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

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

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

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47 Operation extensions

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85 Program of the IEEE ISTO." In order to meet this objective, the PWG will document the results of their work as open
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87 vendors of printer related software will benefit from the interoperability provided by voluntary conformance to these
88 standards.

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

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95 Contact information:

96 IPP Web Page: <http://www.pwg.org/ipp/>
97 IPP Mailing List: ipp@pwg.org

98 To subscribe to the ipp mailing list, send the following email:

- 99 1) send it to majordomo@pwg.org
100 2) leave the subject line blank
101 3) put the following two lines in the message body:
102 subscribe ipp
103 end

104 Implementers of this specification are encouraged to join the IPP Mailing List in order to participate in any
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
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242 1 Introduction and Summary

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

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

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Deleted: Note: There are a number of footnotes that relate this IPP specification to the IPP Document Object extension [ippdoc].

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257 1.1 Attributes Summary

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

260 Table 1 - Summary of Job Creation Operation attributes

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

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Deleted: one or more output device (see

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

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

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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 object.

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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).

2 Terminology

This section defines terminology used throughout this document.

2.1 Conformance Terminology

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].

287 **2.2 Other Terminology**

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

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

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

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

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

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

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

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

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

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

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

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

Deleted: **Page** - a synonym for the term "print-stream page" as defined in [rfc2911] section 12.2.4. A **Page** is a page according to the definition of a page in the language used to express the document data (PDL). Usually a **Page** contains a single page as intended by the author of the source document. However, if the application that generates the PDL places multiple author pages on a single **Page**, they are still considered a single **Page** as far as the Printer and this specification is concerned. ¶
Sheet - the unit of media that a printer puts marks on. A **Sheet** is the most basic unit of output from a Printer. A printer may mark on one side or on both sides of a **Sheet**. ¶

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

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321 Table 4 - Operation, Default, and Supported Attributes

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

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Deleted: 1setOf name(127)
Inserted: output-device
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Deleted: name(127)
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Deleted: DMC ISSUE: Need to add document-message and document-name to above table, as well as other places in the spec. ¶

322 Table 5 lists the Operation attributes that clients supply in Job and Document Creation operations and whether the
323 Printer copies (indicated by "?") the supplied value to the corresponding Job Description⁶ attribute. The following
324 statements apply to all Operation attributes for Job and Document Creation operations and are *not* repeated in each
325 Operation attribute Description:

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

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

- 330 1. support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if
331 defined (see Table 4 and section 7). If the Printer supports either of the "xxx-default" or "xxx-
332 supported" Printer Description attributes, then the Printer MUST also support the corresponding
333 Operation attribute.
- 334 2. validate the values supplied by the client in the "xxx" Operation attribute against the values indicated
335 in the Printer's corresponding "xxx-supported" Printer Description attribute (see section 7). If the
336 values do not validate, the Printer MUST perform one of the actions indicated for that Operation

⁶ The operations defined for Document Creation operations do not have corresponding Document Description attributes defined in this specification, since this specification does not assume that there is a Document object. See [ippdoc] for the corresponding Document Description attributes.

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- Deleted: for Job and Document Creation requests

Operation attribute name	Attribute Syntax	Creation operations			Conformance		Section
		CJ	PJ, PU	SD, SU	Client supply	Printer support	
job-mandatory-attributes	1setOf type2 keyword	y?	y?	+	MAY	MAY	§3.1.2

- Deleted: NOTE: The following operational attribute has a corresponding Job Template attributes
- Inserted: NOTE: The following operational attribute has a corresponding Job Template attributes
- Deleted: output-device-requested
- Deleted: output-device
- Inserted: output-device
- Deleted: name(127)
- Deleted: y?
- Deleted: y?
- Deleted: +
- Deleted: MAY
- Deleted: MAY
- Deleted: §1.1.1

343
344 **3.1 Operation attributes for Job Creation operations only**

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

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

348 This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1) when the client supplies unsupported Job Template attributes⁷ or values in a Job Creation operation. The value 'true' indicates that total fidelity to client-supplied Job Template attributes and values is required for this Job Creation operation. If the client supplies the value 'false' or omits the attribute, then the Printer MUST accept the Job Creation operation.

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

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

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

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

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

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

⁷ The value of the "ipp-attribute-fidelity" Operation attribute has no effect on other *Operation* attributes supplied by the client, only on Job Template attributes supplied by the client.

369 The Printer MUST copy this attribute to the corresponding "job-mandatory-attributes" Job Description attribute (see
370 section 5.1.3) for auditing and trouble-shooting purposes⁸.

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

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

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

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

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

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

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

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

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

⁸ The Printer uses the "job-mandatory-attributes" Job Description attribute for validating subsequent Document
Template attributes supplied in Send-Document and Send-URI operations for this job when also supporting [ippdoc],
where the client can supply Document Template attributes.

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Deleted: ~~<>~~output-device
requested (name(127))¶
This OPTIONAL Operation attribute
specifies the name of the target
output device for a Printer that fans-
out to multiple devices (see [rfc2911]
section 2.1). This allows the client to
control which output device the
Printer selects. If this attribute is
omitted, the Printer selects whichever
output device seems best for the job
in an implementation dependent
manner. The client can discover
which output devices the Printer
supports by querying the Printer's
"output-device-requested-supported"
Printer attribute (see section 7.12). ¶
If the Printer supports this Operation
attribute, the Printer MUST support it
only on Job Creation operations, not
subsequent Document Creation
operations for this Job. ¶
If the Printer supports this Operation
attribute, the Printer MUST support
the "output-device-assigned" Job
Description attribute with the same
values (see [rfc2911] section 4.3.13). ¶
~~<>~~output-device-default
(name(MAX))¶
This OPTIONAL Printer Description
attribute specifies the default value for
the Job's "output-device-assigned"
Job Description attribute. A Printer
MAY have a dynamic scheduling
algorithm to assign jobs to output
devices, in which case the "output-
device-default" Printer attribute is not
configured. If the Printer does not
have a dynamic scheduling algorithm
to assign Jobs to output devices, the
Printer copies the value of the
"output-device-default" Printer
attribute to the Job's "output-device-
assigned" attribute when the client
omits the "output-device-requested"
Operation attribute. ¶

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405 **3.2.1 compression (type2 keyword)**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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470 The following standard keyword values are defined:

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

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

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

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

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

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

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

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

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

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

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

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

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

522 For a packaging format, the "document-format-details" attribute does not provide means to associate each collection
 523 value with particular document in the archive file, so it does not provide a "manifest"¹⁰ of the packaging. One of the
 524 packaging collection values MAY describe the packaging format itself, in which case that collection value MUST be
 525 the first collection value. The remaining collection values provide the summary of the details of the contained files in
 526 any order.

⁹ 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'.

¹⁰ If the client wants to achieve a "manifest", that is a complete list of each file in a packaging, then the client needs to extract each file from the package and submit each one in a separate Document Creation operation. Note: the client can re-compress each file before sending, so the compression isn't lost when sending each document separately.

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

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

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

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

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

Member Attribute Name	Attribute Syntax	Client supplies	Printer Support	Member Attribute Section	Top Level Attribute Section
document-source-application-name	name(MAX)	MAY	MAY	3.2.5.1	N/A
document-source-application-version	text(127)	MAY	MAY	3.2.5.2	N/A
document-source-cs-name	name(40)	MAY	MAY	3.2.5.3	N/A
document-source-cs-version	text(40)	MAY	MAY	3.2.5.4	N/A
document-format	mimeMediaType	MUST	MUST	3.2.5.5	3.2.4
document-format-device-id	text(127)	MAY	MAY	3.2.5.6	N/A
document-format-version	text(127)	SHOULD	MUST	3.2.5.7	3.2.6
document-natural-languages	1setOf naturalLanguage	MAY	MAY	3.2.5.8	3.2.9

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

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

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

551 **3.2.5.1 document-source-application-name (name(MAX))**

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

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556 **3.2.5.2 document-source-application-version (text(127))**

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

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

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

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564 **3.2.5.3 document-source-os-name (name(40))**

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

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

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

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572 **3.2.5.4 document-source-os-version (text(40))**

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

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

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

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

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

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

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584 **3.2.5.5 document-format (mimeMediaType)**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

633 Example values:

634 'PS/3': For Postscript level 3 [rfc1759].
635 'PCL/5e': For PCL 5e [rfc1759].
636 'PDF/1.4': For PDF version 1.4 [pdf]
637 'PDF/X-1a:2001': For PDF/X-1a [iso15930]
638 'DCS/2.0' For Document Color Separation (DCS), version 2.0. [dcs2.0]

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639 'TIFF-IT/FP:1998': TIFF/IT [iso12639] - Full Page - baseline .
640 'TIFF-IT/CT:1998': TIFF/IT [iso12639] - Continuous Tone picture data - baseline
641 'TIFF-IT/FP/P1:1998': TIFF/IT [iso12639] - Full Page - profile 1
642 'TIFF-IT/CT/P1:1998': TIFF/IT [iso12639] - Continuous Tone picture data - profile 1
643 'Automatic': auto sense the format [rfc1759]. Is use in combination with the 'application/octet-stream' (see
644 [rfc2911] section 4.1.9.1) value of the "document-format" attribute (section 3.2.4).
645

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Deleted: <#>output-device

(name(127))¶

This OPTIONAL Operation attribute

specifies the name of the target

output device for a Printer that fans-

out to multiple devices (see [rfc2911]

section 2.1). This allows the client to

control which output device the

Printer selects. If this attribute is

omitted, the Printer selects whichever

output device seems best for the job

in an implementation dependent

manner. The client can discover

which output devices the Printer

supports by querying the Printer's

"output-device-supported" Printer

attribute (see section 7.11). ¶

If the Printer supports this Operation

attribute, the Printer MUST support

the "output-device-assigned" Job

Description attribute with the same

values (see [rfc2911] section 4.3.13).

See section 4.1.6 for additional

information on "output-device" and

related attributes.¶

ISSUE01: The Job Description

attribute "output-device-assigned" is

single-valued even though "output-

device" can be supplied at the Job,

Document and page Override (i.e.

sheet) level. Proposed resolution:

Leave the Job Description attribute

single-valued. This will prevent any

interoperability problems with existing

implementations. It will also handle

the majority of uses. Add a single-

valued Document Description

attribute in [ippdoc] to handle

document level. Implementations that

allow the routing of individual sheets

should be capable of implementing "-

actuals". Even if they don't the

"overrides" Template attribute will

contain the requested output devices.¶

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

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

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

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

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

653 The Printer MUST support this Operation attribute in Print-Job, Print-URI, Send-Document, and Send-URI operations
654 (see [rfc2911 section 3.2.1.1) and MAY support it in the Create-Job operation. For the Print-Job, Print-URI, and
655 Create-Job operations, the Printer MUST copy the value to the corresponding Job Description attribute¹¹.

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

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

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

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

- 666 'en': for English
- 667 'en-us': for US English
- 668 'fr': for French
- 669 'de': for German
- 670

671 **4 Job Template attributes**

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

Inserted: <#>output-device

(name(127))¶

This OPTIONAL Operation attribute

specifies the name of the target

output device for a Printer that fans-

out to multiple devices (see [rfc2911]

section 2.1). This allows the client to

control which output device the

Printer selects. If this attribute is

omitted, the Printer selects whichever

output device seems best for the job [...]

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

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

680 **Table 7 - Job Template attributes**

Job Template attribute name "xxx"	Attribute Syntax	Printer: Default Value attribute syntax "xxx-default"	Printer: Supported Values attribute syntax "xxx-supported"
job-copies	integer(1:MAX)	integer(1:MAX)	rangeOfInteger(1:MAX)
job-cover-back	collection	collection	1setOf type2 keyword
cover-type	type2 keyword	-	1setOf type2 keyword
media	type3 keyword name(MAX)	-	1setOf (type3 keyword name(MAX))
media-col	collection	-	1setOf type2 keyword
<i>member attributes [pwg5100.3]</i>	See [pwg5100.3]	-	-
job-cover-front	collection	collection	1setOf type2 keyword
<i>member attributes - same as job-cover-back</i>	see job-cover-back		
job-finishings	1setOf type2 enum	1setOf type2 enum ¹²	1setOf type2 enum
job-finishings-col	collection	collection ¹²	1setOf type2 keyword
finishing-template	name(MAX)	-	1setOf name(MAX)
stitching	collection	-	1setOf type2 keyword
stitching-reference-edge	type2 keyword	-	1setOf type2 keyword
stitching-offset	integer (0:MAX)	-	1setOf (integer(0:MAX) rangeOfInteger(0:MAX))
stitching-locations	1setOf integer(0:MAX)	-	1setOf (integer(0:MAX) rangeOfInteger(0:MAX))
output-device	name(127)		1setOf name(127)
print-content-optimize	type2 keyword	type2 keyword	1setOf type2 keyword

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

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

688 **4.1.1 job-copies (integer(1:MAX))**

689 This OPTIONAL Job Template attribute specifies the number of job copies, i.e., with all of the Documents taken
 690 together. Its interpretation is independent of the value of the "multiple-document-handling" Job Template attribute.
 691 See the "copies" Job Template attribute defined in [rfc2911] section 4.2.5 that switches between job copies and
 692 document copies depending on the value of the "multiple-document-handling" Job Template attribute ([rfc2911]
 693 section 4.2.4).
 694 For example assume a Job has two documents. The "copies" attribute has a value of '3' and "job-copies" has a
 695 value of '2'. With "multiple-document-handling" set to 'separate-documents-collated-copies' the resulting printout

Deleted: The "job-copies" Job Template attribute is equivalent to "copies" with "multiple-document-handling" = 'single-document-new-sheet'. Issue to Pete: You know this stuff much better than I —would it be possible to add a small example, or a few small examples, that illustrates how "job-copies" and "copies" work, especially if they were both used at the same time? Just an idea.

¹² 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.

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

702 4.1.1.1 job-copies-default (integer(1:MAX))

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

705 4.1.1.2 job-copies-supported (rangeOfInteger(1:MAX))

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

708 4.1.1.3 job-copies-actual (1setof Integer(1:MAX))

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

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711 4.1.2 job-cover-back (collection)

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

719 4.1.2.1 job-cover-back-default (collection)

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

722 4.1.2.2 job-cover-back-supported (1setOf type2 keyword)

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

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

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

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730 4.1.3 job-cover-front (collection)

731 This OPTIONAL Job Template attribute specifies the cover for the front of the job, i.e., with all of the Documents
 732 taken together and is independent of the value of the "multiple-document-handling" Job Template attribute. The
 733 member attributes are the same as the "cover-front" Job Template attribute (see [pwg5100.3] section 3.2) and with
 734 the same conformance requirements. However, the "cover-front" Job Template attribute switches between a job

735 front cover and a document front cover depending on the value of the "multiple-document-handling" Job Template
 736 attribute ([rfc2911] section 4.2.4). The "job-cover-front" Job Template attribute is equivalent to "cover-front" with
 737 "multiple-document-handling" = 'single-document-new-sheet'.

738 4.1.3.1 job-cover-front-default (collection)

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

741 4.1.3.2 job-cover-front-supported (1setOf type2 keyword)

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

745 4.1.3.3 job-cover-front-actual (1setOf collection)

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

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749 4.1.4 job-finishings (1setOf type2 enum)

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

756 4.1.4.1 job-finishings -default (1setOf type2 enum)

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

759 4.1.4.2 job-finishings -ready (1setOf type2 enum)

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

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

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

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

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

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

770 This OPTIONAL Job Template attribute specifies the job finishings collection, i.e., with all of the Documents taken
771 together. Its interpretation is independent of the value of the "multiple-document-handling" Job Template attribute.
772 See the "finishings-col" Job Template attribute defined in [pgw5100.3] section 3.2 that switches between job
773 finishings collection and document finishings collection depending on the value of the "multiple-document-handling"
774 Job Template attribute ([rfc2911] section 4.2.4). The "job-finishings-col" Job Template attribute is equivalent to
775 "finishings-col" with "multiple-document-handling" = 'single-document-new-sheet'.

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

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

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

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

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

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

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

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

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

792 This section defines additional Job Template attributes that are *not* restricted to job-wide scope and MAY be supplied
793 in Document Creation operations and in the "override" attribute to override at the Sheet level (see section 9). When
794 supplied in a Document Creation operation, these Job Template attributes describes the Document explicitly. This
795 specification does *not* define corresponding Document Description attributes, since this specification does not include
796 or depend on a Document object¹³.

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Deleted: Description

Deleted: indicates the name of the output device that the client has supplied in the "output -device" Operation attribute (see section 1.1.1), if any, in the Job Creation operation. The Printer sets the Job's "output-device-assigned" Job Description attribute (see [rfc2911] section ZZZ) to the name of the actual device assigned.

797 **4.2.1 output-device (name(127))**

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

Inserted: indicates the name of the output device that the client has supplied in the "output -device" Operation attribute (see section 1.1.1), if any, in the Job Creation operation. The Printer sets the Job's "output-device-assigned" Job Description attribute (see [rfc2911] section ZZZ) to the name of the actual device assigned.

¹³ For Document Description attributes that correspond to the Operation attributes defined for Document Creation operations, see the Document object defined in [ippdoc].

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803 4.2.1.1 Why there is no output-device-default

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

Deleted: ISSUE 01: The [rfc2911] Job Description attribute "output-device-assigned" is single-valued even though the "output-device" Job Template can be supplied at the Job, Document and page Override (i.e. Sheet) level. Proposed resolution: Leave the Job Description attribute single-valued. This will prevent any interoperability problems with existing implementations. It will also handle the majority of uses. Add a single-valued "output-device" Job Template attribute which MAY be supplied in a Document Creation operation to give it Document scope and in the "overrides" attribute to give it Sheet scope..

811 4.2.1.2 output-device-supported (1setOf name(127))

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

Deleted: Document Description attribute in [ippdoc] to handle document level

814 4.2.1.3 output-device-actual (1setOf name(127))

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

Deleted: Implementations that allow the routing of individual ... [6]

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

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822 4.2.2 print-content-optimize (type2 keyword)

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

Inserted: Implementations that allow the routing of individual ... [7]

827 The standard keyword values are:

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

Deleted: <#> output-device-ready (1setOf name(127))¶ ... [8]

832 4.2.2.1 print-content-optimize-default (type2 keyword)

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

Inserted: <#> output-device-ready (1setOf name(127))¶ ... [9]

835 4.2.2.2 print-content-optimize-supported(1setOf type2 keyword)

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

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838 4.2.2.3 print-content-optimize-actual (1setOf type2 keyword)

839 This OPTIONAL Job Description attribute specifies the "print-content-optimize" (s) that the Printer actually used to
840 produce the job [ippact]. The Printer MAY support this Job Description attribute even if it does not support the "print-

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841 content-optimize " Job Template attribute. Note: The "print-content-optimize -actual" attribute MAY have more than
842 one value, while the "print-content-optimize" Job Description attribute has only a single value.

843

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844 5 Job Description attributes

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

850 This section divides Job Descriptions into two subsections: Section 5.1 contains Job Description attributes that
851 describe the Job as a whole and Section 5.2 contains Job Description attributes that are defaults for the Document(s)
852 in the Job¹⁴. The following legend is used in the tables in both sections:

Legend:

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

853

854 5.1 Job Description attributes that describe the Job as a whole

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

857 **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

Deleted: output-device-req... [14]

858

859 Most of the existing "job-state" and "job-state-reasons" Job Description attribute values apply equally well to
860 individual documents in a multi-document job (with removal of the 'job-' prefix for those that apply to both Job and
861 Document). Furthermore, the job states are completely service-type neutral, so they can apply to scanning, faxing,
862 and formatting processes as well. The job state reasons have a number of reasons that are print service specific, but
863 most can apply to other types of service as well. The reason for separating state from reasons is so that the states
864 can be the fundamental states that most implementations have, while the state reasons can vary depending on the

¹⁴ The [jobx] specification does not define any Document Description attributes. See the [ippdoc] specification.

865 sophistication of the system. The states are the ones that clients are most likely to base actions upon, and the state
866 reasons are more information, both for programs and people.

867 **5.1.1 errors-count (integer(0:MAX))**

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

872 **5.1.2 ipp-attribute-fidelity (boolean)**

873 This OPTIONAL Job Description attribute indicates the value of the corresponding "ipp-attribute-fidelity" Operation
874 attribute ([rfc2911] section 3.2.1.1)¹⁵ that the client supplied in the Job Creation operation. This Job Description
875 attribute has no effect on the processing of the job once the Job Creation operation has been accepted¹⁶. However,
876 this attribute does provide an audit capability to the user and service desk for comparing unexpected printed results
877 with what was submitted.

878 **5.1.3 job-mandatory-attributes (1setOf type2 keyword)**

879 This OPTIONAL Job Description attribute indicates which Job Template attributes that the client required that the
880 Printer Support in order to accept the Job Creation request. The Printer populates this attribute with the value of the
881 corresponding "job-mandatory-attributes" Operation attribute (see section 3.1.2) supplied by the client in the Job
882 Creation operation. This Job Description attribute has no effect on the processing of the job once the Job Creation
883 operation has been accepted¹⁶. However, this Job Description attribute does provide an audit capability of the Job
884 object in the Job History (see [rfc2911] section 4.3.7.2) to the user and service desk for comparing unexpected
885 printed results with what was submitted. See section 3.1.2 for additional details of the semantics of this "job-
886 mandatory-attributes" Operation attribute that are not repeated here.

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887 **5.1.4 warnings-count (integer(0:MAX))**

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

Deleted: ~~output-device-
requested (name(127))~~
This OPTIONAL Job Description attribute indicates the name of the output device that the client has supplied in the "output-device-requested" Operation attribute (see section 3.1.3), if any, in the Job Creation operation. The Printer sets the Job's "output-device-assigned" Job Description attribute (see [rfc2911] section) to the name of the actual device assigned. ¶

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890 **5.2 Job Description attributes that are defaults for the Document(s) in the Job**

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

893 **5.2.1 compression-supplied (type3 keyword)**

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

¹⁵ 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.

¹⁶ 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].

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897 **5.2.2 document-charset-supplied (charset)**

898 This OPTIONAL Job Description attribute specifies the *default* charset used to represent this document (see section
899 3.2.2). The Printer sets this Job Description attribute from the corresponding Operation attribute supplied by the
900 client in the Job Creation operation.

901 **5.2.3 document-digital-signature-supplied (type2 keyword)**

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

907 **5.2.4 document-format-details-supplied (1setOf collection)**

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

913 **5.2.5 document-format-supplied (mimeMediaType)**

914 This REQUIRED¹⁸ Job Description attribute specified the *default* document format of the Document Object content.
915 The Printer sets this Job Description attribute from the corresponding "document-format" Operation attribute (see
916 [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
917 operation.

Deleted: ~~document-format~~
(mimeMediaType) ¶

This REQUIRED¹⁷ Job Description attribute specified the *default* document format of the Document Object content. The Printer sets this Job Description attribute from the corresponding "document-format" Operation attribute (see [rfc2911] section 3.2.1.1 and [this spec] section 3.2.3 for the semantics), if supplied by the client in the Job Creation operation. ¶

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918 **5.2.6 document-format-version-supplied (text(127))**

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

924 **5.2.7 document-message-supplied (text(MAX))**

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

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

¹⁸ [rfc2911] did not define a "document-format" Document Description attribute; it is a new attribute defined in this specification.

932 **5.2.8 document-name-supplied (name (MAX))**

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

936 **5.2.9 document-natural-language-supplied (naturalLanguage)**

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

940 **6 New values to existing attributes**

941 This section defines new values for existing attributes.

942 **6.1 New job-state-reasons(1setOf type2 keyword) Values**

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

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

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

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

956 **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

957
 958 For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely
 959 to occur (if implemented):

- 960 **'digital-signature-type-not-supported'**: One or more documents in the Job contain a digital signature type
 961 that is not supported. Implementation or site policy determines the state of the Job once this
 962 condition is detected.
- 963 **'job-digital-signature-wait'**: The Job is currently being held because the Job was submitted with a
 964 "document-digital-signature" attribute value that is not supported.
- 965 **'digital-signature-did-not-verify'**: One or more documents in the Job contains a digital signature type that is
 966 supported (see section 3.2.3), but the signature did not verify when the Printer attempted to verify the
 967 signature.
- 968 **'errors-detected'** : If the Printer supports this value, the Printer MUST add this value to "job-state-reasons"
 969 when the Printer generates the first error message. That is, a single occurrence of this value is
 970 present in the "job-state-reasons" Job Description attribute if the Printer has generated one or more
 971 errors. An error indicates loss of information, such as a page not imaged. See also the 'warnings-
 972 detected' value.
- 973 **'warnings-detected'** : If the Printer supports this value, the Printer MUST add this value to "job-state-
 974 reasons" when the Printer generates the first warning message. That is, a single occurrence of this
 975 value is present in the "job-state-reasons" Job Description attribute if the Printer has generated one or more
 976 warnings. A warning indicates something did not go as expected, but there was no loss of
 977 information. For example, a font substitution. See also the 'errors-detected' value.

978 6.2 New media (type 3 keyword | name(MAX)) Values

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

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

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

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

991 7 New Printer Description attributes

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

996
 997 The column labels are:

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

998

999

Table 10 - New Printer Description attributes

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

1000

1001

7.1 document-charset-default (charset)

1002

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

1003

1004

1005

1006

7.2 document-charset-supported (1setOf charset)

1007

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

1008

1009

1010

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

1011

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

1012

1013

- Deleted: output-device-requested
- Deleted: output-device-supported
- Inserted: output-device
- Deleted: 1setOf name(127)
- Deleted: [this spec] §7.11

1014 **7.4 document-digital-signature-supported (1setOf type2 keyword)**

1015 This OPTIONAL Printer Description attribute indicates the digital signature technologies that the Printer supports in
1016 Document Contents, that is, supports as values of the "document-digital-signature" Operation attribute (section
1017 3.2.3). The Printer MUST support this attribute if it supports the "document-digital-signature" Operation attribute.

1018 **7.5 document-format-details-default (collection)**

1019 This OPTIONAL Printer Description attribute indicates the default document format details that the Printer will
1020 assume when the client omits the "document-format-details" Operation attribute (section §3.2.5). The member
1021 attributes are the same as "document-format-details" (see section 3.2.5). The Printer MUST support this attribute, if it
1022 supports the "document-format-details" Operation attribute (see section 3.2.5).

1023 **7.6 document-format-details-supported (1setOf type2 keyword)**

1024 This OPTIONAL Printer Description attribute lists the type2 keyword names of the member attributes of "document-
1025 format-details" that the Printer supports. The Printer MUST support this "document-format-details" (1setOf type2
1026 keyword) Printer Description attribute, if the Printer supports the "document-format-details" (1setOf collection)
1027 Operation attribute (see section 3.2.5). Table 11 lists the type2 keywords defined for use in the "document-format-
1028 details-supported" Printer attribute.

1029 **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

1030

1031 **7.7 document-format-version-default (text(127))**

1032 This OPTIONAL Printer Description attribute indicates the default document format version that the Printer will
1033 assume when the client omits the "document-format-version" Operation attribute (section 3.2.6). The Printer MUST
1034 support this attribute if it supports the "document-format-version" Operation attribute.

1035 **7.8 document-format-version-supported (1setOf text(127))**

1036 This OPTIONAL Printer Description attribute indicates the document format versions that the Printer supports for
1037 Document Contents, that is, supports as values of the "document-format-version" Operation attribute (section 3.2.6).
1038 The Printer MUST support this attribute if it supports the "document-format-version" Operation attribute.

1039 **7.9 document-natural-language-default (naturalLanguage)**

1040 This OPTIONAL Printer Description attribute indicates the default document natural language that the Printer will
1041 assume for Document Content when the client omits the "document-natural-language" Operation attribute ([rfc2911]
1042 section 3.2.1.1). The Printer MUST support this attribute if it supports the "document-natural-language" Operation
1043 attribute.

1044 **7.10 document-natural-language-supported (1setOf naturalLanguage)**

1045 This OPTIONAL Printer Description attribute lists the natural languages supported in any of the supported document
1046 formats, that is, it is the union of the natural languages. The Printer MUST support this attribute if it supports the
1047 "document-natural-language" Operation attribute ([rfc2911] section 3.2.1.1).

1048 **8 Status codes**

1049 This section defines additional status codes.

1050 **8.1 server-error-too-many-jobs (0x050B)**

1051 The client has attempted to create a Job using any of the Job Creation operations which would exceed the capacity
1052 of the Printer. The client MAY try the unmodified request again at some later point in time with an expectation that
1053 the capacity condition may have changed.

1054 **8.2 server-error-too-many-documents (0x050C)**

1055 The client has attempted to create a Document using any of the Document Creation operations which would exceed
1056 the capacity of the Printer for this Job. The client MAY try the unmodified request again at some later point in time
1057 with an expectation that the capacity condition may have changed.

1058 **9 Override Scope of Attributes**

1059 This section defines the **Override Scope** of the Job Template attributes. An **Override Scope** is only applicable when
1060 the Job Template attribute is applied as part of an Override [ippOverride]. An Override allows specifying Job
1061 Template attributes that apply to a portion of a Job. The portion of the Job that an Override can apply is referred to
1062 as its Scope. A Scope is the smallest entity to which a Job Template attribute applies. The order of Scopes is: a Job
1063 contains one or more Documents that are printed on one or more Sheets that have up to two Impressions containing
1064 one or more Pages. For a Printer to support a Job Template attribute in an Override, it MUST support the Job
1065 Template at the specified Scope. Furthermore the scope of the attribute MUST be "Sheet", "Impression" or "Page".
1066 Although operation attributes can not be used in an Override, their scope is of interest to determine their applicability
1067 in "Send-Document" and "Send-Uri". The various possible scopes of Operation and Job Template attributes are:

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

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Deleted: ~~<~~output-device-default (name(127))¶
This OPTIONAL Printer Description attribute is the default for both the "output-device-requested" Job Description and the "output-device-assigned" Job Description attribute. A Printer MAY support the "output-device-default" Printer attribute if the Printer's scheduling algorithm has a default output device. On the other hand, a Printer MAY have a dynamic scheduling algorithm in which case this attribute is not supported.¶

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Deleted: ~~<~~output-device-supported (1setOf name(127))¶
This OPTIONAL Printer Description attributes lists the names of output devices that the Printer supports. The Printer MUST support this attribute if it supports the "

Deleted: output-device-requested

Deleted: output-device" Operation attribute (see section 1.1.1).¶

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Inserted: scope of the Operation attributes and Job Template attributes.

Deleted: Operation attributes and

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1103 4. MAY support any Job Template attribute according to section 1.

1104 5. MAY support any of the "job-state-reasons" values according to section 6.

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10.2 Client conformance requirements

1105 In order to claim conformance to this specification,

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

Deleted: a

1109 2. MUST meet the conformance requirements for clients specified in [rfc2911]

1110 3. MUST support at least one Operation attribute according to section 3 and the corresponding Job Description
1111 attributes in section 4.1.5.4 and corresponding Printer attributes in section 7. & combine with #3

1112 4. MAY support any Job Template attribute according to section 1.

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1197 April 1999.
- 1198 [rfc2569]
1199 Herriot, R., Hastings, T., Jacobs, N., Martin, J., "Mapping between LPD and IPP Protocols", RFC 2569, April
1200 1999.
- 1201 [rfc3196]
1202 Hastings, T., Manros, C., Zehler, P., Kugler, C., and H. Holst, "Internet Printing Protocol/1.1: Implementer's
1203 Guide", RFC 3196, November 2001.

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1204 [rfc3239]
1205 Kugler, C., Lewis, H. and T. Hastings, "Internet Printing Protocol (IPP): Requirements for Job, Printer, and
1206 Device Administrative Operations", RFC 3239, February 2002.

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1207 **13 IANA Considerations**

1208 This section contains the registration information for IANA to add to the various IPP Registries according to the
1209 procedures defined in RFC 2911 [rfc2911] section 6 to cover the definitions in this document. The resulting
1210 registrations will be published in the <http://www.iana.org/assignments/ipp-registrations> registry.

1211 *Note to the PWG Editor: Replace the References below to [this spec] with the IEEE-ISTO standard number
1212 for the appropriate document, so that it accurately reflects the content of the information for the IANA Registry.*

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1213 **13.1 Attribute Registrations**

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

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Attribute Name (attribute syntax)	Reference	Section
Job Description attributes:		
compression-supplied (type3 keyword)	[this spec]	5.2.1
document-charset-supplied (charset)	[this spec]	5.2.2
document-digital-signature-supplied (type2 keyword)	[this spec]	5.2.3
document-format-details-supplied (lsetOf collection)	[this spec]	5.2.4
document-source-application-name (name(MAX))	[this spec]	5.2.4
document-source-application-version (text(127))	[this spec]	5.2.4
document-source-os-name (name(40))	[this spec]	5.2.4
document-source-os-version (text(40))	[this spec]	5.2.4
document-format (mimeMediaType)	[this spec]	5.2.4
document-format-device-id (text(127))	[this spec]	5.2.4
document-format-version (text(127))	[this spec]	5.2.4
document-natural-language (lsetOf naturalLanguage)	[this spec]	5.2.4
document-format-supplied (mimeMediaType)	[this spec]	5.2.5
document-format-version-supplied (text(127))	[this spec]	5.2.6
document-message-supplied (text(MAX))	[this spec]	5.2.7
document-name-supplied (name(MAX))	[this spec]	5.2.8
document-natural-language-supplied (naturalLanguage)	[this spec]	5.2.9
errors-count (integer(0:MAX))	[this spec]	5.1.1

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1246 job-attribute-fidelity (boolean) [this spec] 5.1.2
 1247 job-mandatory-attributes (lsetOf type2 keyword) [this spec] 5.1.3
 1248 warnings-count (integer(0:MAX)) [this spec] 5.1.4
 1249
Job Template attributes:
 1250
 1251 job-copies (integer(1:MAX)) [this spec] 4.1.1
 1252 job-copies-default (integer(1:MAX)) [this spec] 4.1.1.1
 1253 job-copies-supported (rangeOfInteger(1:MAX)) [this spec] 4.1.1.2
 1254 job-copies-actual (lsetOf Integer(1:MAX)) [this spec] 4.1.1.3
 1255 job-cover-back (collection) [this spec] 4.1.2
 1256 <member attributes are the same as "cover-back"[pwg5100.3] 3.1>
 1257 job-cover-back-default (collection) [this spec] 4.1.2.1
 1258 <member attributes are the same as "cover-back"[pwg5100.3] 3.1>
 1259 job-cover-back-supported (lsetOf type2 keyword) [this spec] 4.1.2.2
 1260 job-cover-back-actual (lsetOf collection) [this spec] 4.1.2.3
 1261 <member attributes are the same as "cover-back"[pwg5100.3] 3.1>
 1262 job-cover-front (collection) [this spec]
 1263 4.1.34.1.2.3
 1264 <member attributes are the same as "cover-front"[pwg5100.3] 3.1>
 1265 job-cover-front-default (collection) [this spec] 4.1.3.1
 1266 <member attributes are the same as "cover-front"[pwg5100.3] 3.1>
 1267 job-cover-front-supported (lsetOf type2 keyword) [this spec] 4.1.3.2
 1268 job-cover-front-actual (lsetOf collection) [this spec] 4.1.3.3
 1269 <member attributes are the same as "cover-front"[pwg5100.3] 3.1>
 1270 job-finishings (lsetOf type2 enum) [this spec] 4.1.4
 1271 job-finishings-default (lsetOf type2 enum) [this spec] 4.1.4.1
 1272 job-finishings-ready (lsetOf type2 enum) [this spec] 4.1.4.2
 1273 job-finishings-supported (lsetOf type2 keyword) [this spec] 4.1.4.3
 1274 job-finishings-actual (lsetOf type2 enum) [this spec] 4.1.4.4
 1275 job-finishings-col (lsetOf collection) [this spec] 4.1.5
 1276 <member attributes are the same as "finishings-col"[pwg5100.3] 3.2>
 1277 job-finishings-col-default (lsetOf type2 enum) [this spec] 4.1.5.1
 1278 job-finishings-col-ready (lsetOf type2 enum) [this spec] 4.1.5.2
 1279 job-finishings-col-supported (lsetOf type2 keyword)
 1280 [this spec] 4.1.5.3
 1281 job-finishings-col-actual (lsetOf collection) [this spec] 4.1.5.4
 1282 <member attributes are the same as "finishings-col"[pwg5100.3] 3.2>
 1283 output-device (name(127)) [this spec] 4.2.1
 1284 output-device-ready (lsetOf name(127)) [this spec] 1.1.1.1
 1285 output-device-supported (lsetOf name(127)) [this spec] 4.2.1.2
 1286 output-device-actual (lsetOf name(127)) [this spec] 4.2.1.3
 1287 print-content-optimize (type2 keyword) [this spec] 4.2.2
 1288 print-content-optimize-default (type2 keyword) [this spec] 4.2.2.1
 1289 print-content-optimize-supported (lsetOf type2 keyword)
 1290 [this spec] 4.2.2.2
 1291 print-content-optimize-actual (lsetOf type2 keyword)

Deleted: output-device - requested
 Deleted: output - device (name(127)) [this spec] 1.1.1
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1292 [this spec] 4.2.2.3

1293

1294 **Printer Description attributes:**

1295 document-charset-default (charset) [this spec] 7.1

1296 document-charset-supported (1setOf charset) [this spec] 7.2

1297 document-digital-signature-default (type2 keyword) [this spec] 7.3

1298 document-digital-signature-supported (1setOf type2 keyword)

1299 [this spec] 7.4

1300 document-format-details-default (collection) [this spec] 7.5

1301 <member attributes are the same as "document-format-details"

1302 [this spec] 3.2.5>

1303 document-format-details-supported (1setOf type2 keyword)

1304 [this spec] 7.6

1305 document-format-version-default (text(127)) [this spec] 7.7

1306 document-format-version-supported (1setOf text(127)) [this spec] 7.8

1307 document-natural-language-default (naturalLanguage) [this spec] 7.9

1308 document-natural-language-supported (1setOf naturalLanguage)

1309 [this spec] 7.10

1310

1311 **Operation attributes:**

1312 document-charset (charset) [this spec] 3.2.2

1313 document-digital-signature (type2 keyword) [this spec] 3.2.3

1314 document-format-details (1setOf collection) [this spec] 3.2.5

1315 document-source-application-name (name(MAX)) [this spec] 3.2.5.1

1316 document-source-application-version (text(127))

1317 [this spec] 3.2.5.2

1318 document-source-os-name (name(40)) [this spec] 3.2.5.3

1319 document-source-os-version (text(40)) [this spec] 3.2.5.4

1320 document-format (mimeMediaType) [this spec] 3.2.5.5

1321 document-format-device-id (text(127)) [this spec] 3.2.5.6

1322 document-format-version (text(127)) [this spec] 3.2.5.7

1323 document-natural-language (1setOf naturalLanguage)

1324 [this spec] 3.2.5.8

1325 document-format-version (text(127)) [this spec] 3.2.6

1326 document-natural-language (naturalLanguage) [this spec] 3.2.9

1327 job-mandatory-attributes (1setOf type2 keyword) [this spec] 3.1.2

Deleted: output-device - requested-supported (1setOf name(127)) [this spec] 7.12¶

1328 **13.2. Keyword attribute values**

1329 document-digital-signature (type2 keyword) [this spec] 3.2.3

1330 document-digital-signature-default (type2 keyword)

1331 [this spec] 7.3

1332 document-digital-signature-supported (1setOf type2 keyword)

1333 [this spec] 7.4

1334 dss [this spec] 3.2.3

1335 none [this spec] 3.2.3

1336 pgp [this spec] 3.2.3

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1337	smime	[this spec]	3.2.3
1338	xmldsig	[this spec]	3.2.3
1339	document-format-details-supported (1setOf type2 keyword)		
1341		[this spec]	7.6
1342	document-source-application-name	[this spec]	7.6
1343	document-source-application-version	[this spec]	7.6
1344	document-source-os-name	[this spec]	7.6
1345	document-source-os-version	[this spec]	7.6
1346	document-format	[this spec]	7.6
1347	document-format-device-id	[this spec]	7.6
1348	document-format-version	[this spec]	7.6
1349	document-natural-language	[this spec]	7.6
1350			
1351	job-cover-back-supported (1setOf type2 keyword)	[this spec]	4.1.2.2
1352	<same as "cover-back-supported">	[pwg5100.3]	3.1.4
1353	job-cover-front-supported (1setOf type2 keyword)	[this spec]	4.1.2.2
1354	<same as "cover-front-supported">	[pwg5100.3]	3.1.4
1355	job-mandatory-attributes (1setOf type2 keyword)	[this spec]	3.1.2
1356	<any Job Template attribute keyword>		
1357			
1358	job-state-reasons (1setOf type2 keyword)	[rfc2911]	4.3.8
1359	digital-signature-did-not-verify	[this spec]	6.1
1360	digital-signature-type-not-supported	[this spec]	6.1
1361	errors-detected	[this spec]	6.1
1362	job-digital-signature-wait	[this spec]	6.1
1363	warnings-detected	[this spec]	6.1
1364			
1365	media (type2 keyword name(MAX))	[rfc2911]	4.2.11
1366	choice_iso_a4_210x297mm_na_letter_8.5x11in	[this spec]	6.2
1367	print-content-optimize (type2 keyword)	[this spec]	4.2.2
1368	photo	[this spec]	4.2.2
1369	graphic	[this spec]	4.2.2
1370	text	[this spec]	4.2.2
1371	text-and-graphic	[this spec]	4.2.2
1372			

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13.3 Enum Attribute Values

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

1376			
1377	job-finishings (1setOf type2 enum)	[this spec]	4.1.3.3
1378	job-finishings-default (1setOf type2 enum)	[this spec]	4.1.4.1
1379	job-finishings-ready (1setOf type2 enum)	[this spec]	4.1.4.2
1380	job-finishings-supported (1setOf type2 enum)	[this spec]	4.1.4.3
1381	<enum values are the same as "finishings">		

1382
 1383 job-finishings-col-supported (1setOf type2 keyword)
 1384 [this spec] 4.1.5.3
 1385 <same as for "finishing-col-supported" [pwg5100.3] 3.2.5

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1386 **14 Internationalization Considerations**

1387 The internationalization considerations for the extensions defined in this specification are the same as for handling
 1388 the Job object in [rfc2911].

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1389 **15 Security Considerations**

1390 This specification adds no more security burden on Printer implementations than does [rfc2911].

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1391 **16 Contributors**

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1395 **17 Acknowledgments**

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1416 **19 Annex A: Additional requirements for a revision of the PWG IEEE/ISTO**
 1417 **5101.1 Candidate Standard [pwg5101.1] to add the new 'choice_xxx'**

1418 This section also generalizes the choice mechanism for inclusion in a revision to the PWG IEEE/ISTO 5101.1
 1419 Candidate Standard [pwg5101.1]. This specification gives the *outline* of the proposed addition to [pwg5101.1] for
 1420 information only, in order to agree to the one new value defined for use with IPPFAX, namely,
 1421 'choice_iso_a4_210x297mm_na_letter_8.5x11in'.

1422 The proposed extension to [pwg5101.1] will have the following requirements:

- 1423 1. The ABNF will be extended to define the 'choice_' prefix to introduce a list of choices of self describing
 1424 names.
- 1425 2. Following the 'choice_' prefix will be two or more fully self describing names, including all three fields.
- 1426 3. The order of the list of fully self describing names MUST be in alphabetic order, so that there is only one
 1427 canonical order for each list of choices.
- 1428 4. Printer MAY support dynamic combinations of supported values or MAY support the entire choice value as a
 1429 conventional keyword which it simply matches for validation purposes.
- 1430 5. Printer MUST map the choice value to a particular supported value when selecting the actual media for
 1431 marking.
- 1432 6. If the Printer supports a 'choice_xxx' "media" attribute value and the "media-ready" Printer attribute, the
 1433 Printer MUST include the 'choice_xxx' value in its "media-ready" Printer attribute as well as the currently
 1434 loaded value(s) when at least one of the members of a choice value is ready. For example, if
 1435 'iso_a4_210x297mm' is loaded, then the "media-ready" Printer attribute MUST include the
 1436 'iso_a4_210x297mm' and the 'choice_iso_a4_210x297mm_na_letter_8.5x11in' values.

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1437 **20 Annex B: Change Log (informative - to be removed before publication)**

1438 The following summaries of the changes in chronological order:

1439 Version 0.1, 18 May 2003:

- 1440 1. Split document out of Document Object specification.
- 1441 2. Moved "document-format-target" and "document-format-version-target" from the Job Template section to the
 1442 Operation Attributes section so that it can be supplied with Document Creation operations and so that it
 1443 MUST be honored, even if "job-attribute-fidelity" is 'false' or omitted.
- 1444 3. Removed all Document Description attributes and the concept of Job Level and Document Level. That
 1445 terminology is introduced in the Document Object spec [ippdoc]. Now [ippdoc] is only an Informative
 1446 Reference, not a Normative Reference.

1447
 1448 Version 0.2, 19 May 2003:

- 1449 1. Did *not* include the document-format-target and document-format-version-target attributes. PSI has their own
 1450 definitions and we can avoid the discussion as to whether they should be Document Template attributes or
 1451 Operation attributes on Document Creation operations and whether there should be a "document-format-
 1452 target-default" and a "document-format-version-target-default".

1453
 1454 Version 0.3, 28 May 2003:

1455 Agreements reached at the May 28, 2003 telecon:

- 1456 1. Moved the Close-Job operation to the futures specification.

- 1457 2. Added the "pages-per-subset" Job Template from [pwg5100.4]. See Appendix B section **Error! Reference**
- 1458 **source not found.** for the minor differences.
- 1459 3. Added the terms: "Best Effort, Finished Document, Page, Page Subset, and Sheet.
- 1460 4. Clarified the conformance relationships between "xxx" Operation attributes and their corresponding "xxx-
- 1461 default" and "xxx-supported" Printer attributes.
- 1462 5. Added rationale for each missing "xxx-default" and "xxx-supported" attribute.
- 1463 6. Added 'errors-detected' and 'warnings-detected' "job-state-reasons" values.
- 1464 7. Added the new 'choice_iso_a4_210x297mm_na_letter_8.5x11in' "media" attribute value which is a choice
- 1465 of two approximately equal media.
- 1466 8. Added the requirements for choice media keyword values for inclusion in a revision of the PWG IEEE-ISTO
- 1467 5101.1.
- 1468 9. Changed the "document-format-implemented" member attribute from 1setOf mimeType to
- 1469 mimeType since it is the key attribute value.
- 1470 10. Added another "document-format-implemented" example.
- 1471 11. Updated the IANA section to agree with the additions.
- 1472

Version 0.4, June 4, 2003:

- 1474 1. Moved "document-format-details-implemented" Printer Description attribute to Futures.
- 1475 2. Moved "pages-per-subset" (1setOf integer(1:MAX)) Job Template attribute to Futures.
- 1476 3. Removed all CONDITIONALLY REQUIRED and CMUST statements and made them OPTIONAL and MAY.
- 1477 Added a statement of the intent for these attributes, so avoid the conformance statement problems for this
- 1478 specification which is just a list of OPTIONAL attributes.
- 1479 4. Removed the new terms "Honor" and "Best Effort", since they are synonym for "Support" and the opposite. It
- 1480 is confusing to have synonyms.
- 1481 5. Added all of the new Operation/Job Description attributes that describe Documents to be supplied in Job
- 1482 Creation operations and copied to the corresponding Job Description attributes as *default* values for the
- 1483 Document(s) of the Job.
- 1484 6. Added "output-device-default" and "output-device-supported" Printer attribute to provide the default for both
- 1485 the "output-device" Operation attribute and the "output-device-assigned" Job Description attribute.
- 1486 7. Added "document-message" and "document-name" as Operation/Job Description default Document
- 1487 attributes for the Job.
- 1488 8. Clarified that the 'none' value of the "document-digital-signature" must be implemented, but the administrator
- 1489 MAY re move the 'none' value in order to require signatures to be used.
- 1490 9. Sated that all supplied member attributes of the "document-format-details" Operation attribute MUST have a
- 1491 value, i.e., MUST NOT be empty.
- 1492 10. Normalized all of the Application Names and versions and Operating System Name values from the IANA
- 1493 Registry to lower case, as is done with most other IPP attributes, in order to facilitate matching.
- 1494 Moved the requirements for the new 'choice_xxx' values to be added to PWG 5101.1.
- 1495

Deleted: output-device-requested

Version 0.6, August 8, 2003:

- 1496 1. Changed "output-device-requested" to "output-device"
- 1497 2. Made "output-device" a Job Template attribute, instead of an Operation attribute for the following two
- 1498 reasons: (1) so that it can be used at the Sheet level in "overrides" to print a Sheet containing color pages on
- 1499 a color printer while the other Sheets are printed on a black and white printer and (2) so that the "output-
- 1500 device-actual" can be used to indicate the actual device(s) used, since [rfc2911] "output-device-assigned" is
- 1501 only single valued.
- 1502 3. Updated introduction
- 1503 4. Added xxx-supplied to Job Description & updated table 5
- 1504 5. "output-device-default" explicitly prohibited & split out into its own section
- 1505 6. Added "output-device" multivalued issue/resolution
- 1506 7. Added overrides summary and scoping of new attributes
- 1507 8. Added "actual"s
- 1508 9. Added Section 9 "Override Scope of Attributes"
- 1509 10. Added "print-content-optimized"
- 1510 11. Moved "servetoo-many-" error codes from Document Object spec to here.
- 1511

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Deleted: Added "output-device-ready" Job Template Printer attribute.

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Inserted: Added "output-device-ready" Job Template Printer attribute.
Added Section

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1512

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Version 0.5, June 9, 2003:¶
added xxx supported as Job
Description attributes for specific
operational attributes that apply to
documents within the Job

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NOTE: The following operational attribute has a corresponding Job Template attributes

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output-device (name(127))

This OPTIONAL Operation attribute specifies the name of the target output device for a Printer that fans-out to multiple devices (see [rfc2911] section 2.1). This allows the client to control which output device the Printer selects. If this attribute is omitted, the Printer selects whichever output device seems best for the job in an implementation dependent manner. The client can discover which output devices the Printer supports by querying the Printer's "output-device-supported" Printer attribute (see section 7.11).

If the Printer supports this Operation attribute, the Printer MUST support the "output-device-assigned" Job Description attribute with the same values (see [rfc2911] section 4.3.13). See section 4.1.6 for additional information on "output-device" and related attributes.

ISSUE01: The Job Description attribute "output-device-assigned" is single-valued even though "output-device" can be supplied at the Job, Document and page Override (i.e. sheet) level. Proposed resolution: Leave the Job Description attribute single-valued. This will prevent any interoperability problems with existing implementations. It will also handle the majority of uses. Add a single-valued Document Description attribute in [ippdoc] to handle document level. Implementations that allow the routing of individual sheets should be capable of implementing "-actuals". Even if they don't the "overrides" Template attribute will contain the requested output devices.

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. Implementations that allow the routing of individual sheets should be capable of implementing "overridden" and "-actuals". Even if they don't support -actuals, the "overrides" Template attribute will contain the requested output devices.

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. Implementations that allow the routing of individual sheets should be capable of implementing “overridden” and “-actuals”. Even if they don’t support -actuals, the “overrides” Template attribute will contain the requested output devices.

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

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

ISSUE: 02 - OK to define “output-device-ready” Job Template Printer attribute?

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

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

ISSUE: 02 - OK to define “output-device-ready” Job Template Printer attribute?

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d the supported “output-device” values. The Printer MUST support this attribute if it supports the "output-device" Job Template attribute.

output-device-col-actual (1setOf

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collection)

This OPTIONAL Job Description attribute specifies the "output-device"

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Peter Zehler

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Job Job Template Attributes that operate on whole Jobs are not applicable as page overrides.

Document Job Template Attributes that operate on whole Documents are not applicable as page overrides. (The Document Object [ippdoc] is used to apply overrides at this level.)

Sheet Job Template Attributes that operate on whole Sheets, such as "media" and "finishings". Attributes with this scope MAY be included in "overrides".

Impression Job Template Attributes that operate on whole Impressions, such as "number-up" or "x-side1-image-shift". Attributes with this scope MAY be included in "overrides".

Page Job Template Attributes that operate on whole Pages, such as "orientation-requested" or "print-quality". Attributes with this scope MAY be included in "overrides".

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Compression-supplied

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Document

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document-charset

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Document

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document-charset-supplied

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document-format-version-supplied

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document-format-natural-language

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document-message

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document-name

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document-name-supplied

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document-natural-language

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errors-count

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Job

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ipp-attribute-fidelity

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output-device-assigned

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warnings-count

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Job

is only application when an Operation attribute is

4.1.5.4