# IEEE-ISTO

**Industry Standards and Technology Organization**

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1 Working Draft, June 3, 2003
2 Maturity Level: Development

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# 4 The Printer Working Group (PWG)

## 5 Standard for
## 6 The Internet Printing Protocol (IPP):
## 7 Document Object

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9 **Abstract:** This IPP specification extends the IPP Model and Semantics [rfc2911] (DMC Editorial01: and rfc2910?)
10 object model by defining a Document object. The [rfc2911] Job object is extended to contain one or more Document
11 objects that are passive objects operated on by the Job. Multi-Document Jobs exist in IPP [rfc2911] but are not
12 objects in their own right. This specification elevates the Document to an IPP object thus giving access to a
13 document's metadata within a Job. A Document object allows template attributes to be applied at both the Job and
14 Document level. This enables document overrides of Job Template attributes.

15 This specification defines new operations or extends [rfcRFC2911] operations as follows:
16     1 [rfcRFC 2911] operation that creates a Job object: Create-Job
17     2 [rfcRFC 2911] operations that create a Job and Document object: Print-Job, Print-URI
18     2 [rfcRFC 2911] operations that create Document objects: Send-Document, Send-URI
19     5 new operations: Get-Documents, Get-Document-Attributes, Set-Document-Attributes, Cancel-Document,
20        Delete-Document
21 This specification uses the new Operation attributes (defined in [jobx]) that describe the contents of the Document
22 and permit the Printer to reject requests that it cannot process correctly to define new Document Description
23 attributes. The Printer copies these Operation attributes to the corresponding Document Description attributes,
24 which clients may query.

25 This specification also uses existing Job Template attributes to define Document Template attributes ("xxx"
26 Document Template attribute, "xxx-actual" Document Description attribute, "xxx-default" Printer attribute, and "xxx-
27 supported" Printer attribute). In addition this specification lists all of the attributes defined in other IPP specifications
28 to show their relationship to corresponding attributes defined in this IPP specification for use with the Document
29 object.

30  The purpose for specifying the Document object is so that the print industry can have a common semantic
31  specification for use in IPP, the PWG Semantic Model, the PWG Print Service Interface (PSI) project, and the Free
32  Standards Group Job Ticket API, which all have a Document object.

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## 37 Standard for

## 38 The Internet Printing Protocol (IPP):

## 39 Document Object

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

43

44 ftp://ftp.pwg.org/pub/pwg/ipp/new_DOC/wd-ippdoc20030530.pdf, .doc, .rtf

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

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80   **About the IEEE-ISTO**
81
82   The IEEE-ISTO is a not-for-profit corporation offering industry groups an innovative and flexible operational forum
83   and support services.  The IEEE-ISTO provides a forum not only to develop standards, but also to facilitate activities
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85   the IEEE (http://www.ieee.org/) and the IEEE Standards Association (http://standards.ieee.org/).
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90   **About the IEEE-ISTO PWG**

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

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

103  For additional information regarding the Printer Working Group visit:  http://www.pwg.org
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106  **Contact information:**

107          IPP Web Page:  http://www.pwg.org/ipp/
108          IPP Mailing List:  ipp@pwg.org

109  To subscribe to the ipp mailing list, send the following email:
110          1) send it to majordomo@pwg.org
111          2) leave the subject line blank
112          3) put the following two lines in the message body:
113                  subscribe ipp
114                  end

115  Implementers of this specification are encouraged to join the IPP Mailing List in order to participate in any
116  discussions of clarifications or review of registration proposals for additional names.  Requests for additional
117  extensions, for inclusion in this specification, should be sent to the IPP Mailing list for consideration.  In order to
118  reduce spam the mailing list rejects mail from non-subscribers, so you must subscribe to the mailing list in order to
119  send a question or comment to the mailing list.
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283 # 1 Introduction and Summary

284 This IPP specification extends the IPP Model and Semantics [rfc2911] object model by defining a Document object.
285 The [rfc2911] Job object is extended to contain one or more Document objects that are passive objects operated on
286 by the Job. The REQUIRED Print-Job and OPTIONAL Print-URI operations ([rfc2911] sections 3.2.1 and 3.2.2)
287 create a Job object containing a single Document object. The REQUIRED Create-Job operation ([rfc2911] section
288 3.2.4) creates a Job object. The REQUIRED Send-Document and OPTIONAL Send-URI operations ([rfc2911]
289 section 3.3.1 and 3.3.2) add a Document object to the specified Job object. This specification adds a Document
290 Attributes group (and tag) to the Send-Document and Send-URI requests and responses. The Document Attributes
291 group contains any Document Template attributes to be applied to this Document object being created, overriding
292 any corresponding Job Template attributes supplied at the job level (by Create-Job) and thereby allowing the client to
293 vary the Document Template attributes between Document objects in a single Job.

294 This specification defines onetwo new operation for Job objects, fourfive new operations for Document objects once
295 they have been created, and extends [rfcRFC 2911] operations as follows:

296         1 REQUIRED Job operation: Get-Documents
297         1 REQUIRED Job and Document Creation operation: PrintJob [rfc2911]
298         1 OPTIONAL Job and Document Creation operation: Print-URI [rfc2911]
299         1 REQUIRED Document Creation operation: Send-Document [rfc2911]
300         1 OPTIONAL Document Cereation operation: Send-URI [rfc2911]
301         2 REQUIRED Document operations: Cancel-Document, Get-Document-Attributes
302         2 OPTIONAL Document operations: Delete-Document, Set-Document-Attributes.

303 This specification uses the new Operation attributes (defined in [jobx]) that describe the contents of the Document
304 and permit the Printer to reject requests that it cannot process correctly to define new Document Description
305 attributes. The Printer copies these Operation attributes to the corresponding Document Description attributes which
306 client may query.

307 This specification also uses existing Job Template attributes to define Document Template attributes ("xxx"
308 Document Template attribute, "xxx-actual" Document Description attribute [ippact], "xxx-default" Printer attribute, and
309 "xxx-supported" Printer attribute). In addition this specification lists all of the attributes defined in other IPP
310 specifications[1] to show their relationship to corresponding attributes defined in this IPP specification for use with the
311 Document object. The analogous Document Descriptions attributes that correspond to the Job Description attributes
312 are also defined.

313 The semantics of "document-state", "document-state-reasons", and "document-state-message" Document
314 Description attributes are based on the corresponding [rfc2911] "job-state", "job-state-reasons", and "job-state-
315 message" Job Description attributes. The state transitions for a Document are simpler than a Job's. A Document
316 isare either waiting for the Job to process it, being processed by the Job or has reached its terminating state. Only
317 the applicable state values are used. It is assumed that an implementation will only use values from "job-state-
318 reasons" that are applicable to a Document for "document-state-reasons".

319 The intent is to propose this specification as an IPP extension and which will be referenced as part of the PWG
320 Semantic Model. The purpose for specifying the Document object is so that the print industry can have a common
321 semantic specification for use in IPP, the PWG Semantic Model [pwg-sm], the PWG Print Service Interface (PSI)
322 project [pwg-psi], and the Free Standards Group Job Ticket API [fsg-jt], which all have a Document object.

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[1] This specification lists all attributes defined in other IPP specifications at the time of publication of this specification. No attempt will be made to keep this specification up to date after publication.

323 ## 1.1 Scope

324 Part of thise extension is to allow the client to supply printing instructions, called Document Template attributes, when
325 creating each Document object.  An IPP Printer implementation MAY support most of the existing Job Template
326 attributes as Document Template attributes as well.  (The PWG Semantic Model [pwg-sm] currently calls the Job
327 Template attributes and Document Template attributes simply "Job Processing" and "Document Processing"
328 attributes).  Note:  There are a number of footnotes which relate this IPP specification to the PWG Semantic model
329 and other PWG projects, such as the Print Service Interface (PSI) [pwg-psi].

330 The Document object is a passive object[2] and is operated upon by the Job.  The client uses anyeither of the existing
331 Send-Document, and Send-URI, Print-Job, or Print-URI operations to create a Document object.  In addition there
332 are 58 new operations that affect the Document object after it has been created as summarized in Table 1.

333                                **Table 1 - Summary of operations**

| Operation Name | Printer support | Brief Description |
|---|---|---|
| Print-Job [rfc2911] | REQUIRED | Creates a Job object as in [rfc2911] thatwhich contains a single Document object with pushed data in-line.  Some additional Operation attributes are defined in [jobx] for use in creating the Document object with Document Description attributes. |
| Print-URI [rfc2911] | OPTIONAL | Creates a Job object as in [rfc2911] thatwhich contains a single Document object with a reference to the document data.  Some additional Operation attributes are defined in [jobx] for use in creating the Document object with Document Description attributes. |
| Create-Job [rfc2911] | REQUIRED[3] | Creates the Job object as defined in [rfc2911] with Job Attributes.  Job Template attributes that affect individual documents, such as "media", are inherited by the Document objects that are subsequently created for the Job using Send-Document and/or Send-URI. |
| Send-Document [rfc2911] | REQUIRED[3] | Creates a Document object with Document attributes and data.  Some additional Operation attributes are defined in [jobx] for use in creating the Document object with Document Description attributes, along with a new Document attributes group to pass Document Template attributes. |
| Send-URI [rfc2911] | OPTIONAL | Creates a Document object with Document attributes and a URL reference to the data (print-by-reference).  Some additional Operation attributes are defined in [jobx] for use in creating the Document object with Document Description attributes, along with a new Document attributes group to pass Document Template attributes. |
| Get-Document-Attributes | REQUIRED | Get requested attributes of the specified Document in the specified Job. |
| Get-Documents | REQUIRED | Get requested attributes of all of the Documents in the specified Job. |
| Set-Document-Attributes | OPTIONAL | Set the supplied Document attributes on the specified Document. |
| Cancel-Document | REQUIRED | Cancel the specified Document in the specified Job, but don't remove it. |
| Delete-Document | OPTIONAL | Remove the specified Document object and its data from the Job. |

334
335 This specification uses existing [rfc2911] and [jobx] Operation attributes summarized in Table 2 to define new
336 Document Description attributes.  The Printer copies these Operation attributes supplied by the client in the request
337 to the corresponding Job or Document Description attributes.

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[2] The Document object is *not* a sub-job.  If Job trees are desired where sub-jobs can be on different network nodes, such as in JDF, then a separate specification should be generated for Job trees.
[3] In [rfc2911] the Create-Job and Send-Document operations are OPTIONAL for a Printer to support.

338 **Table 2 - Summary of Operation and New Description attributes**

| Operation attribute | Creation operation | Printer support | Description |
|---|---|---|---|
| ipp-attribute-fidelity (boolean) * [rfc2911] §15.1 | Job | MUST | Allows the client to indicate whether or not the Printer MUST support all Job Template and Document Template attributes. |
| job-mandatory-attributes (1setOf type2 keyword) [Jjobx] § 4.1.2 | Job | MUST | Allows the client to list which Job Template and Document Template attributes that the Printer MUST support. |
| document-charset (charset) [jJobx] § 4.2.1 | Document | CMUST[4] | The charset of the Document Object content. |
| document-digital-signature (type2 keyword) [jJobx] § 4.2.2 | Document | MAY | The type of digital signature, if any, used in the Document Object content. |
| document-format (mimeMediaType) * [rfc2911] §3.2.1.1 | Document | MUST | The document format of the Document Object content. |
| document-format-details (1setOf collection) [jJobx] § 4.2.4 | Document | CMUST[5] | The details of the Document Object 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)) [jobx] § 4.2.5 | Document | MAY | The level or version of the document format. |
| document-natural-language (naturalLanguage) *　[rfc2911] §3.2.1.1 | Document | MAY | The primary language of the Document Object content. |

339 * - indicates Operation attributes defined in [rfc2911] that are extended to apply to the Document Creation operations
340 defined in this specification.

341 # 2 Terminology

342 This section defines terminology used throughout this document.

343 ## 2.1 Conformance Terminology

344 Capitalized terms, such as **MUST, MUST NOT, REQUIRED, SHOULD, SHOULD NOT, MAY,** and **OPTIONAL**, have
345 special meaning relating to conformance as defined in RFC 2119 [rfc2119]. If an implementation supports the
346 extension defined in this document, then these terms apply; otherwise, they do not. These terms define
347 conformance to *this document (and [rfc2911]) only*; they do not affect conformance to other documents, unless
348 explicitly stated otherwise. For example, the term REQUIRED in this document means "REQUIRED if this
349 OPTIONAL Document Object specification is implemented".

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

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[4] The Printer MUST support the "document-charset" operation/Document Description attributes if the Printer supports a document-format in which the charset may be ambiguous in the Document content, such as 'application/vnd.hp-PCL' where the charset escape sequence MAY be omitted from the data (see [jobx] §3.2.1).

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

352  ## 2.2 Other Terminology

353  This document uses the same terminology as [rfc2911], such as "**client**", "**Printer**"[6], "**attribute**", "**attribute value**",
354  "**keyword**", "**Job Template attribute**", "**Operation attribute**", "**operation**", "**request**", "**response**", and "**support**"
355  with the same meaning.  In addition, the following terms are defined for use in this document:

356  **Attribute Precedence** - the precedence rules which dictate which attribute value takes precedence when the same
357  attribute is supplied at different points in the workflow with different values, such as at both the **Job Level** and the
358  **Document Level**.  See section 6.

359  **Document attribute** - an **Operation attribute** or a **Document Template attribute** that applies to a **Document**
360  **object** as a whole.  For example, "document-format" is an Operation attribute and "media" is a Document Template
361  attribute.

362  **Document Creation operation** - operations that create Document objects.  Specifically: Print-Job, Print-URI, Send-
363  Document, and Send-URI.  Note:  the Print-Job and Print-URI are both **Job Creation** and **Document Creation**
364  operations, since they create both a Job and a **Document object** at the same time.  TAlso this specification does not
365  extend the Print-Job and Print-URI operations.  However, this specification does extend the Send-Document and
366  Send-URI operations to allow the client to supply **Document Template** attributes in each request.

367  **Document Level** - Operation and Document Template attributes supplied in the Send-Document and Send-URI
368  operations are referred to as being supplied at the **Document Level**.  Note: attributes supplied in the Print-Job and
369  Print-URI requests are considered as being supplied at the **Job Level** only, *not* also at the **Document Level**, even
370  though Print-Job and Print-URI also create **Document objects** (see Table 3).

371  **Document object** - the object to represent the logical concept of a document in a Job.  A **Job object** can contain
372  one or more **Document objects**.

373  **Document Template attribute** - an attribute that the client supplies in a Send-Document or Send-URI operation
374  request in the Document Attributes group.  For example, "media".

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

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

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

383  **Job Level** - **Operation** and **Job Template** attributes supplied in the Print-Job, Print-URI, and Create-Job are
384  referred to as being supplied at the **Job Level** (see Table 3).  Attributes supplied at the **Job Level** are a mixture of
385  **Job attributes** and **Document attributes**.  **Job Template attributes** apply to the Job as a whole, while **Document**
386  **Template attributes** provide defaults for the **Document objects** in case the client does not supply a **Document**
387  **Template attribute** at the **Document Level** for a **Document object**.  Put another way, **Document objects** *inherit*
388  **Document Template attributes** from the **Job object** which are used if the client didn't supply a corresponding
389  **Document Template** attribute for the **Document object**.

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[6] [rfc2911] uses the terms "Printer object" and "Printer" interchangeably to mean the same thing. For simplicity, this document uses the term "Printer" exclusively, except for definitions copied directly from [rfc2911]. None the less, the intent is as in [rfc2911]: a Printer is an object that MAY be hosted in the device or in a server as in [rfc2911].

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

394  Table 3 shows this terminology as applied to the six operations.  Note that Print-Job and Print-URI are both Job
395  Creation operations and Document Creation operations, though they only create single Document jobs.  In other
396  words, for Print-Job and Print-URI, there is only one document per job, so whether the attributes are considered to be
397  submitted at the Job Level and then inherited by the Document object, is moot, since these operations do not have a
398  separate Document group in which the client can supply Document attributes.  Note also that for the "Level" concept,
399  no operation supplies attributes at more than one level.[7]

400  **Table 3 - Job Creation and Document Creation operations**

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

401

## 402  3   New Job operations and semantic extensions to Job operations

403  This section defines the semantic extensions to Job operations that affect Document objects.  Printer and
404  Subscription object (Event Notification [ntfy]) operations MUST have no effect on the Document object and the
405  Document object has no effect on the semantics of the Printer and Subscription operations.  The Job operations that
406  MUST NOT have any effect on the Document object because they are defined to affect the Job object as a whole

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

407  are: **Get-Job-Attributes**[8] ([rfc2911] section 3.3.4)**, Get-Jobs**[9] ([rfc2911] section 3.2.6)**, Hold-Job** ([rfc2911] section
408  3.3.5), **Release-Job** ([rfc2911] section 3.3.6), **Set-Job-Attributes** ([rfc3380] section 4.2), and **Validate-Job**
409  ([rfc2911] section 3.2.3).

410  ~~The Job operations that affect Document objects or that Document objects affect the semantics of the Job operations~~
411  ~~are, in alphabetical order:~~

## 412  **3.1 Job Creation operations**

413  This section defines the extensions to the Job Creation operations.

## 414  **3.1.1 Operation Attributes**

415  The following Operation attribute extensions have additional semantics when used with document objects.  These
416  attributes apply for all the Job Creation operations and Validate-Job:

417  DMC ISSUE01: It seems fishy to me that we discuss these two attributes here, but not document-format or output-
418  device-requested for example.  Is this concept of "copy to Description attribute then use at Document level"
419  discussed elsewhere, such that this section is not needed?

420  **3.1.1.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)**

421  This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1) when the
422  client supplies unsupported Job Template or Document Template attributes[10] or value in a Job Creation operation or
423  a subsequent Document Creation operation for this job.  The value 'true' indicates that total fidelity to client supplied
424  Job Template and Document Template attributes and values is required for this Job Creation operation and all
425  subsequent Document Creation operations for this job.  If the client supplies the value 'false' or omits the attribute,
426  then the Printer MUST accept the Job Creation operation and all subsequent Document Creation operations even if
427  the client supplies unsupported attributes or values in them.

428  The Printer MUST copy this attribute to the corresponding Job Description attribute (see [jobx] section 6.1) and use
429  its value for validating subsequent Document Creation operations for this job.

430  Note: The inheritance of the effect of the "ipp-attribute-fidelity" Operation attribute by subsequent Document Creation
431  operations is like the inheritance of Document Template attributes supplied at the Job Level but affecting the
432  behavior of the Document Level (see Table 3).

433  **3.1.1.2 job-mandatory-attributes (1setOf type2 keyword) Operation attribute**

434  This REQUIRED[11] Operation attribute identifies which Job Template and Document Template attributes the Printer
435  MUST Honor in this Job Creation request and all subsequent Document Creation requests for this Job.

---

[8] The Printer MUST NOT copy up to the Job object any Document attributes supplied at the Document Level in
Create-Document, Send-Document, or Send-URI to the Job object as observable by the client in any Get-Job-
Attributes operation responses.
[9] The Printer MUST NOT copy up to the Job object any Document attributes supplied at the Document Level in
Create-Document, Send-Document, or Send-URI to the Job object as observable by the client in any Get-Jobs~~-
Attributes~~ operation responses.
[10] The value of the "ipp-attribute-fidelity" Operation attribute has no effect on other O*peration* attributes supplied by
the client, only on Job Template and Document Template attributes supplied by the client.
[11] The Printer MUST support the "job-mandatory-attributes" Operation/Job Description attributes for conformance to
this Document Object specification.  However, an implementation that isn't supporting the Document Object MAY still

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

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

447   Note: The inheritance of the effect of the "job-mandatory-attributes" Operation attribute by subsequent Document
448   Creation operations is like the inheritance of Document Template attributes supplied at the Job Level but affecting
449   the behavior of the Document Level (see Table 3).

## 450   **3.1.2 Create-Job ([rfc2911] section 3.2.4)**

451   This REQUIRED[12] operation creates the Job object with all of the mixture of Job and Document attributes supplied in
452   the Create-Job operation.  All Operation attributes supplied affect the Job as a whole.  The client supplies Job
453   Template attributes [rfc2911] that are a mixture of Job and Document attributes supplied together in the Job attribute
454   group in the request[13].  For example, such Job Template attributes as "job-priority" and "job-hold-until" are Job
455   attributes that affect the Job as a whole.  On the other hand, such Job Template attributes as "media" and "number-
456   up" are Document attributes that the client is supplying as defaults for the Document objects.  The Document objects
457   that are subsequently created for the specified Job are said to inherit the Document attributes from the Job object,
458   unless the Document Creation operation supplies a corresponding Document Template attribute.  However, the
459   Printer MUST NOT copy down any Job Level attributes to the Document object as observable by a client in any Get-
460   Documents or Get-Document-Attributes operation responses.

## 461   **3.1.3 Print-Job ([rfc2911] section 3.2.1)**

462   This REQUIRED operation creates one Document object as a side effect of the Print-Job operation in addition to
463   creating the Job object.  The Printer MUST copy all of the supported Operation attributes supplied by the client to the
464   corresponding Job Description or Document Description attributes as indicated in Table 8.  For example, the Printer
465   copies the "job-name" and "attributes-charset" operation attributes to the corresponding Job Description attributes,
466   while copying the "document-format" and "document-charset" Operation attributes to the corresponding Document
467   Description attributes.  The Printer MUST copy the supported Job Template attributes supplied by the client to the
468   Job object and MUST NOT copy them down to the Document object.  In other words, the Document object created
469   by Print-Job has an empty group of Document (and Job) Template attributes.  Any Job Template attributes supplied
470   that affect Documents have effect on the Document object because the Document object inherits them from the Job
471   object.

472   The Printer MUST populate the single Document object's "document-state", "document-state-reasons", and
473   "document-number" Document Description attributes with appropriate values.  Thus a Get-Job-Attributes operation
474   returns the same attributes for a Job created with Print-Job as a Printer that doesn't support the Document object.

---

support the "job-mandatory-attributes" Operation attribute.  See the definition of REQUIRED in section 2.1.  DMC
Editorial: Shouldn't we delete this footnote since "job-mandatory-attributes" is now defined in the jobx spec?

[12] In [rfc2911] the Create-Job operation is OPTIONAL for a Printer to support.

[13] In the PWG Semantic Model, attributes are classified as Job Processing versus Document Processing in their
definition.  The client supplies them in separate Job Processing or Document Processing groups in the Job Creation
operation.  Such Document Processing attributes are defaults for subsequent Document Creation operations for that
Job.

475  However, a Get-Documents or Get-Document-Attributes for a Job created by Print-Job will return no Document
476  Templates attributes (since the client can't submit any with Print-Job), but will return the populated Document
477  Description attributes, such as "document-format", supplied by the client.

478  Note:  Using the Get-Job-Attributes and Get-Document-Attributes, a Job created by Print-Job will be indistinguishable
479  to a client from a Job created with Create-Job and Send-Document with no Document Template attributes supplied.
480  Also an old client performing just a Get-Job-Attributes will see the same results from (1) an old Printer that accepted
481  the Print-Job, (2) a new Printer that accepted the Print-Job, and (3) a new Printer that accepted the Create-Job and
482  Send-Document (with no Document Template attributes supplied).  However, if a new client supplies Document
483  Template attributes on the Send-Document, instead of the same attributes as Job Template attributes on the Create-
484  Job, then an old client will not see any of the Document Template attributes when it performs the Get-Job-Attributes
485  operation (since the Printer does not "copy up" Document Template attributes to the Job Level). on a Get-Job-
486  Attributes on a one document job

## 487  3.1.4 Print-URI ([rfc2911] section 3.2.2)

488  This OPTIONAL operation creates one Document object as a side effect of the Print-URI operation in addition to
489  creating the Job objectcreating the Document object with Document Description attributes.  The Printer MUST copy
490  all of the supported Operation attributes supplied by the client and the Job Template attributes as indicated for Print-
491  Job in section 3.1.3. In addition the Printer MUST copy the "document-uri" Operation attribute to the corresponding
492  Document Description attribute.

493  Note:  Using the Get-Job-Attributes and Get-Document-Attributes, a Job created by Print-URI will be
494  indistinguishable to a client from a Job created with Create-Job and, Send-URI with no Document Template
495  attributes supplied.

## 496  3.2 Validate-Job ([rfc2911] section 3.2.4)

497  This REQUIRED operation is similar to the Print-Job operation ([rfc2911] section 3.2.1 and [this spec] section 3.1.3)
498  except that a client supplies no document data and the Printer allocates no resources (i.e., it creates neither a new
499  Job object nor a Document object).  This operation is used only to verify attributes supplied by the client in the
500  Validate-Job request against the capabilities of a Printer object.  By using the Validate-Job operation a client can
501  validate that an identical Print-Job operation (with the document data) would be accepted.  A client can also use the
502  Validate-Job operation to validate that an identical Send-Document operation (with the document data) would be
503  accepted.  Such a client MAY either:

504       (1) perform all of the Validate-Job operations for each of the documents before doing the Create-Job in order
505            to validate all documents before creating the Job and transmitting any document data OR

506       (2) perform a Create-Job and then a Validate-Job before each Send-Document (or Send-URI) operation.

507  There are certain configurations and implementations where the above validation will not completely validate a multi-
508  document job with differing Document Template attributes for the same Job.  Consider a Printer that is representing
509  several dissimilar devices in which no device is a superset of the others.  In such as case, the Printer MAY reject a
510  Send-Document operation that cannot be supported in the Job because the combination of its supplied Document
511  Template attributes cannot be supported in the same Job in combination with the differing Document Template
512  attributes of the previously supplied documents.  In factsuch a case, there is no way to completely validate a multi-
513  document job which has documents with differing Document Template attributes using Validate-Job, since each
514  Validate-Job is a separate independent operation.  An administrator can avoid such a configuration by making sure
515  that one of the devices is a superset of all of the other devices.

516 ## 3.3 Get-Documents Operation

517 This REQUIRED Job operation allows a client to retrieve the list of Document objects belonging to the target Job
518 object. The client MAY also supply a list of Document attribute names and/or attribute group names. A group of
519 Document object attributes will be returned for each Document object in the Job.

520 This operation is similar to the Get-Document-Attributes operation (see section 4.3), except that this Get-Documents
521 operation returns attributes from all Document objects contained in the Job object, instead of from a single selected
522 Document object in the Job object. As with the Get-Document-Attributes operation the Printer MUST only return
523 attributes that were submitted by a client when the Document object was created by the Send-Document or Send-
524 URI operations and possibly modified by the Set-Document-Attributes operation (see section 4.4).

525 ### 3.3.1 Get-Documents Request

526 The client submits the Get-Documents request to a Printer. The Get-Documents is similar to the Get-Jobs
527 operations (see [rfc2911] section 3.2.6) except that there are no equivalents to the "which-jobs" and "my-jobs"
528 Operation attributes.

529 The following groups of attributes are part of the Get-Documents Request:

530 **Group 1: Operation Attributes**

531 **Natural Language and Character Set:**
532 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.1.

533 **Target:**
534 Either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) Operation attribute(s)
535 which define the target Job object for this operation as described in [rfc2911] section 3.1.5.

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

539 **3.3.1.1 "limit" (integer(1:MAX)):**

540 The client OPTIONALLY supplies this Operation attribute. The Printer MUST support this Operation
541 attribute. It is an integer value that determines the maximum number of Documents that a client will receive
542 from the Printer. The limit is a "stateless limit" in that if the value supplied by the client is 'N', then only the
543 first 'N' Documents are returned in the Get-Documents Response. There is no mechanism to allow for the
544 next 'M' Documents after the first 'N' Documents. If the client does not supply the "limit" attribute, the Printer
545 responds with all Documents in the Job.

546 **3.3.1.2 "requested-attributes" (1setOf type2 keyword):**

547 The client OPTIONALLY supplies this attribute. The Printer MUST support this attribute. It is a set of
548 Document attribute names and/or attribute groups names in whose values the requester is interested. This
549 set of attributes is returned for each Document object that is returned. The allowed attribute group names
550 are the same as those defined in the Get-Document-Attributes operation in section 4.34.3.1.

551 If the client does not supply this attribute, the Printer MUST respond as if the client had supplied this attribute
552 with the single value:

553 'document-number' (see section 9.1.21)
554

555 **3.3.2 Get-Documents Response**

556 The Printer returns all of the Document objects up to the number specified by the "limit" attribute that match the
557 criteria as defined by the attribute values supplied by the client in the request.  If the client requests any Document
558 attributes at all, there is a set of Document Object Attributes returned for each Document object.

559 It is not an error for the Printer to return 0 Documents. If the response returns 0 Documents because there are no
560 Documents in the Job, then the status code for 0 Documents MUST be 'successful-ok'.

561 **Group 1: Operation Attributes**

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

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

568 **Group 2: Unsupported Attributes**

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

570 The response MAY contain or MAY omit the "requested-attributes" Operation attribute with any supplied
571 values (attribute keywords) that were requested by the client but are not supported by the Printer. If the
572 Printer does return unsupported attributes referenced in the "requested-attributes" Operation attribute and
573 that attribute included group names, such as 'all', the unsupported attributes MUST NOT include attributes
574 described in the standard but not supported by the implementation.

575 **Groups 3 to N: Document Object Attributes**

576 The Printer responds with one set of Document Template attributes (see the D column in Table 10) and
577 Document Description attributes (see the Doc column in Table 11) for each returned Document object as
578 specified by the "requested-attributes" Operation attribute supplied by the client in the request.  The Printer
579 ignores (does not respond with) any requested attribute or value which is not supported or which is restricted
580 by the security policy in force, including whether the requesting user is the user that submitted the job (job
581 originating user) or not (see [rfc2911] section 8).  However, the Printer MUST respond with the 'unknown'
582 value for any supported attribute (including all REQUIRED attributes) for which the Printer does not know the
583 value, unless it would violate the security policy.  See the description of the "out-of-band" values in the
584 beginning of [rfc2911] section 4.1.

585 The Printer MUST return the Groups for the requested Job in order of increasing "document-number"
586 Document Description attribute value.


587 **3.4 Cancel-Job** ([rfc2911] section 3.3.3)

588 This REQUIRED operation sets the "document-state" Document Description attribute to 'canceled' and the
589 "document-state-reasons" Document Description attribute withto 'canceled-by-user' or 'canceled-by-operator' for *all*
590 Document objects in the identified Job that have not yet reached a terminal state ('completed', 'canceled', or
591 'aborted').

592  **3.5 Send-Document** ([rfc2911] section 3.3.1)

593  This REQUIRED Job operation is a Document Creation operation that has been extended to accept a new Document
594  Attributes group (Group 4) that the client can supply ~~Document Template attribute and creates a Document object~~
595  (see section 4.1 for the extension semantics).


596  **3.6 Send-URI** ([rfc2911] section 3.3.2)

597  This OPTIONAL Job operation is a Document Creation operation that has been extended to accept a new Document
598  Attributes group (Group 4) that the client can supply ~~Document Template attribute and creates a Document object~~
599  (see section 4.2 for the extension semantics).


600  **3.7 Hold-Job** ([rfc2911] section 3.3.5)

601  This OPTIONAL operation moves the job to the 'pending-held' state, and sets the Job's "job-state-reasons" Job
602  Description attribute as descri~~ption~~bed in [rfc2911] section 3.3.5.  The values of the Documents' "document-state-
603  reasons" Document Description attributes MUST NOT be affected by this operation.


604  **3.8 Release-Job**  ([rfc2911] section 3.3.6)

605  This OPTIONAL operation moves the job out of~~to~~ the 'pending-held' state, if there are no other "job-state-reasons" to
606  hold the job as described in [rfc2911] section 3.3.6.  The values of the Documents' "document-state-reasons"
607  Document Description attributes MUST NOT be affected by this operation.


608  **3.9 Restart-Job** ([rfc2911] section 3.3.7)

609  This OPTIONAL operation starts the Job over again by processing *all* Documents in the Job as described in [rfc2911]
610  section 3.3.7, including Documents that have been canceled by a previous Cancel-Document operation (see section
611  4.5).  Therefore, the Printer removes any 'canceled-by-*xxx*' values from any of the "document-state-reasons"
612  attributes and the Job's "job-state-reasons" attribute~~s~~ so that any canceled Documents are reprocessed along with
613  the other Documents.


614  **3.10 Reprocess-Job** ([adm-ops] section 4.1)

615  This OPTIONAL operation processes the Job again by processing *all* Documents in the Job, including ones that have
616  been canceled by a previous Cancel-Document operation.  Therefore, the Printer removes any 'canceled-by-xxx'
617  values from any of the "document-state-reasons" attributes and the Job's "job-state-reasons" attribute~~s~~ so that any
618  canceled Documents are reprocessed along with the other Documents.


619  **4   Document Operations**

620  This section defines the Document Creation and Document operations.  The Document object semantics are as
621  parallel to the Job object semantics as possible.  Therefore, most of the Job operations have analogous Document
622  operations as shown in Table 16 in section "Appendix A: Document operations compared to Job operations".
623  Operations that can apply only to an entire job~~,~~ have no analogous document operation as indicated.  This extension
624  adds 5 new Document operations that operate on the Document object once it is created by either of the existing two
625  operations: Send-Document and Send-URI operations.  <mark>DMC Editorial02: Aren't there four Document Creation</mark>
626  <mark>operations?  I was going to change this here to say so, but then Table 4 just below would need to be updated as well,</mark>
627  <mark>and then the paragraph before Table 4 might need rewriting (maybe not "very similar" anymore?), so I decided to</mark>

628 <mark>bring this up as a question. If Table 4 doesn't get changed for this reason, it should probably have the two empty</mark>
629 <mark>columns removed. Also, if we add Print-Job and Print-URI to this paragraph and Table 4, they should probably be</mark>
630 <mark>added to Table 5 as well..</mark>

631 Note: By Document object, this specification means the object once it becomes a contained part of a Job object, not
632 before or after. So in this specification a Document object does not represent data in a repository.

633 The signatures of the operation requests that create Document objects are very similar as shown in Table 4. The
634 entries in the table show what a client MUST, MAY, or MUST NOT supply in the indicated operation requests.

635 **Table 4 - Client-supplied Document Creation and Validation Request Signatures**

|  |  |  | Send-Document | Send-URI |
|---|---|---|---|---|
| Target job |  |  | MUST | MUST |
| "document-uri" |  |  | MUST NOT | MUST |
| Document Template attributes |  |  | MAY | MAY |
| Data |  |  | MUST | MUST NOT |

636

637 The entries in Table 5 show what a Printer MUST or MAY support and return in the indicated operations responses.

638 **Table 5 - Printer-returned Document Creation and Validation Response Signatures**

|  | Create-Job | Send-Document | Send-URI |
|---|---|---|---|
| Status code/message | MUST | MUST | MUST |
| Unsupported Attributes | MUST, if any | MUST, if any | MUST, if any |
| Job status attributes | MUST | MUST | MUST |
| Document status attributes: |  |  |  |
|    "document-number" | MUST NOT | MUST | MUST |
|    "document-state" | MUST NOT | MUST | MUST |
|    "document-state-reasons" | MUST NOT~~TY~~ | MUST | MUST |
|    "document-state-message" | MUST NOT | MAY | MAY |

639

## 640 4.1 Send-Document ([rfc2911] section 3.3.1) extension

641 This REQUIRED[14] Document Creation operation allows a client to submit multiple documents in a single Job by
642 making a Send-Document request for each Document. In this specification, the Send-Document creates a
643 Document object ([rfc2911] did not have a Document object). A Printer MUST support this operation with the
644 semantics specified in [rfc2911] and with the extension defined in this specification, since this specification
645 REQUIRES the Printer to support multiple document jobs.

646 See [rfc2911] section 3.3.1 for the semantics of the Send-Document operation not reproduced here.

647 *Access Rights:* The authenticated user (see [rfc2911] section 8.3) performing this operation must either be the job
648 owner (as determined in the Create-Job operation) or an operator or administrator of the Printer (see [rfc2911]

---

[14] This specification REQUIRES the Printer to support the Send-Document operation while [rfc2911] did not. This difference is because this specification REQUIRES the Printer to support multiple document jobs, while [rfc2911] did not.

649  sections 1 and 8.5).  Otherwise, the Printer MUST reject the operation and return: 'client-error-forbidden', 'client-error-
650  not-authenticated', or 'client-error-not-authorized' as appropriate.

### 651  4.1.1 Send-Document Request

652  The following attribute sets are part of the Send-Document Request:

653  **Group 1: Operation Attributes (as in [rfc2911])**

654      As specified in [rfc2911] section 3.3.1 Send-Document request, plus any extensions indicated in Table 8.
655      For example, "compression", "document-format", and "document-name".

656  **Group 2: Document Template Attributes (new - not in [rfc2911])**

657      The client OPTIONALLY supplies a set of Document Template attributes as listed in Table 10.  For example,
658      "media" and "number-up".  If the client is not supplying any Document Template attributes in the request, the
659      client SHOULD omit Group 2 rather than sending an empty group.  However, a Printer MUST be able to
660      accept an empty group.

661  **Group 3: Document Content (as in [rfc2911] Group 2)**

662      The client MUST supply the document data in-line to be processed for this Document if the "last-document"
663      flag is set to 'false' or omitted.  However, since a client might not know that the previous Document Creation
664      operation that the client had supplied (a Send-Document or a Send-URI operation) was the last document
665      (i.e., the client had supplied the "last-document" attribute with a 'false' value), the client MUST use a Send-
666      Document request with no document data where the "last-document" flag is set to 'true' (see [rfc2911]
667      section 3.3.1).  For this Send-Document case with no data, the Printer MUST NOT increment the value of the
668      Job object's "number-of-documents" attribute, since no Document object was added to the job.  In addition, it
669      is not an error for a client to submit a job with no actual document data, i.e., only a single Create-Job and
670      Send-Document request with a "last-document" Operation attribute set to 'true' with no document data; it is
671      only an empty job which is scheduled and processed normally.

### 672  4.1.2 Send-Document Response

673  The following sets of attributes are part of the Send-Document Response:

674  **Group 1: Operation Attributes (as in [rfc2911] Group 1)**

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

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

681  **Group 2: Unsupported Attributes (as in [rfc2911] Group 2)**

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

683  **Group 3: Job Object Attributes (as in [rfc2911] Group 3)**

684      The Printer MUST return the same set of Job status attributes as for the Print-Job response as specified in
685      [rfc2911] section 3.2.1.2.

686    **Group 4: Document Object Attributes (new)**

687          The following Document Description attributes are defined for this Group:


688    **4.1.2.1 document-number (integer(1:MAX))**

689          The Printer MUST return the document number of this Document object that was assigned by the Printer
690          starting with 1 for each Job (see section 9.1.21).


691    **4.1.2.2 document-state (type1 enum)**

692          The Printer MUST return the state of this Document object (see section 9.1.23).


693    **4.1.2.3 document-state-reasons (1setOf type2 keyword)**

694          The Printer MUST return the associated state reasons for this Document (see section 9.1.25).


695    **4.1.2.4 document-state-message (text(MAX))**

696          The Printer MAY return the localized description of the "document-state" and "document-state-reasons"
697          values for this Document (see section 9.1.24).


698    ## 4.2 Send-URI ([rfc2911] section 3.3.2) extension

699    This OPTIONAL Document Creation operation has the same request and response semantics as the Send-
700    Document operation (see section 4.1) except that a client MUST supply a URI reference ("document-uri" Operation
701    attribute) rather than the document data itself.  If a Printer supports this operation, clients can use either this
702    operation or the Send-Document operation to add new Document objects to an existing multi-document Job object.
703    However, if a client needs to indicate that the previous Send-URI or Send-Document was the last document,  the
704    client MUST use the Send-Document operation (see section 4.1) with no document data and the "last-document" flag
705    set to 'true' as specified in [rfc2911] section 3.3.2 (rather than using a Send-URI operation with no "document-uri"
706    Operation attribute).

707    If a Printer supports this operation, it MUST also support the Print-URI operation (see [rfc2911] section 3.2.2).

708    The Printer MUST validate the syntax and URI scheme of the supplied URI before returning a response, just as in
709    the Print-URI operation.  The IPP Printer MAY validate the accessibility of the document as part of the operation or
710    subsequently (see [rfc2911] section 3.2.2).


711    ## 4.3 Get-Document-Attributes

712    This REQUIRED Document operation allows a client to request the values of selected attributes of a Document
713    object.  This operation is almost identical to the Get-Job-Attributes operation (see [rfc2911] section 3.3.4).  The only
714    differences are that the operation is directed at a Document object rather than a Job object and the returned attribute
715    group is a set of Document object attributes rather than a set of Job object attributes.

716    The Printer MUST return the Document Description attributes that a client supplied in the Document Creation
717    operation (Print-Job, Print-URI, Send-Document or Send-URI) as Operation attributes (see the PJ/PU and SD/SU
718    columns in Table 8 and the Doc column in Table 11), any Document Template attributes supplied by Send-Document
719    or Send-URI operations (see the D column in Table 10), plus any additional Document Description attributes that the
720    Printer has generated, such as "document-state" (see the Doc column in Table 11).  The Printer MUST NOT return
721    any Job Level attributes that the Document object inherits and MUST NOT factor out common Document object
722    attributes and return them as Job object attributes.  Thus the Get-Document-Attributes returns to clients only the

723 attributes that clients submitted in Document Creation operations, plus the additional Document Description attributes
724 that the Printer sets.

725 The client MAY display to the user any Document attributes inherited from the Job object.  However, such a client
726 MUST query both the Job object using Get-Job-Attributes and the Document object using Get-Document-Attributes
727 in order to be able to merge the inherited attributes with the explicitly-supplied Document attributes.  Furthermore, the
728 client MAY factor out common explicitly-supplied Document object attributes and display them once as Job object
729 attributes, instead of with each Document object.  However, any such regularization of the display for users is the
730 policy of the client and is outside the scope of this client-Printer protocol specification.  Note: to specify any such
731 regularization or canonicalization policy in the Printer response would have been impossible to agree to.

732 For Document objects, the possible names of attribute groups are:

733      - 'document-template': the subset of the Document Template attributes ~~that apply to a Document object~~ (the "D"
734           column in Table 10) that the implementation supports for Document objects.

735      - 'document-description': the subset of the Document Description attributes specified in the "Doc" column of
736           Table 11 that the implementation supports for Document objects.

737      - 'all': the special group 'all' that includes all attributes that the implementation supports for Document objects.

738 Since a client MAY request specific attributes or named groups, there is a potential that there is some overlap.  For
739 example, if a client requests, 'document-name' and 'document-description', the client is actually requesting the
740 "document-name" attribute once by naming it explicitly, and once by inclusion in the 'document-description' group.  In
741 such cases, the Printer MAY return the attribute only once in the response even if it is requested multiple times.  The
742 client SHOULD NOT request the same attribute in multiple ways.

743 It is NOT REQUIRED that a Document object ~~to~~ support all attributes belonging to a group (since some attributes are
744 OPTIONAL).  However, it is REQUIRED that the Printer support all these group names for the Document object.

## 745 **4.3.1 Get-Document-Attributes Request**

746 The following groups of attributes are part of the Get-Document-Attributes Request when the request is directed at a
747 Document object:

748 **Group 1: Operation Attributes**

749 **Natural Language and Character Set:**
750      The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.1.

751 **Target:**
752      The "document-number" (integer(1:MAX)) Operation attribute MUST be supplied immediately after either (1)
753      the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) Operation attribute(s) which define
754      the target Document object for this operation as described in [rfc2911] section 3.1.5.  If the client omits the
755      "document-number" Operation attribute, the Printer MUST reject the request and return the 'client-error-bad-
756      request' status code.

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

760      **4.3.1.1 "requested-attributes" (1setOf keyword):**

761      The client OPTIONALLY supplies this attribute.  The Printer MUST support this attribute.   It is a set of
762      attribute names and/or attribute group names in whose values the requester is interested.  If the client omits
763      this attribute, the Printer MUST respond as if this attribute had been supplied with a value of 'all'.

## 764  4.3.2 Get-Document-Attributes Response

765      The Printer returns the following sets of attributes as part of the Get-Document-Attributes Response:

766      **Group 1: Operation Attributes**

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

771      **Natural Language and Character Set:**
772      The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.
773      The "attributes-natural-language" MAY be the natural language of the Document object, rather than the one
774      requested.

775      **Group 2: Unsupported Attributes**

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

777      The response MAY contain or MAY omit the "requested-attributes" Operation attribute with any supplied
778      values (attribute keywords) that were requested by the client but are not supported by the Printer. If the
779      Printer does return unsupported attributes referenced in the "requested-attributes" Operation attribute and
780      that attribute included group names, such as 'all', the unsupported attributes MUST NOT include attributes
781      described in the standard but not supported by the implementation.

782      **Group 3: Document Object Attributes**

783      The Printer returns the set of requested Document Template attributes (see the D column in Table 10) and
784      Document Description attributes (see the Doc column in Table 11) and their current values.  The Printer
785      ignores (does not respond with) any requested attribute or value which is not supported.  Furthermore, the
786      Printer MUST NOT return Document Template attributes that were not supplied by a client in a Send-
787      Document or Send-URI request or set by a Set-Document-Attributes request.  So the response reflects what
788      was submitted.  The Printer MAY omit returning attributes that are restricted by the Printer's security policy in
789      force, including whether the requesting user is the user that submitted the job (job originating user) or not
790      (see [rfc2911] section 8).  However, the Printer MUST respond with the 'unknown' value for any supported
791      attribute (including all REQUIRED attributes) for which the Printer does not know the value, unless it would
792      violate the security policy.  See the description of the "out-of-band" values in the beginning of [rfc2911]
793      Section 4.1.

## 794  4.4 Set-Document-Attributes

795      This OPTIONAL Document operation allows a client to set the values of the attributes of a Document object after the
796      Document object was submitted to the Printer.  In the request, the client supplies the set of Document keyword
797      attribute names and values that are to be set.  In the response, the Printer returns success or rejects the entire
798      request with indications of which attribute or attributes could not be set.

799   This operation is almost identical to the Set-Job-Attributes operation and follows the same rules for validation (see
800   [rfc3380] section 4.2).  The only differences are that the Set-Document-Attributes operation is directed at a Document
801   object rather than a Job object.  As with the Set-Job-Attributes operation, t Tthe Set-Document-Attributes operation
802   can add an attribute to the Target object and, accepts the 'delete-attributes' out-of-band value to remove an attribute
803   from the Target object.  In addition the validation is the same as the Send-Document and Send-URI operations that
804   create Document objects, i.e., the Printer validation depends on the "xxx-supported" Printer Description attributes
805   (see [rfc2911] section 3.1).

806   If a client supplies a document attribute in a Set-Document-Attributes request that the Printer supports, and the
807   document was originally submitted without supplying that attribute, the Printer adds the attribute to the Document
808   object.

809   If the client supplies a document attribute with the "out-of-band" value 'delete-attribute' (see [rfc3380] section 8.2),
810   then the Printer MUST remove the attribute and all of its values from the Document object, if present.  The semantic
811   effect of the client supplying the 'delete-attribute' value in a Set-Document-Attributes operation MUST be the same as
812   if the attribute had not been supplied with the Document object in the Document Creation operation, i.e., the Printer
813   applies its default attribute or behavior with lower precedence that the PDL (see the beginning of [rfc2911] section
814   4.2 and [rfc2911] 3.2.1.1).  Any subsequent query of the Document object using Get-Document-Attributes or Get-
815   Documents MUST NOT return any attribute that has been deleted using the 'delete-attribute' out-of-band value.
816   However, a client can re-establish such a deleted Document attribute with any supported value(s) using a
817   subsequent Set-Document-Attributes operation.

818   If the client supplies an attribute in a Set-Document-Attributes request with the 'delete-attribute' value and that
819   attribute is not present on the Document object, the Printer ignores that supplied attribute in the request, does not
820   return the attribute in the Unsupported Attributes group, and returns the 'successful-ok' status code, if there are no
821   other problems with the request.

822   The validation of the Set-Document-Attributes request is performed by the Printer as if the document had been
823   submitted originally with the new attribute values (and the deleted attributes removed) and with "ipp-attribute-fidelity"
824   set to 'true', i.e., all modified attributes Document attributes and values MUST be supported in combination with the
825   Document attributes not modified.  If such a Document Creation operation would have been accepted, then the Set-
826   Document-Attributes MUST be accepted.  If such a Document Creation operation would have been rejected, then the
827   Set-Document-Attributes MUST be rejected and the Document MUST be unchanged.  In addition, if any of the
828   supplied attributes are not supported, are not settable, or the values are not supported, the Printer MUST reject the
829   entire operation; the Printer MUST NOT partially set some of the supplied attributes.  In other words, after the
830   operation, all the supplied attributes MUST be set or none of them MUST be set, thus making the Set-Document-
831   Attributes an atomic operation.

832   The value of the "ipp-attribute-fidelity" and "job-mandatory-attributes" Operation attributes supplied in the original Job
833   Creation request, if any, MUST have no eaffect on the behavior of the Set-Document-Attributes operation, since the
834   Set-Document-Attributes request MUST behave as if "ipp-attribute-fidelity" = 'true'.  In other words, the Printer MUST
835   reject any attempt to set a Document attribute to an unsupported value or to a value that would conflict with another
836   Document attribute value.

837   The Printer MUST accept or reject this operations when the Document's READ-ONLY "document-state" attribute has
838   the values shown in Table 6.  The document's current state MUST affect whether the Printer accepts or rejects the
839   request.  However, the Set-Document-Attributes operation MUST NOT change the state of the Document object
840   (since the Document is a passive object and the Document state is a subset of the Job State).  For example, in the
841   case where the operation creates a request for unavailable resources, the Job (but not the Document) transitions to a
842   new state.  Table 6 shows the allowed behaviors in each document state.

843          **Table 6 - Document State Table for the Set-Document-Attributes operation**

| Current "document-state" | New "document-state" (no change) | Printer's response status code and "action": |
|---|---|---|
| 'pending' | 'pending' | 'successful-ok' |
| 'pending' | 'pending' | 'successful-ok' - needed resources are not ready (the Job MAY change state, but the Document MUST NOT). |
| 'processing' | 'processing' | 'successful-ok' or 'client-error-not-possible' depending on implementation, including the attributes being set, whether the document has started marking media, etc. |
| 'completed' | 'completed' | 'client-error-not-possible' |
| 'canceled' | 'canceled' | 'client-error-not-possible' |
| 'aborted' | 'aborted' | 'client-error-not-possible' |

844

845  This operation MUST NOT change the value of attributes not specified in the operation unless the definition of the
846  attribute explicitly specifies such side -effects.  In general, Document attribute definitions that are settable will not
847  define side -effects on other attributes that are settable, only side effects on READ-ONLY attributes, if any.

## 848  4.4.1 Settable and READ-ONLY Document Description attributes

849  If the Printer supports the Set-Document-Attributes operation, then it SHOULD support setting of:
850          all Document Template document ("xxx") attributes
851  that the implementation supports (see the "D" column labeled "D" in Table 10).

852  Almost all Document Description attributes (see [rfc2911] section 4.3) MUST NOT be settable, i.e., they are defined
853  to be READ-ONLY.  Only Document Description attributes marked with "(r/w)" in Table 11Table 10 MAY be settable
854  using Set-Document-Attributes.  The Printer MUST reject a Set-Document-Attributes request that attempts to set any
855  attributes in Table 11 that are not marked "(r/w)".

856  Note:  From now on, all extensions that define new Document Descriptionobject attributes will indicate whether or not
857  the attributes are READ-ONLY, by including the "READ-ONLY" adjective in their descriptions and/or explicitly stating
858  whether they MAY be settable.

859  *Access Rights:* The authenticated user (see [rfc2911] section 8.3) performing this operation must either be the job
860  owner (as determined in the Job Creation operation) or an operator or administrator of the Printer (see [rfc2911]
861  Sections 1 and 8.5).

## 862  4.4.2 Set-Document-Attributes Request

863  The following sets of attributes are part of the Set-Document-Attributes Request:

864  **Group 1: Operation Attributes**

865      **Natural Language and Character Set:**
866          The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.1.

867      **Target:**
868          The client MUST supply the "document-number" (integer(1:MAX)) Operation attribute immediately after
869          either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) Operation attribute(s)
870          which define the target Document object for this operation as described in [rfc2911] section 3.1.5.  If the

871  client omits the "document-number" Operation attribute, the Printer MUST reject the request and return the
872  'client-error-bad-request' status code.

873  Note: There is no way in a single operation for the client to set all of a Job's Document objects to the same
874  attribute value. Either (1) the client sets the corresponding attribute in each Document object in the Job with
875  separate Set-Document-Attributes requests, or (2) the client sets the corresponding attribute at the Job Level
876  using the Set-Job-Attributes operation. Setting the corresponding attribute at the Job Level (or supplying that
877  attribute initially in the Job Creation operation) causes each Document object to inherit the Job Level
878  attribute value, if the Document object doesn't have a corresponding explicit attribute supplied at the
879  Document Level. In other words, supplying an attribute at the Job Levels will affect all the Job's Document
880  objects that don't have that attribute also explicitly supplied at the Document Level.

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

884  **Group 2: Document Attributes**

885  The client MUST supply a set of Document Template attributes with one or more values (including explicitly
886  allowed out-of-band values) as listed in the "D" column labeled "D" in Table 10, Table 10 - Job Template and
887  Document Template attributes and Document Description attributes flagged with "(r/w)" and listed in the
888  "Doc" column labeled "Doc" in Table 11 Table 11 - Job and Document Description attributes, and any
889  attribute extensions supported by the Printer. The value(s) of each Document attribute supplied in Group 2
890  replaces the value(s) of the corresponding Document attribute on the target Document object. For attributes
891  that can have multiple values (1setOf), all values supplied by the client replace all values of the
892  corresponding Document object attribute.

893  In order to set the Document's "document-message" Document Description attribute (see section 9.1.18), the
894  client MUST supply the attribute in Group 2, rather than supplying a "document-message" Operation attribute
895  in Group 1.

896  If the client supplies an "xxx" attribute with the 'delete-attribute' out-of-band value (see [rfc3380] section 8.2),
897  the Printer MUST remove the "xxx" attribute from the Document object, if present.

898  ## 4.4.3 Set-Document-Attributes Response

899  The Printer returns the following sets of attributes as part of the Set-Document-Attributes Response:

900  **Group 1: Operation Attributes**

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

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

907  **Group 2: Unsupported Attributes**

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

909  If some of the attributes in the operation fail to validate, the Printer MUST reject the operation, MUST NOT
910  change any Document attributes, and MUST return the indicated status code below. In this group, the

911  Printer MUST also return all attributes that fail to validate.  The following are the reasons that an attribute
912  fails to validate and the value returned for the attribute, along with the indicated status code and order of
913  detection:

914  1. The number of attributes supplied by the client exceeds the maximum number that the Printer
915     supports in a Set-Printer-Attributes request:  return the 'client-error-request-entity-too-large' (see
916     [rfc2911] section 13.1.4.9).

917  2. The Printer doesn't support the attribute:  return the attribute with the 'unsupported' out-of-band
918     attribute value (see [rfc2911] section 3.1.7 and [rfc2910]) and the 'client-error-attributes-or-values-
919     not-supported (see [rfc2911] section 13.1.4.12).

920  3. The attribute is READ-ONLY (in its definition) or is not-settable in this implementation:  return the
921     attribute with the 'not-settable' out-of-band attribute value (see [rfc3380] section 8.1) and the
922     'client-error-attributes-not-settable' status code (see [rfc3380] section 7.1).

923  4. The Printer doesn't support the value:  if the attribute in the operation has a single value, return it.
924     If the attribute in the operation is multi-valued, return only those values in a 1setOf that are not
925     supported.  Return the 'client-error-attributes-or-values-not-supported' status code (see [rfc2911]
926     section 13.1.4.12).

927  5. The values of some of the supplied attributes conflict with one another and/or other Document
928     attribute values not being set:  if the conflicting attribute in the operation has a single value, return
929     the attribute and the value.  If the attribute in the operation is multi-valued, return only the attribute
930     and those values in a 1setOf that are conflicting with other attributes.  Return the 'client-error-
931     conflicting-attributes' status code (see [rfc2911] section 13.1.4.15).

## 932  4.5 Cancel-Document

933  This REQUIRED Document operation allows a client to cancel a specified Document in a specified Print Job any time
934  from the time the Document is created up to, but not including, the time that the Document is completed, canceled, or
935  aborted.  Since a Document might already be printing by the time a Cancel-Document is received, some media sheet
936  pages might be printed before the document processing is actually terminated.

937  The Cancel-Document operation does not remove the Document from the Job and Printer, but only sets the specified
938  Document's "document-state" Document Description attribute to 'canceled' and the Document's "document-state-
939  reasons" Document Description attribute withto 'canceled-by-user' or 'cancel-by-operator'. If the Job object is printed
940  again using operations such as the Reprocess-Job operation (see [adm-ops] section 4.1) or the Restart-Job
941  operation (see [rfc2911] section 3.3.7), any canceled Documents are also printed again.  Thus Cancel-Document has
942  the same semantics as Cancel-Job (see [rfc2911] section 3.3.3), which only cancels the processing of the job, and
943  doesn't delete the Job object itself.  See the Delete-Document operation (section 5.4) to remove the Document object
944  itself immediately from the Job and Printer.

945  The Cancel-Document operation does not affect the states of any of the other Document objects in the job. If the Job
946  was processing and there are more Documents to be processed, the Printer does so.  If there are no further
947  Documents to process, the Job moves to the 'completed' state as usual whenever there is no more processing to be
948  done.

949  The Printer MUST accept or reject the request based on the document's current state and transition the document to
950  the indicated new state as follows:

| Current "document-state" | New "document-state" | Printer's response status code and action: |
|---|---|---|
| 'pending' | 'canceled' | 'successful-ok' |
| 'processing' | 'canceled' | 'successful-ok' |
| 'processing' | 'processing' | 'successful-ok'  See Rule 1 |
| 'processing' | 'processing' | 'client-error-not-possible'  See Rule 2 |
| 'completed' | 'completed' | 'client-error-not-possible' |
| 'canceled' | 'canceled' | 'client-error-not-possible' |
| 'aborted' | 'aborted' | 'client-error-not-possible' |

951

952 Rule 1:  If the implementation requires some measurable time to cancel the document in the 'processing' document
953 states, the Printer MUST add the 'processing-to-stop-point' value to the document's "document-state-reasons"
954 attribute and then transition the document to the 'canceled' state when the processing ceases (see [rfc2911] section
955 4.3.8).

956 Rule 2:  If the Document object already has the 'processing-to-stop-point' value in its "document-state-reasons"
957 attribute, then the Printer MUST reject a Cancel-Document operation.

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

962 **4.5.1 Cancel-Document Request**

963 The following groups of attributes are part of the Cancel-Document Request:

964 **Group 1: Operation Attributes**

965 **Natural Language and Character Set:**
966 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.1.

967 **Target:**
968 The client MUST supply the "document-number" (integer(1:MAX)) Operation attribute immediately after
969 either (1) the "printer-uri" (uri) plus "job-id"  (integer(1:MAX)) or (2) the "job-uri" (uri) Operation attribute(s)
970 which define the target Document object for this operation as described in section [rfc2911] 3.1.5.  If the
971 client omits the "document-number" Operation attribute, the Printer MUST reject the request and return the
972 'client-error-bad-request' status code.

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

976 **4.5.1.1 document-message (text(MAX)):** ~~Operation attribute~~

977 The client MAY supply this Operation attribute.  If the Printer supports this attribute, the Printer MUST also
978 support the corresponding "document-message" (text(MAX)) Document Description attribute (see section
979 9.1.18) and copy this value to the "document-message" Document Description attribute.  The end user can
980 use this Document Description attribute as a message to the operator and the operator can use it as a
981 message to the end user.  The Printer MAY print this message on a document start sheet for this document,
982 if any.

983    The Printer MUST ignore the ~~new~~ "job-message-from-operator" Operation attribute (see [adm-ops] section 6)
984    for this operation, since that is a job-~~-~~only attribute and Cancel-Document is a Document operation.

## 4.5.2 Cancel-Document Response

986    The following sets of attributes are part of the Cancel-Document Response:

**Group 1: Operation Attributes**

988    **Status Message:**
989    In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
990    "status-message" (text(255)) and/or a "detailed-status-message<u>s</u>" (text(MAX)) Operation attribute as
991    described in [rfc2911] sections 13 and 3.1.6.

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

**Group 2: Unsupported Attributes**

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

996    Once a successful response has been sent, the implementation guarantees that the Document will eventually end up
997    in the 'canceled' state. Between the time ~~of~~ the Cancel-Document operation is accepted and when the document
998    enters the 'canceled' document-state (see section 9.1.23), the "document-state-reasons" attribute (see section
999    9.1.25) SHOULD <mark>(DMC ISSUE02: Rule 1 for the table above says MUST, as does the description of "document-</mark>
1000   <mark>state-reasons"; OK to change it say MUST here as well?)</mark> contain the 'processing-to-stop-point' value which indicates
1001   to later queries that although the Document might still be 'processing', it will eventually end up in the 'canceled' state,
1002   not the 'completed' state.

# 5   Administrative Job and Document operations

1004   This section summarizes the extensions to existing Administrative Job and Printer operations and defines new
1005   Document Administrative operations. The following administrative operations: **Promote-Job** ([adm-ops] section
1006   4.4.1), **Release-Held-New-Jobs** ([adm-ops] section 3.3.2)**, Resume-Job** ([adm-ops] section 4.3.2)**, ~~-~~Schedule-Job-**
1007   **After** ([adm-ops] section 4.4.2) do not affect the Document objects because they are defined to affect the Job object
1008   as a whole.

## 5.1 Purge-Jobs ([rfc2911] section 3.2.9)

1010   This OPTIONAL Administrative Printer operation removes all Job<u>s</u> and all of their contained Document objects.

## 5.2 Cancel-Current-Job ([adm-ops] section 4.2)

1012   This OPTIONAL Administrative Printer operation sets the "document-state" Document Description attribute to
1013   'canceled' and the "document-state-reasons" Document Description attribute to 'canceled-by-xxx' for any documents
1014   in the current Job that have not yet reached a terminal state ('completed', 'canceled', or 'aborted'), where <u>"</u>xxx<u>"</u> is
1015   'user' or 'operator'. See [adm-ops] section 4.2.

1016   Note: There is no Cancel-Current-Document operation defined, since it is too likely that the Printer would have
1017   moved onto the next document before the operation could issue the request.

1018　## 5.3 Suspend-Current-Job ([adm-ops] section 4.3.1)

1019　This OPTIONAL Administrative Printer operation suspends the current job and sets the Job's "job-state" Job
1020　Description attribute to 'processing-stopped' and "job-state-reasons" to 'job-suspended-by-xxx', where 'xxx' is 'user'
1021　or 'operator'.  The Documents' "document-state" and "document-state-reasons" Document Description attributes are
1022　unaffected (but the Documents are not processed any further, since the Job is stopped).

1023　## 5.4 Delete-Document

1024　This OPTIONAL Administrative Document operation removes the specified Document object and its data
1025　immediately from the specified Job.  The Printer MUST reject the request if the Document is in any state other than,
1026　but 'pending' (there is no 'pending-held' state for Documents).  The Printer does not reassign the "document-number"
1027　Document Description attribute values of the remaining Document objects in the Job, so that the deleted Document
1028　object leaves a gap in the document numbering space for the Job.  The Printer MUST return a 'client-error-not-found'
1029　status code, in a subsequent Get-Document-Attributes operation for this Document object specifying its former
1030　"document-number".  This operation is similar to the Purge-Jobs operation that immediately deletes all jobs from the
1031　Printer.  However, the Delete-Document operation only deletes a single Document from the specified Job.

1032　*Access Rights:* The authenticated user (see [rfc2911] section 8.3) performing this operation MUST be an operator or
1033　administrator of the Printer (see [rfc2911] sections 1 and 8.5).  Otherwise, the Printer MUST reject the operation and
1034　return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate.  This
1035　operation requires operator/administrator privileges, otherwise a rogue client could submit, then delete, at will using
1036　up valuable spooling space.  Instead of using this operation, unprivileged users use Cancel-Document which goes
1037　through the normal accounting, if any.

1038　The Delete-Document request and Delete-Document response have the same attribute groups and attributes as the
1039　Cancel-Document operation (see section 4.5).

1040　# 6　Job and Document Template Attribute Precedence during Job processing

1041　This section defines the Attribute Precedence rules that the Printer MUST follow when processing jobs, including
1042　instructions in the PDL data.  These rules cover Queue Override attributes, Page Override attributes, Document
1043　Object attributes (Operation/Document Description and Document Template), Document Override attributes, Job
1044　Object attributes (Operation/Job Description and Job Template), PDL instructions, PDL Interpreter initialization files,
1045　and Printer's defaults.  Since each attribute can be specified atfor all of these levels, it is important to define which
1046　level takes precedence when the same attribute occurs at different levels with differing values.

1047　The attribute precedence model has the following features:

1048　1)  In principle, each defined attribute can occur at each of the precedence levels.

1049　2)  Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print
1050　driver, submission client, protocol, and Printer:

1051　•  Attributes are supplied by different agents in the system:  application, user, print driver, administrator,
1052　operator, Printer, and the output device hardware.

1053　•  Attributes are supplied at different points in time:  PDL generation, job submission, job acceptance, job
1054　pending, job processing.

1055　3)Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print
1056　driver, submission client, protocol, and Printer.

1057    4)3)The later that an attribute is introduced into the work flow or the closer the specified scope of the attribute is
1058        to the affected object, the higher the precedence is assigned to that attribute, since precedence is intended
1059        to reflect the user's wishes.

1060    The following levels of Attribute Precedence are defined in order of decreasing priority:

1061    1.  **queue override** - The value that the Printer enforces for any job submitted to it (see [ippsave] section
1062        3.1).  Set by the administrator when configuring the Printer by setting an "xxx-supported" Printer attribute
1063        to contain a single value, i.e., the override value.  Example:  the administrator sets the Printer's "sides" =
1064        'two-sided-long' so that all jobs submitted to that (logical) Printer are printed two-sided flipped along the
1065        long edge.

1066        Note:  The **queue override** level is only available for Printers that support the 'guaranteed' value for
1067        its "pdl-override-supported" attribute (see [ippsave] section 8.1).  All other levels are available for all
1068        Printers independent of the "pdl-override-supported" value.  DMC ISSUE03: What about a Printer
1069        that had an override for "sides", but didn't override the PDL for everything else?  They would have to
1070        report "pdl-override-supported"='attempted', right?  So I don't think this "Note:" is correct.

1071    **2.  Document Level - page override programming** - The special "overrides" collection Document
1072        Template attribute (see [OvrRide]) supplied at the Document Level, that is, as a Document Template
1073        Attribute in a Send-Document or Send-URI operation, that contains the attributes that are to have the
1074        page override status for the specified ranges of pages.  This can be sSupplied by the client when
1075        submitting a Document object, or set either by the user or operator after the Document has been
1076        accepted either using the Set-Document-Attributes operation, or by the operator using means local to the
1077        Printer.  Example:  " overrides" = {"pages" = '1:1'; " media" = 'letterhead'}

1078    3.  **Job Level - page override programming** - The special " overrides" collection Job Template attribute
1079        (see [OvrRide]) supplied at the Job Level, that is, in a Job Creation operation, that contains the attributes
1080        that are to have the page override status for the specified ranges of pages in the specified Document.
1081        This can be sSupplied by the client when submitting a job either in the protocol, or set either by the user
1082        or operator after the job has been accepted either using the Set-Job-Attributes operation, or by the
1083        operator using means local to the Printer.  Example:  " overrides" = {"pages" = '1:1'; "document-numbers"
1084        = '1:1'; "media" = 'letterhead'}  DMC ISSUE04: What about "overrides" = {"pages" = '3:3'; "media" =
1085        'letterhead'} at the Job level?  If I read the overrides spec correctly, this means that page 3 of every
1086        document is supposed to be on letterhead.  So what about a "job level" override that doesn't specify a
1087        document number, but nonetheless overrides the document?  Can there be one of these as well as a
1088        specific document override at the job level?

1089    **4.  Document Level - Document object attributes -** The Document attributes supplied at the Document
1090        Level, that is, Operation/Document Description and Document Template attributes supplied in a Send-
1091        Document or Send-URI operation to apply to the Input Document.  This can be sSupplied by the client
1092        when submitting a Document object, or set either by the user or operator after the Document has been
1093        accepted either using the Set-DocumentJob-Attributes operation, or by the operator using means local to
1094        the Printer.  Examples: "media" = 'na-letter' and "copies" = '2'.

1095    5.  `**Job Level - Job object and Document object attributes** - The Job attributes (Operation/Job
1096        Description and Job Template) and Document attributes (Operation/Document Description and
1097        Document Template) supplied at the Job Level, i.e., with a Create-Job, Print-Job, or Print-URI operation.
1098        This can be sSupplied by the client when submitting a Job in the protocol, or set either by the user or
1099        operator after the job has been accepted either using the Set-Job-Attributes operation, or by the operator
1100        using means local to the Printer.  Examples: "media" = 'na-letter' and "copies" = '2'.

1101    6.  **PDL document data** - Aan instruction in the PDL document data.  This is sSupplied by the application or
1102        print driver that created the PDL.  Example:  PostScript setPageDevice specifying na-letter media.

1103 Whether PDL document data is actually lower precedence than the preceding levels depends on the
1104 implementation as expressed in the "pdl-override-supported" Printer Description attribute (see [rfc2911]
1105 section 4.4.28 and [ippsave] section 8.1).
1106
1107 Job Template and Document Template attributes of the form "xxx-requested", such as "orientation-
1108 requested" (see [rfc2911] section 4.2.10) have a lower priority than the PDL.  If the PDL contains a
1109 corresponding instruction, that PDL instruction will be used instead of the supplied "xxx-requested"
1110 attribute.  For example, PostScript PDL data always has a well-defined orientation, so that "orientation-
1111 requested" never affects the result.  On the other hand, PDLs such as text/plain never haves orientation
1112 and PCL MAY omit orientation, in which case, "orientation-requested" takes eaffect.

7. **PDL Init File data** - Aa file that the Printer uses to initialize the PDL Interpreter before it starts
1113
1114 interpreting each document in a Job.  See the description of the "pdl-init-file" Job Template attribute in
1115 [ippsave] Section 5.8. It is immaterial how this file is specified, whether it be by a queue override, job
1116 object attribute or printer default – the precedence of the contents of this file is at this level.

8. **printer default** - Aa Printer "xxx-default" attribute that is applied by the Printer provided that none of the
1117
1118 higher levels have supplied a value.  The Printer implementation supplies values for the Printer's "xxx-
1119 default" attributes that reflect the out-of-the-box action by the output device.  For example, if the output
1120 device will use media from the large-capacity input tray if not directed otherwise, the implementation
1121 supplies the Printer's "media-default" attribute with the 'large-capacity' keyword value without requiring
1122 the administrator to configure that value.  Implementations might allow the administrator to configure the
1123 Printer's "xxx-default" attributes to other values, if other values are supported by the implementation.
1124 Example:  The administrator changes the Printer's "media-default" from 'large-capacity' to 'na-letter'.

9. **Hardware default** - When none of the above the above conditions supply an explicit value, the printer
1125
1126 will apply the defaults supplied by the hardware.  An example of these implicit defaults would be a
1127 "copies" value of 1 or a "sides" value of 'one-sided'.

1128

# 1129 7   Operation Attributes for the Job and Document Creation operations

1130 This section defines some new Operation/Description attributes and lists *all* the Operation/Description attributes that
1131 have been defined in other IPP specifications that are used in Job Creation operations and extends their use to the
1132 Document Creation operations.  In addition, some new Job/Document Description attributes have been defined to be
1133 set from existing Operation attributes.  Note: Operation attributes relate to the operation and do not depend on the
1134 printing capabilities of the Printer.

## 1135 7.1 Operation Attributes *supplied* at the Job and Document Levels for Creation

1136 Table 7 lists all the Operation attributes and their attributes syntaxes supplied in Job Creation and Document
1137 Creation operations and the attribute syntaxes of their corresponding "xxx-default" and "xxx-supported" Printer
1138 Description attributes, if any.  A "-" indicates that there isn't an "xxx-default" or "xxx-supported" Printer Description
1139 attribute.

1140                                     **Table 7- Operation, Default, and Supported Attributes**

| Operation attribute | Operation attribute syntax | Printer: Default Value attribute syntax | Printer: Supported Values attribute syntax |
|---|---|---|---|
| **attributes-charset** | charset | - | 1setOf charset[15] |
| **attributes-natural-language** | naturalLanguage | - | 1setOf naturalLanguage[16] |
| **compression** | type3 keyword | - | 1setOf type3 keyword |
| **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[17] |
| **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 |
| **document-uri** | uri | - | 1setOf uriScheme[18] |
| **ipp-attribute-fidelity** | boolean | - | - |
| **[job-]impressions** | integer(0:MAX) | - | rangeOfInteger(0:MAX) |
| **[job-]k-octets** | integer(0:MAX) | - | rangeOfInteger(0:MAX) |
| **job-mandatory-attributes** | 1setOf type2 keyword | - | - |
| **[job-]media-sheets** | integer(0:MAX) | - | rangeOfInteger(0:MAX) |
| **job-name** | name(MAX) | - | - |
| **job-password** | octetString(255) | - | integer(0:127) |
| **job-password-encryption** | type3 keyword \| name(MAX) | - | 1setOf (type3 keyword \| name(MAX)) |
| **last-document** | boolean | - | - |
| **operation-id** | integer(1:0x8FFF) | - | 1setOf type2 enum[19] |
| **original-requesting-user-name** | name(MAX) | - | - |
| **output-device-requested** | name(127) | name(127) [20] | 1setOf name(MAX)[21] |
| **printer-uri** | uri | - | 1setOf uri |

---

[15] The Supported Printer attribute is named "charset-supported" (see [rfc2911] section 4.4.18), rather than "attributes-charset-supported".

[16] The Supported Printer attribute is named "generated-natural-language-supported" (see [rfc2911] section 4.4.20), rather than "attributes-natural-language-supported".

[17] There is also a "document-format-details-implemented" (1setOf collection), see [jobx] §7.7.

[18] The Supported Printer attribute is named "reference-uri-schemes-supported" (see [rfc2911] section 4.4.27), rather than "document-uri-supported".

[19] The Supported Printer attribute is named "operations-supported" (see [rfc2911] section 4.4.15), rather than "operation-id-supported".

[20] The Default Printer attribute is name "output-device-default" (see [jobx] section 7.11) and is the default for both the "output-device-requested" and "output-device-assigned" Job Description attributes.

[21] The Supported Printer attribute is named "output-device-supported" (see [jobx] section 7.12) and is the list of supported output devices for both the "output-device-requested" and "output-device-assigned" Job Description attributes.

| Operation attribute | Operation attribute syntax | Printer: Default Value attribute syntax | Printer: Supported Values attribute syntax |
|---|---|---|---|
| **request-id** | integer(1:MAX) | - | - |
| **requesting-user-name** | name(MAX) | - | - |
| **version-number** | X.Y | - | 1setOf type2 keyword[22] |

1141

1142 Table 8 lists the Operation attributes that clients supply at the Job Level and/or the Document Level and whether the
1143 Printer copies (indicated by "⇒") the supplied value to corresponding Job Description and/or Document Description
1144 attributes.

1145 *Legend:*
1146 [**job-**]  an attribute that shouldn't have had a "job-" prefix in its name in [rfc2911], so that the same attribute name
1147          could also be used for the Document object as an Operation/Document Description attribute.  When this
1148          attribute is used as an Operation/Document Description attribute, the [**job-**] prefix is dropped.  Note: For the
1149          PWG Semantic Model, the "**job-**" prefix is dropped altogether.
1150 "**Level Supplied**" column indicates whether the Operation attribute can be supplied at the Job Level (PJ=Print-Job,
1151          PU=Print-URI, and CJ=Create-Job) and at the Document Level (SD=Send-Document, and SU=Send-URI).
1152 "**y**"      the Operation attribute is defined for the indicated operation, but does not have a corresponding Job
1153          Description or Document Description attribute (no "⇒").
1154 "**y⇒**"    the Operation attribute has a corresponding (DMC Editorial03: Why did you delete the wording here that
1155          made a distinction between y⇒J and y⇒D?  Either there needs to be wording here about that, or the table
1156          below needs to have the Js and Ds removed.) Document Description attribute to which the Printer MUST
1157          copy this Operation attribute.  See Table 11 for the corresponding Job and Document Description attributes.
1158 "**-**"      the Operation attribute is *not* defined for the indicated operation.
1159 **\*\***       these Operation attributes are defined for *all* operations, not just Job Creation and Document Creation
1160          operations.
1161 "**Conformance**" column indicates the conformance requirements for what the client supplies in a request and the
1162          Printer supports in a request.  If an Operation attribute that is a collection attribute is supported (see
1163          [rfc3382]), then there are conformance requirements for which member attributes MUST be supported by a
1164          Printer and which member attributes a client MUST supply as indicated in the Conformance column for each
1165          collection member attribute in Table 8.
1166 "**Reference and Section**" column indicates where the Operation attribute is defined in other IPP specs and this spec.
1167

1168          **Table 8 - Operation Attributes supplied at the Job and Document Levels in Job and Document Creation**
1169                                              **Requests**

| **Operation** attribute name for Job and Document Creation *requests* | Attribute Syntax | Level Supplied | | | Conformance | | Reference and Section |
|---|---|---|---|---|---|---|---|
| | | Job | | Doc | | | |
| | | CJ | PJ, PU | SD, SU | Client supply | Printer support | |
| **attributes-charset \*\*** | charset | **y⇒J** | **y⇒J** | **y⇒D** | MUST | MUST | [rfc2911] §3.1.4 |
| **attributes-natural-language \*\*** | naturalLanguage | **y⇒J** | **y⇒J** | **y⇒D** | MUST | MUST | [rfc2911] §3.1.4 |
| **compression** | type3 keyword | - | **y⇒D** | **y⇒D** | MAY | MUST | [rfc2911] §3.2.1.1 |
| **document-charset** | charset | - | **y⇒D** | **y⇒D** | MAY | CMUST[23] | [jobx] §43.2.1 |

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[22] The Supported Printer attribute is named "ipp-versions-supported" (see [rfc2911] section 4.4.14), rather than "version-number-supported".

| Operation attribute name for Job and Document Creation *requests* | Attribute Syntax | Level Supplied | | | Conformance | | Reference and Section |
|---|---|---|---|---|---|---|---|
| | | Job | | Doc | | | |
| | | CJ | PJ, PU | SD, SU | Client supply | Printer support | |
| **document-digital-signature** | type2 keyword | - | **y⇒D** | **y⇒D** | MAY | MAY | [jobx] §3.2.2 |
| **document-format** | mimeMediaType | - | **y⇒²⁴D** | **y⇒D** | MAY | MUST | [rfc2911] §3.2.1.1, [jobx] §3.2.3 |
| **document-format-details** | 1setOf collection | - | **y⇒D** | **y⇒D** | MAY | CMUST²⁵ | [jobx] §3.2.4 |
| document-source-application-name | name(MAX) | - | **y⇒D** | **y⇒D** | MAY | MAY | [jobx] §3.2.4.1 |
| document-source-application-version | text(127) | - | **y⇒D** | **y⇒D** | MAY | MAY | [jobx] §3.2.4.2 |
| document-source-os-name | name(40) | - | **y⇒D** | **y⇒D** | MAY | MAY | [jobx] §3.2.4.3 |
| document-source-os-version | text(40) | - | **y⇒D** | **y⇒D** | MAY | MAY | [jobx] §3.2.4.4 |
| document-format | mimeMediaType | - | **y⇒D** | **y⇒D** | MUST | MUST | [jobx] §3.2.4.5 |
| document-format-device-id | text(127) | - | **y⇒D** | **y⇒D** | MAY | MAY | [jobx] §3.2.4.6 |
| document-format-version | text(127) | - | **y⇒D** | **y⇒D** | SHOULD | MUST | [jobx] §3.2.4.7 |
| document-natural-language | naturalLanguage | - | **y⇒D** | **y⇒D** | MAY | MAY | [jobx] §3.2.4.8 |
| **document-format-version** | text(127) | - | **y⇒D** | **y⇒D** | MAY | MAY | [jobx] §3.2.~~5~~6 |
| **document-message** | text(MAX) | - | **y⇒D** | **y⇒D** | MAY | MAY | [jobx] §3.2.6 |
| **document-name** | name(MAX) | - | **y⇒D** | **y⇒D** | MAY | MUST | [rfc2911] §3.2.1.1 |
| **document-natural-language** | naturalLanguage | - | **y⇒D** | **y⇒D** | MAY | MAY | [rfc2911] §3.2.1.1, [this spec] §7.2.1 |
| **document-uri DMC ISSUE05: Why no ⇒D in PJ,PU column?** | uri | - | **y** | **y⇒²⁶D** | CMUST²⁷ | MAY | [rfc2911] §3.2.2 |
| **ipp-attribute-fidelity** | boolean | **y⇒²⁸J** | **y⇒²⁸J** | - | MAY | MUST | [rfc2911] §3.2.1.1, [this spec] §3.1.1.1 |
| **[job-]impressions** | integer(0:MAX) | **y⇒J** | **y⇒J** | **y⇒D** | MAY | MAY | [rfc2911] §3.2.1.1 |
| **[job-]k-octets** | integer(0:MAX) | **y⇒J** | **y⇒J** | **y⇒D** | MAY | MAY | [rfc2911] §3.2.1.1 |
| **job-mandatory-attributes** | 1setOf type2 keyword | **y⇒J²⁹** | **y⇒J** | - | MAY | MUST | [this spec] §3.1.1.2 |

²³ The Printer MUST support the "document-charset" Operation/Document Description attributes, if the Printer supports a charset-ambiguous document format (see [jobx] §3.2.1).

²⁴ The Printer MUST copy the "document-format" Operation attribute to the corresponding (new) Document Description attribute defined in this specification.

²⁵ The Printer MUST support the "document-format-details" Operation/Document Description attributes if the Printer supports a *packaging* MIME type document format, such as 'application/zip' or 'multipart/related'.

²⁶ The Printer MUST copy the "document-~~uri~~format" Operation attribute to the corresponding (new) Document Description attribute defined in this specification.

²⁷ The "document-uri" Operation attribute MUST be supplied in the Print-URI Job Creation operation and the Send-URI Document Creation operation, and MUST NOT be supplied in other operations.

²⁸ The Printer MUST copy the "ipp-attribute-fidelity" Operation attribute to the corresponding (new) Job Description attribute defined in this specification so that the Printer can remember its value for subsequent Document Creation operations.

| **Operation** attribute name for Job and Document Creation *requests* | Attribute Syntax | Level Supplied | | | Conformance | | Reference and Section |
|---|---|---|---|---|---|---|---|
| | | Job | | Doc | | | |
| | | CJ | PJ, PU | SD, SU | Client supply | Printer support | |
| **[job-]media-sheets** | integer(0:MAX) | **y⇒J** | **y⇒J** | **y⇒D** | MAY | MAY | [rfc2911] §3.2.1.1 |
| **job-name** | name(MAX) | **y⇒J** | **y⇒J** | **-** | MAY | MUST | [rfc2911] §4.3.5 |
| **job-password** | octetString(255) | **y⇒J** | **y⇒J** | **-** | MAY | MAY | [ippsave] §4.1 |
| **job-password-encryption** | type3 keyword \| name(MAX) | **y⇒J** | **y⇒J** | **-** | MAY | MAY | [ippsave] §4.2 |
| **last-document** | boolean | **-** | **-** | **y⇒D** ³⁰ | MUST | MUST | [rfc2911] §3.3.1.1 |
| **operation-id ** | integer(1:0x8FFF) | **y** | **y** | **y** | MUST | MUST | [rfc2911] §3.1.2 |
| **original-requesting-user-name ** | name(MAX) | **y⇒J** | **y⇒J** | **-** | MAY | MAY | [adm-ops] §11.7.2.2 |
| **output-device-requested** | name(127) | **y⇒J** | **y⇒J** | **-** | MAY | MAY | [jobx] §5.5 |
| **printer-uri ** | uri | **y⇒ ~~28~~ J³¹** | **y⇒³²J³₁** | **y⇒D³¹** | MUST | MUST | [rfc2911] §3.1.5 |
| **request-id ** | integer(1:MAX) | **y** | **y** | **y** | MUST | MUST | [rfc2911] §3.1.2 |
| **requesting-user-name ** | name(MAX) | **y** | **y** | **y** | SHOULD | MUST | [rfc2911] §3.2.1.1 |
| **version-number ** | X.Y | **y** | **y** | **y** | MUST | MUST | [rfc2911] §3.1.8 |

1170   "y", "y⇒", and "***": s See Legend at the beginning of the Table.
1171   DMC ISSUE06: Why are we not saving the "requesting-user-name"?  Is that what "original-requesting-user-name" is
1172   for?  But the latter is part of an optional spec.  If we don't save "requesting-user-name", how do we authenticate for
1173   cancel/delete?  Am I missing something?

## 1174   7.2 Operation/Document Description attributes

1175   The rest of this section defines the semantics for the Operation attributes that a client MAY supply in a Document
1176   Creation operation and their corresponding Document Description attributes.  The following statements apply to all of
1177   these Operation/Document Description attributes and are *not* repeated in each Description:

1178   If the Printer doesn't support the "xxx" Operation attribute, the Printer MUST ignore the "xxx" attribute (as with any
1179   OPTIONAL Operation attribute) and return the "xxx" attribute with the supplied value as unsupported in the
1180   Unsupported Aattributes group as specified in [rfc2911] section 3.1.7.

1181   If the Printer supports the "xxx" Operation attribute, the Printer MUST support it at the Job and Document level.  The
1182   Printer MUST also:

1183       1.  support the corresponding "xxx" Document Description attribute of the same name (see section 9.1) and vice
1184           versa.

---

²⁹ The Printer MUST copy the "job-mandatory-attributesipp-attribute-fidelity" Operation attribute to the corresponding
(new) Job Description attribute defined in this specification so that the Printer can remember its value for subsequent
Document Creation operations.
³⁰ The Printer MUST copy the "last-document" Operation attribute to the corresponding (new) Document Description
attribute defined in this specification so that the client can determine the last document when querying the Document
objects.
³¹ The Printer MUST copy the "printer-uri" Operation attribute to the Job's "job-printer-uri" Job Description attribute
and Document's "document-printer-uri" Document Description attribute.
³² The Printer MUST copy the "printer-uri" Operation attribute to the Job's "job-printer-uri" Job Description attribute
and Document's "document-printer-uri" Document Description attribute.

1185      2.  copy the value of the "xxx" Operation attribute, if supplied by the client, to the corresponding "xxx" Document
1186          Description attribute.

1187      3.  support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if defined
1188          (see section 10) and vice versa.

1189      4.  validate the values supplied by the client in the "xxx" Operation attribute against the values indicated in the
1190          Printer's corresponding "xxx-supported" Printer Description attribute (see section 10).  If the values do not
1191          validate, the Printer MUST either reject the operation or accept the operation as indicated for each of the
1192          attributes described below.

1193  If the client supplies one of the "xxx" Operation/Document attributes with a value that the Printer does not support,
1194  the Printer MUST perform one of the actions indicated for that Operation, unless specified otherwise, such as (1)
1195  reject the request, (2) accept the request and either (a) hold the job for operator intervention or (b) print the Job
1196  ignoring the attribute.  In all of these cases, the Printer MUST return the Operation attribute with the unsupported
1197  value in the Unsupported Attributes group in the response (see [rfc2911] section 3.1.7).

1198

## 1199  7.2.1 document-natural-language (naturalLanguage)

1200  This OPTIONAL Operation attribute specifies the natural language of the Document Object content (see [rfc2911]
1201  section 3.2.1.1 and section 4.1.8).

1202  If the client supplies this "document-natural-language" Operation attribute with a value that the Printer doesn't
1203  support, the Printer MUST perform one of the following actions:  (1) reject the request OR (2) accept the request and
1204  either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute.  See section 7.2 above
1205  for more details.

1206  The values MAY include the region as well as the language according to [rfc2911] section 4.1.8.  If the document
1207  contains more than one language, the value is the first or primary language of the document.  The Printer MAY use
1208  this value to select fonts or other Internationalization processing.  As indicated in [rfc2911] section 4.1.8, examples
1209  include:

1210          'en':  for English
1211          'en-us': for US English
1212          'fr':  for French
1213          'de':  for German
1214

## 1215  7.3 Operation Attributes *returned* in Job and Document Creation responses

1216  Table 9 lists the Operation attributes that Printers return in Job Creation operation *responses*: (-Print-Job, Print-URI,
1217  and Create-Job) and in Document Creation operation *responses*: (Send-Document and Send-URI).  The column
1218  labeled "Conformance" indicates the conformance for what the Printer returns and what the Printer supports.  The
1219  References and Section columns lists the IETF or IEEE-ISTO specification which defines the semantics of the
1220  attribute.

1221          **Table 9 - Operation attributes *returned* in Job and Document Creation operation *responses***

| Operation attribute name | Attribute Syntax Values | Conformance | | References |
|---|---|---|---|---|
| | | Printer return | Printer support | |
| attributes-charset * | charset | MUST | MUST | [rfc2911] §3.1.4 |

| Operation attribute name | Attribute Syntax _Values | Conformance | | References |
|---|---|---|---|---|
| | | Printer return | Printer support | |
| | _'utf-8' | MAY | MUST | [rfc2911] §4.1.7 |
| | _'us-ascii' | MAY | MAY | [rfc2911] §4.1.7 |
| | _'iso-8859-1' | MAY | MAY | [rfc2911] §4.1.7 |
| | _'iso-10646-ucs-2' | MAY | MAY | [rfc2911] §4.1.7 |
| attributes-natural-language * | naturalLanguage | MUST | MUST | [rfc2911] §3.1.4 |
| | _'en-US' | MAY | MAY | [rfc2911] §4.1.8 |
| detailed-status-messages * | text(MAX) | MAY | MAY | [rfc2911] §3.1.6.3 |
| document-access-error | text(MAX) | MAY | MAY | [rfc2911] §3.1.6.4 |
| document-number | integer(1:MAX) | MUST | MUST | §9.1.21 |
| job-id | integer(1:MAX) | MUST | MUST | [rfc2911] §4.3.2 |
| job-uri | uri | MUST | MUST | [rfc2911] §4.3.1 |
| redirect-uri (uri) 33 | uri | MAY | MAY | [not-srv] §5.2 |
| request-id * | integer(1:MAX32767) | MUST | MUST | [rfc2911] §3.1.2 |
| status-code * | type2 enuminteger(0:32767) | MUST | MUST | [rfc2911] §3.1.6.1 |
| status-message * | text(255) | MAY | MAY | [rfc2911] §3.1.6.2 |
| version-number * | integer(1:255), integer(0:255) | MUST | MUST | [rfc2911] §3.1.8 |

1222　* - indicates attributes that are defined for *all* operations, not just Job Creation operations
1223

1224　# 8　Job Template and Document Template attributes

1225　Table 10 lists *all* of the Job Template attributes defined in other IPP specifications and lists their corresponding
1226　Document Template attributes defined in this IPP specification.  The Job Template attributes can be supplied in the
1227　Job Creation operations: Print-Job, Print-URI, and Create-Job operations.

1228　A subset of these Job Template attributes (e.g., "number-up" and "media", but not "job-priority") are also defined to
1229　apply to Documents and are called Document Template attributes when supplied at the Document Level.  Document
1230　Template attributes can be supplied in the Send-Document and Send-URI operations.

1231　A subset of the Document Template attributes that apply to pages (e.g., "media", but not "document-format" or "job-
1232　priority") can also be supplied as Page Overrides using the "overrides" Job Template collection attribute (see
1233　[OvrRide]) or as a Document Template attribute.

1234　Job Template and Document Template attributes are OPTIONAL for a Printer to support and for a client to supply in
1235　a Job Creation or Document Creation request or Page Overrides.  If a Printer supports a Job Template or Document
1236　Template attribute, then it MUST copy the supplied attribute to the Job or Document object, respectively, so that a
1237　client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs and Get-Document-Attributes/Get-
1238　Documents operations, respectively.  The effect of Job Template Attributes supplied in Job Creation requests are
1239　inherited by the Document objects, unless the Document Creation operation supplies the attribute with a different
1240　value.

---

33 The Printer or Notification Server returns the "redirect-uri" Operation attribute in order to redirect the Get-
Notification operation to a Notification Server or back to the original Printer.

1241 If a Job Template collection attribute is supported (see [rfc3382]), then there are conformance requirements for which
1242 member attributes MUST be supported by a Printer and which member attributes a client MUST supply as indicated
1243 in the Conformance column for each collection member attribute in Table 10.

1244 The "Defined for use" column indicates whether the client MAY supply and the Printer support the attribute at the
1245 Job, Document, or Page Level with the following semantics:

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

1246
1247    "**\*\***" - Most Job Template and Document Template attributes correspond to the PWG Semantic Model Job
1248         Processing and Document Processing attributes, respectively.  However, 4 of the IPP Job Template
1249         attributes are represented in the PWG Semantic Model as Job Description attributes, instead of Job
1250         Processing attributes.  These are indicated in the first column with "**\*\***".

1251                          **Table 10 - Job Template and Document Template attributes**

| Job Template / Document Template attribute name | Attribute Syntax | Defined for use | | | Conformance | | Reference |
|---|---|---|---|---|---|---|---|
| | | J | D | P | Client supply | Printer support | |
| **copies** | integer(1:MAX) | y [34] | y | n | MAY | MAY | [rfc2911] §4.2.5 |

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[34] The IPP "copies" attribute is an *extensive* attribute, so its effect when supplied at the job level is not always
inherited by the documents in a multi-document job.  Instead, its effect depends on the value of the "multiple-
document-handling" Job Template attribute.  The 'single-document' and 'single-document-new-sheet' values produce
copies of the job as a whole with the multiple input documents concatenated into a single output document for each
job copy.  The 'separate-document-uncollated-copies' value produces N copies of the first input document followed
by N copies of the second input document, and so onetc.  The 'separate-document-collated-copies' value produces
N successive job copies, each job copy consisting of 1 copy of the first document followed by 1 copy of the second
document, and so onetc.

| Job Template / Document Template **attribute name** | Attribute Syntax | Defined for use | | | Conformance | | Reference |
|---|---|---|---|---|---|---|---|
| | | J | D | P | Client supply | Printer support | |
| **cover-back** | collection | **y** | **y** | **n** | MAY | MAY | [pwg5100.3] §3.1 |
| **cover-type** | type2 keyword | | | | MUST | MUST | [pwg5100.3] §3.1.2 |
| **media** | type3 keyword \| name(MAX) | | | | MAY be neither or one of, but NOT both | MUST | [pwg5100.3] §3.1.1 |
| **media-col** | collection | | | | | MAY | [pwg5100.3] §3.1.1 |
| **cover-front** | collection | **y** | **y** | **n** | MAY | MAY | [pwg5100.3] §3.1 |
| **cover-type** | type2 keyword | | | | MUST | MUST | [pwg5100.3] §3.1.2 |
| **media** | type3 keyword \| name(MAX) | | | | MAY be neither or one of, but NOT both | MUST | [pwg5100.3] §3.1.1 |
| **media-col** | collection | | | | | MAY | [pwg5100.3] §3.1.1 |
| **feed-orientation** | type3 keyword | **y** | **y** | **n** | MAY | MAY | [ippsave] §5.1 |
| **finishings** | 1setOf type2 enum | **y** [35] | **y** | **y** | MAY be neither or one of, but NOT both | MAY, MUST if "finishing-col" is supported | [rfc2911] §4.2.6 [pwg5100.1] §2 |
| **finishings-col** | collection | **y** [35] | **y** | **y** | | MAY | [pwg5100.3] §3.2 |
| **finishing-template** | name(MAX) | | | | MAY | MAY | [pwg5100.3] §3.2.1 |
| **stitching** | collection | | | | MAY | MAY | [pwg5100.3] §3.2.2 |
| **stitching-reference-edge** | type2 keyword | | | | MUST | MUST | [pwg5100.3] §3.2.2.1 |
| **stitching-offset** | integer (0:MAX) | | | | MUST | MUST | [pwg5100.3] §3.2.2.2 |
| **stitching-locations** | 1setOf integer(0:MAX) | | | | MUST | MUST | [pwg5100.3] §3.2.2.3 |
| **font-name-requested** | name(MAX) | **y** | **y** | **y** | MAY | MAY | [ippsave] §5.2 |
| **font-size-requested** | integer (1:MAX) | **y** | **y** | **y** | MAY | MAY | [ippsave] §5.3 |
| **force-front-side** | 1setOf integer(1:MAX) | **y** [36] | **y** | **y** | MAY | MAY | [pwg5100.3] §3.3 |
| **imposition-template** | type3~~2~~ keyword \| name(MAX) | **y** | **y** | **y** | MAY | MAY | [pwg5100.3] §3.4 |
| **insert-sheet** | 1setOf collection | **y** [36] | **y** | **y** | MAY | MAY | [pwg5100.3] §3.5 |
| **insert-after-page-number** | integer(0:MAX) | | | | MUST | MUST | [pwg5100.3] §3.5.1 |
| **insert-count** | integer(0:MAX) | | | | MAY | MUST | [pwg5100.3] §3.5.2 |
| **media** | type3 keyword \| name(MAX) | | | | MUST be one or the other, but NOT both | MUST | [pwg5100.3] §3.5.3 |
| **media-col** | collection | | | | | MAY | [pwg5100.3] §3.5.3 |
| **job-account-id** ** | name(MAX) | **y** | **n** | **n** | MAY | MAY | [pwg5100.3] §3.6 |

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[35] The IPP "finishings" and "finishings-col" attributes are *extensive* attributes, so their effect when supplied at the Job Level is not always inherited by the documents in a multi-document job.  Instead, their effect depends on the value of the "multiple-document-handling" Job Template attribute.  The 'single-document' and 'single-document-new-sheet' values cause the finishing to be applied to each job copy as a whole.  The 'separate-documents-collated-copies' and 'separate-document-uncollated-copies' values cause the finishing to be applied to each document.

[36] The effect of the IPP "force-front-side" and "insert-sheet" attributes when supplied at the job level of a multi-document job depends on the value of the "multiple-document-handling" Job Template attribute.  For the 'single-document' and 'single-document-new-sheet' values, the pages are numbered as a single set from 1 to n for the job as a whole.  For the 'separate-documents-collated-copies' and 'separate-document-uncollated-copies' values, the pages are numbered from 1 to n for each document separately.

| Job Template / Document Template attribute name | Attribute Syntax | Defined for use | | | Conformance | | Reference |
|---|---|---|---|---|---|---|---|
| | | J | D | P | Client supply | Printer support | |
| **job-accounting-sheets** | collection | **y** | **n** | **n** | MAY | MAY | [pwg5100.3] §3.8 |
| job-accounting-sheets-type | type3 keyword \| name(MAX) | | | | MUST | MUST | [pwg5100.3] §3.8.1 |
| media | type3 keyword \| name(MAX) | | | | MAY be neither or one of, but NOT both | MUST | [pwg5100.3] §3.8.2 |
| media-col | collection | | | | | MAY | [pwg5100.3] §3.8.2 |
| job-accounting-output-bin | type3 keyword \| name(MAX) | | | | MAY | MAY | [pwg5100.3] §3.8.3 |
| **job-accounting-user-id**\*\* | name(MAX) | **y** | **n** | **n** | MAY | MAY | [pwg5100.3] §3.7 |
| **job-copies** | integer(1:MAX) | **y** | **n** [37] | **n** | MAY | MAY | [jobx] §4.1.1 |
| **job-cover-back** | collection | **y** | **n** [38] | **n** | MAY | MAY | [jobx] §4.1.2 |
| *same as* cover-back | **see** cover-back | | | | | | |
| **job-cover-front** | collection | **y** | **n** [39] | **n** | MAY | MAY | [jobx] §4.1.3 |
| *same as* cover-front | **see** cover-front | | | | | | |
| **job-error-sheet** | collection | **y** | **n** | **n** | MAY | MAY | [pwg5100.3] §3.9 |
| **job-error-sheet-type** | type3 keyword \| name(MAX) | | | | MUST | MUST | [pwg5100.3] §3.9.1 |
| **job-error-sheet-when** | type2 keyword | | | | MAY | MAY | [pwg5100.3] §3.9.2 |
| **media** | type3 keyword \| name(MAX) | | | | MAY be neither or one of, but NOT both | MUST | [pwg5100.3] §3.9.3 |
| **media-col** | collection | | | | | MAY | [pwg5100.3] §3.9.3 |
| **job-finishings** | 1setOf type2 enum | **y** | **n** [40] | **n** | MAY | MAY | [jobx] §4.1.4 |
| **job-finishings-col** | collection | **y** | **n** [41] | **n** | MAY | MAY | [jobx] §4.1.5 |
| *same as* finishings-col | **see** finishings-col | | | | | | |
| **job-hold-until** | type3 keyword \| name(MAX) | **y** | **n** | **n** | MAY | MAY | [rfc2911] §4.2.2 |
| **job-hold-until-time** | dateTime | **y** | **n** | **n** | MAY | MAY | [ippsave] §5.4 |
| **job-message-to-operator** | text(MAX) | **y** | **n** [42] | **n** | MAY | MAY | [pwg5100.3] §3.10 |

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[37] The "job-copies" Job Template attribute makes copies of the entire job and MUST NOT be supplied at the Document or Page Level. The "job-copies" Job Template attribute is equivalent to "copies" with "multiple-document-handling" = 'single-document-new-sheet'.

[38] The "job-cover-back" Job Template attribute makes a single back cover for each job copy and MUST NOT be supplied at the Document or Page Level. The "job-cover-back" Job Template attribute is equivalent to "cover-back" with "multiple-document-handling" = 'single-document-new-sheet'.

[39] The "job-cover-front" Job Template attribute makes a single front cover for each job copy and MUST NOT be supplied at the Document or Page Level. The "job-cover-front" Job Template attribute is equivalent to "cover-front" with "multiple-document-handling" = 'single-document-new-sheet'.

[40] The "job-finishing" Job Template attribute finishes each job copy as a whole and MUST NOT be supplied at the Document or Page Level. The "job-finishings" Job Template attribute is equivalent to "finishings" with "multiple-document-handling" = 'single-document-new-sheet'.

[41] The "job-finishing-col" Job Template attribute finishes each job copy as a whole and MUST NOT be supplied at the Document or Page Level. The "job-finishings-col" Job Template attribute is equivalent to "finishings-col" with "multiple-document-handling" = 'single-document-new-sheet'.

[42] The "job-message-to-operator" Job Template attribute has no corresponding Document Template attribute. Instead, the user and operator communicate with each other using the same "document-message" Operation attribute which the Printer copies to the "document-message" Document Description attribute.

| Job Template / Document Template attribute name | Attribute Syntax | Defined for use | | | Conformance | | Reference |
|---|---|---|---|---|---|---|---|
| | | J | D | P | Client supply | Printer support | |
| **job-phone-number** | text(127) | **y** | **n** | **n** | MAY | MAY | [ippsave] §5.5 |
| **job-priority** | integer(1:100 | **y** | **n** | **n** | MAY | MAY | [rfc2911] §4.2.1 |
| **job-recipient-name** ** | name(MAX) | **y** | **n** | **n** | MAY | MAY | [ippsave] §5.6 |
| **job-save-disposition** | collection | **y** | **n** | **n** | MAY | MAY | [ippsave] §5.7 |
|    **save-disposition** | type3 keyword | y | n | n | MAY | MAY | [ippsave] §5.7.1.1 |
|    **save-info** | 1setOf collection | y | n | n | MAY | MAY | [ippsave] §5.7.1.2 |
|       **save-location** | uri | y | n | n | MAY | MAY | [ippsave] §5.7.1.2.3.1 |
|       **save-name** | name(MAX) | y | n | n | MAY | MAY | [ippsave] §5.7.1.2.3.2 |
|       **save-document-format** | mimeMediaType | y | n | n | MAY | MAY | [ippsave] §5.7.1.2.3.3 |
| **job-sheet-message** | text(MAX) | **y** | **n** | **n** | MAY | MAY | [pwg5100.3] §3.12 |

| Job Template / Document Template attribute name | Attribute Syntax | Defined for use | | | Conformance | | Reference |
|---|---|---|---|---|---|---|---|
| | | J | D | P | Client supply | Printer support | |
| **job-sheets** | type3 keyword \| name(MAX) | **y** | **n** | **n** | MAY be neither or one of, but NOT both | MAY, MUST if "job-sheets-col" supported | [rfc2911] §4.2.3 |
| **job-sheets-col** | collection | **y** | **n** | **n** | | MAY | [pwg5100.3] §3.11 |
| job-sheets | type3 keyword \| name(MAX) | | | | MUST | MUST | [pwg5100.3] §3.11.1 |
| media | type3 keyword \| name(MAX) | | | | MUST be one or the other, but NOT both | MUST | [pwg5100.3] §3.11.2 |
| media-col | collection | | | | | MAY | [pwg5100.3] §3.11.2 |
| **media** | type3 keyword \| name(MAX) | **y** | **y** | **y** | MAY be neither or one of, but NOT both | MAY, MUST if "media-col" supported | [rfc2911] §4.2.11 |
| **media-col** | collection | **y** | **y** | **y** | | MAY | [pwg5100.3] §3.13 |
| media-back-coating | type3 keyword \| name(MAX) | | | | MAY | MAY | [pwg5100.3] §3.13.10 |
| media-color | type3 keyword \| name(MAX) | | | | MAY | MAY | [pwg5100.3] §3.13.4 |
| media-front-coating | type3 keyword \| name(MAX) | | | | MAY | MAY | [pwg5100.3] §3.13.10 |
| media-grain | type3 keyword \| name(MAX) | | | | MAY | MAY | [ippsave] §8.4.2 |
| media-hole-count | integer(0:MAX) | | | | MAY | MAY | [pwg5100.3] §3.13.6 |
| media-info | text(255) | | | | MAY | MAY | [pwg5100.3] §3.13.3 |
| media-key | type3 keyword \| name(MAX) | | | | MAY | MAY | [pwg5100.3] §3.13.1 |
| media-material | type3 keyword \| name(MAX) | | | | MAY | MAY | [ippsave] §8.4.3 |
| media-order-count | integer(1:MAX) | | | | MAY | MAY | [pwg5100.3] §3.13.7 |
| media-preprinted | type3 keyword \| name(MAX) | | | | MAY | MAY | [pwg5100.3] §3.13.5 |
| media-recycled | type3 keyword \| name(MAX) | | | | MAY | MAY | [pwg5100.3] §3.13.11 |
| media-size | collection | | | | MAY | MUST | [pwg5100.3] §3.13.8 |
| x-dimension | integer(0:MAX) | | | | MUST | MUST | [pwg5100.3] §3.13.8.1 |
| y-dimension | integer(0:MAX) | | | | MUST | MUST | [pwg5100.3] §3.13.8.2 |
| media-thickness | integer(1:MAX) | | | | MAY | MAY | [ippsave] §8.4.4 |
| media-tooth | type3 keyword \| name(MAX) | | | | MAY | MAY | [ippsave] §8.4.1 |
| media-type | type3 keyword \| name(MAX) | | | | MAY | MAY | [pwg5100.3] §3.13.2 |
| media-weight-metric | integer(0:MAX) | | | | MAY | MAY | [pwg5100.3] §3.13.9 |
| **media-input-tray-check** | type3 keyword \| name(MAX) | **y** | **y** | **y** | MAY | MAY | [pwg5100.3] §3.14 |
| **media-type** [43] | type3 keyword \| name(MAX) | **y** | **y** | **y** | MAY | MAY | [upnp], [pwg5100.3] §3.13.2 |
| **multiple-document-handling** | type2 keyword | **y** | **n** | **n** | MAY | MUST[44] | [rfc2911] §4.2.4 |
| **number-up** | integer(1:MAX) | **y** | **y** | **y** | MAY | MAY | [rfc2911] §4.2.9 |
| **orientation-requested** | type2 enum | **y** | **y** | **y** | MAY | MAY | [rfc2911] §4.2.10 |

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[43] UPnPv1 and UPnPv2 define a separate MediaType Job Template attribute with the same values as the "media-type" member attribute of "media-col".

[44] A Printer MUST support the "multiple-document-handling" Job Template attribute with at least one value.

| Job Template / Document Template attribute name | Attribute Syntax | Defined for use | | | Conformance | | Reference |
|---|---|---|---|---|---|---|---|
| | | J | D | P | Client supply | Printer support | |
| **output-bin** | type2 keyword \| name(MAX) | **y** | **n** | **n** | MAY | MAY | [pwg5100.2] §2.1 |
| **overrides** | 1setOf collection | **y** [45] | **y** | **n** | MAY | MAY | [OvrRide] §4.1, also see §8.2 |
| **pages** | 1setOf rangeOfInteger(1:MAX) | | | | MUST | MUST | [OvrRide] §4.1.1 |
| ~~d~~Documen~~t~~-numbers | 1setOf rangeOfInteger(1:MAX) | | | | MAY | MUST | [OvrRide] §4.1.2 |
| **document-copies** | 1setOf rangeOfInteger(1:MAX) | | | | MAY | MAY | [OvrRide] §4.1.3 |
| *any other Job Template attributes that affect pages, such as "media" or "media-col"* | | | | | MAY | MAY | [OvrRide] §4.1.4 |
| **page-delivery** | type2 keyword | **y** | **y** | **n** | MAY | MAY | [pwg5100.3] §3.15 |
| **page-order-received**** | type2 keyword | **y** | **y** | **n** | MAY | MAY | [pwg5100.3] §3.16 |
| **page-ranges** | 1setOf rangeOfInteger(1:MAX) | **y** | **y** | **n** | MAY | MAY | [rfc2911] §4.2.7 |
| ~~**pages-per-subset**~~ | ~~1setOf integer(1:MAX)~~ | ~~**y**~~ [46] | ~~**n**~~ | ~~**n**~~ | ~~MAY~~ | ~~MAY~~ | ~~[pwg5100.3] §5.3~~ |
| **pdl-init-file** | 1setOf collection | **y** | **y** | **n** | MAY | MAY | [ippsave] §5.8 |
| pdl-init-file-location | uri | | | | MAY | MAY | [ippsave] §5.8.1.1 |
| pdl-init-file-name | name(MAX) | | | | MAY | MAY | [ippsave] §5.8.1.2 |
| pdl-init-file-entry | name(MAX) | | | | MAY | MAY | [ippsave] §5.8.1.3 |
| **presentation-direction-number-up** | type2 keyword | **y** | **y** | **y** | MAY | MAY | [pwg5100.3] §3.17 |
| **print-quality** | type2 enum | **y** | **y** | **y** | MAY | MAY | [rfc2911] §4.2.13 |
| **printer-resolution** | resolution | **y** | **y** | **y** | MAY | MAY | [rfc2911] §4.2.12 |
| **proof-print** | collection | **y** | **n** | **n** | MAY | MAY | [ippsave] §5.9 |
| proof-print-copies | integer (0:MAX) | ~~y~~ | ~~n~~ | ~~n~~ | MAY | MAY | [ippsave] §5.9.1.1 |
| media | type3 keyword \| name(MAX) | | | | MAY be neither or one of, but NOT both | MUST | [ippsave] §5.8.1.2 |
| media-col | collection | | | | | MAY | [ippsave] §5.8.1.2 |
| **separator-sheets** | collection | **y** | **y** | **n** | MAY | MAY | [pwg5100.3] §3.18 |
| separator-sheets-type | type3 keyword \| name(MAX) | | | | MUST | MUST | [pwg5100.3] §3.18.1 |
| media | type3 keyword \| name(MAX) | | | | MAY be neither or one of, but NOT both | MUST | [pwg5100.3] §3.18.2 |
| media-col | collection | | | | | MAY | [pwg5100.3] §3.18.2 |
| **sheet-collate** | type2 keyword | **y** | **y** | **n** | MAY | MAY | [rfc3381] §3.1 |
| **sides** | type2 keyword | **y** | **y** | **y** | MAY | MAY | [rfc2911] §4.2.8 |

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[45] The effect of the IPP "page-overrides" Job Template attribute when supplied at the ~~J~~job ~~L~~level of a multi-document job depends on the value of the "multiple-document-handling" Job Template attribute. For the 'single-document' and 'single-document-new-sheet' values, the pages are numbered as a single set from 1 to n for the ~~j~~Job as a whole. For the 'separate-documents-collated-copies' and 'separate-document-uncollated-copies' values, the pages are numbered from 1 to n for each ~~D~~document separately.

[46] The client MUST supply the "pages-per-subset" Job Template attribute at the Job Level and it can only be used when the "multiple-document-handling" Job Template attribute is 'separate-documents-collated-copies' or 'separate-documents-uncollated-copes', since the purpose of the "pages-per-subset" attribute is to produce separate output documents for each subset. Otherwise, the Printer MUST ignore the "pages-per-subset" attribute.

| Job Template / Document Template attribute name | Attribute Syntax | Defined for use | | | Conformance | | Reference |
|---|---|---|---|---|---|---|---|
| | | J | D | P | Client supply | Printer support | |
| **x-image-position** | type2 keyword | **y** | **y** | **y** | MAY | MAY | [pwg5100.3] §3.19.2 |
| **x-image-shift** | integer(MIN:MAX) | **y** | **y** | **y** | MAY | MAY | [pwg5100.3] §3.19.3 |
| **x-side1-image-shift** | integer(MIN:MAX) | **y** | **y** | **y** | MAY | MAY | [pwg5100.3] §3.19.4 |
| **x-side2-image-shift** | integer(MIN:MAX) | **y** | **y** | **y** | MAY | MAY | [pwg5100.3] §3.19.5 |
| **y-image-position** | type2 keyword | **y** | **y** | **y** | MAY | MAY | [pwg5100.3] §3.19.6 |
| **y-image-shift** | integer(MIN:MAX) | **y** | **y** | **y** | MAY | MAY | [pwg5100.3] §3.19.7 |
| **y-side1-image-shift** | integer(MIN:MAX) | **y** | **y** | **y** | MAY | MAY | [pwg5100.3] §3.19.8 |
| **y-side2-image-shift** | integer(MIN:MAX) | **y** | **y** | **y** | MAY | MAY | [pwg5100.3] §3.19.9 |

1252 "**\*\***" - These 4 attributes are Job Description attributes, not Job Processing attributes, in the PWG Semantic Model
1253      [pwg-sm] - see the comment just~~Legend~~ before the Table.
1254

## 1255 8.1 Document Template attributes

1256 Most Job Template attributes can be used as Document Template attributes for use in Document Creation
1257 operations to apply to the Document object. However, the Job Template attributes that have the "job-" prefix MUST
1258 NOT be used as Document Template attributes, since they are defined to apply to the job as a whole. Table 10
1259 shows lists all of the Document Template attributes for use with the Document Creation operations and the
1260 Document object. All of the definitions of the Document Template attributes are done by reference to the
1261 corresponding Job Template attributes in other specifications. However, the semantics of each Document Template
1262 attribute only applies to the Document object with which the attribute is associated either by being supplied by the
1263 client in the Document Creation operation or supplied by the Printer as a default because the client did not (and the
1264 PDL did not have any corresponding instruction). See section 6 for defaulting semantics.

1265 The Document Template attributes share the same "xxx-default", "xxx-supported", and "xxx-ready" Printer attributes
1266 with the Job Template attributes of the same name.

1267 The Document object also has the corresponding "xxx-actual" READ-ONLY Document Description attributes defined
1268 that correspond to the "xxx" Document Template attributes (see [ippact]).

## 1269 8.2 Document Template attributes containing explicit Document numbers

1270 Job Template attributes that contain explicit Document numbers, such as "overrides", must have an appropriate
1271 value. The Document number MUST have a single value and the single value MUST match the Document number
1272 to which the Document Template attributes are being applied. If they do not match, the Printer MUST reject the
1273 request with a status of 'client-error-bad-request'.

1274 # 9   Job Description and Document Description attributes

1275 Table 11 lists all the Job Description attributes defined in other IPP specifications and the corresponding Document
1276 Description attributes defined in this IPP specification.  Job Description and Document Description attributes are Job
1277 object and Document object attributes, respectively, that are filled in by the Printer.  Some Job/Document Description
1278 attribute values are supplied by the client in the Job/Document Creation operation using corresponding Operation
1279 attributes as flagged with "⇒".  Unless specified otherwise herein, the Printer MUST NOT support modification of Job
1280 Description and Document Descriptions attributes.

1281 The column labeled "attribute syntax" indicates the attribute syntax (see [rfc2911] section 4.1).  The Printer
1282 conformance is indicated along with the reference to the specification in which the attribute is defined.  The
1283 conformance for Document Description attributes (if the Printer supports the Document object) is the same as the
1284 corresponding Job Description attributes.

1285 Each of the Document Description attributes have a sub-section in section 9.1.  The column labeled References
1286 column contains references to the sub-section in this document if there is significant information there.  Those
1287 subsections that are only references to other specifications contain only that reference in the Reference column.
1288 Those attributes that are only Job Description attributes with no subsection in this specification have an "n/a" in the
1289 "Doc Desc" column.

1290 Note:  There are no corresponding Page Range (or Page Override) Description attributes.  The Page Range is not an
1291 object with a state and it cannot be queried.

1292 ***Legend:***
1293 [job-]   indicates an attribute that shouldn't have had a "job-" prefix in its name in [rfc2911], so that the same attribute
1294        name could also be used for the Document object as a Document Description attribute.  Note: For the PWG
1295        Semantic Model, the "job-" prefix is dropped.
1296 "-"      indicates that the Job or Document attribute is *not* defined.
1297 "⇒y"    the Printer MUST populate this Job or Document Description attribute by copying *from* the corresponding
1298        Operation attribute that the client MAY supply[47] in a Job or Document Creation operation.   See Table 8 for
1299        the corresponding Operation attribute.
1300 (r/w)   indicates that the Job Description or Document Description attribute is read/write, so that the client can
1301        changes its value using the Set-Job-Attributes or Set-Document-Attributes operation (see section 4.4).
1302
1303 DMC Editorial04: Need to sort the table, I believe, since in taking out the [job-] prefix, it is no longer sorted.  Sections
1304        following need to be reordered as well (sections 9.1.x).  I don't want to just go ahead and do this change as it
1305        would be very confusing in looking at the revisions.
1306 DMC Editorial05: This table has gotten rid of [job-] indication, but Table 8 hasn't.  Is this what we want?
1307 DMC ISSUE07: I definitely believe that we need a "Document-equivalent" of job-collation-type.  It would have
1308        different semantics, since the Job level semantics include the concept of documents, but I believe that since
1309        it is useful to know whether a Job is doing collated or uncollated copies, it would also be useful to know the
1310        same for Documents.
1311 DMC ISSUE08: Wouldn't we want to make "number-of-documents" a MUST now?

---

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

1312                              **Table 11 - Job and Document Description attributes**

| Job Description / Document Description attribute name | IPP Attribute Syntax | Job | Doc | Printer conform-ance | Reference Job Description Attr | Doc Desc. |
|---|---|---|---|---|---|---|
| **attributes-charset** | charset | ⇒y- | ⇒y | MUST | [rfc2911] §4.3.19 | §9.1.1 |
| **attributes-natural-language** | naturalLanguage | ⇒y- | ⇒y | MUST | [rfc2911] §4.3.20 | §9.1.2 |
| **compression** | type3 keyword | - | ⇒y | MUST | [rfc2911] §3.2.1.1 | §9.1.3 |
| **current-page-order** | type2 keyword | y | y | MAY | [pwg5100.3] §4.1 | §9.1.4 |
| **date-time-at-completed** | dateTime | y | y | MAY | [rfc2911] §4.3.14.7 | §9.1.5 |
| **date-time-at-creation** | dateTime | y | y | MAY | [rfc2911] §4.3.14.5 | §9.1.6 |
| **date-time-at-processing** | dateTime | y | y | MAY | [rfc2911] §4.3.14.6 | §9.1.7 |
| **document-charset** | charset | - | ⇒y | CMUST[48] | - | §9.1.8 |
| **document-digital-signature** | type2 keyword | - | ⇒y | MAY | - | §9.1.9 |
| **document-format** | mimeMediaType | - | ⇒y | MUST | [rfc2911] §3.2.1.1 | §9.1.10 9.1.8 |
| **document-format-details** | 1setOf collection | - | ⇒y | CMUST[49] | [jobx] §3.2.4 | §9.1.11 |
| document-source-application-name | name(MAX) | - | ⇒y | MAY | [jobx] §3.2.4.1 | |
| document-source-application-version | text(127) | - | ⇒y | MAY | [jobx] §3.2.4.2 | |
| document-source-os-name | name(40) | - | ⇒y | MAY | [jobx] §3.2.4.3 | |
| document-source-os-version | text(40) | - | ⇒y | MAY | [jobx] §3.2.4.4 | |
| document-format | mimeMediaType | - | ⇒y | MUST | [jobx] §3.2.4.5 | |
| document-format-device-id | text(127) | - | ⇒y | MUST | [jobx] §3.2.4.6 | |
| document-format-version | text(127) | - | ⇒y | MAY | [jobx] §3.2.4.7 | |
| document-natural-language | naturalLanguage | - | ⇒y | MAY | [jobx] §3.2.4.8 | |
| **document-format-details-detected** | 1setOf collection | - | y | MAY | - | §9.1.12 |
| **document-format-detected** | mimeMediaType | - | y | MAY | - | §9.1.13 |
| **document-format-version** | text(127) | - | ⇒y | MAY | [jobx] §3.2.5- | §9.1.14 |
| **document-format-version-detected** | text(127) | - | y | MAY | - | §9.1.15 |
| **document-job-id** | integer(1:MAX) | - | y | MUST | - | §9.1.16 9.1.11 |
| **document-job-uri** | uri | - | y | MUST | - | §9.1.17 |
| **document-message (r/w)** | text(MAX) | - | y | MAY | [jobx] §3.2.6 | §9.1.18 |
| **document-name (r/w)** | name(MAX) | - | ⇒y | MUST | [rfc2911] §3.2.1.1 | §9.1.19 |
| **document-natural-language** | naturalLanguage | - | ⇒y | MAY | | §9.1.20 |
| **document-number** | integer(0:MAX) | - | y | MUST | - | §9.1.21 |
| **document-printer-uri** | uri | - | y | MUST | - | §9.1.22 |
| **document-state** | type1 enum | - | y | MUST | - | §9.1.23 |
| **document-state-message** | text(MAX) | - | y | MAY | - | §9.1.24 |
| **document-state-reasons** | 1setOf type2 keyword | - | y | MUST | - | §9.1.25 |
| **document-uri** | uri | - | ⇒y | MAY | - | §9.1.26 |
| **impressions-completed-current-copy** | integer(0:MAX) | y | y | MAY | [rfc3381] §4.4 | §9.1.27 |

---

[48] The Printer MUST support the "document-charset" Operation/Document Description attributes if the Printer supports any charset-ambiguous document formats (see [jobx] §3.2.1).
[49] The Printer MUST support the "document-format-details" Operation/Document Description attributes if the Printer supports a packaging MIME type document format, such as 'application/zip' or 'multipart/related'.

| Job Description / Document Description attribute name | IPP Attribute Syntax | Job | Doc | Printer conform-ance | Reference Job Description Attr | Doc Desc. |
|---|---|---|---|---|---|---|
| **ipp-attribute-fidelity** | boolean | ⇒y | - | MUST | [rfc2911] §3.2.1.1 [jobx] §5.1 | - |
| **job-collation-type** | type2 enum | y | - | MAY | [rfc3381] §4.1 | - |
| **detailed-status-messages** | 1setOf text (MAX) | y | y | MAY | [rfc2911] §4.3.10 | §9.1.28 |
| **document-access-errors** | 1setOf text(MAX) | y | y | MAY | [rfc2911] §4.3.11 | §9.1.29 |
| **errors-count** | integer(0:MAX) | y | y | MAY | [jobx] §5.2 | §9.1.30 |
| **job-id** | integer (1:MAX) | y | - | MUST | [rfc2911] §4.3.2 | - |
| **impressions** | integer(0:MAX) | ⇒y | ⇒y | MAY | [rfc2911] §4.3.17.2 | §9.1.31 |
| **impressions-completed** | integer(0:MAX) | y | y | MAY | [rfc2911] §4.3.18.2 | §9.1.32 |
| **k-octets** | integer(0:MAX) | ⇒y | ⇒y | MAY | [rfc2911] §4.3.17.1 | §9.1.33 |
| **k-octets-processed** | integer(0:MAX) | y | y | MAY | [rfc2911] §4.3.18.1 | §9.1.34 |
| **job-mandatory-attributes** | 1setOf type2 keyword | ⇒y | - | MUST | [jobx] §5.3 | - |
| **media-sheets** | integer(0:MAX) | ⇒y | ⇒y | MAY | [rfc2911] §4.3.17.3 | §9.1.35 |
| **[media-sheets-completed** | integer(0:MAX) | y | y | MAY | [rfc2911] §4.3.18.3 | §9.1.36 |
| **job-message-from-operator** | text(127) | y | - [50] | MAY | [rfc2911] §4.3.16 | - |
| **more-info** | uri | y | y | MAY | [rfc2911] §4.3.4 | §9.1.37 |
| **job-name (r/w)** | name(MAX) | ⇒y | - [51] | MUST | [rfc2911] §4.3.5 | - |
| **job-originating-user-name** | name (MAX) | y | - | MUST | [rfc2911] §4.3.6 | - |
| **job-password** | octetString(255) | ⇒y | - | MAY | [ippsave] §6.2 | - |
| **job-password-encryption** | type3 keyword | name(MAX) | ⇒y | - | MAY | [ippsave] §6.3 | - |
| **job-printer-make-and-model** | text(127) | y | - | CMUST [52] | [ippsave] §6.1 | - |
| **printer-up-time** | integer (1:MAX) | y | y | MUST | [rfc2911] §4.3.14.4 | §9.1.38 |
| **job-printer-uri** | uri | ⇒[53] y | - | MUST | [rfc2911] §4.3.3 | - |
| **job-state** | type1 enum | y | - [54] | MUST | [rfc2911] §4.3.7 | - |
| **job-state-message** | text(MAX) | y | - [55] | MAY | [rfc2911] §4.3.9 | - |
| **job-state-reasons** | 1setOf type2 keyword | y | - [56] | MUST | [rfc2911] §4.3.8 | - |
| **job-uri** | uri | y | - | MUST | [rfc2911] §4.3.1 | - |
| **warnings-count** | integer(0:MAX) | y | y | MAY | [jobx] §5.3 | §9.1.39 |

---

[50] The "job-message-from-operator" Job Description attribute has no corresponding "document-message-from-operator" (text(127)) Document Description attribute. Instead, both the user and the operator use the "document-message" (text(127)) Operation/Document Description attribute (see section 9.1.18) to communicate with each other.

[51] The Document Description attribute that corresponds to the "job-name" Job Description attribute is the (existing) "document-name" attribute defined in [rfc2911] and also discussed in this spec in section 9.1.19.

[52] The Printer MUST support the "job-printer-make-and-model" Job Description attribute if the "job-save-disposition" Job Template attribute is supported.

[53] The Printer sets the "job-printer-uri" Job Description attribute from the "printer-uri" Operation attribute.

[54] The Document Description attribute that corresponds to the "job-state" Job Description attribute is the (new) "document-state" attribute.

[55] The Document Description attribute that corresponds to the "job-state-message" Job Description attribute is the (new) "document-state-message" attribute.

[56] The Document Description attribute that corresponds to the "job-state-reasons" Job Description attribute is the (new) "document-state-reasons" attribute.

| Job Description / Document Description attribute name | IPP Attribute Syntax | Job | Doc | Printer conform-ance | Reference Job Description Attr | Doc Desc. |
|---|---|---|---|---|---|---|
| **last-document** | boolean | - | ⇒y | ~~MUST~~M~~A~~AY | ~~[rfc2911] §4.3.12~~ | §9.1.40 |
| **number-of-documents** | integer(0:MAX) | y | - | MAY | [rfc2911] §4.3.1~~2~~5 | - |
| **number-of-intervening-jobs** | integer(0:MAX) | y | - | MAY | [rfc2911] §4.3.1~~5~~3 | - |
| **output-device-requested** | name(127) | y | - | MAY | [jobx] §5.5 | - |
| **output-device-assigned** | name(127) | y | y | MAY | [rfc2911] §4.3.1~~3~~7.2 | §9.1.41 |
| **sheet-completed-copy-number** | integer(0:MAX) | y | y | MAY | [rfc3381] §4.2 | §9.1.42 |
| **sheet-completed-document-number** | integer(0:MAX) | y | - | MAY | [rfc3381] §4.3 | - |
| **time-at-completed** | integer (MIN:MAX) | y | y | MUST | [rfc2911] §4.3.14.3 | §9.1.43 |
| **time-at-creation** | integer (MIN:MAX) | y | y | MUST | [rfc2911] §4.3.14.1 | §9.1.44 |
| **time-at-processing** | integer (MIN:MAX) | y | y | MUST | [rfc2911] §4.3.14.2 | §9.1.45 |

1313  "**y**", "**⇒y**", "-"    See the description in the Legend before the table.
1314
1315  Most of the existing "job-state" and "job-state-reasons" Job Description attribute values apply equally well to
1316  individual documents in a multi-document job (with removal of the 'job-' prefix for those that apply to both Job and
1317  Document). The reason for separating state from reasons, is so that the states can be the fundamental states that
1318  most implementations have, while the state reasons can vary depending on the sophistication of the system. The
1319  states are the ones that clients are most likely to base actions upon, and the state reasons are more information,
1320  both for programs and people.

## 1321  9.1 Document Description attributes

1322  This section contains *all* of the Document Description attributes for use with the Document object. Most of these
1323  definitions refer to the corresponding Job Template attribute semantics in other specifications. However, the
1324  semantics of each Document Description attribute only applies to the Document object containing the Document
1325  Description attribute. The Printer MAY support changing these Document Description attributes with the Set-
1326  Document-Attributes operation (see section 4.4), but only if indicated explicitly in this section.

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

### 1327  9.1.1 attributes-charset (charset)

1328  This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1329  attribute (see [rfc2911] §4.3.19) applied to the Document object. The Printer sets this Document Description attribute
1330  from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section
1331  4.1). DMC ISSUE09: Section 4.1 doesn't seem to be the right section, but I'm not quite sure which section "the
1332  author" wanted to point them to. If this is changed, it must be changed in a number of places below as well.

1333  DMC ISSUE10: This attribute and the next are the only two (unless I'm mistaken) that have the same name as Job
1334  Description and as Document Description, AND that are copied from Operation attributes. So, for Print-Job, does the
1335  value get copied to the Job Description or Document Description attribute, or both?

### 9.1.2 attributes-natural-language (naturalLanguage)

This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description attribute (see [rfc2911] §4.3.20) applied to the Document object.  The Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section 4.1).

### 9.1.3 compression (type3 keyword)

This REQUIRED Document Description attribute specifies the compression used to represent this document (see [rfc2911] §3.2.1.1).  The Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section 4.1).

### 9.1.4 current-page-order (type2 keyword)

This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description attribute (see [pwg5100.3] §4.1) applied to the Document object.

### 9.1.5 date-time-at-completed (dateTime)

This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description attribute (see [rfc2911] §4.3.14.7) applied to the Document object.

### 9.1.6 date-time-at-creation (dateTime)

This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description attribute (see [rfc2911] §4.3.14.5) applied to the Document object.

### 9.1.7 date-time-at-processing (dateTime)

This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description attribute (see [rfc2911] §4.3.14.6) applied to the Document object.

### 9.1.8 document-charset (charset)

This CONDITIONALLY REQUIRED~~OPTIONAL~~ Document Description attribute specifies the charset used to represent this document (see [jobx] §4.2.1).  The Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section 4.1).  This attribute is REQUIRED for a Printer to support if the Printer supports any charset-ambiguous document formats; otherwise, this attribute is OPTIONAL.  Note, however, that if a Printer supports the "document-charset" Operation attribute, the Printer MUST support this "document-charset" Document Description attribute.

### 9.1.9 document-digital-signature (type2 keyword)

This OPTIONAL Document Description attribute specifies the digital signature technology used in the Document content.  The Printer sets this Document Description attribute from the corresponding "document-digital-signature" Operation attribute ([jobx] §4.2.2 for the semantics), if supplied by the client in the Document Creation operation (see section 4.1).  If a Printer supports the "document-digital-signature" Operation attribute, the Printer MUST support this "document-digital-signature" Document Description attribute.

1370 **9.1.10 document-format (mimeMediaType)**

1371 This REQUIRED[57] Document Description attribute specifiesd the document format of the Document Object content.
1372 The Printer sets this Document Description attribute from the corresponding "document-format" Operation attribute
1373 (see section [jobx] §4.2.3 for the semantics), if supplied by the client in the Document Creation operation (see section
1374 4.1).

1375 **9.1.11 document-format-details (1setOf collection)**

1376 This CONDITIONALLY REQUIREDOPTIONAL Document Description attribute specifies the details of the document
1377 format(s) of the Document Object content. The Printer sets this Document Description attribute from the
1378 corresponding "document-format-details" Operation attribute ([jobx] §4.2.4 for the semantics), if supplied by the client
1379 in the Document Creation operation (see section 4.1). This attribute is REQUIRED for a Printer to support if the
1380 Printer supports a packaging MIME type document format, such as 'application/zip' or 'multipart/related'; otherwise,
1381 this attribute is OPTIONAL. Note, however, that iIf a Printer supports the "document-format-details" Operation
1382 attribute, the Printer MUST support this "document-format-details" Document Description attribute.

1383 **9.1.12 document-format-details-detected (1setOf collection)**

1384 This OPTIONAL Document Description attribute is generated by the Printer to indicate the actual document format
1385 details of the Document object as detected by the Printer. The member attributes are the same as the "document-
1386 format-details" Operation attribute. (see [jobx] §6.6.4 for details)

1387 **9.1.13 document-format-detected (mimeMediaType)**

1388 This OPTIONAL Document Description attribute is generated by the Printer to indicate the actual document format of
1389 the Document object content as detected by the Printer. See [jobx] §6.6.5 for detailed semantics.

1390 **9.1.14 document-format-version (text(127))**

1391 This OPTIONAL Document Description attribute specifies the version of the document format of the Document
1392 Object content. The Printer sets this Document Description attribute from the corresponding "document-format-
1393 version" Operation attribute ([jobx] §4.2.6 for the semantics), if supplied by the client in the Document Creation
1394 operation (see section 4.1). If a Printer supports the "document-format-version" Operation attribute, the Printer
1395 MUST support this "document-format-version" Document Description attribute.

1396 **9.1.15 document-format-version-detected (text(127))**

1397 This OPTIONAL Document Description attribute is generated by the Printer to indicate the actual document format
1398 version of the Document content as detected by the Printer. See [jobx] §6.6.7 for detailed semantics..

1399 **9.1.16 document-job-id (integer(1:MAX))**

1400 This REQUIRED Document Description attribute is a *copy* of the Job's "job-id" Job Description attribute (see
1401 [rfc2911] §4.3.2), i.e., the "job-id" of the Job containing this Document.

---

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

### 9.1.17 document-job-uri (uri)

1402

1403 This REQUIRED Document Description attribute is a *copy* of the Job's "job-uri" Job Description attribute (see
1404 [rfc2911] §4.3.1), i.e., the URI of the Job that contains this Document.  Example:
1405 ipp://www.company.com/printers/myprinter/jobs/22

### 9.1.18 document-message (text(MAX))

1406

1407 This OPTIONAL Document Description attribute contains a message from either (1) the user to the operator about
1408 the Document or (2) from the operator, system administrator, or "intelligent" process to indicate to the end user the
1409 reasons for modification or other management action taken on the Document.  The Printer populates this Document
1410 Description attribute from the "document-message" (text(MAX)) Operation attribute value supplied by the client in any
1411 of the Document Creation operations (see section 4.1) or in a Cancel-Document operation (see section 4.5).

1412 In addition, the user and the operator can set the value of this Document Description attribute explicitly using the Set-
1413 Document-Attributes operation (see section 4.4).

### 9.1.19 document-name (name(MAX))

1414

1415 This REQUIRED[58] Document Description attribute specifies the name of the document (see [rfc2911] §3.2.1.1).   The
1416 Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client in
1417 the Document Creation operation (see section 4.1).

1418 This attribute may be modified by a client using the Set-Document-Attributes operation (see section 4.4).

### 9.1.20 document-natural-language (naturalLanguage)

1419

1420 This OPTIONAL Document Description attribute specifies the natural language of the Document Object content.  The
1421 Printer sets this Document Description attribute from the corresponding "document-natural-language" Operation
1422 attribute (section 7.2.1 for the semantics), if supplied by the client in the Document Creation operation (see section
1423 4.1).  If a Printer supports the "document-natural-language" Operation attribute, the Printer MUST support this
1424 "document-natural-language" Document Description attribute.

### 9.1.21 document-number (integer(1:MAX)) <mark>DMC ISSUE11: Table above (and IANA section) says (0:MAX)</mark>

1425
1426

1427 This REQUIRED Document Description attribute is the ordinal number of the document within the job, and which
1428 determines its order of being printed in a multi-document job.  The Printer MUST generate the values monotonically
1429 increasing from 1 for each job.

### 9.1.22 document-printer-uri (uri)

1430

1431 This REQUIRED Document Description attribute is a *copy* of the "printer-uri" Operation attribute (see [rfc2911]
1432 §3.1.5), i.e., the URI of the Printer containing the Job which contains this Document.  Example:
1433 ipp://www.company.com/printers/myprinter.

---

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

1434 ## 9.1.23 document-state (type1 enum)

1435 The REQUIRED "document-state" Document Description attributes identifies the current state of the document. The
1436 values for "document-state" are a subset of~~the same as~~ the values for "job-state"~~.~~ ([rfc2911] §4.3.7); in particular, the
1437 "job-state" values 'pending-held' and 'processing-stopped' do not apply to "document-state". Even though IPP
1438 defines five values for document state (plus the out-of-band 'unknown' value - see [rfc2911] section 4.1),
1439 implementations only need to support those states which are appropriate for the particular implementation. In other
1440 words, an IPP Printer implementation supports only those document states implemented by the output device and
1441 available to the IPP Printer implementation. ~~The values 'pending-held' and 'processing-stopped' do not apply to~~
1442 ~~"document-state".~~

1443 Table 12 lists the "document-state" attribute values.

1444 **Table 12 - "document-state" attribute values**

| "document-state" Values |
|---|
| 3  pending |
| 5  processing |
| 7  canceled |
| 8  aborted |
| 9  completed |

1445

1446 Standard enum values are:

| Value | Symbolic Name and Description |
|---|---|
| '3' | **'pending'** :  The D~~d~~ocument has not started to be processed at all. |
| '5' | **'processing'** :  One or more of: |

1. The job has begun using, or is attempting to use, one or more purely software processes that are analyzing, creating, or interpreting a PDL, etc. for the Document,
2. The job has begun using, or is attempting to use, one or more hardware devices that are interpreting a PDL, making marks on a medium, and/or performing finishing, such as stapling, etc. for the Document,
3. The~~ ~~Document is ready for printing, but the output device is not yet printing it, either because the Document hasn't reached the output device or because the Document is queued in the output device or some other spooler, awaiting the output device to print it.

The 'processing' state for the Document indicates that the Document has begun to be processed. Even if the Job stops being processed, the Document remains in the 'processing' state until it moves to one of the three terminal states.

Implementations MAY  include additional values in the document's "document-state-reasons" attribute to indicate the progress of the D~~d~~ocument, such as adding the 'printing' value to indicate when the output device is actually making marks on paper and/or the 'processing-to-stop-point' value to indicate that the Printer is in the process of canceling or aborting the Document.

| '7' | **'canceled'** :  The D~~d~~ocument has been canceled by a Cancel-Document operation and the Printer has completed canceling the D~~d~~ocument and all D~~d~~ocument status attributes have reached their final values for the D~~d~~ocument. While the Printer is canceling the D~~d~~ocument, the D~~d~~ocument remains in its current state, but the D~~d~~ocument's "~~ ~~document-state-reasons" |

| Value | Symbolic Name and Description |
|---|---|
| | attribute SHOULD contain the 'processing-to-stop-point' value and one of the 'canceled-by-user', 'canceled-by-operator', or 'canceled-at-device' values.  When the Ddocument moves to the 'canceled' state, the  'processing-to-stop-point' value, if present, MUST be removed, but the 'canceled-by-xxx', if present, MUST remain. |
| '8' | **'aborted'** :  The Ddocument has been aborted by the system, usually while the Ddocument was in the 'processing' state and the Printer has completed aborting the Ddocument and all Ddocument status attributes have reached their final values for the Ddocument.  While the Printer is aborting the Ddocument, the Ddocument remains in its current state, but the Ddocument's " document-state-reasons" attribute SHOULD contain the 'processing-to-stop-point' and 'aborted-by-system' values.  When the Ddocument moves to the 'aborted' state, the  'processing-to-stop-point' value, if present, MUST be removed, but the 'aborted-by-system' value, if present, MUST remain. |
| '9' | **'completed'** :  The Ddocument has completed successfully or with warnings or errors after processing and all of the Ddocument media sheets have been successfully stacked in the appropriate output bin(s) and all Ddocument status attributes have reached their final values for the Ddocument.  The Ddocument's " document-state-reasons" attribute SHOULD contain one of: 'completed-successfully', 'completed-with-warnings', or 'completed-with-errors' values. |

1447 The final value for this attribute MUST be one of: 'completed', 'canceled', or 'aborted' before the Printer removes the
1448 Ddocument altogether.  The length of time that Ddocuments remain in the 'canceled', 'aborted', and 'completed'
1449 states depends on implementation.

1450 Documents reach one of the three terminal states: 'completed', 'canceled', or 'aborted', after the Job has completed
1451 all activity for the Document, including stacking output media, and all Ddocument status attributes have reached their
1452 final values for the Ddocument.

1453

1454 **9.1.23.1 The "document-state" Document Description attribute and the Document object life Cycle**

1455 The "document-state" attribute is one of the most important Document Description attributes.  Figure 1 shows the
1456 values of the "document-state" attribute and the Document object life cycle as affected by actions on the Job,
1457 Document, Printer, and job processing.  Documents are not active objects.  Active objects in IPP are Printers and
1458 Jobs.  Printers and Jobs have URIs where requests are sent and acted upon.  Documents have no such URI.
1459 Printers schedule Jobs and Jobs, once scheduled, process the Documents that theyit contains.  Tlthe Document's
1460 life cycle is closely tied to the lifecycle of a Job[59].  Documents basically have three states.   The first is waiting to be
1461 processed by a Job (i.e. pending).  The second state is from the time the Job first starts processing the Document
1462 (i.e., processing) and until it reaches one of its terminal states.  The third state for a Document is one of its terminal
1463 states (i.e., completed, canceled, or aborted).

1464 DMC Editorial06: Reprocess-Job is misspelled in the picture below, but I can't edit the picture to fix it.

---

[59] The Document object is not really a sub-job.  If the Document object were its own independent active object, i.e., were a sub-job, then the Document state would affect the job state and there would be complex and debatable roll-up rules for how the various "document-state" values of all of the Job's document are rolled up to give a single value for the Job's "job-state" attribute.  Instead, the Job state reflects the overall processing of the job and is the same whether or not the Document object is supported.
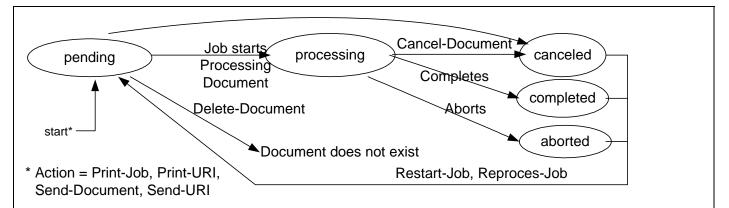
pending

Job starts
Processing
Document

processing

Cancel-Document

canceled

Completes

completed

Aborts

aborted

Delete-Document

Document does not exist

start*

Restart-Job, Reproces-Job

* Action = Print-Job, Print-URI,
Send-Document, Send-URI

1465

1466     **Figure 1 - The "document-state" Document Description attribute and the Document object life cycle**

1467 A Document object has a much simpler life cycle than a Job object.  A Document always progresses from left to right
1468 in the state diagram.  No other state transitions are defined.


## 9.1.24 document-state-message (text(MAX))

1470 This OPTIONAL Document Description attribute specifies information about the "document-state" and "document-
1471 state-reasons" attributes in human readable text.  If the Printer supports this attribute, the Printer MUST be able to
1472 generate this message in any of the natural languages identified by the Printer's "generated-natural-language-
1473 supported" attribute (see the "attributes-natural-language" Operation attribute specified in [rfc2911] Section 3.1.4.1).

1474 The value SHOULD NOT contain additional information not contained in the values of the "document-state" and
1475 "document-states-reasons" attributes, such as interpreter error information.  Otherwise, application programs might
1476 attempt to parse the (localized text).  For such additional information such as interpreter errors for application
1477 program consumption or specific document access errors, new attributes with keyword values, needs to be
1478 developed and registered.


## 9.1.25 document-state-reasons (1setOf type2 keyword)

1480 The REQUIRED "document-state-reasons" Document Description attributes provides additional information about
1481 each document's current state, i.e., information that augments the value of the Document's "document-state"
1482 attribute.

1483 These values MAY be used with any document state for which the reason makes sense.  Some of these value
1484 definitions indicate conformance requirements; the rest are OPTIONAL.  Furthermore, when implemented, the Printer
1485 MUST return these values when the reason applies and MUST NOT return them when the reason no longer applies
1486 whether the value of the Document's "document-state" attribute changed or not.  When the Document does not have
1487 any reasons for being in its current state, the value of the Document's "document-state-reasons" attribute MUST be
1488 'none'.

1489 Some of the Job's "job-state-reasons" values affect job scheduling, such as 'resources-are-not-ready' and 'job-hold-
1490 until-specified'.  However, "document-state-reasons" values MUST NOT affect job scheduling, since Document
1491 objects are passive objects operated on by the containing Job object.

1492 Note: While values cannot be added to the "document-state" attributes without impacting deployed clients that take
1493 actions upon receiving "document-state" values, it is the intent that additional "document-state-reasons' values can
1494 be defined and registered without impacting such deployed clients. In other words, the "document-state-reasons"
1495 attribute iss are intended to be extensible.

1496 Table 13 lists the standard keyword values for the "document-state-reasons" attributes defined in this specification
1497 and derived from "job-state-reasons" defined in other IPP specifications as indicated in the References column. In
1498 Table 13 the keywords are listed in alphabetic order, while in their descriptions following Table 13, they are listed in
1499 the most likely order of occurrence to help understanding.

1500 When the Document object is supported, the Printer implementation SHOULD still support the corresponding Job
1501 level "job-state-reasons", so that clients that do not support the Document object will receive the same information.
1502 Also it is usually more convenient for the client to obtain just the Job level status. However, the client SHOULD
1503 query both Job and Document attributes and convert them to some canonical form for display to the user, so that all
1504 Jobs and their Documents are displayed in a uniform manner, no matter from which clients they were submitted.

1505 **Table 13 - "document-state-reasons" attribute values**

| IPP Job Description / Document Description attribute name | IPP Attribute Syntax plus Values | Printer conformance | Reference |
|---|---|---|---|
| **document-state-reasons** | 1setOf type2 keyword | MUST | 9.1.25 |
| | aborted-by-system | MAY | [rfc2911] §4.3.8 |
| | compression-error | MAY | [rfc2911] §4.3.8 |
| | digital-signature-did-not-verify | MAY | [jobx] §6.1 |
| | digital-signature-type-not-supported | MAY | [jobx] §6.1 |
| | document-access-error | MAY | [rfc2911] §4.3.8 |
| | document-format-error | MAY | [rfc2911] §4.3.8 |
| | canceled-at-device | MAY | [rfc2911] §4.3.8 * |
| | canceled-by-operator | MAY | [rfc2911] §4.3.8 * |
| | canceled-by-user | MAY | [rfc2911] §4.3.8 * |
| | completed-successfully | MAY | [rfc2911] §4.3.8 * |
| | completed-with-errors | MAY | [rfc2911] §4.3.8 * |
| | completed-with-warnings | MAY | [rfc2911] §4.3.8 * |
| | data-insufficient | MAY | [rfc2911] §4.3.8 * |
| | digital-signature-wait | MAY | [jobx] §6.1 * |
| | errors-detected | MAY | [jobx] §6.1 * |
| | incoming | MAY | [rfc2911] §4.3.8 * |
| | interpreting | MAY | [rfc2911] §4.3.8 * |
| | none | MUST | [rfc2911] §4.3.8 |
| | outgoing | MAY | [rfc2911] §4.3.8 * |
| | printing | MAY | [rfc2911] §4.3.8 * |
| | processing-to-stop-point | MAY | [rfc2911] §4.3.8 |
| | queued | MAY | [rfc2911] §4.3.8 * |
| | queued-for-marker | MAY | [rfc2911] §4.3.8 * |
| | queued-in-device | MAY | [rfc2911] §4.3.8 |
| | resources-are-not-ready | MAY | [rfc2911] §4.3.8 |
| | resources-are-not-supported | MAY | [pwg5100.3] §6.1 |
| | spooling | MAY | [ippsave] §8.3.1 * |
| | streaming | MAY | [ippsave] §8.3.1 * |
| | submission-interrupted | MAY | [rfc2911] §4.3.8 |
| | transforming | MAY | [rfc2911] §4.3.8 * |
| | unsupported-compression | MUST | [rfc2911] §4.3.8 |
| | unsupported-document-format | MUST | [rfc2911] §4.3.8 |
| | warnings-detected | MAY | [jobx] §6.1 * |

1506 * The state reason keyword value is derived from an existing "job-state-reasons" value. The associated value is
1507 prefixed by 'job-' when it is a value of the "job-state-reasons" attribute[60]. The semantics for the reasons differ
1508 only by the object to which they are bound. For example 'job-printing' means that at least one document in
1509 the job is printing, i.e. the job is printing, while 'printing' means the document within the job is printing.

1511 For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely
1512 to occur (if implemented), starting with the 'none' value :

1513 **'none'** :  There are no reasons for the Document's current state. This state reason is semantically
1514 equivalent to "document-state-reasons" attribute without any value and MUST be used when there is
1515 no other value, since the 1setOf attribute syntax requires at least one value. [rfc2911] §4.3.8

1516 jobx**'resources-are-not-supported'** : At least one of the resources needed by the Document, such as
1517 media, fonts, resource objects, etc., is not supported on any of the physical printers for which the
1518 Document is a candidate. This condition MAY be detected when the Document is accepted, or
1519 subsequently while the Document is pending or processing, depending on implementation. The
1520 Job containing the Document may (1) remain in its current state, (2) be moved to the 'pending-held'
1521 state, depending on implementation and/or job scheduling policy, or (3) scheduled normally, but the
1522 Printer is put into the 'stopped' state when the Document is attempted to be processed on the
1523 Printer. This value is intended for use with an implementation that supports the "user-defined-
1524 values-supported" Printer attribute (see [pwg5100.3] section 6.1), which allows a Job to be accepted
1525 with an unsupported 'name' value. [pwg5100.3] §6.1

1526 **'resources-are-not-ready'** :  At least one of the resources needed by the Document, such as media, fonts,
1527 resource objects, etc., is not ready on any of the physical printer's for which the Document is a
1528 candidate. This condition MAY be detected when the Document is accepted, or subsequently while
1529 the Document is pending or processing, depending on implementation. The Job containing the
1530 Document may remain in its current state or be moved to the 'pending-held' state, depending on
1531 implementation and/or scheduling policy. [rfc2911] §4.3.8

1532 **'digital-signature-type-not-supported** : The DocumentJob contains a digital signature type that is not
1533 supported. Implementation or site policy determines the state of the Job containing the Document
1534 once this condition is detected. [jobx] § 6.1.

1535 **'incoming'** :  The Printer is retrieving/accepting Document data as a result of a Print-Job, Print-URI, Send-
1536 Document or Send-URI operation. [rfc2911] §4.3.8

1537 **'spooling'** : Same as 'incoming' with the specialization that the Printer is spooling the Document data before
1538 processing it. This value corresponds to the 'spool' or 'automatic' value of the "job-spooling-
1539 supported" Printer Description attribute. [ippsave] §8.3.1

1540 **'streaming'** : Same as 'incoming' with the specialization that the Printer is processing the Document data as
1541 it is being received (that is, the Document is not being spooled, but rather is being processed in
1542 chunks by the output device and is being imaged during reception). This value corresponds to the
1543 'stream' or 'automatic' value of the "job-spooling-supported" Printer Description attribute. [ippsave]
1544 §8.3.1

1545 **'data-insufficient'** :  The Printer is expecting additional Document data before it can move the Document
1546 into the 'processing' state. If a Printer starts processing before it has received all data, the Printer
1547 removes the 'data-insufficient' reason, but the 'incoming' remains. If a Printer starts processing after
1548 it has received all data, the Printer removes the 'data-insufficient' reason and the 'incoming' at the
1549 same time. [rfc2911] §4.3.8

1550 **'unsupported-compression'** : The document was aborted by the system because the Printer determined
1551 while attempting to decompress the Document data's that the compression is actually not among

---

[60] For the PWG Semantic Model [pwg-sm], the "job-" prefix is being dropped altogether so that the same values can be used for both the JobStateReasons and DocumentStateReasons attributes.

1552 those supported by the Printer. This value MUST be supported, since "compression"s is a
1553 REQUIRED Operation attribute. [rfc2911] §4.3.8

1554 **'compression-error'** : The document was aborted by the system because the Printer encountered an error
1555 in the Ddocument -data while decompressing it. If the Printer posts this reason, the Ddocument -
1556 data has already passed any tests that would have led to the 'unsupported-compression' job-state-
1557 reason/document-state-reason. [rfc2911] §4.3.8

1558 **'document-access-error'** : After accepting a Print-URI or Send-URI request, the Printer could not access
1559 the Ddocument's reference. This reason is intended to cover any file access problem, including file
1560 does not exist and access denied because of an access control problem. The Printer MAY also
1561 indicate the Ddocument access error using the "-document-access-errors" Printer Description
1562 attribute. —Whether the Printer aborts the Ddocument and moves the Ddocument to the 'aborted'
1563 Documentjob state or prints all Ddocuments that are accessible and moves the Ddocument to the
1564 'completed' Ddocument state and adds the 'completed-with-errors' value in the Jjob's "job-state-
1565 reasons" or Ddocument's "document-state-reasons" attribute depends on implementation and/or site
1566 policy. This value SHOULD be supported if the Print-URI or Send-URI operations are supported.
1567 [rfc2911] §4.3.8

1568 **'unsupported-document-format'** : The Ddocument was aborted by the system because the Ddocument -
1569 data's document-format is not among those supported by the Printer. If the client specifies the
1570 document-format as 'application/octet-stream', the printer MAY abort the Ddocument and post this
1571 reason even though the format is a member of the "document-format-supported" printer attribute, but
1572 not among the auto-sensed document-formats. This value MUST be supported, since "document-
1573 format" is a REQUIRED Operation attribute. [rfc2911] §4.3.8

1574 **'document-format-error'** : The Ddocument was aborted by the system because the Printer encountered an
1575 error in the Ddocument -data while processing it. If the Printer posts this reason, the Ddocument -
1576 data has already passed any tests that would have led to the 'unsupported-document-format' job-
1577 state-reason/document-state-reason. [rfc2911] §4.3.8

1578 **'submission-interrupted'** : The Ddocument was not completely submitted for some unforeseen reason,
1579 such as: (1) the Printer has crashed before the document was closed by the client, (2) the Printer or
1580 the document transfer method has crashed in some non-recoverable way before the Ddocument
1581 data was entirely transferred to the Printer, (3) the client crashed or failed to close the job before the
1582 time-out period. See the description of the "multiple-operation-time-out" Printer attribute in [rfc2911]
1583 sSection 4.4.31. [rfc2911] §4.3.8

1584 **'digital-signature-wait'** : The Job is currently being held because the DocumentJob was submitted with a
1585 "document-digital-signature" attribute value that is not supported. The operator MAY either cancel
1586 the job or release it to be processed. [jobx] §6.1.

1587 **'outgoing'** : The Printer is transmitting the Ddocument to the output device. [rfc2911] §4.3.8

1588 **'queued'** : The Document is in the 'processing' state, but more specifically, the Printer has queued the
1589 Document data. [rfc2911] §4.3.8

1590 **'transforming'** : The Document is in the 'processing' state, but more specifically, the Printer is interpreting
1591 Ddocument data and producing another electronic representation. [ippsave] §8.3.1

1592 **'interpreting'** : The Document is in the 'processing' state, but more specifically, the Printer is interpreting the
1593 Ddocument data. [rfc2911] §4.3.8

1594 **'queued-for-marker'** : The Document is in the 'pending', or 'processing' states, but more specifically, the
1595 Printer has completed enough processing of the document to be able to start marking and the
1596 document is waiting for the marker. All implementations put the document into (or back into) the
1597 'processing' state when marking does begin. rfc2911] §4.3.8

1598 **'printing'** : The output device is marking media for this Document. This value is useful for Printers which
1599 spend a great deal of time processing (1) when no marking is happening and then want to show that
1600 marking is now happening or (2) when the Ddocument is in the process of being canceled or aborted

1601  while the Ddocument remains in the 'processing' state, but the marking has not yet stopped so that
1602  impression or sheet counts are still increasing for the Ddocument. [rfc2911] §4.3.8

1603  **'digital-signature-did-not-verify'** : The Document contains a digital signature type that is supported but the
1604  signature did not verify when the Printer attempted to verify the signature. [jobx] §6.1

1605  **'canceled-by-user'** : The Ddocument was canceled by the owner of the Jjob containing the Document using
1606  the Cancel-Document request, i.e., by a user whose authenticated identity is the same as the value
1607  of the originating user that created the Job object, or by some other authorized end-user, such as a
1608  member of the job owner's security group.  The 'canceled-by-user' value SHOULD be supported for
1609  the "document-state-reasons" attributes for use with the Cancel-Document.  [rfc2911] §4.3.8

1610  **'canceled-by-operator'** : The Ddocument was canceled by the operator using the Cancel-Document
1611  request, i.e., by a user who has been authenticated as having operator privileges (whether local or
1612  remote).  If the security policy is to allow anyone to cancel anyone's Ddocument, then these values
1613  may be used when the Ddocument is canceled by other than the owner of the job.  For such a
1614  security policy, in effect, everyone is an operator as far as canceling Ddocuments is concerned.
1615  Thisese values SHOULD be supported if the implementation permits canceling by other than the
1616  owner of the job.  [rfc2911] §4.3.8

1617  **'canceled-at-device'** : The Ddocument was canceled by an unidentified local user, i.e., a user at a console
1618  at the device.  This value SHOULD be supported if the implementation supports canceling
1619  jobsJobs/Ddocuments at the console.  [rfc2911] §4.3.8

1620  **'aborted-by-system'** : The Ddocument (1) is in the process of being aborted, or (2) has been aborted by the
1621  system and placed in the 'aborted' state.. This value SHOULD be supported.  [rfc2911] §4.3.8

1622  **'processing-to-stop-point'** : The requester has issued a Cancel-Document operation or the Printer has
1623  aborted the Ddocument, but is still performing some actions on the Ddocument until a specified stop
1624  point occurs or Ddocument termination/cleanup is completed.
1625  If the implementation requires some measurable time to cancel the Ddocument in the 'processing' or
1626  'processing-stopped' Ddocument states, the Printer MUST use this value to indicate that the Printer
1627  is still performing some actions on the Ddocument while the Ddocument remains in the 'processing'
1628  state.  After all the Ddocument's Ddocument Ddescription attributes have stopped incrementing, the
1629  Printer moves the Ddocument from the 'processing' state to the 'canceled' or 'aborted' Ddocument
1630  states.  [rfc2911] §4.3.8

1631  **'errors-detected'** : Errors were detected during the processing of this Document.  If the Printer supports
1632  thisese values, the Printer MUST add the value to "document-state-reasons" when it generates the
1633  first error message. That is, a single occurrence of this value is present in the "document-state-
1634  reasons" if the Printer has generated one or more errors.  An error indicates loss of information, such
1635  as a page not imaged.  A warning indicates no loss of information (see 'warnings-detected' state
1636  reason). [jobx] §6.1

1637  **'warnings-detected'** : Warnings were detected during the processing of this Document.  If the Printer
1638  supports thisese values, the Printer MUST add the value to "document-state-reasons" when it
1639  generates the first warning message. That is, a single occurrence of this value is present in the
1640  "document-state-reasons" if the Printer has generated one or more warnings.  A warning indicates
1641  something did not go as expected, but there was no loss of information; f.  For example, a font
1642  substitution.  An error indicates loss of information (see 'errors-detected' state reason). [jobx] §6.1

1643  **'completed-successfully'** : The Ddocument completed successfully. There were no warnings or errors in
1644  printing.  This value SHOULD be supported.  [rfc2911] §4.3.8

1645  **'completed-with-warnings'** : The print part of the Ddocument completed with warnings (whether or not
1646  there were save errors).  This value SHOULD be supported if the implementation detects warnings.
1647  [rfc2911] §4.3.8  DMC Editorial07: What are "save errors"?  Why does this reason and the next
1648  reason use the words "The print part of" when the previous reason doesn't?

1649           **'completed-with-errors'** :  The print part of the Ddocument completed with errors (and possibly warnings
1650                 too) (whether or not there were save errors).  This value SHOULD be supported if the
1651                 implementation detects errors.  [rfc2911] §4.3.8

1652           **'queued-in-device'** : The Ddocument has been forwarded to a device or print system that is unable to send
1653                 back status.  The Printer sets the Ddocument's "document-state" attribute to 'completed' and adds
1654                 the 'queued-in-device' value to the Ddocument's " document-state-reasons" attribute to indicate that
1655                 the Printer has no additional information about the Ddocument and never will have any better
1656                 information.  See the description of the "document-state" attribute above, as well as the description
1657                 of specifically the portion on "Forwarding Servers" in [rfc2911] section 4.3.7.1.  [rfc2911] §4.3.8

1658 NOTE:  The semantics of this attribute or the set of valid values may be different for different document formats.

## 9.1.26 document-uri (uri)

1659

1660 This Document Description attribute is the URI that the client supplied in the corresponding Operation attribute in a
1661 Send-URI operation (see [rfc2911] section 3.3.2).  The Printer MUST support this attribute if the Printer supports the
1662 Send-URI operation (see section 4.2).

1663 Note: this URI identifies the source location of the document data.  This URI is NOT the identifier of the Document
1664 Object.  The simple identifier of the Document is the "document-number".

## 9.1.27 impressions-completed-current-copy (integer(0:MAX))

1665

1666 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1667 attribute (see [rfc3381] §4.4) applied to the Document object.

## 9.1.28 detailed-status-messages (1setOf text(MAX))

1668

1669 This OPTIONAL "detailed-status-messages" Document Description attribute has the same semantics as the
1670 corresponding "job-detailed-status-messages" Job Description attribute (see [rfc2911] job-detailed-status-message
1671 §4.3.10) applied to the Document object.

1672 DMC Editorial08 for Pete: This attribute's description, as well as the next 11 or so, have the name of the Job
1673 Description attribute added between the "[rfc2911]" and the "$x.x".  This is not done anywhere else in this document,
1674 and should be gotten rid of, I believe.  If it makes sense here, we have to look at everywhere else it might make
1675 sense.

## 9.1.29 document-access-errors (1setOf text(MAX))

1676

1677 This OPTIONAL "document-access-errors" Document Description attribute has the same semantics as the
1678 corresponding "job-document-access-errorsdetailed-status-message" Job Description attribute (see [rfc2911] job-
1679 document-access-errors §4.3.11) applied to the Document object.

## 9.1.30 errors-count (integer(0:MAX))

1680

1681 This OPTIONAL "errors-count" Document Description attribute counts the number of errors that the Printer
1682 encounters while processing and printing the Document object.  An error indicates loss of information, such as a
1683 page not imaged.  A warning indicates no loss of information (see [jobx] job-errors-count §5.2).

## 9.1.31 impressions (integer(0:MAX))

1684

1685 This OPTIONAL "impressions" Document Description attribute has the same semantics as the corresponding "job-
1686 impressions" Job Description attribute (see [rfc2911] job-impressions §4.3.17.2) applied to the Document object.

1687   The Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client
1688   in the Document Creation operation (see §4), but may, as with "job-impressions", change the value if it is able to
1689   compute a value that is more accurate than the client supplied value (see [rfc2911] §4.3.17).


### 9.1.32 impressions-completed (integer(0:MAX))

1691   This OPTIONAL "impressions-completed" Document Description attribute has the same semantics as the
1692   corresponding "job-impressions-completed" Job Description attribute (see [rfc2911] job-impressions-completes
1693   §4.3.18.2) applied to the Document object.


### 9.1.33 k-octets (integer(0:MAX))

1695   This OPTIONAL "k-octets" Document Description attribute has the same semantics as the corresponding "job-k-
1696   octets" Job Description attribute (see [rfc2911] job-k-octets §4.3.17.1) applied to the Document object.  The Printer
1697   sets this Document Description attribute from the corresponding Operation attribute supplied by the client in the
1698   Document Creation operation (see §4), but may, as with "job-k-octets" change the value if it is able to compute a
1699   value that is more accurate than the client supplied value (see [rfc2911] §4.3.17).


### 9.1.34 k-octets-processed (integer(0:MAX))

1701   This OPTIONAL "k-octets-processed" Document Description attribute has the same semantics as the corresponding
1702   "job-k-octets-processed" Job Description attribute (see [rfc2911] job-k-octets-processed §4.3.18.1) applied to the
1703   Document object.


### 9.1.35 media-sheets (integer(0:MAX))

1705   This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-
1706   media-sheets" Job Description attribute (see [rfc2911] job-media-sheets §4.3.17.3) applied to the Document object.
1707   The Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client
1708   in the Document Creation operation (see §4), but may, as with "job-media-sheets", change the value if it is able to
1709   compute a value that is more accurate than the client supplied value (see [rfc2911] §4.3.17).


### 9.1.36 media-sheets-completed (integer(0:MAX))

1711   This OPTIONAL "media-sheets-completed" Document Description attribute has the same semantics as the
1712   corresponding "job-media-sheets-completed" Job Description attribute (see [rfc2911] job-media-sheets-completed
1713   4.3.18.3) applied to the Document object.


### 9.1.37 more-info (uri)

1715   This OPTIONAL "more-info" Document Description attribute has the same semantics as the corresponding "job-
1716   more-info" Job Description attribute (see [rfc2911] job-more-info §4.3.4) applied to the Document object.


### 9.1.38 printer-up-time (integer (1:MAX))

1718   This REQUIRED "printer-up-time" Document Description attribute indicates the amount of time (in seconds) that the
1719   Printer implementation has been up and running.  This attribute is an alias for the "printer-up-time" Printer Description
1720   attribute (see [rfc2911] job-printer-up-time section 4.4.29).

1721   A client MAY request this attribute in a Get-Document-Attributes or Get-Documents request and use the value
1722   returned in combination with other requested Event Time DocumentJob Description Attributes in order to display time
1723   attributes to a user.  The difference between this attribute and the 'integer' value of a "time-at-xxx" attribute is the

1724 number of seconds ago that the "time-at-xxx" event occurred.  A client can compute the wall-clock time at which the
1725 "time-at-xxx" event occurred by subtracting this difference from the client's wall-clock time.

### 9.1.39 warnings-count (integer(0:MAX))

1727 This OPTIONAL "warnings-count" Document Description attribute has the same semantics as the corresponding
1728 "job-warnings-count" Job Description attribute (see [jobx] job-warnings-count §5,4) applied to the Document object.
1729 .A warning indicates something did not go as expected, but there was no loss of information; f. For example, a font
1730 substitution.  An error indicates loss of information (see section 9.1.30).

### 9.1.40 last-document  (boolean)

1732 This OPTIONAL REQUIRED Document Description attribute indicates whether or not this Document is the last
1733 Document in the Job.   See [rfc2911] §4.3.12.  The Printer sets this Document Description attribute from the
1734 corresponding Operation attribute supplied by the client in the Document Creation operation (see §4).  DMC
1735 ISSUE12: What about the case where the last document is empty with last-document='true'?  Does the Printer have
1736 to go back to the previous document and change its "last-document" Description attribute to be 'true', even though
1737 the request said 'false'?

### 9.1.41 output-device-assigned (name(127))

1739 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1740 attribute (see [rfc2911] §4.3.7.2) applied to the Document object.  DMC ISSUE13: So even though the user cannot
1741 ask for different output-device's for different Documents (since output-device-requested is only a *Job*
1742 *Operation/Description* attribute), the Printer can print the Documents of the Job on different devices?  To me, this
1743 seems to be a Job Description attribute only.  Or we have to allow the user to ask for different devices for different
1744 Documents.  And if we allow that, can the user ask for different devices on a page basis in "overrides"?  Or am I
1745 missing something?

### 9.1.42 sheet-completed-copy-number (integer(0:MAX))

1747 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1748 attribute (see [rfc3381] §4.2) applied to the Document object.

### 9.1.43 time-at-completed (integer (MIN:MAX))

1750 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1751 attribute (see [rfc2911] §4.3.14.3) applied to the Document object.

### 9.1.44 time-at-creation (integer (MIN:MAX))

1753 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1754 attribute (see [rfc2911] §4.3.14.1) applied to the Document object.

### 9.1.45 time-at-processing (integer (MIN:MAX))

1756 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1757 attribute (see [rfc2911] §4.3.14.2) applied to the Document object.

## 1758 10 Printer attributes

1759 This section lists *all* of the Printer attributes defined in other IPP documents.  Printer attributes are divided into three
1760 disjoint groups:
1761

| Job Template attributes (JT) | These Printer attributes are related directly to the "xxx" Job Template attributes that a client can supply in a Job Creation request as follows: <br> 1. "xxx-supported" indicates the supported values. <br> 2. "xxx-default" indicates the values that will be used if the client and the PDL omit the attribute. <br> 3. "xxx-ready" indicates the supported values that are available without human intervention, for those few attributes that require human intervention, such as "media" and possibly "job-finishing". <br> These Printer attributes are also returned in a Get-Printer-Attributes response when the client supplies: "requested-attributes" = 'job-template'. |
|---|---|
| Document Template attributes (DT) | These Printer attributes are related directly to the "xxx" Document Template attributes that a client can supply in a Document Creation request as follows: <br> 1. "xxx-supported" indicates the supported values. <br> 2. "xxx-default" indicates the values that will be used if the client and the PDL omit the attribute. <br> 3. "xxx-ready" indicates the supported values that are available without human intervention, for those few attributes that require human intervention, such as "media" and possibly "finishing". <br> These Printer attributes are also returned in a Get-Printer-Attributes response when the client supplies: "requested-attributes" = 'document-template' (new value defined in this specification). |
| Printer Description attributes (PD) | These Printer attributes describe the Printer, such as "printer-name" and "printer-location".  Some of them are "xxx-supported" and "xxx-default" for Operation attributes that the client can supply in a Job Creation request. |
| neither (-) | These Printer attributes describe supported and defaults for member attributes of collection Job Template attributes. |

1762
1763 In a Get-Printer-Attributes request, a client can request all of the Printer attributes in the Job Template (JT),
1764 Document Template (DT), or Printer Description (PD) groups by supplying the 'job-template', 'document-template', or
1765 'printer-description' group name, respectively.  The client can also request "all".

1766 In Table 14, the column labels are:

1767 "**Attribute Syntax**" - indicates the attribute syntax (see [rfc2911] section 4.1).  Many "xxx-default" and "xxx-
1768 supported" attributes have the 'collection' syntax which consists of a number of member attributes.
1769 These member attributes are not listed in this table when they are the same as the corresponding
1770 "xxx" attribute in Table 10.  Only those few Printer attribute collection attributes that do not have a
1771 corresponding Job Template attributes show the member attributes in this table.

1772 "**Grp**" - indicates to which group the attribute belongs.  "PD" = Printer Description; "JT" = Job Template; "DT"
1773 = Document Template as explained above.

1774 "**Printer Conf.**" - indicates the IPP/1.1 Printer conformance requirements for supporting the attribute.  Those
1775 attributes labeled as "MAY" may have conditional requirements that require their support, if the
1776 Printer supports a related attribute, operation, or feature.  For example, all Job Template attributes
1777 are OPTIONAL for a Printer to support.  However, if a Printer supports Job Template attribute "xxx",
1778 then it MUST also support the corresponding "xxx-default" and "xxx-supported" attributes.  Similarly,
1779 if Event Notification is supported, then some of the attributes indicated as "MAY" in this table become
1780 MUST.

1781 "**Reference**" - lists the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

1782 **Table 14 - Printer attributes (Job Template, Document Template, and Printer Description)**

| **Printer** attribute name (Job Template, Document Template & Printer Description) | Attribute Syntax | Grp | Printer Conf. | Reference |
|---|---|---|---|---|
| **charset-configured** | charset | PD | MUST | [rfc2911] §4.4.17 |
| **charset-supported** | 1setOf charset | PD | MUST | [rfc2911] §4.4.18 |
| **color-supported** | boolean | PD | MAY | [rfc2911] §4.4.26 |
| **compression-supported** | type3 keyword | PD | MUST | [rfc2911] §4.4.32 |
| **copies-default** | integer(1:MAX) | JT,DT | MAY | [rfc2911] §4.2.5 |
| **copies-supported** | rangeOfInteger(1:MAX) | JT,DT | MAY | [rfc2911] §4.2.5 |
| **cover-back-default** | collection | JT,DT | MAY | [pwg5100.3] §3.1.3 |
| **cover-back-supported** | 1setOf type2 keyword | JT,DT | MAY | [pwg5100.3] §3.1.4 |
| **cover-front-default** | collection | JT,DT | MAY | [pwg5100.3] §3.1.3 |
| **cover-front-supported** | 1setOf type2 keyword | JT,DT | MAY | [pwg5100.3] §3.1.4 |
| **cover-type-supported** | 1setOf type2 keyword | - | MAY | [pwg5100.3] §3.1.2.1 |
| **document-charset-default** | charset | PD | CMUST [61] | [jobx] §7.1 |
| **document-charset-supported** | 1setOf charset | PD | CMUST [61] | [jobx] §7.2 |
| **document-creation-attributes-supported** | 1setOf type2 keyword | PD | MUST | [this-spec] §10.1 |
| **document-digital-signature-default** | type2 keyword | PD | MAY | [jobx] §7.3 |
| **document-digital-signature-supported** | 1setOf type2 keyword | PD | MAY | [jobx] §7.4 |
| **document-format-default** | mimeMediaType | PD | MUST | [rfc2911] §4.4.21 |
| **document-format-details-supported** | 1setOf type2 keyword | PD | CMUST [62] | [jobx] §7.6 |
| ~~**document-format-details-implemented**~~ | ~~1setOf collection~~ | ~~PD~~ | ~~CMUST [58]~~ | ~~[jobx~~jobx~~]~~ §7.7 |
| **document-format-supported** | 1setOf mimeMediaType | PD | MUST | [rfc2911] §4.4.22 |
| **document-format-varying-attributes** | 1setOf type2 keyword | PD | MAY | [rfc3380] §6.3 |
| **document-format-version-default** | text(127) | PD | MAY | [jobx] §7.8 |
| **document-format-version-supported** | 1setOf text(127) | PD | MAY | [jobx] §7.9 |
| **document-natural-language-default** | naturalLanguage | PD | MAY | [jobx] §7.10 |
| **document-natural-language-supported** | 1setOf naturalLanguage | PD | MAY | [jobx] §7.11 |
| **feed-orientation-default** | type3 keyword | JT,DT | MAY | [ippsave] §5.1.1 |
| **feed-orientation-supported** | 1setOf type3 keyword | JT,DT | MAY | [ippsave] §5.1.2 |
| **finishings-col-default** | collection | JT,DT | MAY | [pwg5100.3] §3.2.3 |
| **finishings-col-ready** | 1setOf collection | JT,DT | MAY | [pwg5100.3] §3.2.4 |
| **finishings-col-supported** | 1setOf type2 keyword | JT,DT | MAY | [pwg5100.3] §3.2.5 |
| **finishings-default** | 1setOf type2 enum | JT,DT | MAY | [rfc2911] §4.2.6 |
| **finishings-ready** | 1setOf type2 enum | JT,DT | MAY | [rfc2911] §4.2.6 |
| **finishings-supported** | 1setOf type2 enum | JT,DT | MAY | [rfc2911] §4.2.6 |
| **finishing-template-supported** | 1setOf name(MAX) | - | MAY | [pwg5100.3] §3.2.1.1 |
| **font-name-requested-default** | name(MAX) | JT,DT | MAY | [ippsave] §5.2.1 |
| **font-name-requested-supported** | 1setOf name(MAX) | JT,DT | MAY | [ippsave] §5.2.2 |

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[61] The Printer MUST support the "document-charset-default" and "document-charset-supported" Printer Description attributes, if the Printer supports a charset-ambiguous document format (see [jobx] §3.2.1).

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

| **Printer** attribute name (Job Template, Document Template & Printer Description) | Attribute Syntax | Grp | Printer Conf. | Reference |
|---|---|---|---|---|
| **font-size-requested-default** | integer (1:MAX) | JT,DT | MAY | [ippsave] §5.3.1 |
| **font-size-requested-supported** | 1setOf integer (1:MAX) | JT,DT | MAY | [ippsave] §5.3.1 |
| **force-front-side-default** | 1setOf integer(1:MAX) | JT,DT | MAY | [pwg5100.3] §3.3 |
| **force-front-side-supported** | rangeOfInteger(1:MAX) | JT,DT | MAY | [pwg5100.3] §3.3 |
| **generated-natural-language-supported** | 1setOf naturalLanguage | PD | MUST | [rfc2911] §4.4.20 |
| **imposition-template-default** | type3 keyword | name(MAX) | JT,DT | MAY | [pwg5100.3] §3.4 |
| **imposition-template-supported** | 1setOf (type3 keyword | name(MAX)) | JT,DT | MAY | [pwg5100.3] §3.4 |
| **insert-after-page-number-supported** | rangeOfInteger(0:MAX) | - | MAY | [pwg5100.3] §3.5.1.1 |
| **insert-count-supported** | rangeOfInteger(0:MAX) | - | MAY | [pwg5100.3] §3.5.2.1 |
| **insert-sheet-default** | 1setOf collection | JT,DT | MAY | [pwg5100.3] §3.5.4 |
| **insert-sheet-supported** | 1setOf type2 keyword | JT,DT | MAY | [pwg5100.3] §3.5.5 |
| **ippget-event-life** | integer(15:MAX) | PD | MAY | [get-method] §8.1 |
| **ipp-versions-supported** | 1setOf type2 keyword | PD | MUST | [rfc2911] §4.4.20 |
| **job-account-id-default** | name(MAX) | JT | MAY | [pwg5100.3] §3.6 |
| **job-account-id-supported** | boolean | JT | MAY | [pwg5100.3] §3.6 |
| **job-accounting-output-bin-default** | type3 keyword | name(MAX) | - | MAY | [pwg5100.3] §3.8.3.1 |
| **job-accounting-output-bin-supported** | 1setOf (type3 keyword | name(MAX)) | - | MAY | [pwg5100.3] §3.8.3.2 |
| **job-accounting-sheets-default** | collection | JT | MAY | [pwg5100.3] §3.8.4 |
| **job-accounting-sheets-supported** | 1setOf type2 keyword | JT | MAY | [pwg5100.3] §3.8.5 |
| **job-accounting-sheets-type-supported** | 1setOf (type3 keyword | name(MAX)) | - | MAY | [pwg5100.3] §3.8.1.1 |
| **job-accounting-user-id-default** | name(MAX) | JT | MAY | [pwg5100.3] §3.7 |
| **job-accounting-user-id-supported** | boolean | JT | MAY | [pwg5100.3] §3.7 |
| **job-copies-default** | integer(1:MAX) | JT | MAY | [jobx] §4.1.1.1 |
| **job-copies-supported** | reangeOfInteger(1:MAX) | JT | MAY | [jobx] §4.1.1.2 |
| **job-cover-back-default** | collection | JT | MAY | [jobx] §4.1.2.1 |
| **job-cover-back-supported** | 1setOf type2 keyword | JT | MAY | [jobx] §4.1.2.2 |
| **job-cover-front-default** | collection | JT | MAY | [jobx] §4.1.3.1 |
| **job-cover-front-supported** | 1setOf type2 keyword | JT | MAY | [jobx] §4.1.3.2 |
| **job-creation-attributes-supported** | 1setOf type2 keyword | PD | MAY | [ippsave] §7.1 |
| **job-error-sheet-default** | collection | JT | MAY | [pwg5100.3] §3.7 |
| **job-error-sheet-supported** | 1setOf type2 keyword | JT | MAY | [pwg5100.3] §3.9.5 |
| **job-error-sheet-type-supported** | 1setOf (type3 keyword | name(MAX)) | - | MAY | [pwg5100.3] §3.9.1.1 |
| **job-error-sheet-when-supported** | 1setOf type2 keyword | - | MAY | [pwg5100.3] §3.9.2.1 |
| **job-finishings-default** | 1setOf type2 enum | JT | MAY | [jobx] §4.1.4.1 |
| **job-finishings-supported** | 1setOf type2 enum | JT | MAY | [jobx] §4.1.4.2 |
| **job-finishings-col-default** | collection | JT | MAY | [jobx] §4.1.5.1 |
| **job-finishings-col-supported** | 1setOf type2 keyword | JT | MAY | [jobx] §4.1.5.2 |
| **job-hold-until-default** | type3 keyword | name(MAX) | JT | MAY | [rfc2911] §4.2.2 |
| **job-hold-until-supported** | 1setOf (type3 keyword | name(MAX)) | JT | MAY | [rfc2911] §4.2.2 |
| **job-impressions-supported** | rangeOfInteger(0:MAX) | PD | MAY | [rfc2911] §4.4.34 |
| **job-k-octets-supported** | rangeOfInteger(0:MAX) | PD | MAY | [rfc2911] §4.4.33 |
| **job-media-sheets-supported** | rangeOfInteger(0:MAX) | PD | MAY | [rfc2911] §4.4.35 |
| **job-message-to-operator-default** | text(MAX) | JT | MAY | [pwg5100.3] §3.12 |

| **Printer** attribute name (Job Template, Document Template & Printer Description) | Attribute Syntax | Grp | Printer Conf. | Reference |
|---|---|---|---|---|
| **job-message-to-operator-supported** | boolean | JT | MAY | [pwg5100.3] §3.12 |
| **job-password-supported** | integer(0:127) | PD | MAY | [ippsave] §7.2 |
| **job-password-encryption-supported** | 1setOf (type3 keyword \| name(MAX)) | PD | MAY | [ippsave] §7.3 |
| **job-priority-default** | integer(1:100) | JT | MAY | [rfc2911] §4.2.1 |
| **job-priority-supported** | 1setOf integer(1:100) | JT | MAY | [rfc2911] §4.2.1 |
| **job-settable-attributes-supported** | 1setOf type2 keyword | PD | MAY | [rfc3380] §6.2 |
| **job-sheet-message-default** | text(MAX) | JT | MAY | [pwg5100.3] §3.12 |
| **job-sheet-message-supported** | boolean | JT | MAY | [pwg5100.3] §3.12 |
| **job-sheets-col-default** | collection | JT | MAY | [pwg5100.3] §3.11.3 |
| **job-sheets-col-supported** | 1setOf type2 keyword | JT | MAY | [pwg5100.3] §3.11.4 |
| **job-sheets-default** | type3 keyword \| name(MAX) | JT | MAY | [rfc2911] §4.2.3 |
| **job-sheets-supported** | 1setOf (type3 keyword \| name(MAX)) | JT | MAY | [rfc2911] §4.2.3 |
| **job-spooling-supported** | type2 keyword | PD | MAY | [ippsave] §7.4 |
| **max-save-info-supported** | integer(1:MAX) | PD | MAY | [ippsave] §7.5 |
| **max-stitching-locations-supported** | integer(1:MAX) | PD | MAY | [pwg5100.3] §5.2 |
| **media-back-coating-supported** | 1setOf (type3 keyword \| name(MAX)) | - | MAY | [pwg5100.3] §3.13.10.2 |
| **media-col-database** | 1setOf collection | - [63] | MAY | [ippsave] §7.6 |
| *any "media-col" member attribute* | DMC Editorial09: What is this row doing here (and a few just below)? | | | |
| **media-col-default** | collection | JT | MAY | [pwg5100.3] §3.13.12 |
| *any "media-col" member attribute* | | | | |
| **media-color-supported** | 1setOf type2 keyword | - | MAY | [pwg5100.3] §3.13.4.1 |
| **media-col-ready** | 1setOf collection | JT | MAY | [pwg5100.3] §3.13.13 |
| *any "media-col" member attribute* | | | | |
| **media-col-supported** | 1setOf type2 keyword | JT | MAY | [pwg5100.3] §3.13.14 |
| **media-default** | type3 keyword \| name(MAX) | JT,DT | MAY | [rfc2911] §4.2.11 |
| **media-front-coating-supported** | 1setOf (type3 keyword \| name(MAX)) | - | MAY | [pwg5100.3] §3.13.10.1 |
| **media-hole-count-supported** | 1setOf rangeOfInteger(0:MAX) | - | MAY | [pwg5100.3] §3.13.6.1 |
| **media-info-supported** | boolean | - | MAY | [pwg5100.3] §3.13.3.1 |
| **media-input-tray-check-default** | type3 keyword \| name(MAX) | JT | MAY | [pwg5100.3] §3.14 |
| **media-input-tray-check-supported** | 1setOf (type3 keyword \| name(MAX)) | JT | MAY | [pwg5100.3] §3.14 |
| **media-key-supported** | 1setOf (type3 keyword \| name(MAX)) | - | MAY | [pwg5100.3] §3.13.1.1 |
| **media-order-count-supported** | 1setOf rangeOfInteger(1:MAX) | - | MAY | [pwg5100.3] §3.13.7.1 |
| **media-pre-printed-supported** | 1setOf (type3 keyword \| name(MAX)) | - | MAY | [pwg5100.3] §3.13.5.1 |
| **media-ready** | 1setOf (type3 keyword \| name(MAX)) | JT,DT | MAY | [rfc2911] §4.2.11 |
| **media-recycled-supported** | 1setOf (type3 keyword \| name(MAX)) | - | MAY | [pwg5100.3] §3.13.11.1 |

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[63] The Printer does not return the "media-col-database" attribute when the client requests the 'all' or 'printer-description' attribute group because there MAY be a large number of values.  Instead the client MUST query "media-col-database" explicitly in a Get-Printer-Attributes request.

| Printer attribute name (Job Template, Document Template & Printer Description) | Attribute Syntax | Grp | Printer Conf. | Reference |
|---|---|---|---|---|
| | | | | |
| **media-size-supported** | 1setOf collection | - | MAY | [pwg5100.3] §3.13.8.3 |
| **media-supported** | 1setOf (type3 keyword \| name(MAX)) | JT,DT | MAY | [rfc2911] §4.2.11 |
| | | | | |
| | | | | |
| **media-weight-metric-supported** | 1setOf rangeOfInteger(1:MAX) | - | MAY | [pwg5100.3] §3.13.9.1 |
| **multiple-document-handling-default** | type2 keyword | JT | MUST[64] | [rfc2911] §4.2.4 |
| **multiple-document-handling-supported** | 1setOf type2 keyword | JT | MUST[64] | [rfc2911] §4.2.4 |
| **multiple-document-jobs-supported** | boolean | PD | MUST[64] | [rfc2911] §4.4.16 |
| **multiple-operation-time-out** | integer(1:MAX) | PD | MUST[64] | [rfc2911] §4.4.31 |
| **natural-language-configured** | naturalLanguage | PD | MUST | [rfc2911] §4.4.19 |
| **notify-attributes-supported** | 1setOf type2 keyword | PD | MAY | [ntfy] §5.3.4 |
| **notify-events-default** | 1setOf type2 keyword | PD | MAY | [ntfy] §5.3.3 |
| **notify-events-supported** | 1setOf type2 keyword | PD | MAY | [ntfy] §5.3.3 |
| **notify-lease-duration-default** | integer(0:67108863) | PD | MAY | [ntfy] §5.3.8 |
| **notify-lease-duration-supported** | 1setOf (integer(0: 67108863) \| rangeOfInteger(0:67108863)) | PD | MAY | [ntfy] §5.3.8 |
| **notify-lease-expiration-time** | integer(0:MAX) | PD | MAY | [ntfy] §5.4.3 |
| **notify-max-events-supported** | integer(2:MAX) | PD | MAY | [ntfy] §5.3.3 |
| **notify-pull-method-supported** | 1setOf type2 keyword | PD | MAY | [ntfy] §5.3.2 |
| **notify-schemes-supported** | 1setOf uriScheme | PD | MAY | [ntfy] §5.3.1 |
| **number-up-default** | integer(1:MAX) | JT,DT | MAY | [rfc2911] §4.2.9 |
| **number-up-supported** | 1setOf (integer(1:MAX) \| rangeOfInteger(1:MAX)) | JT,DT | MAY | [rfc2911] §4.2.9 |
| **operations-supported** | 1setOf type2 enum | PD | MUST | [rfc2911] §4.4.15 |
| **orientation-requested-default** | type2 enum | JT,DT | MAY | [rfc2911] §4.2.10 |
| **orientation-requested-supported** | 1setOf type2 enum | JT,DT | MAY | [rfc2911] §4.2.10 |
| **output-bin-default** | type2 keyword \| name(MAX) | JT | MAY | [pwg5100.2] §2.1 |
| **output-bin-supported** | 1setOf (type2 keyword \| name(MAX)) | JT | MAY | [pwg5100.2] §2.1 |
| **output-device-requested-supported** | 1setOf name(127) | PD | MAY | [jobx] §7.12 |
| **page-delivery-default** | type2 keyword | JT,DT | MAY | [pwg5100.3] §3.15 |
| **page-delivery-supported** | 1setOf type2 keyword | JT,DT | MAY | [pwg5100.3] §3.15 |
| **page-order-received-default** | type2 keyword | JT,DT | MAY | [pwg5100.3] §3.16 |
| **page-order-received-supported** | 1setOf type2 keyword | JT,DT | MAY | [pwg5100.3] §3.16 |
| **overrides-supported** | 1setOf type2 keyword | JT,DT | MAY | [OvrRide] §5.2.9 |
| **page-ranges-supported** | boolean | JT,DT | MAY | [rfc2911] §4.2.7 |
| **pages-per-minute** | integer(0:MAX) | PD | MAY | [rfc2911] §4.4.36 |
| **pages-per-minute-color** | integer(0:MAX) | PD | MAY | [rfc2911] §4.4.37 |
| ~~**pages-per-subset-supported**~~ | ~~boolean~~ | ~~PD~~ | ~~MAY~~ | ~~[Jobx] §4.1.6.2~~ |
| **parent-printers-supported** | 1setOf uri | PD | MAY | [adm-ops] §7.2 |
| **pdl-override-supported** | type2 keyword | PD | MUST | [rfc2911] §4.4.28 [ippsave] §8.1 |

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[64] A Printer MUST support "multiple-document-handling-default", "multiple-document-handling-supported", "multiple-document-jobs-supported", and "multiple-operation-time-out" Printer attributes since the Printer MUST support multiple document jobs, even though they are OPTIONAL for a Printer to conform to [rfc2911].

| **Printer** attribute name (Job Template, Document Template & Printer Description) | Attribute Syntax | Grp | Printer Conf. | Reference |
|---|---|---|---|---|
| **presentation-direction-number-up-default** | type2 keyword | JT,DT | MAY | [pwg5100.3] §3.17 |
| **presentation-direction-number-up-supported** | 1setOf type2 keyword | JT,DT | MAY | [pwg5100.3] §3.17 |
| **printer-current-time** | dateTime | PD | MAY | [rfc2911] §4.4.30 |
| **printer-detailed-status-messages** | 1setOf text(MAX) | PD | MAY | [ippsave] §7.7 |
| **printer-driver-installer** | uri | PD | MAY | [rfc2911] §4.4.8 |
| **printer-info** | text(127) | PD | MAY | [rfc2911] §4.4.6 |
| **printer-is-accepting-jobs** | boolean | PD | MUST | [rfc2911] §4.4.23 |
| **printer-location** | text(127) | PD | MAY | [rfc2911] §4.4.5 |
| **printer-make-and-model** | text(127) | PD | MAY | [rfc2911] §4.4.9 |
| **printer-message-date-time** | dateTime | PD | MAY | [rfc3380] §6.5 |
| **printer-message-from-operator** | text(127) | PD | MAY | [rfc2911] §4.4.25 |
| **printer-message-time** | integer(MIN:MAX) | PD | MAY | [rfc3380] §6.4 |
| **printer-more-info** | uri | PD | MAY | [rfc2911] §4.4.7 |
| **printer-more-info-manufacturer** | uri | PD | MAY | [rfc2911] §4.4.10 |
| **printer-name** | name(127) | PD | MUST | [rfc2911] §4.4.4 |
| **printer-notify-server-uri** | uri | PD | MAY | [not-srv] §4.1 |
| **printer-resolution-default** | resolution | JT,DT | MAY | [rfc2911] §4.2.12 |
| **printer-resolution-supported** | 1setOf resolution | JT,DT | MAY | [rfc2911] §4.2.12 |
| **printer-settable-attributes-supported** | 1setOf type2 keyword | PD | MAY | [rfc3380] §6.1 |
| **printer-state** | type1 enum | PD | MUST | [rfc2911] §4.4.11 |
| **printer-state-change-date-time** | dateTime | PD | MAY | [ntfy] §6.2 |
| **printer-state-change-time** | integer(1:MAX) | PD | MAY | [ntfy] §6.1 |
| **printer-state-message** | text(MAX) | PD | MAY | [rfc2911] §4.4.13 |
| **printer-state-reasons** | 1setOf type2 keyword | PD | MUST | [rfc2911] §4.4.12 |
| **printer-up-time** | integer(1:MAX)) | PD | MUST | [rfc2911] §4.4.29 |
| **printer-uri-supported** | 1setOf uri | PD | MUST | [rfc2911] §4.4.1 |
| **printer-xri-supported** | 1setOf collection | PD | MAY | [rfc3380] §6.6 |
|    **xri-uri** | uri | PD | MUST | [rfc3380] §6.6 |
|    **xri-authentication** | 1setOf type2 keyword | PD | MUST | [rfc3380] §6.6 |
|    **xri-security** | 1setOf type2 keyword | PD | MUST | [rfc3380] §6.6 |
| **print-quality-default** | type2 enum | JT,DT | MAY | [rfc2911] §4.2.13 |
| **print-quality-supported** | 1setOf type2 enum | JT,DT | MAY | [rfc2911] §4.2.13 |
| **queued-job-count** | integer(0:MAX) | PD | MUST | [rfc2911] §4.4.24 |
| **reference-uri-schemes-supported** | 1setOf uriScheme | PD | MUST[65] | [rfc2911] §4.4.27 |
| **separator-sheets-default** | collection | JT,DT | MAY | [pwg5100.3] §3.18.3 |
| **separator-sheets-supported** | 1setOf type2 keyword | JT,DT | MAY | [pwg5100.3] §3.18.4 |
| **separator-sheets-type-supported** | 1setOf (type3 keyword \| name(MAX)) | - | MAY | [pwg5100.3] §3.18.1.1 |
| **sheet-collate-default** | type2 keyword | JT,DT | MAY | [rfc3381] §3.1 |
| **sheet-collate-supported** | 1setOf type2 keyword | JT,DT | MAY | [rfc3381] §3.1 |
| **sides-default** | type2 keyword | JT,DT | MAY | [rfc2911] §4.2.8 |
| **sides-supported** | 1setOf type2 keyword | JT,DT | MAY | [rfc2911] §4.2.8 |
| **stitching-locations-supported** | 1setOf (integer(0:MAX) \| rangeOfInteger(0:MAX)) | - | MAY | [pwg5100.3] §3.2.2.3.1 |

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[65] The Printer MUST support "reference-uri-scheme-supported" Printer Description attribute, since the Send-URI operation is REQUIRED.

| **Printer** attribute name (Job Template, Document Template & Printer Description) | Attribute Syntax | Grp | Printer Conf. | Reference |
|---|---|---|---|---|
| **stitching-offset-supported** | 1setOf (integer (0:MAX) \| rangeOfInteger(0:MAX)) | - | MAY | [pwg5100.3] §3.2.2.2.1 |
| **stitching-reference-edge-supported** | 1setOf type2 keyword | - | MAY | [pwg5100.3] §3.2.2.1.1 |
| **subordinate-printers-supported** | 1setOf uri | PD | MAY | [adm-ops] §7.1 |
| **uri-authentication-supported** | 1setOf type2 keyword | PD | MUST | [rfc2911] §4.4.2 |
| **uri-security-supported** | 1setOf type2 keyword | PD | MUST | [rfc2911] §4.4.3 |
| **user-defined-values-supported** | 1setOf type2 keyword | PD | MAY | [pwg5100.3] §5.1 |
| **which-jobs-supported** | 1setOf type2 keyword | PD | MAY | [ippsave] §7.8 |
| **x-image-position-default** | type2 keyword | JT,DT | MAY | [pwg5100.3] §3.19.2 |
| **x-image-position-supported** | 1setOf type2 keyword | JT,DT | MAY | [pwg5100.3] §3.19.2 |
| **x-image-shift-default** | integer(MIN:MAX) | JT,DT | MAY | [pwg5100.3] §3.19.3 |
| **x-image-shift-supported** | rangeOfInteger(MIN:MAX) | JT,DT | MAY | [pwg5100.3] §3.19.3 |
| **xri-authentication-supported** | 1setOf type2 keyword | PD | MAY | [rfc3380] §6.8 |
| **xri-security-supported** | 1setOf type2 keyword | PD | MAY | [rfc3380] §6.9 |
| **xri-uri-scheme-supported** | 1setOf uriScheme | PD | MAY | [rfc3380] §6.7 |
| **x-side1-image-shift-default** | integer(MIN:MAX) | JT,DT | MAY | [pwg5100.3] §3.19.4 |
| **x-side1-image-shift-supported** | rangeOfInteger(MIN:MAX) | JT,DT | MAY | [pwg5100.3] §3.19.4 |
| **x-side2-image-shift-default** | integer(MIN:MAX) | JT,DT | MAY | [pwg5100.3] §3.19.5 |
| **x-side2-image-shift-supported** | rangeOfInteger(MIN:MAX) | JT,DT | MAY | [pwg5100.3] §3.19.5 |
| **y-image-position-default** | type2 keyword | JT,DT | MAY | [pwg5100.3] §3.19.6 |
| **y-image-position-supported** | 1setOf type2 keyword | JT,DT | MAY | [pwg5100.3] §3.19.6 |
| **y-image-shift-default** | integer(MIN:MAX) | JT,DT | MAY | [pwg5100.3] §3.19.7 |
| **y-image-shift-supported** | rangeOfInteger(MIN:MAX) | JT,DT | MAY | [pwg5100.3] §3.19.7 |
| **y-side1-image-shift-default** | integer(MIN:MAX) | JT,DT | MAY | [pwg5100.3] §3.19.8 |
| **y-side1-image-shift-supported** | rangeOfInteger(MIN:MAX) | JT,DT | MAY | [pwg5100.3] §3.19.8 |
| **y-side2-image-shift-default** | integer(MIN:MAX) | JT,DT | MAY | [pwg5100.3] §3.19.9 |
| **y-side2-image-shift-supported** | rangeOfInteger(MIN:MAX) | JT,DT | MAY | [pwg5100.3] §3.19.9 |

1783 DMC ISSUE14: I did not have the time nor the expertise to go through the above table in as much detail as I did
1784 other tables above. However, based on the other tables, it is likely that there are some small errors or omissions in
1785 this table. Someone that understands all the optional extensions and all the collection attributes should go through
1786 this very carefully before last call. *BUT* Would it make sense to clear out of this table any attributes that don't have
1787 increased semantics (I would not count just a "DT" in the Grp column as increased semantics, but maybe I'm wrong
1788 about that).

1790 DMC ISSUE15: If I'm reading it right, the above table would seem to show some member attributes of collections as
1791 "main" attributes (e.g. media-color-supported) and others as member attributes (e.g. xri-uri). This should be made
1792 consistent, and my vote to make it consistent is to show member attributes as member attributes, as they are in all
1793 the other tables in this specification (smaller font, indented, conformance means IF collection attribute supported, and
1794 so on).

1795 The remainder of this section defines the Printer Description attributes that are not defined in other specifications,
1796 and are not simple. Most of these are "xxx-default" and "xxx-supported" Printer Description attributes. A Printer
1797 MUST support these Printer Description attributes, if it supports the corresponding Operation/Description attributes,
1798 in order to indicate the default and supported values that the Printer supports.

## 10.1 document-creation-attributes-supported (1setOf type2 keyword)

1800 This REQUIRED Printer Description attribute lists the keyword names of the Document Template and Operation
1801 attributes that the Printer will accept in the Send-Document and Send-URI Document Creation operations. DMC
1802 ISSUE16: What about "document-uri"—the Printer MUST accept it in Send-URI and MUST NOT in Send-Document.

# 1805	11 New Values for Existing Printer Description Attributes

1806	This section contains those attributes for which additional values are added.

## 1807	11.1 operations-supported (1setOf type2 enum)

1808	The following "operation-id" values are added in order to support the new operations defined in this document:

1809	**Table 15 – Operation-id assignments**

| Value | Operation Name | Reference |
|-------|----------------|-----------|
| 0x0033 | Cancel-Document | [this-spec] §4.5 |
| 0x0034 | Get-Document-Attributes | [this-spec] §4.3 |
| 0x0035 | Get-Documents | [this-spec] §3.3 |
| 0x0036 | Delete-Document | [this-spec] §5.4 |
| 0x0037 | Set-Document-Attributes | [this-spec] §4.4 |

1810

# 1811	12 Encodings of Additional Attribute Tags

1812	This section assigns values to an attributes tags as an extension to the encoding defined in [rfc2910]).

1813	The "document-attributes-tag" delimits Document Template Attributes Groups in requests and Document Attributes
1814	Groups in responses.

1815	The following table specifies the values for the delimiter tag:

| Tag Value (Hex) | Meaning |
|-----------------|---------|
| 0x09 | "document-attributes-tag" |

1816

# 1817	13 Status codes

1818	This section defines additional status codes for use with multi-document jobs.

## 1819	13.1 server-error-too-many-jobs (0x050B)

1820	The client has attempted to create a Job using any of the Job Creation operations which would exceed the capacity
1821	of the Printer and/or the policy for this user or type of Jjob.  The client SHOULD NOT try again later.  DMC ISSUE17:
1822	I would have said SHOULD try again later, because resources might have been freed up.  That is, I would have read
1823	"too many jobs" as a resource issue and "too many documents" as a policy issue.  If we're saying not to try again, we
1824	should be clear that this error should only be returned if the problem is not expected to go away.

1825   **13.2 server-error-too-many-documents (0x050C)**

1826   The client has attempted to create a Document using any of the Document Creation operations which would exceed
1827   the capacity of the Printer for this Job and/or the policy for this user or type of J~j~ob.  The client SHOULD NOT try
1828   again later.


1829   # 14 Conformance Requirements

1830   This section specifies the conformance requirements for Printers and clients.


1831   ## 14.1 Printer conformance requirements

1832   In order to conform to this specification, a Printer:

1833       1.  MUST meet the conformance requirements for Printers specified in [rfc2911].

1834       2.  MUST support the Job operation that section 3 REQUIRES a Printer to support.

1835       3.  MUST support the Document operations that section 4 REQUIRES a Printer to support.

1836       4.  MAY support any of the Administrative operations in section 5.

1837       5.  MUST support the Attribute Precedence semantics specified in section 6 for the levels that the Printer
1838           supports.

1839       6.  MUST support the Operation attributes in the Print-Job and Send-Document operations and, if
1840           supported, the Print-URI and Send-URI operations, that section 7 REQUIRES a Printer to support.

1841       7.  MUST support any Operation attributes that section 7 REQUIRES a Printer to support along with the
1842           corresponding Document Description attributes that section 9.1~8.2~ REQUIRES a Printer to support and
1843           any "xxx-default" and "xxx-supported" Printer attributes that section 10 REQUIRES a Printer to support.

1844       8.  MAY support any of the Document Template attributes in Document Creation operations as indicated in
1845           section 8 and MUST NOT support them for contexts for where they are not defined as indicated in ~the~
1846           Table 10~Table 11~ with an  "**n-**".

1847       9.  MUST support the Document Description attributes that section 9.1~8.2~ REQUIRES a Printer to support.

1848       10. MUST support the Printer attributes that section 10 REQUIRES a Printer to support.~.~

1849       11. MUST support the values of Printer Description attributes that section 11 REQUIRES a Printer to
1850           support.


1851   ## 14.2 Client conformance requirements

1852   In order to conform to this specification, a client:

1853       1.  MUST meet the conformance requirements for clients specified in [rfc2911].

1854   2. MAY support any of the new~~Document~~ operations, or new semantics for existing operations, defined in
1855      section~~s~~ 3, 4, and 5~~3.7~~.  DMC Editorial10: I changed this, but want to verify that it is a "valid" conformance
1856      statement?

1857   3. MUST supply the Operation attributes that section 7 REQUIRES a client to supply in operation requests.

1858   4. MUST supply any Document Template attributes in the format that section 8 REQUIRES a client to supply in
1859      Document Creation operations and MUST NOT support them for contexts for where they are not defined as
1860      indicated in the Table 10~~Table 11~~ with an~~-~~ "**n**".

1861   5. SHOULD support any of the Document Description attributes that section 9.1~~8.2~~ REQUIRES a Printer to
1862      support.

1863   6. MAY support any of the Printer attributes listed in section 10.

1864   7. MAY support any of the values of the Printer Description~~s~~ attributes in section 11.


# 15 Normative References

1866   DMC Editorial11: There are widely varying styles in the references in this chapter and the next.  I haven't made much
1867   of an attempt to make them consistent, as I'm not sure what the "right" style is.

1868   ~~Note:  The references in the body of this IEEE-ISTO document use the more reader-friendly mnemonic symbols~~
1869   ~~below, rather than the RFC number (except for [rfc2910] and [rfc2911]).  IETF RFCs and IANA registrations require~~
1870   ~~using the RFC numbers in the body of the document for references.~~

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1991 ## 17 IANA Considerations

1992 This section contains the registration information for IANA to add to the various IPP Registries according to the
1993 procedures defined in RFC 2911 [rfc2911] section 6 to cover the definitions in this document.  The resulting
1994 registrations will be published in the http://www.iana.org/assignments/ipp-registrations registry.

1995     *Note to the RFC Editor: Replace the References below to [this spec] with the IEEE PWG RFC number for the*
1996     *appropriate document, so that it accurately reflects the content of the information for the IANA Registry.*

## 17.1 Attribute Registrations

1998 The following table lists all the attributes defined in this specification. These are to be registered according to the
1999 procedures in RFC 2911 [rfc2911] section 6.2. If the attribute has a separate sub-section definition in this
2000 specification, that sub-section is listed as the Reference. This specification lists most Job Template attributes as also
2001 being Document Template attributes. However, the definitions of these Document Template attributes are not
2002 duplicated in this specification. Instead, the Reference column in this sub-section indicates Section 8 which contains
2003 a table of all Job Template and corresponding Document Template attributes (including dropping the "job-" prefix).
2004 This table contains the reference in another specification that completely defines each attribute. These Document
2005 Template attributes will also be added to the IANA IPP Registry under the Document Template attributes with a
2006 reference to this specification and Section 8.
2007

```
2008  Attribute Name (attribute syntax)                   Reference      Section
2009  ---------------------------------                   ----------     --------
2010  Document Description attributes:
2011  attributes-charset (charset)                        [this spec]    9.1.1
2012  attributes-natural-language (naturalLanguage)       [this spec]    9.1.2
2013  compression (type3 keyword)                         [this spec]    9.1.3
2014  current-page-order (type2 keyword)                  [this spec]    9.1.4
2015  date-time-at-completed (dateTime)                   [this spec]    9.1.5
2016  date-time-at-creation (dateTime)                    [this spec]    9.1.6
2017  date-time-at-processing (dateTime)                  [this spec]    9.1.7
2018  detailed-status-messages (1setOf text-(MAX))_  —     [this spec]   9.1.28
2019  document-access-errors (1setOf text(MAX))           [this spec]    9.1.29
2020  document-charset (charset)                          [this spec]    9.1.8
2021  document-digital-signature (type2 keyword)          [this spec]    9.1.9
2022  document-format (mimeMediaType)                     [this spec]
2023  9.1.109.1.8
2024  document-format-details (1setOf collection)————     [this spec]
2025  9.1.11
2026
2027  document-format-details-detected (1setOf collection)
2028                                                      [this spec]    9.1.12
2029  document-format-detected (mimeMediaType)            [this spec]    9.1.13
2030  document-format-version (text(127))                 [this spec]    9.1.14
2031  document-format-version-detected (text(127))        [this spec]    9.1.15
2032  document-job-id (integer(1:MAX))                    [this spec]    9.1.11
2033  document-job-uri (uri)                              [this spec]    9.1.17
2034  document-message (text(MAX))                        [this spec]    9.1.18
2035  document-name (name(MAX))                           [this spec]    9.1.19
2036  document-natural-language (naturalLanguage)         [this spec]    9.1.20
2037  document-number (integer(0:MAX))                    [this spec]    9.1.21
2038  document-printer-uri (uri)                          [this spec]    9.1.22
2039  document-state (type1 enum)                         [this spec]    9.1.23
2040  document-state-message (text(MAX))                  [this spec]    9.1.24
```

```
2041   document-state-reasons (1setOf type2 keyword)    [this spec]  9.1.25
2042   document-uri (uri)                               [this spec]  9.1.26
2043   errors-count (integer(0:MAX))                    [this spec]  9.1.30
2044   impressions  (integer(0:MAX))                    [this spec]  9.1.31
2045   impressions-completed (integer(0:MAX))           [this spec]  9.1.32
2046   impressions-completed-current-copy (integer(0:MAX))
2047                                                    [this spec]  9.1.27
2048   k-octets  (integer(0:MAX))                       [this spec]  9.1.33
2049   k-octets-processed (integer(0:MAX))              [this spec]  9.1.34
2050   last-document  (boolean)                         [this spec]
2051   9.1.409.1.39
2052   media-sheets  (integer(0:MAX))                   [this spec]  9.1.35
2053   media-sheets-completed (integer(0:MAX))          [this spec]  9.1.36
2054   more-info (uri)                                  [this spec]  9.1.37
2055   output-device-assigned (name(127))               [this spec]  9.1.41
2056   printer-up-time (integer (1:MAX))                [this spec]  9.1.38
2057   sheet-completed-copy-number (integer(0:MAX))     [this spec]  9.1.42
2058   time-at-completed (integer (MIN:MAX))            [this spec]  9.1.43
2059   time-at-creation (integer (MIN:MAX))             [this spec]  9.1.44
2060   time-at-processing (integer (MIN:MAX))           [this spec]  9.1.45
2061
2062
2063   Document Templates attributes:
2064   copies (integer(1:MAX))                          [this spec]    8
2065   copies-default (integer(1:MAX))                  [this spec]    8
2066   copies-supported (integer(1:MAX))                [this spec]    8
2067   cover-back (collection)                          [this spec]    8
2068     cover-type (type2 keyword)                     [this spec]    8
2069     media (type3 keyword | name(MAX))              [this spec]    8
2070     media-col (collection)                         [this spec]    8
2071   cover-back-default (collection)                  [this spec]    8
2072   cover-back-supported (1setOf type2 keyword)      [this spec]    8
2073   cover-front (collection)                         [this spec]    8
2074     cover-type (type2 keyword)                     [this spec]    8
2075     media (type3 keyword | name(MAX))              [this spec]    8
2076     media-col (collection)                         [this spec]    8
2077   cover-front-default (collection)                 [this spec]    8
2078   cover-front-supported (1setOf type2 keyword)     [this spec]    8
2079   feed-orientation (type3 keyword)                 [this spec]    8
2080   feed-orientation-default (type3 keyword)         [this spec]    8
2081   feed-orientation-supported (1setOf type3 keyword) [this spec]   8
2082   finishings (1setOf type2 enum)                   [this spec]    8
2083   finishings-default (1setOf type2 enum)           [this spec]    8
2084   finishings-supported (1setOf type2 enum)         [this spec]    8
2085   finishings-col (collection)                      [this spec]    8
2086     finishing-template (name(MAX))                 [this spec]    8
```

```
2087      stitching (collection)                            [this spec]      8
2088        stitching-locations (1setOf integer(0:MAX))     [this spec]      8
2089        stitching-offset (integer (0:MAX))              [this spec]      8
2090        stitching-reference-edge (type2 keyword)        [this spec]      8
2091    finishings-col-default (collection)                 [this spec]      8
2092    finishings-col-supported (1setOf type2 keyword)     [this spec] —    8
2093    font-name-requested (name(MAX))                     [this spec]      8
2094    font-name-requested-default (name(MAX))             [this spec]      8
2095    font-name-requested-supported (1setOf name(MAX)) —[this spec]       8
2096    font-size-requested (integer(1:MAX))                [this spec]      8
2097    font-size-requested-default (integer(1:MAX))name(MAX))
2098                                                        [this spec]      8
2099    font-size-requested-supported (1setOf rangeOfInteger(1:MAX))name(MAX))
2100                                                        [this spec]      8
2101    force-front-side (1setOf integer(1:MAX))            [this spec]      8
2102    force-front-side-default (1setOf integer(1:MAX)) ———[this spec]      8
2103    force-front-side-supported (rangeOfInteger(1:MAX))
2104                                                        [this spec]      8
2105    imposition-template (type3 keyword | name(MAX))     [this spec]      8
2106    imposition-template-default (type3 keyword | name(MAX))
2107                                                        [this spec]      8
2108    imposition-template-supported (1setOf (type3 keyword | name(MAX)))
2109                                                        [this spec]      8
2110    insert-sheet (1setOf collection)                    [this spec]      8
2111      insert-after-page-number (integer(0:MAX))         [this spec]      8
2112      insert-count (integer(0:MAX))                     [this spec]      8
2113      media (type3 keyword | name(MAX))                 [this spec]      8
2114      media-col (collection)                            [this spec]      8
2115    insert-sheet-default (1setOf collection)       ————[this spec]      8
2116    insert-sheet-supported (1setOf type2 keyword)       [this spec]      8
2117    media (type3 keyword | name(MAX))                   [this spec]      8
2118    media-default (type3 keyword | name(MAX))           [this spec]      8
2119    media-ready (1setOf (type3 keyword | name(MAX)))    [this spec]      8
2120    media-supported (1setOf (type3 keyword | name(MAX)))
2121                                                        [this spec]      8
2122    media-col (collection)                              [this spec]      8
2123      media-back-coating (type3 keyword | name(MAX))    [this spec]      8
2124      media-color (type3 keyword | name(MAX))           [this spec]      8
2125      media-front-coating (type3 keyword | name(MAX))   [this spec]      8
2126      media-grain (type3 keyword | name(MAX))           [this spec]      8
2127      media-hole-count (integer(0:MAX))                 [this spec]      8
2128      media-info (text(255))                            [this spec]      8
2129      media-key (type3 keyword | name(MAX))             [this spec]      8
2130      media-material (type3 keyword | name(MAX))        [this spec]      8
2131      media-order-count (integer(1:MAX))                [this spec]      8
2132      media-preprinted (type3 keyword | name(MAX))      [this spec]      8
```

```
2133    media-recycled (type3 keyword | name(MAX))      [this spec]    8
2134    media-size (collection)                         [this spec]    8
2135      x-dimension (integer(0:MAX))                  [this spec]    8
2136      y-dimension (integer(0:MAX))                  [this spec]    8
2137    media-thickness (integer(1:MAX))               [this spec]    8
2138    media-tooth (type3 keyword | name(MAX))        [this spec]    8
2139    media-type (type3 keyword | name(MAX))         [this spec]    8
2140    media-weight-metric (integer(0:MAX))           [this spec]    8
2141  media-col-default (collection)                    [this spec]    8
2142  media-col-ready (1setOf collection)               [this spec]    8
2143  media-col-supported (1setOf type2 keyword)        [this spec]    8
2144  media-input-tray-check (type3 keyword | name(MAX))
2145                                                    [this spec]    8
2146  media-input-tray-check-default (type3 keyword | name(MAX))
2147                                                    [this spec]    8
2148  media-input-tray-check-supported (1setOf (type3 keyword | name(MAX)))
2149                                                    [this spec]    8
2150  media-type (type3 keyword | name(MAX))            [this spec]    8
2151  media-type-default (type3 keyword | name(MAX))    [this spec]    8
2152  media-type-supported (1setOf (type3 keyword | name(MAX)))
2153                                                    [this spec]    8
2154
2155  number-up (integer(1:MAX))                        [this spec]    8
2156  number-up-default (integer(1:MAX))                [this spec]    8
2157  number-up-supported (1setOf (integer(1:MAX)) | rangeOfInteger (1:MAX)))
2158                                                    [this spec]    8
2159  orientation-requested (type2 enum)                [this spec]    8
```

```
2163  orientation-requested-default (type2 enum)        [this spec]    8
2164  orientation-requested-supported (1setOf type2 enum)
2165                                                    [this spec]    8
```

2166  DMC Editorial13 for Pete: I moved overrides up to be in alphabetic
2167  order, but also made changes to the entries.

```
2168  overrides (1setOf collection)                     [this spec]    8
2169    pages (1setOf rangeOfInteger(MAX))              [this spec]    8
2170    document-numbers (1setOf rangeOfInteger(MAX))   [this spec]    8
2171    document-copies (1setOf rangeOfInteger(MAX))    [this spec]    8
2172  overrides-supported (1setOf type2 keyword)        [this spec]    8
2173  output-bin (type2 keyword | name(MAX))            [this spec]    8
2174  output-bin-default (type2 keyword | name(MAX))    [this spec]    8
2175  output-bin-supported (1setOf type2 keyword | name(MAX))
2176                                                    [this spec]    8
2177  page-delivery (type2 keyword)                     [this spec]    8
2178  page-delivery-default (type2 keyword)             [this spec]    8
```

```
2179  page-delivery-supported (1setOf type2 keyword)     [this spec]     8
2180  page-order-received (type2 keyword)         [this spec]     8
2181  page-order-received-default (type2 keyword)      [this spec]     8
2182  page-order-received-supported (1setOf type2 keyword)
2183                                               [this spec]     8
2184  page overrides (1setOf collection)                 [this spec]     8
2185    pages (1setOf rangeOfInteger(MAX))              [this spec]     8
2186    document-numbers (1setOf rangeOfInteger(MAX))   [this spec]     8
2187    document-copies (1setOf rangeOfInteger(MAX))    [this spec]     8
2188    input documents (1setOf rangeOfInteger(MAX))    [this spec]     8
2189    output-documents (1setOf rangeOfInteger(MAX))   [this spec]     8
2190    pages (1setOf rangeOfInteger(MAX))              [this spec]     8
2191    <any other Job Template attributes that affect pages,
2192    such as media or media col>
2193  overrides-supported (1setOf type2 keyword)         [this spec]     8
2194  page-ranges (1setOf rangeOfInteger(1:MAX))       [this spec]     8
2195  page-ranges-supported (boolean)                  [this spec]     8
2196  pdl-init-file (1setOf collection)                [this spec]     8
2197    pdl-init-file-entry (name(MAX))                [this spec]     8
2198    pdl-init-file-location (uri)                   [this spec]     8
2199    pdl-init-file-name (name(MAX))                 [this spec]     8
2200  pdl-init-file-default (1setOf collection)        [this spec]     8
2201  pdl-init-file-supported (1setOf type2 keyword)   [this spec]     8
2202
2203  pages-per-subset (1setOf integer(1:MAX))           [this spec]     8
2204  pages-per-subset-supported (boolean)               [this spec]     8
2205  presentation-direction-number-up (type2 keyword) [this spec]     8
2206  presentation-direction-number-up-default (type2 keyword)
2207                                               [this spec]     8
2208  presentation-direction-number-up-supported (1setOf type2 keyword)
2209                                               [this spec]     8
2210  print-quality (type2 enum)                       [this spec]     8
2211  print-quality-default (type2 enum)               [this spec]     8
2212  print-quality-supported (1setOf type2 enum)      [this spec]     8
2213  printer-resolution (resolution)                  [this spec]     8
2214  printer-resolution-default (resolution)          [this spec]     8
2215  printer-resolution-supported (1setOf resolution) [this spec]     8
2216  separator-sheets (collection)                    [this spec]     8
2217    media (type3 keyword | name(MAX))              [this spec]     8
2218    media-col (collection)                         [this spec]     8
2219    separator-sheets-type (type3 keyword | name(MAX))
2220                                               [this spec]     8
2221  separator-sheets-default (collection)            [this spec]     8
2222  separator-sheets-supported (1setOf type2 keyword) [this spec]     8
2223  sheet-collate (type2 keyword)                    [this spec]     8
2224  sheet-collate-default (type2 keyword)            [this spec]     8
```

```
2225  sheet-collate-supported (1setOf type2 keyword)   [this spec]    8
2226  sides (type2 keyword)                            [this spec]    8
2227  sides-default (type2 keyword)                    [this spec]    8
2228  sides-supported (1setOf type2 keyword)           [this spec]    8
2229  x-image-position (type2 keyword)                 [this spec]    8
2230  x-image-position-default (type2 keyword)         [this spec]    8
2231  x-image-position-supported (1setOf type2 keyword) [this spec]   8
2232  x-image-shift (integer(MIN:MAX))                 [this spec]    8
2233  x-image-shift-default (integer(MIN:MAX))         [this spec]    8
2234  x-image-shift-supported (rangeOfInteger(MIN:MAX)) [this spec]   8
2235  x-side1-image-shift (integer(MIN:MAX))           [this spec]    8
2236  x-side1-image-shift-default (integer(MIN:MAX))   [this spec]    8
2237  x-side1-image-shift-supported (rangeOfInteger (MIN:MAX))
2238                                    +              [this spec]    8
2239  x-side2-image-shift (integer(MIN:MAX))           [this spec]    8
2240  x-side2-image-shift-default (integer(MIN:MAX))   [this spec]    8
2241  x-side2-image-shift-supported (rangeOfInteger (MIN:MAX))
2242                                                   [this spec]    8
2243  y-image-position (type2 keyword)                 [this spec]    8
2244  y-image-position-default (type2 keyword)         [this spec]    8
2245  y-image-position-supported (1setOf type2 keyword) [this spec]   8
2246  y-image-shift (integer(MIN:MAX))                 [this spec]    8
2247  y-image-shift-default (integer(MIN:MAX))         [this spec]    8
2248  y-image-shift-supported (rangeOfInteger (MIN:MAX)) [this spec]  8
2249  y-side1-image-shift (integer(MIN:MAX))           [this spec]    8
2250  y-side1-image-shift-default (integer(MIN:MAX))   [this spec]    8
2251  y-side1-image-shift-supported (rangeOfInteger (MIN:MAX))
2252                                                   [this spec]    8
2253  y-side2-image-shift (integer(MIN:MAX))           [this spec]    8
2254  y-side2-image-shift-default (integer(MIN:MAX))   [this spec]    8
2255  y-side2-image-shift-supported (rangeOfInteger (MIN:MAX))
2256                                                   [this spec]    8
2257
2258
2259
2260  Printer Description attributes:
2261  document-creation-attributes-supported (1setOf type2 keyword)
2262                                                   [this spec]  10.1
2263
2264  Operation attributes:
2265  document-message (text(MAX))                     [this spec]  9.1.18
2266
```

## 2267   17.2 Keyword attribute values

2268   ACTION (Tom) - Need to list the keyword attribute values.  Do so by reference to the values registered for
2269   corresponding attributes.

## 2270 17.3 Enum Attribute Values

2271 The following table lists all the new enum attribute values defined in this document as additional type2 enum values.
2272 These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.
2273

```
2274    Value         Name                           Reference   Section:
2275    --------      ----------------------         ---------   -------
2276 document-state (type1 enum)                     [this spec] 9.1.23
2277    3   pending                                  [this spec] 9.1.23
2278    5   processing                               [this spec] 9.1.23
2279    7   canceled                                 [this spec] 9.1.23
2280    8   aborted                                  [this spec] 9.1.23
2281    9   completed                                [this spec] 9.1.23
2282
2283
2284 operations-supported (1setOf type2 enum)————         [rfc2911]
2285 4.4.15
2286    0x0033    Cancel-Document                     [this spec] 4.5
2287    0x0034    Get-Document-Attributes             [this spec] 4.3
2288    0x0035    Get-Documents                       [this spec] 3.3
2289    0x0036    Delete-Document                     [this spec] 5.4
2290    0x0037    Set-Document-Attributes             [this spec] 4.4
2291
```

## 2292 17.4 Operations

2293 The following table lists all of the operations defined in this document.  These are to be registered according to the
2294 procedures in RFC 2911 [rfc2911] section 6.4.
2295

```
2296 Operations                                 Reference    Section
2297 --------------------------                 ---------    --------
2298 Cancel-Document                            [this spec]  4.5
2299
2300 Delete-Document                            [this spec]  5.4
2301 Get-Document-Attributes                    [this spec]  4.3
2302 Get-Documents                              [this spec]  3.3
2303
2304 Set-Document-Attributes                    [this spec]  4.4
2305
```

## 2306 17.5 Attribute Group tags

2307 The following table lists all the attribute group tags defined in this specification.  These are to be registered according
2308 to the procedures in RFC 2911 [rfc2911] section 6.5.

```
2309 Value    Name                                  Reference    Section
2310 -----    ------------------------------------  ---------    -------
2311 0x09     document-attributes-tag               [this spec]  12
2312
```

## 17.6 Status codes

The following table lists all the status codes defined in this specification.  These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.6.

```
Value      Status Code Name                        Reference    Section
------     ------------------------------------    ---------    -------
0x0500:0x05FF - Server Error:
0x050B    server-error-too-many-jobs              [this spec]   13.1
0x050C    server-error-too-many-documents         [this spec]   13.2
```

## 17.7 Attribute Group name Registrations

The following table lists the one new attribute group name defined in this document.  This is to be registered according to the procedures in RFC 2911 [rfc2911] section 6.2.

```
Attribute Group name                             Reference    Section
--------------------                             ---------    -------
document-template                                [this spec]   4.3
```

# 18 Internationalization Considerations

The internationalization considerations for this extension for handling the Document object are the same as for handling the Job object in [rfc2911].

# 19 Security Considerations

The Document object should provide no more increased security considerations than the Job object.  The Printer MUST provide the same access control for Document objects as for Job objects.

The Printer implementer needs to consider counter measures for denial of service attacks for the Create-Job operation.  For example, a rogue client could issue repeated Create-Job and/or Send-Document/Send-URI requests in an attempt to exceed the capacity of the Printer to absorb such requests and thereby deny Job Creation and Document Creation requests from other clients.  For example, a Printer might avoid a fixed set of allocations for Jobs and Documents and a. Also be able to detect when an excessive number of Create-Job and Send-Document/Send-URI requests have been supplied.  In such a case, the Printer would return either a 'server-error-too-many-jobs' status- code (see section 13.1) or a 'server-error-too-many-documents' status- code (see section 13.2).

# 20 Contributors

Dennis Carney, IBM
Don Fullman, Xerox
Harry Lewis, IBM
Ira McDonald, High North
Michael Sweet, Easy Software Products

2348 **21 Acknowledgments**

2349 **22 Author's Address**

2350      Tom Hastings
2351      Xerox Corporation
2352      737 Hawaii St.
2353      El Segundo, CA 90245
2354
2355      Phone: 310 333-6413
2356      Fax:  310 333-5514
2357      e-mail: hastings@cp10.es.xerox.com
2358
2359      Peter Zehler
2360      Xerox Corporation
2361      MS: 0128-30E
2362      800 Phillips Road
2363      Webster, NY 14580-9701
2364
2365      Phone: 585 265-8755
2366      Fax:  585 422-7961
2367      e-mail: PZehler@crt.xerox.com

2368 **23 Appendix A: Document operations compared to Job operations <mark>DMC</mark>**
2369 **<mark>Editorial14: Do you have to say "Normative" or "Informative" in this title?</mark>**

2370 This appendix compares the Document operations with the existing Job operations to show the parallelism.

2371 Table 16 compares the Job and Document operations.  The two Conf. columns indicate the conformance
2372 requirements (REQUIRED = REQ, OPTIONAL = OPT) for the Job and Document operations respectively.  A "REQ"
2373 in the Document Conformance column means if the Document object is supported.  Whether a Document operation
2374 is a method on the Job object or the Document object depends on the modeling regime and is not an essential part
2375 of the semantics described here, since these semantics are intended to apply to both to object-oriented and object-
2376 based protocols, APIs, and implementations.

2377                **Table 16 - Document operations compared to Job operations**

| Job operations | Job Conf. | Document operations | Doc Conf. |
|---|---|---|---|
| **Cancel-Current-Job** | OPT | *N/A, can only cancel a document explicitly by document number and explicit job id.* | OPT |
| **Cancel-Job** | REQ | **Cancel-Document** | REQ |
| | | | |
| **Get-Job-Attributes** | REQ | **Get-Document-Attributes** | REQ |
| **Get-Jobs** | REQ | **Get-Documents** | REQ |
| **Hold-Job** | | *N/A, can only hold an entire job.* | |
| **Print-Job** | REQ | **Send-Document** (existing operation - see [rfc2911] with an additional Document attributes group defined in section 4.1) | OPTREQ |
| **Print-URI** | OPT | **Send-URI** (existing operation - see [rfc2911] with an additional Document attributes group defined in section 4.2) | OPT |

| Job operations | Job Conf. | Document operations | Doc Conf. |
|---|---|---|---|
|  |  |  |  |
| **Promote-Job** | OPT | *N/A, can only promote an entire job* |  |
| **Purge-Jobs** | OPT | **Delete-Document** | OPT |
| **Release-Held-New-Jobs** | OPT | *N/A, can only release entire jobs* |  |
| **Release-Job** | OPT | *N/A, can only release an entire job* |  |
| **Reprocess-Job** | OPT | *N/A, can only reprocess an entire job* |  |
| **Restart-Job** | OPT | *N/A, can only restart an entire job* |  |
| **Resume-Job** | OPT | *N/A, can only resume an entire job* |  |
| **Schedule-Job-After** | OPT | *N/A, can only schedule an entire job* |  |
| **Set-Job-Attributes** | OPT | **Set-Document-Attributes** | OPT |
| **Suspend-Current-Job** | OPT | *N/A, can only suspend an entire job in order to run another one* |  |
| **Validate-Job** | REQ | *N/A, use Validate-Job to validate a single document or each document in a multi-document job.* |  |

2378
2379

# 2380 24 Annex B: IEEE-ISTO 5100.4-2001 Document Overrides (informative)

2381 With the introduction of the Document Object, there is no longer a need for the "document-overrides" (1setOf
2382 collection) attribute [pwg5100.4-2001] as an Operation attribute or a Job Template attribute.  A new Overrides
2383 document [OvrRide] without the "document-overrides" attribute will be published.  With the introduction of the
2384 Document object, the client simply supplies the Document Template attributes (see Table 10) for each Document
2385 Creation request (in a new Document Template attribute group).  There is no longer a need for the "document-
2386 overrides" attribute.

2387 Page Overrides will be specified in a new document [OvrRide] that replaces the obsolete [pwg5100.4-2001].   Other
2388 [pwg5100.4-2001] features such as Subset Processing and Error/Warning counts have been moved to other
2389 specifications.

# 2390 25 Annex CB: Change Log (informative)

2391 The following summaries of the changes in chronological order:

2392 Version 0.3, 9 September 2002:
2393     1. Reformatted as an IEEE-ISTO standard and added the usual sections for a standard.
2394     2. Added "original-requesting-user-name" Operation attribute to Table 8.
2395     3. Added "y" to "output-bin" in Table 10 so it MAY be a Document Template attribute.
2396     4. Clarified the * and  in Table 11 - Job and Document Description attributes.
2397     5. Added section 9.1.1 all of the Printer attributes defined In any IPP standard.
2398     6. Allocated operation-id enums in section 11 to the 7 Document operations.
2399     7. Added the conformance section 14
2400     8. Completed the IANA Considerations section 0.
2401
2402 Version 0.4, 14 October 2002:
2403     1. Added the operation specifications.
2404     2. Added the Create-Document and Send-Data to be more parallel with Jobs and support PWG PSI.
2405     3. Resolved the 15 issues in version 0.3 as discussed on the mailing list.

2406      4. Added the Attribute Precedence section 6.
2407      5. Added [ippsave] attributes.
2408      6. Added job-mandatory-attributes, job-cover-back, job-cover-front, job-copies, job-finishings, job-finishings-col.
2409        document-id-uri, and redirect-uri.
2410
2411 Version 0.5, 25 October 2002, as a result of the PWG Semantic Model telecon, October 24, 2002:
2412      1. Fixed the title to say "Proposed Standard" and removed the 5100.n number until the document is approved by
2413        the PWG Last Call to progress as a Draft Standard.
2414      2. Changed Cancel-Document from OPTIONAL to REQUIRED.
2415      3. Added Table 4 and Table 5 to show the request and response signatures of the Document Creation and
2416        Validation operations.
2417      4. Renamed the "document-number" Operation attribute to "input-document-number", to agree with [pwg5100.4-
2418        2001] and because the Document object is really the Input Document (as opposed to the Output Document).
2419        The Printer copies this value to the Document's "document-number" Document Description attribute.
2420      5. Clarified that the Printer MUST reject a Create-Document request if the "document-number" already exists.
2421      6. Clarified that the client cannot supply Subscription attributes in any Document Creation requests.
2422      7. Added "document-message" (text(127)) Operation attribute to the Document Creation requests to go with the
2423        "document-message" agreement (see point #15 ).
2424      8. Fixed Create-Document response to return Job status attributes in Group 3 and Document status attributes in
2425        Group 4.
2426      9. Required the Printer to return just the "document-number" and "document-id-uri" (uri) Document Description
2427        attribute in a Document Creation response.
2428      10. Added the "document-mandatory-attributes" Operation attribute.
2429      11. Separated the returned Job status attributes and the Document status attributes into two groups, one Job
2430        Attributes and the other Document attributes.
2431      12. Allowed the client to supply or omit the "document-uri" Operation attribute in a Validate-Job request.
2432      13. Clarified that the "document-number" Operation attribute MUST follow the Printer and Job Target in Group 1.
2433      14. Changed the Get-Documents response when there is no "requested-attributes" to simply "document-number"
2434        and "document-id-uri" to be parallel with the Get-Jobs operation.
2435      15. Changed the "message" Operation attribute in Cancel-Document and Cancel-Current-Document to
2436        "document-message" Operation attribute which the Printer copies to the "document-message" Document
2437        Description attribute for use both by the user and the operator.
2438      16. Clarified that the "document-state-reasons" values never affect Job scheduling.
2439      17. Made Job Level - page override programming higher precedence than Document level Document object
2440        attributes.
2441      18. Clarified PDL document data precedence and its relationship to Job Template attributes ending with "-
2442        requested".
2443      19. In Table 8, flagged the Operation attributes that the Printer copies to the corresponding Job and Document
2444        Description attributes in Document Creations operations.
2445      20. Fixed "job-mandatory-attributes" Operation attribute so its only supplied at Job level, now that we have
2446        "document-mandatory-attributes" Operation attribute.
2447      21. Clarified that "ipp-attribute-fidelity" can be supplied at both the Job and Document Levels and how it interacts
2448        with "job-mandatory-attributes" and "document-mandatory-attributes" Operation attributes.
2449      22. Disallowed "output-bin" at the Document Level (and Page Level).  It subsets the single stream of Input-Pages
2450        across Input-Documents.
2451      23. Disallowed "page-ranges" at the Page Level.
2452      24. Disallowed "pages-per-subset" at the Document level (and Page Level).
2453      25. Disallowed "separator-sheets" at the Page Level.
2454      26. Added "document-printer-up-time" Document Description attribute for Get-Documents and Get-Document-
2455        Attributes responses that the Printer MUST support, just like "job-printer-up-time" Operation attribute for Get-
2456        Jobs and Get-Job-Attributes.
2457
2458 Version 0.6, 13 January 2003, agreements from New Orleans October PWG meeting and subsequent telecons:
2459      1. Deleted the Cancel-Current-Document and Validate-Document operations.
2460      2. Deprecated the "input-document-number" Operation attribute from the Document Creation operations.

2461          3.  Deleted the "document-mandatory-attributes" Operation attribute to align with the PWG Semantic model.  So
2462               both specifications have only the "job-mandatory-attributes" Operation attribute.  The client can only supply
2463               at the Job Level.  The Document Level inherits from the Job Level.
2464          4.  Increased "document-message" Operation attribute length from 127 to MAX (1023) octets.
2465          5.  Clarified that "ipp-attribute-fidelity" and "job-mandatory-attributes" can only be supplied at the Job Level; the
2466               Document level inherits their values.
2467          6.  Added "ipp-attribute-fidelity" and "job-mandatory-attributes" Job Description attributes.
2468          7.  Added the "media-size-name" as a member attribute of "media-col" and as a separate Job Template attribute
2469               as used by UPnPv1 and UPnPv2.
2470          8.  Added the "media-type" as a Job and Document Template attribute on its own as used by  UPnPv1 and
2471               UPnPv2 (as well as leaving it as a member attribute of the "media-col" Job and Document Template
2472               attributes).
2473          9.  Renamed "document-printer-up-time" Document Description attribute to simply "printer-up-time".
2474          10.  Added the following Job Description attributes: "ipp-attribute-fidelity", and "job-mandatory-attributes".
2475          11.  Removed the following Document Description attributes: "ipp-attribute-fidelity".
2476          12.  Added the following Document Description attributes: "document-format-detail", "document-format-detected",
2477               "job-id", "job-printer-uri", "job-uri", "output-device-assigned".
2478          13.  Defined all of the Document Description attributes, often with references to other specifications, so that they
2479               appear in the table of contents.
2480
2481  Version 0.7, 14 March 2003, agreements from the Maui January PWG meeting and subsequent telecons:
2482          1.  Fixed up the file naming and numbering to agree with the latest PWG process agreements.
2483          2.  Updated the Abstract and Introduction to reflect the additions.
2484          3.  Fixed cross references to use the standard numbers as agreed, rather than mnemonic references.
2485          4.  Deprecated the "input-document-number" Operation attribute ([pwg5100.4-2001] section 9.2.1 in the Create-
2486               Document Requests
2487          5.  Renamed Send-Data to Send-Document-Data to more clearly reflect the scope of the operation.
2488          6.  Added the REQUIRED Close-Job operation to close a job that contains Document objects.  Using "last-
2489               document" still works too and the Printer MUST support both ways.
2490          7.  Retained the idea that the Printer MUST NOT copy down any attributes supplied in the Job Creation
2491               operation to the Document object as observable in Document object query responses.  Document objects
2492               inherit that effect from the Job object.
2493          8.  Added the following operation and Document Description attributes: document-container-summary
2494               (collection), document-creator-application-name (name(MAX)), document-creator-application-version
2495               (text(127)), document-creator-os-name (name(40)), document-creator-os-version (text(40)), document-
2496               format-device-id (text(127)), document-format-version (text(127)).  The "document-container-summary"
2497               collection attribute may contain them, plus "document-format" and "document-natural-language".
2498          9.  REQUIRED Printers to support "document-format-version" Document Description.
2499          10.  Deprecated "document-overrides" and indicated that the agreement is to re-issue [pwg5100.4-2001] without
2500               "document-overrides".
2501          11.  Prefixed the following three Document Description attributes that are copies of Job Description attributes with
2502               "document-" so that no Document attribute has a "job-" prefix:  "job-printer-uri" becomes "document-job-
2503               printer-uri", "job-uri" becomes "document-job-uri", and "job-id" becomes "document-job-id".
2504          12.  Added the encoding for the "document-attributes-tag" as 0x09.
2505          13.  Updated the IANA Registration section, but still needs more work.
2506
2507  Version 0.8, 24 March 2003, agreements from the March 20 telecon:
2508          1.  Changed the name of the Send-Document-Data back to Send-Data to keep the name short.  There wasn't
2509               support for keeping the name of the object affected in the name of the operation.
2510          2.  Changed "job-mandatory-attributes" operation/Job Description attribute so that a Printer MUST support it.
2511          3.  Changed the name of the collection attribute back to "document-format-details".
2512          4.  Removed the Operation attributes and Document Description attributes that were already in the member
2513               attributes of "document-format-details", so that any details must use the "document-format-details" (1setOf
2514               collection).

2515 5. Clarified that with the removal of "document-overrides", that the client can achieve subset finishing using
2516   "pages-per-subset" and "page-overrides".
2517 6. Clarified that a Printer that supports "page-overrides" Document Template attribute MUST also support it as
2518   an Operation attribute in Send-Document and Send-URI, but not Create-Document, for backward
2519   compatibility.
2520 7. Clarified that containers may contain containers, but that the "document-format-details" MUST be flattened, if
2521   present.
2522 8. Clarified that the collection values MAY describe the container format itself, in which case, it must be the first
2523   collection value.
2524 9. Added "document-format-details-detected (1setOf collection) Document Description attribute.
2525 10. Clarified that "document-natural-language" identifies the primary or first language if a Document contains
2526   more than one language.
2527 11. Added document-format-details-supported (1setOf type2 keyword) Printer Description attribute.
2528 12. Added document-format-details-implemented (1setOf collection) Printer Description attribute.
2529 13. Clarified that a Printer MUST support the "document-creation-attributes-supported" (1setOf type2 keywords)
2530   Printer Description attribute.
2531
2532 Version 0.9, 7 April 2003, agreements from the April 3 telecon:
2533 1. Added "document-charset" (charset), "document-digital-signature" (type2 keyword), "document-format-
2534   version" (text(127)), and "document-natural-language" (naturalLanguage) Operation and Document
2535   Description attributes and corresponding "xxx-default" and "xxx-supported" Printer Description attributes.
2536 2. Changed the "document-natural-language" member attribute of "document-format-details" (1setOf collection)
2537   operation attribute to be 1setOf, but kept the top level "document-natural-language" Operation attribute as
2538   single-valued.
2539 3. Added Summary Table 2 of new Operation/Document Description attributes.
2540 4. Defined CONDITIONALLY REQUIRED and CMUST Conformance Terms.
2541 5. Deleted the "document-id-uri" Operation attribute no longer needed by PSI.
2542 6. Changed "ipp-attribute-fidelity" so it doesn't affect operation attributes, so it is the same as in [rfc2911].
2543 7. Clarified the operation attributes supplied at the Job Level in Print-Job and Print-URI versus Create-Job by
2544   introducing the "p" notation in Table 8.
2545 8. Added columns to Table 8 to show the corresponding Document Description attributes and the "xxx-default"
2546   and "xxx-supported" Printer Description attributes.
2547 9. Clarified that all of the new Operation attributes are hints, except "document-charset" and "document-format"
2548   and that the client can turn them into Must Honor by supplying their keyword attribute names in the "job-
2549   mandatory-attributes Operation attribute.
2550 10. Add the unique lang prefix from the Printer MIB to all "document-format-version" values, so that they can all
2551   be in a single flat list for the Printer's "document-format-version-supported" Printer Description attribute.
2552
2553 Version 0.10, May 1, 2003, agreements from the May 1 telecon:
2554 1. Removed the conformance language from the Abstract.
2555 2. Clarified that the "job-mandatory-attributes" can include keywords that the Printer doesn't support. The
2556   rejection occurs only if the client actually supplies the unsupported Template attribute in a request.
2557 3. Clarified that a Print-Job is indistinguishable to Create-Job and one Send-Document.
2558 4. Added that the Printer MUST reject a redundant Close-Job.
2559 5. Clarified that the Printer MUST validate Create-Document in the context of the Job as a whole, including
2560   previous Documents in the same Job.
2561 6. Split Table 7 of Operation Attributes into two. Show the syntaxes for the "xxx-default" and "xxx-supported"
2562   attributes in the first table.
2563 7. Split the Print-Job/Print-URI from the Create-Job into two columns.
2564 8. Added "output-device-requested" Operation attribute.
2565 9. Added the Printer options (reject, hold, ignore) when the client supplies unsupported values in the Operation
2566   attributes for all but "compression", "document-charset", "document-format".
2567 10. Use the 'application/vnd.PWG-XXX' for unregistered Printer MIB printer languages.
2568 11. Added "output-device-requested (name(127) Operation/Job Description attribute for Job Creation operations.

2569     12. Added "document-format-target" (mimeMediaType) and "document-format-version-target" (text(127) Job
2570         Template and Document Template attributes.
2571     13. Clarified that a Document Template attribute share the "xxx-default" and "xxx-supported" Printer attribute
2572         values with the Job Template attribute of the same name.
2573     14. Added that Document Template attributes MAY have corresponding "xxx-actual" Document Description
2574         attributes.
2575     15. Added "document-format-version-detected" Document Description attribute.
2576     16. Added 'digital-signature-did-not-verify', and 'digital-signature-type-not-supported', and [job-]errors-detected' to
2577         "job-state-reasons" and "document-state-reasons".
2578     17. Added 'job-digital-signature-wait' to "job-state-reasons".
2579
2580 Version 0.11, May 9, 2003, agreements from the May 1 telecon:
2581     1. Split the document up into 3 separate documents.
2582         a. The Document Object extension to IPP
2583         b. Job and Document extensions to IPP from IPPFAX, PSI and others
2584         c. Future extensions
2585     2. Added 'server-error-too-many-jobs' and 'server-error-too-many-documents' statues codes.
2586     3. Removed Create-Document and Send-Data operations.
2587     4. Removed Job State and job-state-reasons info
2588
2589 Version 0.12, June 3, 2003,
2590     1. Incorporated Tom's editorial changes.
2591     2. Made changes from the May 22 telecon:
2592         a. Replaced 5100.4 with OvrRide
2593         b. Removed [job-] convention everywhere
2594         c. Removed "hints"
2595         d. Added HW defaults to precedence
2596         e. Fixed all table headers
2597         f. Removed Close-Job
2598     3. Updated references throughout
2599     4. added xxx-supported and xxx-default IANA registrations
2600     5. Removed "forwarding server" discussion
2601     6. Removed "overrides" operational attribute in document operations.  "overrides" are now treated as any other
2602       Template attribute
2603     ~~6.~~7. tribute
2604