9 Override Scope of Attributes

1061 This section defines the Override Scope of the Job Template attributes. An Override Scope is only applicable when
1062 the Job Template attribute is applied as part of an Override [ippOverride]. An Override allows specifying Job
1063 Template attributes that apply to a portion of a Job. The portion of the Job that an Override can apply is referred to
1064 as its Scope. A Scope is the smallest entity to which a Job Template attribute applies. The order of Scopes is: a Job
1065 contains one or more Documents that are printed on one or more Sheets that have up to two Impressions containing
1066 one or more Pages. For a Printer to support a Job Template attribute in an Override, it MUST support the Job
1067 Template at the specified Scope. Furthermore the scope of the attribute MUST be 'Sheet', 'Impression' or 'Page'.
1068 Although operation attributes can not be used in an Override, their scope is of interest to determine their applicability
1069 in "Send-Document" and "Send-Uri". The various possible scopes of Operation and Job Template attributes are:

1070	Job	Job Template Attributes that operate on whole Jobs are not applicable as page overrides.
1071	Document	Job Template Attributes that operate on whole Documents are not applicable as page
1072		overrides. (The Document operations "Send-Document" and Send-Iri" as well as the
1073		Document Object [ippdoc] are used to apply overrides at this level.)
1074	Sheet	Job Template Attributes that operate on whole Sheets, such as "media" and "finishings".
1075		Attributes with this scope MAY be included in "overrides".
1076	Impression	Job Template Attributes that operate on whole Impressions, such as "number-up" or "x-
1077		side1-image-shift". Attributes with this scope MAY be included in "overrides".
1078	Page	Job Template Attributes that operate on whole Pages, such as "orientation-requested" or
1079		"print-quality". Attributes with this scope MAY be included in "overrides".
1080		

1081 9.1 Override Scope of Job Template attributes

1082 By definition only the "output-device" and "print-content-optimize" attributes from this specification can be used in an
1083 Override.

1084 **Table 12 Override Scope for Job Template Attributes**

Attribute Name	Override Scope

Attribute Name	Scope
document-format-details	Document
document-format-version	Document
document-format-natural-language	Document
document-message	Document
document-name	Document
document-natural-language	Document

1093

1094 **10 Conformance Requirements**

1095 This specification contains a number of independent OPTIONAL attributes. This section summarizes the
 1096 conformance requirements for Printers and clients.

1097 **10.1 Printer conformance requirements**

1098 In order to claim conformance to this specification,

- 1099 1. A Vendor MUST explicitly identify the attributes and values supported by the Printer implementation in
 1100 any such claim of conformance. In addition, the Vendor's Printer implementation:
- 1101 2. MUST meet the conformance requirements for Printers specified in [rfc2911].
- 1102 3. MUST support one or more OPTIONAL Operation attribute according to section 3 and the corresponding
 1103 Job Description attributes in section 4.1.5.4 and corresponding Printer attributes in section 7. & and
 1104 combine with #3
- 1105 4. MAY support any Job Template attribute according to section 4.
- 1106 5. MAY support any of the "job-state-reasons" values according to section 6.

1107 **10.2 Client conformance requirements**

1108 In order to claim conformance to this specification,

- 1109 1. A Vendor MUST explicitly identify the attributes and values supported by the client implementation in any
1110 such claim of conformance. In addition, the Vendor's client:
- 1111 2. MUST meet the conformance requirements for clients specified in [rfc2911]
- 1112 3. MUST support at least one Operation attribute according to section 3 and the corresponding Job Description
1113 attributes in section 4.1.5.4 and corresponding Printer attributes in section 7. & combine with #3
- 1114 4. MAY support any Job Template attribute according to section 4.

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1209 13 IANA Considerations

1210 This section contains the registration information for IANA to add to the various IPP Registries according to the
 1211 procedures defined in RFC 2911 [rfc2911] section 6 to cover the definitions in this document. The resulting
 1212 registrations will be published in the <http://www.iana.org/assignments/ipp-registrations> registry.

1213 *Note to the PWG Editor: Replace the References below to [this spec] with the IEEE-ISTO standard number*
 1214 *for the appropriate document, so that it accurately reflects the content of the information for the IANA Registry.*

1215 13.1 Attribute Registrations

1216 The following table lists all the attributes defined in this specification. These are to be registered according to the
 1217 procedures in RFC 2911 [rfc2911] section 6.2. If the attribute has a separate sub-section definition in this
 1218 specification, that sub-section is listed as the Reference. This table contains the reference to another specification
 1219 that completely defines each attribute.

1220	1221 Attribute Name (attribute syntax)	1222 Reference	1223 Section
1224	-----	-----	-----
1224	Job Description attributes:		
1225	compression-supplied (type3 keyword)	[this spec]	5.2.1
1226	document-charset-supplied (charset)	[this spec]	5.2.2
1227	document-digital-signature-supplied (type2 keyword)		
1228		[this spec]	5.2.3
1229	document-format-details-supplied (lsetOf collection)		
1230		[this spec]	5.2.4
1231	document-source-application-name (name(MAX))	[this spec]	5.2.4
1232	document-source-application-version (text(127))		
1233		[this spec]	5.2.4
1234	document-source-os-name (name(40))	[this spec]	5.2.4
1235	document-source-os-version (text(40))	[this spec]	5.2.4
1236	document-format (mimeMediaType)	[this spec]	5.2.4
1237	document-format-device-id (text(127))	[this spec]	5.2.4
1238	document-format-version (text(127))	[this spec]	5.2.4
1239	document-natural-language (lsetOf naturalLanguage)		
1240		[this spec]	5.2.4
1241	document-format-supplied (mimeMediaType)	[this spec]	5.2.5
1242	document-format-version-supplied (text(127))	[this spec]	5.2.6
1243	document-message-supplied (text(MAX))	[this spec]	5.2.7
1244	document-name-supplied (name(MAX))	[this spec]	5.2.8
1245	document-natural-language-supplied (naturalLanguage)		
1246		[this spec]	5.2.9
1247	errors-count (integer(0:MAX))	[this spec]	5.1.1
1248	job-attribute-fidelity (boolean)	[this spec]	5.1.2
1249	job-mandatory-attributes (lsetOf type2 keyword)	[this spec]	5.1.3
1250	warnings-count (integer(0:MAX))	[this spec]	5.1.4

1251
 1252 **Job Template attributes:**

1253	job-copies (integer(1:MAX))	[this spec]	4.1.1
1254	job-copies-default (integer(1:MAX))	[this spec]	4.1.1.1
1255	job-copies-supported (rangeOfInteger(1:MAX))	[this spec]	4.1.1.2
1256	job-copies-actual (1setOf Integer(1:MAX))	[this spec]	4.1.1.3
1257	job-cover-back (collection)	[this spec]	4.1.2
1258	<member attributes are the same as "cover-back"	[pwg5100.3]	3.1>
1259	job-cover-back-default (collection)	[this spec]	4.1.2.1
1260	<member attributes are the same as "cover-back"	[pwg5100.3]	3.1>
1261	job-cover-back-supported (1setOf type2 keyword)	[this spec]	4.1.2.2
1262	job-cover-back-actual (1setOf collection)	[this spec]	4.1.2.3
1263	<member attributes are the same as "cover-back"	[pwg5100.3]	3.1>
1264	job-cover-front (collection)	[this spec]	
1265	4.1.34.1.2.3		
1266	<member attributes are the same as "cover-front"	[pwg5100.3]	3.1>
1267	job-cover-front-default (collection)	[this spec]	4.1.3.1
1268	<member attributes are the same as "cover-front"	[pwg5100.3]	3.1>
1269	job-cover-front-supported (1setOf type2 keyword)	[this spec]	4.1.3.2
1270	job-cover-front (1setOf collection)	[this spec]	4.1.3.3
1271	<member attributes are the same as "cover-front"	[pwg5100.3]	3.1>
1272	job-finishings (1setOf type2 enum)	[this spec]	4.1.4
1273	job-finishings-default (1setOf type2 enum)	[this spec]	4.1.4.1
1274	job-finishings-ready (1setOf type2 enum)	[this spec]	4.1.4.2
1275	job-finishings-supported (1setOf type2 keyword)	[this spec]	4.1.4.3
1276	job-finishings-actual (1setOf type2 enum)	[this spec]	4.1.4.4
1277	job-finishings-col (1setOf collection)	[this spec]	4.1.5
1278	<member attributes are the same as "finishings-col"	[pwg5100.3]	3.2>
1279	job-finishings-col-default (1setOf type2 enum)	[this spec]	4.1.5.1
1280	job-finishings-col-ready (1setOf type2 enum)	[this spec]	4.1.5.2
1281	job-finishings-col-supported (1setOf type2 keyword)		
1282		[this spec]	4.1.5.3
1283	job-finishings-col-actual (1setOf collection)	[this spec]	4.1.5.4
1284	<member attributes are the same as "finishings-col"	[pwg5100.3]	3.2>
1285	output-device (name(127))	[this spec]	4.2.1
1286	output-device-ready (1setOf name(127))	[this spec]	Error!
1287	Reference source not found.		
1288	output-device-supported (1setOf name(127))	[this spec]	4.2.1.2
1289	output-device-actual (1setOf name(127))	[this spec]	4.2.1.3
1290	print-content-optimize (type2 keyword)	[this spec]	4.2.2
1291	print-content-optimize-default (type2 keyword)	[this spec]	4.2.2.1
1292	print-content-optimize-supported (1setOf type2 keyword)		
1293		[this spec]	4.2.2.2
1294	print-content-optimize-actual (1setOf type2 keyword)		
1295		[this spec]	4.2.2.3
1296			
1297	Printer Description attributes:		
1298	document-charset-default (charset)	[this spec]	7.1

1299	document-charset-supported (1setOf charset)	[this spec]	7.2
1300	document-digital-signature-default (type2 keyword)	[this spec]	7.3
1301	document-digital-signature-supported (1setOf type2 keyword)		
1302		[this spec]	7.4
1303	document-format-details-default (collection)	[this spec]	7.5
1304	<member attributes are the same as "document-format-details"		
1305		[this spec]	3.2.5>
1306	document-format-details-supported (1setOf type2 keyword)		
1307		[this spec]	7.6
1308	document-format-version-default (text(127))	[this spec]	7.7
1309	document-format-version-supported (1setOf text(127))	[this spec]	7.8
1310	document-natural-language-default (naturalLanguage)	[this spec]	7.9
1311	document-natural-language-supported (1setOf naturalLanguage)		
1312		[this spec]	7.10

1313

1314 **Operation attributes:**

1315	document-charset (charset)	[this spec]	3.2.2
1316	document-digital-signature (type2 keyword)	[this spec]	3.2.3
1317	document-format-details (1setOf collection)	[this spec]	3.2.5
1318	document-source-application-name (name(MAX))	[this spec]	3.2.5.1
1319	document-source-application-version (text(127))		
1320		[this spec]	3.2.5.2
1321	document-source-os-name (name(40))	[this spec]	3.2.5.3
1322	document-source-os-version (text(40))	[this spec]	3.2.5.4
1323	document-format (mimeMediaType)	[this spec]	3.2.5.5
1324	document-format-device-id (text(127))	[this spec]	3.2.5.6
1325	document-format-version (text(127))	[this spec]	3.2.5.7
1326	document-natural-language (1setOf naturalLanguage)		
1327		[this spec]	3.2.5.8
1328	document-format-version (text(127))	[this spec]	3.2.6
1329	document-natural-language (naturalLanguage)	[this spec]	3.2.9
1330	job-mandatory-attributes (1setOf type2 keyword)	[this spec]	3.1.2

1331 **13.2 Keyword attribute values**

1332	document-digital-signature (type2 keyword)	[this spec]	3.2.3
1333	document-digital-signature-default (type2 keyword)		
1334		[this spec]	7.3
1335	document-digital-signature-supported (1setOf type2 keyword)		
1336		[this spec]	7.4
1337	dss	[this spec]	3.2.3
1338	none	[this spec]	3.2.3
1339	pgp	[this spec]	3.2.3
1340	smime	[this spec]	3.2.3
1341	xmldsig	[this spec]	3.2.3
1342			
1343	document-format-details-supported (1setOf type2 keyword)		

1344		[this spec]	7.6
1345	document-source-application-name	[this spec]	7.6
1346	document-source-application-version	[this spec]	7.6
1347	document-source-os-name	[this spec]	7.6
1348	document-source-os-version	[this spec]	7.6
1349	document-format	[this spec]	7.6
1350	document-format-device-id	[this spec]	7.6
1351	document-format-version	[this spec]	7.6
1352	document-natural-language	[this spec]	7.6
1353			
1354	job-cover-back-supported (1setOf type2 keyword)	[this spec]	4.1.2.2
1355	<same as "cover-back-supported">	[pwg5100.3]	3.1.4
1356	job-cover-front-supported (1setOf type2 keyword)	[this spec]	4.1.2.2
1357	<same as "cover-front-supported">	[pwg5100.3]	3.1.4
1358	job-mandatory-attributes (1setOf type2 keyword)	[this spec]	3.1.2
1359	<any Job Template attribute keyword>		
1360			
1361	job-state-reasons (1setOf type2 keyword)	[rfc2911]	4.3.8
1362	digital-signature-did-not-verify	[this spec]	6.1
1363	digital-signature-type-not-supported	[this spec]	6.1
1364	errors-detected	[this spec]	6.1
1365	job-digital-signature-wait	[this spec]	6.1
1366	warnings-detected	[this spec]	6.1
1367			
1368	media (type2 keyword name(MAX))	[rfc2911]	4.2.11
1369	choice_iso_a4_210x297mm_na_letter_8.5x11in	[this spec]	6.2
1370	print-content-optimize (type2 keyword)	[this spec]	4.2.2
1371	photo	[this spec]	4.2.2
1372	graphic	[this spec]	4.2.2
1373	text	[this spec]	4.2.2
1374	text-and-graphic	[this spec]	4.2.2
1375			

1376 13.3 Enum Attribute Values

1377 The following table lists all the new enum attribute values defined in this document as additional type2 enum values.
 1378 These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.

1379			
1380	job-finishings (1setOf type2 enum)	[this spec]	4.1.3.3
1381	job-finishings-default (1setOf type2 enum)	[this spec]	4.1.4.1
1382	job-finishings-ready (1setOf type2 enum)	[this spec]	4.1.4.2
1383	job-finishings-supported (1setOf type2 enum)	[this spec]	4.1.4.3
1384	<enum values are the same as "finishings">		
1385			
1386	job-finishings-col-supported (1setOf type2 keyword)		
1387		[this spec]	4.1.5.3
1388	<same as for "finishing-col-supported">	[pwg5100.3]	3.2.5

1389 14 Internationalization Considerations

1390 The internationalization considerations for the extensions defined in this specification are the same as for handling
1391 the Job object in [rfc2911].

1392 15 Security Considerations

1393 This specification adds no more security burden on Printer implementations than does [rfc2911].

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1419 19 Annex A: Additional requirements for a revision of the PWG IEEE/ISTO 1420 5101.1 Candidate Standard [pwg5101.1] to add the new 'choice_xxx'

1421 This section also generalizes the choice mechanism for inclusion in a revision to the PWG IEEE/ISTO 5101.1
1422 Candidate Standard [pwg5101.1]. This specification gives the *outline* of the proposed addition to [pwg5101.1] for
1423 information only, in order to agree to the one new value defined for use with IPPFAX, namely,
1424 'choice_iso_a4_210x297mm_na_letter_8.5x11in'.

1425 The proposed extension to [pwg5101.1] will have the following requirements:

- 1426 1. The ABNF will be extended to define the `'choice_'` prefix to introduce a list of choices of self describing
1427 names.
- 1428 2. Following the `'choice_'` prefix will be two or more fully self describing names, including all three fields.
- 1429 3. The order of the list of fully self describing names MUST be in alphabetic order, so that there is only one
1430 canonical order for each list of choices.
- 1431 4. Printer MAY support dynamic combinations of supported values or MAY support the entire choice value as a
1432 conventional keyword which it simply matches for validation purposes.
- 1433 5. Printer MUST map the choice value to a particular supported value when selecting the actual media for
1434 marking.
- 1435 6. If the Printer supports a `'choice_xxx'` "media" attribute value and the "media-ready" Printer attribute, the
1436 Printer MUST include the `'choice_xxx'` value in its "media-ready" Printer attribute as well as the currently
1437 loaded value(s) when at least one of the members of a choice value is ready. For example, if
1438 `'iso_a4_210x297mm'` is loaded, then the "media-ready" Printer attribute MUST include the
1439 `'iso_a4_210x297mm'` and the `'choice_iso_a4_210x297mm_na_letter_8.5x11in'` values.

1440 20 Annex B: Change Log (informative - to be removed before publication)

1441 The following summaries of the changes in chronological order:

1442 Version 0.1, 18 May 2003:

- 1443 1. Split document out of Document Object specification.
- 1444 2. Moved "document-format-target" and "document-format-version-target" from the Job Template section to the
1445 Operation Attributes section so that it can be supplied with Document Creation operations and so that it
1446 MUST be honored, even if "job-attribute-fidelity" is 'false' or omitted.
- 1447 3. Removed all Document Description attributes and the concept of Job Level and Document Level. That
1448 terminology is introduced in the Document Object spec [ippdoc]. Now [ippdoc] is only an Informative
1449 Reference, not a Normative Reference.

1450

1451 Version 0.2, 19 May 2003:

- 1452 1. Did *not* include the document-format-target and document-format-version-target attributes. PSI has their own
1453 definitions and we can avoid the discussion as to whether they should be Document Template attributes or
1454 Operation attributes on Document Creation operations and whether there should be a "document-format-
1455 target-default" and a "document-format-version-target-default".

1456

1457 Version 0.3, 28 May 2003:

1458 Agreements reached at the May 28, 2003 telecon:

- 1459 1. Moved the Close-Job operation to the futures specification.
- 1460 2. Added the "pages-per-subset" Job Template from [pwg5100.4]. See Appendix B section **Error! Reference
1461 source not found.** for the minor differences.
- 1462 3. Added the terms: "Best Effort, Finished Document, Page, Page Subset, and Sheet.
- 1463 4. Clarified the conformance relationships between "xxx" Operation attributes and their corresponding "xxx-
1464 default" and "xxx-supported" Printer attributes.
- 1465 5. Added rationale for each missing "xxx-default" and "xxx-supported" attribute.
- 1466 6. Added 'errors-detected' and 'warnings-detected' 'job-state-reasons' values.
- 1467 7. Added the new `'choice_iso_a4_210x297mm_na_letter_8.5x11in'` "media" attribute value which is a choice
1468 of two approximately equal media.
- 1469 8. Added the requirements for choice media keyword values for inclusion in a revision of the PWG IEEE-ISTO
1470 5101.1.

- 1471 9. Changed the "document-format-implemented" member attribute from 1setOf mimeType to
 1472 mimeType since it is the key attribute value.
 1473 10. Added another "document-format-implemented" example.
 1474 11. Updated the IANA section to agree with the additions.
 1475

1476 Version 0.4, June 4, 2003:

- 1477 1. Moved "document-format-details-implemented" Printer Description attribute to Futures.
 1478 2. Moved "pages-per-subset" (1setOf integer(1:MAX)) Job Template attribute to Futures.
 1479 3. Removed all CONDITIONALLY REQUIRED and CMUST statements and made them OPTIONAL and MAY.
 1480 Added a statement of the intent for these attributes, so avoid the conformance statement problems for this
 1481 specification which is just a list of OPTIONAL attributes.
 1482 4. Removed the new terms "Honor" and "Best Effort", since they are synonym for "Support" and the opposite. It
 1483 is confusing to have synonyms.
 1484 5. Added all of the new Operation/Job Description attributes that describe Documents to be supplied in Job
 1485 Creation operations and copied to the corresponding Job Description attributes as *default* values for the
 1486 Document(s) of the Job.
 1487 6. Added "output-device-default" and "output-device-supported" Printer attribute to provide the default for both
 1488 the "output-device" Operation attribute and the "output-device-assigned" Job Description attribute.
 1489 7. Added "document-message" and "document-name" as Operation/Job Description default Document
 1490 attributes for the Job.
 1491 8. Clarified that the 'none' value of the "document-digital-signature" must be implemented, but the administrator
 1492 MAY remove the 'none' value in order to require signatures to be used.
 1493 9. Sated that all supplied member attributes of the "document-format-details" Operation attribute MUST have a
 1494 value, i.e., MUST NOT be empty.
 1495 10. Normalized all of the Application Names and versions and Operating System Name values from the IANA
 1496 Registry to lower case, as is done with most other IPP attributes, in order to facilitate matching.

1497 Moved the requirements for the new 'choice_xxx' values to be added to PWG 5101.1.
 1498

1499 Version 0.6, August 8, 2003:

- 1500 1. Changed "output-device-requested" to "output-device"
 1501 2. Made "output-device" a Job Template attribute, instead of an Operation attribute for the following two
 1502 reasons: (1) so that it can be used at the Sheet level in "overrides" to print a Sheet containing color pages on
 1503 a color printer while the other Sheets are printed on a black and white printer and (2) so that the "output-
 1504 device-actual" can be used to indicate the actual device(s) used, since [rfc2911] "output-device-assigned" is
 1505 only single valued.
 1506 3. Updated introduction
 1507 4. Added xxx-supplied to Job Description & updated table 5
 1508 5. "output-device-default" explicitly prohibited & split out into its own section
 1509 6. Added "output-device" multivalue issue/resolution.
 1510 7. Added overrides summary and scoping of new attributes
 1511 8. Added "-actual"s
 1512 9. Added Section 9 "Override Scope of Attributes"
 1513 10. Added "print-content-optimized"
 1514 11. Moved "server-too-many-*" error codes from Document Object spec to here.
 1515