1 Working Draft, May 19, 2003
2 Maturity Level: Development <mark>2 ISSUES are highlighted like this.</mark>
3 <mark>Important information to review is highlighted like this</mark>.

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The Printer Working Group (PWG)
Standard for
The Internet Printing Protocol (IPP):
Document Object

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

16 This specification defines new operations or extends RFC2911 operations as follows:
17   1 RFC 2911 operation that creates a Job object: Create-Job
18   2 RFC 2911 operations that create a Job and Document object: PrintJob, Print-URI
19   2 RFC 2911 operations that create Document objects: Send-Document, Send-URI
20   5 new operations: Get-Documents, Get-Document-Attributes, Set-Document-Attributes, Cancel-Document,
21   Delete-Document

22 This specification uses the new Operation attributes (defined in [jobx]) that describe the contents of the Document
23 and permit the Printer to reject requests that it cannot process correctly to define new Document Description
24 attributes. The Printer copies these Operation attributes to the corresponding Document Description attributes,
25 which clients may query.

26 This specification also uses existing Job Template attributes to define Document Template attributes ("xxx"
27 Document attribute, "xxx-actual" Document Description, "xxx-default" Printer attribute, and "xxx-supported" Printer
28 attribute. In addition this specification lists all of the attributes defined in other IPP specifications to show their
29 relationship to corresponding attributes defined in this IPP specification for use with the Document 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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35 Working Draft, May 18, 2003

The Printer Working Group (PWG)

Standard for
The Internet Printing Protocol (IPP):
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-ippdoc20030518.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**
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82 The IEEE-ISTO is a not-for-profit corporation offering industry groups an innovative and flexible operational forum
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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
104
105

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.
120

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

293   This specification defines two new operation for Job objects, five new operations for Document objects once they
294   have been created, and extends RFC 2911 operations as follows:

295   1 REQUIRED Job operation: Get-Documents   <mark>ISSUE01: Should Close-Job [jobx] be REQUIRED?</mark>
296   1 REQUIRED Job and Document Creation operation: PrintJob [rfc2911]
297   1 OPTIONAL Job and Document Creation operation: Print-URI [rfc2911]
298   1 REQUIRED Document Creation operation: Send-Document [rfc2911]
299   OPTIONAL Document creation operation: Send-URI [rfc2911]
300   2 REQUIRED Document operations: Cancel-Document, Get-Document-Attributes
301   2 OPTIONAL Document operations: Delete-Document, Set-Document-Attributes.

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

306   This specification also uses existing Job Template attributes to define Document Template attributes ("xxx"
307   Document attribute, "xxx-actual" Document Description [ippact], "xxx-default" Printer attribute, and "xxx-supported"
308   Printer attribute. In addition this specification lists all of the attributes defined in other IPP specifications[1] to show
309   their relationship to corresponding attributes defined in this IPP specification for use with the Document object. The
310   full semantics of the "document-state", "document-state-reasons", and "document-state-message" Document
311   Description attributes are given along side of the corresponding [rfc2911] "job-state", "job-state-reasons", and "job-
312   state-message" Job Description attributes. Finally, the analogous Document Descriptions attributes that correspond
313   to the Job Description attributes are defined.

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

318   1.1 Scope

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

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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 attributes). Note: There are a number of footnotes which relate this IPP specification to the PWG Semantic model
324 and other PWG projects, such as the Print Service Interface (PSI) [pwg-psi].

325 The Document object is a passive object[2] and is operated upon by the Job. The client uses either of the existing
326 Send-Document and Send-URI operations to create a Document object. In addition there are 8 new operations that
327 affect the Document object after it has been created as summarized in Table 1.

328   **Table 1 - Summary of operations**

Operation Name	Printer support	Brief Description
Print-Job [rfc2911]	REQUIRED	Creates a Job object as in [rfc2911] which 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] which 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.
Close-Job [jobx]	OPTIONAL	Closes the Job object that was created with Document objects.
Get-Document-Attributes	REQUIRED	Get requested attributes of 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.

329
330 This specification uses existing Operation attributes summarized in Table 2 to define new Document Description
331 attributes. The Printer copies these Operation attributes supplied by the client in the request to the corresponding
332 Job or Document Description attributes.

333   **Table 2 - Summary of New Operation/Description attributes**

Operation attribute	Creation operation	Printer support	Description
ipp-attribute-fidelity (boolean) *	Job	MUST	Allows the client to indicate whether or not the

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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.

			Printer MUST support all Job Template and Document Template attributes.
job-mandatory-attributes (1setOf type2 keyword)	Job	MUST	Allows the client to list which Job Template and Document Template attributes that the Printer MUST support.
document-charset (charset)	Document	CMUST[4]	The charset of the Document Object content
document-digital-signature (type2 keyword)	Document	MAY	The type of digital signature, if any used in the Document Object content.
document-format (mimeMediaType) *	Document	MUST	The document format of the Document Object content
document-format-details (1setOf collection)	Document	CMUST[5]	The details of the Document Object content, including when its package of files (zip, multipart/related), such as application and operating system that created the document, the intended device type (when the format is device-dependent), the natural languages of the document.
document-format-version (text(127))	Document	MAY	The level or version of the document format.
document-natural-language (naturalLanguage) *	Document	MAY	The primary language of the Document Object content.

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

336 # 2 Terminology

337 This section defines terminology used throughout this document.

338 ## 2.1 Conformance Terminology

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

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

347 ## 2.2 Other Terminology

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

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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 section **Error! Reference source not found.**).

[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'

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

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

357   **Document Creation operation** - operations that create Document objects. Specifically: Print-Job, Print-URI, Send-
358   Document, and Send-URI. Note: the Print-Job and Print-URI are both **Job Creation** and **Document Creation**
359   operations, since they create both Job and a **Document object** at the same time. Also this specification does not
360   extend the Print-Job and Print-URI operations. However, this specification does extend the Send-Document and
361   Send-URI operations to allow the client to supply **Document Template** attributes in each request.

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

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

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

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

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

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

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

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

389   Table 3 shows this terminology as applied to the six operations. Note that Print-Job and Print-URI are both Job
390   Creation operations and Document Creation operations, though they only create single Document jobs. In other

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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].

391 words, for Print-Job and Print-URI, there is only one document per job, so whether the attributes are considered to be
392 submitted at the Job Level and then inherited by the Document object, is moot, since these operations do not have a
393 separate Document group in which the client can supply Document attributes. Note also that for the "Level" concept,
394 no operation supplies attributes at more than one level.[7]

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

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

396

397 **3 New Job operations and semantic extensions to Job operations**

398 This section defines the semantic extensions to Job operations that affect Document objects. Printer and
399 Subscription object (Event Notification [ntfy]) operations MUST have no effect on the Document object and the
400 Document object has no effect on the semantics of the Printer and Subscription operations. The Job operations that
401 MUST NOT have any effect on the Document object because they are defined to affect the Job object as a whole
402 are: **Get-Job-Attributes**[8] ([rfc2911] section 3.3.4)**, Get-Jobs**[9] ([rfc2911] section 3.2.6)**, Hold-Job** ([rfc2911] section
403 3.3.5), **Release-Job** ([rfc2911] section 3.3.6), **Set-Job-Attributes** ([rfc3380] section 4.2), and **Validate-Job**
404 ([rfc2911] section 3.2.3).

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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).

[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-Job-Attributes operation responses.

405 The Job operations that affect Document objects or that Document objects affect the semantics of the Job operations
406 are, in alphabetical order:

407 ## 3.1 Job Creation operations

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

409 ### 3.1.1 Operation Attributes

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

412 **3.1.1.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)**

413 This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1)_when the
414 client supplies unsupported Job Template or Document Template attributes[10] or value in a Job Creation operation or
415 a subsequent Document Creation operation for this job. The value 'true' indicates that total fidelity to client supplied
416 Job Template and Document Template attributes and values is required for this Job Creation operation and all
417 subsequent Document Creation operations for this job. If the client supplies the value 'false' or omits the attribute,
418 then the Printer MUST accept the Job Creation operation and all subsequent Document Creation operations even if
419 the client supplies unsupported attributes or values in them.

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

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

425 **3.1.1.2 job-mandatory-attributes (1setOf type2 keyword) Operation attribute**

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

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

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

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[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
support the "job-mandatory-attributes" Operation attribute. See the definition of REQUIRED in section 2.1.

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

442   ## 3.1.2 Create-Job ([rfc2911] section 3.2.4)

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

453   ## 3.1.3 Print-Job ([rfc2911] section 3.2.1)

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

464   The Printer MUST populate the single Document object's "document-state", "document-state-reasons", and
465   "document-number" Document Description attributes with appropriate values. Thus a Get-Job-Attributes operation
466   returns the same attributes for a Job created with Print-Job as a Printer that doesn't support the Document object.
467   However, a Get-Documents or Get-Document-Attributes for a Job created by Print-Job will return no Document
468   Templates attributes (since the client can't submit any with Print-Job), but will return the populated Document
469   Description attributes, such as "document-format", supplied by the client.

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

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[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.

479   3.1.4 Print-URI ([rfc2911] section 3.2.2)

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

484   Note: Using the Get-Job-Attributes and Get-Document-Attributes, a Job created by Print-URI will be
485   indistinguishable to a client from a Job created with Create-Job, Send-URI with no Document Template attributes
486   supplied, and Close-Job (see Note in section 3.1.3).

487   3.2 Validate-Job ([rfc2911] section 3.2.4)

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

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

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

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

507   3.3 Get-Documents Operation

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

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

516   3.3.1 Get-Documents Request

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

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

521   **Group 1: Operation Attributes**

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

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

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

530   **3.3.1.1 "limit" (integer(1:MAX)):**

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

537   **3.3.1.2 "requested-attributes" (1setOf type2 keyword):**

538   The client OPTIONALLY supplies this attribute. The Printer MUST support this attribute. It is a set of
539   Document attribute names and/or attribute groups names in whose values the requester is interested. This
540   set of attributes is returned for each Document object that is returned. The allowed attribute group names
541   are the same as those defined in the Get-Document-Attributes operation in section 4.3.1.

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

544   'document-number' (see section 9.1.21)
545

3.3.2 Get-Documents Response

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

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

552   **Group 1: Operation Attributes**

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

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

559   **Group 2: Unsupported Attributes**

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

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

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

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

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

3.4 Cancel-Job ([rfc2911] section 3.3.3)

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

3.5 Close-Job([jobx] section 3.1)

583   This OPTIONAL operation defined in [jobx] closes the Job[14]. The Printer SHOULD support this operation. The client
584   SHOULD issue this operation to close the job, instead of supplying the "last-document" Operation attribute (see
585   section 4.1) with a 'true' value in a Document Creation operation (or a Send-Document operation with no data - see
586   [rfc2911] section 3.3.1). The Printer MUST support both means of closing jobs for backward compatibility with
587   [rfc2911].

588   ISSUE02: Should Close-Job be REQUIRED for the Document object spec?

3.6 Send-Document ([rfc2911] section 3.3.1)

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

---

[14] Close-Job is a operation defined by [JobX] and is not defined in [rfc2911].

593 **3.7 Send-URI** ([rfc2911] section 3.3.2)

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

597 **3.8 Hold-Job** ([rfc2911] section 3.3.5)

598 This OPTIONAL operation moves the job to the 'pending-held' state, and sets the Job's "job-state-reasons" Job
599 Description attribute as description in [rfc2911] section 3.3.5. The values of the Documents' "document-state-
600 reasons" Document Description attributes MUST NOT be affected by this operation.

601 **3.9 Release-Job** ([rfc2911] section 3.3.6)

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

605 **3.10 Restart-Job** ([rfc2911] section 3.3.7)

606 This OPTIONAL operation starts the Job over again by processing *all* Documents in the Job as described in [rfc2911]
607 section 3.3.7, including Documents that have been canceled by a previous Cancel-Document operation (see section
608 4.5). Therefore, the Printer removes any 'canceled-by-*xxx*' values from any of the "document-state-reasons"
609 attributes and the Job's "job-state-reasons" attributes so that any canceled Documents are reprocessed along with
610 the other Documents.

611 **3.11 Reprocess-Job** ([adm-ops] section 4.1)

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

616 **4   Document Operations**

617 This section defines the Document Creation and Document operations. The Document object semantics are as
618 parallel to the Job object semantics as possible. Therefore, most of the Job operations have analogous Document
619 operations as shown in Table 16 in section "Appendix A: Document operations compared to Job operations".
620 Operations that can apply only to an entire job, have no analogous document operation as indicated. This extension
621 adds 5 new Document operations that operate on the Document object once it is created by either of the existing two
622 operations: Send-Document and Send-URI operations.

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

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

627 **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

628

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

630 **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 NOY	MUST	MUST
"document-state-message"	MUST NOT	MAY	MAY

631

632 4.1 Send-Document ([rfc2911] section 3.3.1) extension

633 This REQUIRED[15] Document Creation operation allows a client to submit multiple documents in a single Job by
634 making a Send-Document request for each Document. In this specification, the Send-Document creates a
635 Document object ([rfc2911] did not have a Document object). A Printer MUST support this operation with the
636 semantics specified in [rfc2911] and with the extension defined in this specification, since this specification
637 REQUIRES the Printer to support multiple document jobs.

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

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

643 4.1.1 Send-Document Request

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

---

[15] 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.

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

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

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

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

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

654 The client MUST supply the document data in-line to be processed for this Document if the "last-document"
655 flag is set to 'false' or omitted. However, since a client might not know that the previous Document Creation
656 operation that the client had supplied (a Send-Document or a Send-URI operation) was the last document
657 (i.e., the client had supplied the "last-document" attribute with a 'false' value), the client MUST use either (1)
658 the Close-Job operation (see section 3.5) or (2) or (2) a Send-Document request with no document data
659 where the "last-document" flag is set to 'true' (see [rfc2911] section 3.3.1). For this Send-Document case
660 with no data, the Printer MUST NOT increment the value of the Job object's "number-of-documents"
661 attribute, since no Document object was added to the job. In addition, it is not an error for a client to submit a
662 job with no actual document data, i.e., only a single Create-Job and Send-Document request with a "last-
663 document" Operation attribute set to 'true' with no document data; it is only an empty job which is scheduled
664 and processed normally.

665 ## 4.1.2 Send-Document Response

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

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

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

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

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

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

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

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

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

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

681   **4.1.2.1 document-number (integer(1:MAX))**

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

684   **4.1.2.2 document-state (type1 enum)**

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

686   **4.1.2.3 document-state-reasons (1setOf type2 keyword)**

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

688   **4.1.2.4 document-state-message (text(MAX))**

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

691 4.2 Send-URI ([rfc2911] section 3.3.2) extension

692   This OPTIONAL Document Creation operation has the same request and response semantics as the Send-
693   Document operation (see section 4.1) except that a client MUST supply a URI reference ("document-uri" Operation
694   attribute) rather than the document data itself. If a Printer supports this operation, clients can use either this
695   operation or the Send-Document operation to add new Document objects to an existing multi-document Job object.
696   However, if a client needs to indicate that the previous Send-URI or Send-Document was the last document, the
697   client MUST use either (1) the Close-Job operation (see section 3.5) or (2) the Send-Document operation (see
698   section 4.1) with no document data and the "last-document" flag set to 'true' as specified in [rfc2911] section 3.3.2
699   (rather than using a Send-URI operation with no "document-uri" Operation attribute).

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

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

704 4.3 Get-Document-Attributes

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

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

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

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

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

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

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

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

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

4.3.1 Get-Document-Attributes Request

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

741 **Group 1: Operation Attributes**

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

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

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

753 **4.3.1.1 "requested-attributes" (1setOf keyword):**

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

757   ### 4.3.2 Get-Document-Attributes Response

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

759   **Group 1: Operation Attributes**

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

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

768   **Group 2: Unsupported Attributes**

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

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

775   **Group 3: Document Object Attributes**

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

787   ## 4.4 Set-Document-Attributes

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

792   This operation is almost identical to the Set-Job-Attributes operation and follows the same rules for validation (see
793   [rfc3380] section 4.2). The only differences are that the Set-Document-Attributes operation is directed at a Document
794   object rather than a Job object. As with the Set-Job-Attributes operation, The Set-Document-Attributes operation
795   can add an attribute to the Target object, accepts the 'delete-attributes' out-of-band value to remove an attribute from
796   the Target object. In addition the validation is the same as the Send-Document and Send-URI operations that create
797   Document objects, i.e., the Printer validation depends on the "xxx-supported" Printer Description attributes (see
798   [rfc2911] section 3.1).

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

802 If the client supplies a document attribute with the "out-of-band" value 'delete-attribute' (see [rfc3380] section 8.2),
803 then the Printer MUST remove the attribute and all of its values from the Document object, if present. The semantic
804 effect of the client supplying the 'delete-attribute' value in a Set-Document-Attributes operation MUST be the same as
805 if the attribute had not been supplied with the Document object in the Document Creation operation, i.e., the Printer
806 applies its default attribute or behavior with lower precedence that the PDL (see the beginning of [rfc2911] section
807 4.2 and [rfc2911] 3.2.1.1). Any subsequent query of the Document object using Get-Document-Attributes or Get-
808 Documents MUST NOT return any attribute that has been deleted using the 'delete-attribute' out-of-band value.
809 However, a client can re-establish such a deleted Document attribute with any supported value(s) using a
810 subsequent Set-Document-Attributes operation.

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

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

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

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

836   **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

Current "document-state"	New "document-state" (no change)	Printer's response status code and "action":
		document has started marking media, etc.
'completed'	'completed'	'client-error-not-possible'
'canceled'	'canceled'	'client-error-not-possible'
'aborted'	'aborted'	'client-error-not-possible'

837

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

841 4.4.1 Settable and READ-ONLY Document Description attributes

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

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

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

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

855 4.4.2 Set-Document-Attributes Request

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

857 **Group 1: Operation Attributes**

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

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

866   Note: There is no way in a single operation for the client to set all of a Job's Document objects to the same
867   attribute value. Either (1) the client sets the corresponding attribute in each Document object in the Job with
868   separate Set-Document-Attributes requests, or (2) the client sets the corresponding attribute at the Job Level
869   using the Set-Job-Attributes operation. Setting the corresponding attribute at the Job Level (or supplying that
870   attribute initially in the Job Creation operation) causes each Document object to inherit the Job Level

871   attribute value, if the Document object doesn't have a corresponding explicit attribute supplied at the
872   Document Level. In other words, supplying an attribute at the Job Levels will affect all the Job's Document
873   objects that don't have that attribute also explicitly supplied at the Document Level.

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

877   **Group 2: Document Attributes**

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

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

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

891   ## 4.4.3 Set-Document-Attributes Response

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

893   **Group 1: Operation Attributes**

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

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

900   **Group 2: Unsupported Attributes**

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

902   If some of the attributes in the operation fail to validate, the Printer MUST reject the operation, MUST NOT
903   change any Document attributes, and MUST return the indicated status code below. In this group, the
904   Printer MUST also return all attributes that fail to validate. The following are the reasons that an attribute
905   fails to validate and the value returned for the attribute, along with the indicated status code and order of
906   detection:

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

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

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

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

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

925 4.5 Cancel-Document

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

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

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

942   The Printer MUST accept or reject the request based on the document's current state and transition the document to
943   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'

944
945 Rule 1: If the implementation requires some measurable time to cancel the document in the 'processing' document
946 states, the Printer MUST add the 'processing-to-stop-point' value to the document's "document-state-reasons"
947 attribute and then transition the document to the 'canceled' state when the processing ceases (see [rfc2911] section
948 4.3.8).

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

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

955 **4.5.1 Cancel-Document Request**

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

957 **Group 1: Operation Attributes**

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

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

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

969 **4.5.1.1 document-message (text(MAX))**   **Operation attribute**

970   The client MAY supply this Operation attribute. If the Printer supports this attribute, the Printer MUST also
971   support the corresponding "document-message" (text(MAX)) Document Description attribute (see section
972   9.1.18) and copy this value to the "document-message" Document Description attribute. The end user can
973   use this Document Description attribute as a message to the operator and the operator can use it as a
974   message to the user. The Printer MAY print this message on a document start sheet for this document, if
975   any.

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

978 4.5.2 Cancel-Document Response

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

980 **Group 1: Operation Attributes**

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

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

987 **Group 2: Unsupported Attributes**

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

989 Once a successful response has been sent, the implementation guarantees that the Document will eventually end up
990 in the 'canceled' state. Between the time of the Cancel-Document operation is accepted and when the document
991 enters the 'canceled' document-state (see section 9.1.23), the "document-state-reasons" attribute (see section
992 9.1.25) SHOULD contain the 'processing-to-stop-point' value which indicates to later queries that although the
993 Document might still be 'processing', it will eventually end up in the 'canceled' state, not the 'completed' state.

994 5   Administrative Job and Document operations

995 This section summarizes the extensions to existing Administrative Job and Printer operations and defines new
996 Document Administrative operations. The following administrative operations: **Promote-Job** ([adm-ops] section
997 4.4.1), **Release-Held-New-Jobs** ([adm-ops] section 3.3.2)**, Resume-Job** ([adm-ops] section 4.3.2)**, Schedule-Job-
998 After** ([adm-ops] section 4.4.2) do not affect the Document objects because they are defined to affect the Job object
999 as a whole.

1000 5.1 Purge-Jobs ([rfc2911] section 3.2.9)

1001 This OPTIONAL Administrative Printer operation removes all Job and all of their contained Document objects.

1002 5.2 Cancel-Current-Job ([adm-ops] section 4.2)

1003 This OPTIONAL Administrative Printer operation sets the "document-state" Document Description attribute to
1004 'canceled' and the "document-state-reasons" Document Description attribute to 'canceled-by-xxx' for any documents
1005 in the current Job that have not yet reached a terminal state ('completed', 'canceled', or 'aborted'), where "xxx" is
1006 'user' or 'operator'. See [adm-ops] section 4.2.

1007 Note: There is no Cancel-Current-Document operation defined, since it is too likely that the Printer would have
1008 moved onto the next document before the operation could issue the request.

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

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

5.4 Delete-Document

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

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

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

6   Job and Document Template Attribute Precedence during Job processing

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

The attribute precedence model has the following features:

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

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

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

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

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

1048   4) The later that an attribute is introduced into the work flow or the closer the specified scope of the attribute is to
1049   the affected object, the higher the precedence is assigned to that attribute, since precedence is intended to
1050   reflect the user's wishes.

1051 The following levels of Attribute Precedence are defined in order of decreasing priority:

1052   1. **queue override** - The value that the Printer enforces for any job submitted to it (see [ippsave] section
1053   3.1). Set by the administrator when configuring the Printer by setting an "xxx-supported" Printer attribute
1054   to contain a single value, i.e., the override value. Example: the administrator sets the Printer's "sides" =
1055   'two-sided-long' so that all jobs submitted to that (logical) Printer are printed two-sided flipped along the
1056   long edge.

1057   Note: The **queue override** level is only available for Printers that support the 'guaranteed' value for
1058   its "pdl-override-supported" attribute (see [ippsave] section 8.1). All other levels are available for all
1059   Printers independent of the "pdl-override-supported" value.

1060   **2. Document Level - page override programming** - The special "page-overrides" collection Document
1061   Template attribute (see [pwg5100.4]) supplied at the Document Level, that is, in a Send-Document or
1062   Send-URI operation, that contains the attributes that are to have the page override status for the
1063   specified ranges of pages in the Input-Document. Supplied by the client when submitting a Document
1064   object, or set by the user or operator after the Document has been accepted either using the Set-
1065   Document-Attributes operation, or by the operator using means local to the Printer. Example: "page-
1066   overrides" = {"input-documents" = '1:1'; "pages" = '1:1'; "media" = 'letterhead'}

1067   3. **Job Level - page override programming** - The special "page-overrides" collection Job Template
1068   attribute (see [pwg5100.4]) supplied at the Job Level, that is, in a Job Creation operation, that contains
1069   the attributes that are to have the page override status for the specified ranges of pages in the Input-
1070   Document. Supplied by the client when submitting a job either in the protocol, or set by the user or
1071   operator after the job has been accepted either using the Set-Job-Attributes operation, or by the operator
1072   using means local to the Printer. Example: "page-overrides" = {"input-documents" = '1:1'; "pages" =
1073   '1:1'; "media" = 'letterhead'}

1074   **4. Document Level - Document object attributes -** The Document attributes supplied at the Document
1075   Level, that is, Operation/Document Description and Document Template attributes supplied in a Send-
1076   Document or Send-URI operation to apply to the Input Document. Supplied by the client when
1077   submitting a Document object, or set by the user or operator after the Document has been accepted
1078   either using the Set-Job-Attributes operation, or by the operator using means local to the Printer.
1079   Examples: "media" = 'na-letter' and "copies" = '2'.

1080   5. `**Job Level - Job object and Document object attributes** - The Job attributes (Operation/Job
1081   Description and Job Template) and Document attributes (Operation/Document Description and
1082   Document Template) supplied at the Job Level, i.e., with a Create-Job, Print-Job, or Print-URI operation.
1083   Supplied by the client when submitting a Job in the protocol, or set by the user or operator after the job
1084   has been accepted either using the Set-Job-Attributes operation, or by the operator using means local to
1085   the Printer. Examples: "media" = 'na-letter' and "copies" = '2'.

1086   6. **PDL document data** - an instruction in the PDL document data. Supplied by the application or print
1087   driver that created the PDL. Example: PostScript setPageDevice specifying na-letter media. Whether
1088   PDL document data is actually lower precedence than the preceding levels depends on the
1089   implementation as expressed in the "pdl-override-supported" Printer Description attribute (see [rfc2911]
1090   section 4.4.28 and [ippsave] section 8.1).
1091
1092   Job Template and Document Template attributes of the form "xxx-requested", such as "orientation-
1093   requested" (see [rfc2911] section 4.2.10) have a lower priority than the PDL. If the PDL contains a

1094   corresponding instruction, that PDL instruction will be used instead of the supplied "xxx-requested"
1095   attribute. For example, PostScript PDL data always has a well-defined orientation, so that "orientation-
1096   requested" never affects the result. On the other hand, PDLs such as text/plain never has orientation
1097   and PCL MAY omit orientation, in which case, "orientation-requested" takes affect.

7.   **PDL Init File data** - a file that the Printer uses to initialize the PDL Interpreter before it starts interpreting
1098   each document in a Job. See description of "pdl-init-file" Job Template attribute in [ippsave] Section 5.8.
1099
1100   It is immaterial how this file is specified, whether it be by a queue override, job object attribute or printer
1101   default – the precedence of the contents of this file is at this level.

8.   **printer default** - a Printer "xxx-default" attribute that is applied by the Printer provided that none of the
1102   higher levels have supplied a value. The Printer implementation MUST supply values for all of the
1103   Printer's "xxx-default" attributes that reflect the out-of-the-box action by the output device. For example,
1104   if the output device will use media from the large-capacity input tray if not directed otherwise, the
1105   implementation MUST supply the Printer's "media-default" attribute with the 'large-capacity' keyword
1106   value without requiring the administrator to configure that value. The implementation MUST allow the
1107   administrator to configure the Printer's "xxx-default" attributes to other values, if other value are
1108   supported by the implementation. Example: The administrator changes the Printer's "media-default"
1109   from 'large-capacity' to 'na-letter'.
1110

Note: Because of the requirement that the implementation supply pre-configured values for the
1111   Printer's "xxx-default" attributes, there is no need for a lower "hardware default" precedence
1112   level.
1113

1114 7   Operation Attributes for the Job and Document Creation operations

1115 This section defines some new Operation/Description attributes and lists *all* the Operation/Description attributes that
1116 have been defined in other IPP specifications that are used in Job Creation operations and extends their use to the
1117 Document Creation operations. In addition, some new Job/Document Description attributes have been defined to be
1118 set from existing Operation attributes. Note: Operation attributes relate to the operation and do not depend on the
1119 printing capabilities of the Printer.

1120 7.1 Operation Attributes *supplied* at the Job and Document Levels for Creation

1121 Table 7 lists all the Operation attributes and their attributes syntaxes supplied in Job Creation and Document
1122 Creation operations and the attribute syntaxes of their corresponding "xxx-default" and "xxx-supported" Printer
1123 Description attributes, if any. A "-" indicates that there isn't a "xxx-default" or "xxx-supported" Printer Description
1124 attribute.

1125   **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[16]
attributes-natural-language	naturalLanguage	-	1setOf naturalLanguage
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

---

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

Operation attribute	Operation attribute syntax	Printer: Default Value attribute syntax	Printer: Supported Values attribute syntax
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)	-	1setOf name(MAX)
page-overrides	1setOf collection[20]	-	1setOf type2 keyword
printer-uri	uri	-	1setOf uri
request-id	integer(1:MAX)	-	-
requesting-user-name	name(MAX)	-	-
version-number	X.Y	-	1setOf type2 keyword[21]

1126

1127   Table 8 lists the Operation attributes that clients supply at the Job Level and/or the Document Level and whether the
1128   Printer copies (indicated by "⇒") the supplied value to corresponding Job Description and/or Document Description
1129   attributes.

1130   Legend:
1131   [**job-**]   an attribute that shouldn't have had a "job-" prefix in its name in [rfc2911], so that the same attribute name
1132   could also be used for the Document object as an Operation/Document Description attribute. When this

---

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

[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] See "page-overrides" in Table 10 for the list of its member attributes.

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

1133   attribute is used as an Operation/Document Description attribute, the [**job-**] prefix is dropped. Note: For the
1134   PWG Semantic Model, the "**job-**" prefix is dropped.
1135   "**Level Supplied**" column indicates whether the Operation attribute can be supplied at the Job Level (PJ=Print-Job,
1136   PU=Print-URI, and CJ=Create-Job) and at the Document Level (SD=Send-Document, and SU=Send-URI) .
1137   "**y**"   the Operation attribute is defined for the indicated operation, but does not have a corresponding Job
1138   Description or Document Description attribute (no "⇒").
1139   "**y**⇒"   the Operation attribute has a corresponding Job Description (**y**⇒**J)** or Document Description (**y**⇒**D)** attribute
1140   to which the Printer MUST copy this Operation attribute. See Table 11 for the corresponding Job and
1141   Document Description attributes.
1142   "**-**"   the Operation attribute is *not* defined for the indicated operation.
1143   ******   these Operation attributes are defined for *all* operations, not just Job Creation and Document Creation
1144   operations
1145   "**Conformance**" column indicates the conformance requirements for what the client supplies in a request and the
1146   Printer supports in a request.
1147   "**Reference and Section**" column indicates where the Operation attribute is defined in other IPP specs and this spec.
1148

1149   **Table 8 - Operation Attributes supplied at the Job and Document Levels in Job and Document Creation**
1150   **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**⇒	MUST	MUST	[rfc2911] §3.1.4
attributes-natural-language **	naturalLanguage	**y**⇒**J**	**y**⇒**J**	**y**⇒	MUST	MUST	[rfc2911] §3.1.4
compression	type3 keyword	**-**	**y**⇒**D**	**y**⇒	MAY	MUST	[rfc2911] §3.2.1.1
document-charset	charset	**-**	**y**⇒**D**	**y**⇒	MAY	CMUST[22]	[jobx] §4.2.1
document-digital-signature	type2 keyword	**-**	**y**⇒**D**	**y**⇒	MAY	MAY	[jobx] §4.2.2
document-format	mimeMediaType	**-**	**y**⇒[23]**D**	**y**⇒ Error! Bookmark not defined.	MAY	MUST	[rfc2911] §3.2.1.1, [jobx] §4.2.3
document-format-details	1setOf collection	**-**	**y**⇒**D**	**y**⇒	MAY	CMUST[24]	[jobx] §4.2.4

---

[22] The Printer MUST support the "document-charset" Operation/Document Description attributes, if the Printer supports a charset-ambiguous document format (see section **Error! Reference source not found.**).
[23] The Printer MUST copy the "document-format" Operation attribute to the corresponding (new) Document Description attribute defined in this specification.
[24] 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'.

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-source-application-name	name(MAX)	-	y⇒D	y⇒	MAY	MAY	[jobx] §4.2.4.1
document-source-application-version	text(127)	-	y⇒D	y⇒	MAY	MAY	[jobx] §4.2.4.2
document-source-os-name	name(40)	-	y⇒D	y⇒	MAY	MAY	[jobx] §4.2.4.3
document-source-os-version	text(40)	-	y⇒D	y⇒	MAY	MAY	[jobx] §4.2.4.4
document-format	mimeMediaType	-	y⇒D	y⇒	MUST	MUST	[jobx] §4.2.4.5
document-format-device-id	text(127)	-	y⇒D	y⇒	MAY	MAY	[jobx] §4.2.4.6
document-format-version	text(127)	-	y⇒D	y⇒	SHOULD	MUST	[jobx] §4.2.4.7
document-natural-language	naturalLanguage	-	y⇒D	y⇒	MAY	MAY	[jobx] §4.2.4.8
document-format-version	text(127)	-	y⇒D	y⇒	MAY	MAY	[jobx] §4.2.6
document-name	name(MAX)	-	y⇒D	y⇒	MAY	MUST	[rfc2911] §3.2.1.1
document-natural-language	naturalLanguage	-	y⇒D	y⇒	MAY	MAY	[rfc2911] §3.2.1.1, [this spec] §7.2.1
document-uri	uri	-	y	y⇒	CMUST ²⁵	MAY	[rfc2911] §3.2.2
ipp-attribute-fidelity	boolean	y⇒²⁶ J	y⇒²⁶J	-	MAY	MUST	[rfc2911] §3.2.1.1, [this spec] §3.1.1.1
[job-]impressions	integer(0:MAX)	y⇒J	y⇒J	y⇒	MAY	MAY	[rfc2911] §3.2.1.1
[job-]k-octets	integer(0:MAX)	y⇒J	y⇒J	y⇒	MAY	MAY	[rfc2911] §3.2.1.1
job-mandatory-attributes	1setOf type2 keyword	y⇒J	y⇒J	-	MAY	MUST	[this spec] §3.1.1.2
[job-]media-sheets	integer(0:MAX)	y⇒J	y⇒J	y⇒	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⇒²⁷	MUST	MUST	[rfc2911] §3.3.1.1, [jobx] §???
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

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²⁵ 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.

²⁶ 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.

²⁷ 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.

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	
output-device-requested	name(127)	**y⇒J**	**y⇒J**	**-**	MAY	MAY	[jobx] §
page-overrides	1setOf collection[28]	**-**	**-**	**y⇒[29]**	MAY	MAY	[pwg5100.4] §5.2, [OvrRide]§9.2.3
printer-uri **	uri	**y⇒[31]J**	**y⇒[30]J**	**y**	MUST	MUST	[rfc2911] §3.1.5
printer-uri **	uri	**y⇒[31]J**	**y⇒[31]J**	**y**	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

1151 **"y", "y⇒"**, and **"**"**. See Legend at the beginning of the Table.
1152

1153 7.2 Operation/Document Description attributes

1154 The rest of this section defines the semantics for the Operation attributes that a client MAY supply in a Document
1155 Creation operation and their corresponding Document Description attributes. The following statements apply to all of
1156 these Operation/Document Description attributes and are *not* repeated in each Description:

1157 If the Printer doesn't support the "xxx" Operation attribute, the Printer MUST ignore the "xxx" attribute (as with any
1158 OPTIONAL Operation attribute) and return the "xxx" attribute with the supplied value as unsupported in the
1159 Unsupported attributes group as specified in [rfc2911] section 3.1.7.

1160 If the Printer supports the "xxx" Operation attribute, the Printer MUST support it at the Job and Document level. The
1161 Printer MUST also:

1162   1. support the corresponding "xxx" Document Description attribute of the same name (see section 9.1) and vice
1163   versa.

1164   2. copy the value of the "xxx" Operation attribute, if supplied by the client, to the corresponding "xxx" Document
1165   Description attribute.

1166   3. support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if defined
1167   (see section 10) and vice versa.

---

[28] See "page-overrides" in Table 10 for the list of its member attributes.

[29] The preferred method for a client to supply "page-overrides" is as a Document Template attribute (see section 8).
However, the "page-overrides" attribute is also an Operation attribute that the client MAY supply in the Send-
Document or Send-URI operation in [pwg5100.4] as an Operation attribute, since there was no place for supplying
Job Template or Document Template attributes until this IPP Document Object specification. The Printer copies the
"page-overrides" Operation attribute to the corresponding Job Template Document attribute. There is no "page-
overrides" Job or Document Description attribute.

[30] 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.

 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.

1168   4. validate the values supplied by the client in the "xxx" Operation attribute against the values indicated in the
1169   Printer's corresponding "xxx-supported" Printer Description attribute (see section 10). If the values do not
1170   validate, the Printer MUST either reject the operation or accept the operation as indicated for each of the
1171   attributes described below.

1172 If the client supplies one of the "xxx" Operation/Document attributes with a value that the Printer does not support,
1173 the Printer MUST perform one of the actions indicated for that Operation, unless specified otherwise, such as (1)
1174 reject the request, (2) accept the request and either (a) hold the job for operator intervention or (b) print the Job
1175 ignoring the attribute. In all of these cases, the Printer MUST return the Operation attribute with the unsupported
1176 value in the Unsupported Attributes group in the response (see [rfc2911] section 3.1.7).

1177

7.2.1 document-natural-language (naturalLanguage)

1178

1179 This OPTIONAL Operation attribute specifies the natural language of the Document Object content (see [rfc2911]
1180 section 3.2.1.1 and section 4.1.8).

1181 If the client supplies this "document-natural-language" Operation attribute with a value that the Printer doesn't
1182 support, the Printer MUST perform one of the following actions: (1) reject the request OR (2) accept the request and
1183 either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See section 7.2 above
1184 for more details.

1185 The values MAY include region as well as the language according to [rfc2911 section 4.1.8. If the document
1186 contains more than one language, the value is the first or primary language of the document. The Printer MAY use
1187 this value to select fonts or other Globalization processing. As indicated in [rfc2911] section 4.1.8, example include:

1188   'en': for English
1189   'en-us': for US English
1190   'fr': for French
1191   'de': for German
1192

7.3 Override Operation attributes in Send-Document and Send-URI

1193

1194 ACTION ITEM PZ: Rework to align with new override spec

1195 With the introduction of the Document Object, there is no longer a need for the "document-overrides" (1setOf
1196 collection) attribute [pwg5100.4] as an Operation attribute or a Document Template attribute. Also we are unaware
1197 of any implementations of the "document-overrides" attribute. Therefore, the intent is to republish the Overrides
1198 document [pwg5100.4] with only the "page-overrides" attribute. With the introduction of the Document object, the
1199 client simply supplies the Document Template attributes (see Table 10) for each Document Creation request (in a
1200 new Document Template attribute group) without needing a collection (and without needing the "document-overrides"
1201 attribute).

1202 The "document-overrides" attribute is also useful in combination with the "pages-per-subset" (1setOf integer) Job
1203 Template attribute (see [pwg5100.4]) which divides up the Input Page stream concatenated across the Input
1204 Documents into separate Output Documents. For example, making every 10 Input Pages be a separate Output
1205 Document but the client only wants to staple the first Output Document, so the client supplies a single "document-
1206 overrides" Job Template attribute with "finishings" that affects Output-Document 1 only. With the removal of the
1207 "document-overrides" attribute, the client uses the "page-overrides" Job Template attribute to affect the stapling of
1208 pages 1:10 only.

1209 Similarly, according to [pwg5100.4], the "page-overrides" (collection) attribute MAY be supplied by the client in a
1210 Send-Document or Send-URI request as an Operation attribute to apply page overrides to this and/or subsequent
1211 documents in the job (by supplying either the "input-documents" (1setOf rangeOfInteger (1:MAX)) or the "output-

1212 documents" (1setOf rangeOfInteger) member attribute). See the "page-overrides" Job Template attribute in Table 10
1213 for the listing of the member attributes. However, with the introduction of the Document object, the "page-overrides"
1214 (collection) attribute MUST be supplied as a Document Template attribute as one of the Document Template
1215 attributes for the document being created in the Send-Document or Send-URI operation and for this Document only.
1216 However, if a Printer supports the "page-overrides" attribute as a Document Template attribute (in any Document
1217 Creation operations), a Printer MUST also support the "page-overrides" attribute as an Operation attribute in the
1218 Send-Document and Send-URI operations according to [pwg5100.4] for backward compatibility with clients that do
1219 not support the Document object.

1220 7.4 Operation Attributes *returned* in Job and Document Creation responses

1221 Table 9 lists the Operation attributes that Printers return in Job Creation operation *responses*: Print-Job, Print-URI,
1222 and Create-Job and in Document Creation operation *responses*: Send-Document and Send-URI. The column
1223 labeled "Conformance" indicates the conformance for what the Printer returns and what the Printer supports. The
1224 Reference and Section columns list the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

1225 **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
	'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-message *	text	MAY	MAY	[rfc2911] §3.1.6.3
document-access-error	text	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) [32]	uri	MAY	MAY	[not-srv] §5.2
request-id *	integer(1:32767)	MUST	MUST	[rfc2911] §3.1.2
status-code *	integer(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

1226 * - indicates attributes that are defined for *all* operations, not just Job Creation operations
1227

---

[32] 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.

1228 ## 8   Job Template and Document Template attributes

1229 Table 10 lists *all* of the Job Template attributes defined in other IPP specifications and lists their corresponding
1230 Document Template attributes defined in this IPP specification. The Job Template attributes can be supplied in the
1231 Job Creation operations: Print-Job, Print-URI, and Create-Job operations.

1232 A subset of these Job Template attributes (e.g., "number-up" and "media", but not "job-priority") are also defined to
1233 apply to Documents and are called Document Template attributes when supplied at the Document Level. Document
1234 Template attributes can be supplied in the Send-Document and Send-URI operations.

1235 A subset of the Document Template attributes that apply to pages (e.g., "media", but not "document-format" or "job-
1236 priority") can also be supplied as Page Overrides using the "page-overrides" Job Template collection attribute (see
1237 [pwg5100.4]) or as a Document Template attribute.

1238 Job Template and Document Template attributes are OPTIONAL for a Printer to support and for a client to supply in
1239 a Job Creation or Document Creation request or Page Overrides. If a Printer supports a Job Template or Document
1240 Template attribute, then it MUST copy the supplied attribute to the Job or Document object, respectively so that a
1241 client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs and Get-Document-Attributes/Get-
1242 Documents operations, respectively. The effect of Job Template Attributes supplied in Job Creation requests are
1243 inherited by the Document objects, unless the Document Creation operation supplies the attribute with a different
1244 value.

1245 If a Job Template collection attribute is supported (see [rfc3382]), then there are conformance requirements for which
1246 member attributes MUST be supported and which member attributes a client MUST supply as indicated in the
1247 Conformance column for each collection member attribute in Table 10.

1248 The "Defined for use" column indicates whether the client MAY supply and the Printer support the attribute at the
1249 Job, Document, or Page Level with the following semantics:

Supplied	Description
J=y:	Job Level: The attributes MAY be supplied as Job Template attributes at the Job Level in a Job Creation request (Print-Job, Print-URI, Create-Job) in which case each Document inherits the Job Template attribute as a default which is used unless an attribute at the document level is also supplied. Note: The "multiple-document-handling" attribute controls whether extensive attributes, such as "finishing", "copies", affect the entire job as a whole ('single-xxx' values) or affect each document separately ('separate-xxx' values).
D=y:	Document Level: The attribute MAY be supplied at the Document Level as 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.

1250
1251   "*" - Most Job Template and Document Template attributes correspond to the PWG Semantic Model Job
1252   Processing and Document Processing attributes, respectively. However, 4 of the IPP Job Template
1253   attributes are represented in the PWG Semantic Model as Job Description attributes, instead of Job
1254   Processing attributes. These are indicated in the first column with "*".

1255   **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** [33]	**y**	**n**	MAY	MAY	[rfc2911] §4.2.5
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** [34]	**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** [34]	**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** [35]	**y**	**y**	MAY	MAY	[pwg5100.3] §3.3
imposition-template	type2 keyword | name(MAX)	**y**	**y**	**y**	MAY	MAY	[pwg5100.3] §3.4

---

[33] 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 produce N copies of the first input document followed by N copies of the second input document, etc. The 'separate-document-collated-copies' produce N successive job copies, each job copy consisting of 1 copy of the first document followed by 1 copy of the second document, etc.

[34] 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' 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.

[35] 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	
insert-sheet	1setOf collection	**y** [35]	**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,	MUST	[pwg5100.3] §3.5.3
media-col	collection				but NOT both	MAY	[pwg5100.3] §3.5.3
job-account-id **	name(MAX)	**y**	**n**	**n**	MAY	MAY	[pwg5100.3] §3.6
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	MUST	[pwg5100.3] §3.8.2
media-col	collection				of, but NOT both	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** [36]	**n**	MAY	MAY	[jobx] §5.1.1**Error! Reference source not found.**

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[36] 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'.

Job Template / Document Template **attribute name**	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
job-cover-back	collection	**y**	**n** [37]	**n**	MAY	MAY	[jobx] §5.1.2**Error! Reference source not found.**
same as cover-back	see cover-back						
job-cover-front	collection	**y**	**n** [38]	**n**	MAY	MAY	[jobx] §5.1.3**Error! Reference source not found.**
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** [39]	**n**	MAY	MAY	[jobx] §5.1.4**Error! Reference source not found.**
job-finishings-col	collection	**y**	**n** [40]	**n**	MAY	MAY	[jobx] §5.1.5**Error! Reference source not found.**
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** [41]	**n**	MAY	MAY	[pwg5100.3] §3.10
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

[37] 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'.

[38] 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'.

[39] 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'.

[40] 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'.

[41] 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-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 [42]	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[43]	[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

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

[43] 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
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-overrides	1setOf collection	**y** [44]	**y**	**n**	MAY	MAY	[pwg5100.4] §5.2
input-documents	1setOf rangeOfInteger(1:MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.4] §5.2.1
output-documents	1setOf rangeOfInteger(1:MAX)					MUST	[pwg5100.4] §5.2.2
document-copies	1setOf rangeOfInteger(1:MAX)				MAY	MAY	[pwg5100.4] §5.2.3
pages	1setOf rangeOfInteger(1:MAX)				MUST	MUST	[pwg5100.4] §5.2.4
any other Job Template attributes that affect pages, such as "media" or "media-col"					MAY	MAY	
page-ranges	1setOf rangeOfInteger(1:MAX)	**y**	**y**	**n**	MAY	MAY	[rfc2911] §4.2.7
pages-per-subset	1setOf integer(1:MAX)	**y** [45]	**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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[44] The effect of the IPP "page-overrides" Job Template attribute 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.

[45] The client MUST supply the "pages-per-subset" Job Template attribute at the Job Level and 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

1256 "**" - These 4 attributes are Job Description attributes, not Job Processing attributes, in the PWG Semantic Model
1257   [pwg-sm] - see Legend before the Table.
1258

1259 8.1 Document Template attributes

1260 Most Job Template attributes can be used as Document Template attributes for use in Document Creation
1261 operations to apply to the Document object. However, the Job Template attributes that have the "job-" prefix MUST
1262 NOT be used as Document Template attributes, since they are defined to apply to the job as a whole. Table 10
1263 shows lists all of the Document Template attributes for use with the Document Creation operations and the
1264 Document object. All of the definitions of the Document Template attributes are done by reference to the
1265 corresponding Job Template attributes in other specifications. However, the semantics of each Document Template
1266 attribute only applies to the Document object with which the attribute is associated either by being supplied by the
1267 client in the Document Creation operation or supplied by the Printer as a default because the client did not (and the
1268 PDL did not have any corresponding instruction). See section 6 for defaulting semantics.

1269 The Document Template attribute share the same "xxx-default", "xxx-supported", and "xxx-ready" Printer attributes
1270 with the Job Template attributes of the same name.

1271 The Document object also has the corresponding "xxx-actual" READ-ONLY Document Description attributes defined
1272 that correspond to the "xxx" Document Template attributes (see [ippact]).

1273 9 Job Description and Document Description attributes

1274 Table 11 lists all the Job Description defined in other IPP specifications and the corresponding Document Description
1275 attributes defined in this IPP specification. Job Description and Document Description attributes are Job object and
1276 Document object attributes, respectively, that are filled in by the Printer. Some Job/Document Description attribute
1277 values are supplied by the client in the Job/Document Creation operation using corresponding Operation attributes
1278 as flagged with "". Unless specified otherwise herein, the Printer MUST NOT support modification of Job Description
1279 and Document Descriptions attributes.

1280 The column labeled "attribute syntax" indicates the attribute syntax (see [rfc2911] section 4.1). The Printer
1281 conformance is indicated along with the reference to the specification in which the attribute is defined. The
1282 conformance for Document Description attributes (if the Printer supports the Document object) is the same as the
1283 corresponding Job Description attributes.

1284 Each of the Document Description attributes have a sub-section in section 9.1. The column labeled References
1285 column contains references to the sub-section in this document if there is significant information there. Those
1286 subsections that are only references to other specifications contain only that reference in the Reference column.
1287 Those attributes that are only Job Description attributes with no subsection in this specification have a "n/a" in the
1288 "Doc Desc" column.

1289 Note: There are no corresponding Page Range (or Page Override) Description attributes. The Page Range is not an
1290 object with a state and it cannot be queried.

1291 Legend:
1292 [job-]   indicates an attribute that shouldn't have had a "job-" prefix in its name in [rfc2911], so that the same attribute
1293   name could also be used for the Document object as a Document Description attribute. Note: For the PWG
1294   Semantic Model, the "job-" prefix is dropped.
1295 "-"   indicates that the Job or Document attribute is *not* defined.
1296 "⇒y"   the Printer MUST populate this Job or Document Description attribute by copying *from* the corresponding
1297   Operation attribute that the client MAY supply[46] in a Job or Document Creation operation. See Table 8 for
1298   the corresponding Operation attribute.
1299 (r/w)   indicates that the Job Description or Document Description attribute is read/write, so that the client can
1300   changes its value using the Set-Job-Attributes or Set-Document-Attributes operation (see section 4.4).

1301   **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	MUST	[rfc2911] §4.3.19	§9.1.1
attributes-natural-language	naturalLanguage	-	⇒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[47]	-	**§9.1.8**
document-digital-signature	type2 keyword	-	⇒y	MAY	-	**§9.1.9**
document-format	mimeMediaType	-	⇒y	MUST	[rfc2911] §3.2.1.1	§9.1.8
document-format-details	1setOf collection	-	⇒y	CMUST[48]	-	**§9.1.11**

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[46] 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.
[47] The Printer MUST support the "document-charset" Operation/Document Description attributes if the Printer
supports any charset-ambiguous document formats (see section **Error! Reference source not found.**).
[48] 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.
document-source-application-name	name(MAX)	-	⇒y	MAY	-	§**Error! Reference source not found.**
document-source-application-version	text(127)	-	⇒y	MAY	-	§**Error! Reference source not found.**
document-source-os-name	name(40)	-	⇒y	MAY	-	§**Error! Reference source not found.**
document-source-os-version	text(40)	-	⇒y	MAY	-	§**Error! Reference source not found.**
document-format	mimeMediaType	-	⇒y	MUST	-	§**Error! Reference source not found.**
document-format-device-id	text(127)	-	⇒y	MUST	-	§**Error! Reference source not found.**
document-format-version	text(127)	-	⇒y	MAY	-	§**Error! Reference source not found.**
document-natural-language	naturalLanguage	-	⇒y	MAY	-	§**Error! Reference source not found.**
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	-	§**9.1.14**
document-format-version-detected	text(127)	-	**y**	MAY	-	§**9.1.15**
document-job-id	integer(1:MAX)	-	**y**	MUST	-	§9.1.11
document-job-uri	uri	-	**y**	MUST	-	§9.1.17
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

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] §6.1**Error! Reference source not found.**	-
job-collation-type	type2 enum	**y**	**-**	MAY	[rfc3381] §4.1	-
[job-]detailed-status-message	1setOf text (MAX)	**y**	**y**	MAY	[rfc2911] §4.3.10	§9.1.28
[job-]document-access-errors	1setOf text(MAX)	**y**	**y**	MAY	[rfc2911] §4.3.11	§9.1.29
job-id	integer (1:MAX)	**y**	**-**	MUST	[rfc2911] §4.3.2	-
[job-]impressions	integer(0:MAX)	⇒**y**	⇒**y**	MAY	[rfc2911] §4.3.17.2	§9.1.31
[job-]impressions-completed	integer(0:MAX)	**y**	**y**	MAY	[rfc2911] §4.3.18.2	§9.1.32
[job-]k-octets	integer(0:MAX)	⇒**y**	⇒**y**	MAY	[rfc2911] §4.3.17.1	§9.1.33
[job-]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] §6.3**Error! Reference source not found.**	-
[job-]media-sheets	integer(0:MAX)	⇒**y**	⇒**y**	MAY	[rfc2911] §4.3.17.3	§9.1.35
[job-]media-sheets-completed	integer(0:MAX)	**y**	**y**	MAY	[rfc2911] §4.3.18.3	§9.1.36
job-message-from-operator	text(127)	**y**	**-** [49]	MAY	[rfc2911] §4.3.16	-
[job-]more-info	uri	**y**	**y**	MAY	[rfc2911] §4.3.4	§9.1.37
job-name(r/w)	name(MAX)	⇒**y**	**-** [50]	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 [51]	[ippsave] §6.1	-
[job-]printer-up-time	integer (1:MAX)	**y**	**y**	MUST	[rfc2911] §4.3.14.4	§9.1.38
job-printer-uri	uri	⇒[52]**y**	**-**	MUST	[rfc2911] §4.3.3	-
job-state	type1 enum	**y**	**-** [53]	MUST	[rfc2911] §4.3.7	-
job-state-message	text(MAX)	**y**	**-** [54]	MAY	[rfc2911] §4.3.9	-
job-state-reasons	1setOf type2 keyword	**y**	**-** [55]	MUST	[rfc2911] §4.3.8	-
job-uri	uri	**y**	**-**	MUST	[rfc2911] §4.3.1	-
[job-]warnings-count	integer(0:MAX)	**y**	**y**	MAY	[pwg5100.4] §6.1	§**9.1.39**

---

[49] 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.

[50] The Document Description attribute that corresponds to the "job-name" Job Description attribute is the (existing) "document-name" attribute defined in [rfc2911].

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

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

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

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

[55] 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**	MAY	[rfc2911] §4.3.12	§9.1.39
number-of-documents	integer(0:MAX)	**y**	-	MAY	[rfc2911] §4.3.15	-
number-of-intervening-jobs	integer(0:MAX)	**y**	-	MAY	[rfc2911] §4.3.13	-
output-device-requested	name(127)	**y**	-	MAY	[jobx] §6.5**Error! Reference source not found.**	-
output-device-assigned	name(127)	**y**	**y**	MAY	[rfc2911] §4.3.7.2	§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

1302   "y", "⇒**y**", "-"   See the description in the Legend before the table.
1303
1304   Most of the existing "job-state" and "job-state-reasons" Job Description attribute values apply equally well to
1305   individual documents in a multi-document job (with removal of the 'job-' prefix for those that apply to both Job and
1306   Document). Furthermore, the job states are completely service-type neutral, so they can apply to scanning. faxing,
1307   formatting processes as well. The job state reasons have a number of reasons that are print service specific, but
1308   most can apply to other types of service as well. The reason for separating state from reasons, is so that the states
1309   can be the fundamental states that most implementations have, while the state reasons can vary depending on the
1310   sophistication of the system. The states are the ones that clients are most likely to base actions upon, and the state
1311   reasons are more information, both for programs and people.

1312   The descriptions of the new "document-state" and "document-state-reasons" attributes are merged in with the
1313   existing "job-state" and "job-state-reasons". Such merging shows the parallelism in the description to aid
1314   understanding and implementation and so that future maintenance will continue this strong parallelism. The "/"
1315   character separates the words: Job from Document so that the same description can serve for both Job and
1316   Document objects.

1317   9.1 Document Description attributes

1318   This section contains *all* of the Document Description attributes for use with the Document object. Most of these
1319   definitions refer to the corresponding Job Template attribute semantics in other specifications. However, the
1320   semantics of each Document Description attribute only applies to the Document object containing the Document
1321   Description attribute.   The Printer MAY support changing these Document Description attributes with the Set-
1322   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!*

1323   9.1.1 attributes-charset (charset)

1324   This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1325   attribute (see [rfc2911] §4.3.19) applied to the Document object. The Printer sets this Document Description attribute
1326   from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section
1327   4.1).

1328 **9.1.2 attributes-natural-language (naturalLanguage)**

1329 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1330 attribute (see [rfc2911] §4.3.20) applied to the Document object. The Printer sets this Document Description attribute
1331 from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section
1332 4.1).

1333 **9.1.3 compression (type3 keyword)**

1334 This REQUIRED Document Description attribute specifies the compression used to represent this document (see
1335 [rfc2911] §3.2.1.1). The Printer sets this Document Description attribute from the corresponding Operation attribute
1336 supplied by the client in the Document Creation operation (see section 4.1).

1337 **9.1.4 current-page-order (type2 keyword)**

1338 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1339 attribute (see [pwg5100.3] §4.1) applied to the Document object.

1340 **9.1.5 date-time-at-completed (dateTime)**

1341 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1342 attribute (see [rfc2911] §4.3.14.7) applied to the Document object.

1343 **9.1.6 date-time-at-creation (dateTime)**

1344 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1345 attribute (see [rfc2911] §4.3.14.5) applied to the Document object.

1346 **9.1.7 date-time-at-processing (dateTime)**

1347 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1348 attribute (see [rfc2911] §4.3.14.6) applied to the Document object.

1349 **9.1.8 document-charset (charset)**

1350 This OPTIONAL Document Description attribute specifies the charset used to represent this document (see [JobX]
1351 §4.2.1). The Printer sets this Document Description attribute from the corresponding Operation attribute supplied by
1352 the client in the Document Creation operation (see section 4.1).

1353 **9.1.9 document-digital-signature (type2 keyword)**

1354 This OPTIONAL Description attribute specifies the digital signature technology used in the Document content. The
1355 Printer sets this Document Description attribute from the corresponding "document-digital-signature" Operation
1356 attribute ([JobX] §4.2.2 for the semantics), if supplied by the client in the Document Creation operation (see section
1357 4.1). If a Printer supports the "document-digital-signature" Operation attribute, the Printer MUST support this
1358 "document-digital-signature" Document Description attribute.

1359   **9.1.10 document-format (mimeMediaType)**

1360   This REQUIRED[56] Document Description attribute specified the document format of the Document Object content.
1361   The Printer sets this Document Description attribute from the corresponding "document-format" Operation attribute
1362   (see section [JobX] §4.2.3for the semantics), if supplied by the client in the Document Creation operation (see
1363   section 4.1).

1364   **9.1.11 document-format-details (1setOf collection)**

1365   This OPTIONAL Description attribute specifies the details of the document format(s) of the Document Object content.
1366   The Printer sets this Document Description attribute from the corresponding "document-format-details" Operation
1367   attribute ([JobX] §4.2.4 for the semantics), if supplied by the client in the Document Creation operation (see section
1368   4.1). . If a Printer supports the "document-format-details" Operation attribute, the Printer MUST support this
1369   "document-format-details" Document Description attribute.

1370   **9.1.12 document-format-details-detected (1setOf collection)**

1371   This OPTIONAL Description attribute is generated by the Printer to indicate the actual document format details of the
1372   Document object as detected by the Printer. The member attributes are the same as the "document-format-details"
1373   Operation attribute. (see [JobX] §6.6.4 for details)

1374   **9.1.13 document-format-detected (mimeMediaType)**

1375   This OPTIONAL Description attribute is generated by the Printer to indicate the actual document format of the
1376   Document object content as detected by the Printer. See [JobX] §6.6.5 for detailed semantics.

1377   **9.1.14 document-format-version (text(127))**

1378   This OPTIONAL Description attribute specifies the version of the document format of the Document Object content.
1379   The Printer sets this Document Description attribute from the corresponding "document-format-version" Operation
1380   attribute ([JobX] §4.2.6 for the semantics), if supplied by the client in the Document Creation operation (see section
1381   4.1). If a Printer supports the "document-format-version" Operation attribute, the Printer MUST support this
1382   "document-format-version" Document Description attribute.

1383   **9.1.15 document-format-version-detected (text(127))**

1384   This OPTIONAL Description attribute is generated by the Printer to indicate the actual document format version of
1385   the Document content as detected by the Printer. See [JobX] §6.6.7 for detailed semantics..

1386   **9.1.16 document-job-id (integer(1:MAX))**

1387   This REQUIRED Document Description attribute is a *copy* of the Job's "job-id" Job Description attribute (see
1388   [rfc2911] §4.3.2), i.e., the "job-id" of the Job containing this Document.

1389   **9.1.17 document-job-uri (uri)**

1390   This REQUIRED Document Description attribute is a *copy* of the Job's "job-uri" Job Description attribute (see
1391   [rfc2911] §4.3.1), i.e., the URI of the Job that contains this Document. Example:
1392   ipp://www.company.com/printers/myprinter/jobs/22

---

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

9.1.18 document-message (text(MAX))

1393

1394 This OPTIONAL Document Description contains a message from either (1) the user to the operator about the
1395 Document or (2) from the operator, system administrator, or "intelligent" process to indicate to the end user the
1396 reasons for modification or other management action taken on the Document. The Printer populates this Document
1397 Description attribute from the "document-message" (text(MAX) Operation attribute value supplied by the client in any
1398 of the Document Creation operations (see section 4.1) or in a Cancel-Document operation (see section 4.5).

1399 In addition, the user and the operator can set the value of this Document Description attribute explicitly using the Set-
1400 Document-Attributes operation (see section 4.4).

9.1.19 document-name (name(MAX))

1401

1402 This REQUIRED Document Description attribute specifies the name of the document (see [rfc2911] §3.2.1.1).   The
1403 Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client in
1404 the Document Creation operation (see section 4.1).

1405 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)

1406

1407 This OPTIONAL Document Description attribute specifies the natural language of the Document Object content. The
1408 Printer sets this Document Description attribute from the corresponding "document-natural-language" Operation
1409 attribute (section 7.2.1 for the semantics), if supplied by the client in the Document Creation operation (see section
1410 4.1). If a Printer supports the "document-natural-language" Operation attribute, the Printer MUST support this
1411 "document-natural-language" Document Description attribute.

9.1.21 document-number (integer(1:MAX))

1412

1413 This REQUIRED Document Description attribute is the ordinal number of the document within the job which
1414 determines its order of being printed in a multi-document job. The Printer MUST generate the values monotonically
1415 increasing from 1 for each job.

9.1.22 document-printer-uri (uri)

1416

1417 This REQUIRED Document Description attribute is a *copy* of the "printer-uri" Operation attribute (see [rfc2911]
1418 §3.1.5), i.e., the URI of the Printer containing the Job which contains this Document. Example:
1419 ipp://www.company.com/printers/myprinter.

9.1.23 document-state (type1 enum) and job-state (type1 enum)

1420

1421 The REQUIRED "document-state" Document Description attributes identify the current state of the document. Even
1422 though IPP defines five values for document state (plus the out-of-band 'unknown' value - see [rfc2911] section 4.1),
1423 implementations only need to support those states which are appropriate for the particular implementation. In other
1424 words, an IPP Printer implementation supports only those document states implemented by the output device and
1425 available to the IPP Printer implementation.

1426 Table 12 lists the "document-state" attribute values.

1427   **Table 12 - "document-state" attribute values**

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

1428

1429   Standard enum values are:

Value	Symbolic Name and Description
'3'	**'pending'** : The document has not started to be processed at all.
'4'	**'pending-held'** : The 'pending-held' state does not apply to the Document object's "document-state" attribute.
'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 Documenthasn'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 document, such as adding the 'printing' value to indicate when the output device is actually making marks on

'6'	**'processing-stopped'** : The 'processing-stopped' state does not apply to the Document object's "document-state" attribute.
'7'	**'canceled'** : The document has been canceled by a Cancel-Document operation and the Printer has completed canceling the document and all document status attributes have reached their final values for the document. While the Printer is canceling the document, the document remains in its current state, but the document's " document-state-reasons" attribute SHOULD contain the 'processing-to-stop-point' value and one of the 'canceled-by-user', 'canceled-by-operator', or 'canceled-at-device' value. When the document 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 document has been aborted by the system, usually while the document was in the 'processing' state and the Printer has completed aborting the document and all document status attributes have reached their final values for the document. While the Printer is aborting the document, the document remains in its current state, but the document's " document-state-reasons" attribute SHOULD contain the 'processing-to-stop-point' and 'aborted-by-system' values. When the document moves to the 'aborted' state, the 'processing-to-stop-point' value, if present, MUST be removed, but the 'aborted-by-system'

Value	Symbolic Name and Description
	value, if present, MUST remain.
'9'	**'completed'** : The document has completed successfully or with warnings or errors after processing and all of the document media sheets have been successfully stacked in the appropriate output bin(s) and all document status attributes have reached their final values for the document. The document's " document-state-reasons" attribute SHOULD contain one of: 'completed-successfully', 'completed-with-warnings', or 'completed-with-errors' values.

1430 The final value for this attribute MUST be one of: 'completed', 'canceled', or 'aborted' before the Printer removes the
1431 document altogether. The length of time that documents remain in the 'canceled', 'aborted', and 'completed' states
1432 depends on implementation.

1433 Documents reach one of the three terminal states: 'completed', 'canceled', or 'aborted', after the Job has completed
1434 all activity for the Document, including stacking output media, and all document status attributes have reached their
1435 final values for the document.

1436

1437 **9.1.23.1 The "document-state" Document Description attribute and the Document object life Cycle**

1438 The "document-state" attribute is one of the most important Document Description attributes. Figure 1 shows the
1439 values of the "document-state" attribute and the Document object life cycle as affected by actions on the Job,
1440 Document, Printer, and job processing. Documents are not active objects and their life cycle is closely tied to the
1441 lifecycle of a Job[57]. Documents basically have three states. The first is waiting to be processed by a Job (i.e.
1442 pending). The second state is from the time the Job first starts processing the Document (i.e., processing) and until it
1443 reaches one of its terminal states. The third state for a Document is one of its terminal states (i.e., completed,
1444 canceled, or aborted).
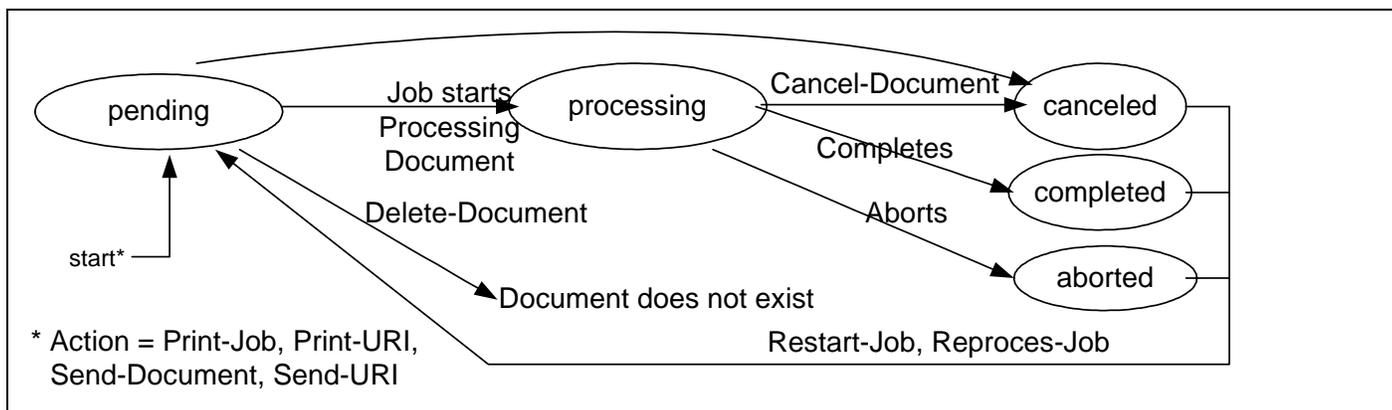
1445

1446 **Figure 1 - The "document-state" Document Description attribute and the Document object life cycle**

1447 A Document object has a much simpler life cycle than a Job object. A Document always progresses from left to right
1448 in the state diagram. No other state transitions are defined.

---

[57] 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.

1449 **9.1.23.2 Forwarding Servers**

1450 As with all other IPP attributes, if the implementation can not determine the correct value for this attribute, it SHOULD
1451 respond with the out-of-band value 'unknown' (see [rfc2911] Section 4.1) rather than try to guess at some possibly
1452 incorrect value and give the end user the wrong impression about the state of the Job/Document object. For
1453 example, if the implementation is just a gateway into some printing system from which it can normally get status, but
1454 temporarily is unable, then the implementation should return the 'unknown' value. However, if the implementation is
1455 a gateway to a printing system that never provides detailed status about the document, the implementation MAY set
1456 the IPP Document object's state to 'completed', provided that it also sets the 'queued-in-device' value in the
1457 document's " document-state-reasons" attribute (see "document-

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

1458

1459 This OPTIONAL Document Description attribute specifies information about the " document-state" and " document-
1460 state-reasons" attributes in human readable text. If the Printer supports this attribute, the Printer MUST be able to
1461 generate this message in any of the natural languages identified by the Printer's "generated-natural-language-
1462 supported" attribute (see the "attributes-natural-language" Operation attribute specified in [rfc2911] Section 3.1.4.1).

1463 The value SHOULD NOT contain additional information not contained in the values of the "job-state" and "job-states-
1464 reasons" attributes, such as interpreter error information. Otherwise, application programs might attempt to parse the
1465 (localized text). For such additional information such as interpreter errors for application program consumption or
1466 specific document access errors, new attributes with keyword values, needs to be developed and registered.

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

1467

1468 The REQUIRED "document-state-reasons" Document Description attribute provide additional information about each
1469 document's current state, i.e., information that augments the value of the Document's "document-state" attribute.

1470 These values MAY be used with any document state for which the reason makes sense. Some of these value
1471 definitions indicate conformance requirements; the rest are OPTIONAL. Furthermore, when implemented, the Printer
1472 MUST return these values when the reason applies and MUST NOT return them when the reason no longer applies
1473 whether the value of the Document's "document-state" attribute changed or not. When the Document does not have
1474 any reasons for being in its current state, the value of the Document's "document-state-reasons" attribute MUST be
1475 'none'.

1476 Some of the Job's "job-state-reasons" values affect job scheduling, such as 'resources-are-not-ready' and 'job-hold-
1477 until-specified'. However, "document-state-reasons" values MUST NOT affect job scheduling, since Document
1478 objects are passive objects operated on by the containing Job object.

1479 Note: While values cannot be added to the "document-state" attributes without impacting deployed clients that take
1480 actions upon receiving "document-state" values, it is the intent that additional "document-state-reasons' values can
1481 be defined and registered without impacting such deployed clients. In other words, the "document-state-reasons"
1482 attributes are intended to be extensible.

1483 Table 13 lists the standard keyword values for the "document-state-reasons" attributes defined in this and other IPP
1484 specifications as indicated in the References column. In Table 13 the keywords are listed in alphabetic order
1485 (observing the "[job-]" prefix), while in their descriptions following Table 13, they are listed in the most likely order of
1486 occurrence to help understanding.

1487 When the Document object is supported, the Printer implementation SHOULD still support the corresponding Job
1488 level "job-state-reasons", so that clients that do not support the Document object will receive the same information.
1489 Also it is usually more convenient for the client to obtain just the Job level status. However, the client SHOULD
1490 query both Job and Document attributes and convert them to some canonical form for display to the user, so that all
1491 Jobs and their Documents are displayed in a uniform manner, no matter from which clients they were submitted.

1492 **Notation:**
1493 [job-] indicates a state reason keyword value that has the 'job-' prefix when it is a value of the "job-state-reasons"
1494   attribute, but does not have the 'job-' prefix when it is a value of the "document-state-reasons" attribute[58]. For
1495   purposes of sorting in Table 13, the "[job-]" prefix is observed.
1496 "-"   indicates that the Job or Document value is *not* defined.

1497   **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] §
	digital-signature-type-not-supported	MAY	[jobx] §
	document-access-error	MAY	[rfc2911] §4.3.8
	document-format-error	MAY	[rfc2911] §4.3.8
	[job-]canceled-at-device	MAY	[rfc2911] §4.3.8
	[job-]canceled-by-operator	MAY	[rfc2911] §4.3.8
	[job-]canceled-by-user	MAY	[rfc2911] §4.3.8
	[job-]completed-successfully	MAY	[rfc2911] §4.3.8
	[job-]completed-with-errors	MAY	[rfc2911] §4.3.8
	[job-]completed-with-warnings	MAY	[rfc2911] §4.3.8
	[job]-data-insufficient	MAY	[rfc2911] §4.3.8
	[job-]digital-signature-wait	MAY	[jobx] §
	[job-]errors-detected	MAY	[jobx] §
	[job-]incoming	MAY	[rfc2911] §4.3.8
	[job-]interpreting	MAY	[rfc2911] §4.3.8
	[job-]outgoing	MAY	[rfc2911] §4.3.8
	[job-]printing	MAY	[rfc2911] §4.3.8
	[job-]queued	MAY	[rfc2911] §4.3.8
	[job-]queued-for-marker	MAY	[rfc2911] §4.3.8
	[job-]spooling	MAY	[ippsave] §8.3.1
	[job-]streaming	MAY	[ippsave] §8.3.1
	[job-]transforming	MAY	[rfc2911] §4.3.8
	[job-]warnings-detected	MAY	[pwg5100.4] §7.1
	none	MUST	[rfc2911] §4.3.8
	processing-to-stop-point	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
	submission-interrupted	MAY	[rfc2911] §4.3.8
	unsupported-compression	MUST	[rfc2911] §4.3.8
	unsupported-document-format	MUST	[rfc2911] §4.3.8

1498
1499 For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely
1500 to occur (if implemented), starting with the 'none' value. :

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[58] 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.

1501 **'none' :** There are no reasons for the document's current state. This state reason is semantically equivalent
1502   to "document-state-reasons" attribute without any value and MUST be used when there is no other
1503   value, since the 1setOf attribute syntax requires at least one value. [rfc2911] §4.3.8

1504 **'digital-signature-did-not-verify'** : The Document contains a digital signature type that is supported (see
1505   section [JobX] §but the signature did not verify when the Printer attempted to verify the signature.
1506   [jobx]

1507 **'resources-are-not-supported'** : At least one of the resources needed by the document, such as media,
1508   fonts, resource objects, etc., is not supported on any of the physical printers for which the document
1509   is a candidate. This condition MAY be detected when the document is accepted, or subsequently
1510   while the document is pending or processing, depending on implementation. The job containing the
1511   document may (1) remain in its current state, (2) be moved to the 'pending-held' state, depending on
1512   implementation and/or job scheduling policy, or (3) scheduled normally, but the Printer is put into the
1513   'stopped' state when the document is attempted to be processed on the Printer. This value is
1514   intended for use with an implementation that supports the "user-defined-values-supported" Printer
1515   attribute (see [pwg5100.3] section 6.1), which allows a job to be accepted with an unsupported
1516   'name' value. [pwg5100.3] §6.1

1517 **'resources-are-not-ready'** : At least one of the resources needed by the document, such as media, fonts,
1518   resource objects, etc., is not ready on any of the physical printer's for which the document is a
1519   candidate. This condition MAY be detected when the document is accepted, or subsequently while
1520   the document is pending or processing, depending on implementation. The job containing the
1521   document may remain in its current state or be moved to the 'pending-held' state, depending on
1522   implementation and/or scheduling policy. [rfc2911] §4.3.8

1523 **incoming'** : The Printer is retrieving/accepting document data as a result of a Print-Job, Print-URI, Send-
1524   Document or Send-URI operation. [rfc2911] §4.3.8

1525 **spooling'** : Same as 'job-incoming' with the specialization that the Printer is spooling the Document data
1526   before processing it. This value corresponds to the 'spool' or 'automatic' value of the "job-spooling-
1527   supported" Printer Description attribute. [ippsave] §8.3.1

1528 **streaming'** : Same as 'job-incoming' with the specialization that the Printer is processing the Document data
1529   as it is being received (that is, the document is not being spooled, but rather is being processed in
1530   chunks by the output device and is being imaged during reception). This value corresponds to the
1531   'stream' or 'automatic' value of the "job-spooling-supported" Printer Description attribute. [ippsave]
1532   §8.3.1

1533 **data-insufficient'** : The Printer is expecting additional document data before it can move the document into
1534   the 'processing' state. If a Printer starts processing before it has received all data, the Printer
1535   removes the 'job-data-insufficient' reason, but the 'job-incoming' remains. If a Printer starts
1536   processing after it has received all data, the Printer removes the 'job-data-insufficient' reason and the
1537   'job-incoming' at the same time. [rfc2911] §4.3.8

1538 **'unsupported-compression'** : The document was aborted by the system because the Printer determined
1539   while attempting to decompress the document-data's that the compression is actually not among
1540   those supported by the Printer. This value MUST be supported, since "compressions is a
1541   REQUIRED Operation attribute. [rfc2911] §4.3.8

1542 **'compression-error'** : The document was aborted by the system because the Printer encountered an error
1543   in the document-data while decompressing it. If the Printer posts this reason, the document-data
1544   has already passed any tests that would have led to the 'unsupported-compression' job-state-
1545   reason/document-state-reason. [rfc2911] §4.3.8

1546 **'document-access-error'** : After accepting a Print-URI or Send-URI request, the Printer could not access
1547   the documents reference. This reason is intended to cover any file access problem, including file
1548   does not exist and access denied because of an access control problem. The Printer MAY also
1549   indicate the document access error using the " document-access-errors" Printer Description attribute
1550   Whether the Printer aborts the document and moves the document to the 'aborted' job state or prints

1551   all documents that are accessible and moves the document to the 'completed' document state and
1552   adds the 'completed-with-errors' value in the job's "job-state-reasons" or document's "document-
1553   state-reasons" attribute depends on implementation and/or site policy. This value SHOULD be
1554   supported if the Print-URI or Send-URI operations are supported. [rfc2911] §4.3.8

1555   **'unsupported-document-format'** : The document was aborted by the system because the document-data's
1556   document-format is not among those supported by the Printer. If the client specifies the document-
1557   format as 'application/octet-stream', the printer MAY abort the document and post this reason even
1558   though the format is a member of the "document-format-supported" printer attribute, but not among
1559   the auto-sensed document-formats. This value MUST be supported, since "document-format" is a
1560   REQUIRED Operation attribute. [rfc2911] §4.3.8

1561   **'document-format-error'** : The document was aborted by the system because the Printer encountered an
1562   error in the document-data while processing it. If the Printer posts this reason, the document-data
1563   has already passed any tests that would have led to the 'unsupported-document-format' job-state-
1564   reason/document-state-reason. [rfc2911] §4.3.8

1565   **'submission-interrupted'** : The document was not completely submitted for some unforeseen reason, such
1566   as: (1) the Printer has crashed before the document was closed by the client, (2) the Printer or the
1567   document transfer method has crashed in some non-recoverable way before the document data was
1568   entirely transferred to the Printer, (3) the client crashed or failed to close the job before the time-out
1569   period. See the description of the "multiple-operation-time-out" Printer attribute in [rfc2911] Section
1570   4.4.31. [rfc2911] §4.3.8

1571   **'outgoing'** : The Printer is transmitting the document to the output device. [rfc2911] §4.3.8

1572   **'queued'** : Document is in the 'processing' state, but more specifically, the Printer has queued the Document
1573   data. [rfc2911] §4.3.8

1574   **'transforming'** : Document is in the 'processing' state, but more specifically, the Printer is interpreting
1575   document data and producing another electronic representation. [ippsave] §8.3.1

1576   **'interpreting'** : Document is in the 'processing' state, but more specifically, the Printer is interpreting the
1577   document data. [rfc2911] §4.3.8

1578   **'queued-for-marker'** : Document is in the 'pending', or 'processing' states, but more specifically, the Printer
1579   has completed enough processing of the document to be able to start marking and the document is
1580   waiting for the marker. All implementations put the document into (or back into) the 'processing'
1581   state when marking does begin. rfc2911] §4.3.8

1582   **'printing'** : The output device is marking media. This value is useful for Printers which spend a great deal of
1583   time processing (1) when no marking is happening and then want to show that marking is now
1584   happening or (2) when the document is in the process of being canceled or aborted while the
1585   document remains in the 'processing' state, but the marking has not yet stopped so that impression
1586   or sheet counts are still increasing for the document. [rfc2911] §4.3.8

1587   **'canceled-by-user'** : The document was canceled by the owner of the job using the Cancel-Document
1588   request, i.e., by a user whose authenticated identity is the same as the value of the originating user
1589   that created the Job object, or by some other authorized end-user, such as a member of the job
1590   owner's security group. The 'canceled-by-user' value SHOULD be supported for the "document-
1591   state-reasons" attributes for use with the Cancel-Document. [rfc2911] §4.3.8

1592   **'canceled-by-operator'** : The document was canceled by the operator using the Cancel-Document request,
1593   i.e., by a user who has been authenticated as having operator privileges (whether local or remote). If
1594   the security policy is to allow anyone to cancel anyone's document, then these values may be used
1595   when the document is canceled by other than the owner of the job. For such a security policy, in
1596   effect, everyone is an operator as far as canceling documents is concerned. These values SHOULD
1597   be supported if the implementation permits canceling by other than the owner of the job. [rfc2911]
1598   §4.3.8

1599 **'canceled-at-device'** : The document was canceled by an unidentified local user, i.e., a user at a console at
1600   the device. This value SHOULD be supported if the implementation supports canceling
1601   jobs/documents at the console. [rfc2911] §4.3.8

1602 **'aborted-by-system'** : The document (1) is in the process of being aborted, or (2) has been aborted by the
1603   system and placed in the 'aborted' state.. This value SHOULD be supported. [rfc2911] §4.3.8

1604 **'processing-to-stop-point'** : The requester has issued a Cancel-Document operation or the Printer has
1605   aborted the document, but is still performing some actions on the document until a specified stop
1606   point occurs or document termination/cleanup is completed.
1607   If the implementation requires some measurable time to cancel the document in the 'processing' or
1608   'processing-stopped' document states, the Printer MUST use this value to indicate that the Printer is
1609   still performing some actions on the document while the document remains in the 'processing' state.
1610   After all the document's document description attributes have stopped incrementing, the Printer
1611   moves the document from the 'processing' state to the 'canceled' or 'aborted' document states.
1612   [rfc2911] §4.3.8

1613 **'errors-detected'** : If the Printer supports these values, the Printer MUST add the value to "document-state-
1614   reasons" when it generates the first error message. That is, a single occurrence of this value is
1615   present in the "document-state-reasons" if the Printer has generated one or more errors. An error
1616   indicates loss of information, such as a page not imaged. A warning indicates no loss of information
1617   (see 'warnings-count' state reason). [jobx] §

1618 **'warnings-detected'** : If the Printer supports these values, the Printer MUST add the value to "-state-
1619   reasons" when it generates the first warning message. That is, a single occurrence of this value is
1620   present in the "document-state-reasons" if the Printer has generated one or more warnings. A
1621   warning indicates something did not go as expected, but there was no loss of information. For
1622   example, a font substitution. An error indicates loss of information (see 'errors-count' state reason).
1623   [jobx] §

1624 **'completed-successfully'** : The document completed successfully. There were no warnings or errors in
1625   printing. This value SHOULD be supported. [rfc2911] §4.3.8

1626 **'completed-with-warnings'** : The print part of the document completed with warnings (whether or not there
1627   were save errors). This value SHOULD be supported if the implementation detects warnings.
1628   [rfc2911] §4.3.8

1629 **'completed-with-errors'** : The print part of the document completed with errors (and possibly warnings too)
1630   (whether or not there were save errors). This value SHOULD be supported if the implementation
1631   detects errors. [rfc2911] §4.3.8

1632 **'queued-in-device'** : The document has been forwarded to a device or print system that is unable to send
1633   back status. The Printer sets the document's "document-state" attribute to 'completed' and adds the
1634   'queued-in-device' value to the document's " document-state-reasons" attribute to indicate that the
1635   Printer has no additional information about the document and never will have any better information.
1636   See the description of the " document-state" attribute above, specifically the portion on "Forwarding
1637   Servers". [rfc2911] §4.3.8

1638 NOTE: The semantics of this attribute or the set of valid values may be different for different document formats.

1639 9.1.26 document-uri (uri)

1640 This Document Description attribute is the URI that the client supplied in the corresponding Operation attribute in a
1641 Send-URI operation (see [rfc2911] section 3.3.2). The Printer MUST support this attribute if the Printer supports the
1642 Send-URI operation (see section 4.2).

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

1644 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1645 attribute (see [rfc3381] §4.4) applied to the Document object.

9.1.28 [job-]detailed-status-message (1setOf text(MAX))

1647 This OPTIONAL "detailed-status-message" Document Description attribute has the same semantics as the
1648 corresponding "job-detailed-status-message" Job Description attribute (see [rfc2911] §4.3.10) applied to the
1649 Document object.

9.1.29 [job-]document-access-errors (1setOf text(MAX))

1651 This OPTIONAL "document-access-errors" Document Description attribute has the same semantics as the
1652 corresponding "job-detailed-status-message" Job Description attribute (see [rfc2911] §4.3.11) applied to the
1653 Document object.

9.1.30 [job-]errors-count (integer(0:MAX))

1655 This OPTIONAL "errors-count" Document Description attribute counts the number of errors that the Printer
1656 encounters while processing and printing the Document object. An error indicates loss of information, such as a
1657 page not imaged. A warning indicates no loss of information (see [jobx] §4.3.11)

9.1.31 [job-]impressions (integer(0:MAX))

1659 This OPTIONAL "impressions" Document Description attribute has the same semantics as the corresponding "job-
1660 impressions" Job Description attribute (see [rfc2911] §4.3.17.2) applied to the Document object.   The Printer sets
1661 this Document Description attribute from the corresponding Operation attribute supplied by the client in the
1662 Document Creation operation (see section **Error! Reference source not found.**).

9.1.32 [job-]impressions-completed (integer(0:MAX))

1664 This OPTIONAL "impressions-completed" Document Description attribute has the same semantics as the
1665 corresponding "job-impressions-completed" Job Description attribute (see [rfc2911] §4.3.18.2) applied to the
1666 Document object.

9.1.33 [job-]k-octets (integer(0:MAX))

1668 This OPTIONAL "k-octets" Document Description attribute has the same semantics as the corresponding "job-k-
1669 octets" Job Description attribute (see [rfc2911] §4.3.17.1) applied to the Document object. The Printer sets this
1670 Document Description attribute from the corresponding Operation attribute supplied by the client in the Document
1671 Creation operation (see section **Error! Reference source not found.**).

9.1.34 [job-]k-octets-processed (integer(0:MAX))

1673 This OPTIONAL "k-octets-processed" Document Description attribute has the same semantics as the corresponding
1674 "job-k-octets-processed" Job Description attribute (see [rfc2911] §4.3.18.1) applied to the Document object.

9.1.35 [job-]media-sheets (integer(0:MAX))

1676 This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-
1677 media-sheets" Job Description attribute (see [rfc2911] §4.3.17.3) applied to the Document object.   The Printer sets

1678 this Document Description attribute from the corresponding Operation attribute supplied by the client in the
1679 Document Creation operation (see section **Error! Reference source not found.**).

1680 9.1.36 [job-]media-sheets-completed (integer(0:MAX))

1681 This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-
1682 media-sheets-completed" Job Description attribute (see [rfc2911] 4.3.18.3) applied to the Document object.

1683 9.1.37 [job-]more-info (uri)

1684 This OPTIONAL "more-info" Document Description attribute has the same semantics as the corresponding "job-
1685 more-info" Job Description attribute (see [rfc2911] §4.3.4) applied to the Document object.

1686 9.1.38 [job-]printer-up-time (integer (1:MAX))

1687 This REQUIRED "printer-up-time" Document Description attribute indicates the amount of time (in seconds) that the
1688 Printer implementation has been up and running. This attribute is an alias for the "printer-up-time" Printer Description
1689 attribute (see [rfc2911] section 4.4.29).

1690 A client MAY request this attribute in a Get-Document-Attributes or Get-Documents request and use the value
1691 returned in combination with other requested Event Time Job Description Attributes in order to display time attributes
1692 to a user. The difference between this attribute and the 'integer' value of a "time-at-xxx" attribute is the number of
1693 seconds ago that the "time-at-xxx" event occurred. A client can compute the wall-clock time at which the "time-at-
1694 xxx" event occurred by subtracting this difference from the client's wall-clock time.

1695 9.1.39 [job-]warnings-count (integer(0:MAX))

1696 This OPTIONAL "warnings-count" Document Description attribute has the same semantics as the corresponding
1697 "job-warnings-count" Job Description attribute (see [jobx] §.) applied to the Document object.   See [pwg5100.4] §6.1.
1698 A warning indicates something did not go as expected, but there was no loss of information. For example, a font
1699 substitution. An error indicates loss of information (see section 9.1.30).

1700 9.1.40 last-document (boolean)

1701 This OPTIONAL Document Description attribute indicates whether or not this Document is the last Document in the
1702 Job.   See [rfc2911] §4.3.12. The Printer sets this Document Description attribute from the corresponding Operation
1703 attribute supplied by the client in the Document Creation operation (see section **Error! Reference source not**
1704 **found.**).

1705 9.1.41 output-device-assigned (name(127))

1706 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1707 attribute (see [rfc2911] §4.3.7.2) applied to the Document object.

1708 9.1.42 sheet-completed-copy-number (integer(0:MAX))

1709 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1710 attribute (see [rfc3381] §4.2) applied to the Document object.

1711 9.1.43 time-at-completed (integer (MIN:MAX))

1712 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1713 attribute (see [rfc2911] §4.3.14.3) applied to the Document object.

1714 **9.1.44 time-at-creation (integer (MIN:MAX))**

1715 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1716 attribute (see [rfc2911] §4.3.14.1) applied to the Document object.

1717 **9.1.45 time-at-processing (integer (MIN:MAX))**

1718 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1719 attribute (see [rfc2911] §4.3.14.2) applied to the Document object.

1720 # 10 Printer attributes

1721 This section lists *all* of the Printer attributes defined in other IPP documents. Printer attributes are divided into three
1722 disjoint groups:

1723

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

1724
1725 In a Get-Printer-Attributes request, a client can request all of the Printer attributes in the Job Template (JT) or Printer
1726 Description (PD) groups by supplying the 'job-template' or 'printer-description' group name, respectively. The client
1727 can also request "all". The column labels are:

1728   "**Attribute Syntax**" - indicates the attribute syntax (see [rfc2911] section 4.1). Many "xxx-default" and "xxx-
1729   supported" attributes have the 'collection' syntax which consists of a number of member attributes.
1730   These member attributes are not listed in this table when they are the same as the corresponding
1731   "xxx" attribute in Table 10. Only those few Printer attribute collection attributes that do not have a
1732   corresponding Job Template attributes show the member attributes in this table.

1733   "**Grp**" - indicates to which group the attribute belongs. "PD" = Printer Description; "JT" = Job Template as
1734   explained above.

1735 "**Printer Conf**." - indicates the IPP/1.1 Printer conformance requirements for supporting the attribute. Those
1736 attributes labeled as "MAY" may have conditional requirements that require their support, if the
1737 Printer supports a related attribute, operation, or feature. For example, all Job Template attributes
1738 are OPTIONAL for a Printer to support. However, if a Printer supports Job Template attribute "xxx",
1739 then it MUST also support the corresponding "xxx-default" and "xxx-supported" attributes. Similarly,
1740 if Event Notification is supported, then some of the attributes indicated as "MAY" in this table become
1741 MUST.

1742 "**Reference**" - lists the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

1743 **Table 14 - Printer attributes (Job Template and Printer Description)**

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
attributes-charset-supported	1setOf charset	PD	MUST	[this-spec] §**Error! Reference source not found.**
attributes-natural-language-supported	1setOf naturalLanguage	PD	MUST	[this-spec] §**Error! Reference source not found.**
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 [59]	[jobx] §
document-charset-supported	1setOf charset	PD	CMUST[59]	[jobx] §
document-creation-attributes-supported	1setOf type2 keyword	PD	MUST	[this-spec] §10.1
document-digital-signature-default	type2 keyword	PD	MAY	[jobx] §
document-digital-signature-supported	1setOf type2 keyword	PD	MAY	[jobx] §z,.z.z
document-format-default	mimeMediaType	PD	MUST	[rfc2911] §4.4.21
document-format-details-supported	1setOf type2 keyword	PD	CMUST [60]	[jobx] §
document-format-details-implemented	1setOf collection	PD	CMUST[60]	[jobx] §
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] §

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[59] The Printer MUST support the "document-charset-default" and "document-charset-supported" Printer Description attributes, if the Printer supports a charset-ambiguous document format (see section **Error! Reference source not found.**).

[60] 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 & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
document-format-version-supported	1setOf text(127)	PD	MAY	[jobx] §
document-natural-language-default	naturalLanguage	PD	MAY	[jobx] §z.z.z
document-natural-language-supported	1setOf naturalLanguage	PD	MAY	[jobx] §z.z.z
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
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] §z.z.z
job-copies-supported	reangeOfInteger(1:MAX)	JT	MAY	[jobx] §z.z.z
job-cover-back-default	collection	JT	MAY	[jobx] §z.z.z
job-cover-back-supported	1setOf type2 keyword	JT	MAY	[jobx] §z.z.z
job-cover-front-default	collection	JT	MAY	[jobx] §z.z.z
job-cover-front-supported	1setOf type2 keyword	JT	MAY	[jobx] §z.z.z
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

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
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] §z.z.z
job-finishings-supported	1setOf type2 enum	JT	MAY	[jobx] §z.z.z
job-finishings-col-default	collection	JT	MAY	[jobx] §z.z.z
job-finishings-col-supported	1setOf type2 keyword	JT	MAY	[jobx] §z.z.z
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
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	- [61]	MAY	[ippsave] §7.6
any "media-col" member attribute				
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

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[61] The Printer does not return the "media-col-database" attribute when the client requests '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 & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
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
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[62]	[rfc2911] §4.2.4
multiple-document-handling-supported	1setOf type2 keyword	JT	MUST[62]	[rfc2911] §4.2.4
multiple-document-jobs-supported	boolean	PD	MUST[62]	[rfc2911] §4.4.16
multiple-operation-time-out	integer(1:MAX)	PD	MUST[62]	[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] §z.z.z

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[62] A Printer MUST support "multiple-document-handling-default", "multiple-document-handling-default", "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 & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
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
page-overrides-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.4] §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	[pwg5100.4] §5.3.2
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
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

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
reference-uri-schemes-supported	1setOf uriScheme	PD	MUST[63]	[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
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

1744
1745   The remainder of this section defines the Printer Description attributes that are not defined in other specifications.
1746   Most of these are "xxx-default" and "xxx-supported" Printer Description attributes. A Printer MUST support these
1747   Printer Description attributes, if it supports the corresponding Operation/Description attributes, in order to indicate the
1748   default and supported values that the Printer supports.

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

1749	**10.1 document-creation-attributes-supported (1setOf type2 keyword)**

1750	This REQUIRED Printer Description attribute lists the keyword names of the Document Template and Operation
1751	attributes that the Printer will accept in the Send-Document and Send-URI Document Creation operations.

1752	# 11 New Values for Existing Printer Description Attributes

1753	This section contains those attributes for which additional values are added.

1754	**11.1 operations-supported (1setOf type2 enum)**

1755	The following "operation-id" values are added in order to support the new operations defined in this document:

1756	**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

1757

1758	# 12 Encodings of Additional Attribute Tags

1759	This section assigns values to an attributes tags as an extension to the encoding defined in [rfc2910]).

1760	The "document-attributes-tag" delimits Document Template Attributes Groups in requests and Document Attributes
1761	Groups in responses.

1762	The following table specifies the values for the delimiter tag:

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

1763

1764	# 13 Status codes

1765	This section defines additional status codes for use with multi-document jobs.

1766	**13.1 server-error-too-many-jobs (0x050B)**

1767	The client has attempted to create a Job using any of the Job Creation operations which would exceed the capacity
1768	of the Printer and/or the policy for this user or type of job. The client SHOULD NOT try again later.

1769 **13.2 server-error-too-many-documents (0x050C)**

1770 The client has attempted to create a Document using any of the Document Creation operations which would exceed
1771 the capacity of the Printer for this Job and/or the policy for this user or type of job. The client SHOULD NOT try again
1772 later.

1773 # 14 Conformance Requirements

1774 This section specifies the conformance requirements for Printers and clients.

1775 ## 14.1 Printer conformance requirements

1776 In order to conform to this specification, a Printer:

1777   1. MUST meet the conformance requirements for Printers specified in [rfc2911].

1778   2. MUST support the Job operation that section 3 REQUIRES a Printer to support.

1779   3. MUST support the Document operations that section 4 REQUIRES a Printer to support.

1780   4. MAY support any of the Administrative operations in section 5.

1781   5. MUST support the Attribute Precedence semantics specified in section 6 for the levels that the Printer
1782   supports.

1783   6. MUST support the Operation attributes in the Send-Document operation and, if supported, the Send-URI
1784   operation that section 7 REQUIRES a Printer to support.

1785   7. MUST support any Operation attributes that section 7 REQUIRES a Printer to support along with the
1786   corresponding Document Description attributes that section 9 REQUIRES a Printer to support and any
1787   "xxx-default" and "xxx-supported" Printer attributes that section 10 REQUIRES a Printer to support.

1788   8. MAY support any of the Document Template attributes in Document Creation operations as indicated in
1789   section 8 and MUST NOT support them for contexts for where they are not defined as indicated in the
1790   Table 11 with an "-".

1791   9. MUST support the Document Description attributes that section 9 REQUIRES a Printer to support.

1792   10. MUST support the Printer attributes that section 10 REQUIRES a Printer to support.

1793   11. MUST support the values of Printer Description attributes that section 11 REQUIRES a Printer to
1794   support.

1795 ## 14.2 Client conformance requirements

1796 In order to conform to this specification, a client:

1797   1. MUST meet the conformance requirements for clients specified in [rfc2911]

1798   2. MAY support any of the Document operations defined in section 3.8.

1799   3. MUST supply the Operation attributes that section 7 REQUIRES a client to supply in operation requests.

1800   4. MUST supply any Document Template attributes in the format that section 8 REQUIRES a client to supply in
1801   Document Creation operations and MUST NOT support them for contexts for where they are not defined as
1802   indicated in the Table 11 with an "n".

1803   5. SHOULD support any of the Document Description attributes that section 9 REQUIRES a Printer to support.

1804   6. MAY support any of the Printer attributes listed in section 10.

1805   7. MAY support any of the values of the Printer Descriptions attributes in section 11.

1806 15 Normative References

1807 Note: The references in the body of this IEEE-ISTO document use the more reader-friendly mnemonic symbols
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1921   17 IANA Considerations

1922   This section contains the registration information for IANA to add to the various IPP Registries according to the
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1924   registrations will be published in the http://www.iana.org/assignments/ipp-registrations registry.

1925   *Note to the RFC Editor: Replace the References below to [this spec] with the RFC number for the appropriate*
1926   *document, so that it accurately reflects the content of the information for the IANA Registry.*

1927   17.1 Attribute Registrations

1928   The following table lists all the attributes defined in this specification. These are to be registered according to the
1929   procedures in RFC 2911 [rfc2911] section 6.2. If the attribute has a separate sub-section definition in this
1930   specification, that sub-section is listed as the Reference. This specification lists most Job Template attributes as also
1931   being Document Template attributes. However, the definitions of these Document Template attributes are not
1932   duplicated in this specification. Instead, the Reference column in this sub-section indicates Section 8 which contains
1933   a table of all Job Template and corresponding Document Template attributes (including dropping the "job-" prefix).
1934   This table contains the reference in another specification that completely defines each attribute.   These Document
1935   Template attributes will also be added to the IANA IPP Registry under the Document Template attributes with a
1936   reference to this specification and Section 8.
1937
```
1938    Attribute Name (attribute syntax)                 Reference    Section
1939    ----------------------------------                ----------   --------
1940    Document Description attributes:
1941    attributes-charset (charset)                      [this spec]  9.1.1
1942    attributes-natural-language (naturalLanguage)     [this spec]  9.1.2
1943    compression (type3 keyword)                       [this spec]  9.1.3
```

```
1944  current-page-order (type2 keyword)            [this spec]  9.1.4
1945  date-time-at-completed (dateTime)             [this spec]  9.1.5
1946  date-time-at-creation (dateTime)              [this spec]  9.1.6
1947  date-time-at-processing (dateTime)            [this spec]  9.1.7
1948  detailed-status-message (1setOf text (MAX))   [this spec]  9.1.28
1949  document-access-errors (1setOf text(MAX))     [this spec]  9.1.29
1950  document-charset (charset)                    [this spec]  9.1.8
1951  document-digital-signature (type2 keyword)    [this spec]  9.1.9
1952  document-format (mimeMediaType)               [this spec]  9.1.8
1953  document-format-details (collection)          [this spec]  9.1.11
1954    document-source-application-name (name(MAX))  [this spec]  **Error!**
1955  **Reference source not found.**
1956    document-source-application-version (text(127))
1957                                                [this spec]  **Error!**
1958  **Reference source not found.**
1959    document-source-os-name (name(40))          [this spec]  **Error!**
1960  **Reference source not found.**
1961    document-source-os-version (text(40))       [this spec]  **Error!**
1962  **Reference source not found.**
1963    document-format (mimeMediaType              [this spec]  **Error!**
1964  **Reference source not found.**
1965    document-format-device-id (text(127))       [this spec]  **Error!**
1966  **Reference source not found.**
1967    document-format-version (text(127)          [this spec]  **Error!**
1968  **Reference source not found.**
1969    document-natural-language (1setOf naturalLanguage)
1970                                                [this spec]  **Error!**
1971  **Reference source not found.**
1972  document-format-details-detected (1setOf collection)
1973                                                [this spec]  9.1.12
1974  document-format-detected (mimeMediaType)      [this spec]  9.1.13
1975  document-format-version (text(127))           [this spec]  9.1.14
1976  document-format-version-detected (text(127))  [this spec]  9.1.15
1977  document-job-id (integer(1:MAX))              [this spec]  9.1.11
1978  document-job-uri (uri)                        [this spec]  9.1.17
1979  document-message (text(MAX))                  [this spec]  9.1.18
1980  document-name (name(MAX))                     [this spec]  9.1.19
1981  document-natural-language (naturalLanguage)   [this spec]  9.1.20
1982  document-number (integer(0:MAX))              [this spec]  9.1.21
1983  document-printer-uri (uri)                    [this spec]  9.1.22
1984  document-state (type1 enum)                   [this spec]  9.1.23
1985  document-state-message (text(MAX))            [this spec]  9.1.24
1986  document-state-reasons (1setOf type2 keyword) [this spec]  9.1.25
1987  document-uri (uri)                            [this spec]  9.1.26
1988  impressions  (integer(0:MAX))                 [this spec]  9.1.31
1989  impressions-completed (integer(0:MAX))        [this spec]  9.1.32
```

```
1990   impressions-completed-current-copy (integer(0:MAX))
1991                                               [this spec]  9.1.27
1992   k-octets  (integer(0:MAX))                  [this spec]  9.1.33
1993   k-octets-processed (integer(0:MAX))         [this spec]  9.1.34
1994   last-document  (boolean)                    [this spec]  9.1.39
1995   media-sheets  (integer(0:MAX))              [this spec]  9.1.35
1996   media-sheets-completed (integer(0:MAX))     [this spec]  9.1.36
1997   more-info (uri)                             [this spec]  9.1.37
1998   output-device-assigned (name(127))         [this spec]  9.1.41
1999   printer-up-time (integer (1:MAX))           [this spec]  9.1.38
2000   sheet-completed-copy-number (integer(0:MAX)) [this spec]  9.1.42
2001   time-at-completed (integer (MIN:MAX))       [this spec]  9.1.43
2002   time-at-creation (integer (MIN:MAX))        [this spec]  9.1.44
2003   time-at-processing (integer (MIN:MAX))      [this spec]  9.1.45
2004
2005
2006   Document Templates attributes:
2007   ACTION (Tom) - Need to add the xxx-default and xxx-supported for each.
2008   copies (integer(1:MAX))                     [this spec]    8
2009   cover-back (collection)                     [this spec]    8
2010     cover-type (type2 keyword)               [this spec]    8
2011     media (type3 keyword | name(MAX))        [this spec]    8
2012     media-col (collection)                   [this spec]    8
2013   cover-front (collection)                    [this spec]    8
2014     cover-type (type2 keyword)               [this spec]    8
2015     media (type3 keyword | name(MAX))        [this spec]    8
2016     media-col (collection)                   [this spec]    8
2017   feed-orientation (type3 keyword)            [this spec]    8
2018   finishings (1setOf type2 enum)              [this spec]    8
2019   finishings-col (collection)                 [this spec]    8
2020     finishing-template (name(MAX))           [this spec]    8
2021     stitching (collection)                   [this spec]    8
2022       stitching-locations (1setOf integer(0:MAX)) [this spec]    8
2023       stitching-offset (integer (0:MAX))     [this spec]    8
2024       stitching-reference-edge (type2 keyword) [this spec]    8
2025   font-name-requested (name(MAX))             [this spec]    8
2026   font-size-requested (integer(1:MAX))        [this spec]    8
2027   force-front-side (1setOf integer(1:MAX))    [this spec]    8
2028   imposition-template (type2 keyword | name(MAX)) [this spec]    8
2029   insert-sheet (1setOf collection)            [this spec]    8
2030     insert-after-page-number (integer(0:MAX)) [this spec]    8
2031     insert-count (integer(0:MAX))            [this spec]    8
2032     media (type3 keyword | name(MAX))        [this spec]    8
2033     media-col (collection)                   [this spec]    8
2034   media (type3 keyword | name(MAX))          [this spec]    8
2035   media-col (collection)                      [this spec]    8
```

```
2036    media-back-coating (type3 keyword | name(MAX)) [this spec]    8
2037    media-color (type3 keyword | name(MAX))          [this spec]    8
2038    media-front-coating (type3 keyword | name(MAX))[this spec]    8
2039    media-hole-count (integer(0:MAX))                [this spec]    8
2040    media-info (text(255))                           [this spec]    8
2041    media-key (type3 keyword | name(MAX))            [this spec]    8
2042    media-order-count (integer(1:MAX))               [this spec]    8
2043    media-preprinted (type3 keyword | name(MAX))     [this spec]    8
2044    media-recycled (type3 keyword | name(MAX))       [this spec]    8
2045    media-size (collection)                          [this spec]    8
2046      x-dimension (integer(0:MAX))                   [this spec]    8
2047      y-dimension (integer(0:MAX))                   [this spec]    8
2048    media-type (type3 keyword | name(MAX)            [this spec]    8
2049    media-weight-metric (integer(0:MAX))             [this spec]    8
2050  media-input-tray-check (type3 keyword | name(MAX))
2051                                                     [this spec]    8
2052  number-up (integer(1:MAX))                         [this spec]    8
2053  orientation-requested (type2 enum)                 [this spec]    8
2054  output-bin (type2 keyword | name(MAX))             [this spec]    8
2055  page-delivery (type2 keyword)                      [this spec]    8
2056  page-order-received (type2 keyword)                [this spec]    8
2057  page-overrides (1setOf collection)                 [this spec]    8
2058    document-copies (1setOf rangeOfInteger(MAX))     [this spec]    8
2059    input-documents (1setOf rangeOfInteger(MAX))     [this spec]    8
2060    output-documents (1setOf rangeOfInteger(MAX))    [this spec]    8
2061    pages (1setOf rangeOfInteger(MAX))               [this spec]    8
2062    <any other Job Template attributes that affect pages,
2063     such as media or media-col>
2064  page-ranges (1setOf rangeOfInteger(1:MAX))         [this spec]    8
2065  pages-per-subset (1setOf integer(1:MAX))           [this spec]    8
2066  presentation-direction-number-up (type2 keyword) [this spec]    8
2067  print-quality (type2 enum)                         [this spec]    8
2068  printer-resolution (resolution)                    [this spec]    8
2069  separator-sheets (collection)                      [this spec]    8
2070    media (type3 keyword | name(MAX))                [this spec]    8
2071    media-col (collection)                           [this spec]    8
2072    separator-sheets-type (type3 keyword | name(MAX))
2073                                                     [this spec]    8
2074  sheet-collate (type2 keyword)                      [this spec]    8
2075  sides (type2 keyword)                              [this spec]    8
2076  x-image-position (type2 keyword)                   [this spec]    8
2077  x-image-shift (integer(MIN:MAX))                   [this spec]    8
2078  x-side1-image-shift (integer(MIN:MAX))             [this spec]    8
2079  x-side2-image-shift (integer(MIN:MAX))             [this spec]    8
2080  y-image-position (type2 keyword)                   [this spec]    8
2081  y-image-shift (integer(MIN:MAX))                   [this spec]    8
```

```
2082   y-side1-image-shift (integer(MIN:MAX))            [this spec]    8
2083   y-side2-image-shift (integer(MIN:MAX))            [this spec]    8
2084
2085
2086
2087   Printer Description attributes:
2088   document-creation-attributes-supported (1setOf type2 keyword)
2089                                                     [this spec]  10.1
2090
2091   Operation attributes:
2092   document-message (text(MAX))                      [this spec]   9.1.18
2093
```

2094   17.2 Keyword attribute values

2095   <mark>ACTION (Tom) - Need to list the keyword attribute values. Do so by reference to the values registered for</mark>
2096   <mark>corresponding attributes.</mark>

2097   17.3 Enum Attribute Values

2098   The following table lists all the new enum attribute values defined in this document as additional type2 enum values.
2099   These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.
2100

```
2101    Value        Name                             Reference   Section:
2102   --------     ----------------------           ---------   -------
2103   document-state (type1 enum)                    [this spec] 9.1.23
2104    3    pending                                  [this spec] 9.1.23
2105    5    processing                               [this spec] 9.1.23
2106    7    canceled                                 [this spec] 9.1.23
2107    8    aborted                                  [this spec] 9.1.23
2108    9    completed                                [this spec] 9.1.23
2109
2110
2111   operations-supported (type2 enum)              [rfc2911]   4.4.15
2112    0x0033    Cancel-Document                     [this spec] 4.5
2113    0x0034    Get-Document-Attributes             [this spec] 4.3
2114    0x0035    Get-Documents                       [this spec] 3.3
2115    0x0036    Delete-Document                     [this spec] 5.4
2116    0x0037    Set-Document-Attributes             [this spec] 4.4
2117
```

2118   17.4 Operations

2119   The following table lists all of the operations defined in this document. These are to be registered according to the
2120   procedures in RFC 2911 [rfc2911] section 6.4.
2121

```
2122   Operations                                     Reference   Section
2123   -------------------------                      ---------   --------
```

```
2124  Cancel-Document                                       [this spec]  4.5
2125
2126  Delete-Document                                       [this spec]  5.4
2127  Get-Document-Attributes                               [this spec]  4.3
2128  Get-Documents                                         [this spec]  3.3
2129
2130  Set-Document-Attributes                               [this spec]  4.4
2131
```

2132 17.5 Attribute Group tags

2133 The following table lists all the attribute group tags defined in this specification. These are to be registered according
2134 to the procedures in RFC 2911 [rfc2911] section 6.5.

```
2135  Value    Name                                   Reference     Section
2136  -----    -----------------------------------    ---------     -------
2137  0x09     document-attributes-tag                [this spec]   12
2138
```

2139 17.6 Status codes

2140 The following table lists all the status codes defined in this specification. These are to be registered according to the
2141 procedures in RFC 2911 [rfc2911] section 6.6.

```
2142  Value     Status Code Name                      Reference    Section
2143  ------    ------------------------------------  ---------    -------
2144  0x0500:0x05FF - Server Error:
2145  0x050B    server-error-too-many-jobs            [this spec]
2146  0x050C    server-error-too-many-documents       [this spec]
```

2147 18 Internationalization Considerations

2148 The internationalization considerations for this extension for handling the Document object are the same as for
2149 handling the Job object in [rfc2911].

2150 19 Security Considerations

2151 The Document object should provide no more increased security considerations than the Job object. The Printer
2152 MUST provide the same access control for Document objects as for Job objects.

2153 The Printer implementer needs to consider counter measures for denial of service attacks for the Create-Job
2154 operation. For example, a rogue client could issue repeated Create-Job and/or Send-Document/Send-URI requests
2155 in an attempt to exceed the capacity of the Printer to absorb such requests and thereby deny Job Creation and
2156 Document Creation requests from other clients. For example, avoid a fixed set of allocations for Jobs and
2157 Documents. Also be able to detect when an excessive number of Create-Job and Send-Document/Send-URI
2158 requests have been supplied. In such a case, the Printer would return either a 'server-error-too-many-jobs' status
2159 code (see section 13.1) or a 'server-error-too-many-documents' status code (see section 13.2).

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2167 21 Acknowledgments

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2187 23 Appendix A: Document operations compared to Job operations

2188   This appendix compares the Document operations with the existing Job operations to show the parallelism.

2189   Table 16 compares the Job and Document operations. The two Conf. columns indicate the conformance
2190   requirements (REQUIRED = REQ, OPTIONAL = OPT) for the Job and Document operations respectively. A "REQ"
2191   in the Document Conformance column means if the Document object is supported. Whether a Document operation
2192   is a method on the Job object or the Document object depends on the modeling regime and is not an essential part
2193   of the semantics described here, since these semantics are intended to apply to both to object-oriented and object-
2194   based protocols, APIs, and implementations.

2195   **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

Job operations	Job Conf.	Document operations	Doc Conf
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)	OPT
Print-URI	OPT	**Send-URI** (existing operation - see [rfc2911] with an additional Document attributes group defined in section 4.2)	OPT
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.*	

2196
2197

2198 # 24 Annex B: Change Log (informative)

2199 The following summaries of the changes in chronological order:

2200 Version 0.3, 9 September 2002:
2201   1. Reformatted as an IEEE-ISTO standard and added the usual sections for a standard.
2202   2. Added "original-requesting-user-name" Operation attribute to Table 8.
2203   3. Added "y" to "output-bin" in Table 10 so it MAY be a Document Template attribute.
2204   4. Clarified the * and in Table 11 - Job and Document Description attributes.
2205   5. Added section 9.1.1 all of the Printer attributes defined In any IPP standard.
2206   6. Allocated operation-id enums in section 11 to the 7 Document operations.
2207   7. Added the conformance section 14
2208   8. Completed the IANA Considerations section 0.
2209
2210 Version 0.4, 14 October 2002:
2211   1. Added the operation specifications.
2212   2. Added the Create-Document and Send-Data to be more parallel with Jobs and support PWG PSI.
2213   3. Resolved the 15 issues in version 0.3 as discussed on the mailing list.
2214   4. Added the Attribute Precedence section 6.
2215   5. Added [ippsave] attributes.
2216   6. Added job-mandatory-attributes, job-cover-back, job-cover-front, job-copies, job-finishings, job-finishings-col.
2217   document-id-uri, and redirect-uri.
2218
2219 Version 0.5, 25 October 2002, as a result of the PWG Semantic Model telecon, October 24, 2002:

2220   1. Fixed the title to say "Proposed Standard" and removed the 5100.n number until the document is approved by
2221   the PWG Last Call to progress as a Draft Standard.
2222   2. Changed Cancel-Document from OPTIONAL to REQUIRED.
2223   3. Added Table 4 and Table 5 to show the request and response signatures of the Document Creation and
2224   Validation operations.
2225   4. Renamed the "document-number" Operation attribute to "input-document-number", to agree with [pwg5100.4]
2226   and because the Document object is really the Input Document (as opposed to the Output Document). The
2227   Printer copies this value to the Document's "document-number" Document Description attribute.
2228   5. Clarified that the Printer MUST reject a Create-Document request if the "document-number" already exists.
2229   6. Clarified that the client cannot supply Subscription attributes in any Document Creation requests.
2230   7. Added "document-message" (text(127)) Operation attribute to the Document Creation requests to go with the
2231   "document-message" agreement (see point #15).
2232   8. Fixed Create-Document response to return Job status attributes in Group 3 and Document status attributes in
2233   Group 4.
2234   9. Required the Printer to return just the "document-number" and "document-id-uri" (uri) Document Description
2235   attribute in a Document Creation response.
2236   10. Added the "document-mandatory-attributes" Operation attribute.
2237   11. Separated the returned Job status attributes and the Document status attributes into two groups, one Job
2238   Attributes and the other Document attributes.
2239   12. Allowed the client to supply or omit the "document-uri" Operation attribute in a Validate-Job request.
2240   13. Clarified that the "document-number" Operation attribute MUST follow the Printer and Job Target in Group 1.
2241   14. Changed the Get-Documents response when there is no "requested-attributes" to simply "document-number"
2242   and "document-id-uri" to be parallel with the Get-Jobs operation.
2243   15. Changed the "message" Operation attribute in Cancel-Document and Cancel-Current-Document to
2244   "document-message" Operation attribute which the Printer copies to the "document-message" Document
2245   Description attribute for use both by the user and the operator.
2246   16. Clarified that the "document-state-reasons" values never affect Job scheduling.
2247   17. Made Job Level - page override programming higher precedence than Document level Document object
2248   attributes.
2249   18. Clarified PDL document data precedence and its relationship to Job Template attributes ending with "-
2250   requested".
2251   19. In Table 8, flagged the Operation attributes that the Printer copies to the corresponding Job and Document
2252   Description attributes in Document Creations operations.
2253   20. Fixed "job-mandatory-attributes" Operation attribute so its only supplied at Job level, now that we have
2254   "document-mandatory-attributes" Operation attribute.
2255   21. Clarified that "ipp-attribute-fidelity" can be supplied at both the Job and Document Levels and how it interacts
2256   with "job-mandatory-attributes" and "document-mandatory-attributes" Operation attributes.
2257   22. Disallowed "output-bin" at the Document Level (and Page Level). It subsets the single stream of Input-Pages
2258   across Input-Documents.
2259   23. Disallowed "page-ranges" at the Page Level.
2260   24. Disallowed "pages-per-subset" at the Document level (and Page Level).
2261   25. Disallowed "separator-sheets" at the Page Level.
2262   26. Added "document-printer-up-time" Document Description attribute for Get-Documents and Get-Document-
2263   Attributes responses that the Printer MUST support, just like "job-printer-up-time" Operation attribute for Get-
2264   Jobs and Get-Job-Attributes.
2265
2266 Version 0.6, 13 January 2003, agreements from New Orleans October PWG meeting and subsequent telecons:
2267   1. Deleted the Cancel-Current-Document and Validate-Document operations.
2268   2. Deprecated the "input-document-number" Operation attribute from the Document Creation operations.
2269   3. Deleted the "document-mandatory-attributes" Operation attribute to align with the PWG Semantic model. So
2270   both specifications have only the "job-mandatory-attributes" Operation attribute. The client can only supply
2271   at the Job Level. The Document Level inherits from the Job Level.
2272   4. Increased "document-message" Operation attribute length from 127 to MAX (1023) octets.
2273   5. Clarified that "ipp-attribute-fidelity" and "job-mandatory-attributes" can only be supplied at the Job Level; the
2274   Document level inherits their values.

2275   6. Added "ipp-attribute-fidelity" and "job-mandatory-attributes" Job Description attributes.
2276   7. Added the "media-size-name" as a member attribute of "media-col" and as a separate Job Template attribute
2277   as used by UPnPv1 and UPnPv2.
2278   8. Added the "media-type" as a Job and Document Template attribute on its own as used by UPnPv1 and
2279   UPnPv2 (as well as leaving it as a member attribute of the "media-col" Job and Document Template
2280   attributes).
2281   9. Renamed "document-printer-up-time" Document Description attribute to simply "printer-up-time".
2282   10. Added the following Job Description attributes: "ipp-attribute-fidelity", and "job-mandatory-attributes".
2283   11. Removed the following Document Description attributes: "ipp-attribute-fidelity".
2284   12. Added the following Document Description attributes: "document-format-detail", "document-format-detected",
2285   "job-id", "job-printer-uri", "job-uri", "output-device-assigned".
2286   13. Defined all of the Document Description attributes, often with references to other specifications, so that they
2287   appear in the table of contents.
2288
2289 Version 0.7, 14 March 2003, agreements from the Maui January PWG meeting and subsequent telecons:
2290   1. Fixed up the file naming and numbering to agree with the latest PWG process agreements.
2291   2. Updated the Abstract and Introduction to reflect the additions.
2292   3. Fixed cross references to use the standard numbers as agreed, rather than mnemonic references.
2293   4. Deprecated the "input-document-number" Operation attribute ([pwg5100.4] section 9.2.1 in the Create-
2294   Document Requests
2295   5. Renamed Send-Data to Send-Document-Data to more clearly reflect the scope of the operation.
2296   6. Added the REQUIRED Close-Job operation to close a job that contains Document objects. Using "last-
2297   document" still works too and the Printer MUST support both ways.
2298   7. Retained the idea that the Printer MUST NOT copy down any attributes supplied in the Job Creation
2299   operation to the Document object as observable in Document object query responses. Document objects
2300   inherit that effect from the Job object.
2301   8. Added the following operation and Document Description attributes: document-container-summary
2302   (collection), document-creator-application-name (name(MAX)), document-creator-application-version
2303   (text(127)), document-creator-os-name (name(40)), document-creator-os-version (text(40)), document-
2304   format-device-id (text(127)), document-format-version (text(127). The "document-container-summary"
2305   collection attribute may contain them, plus "document-format" and "document-natural-language".
2306   9. REQUIRED Printers to support "document-format-version" Document Description.
2307   10. Deprecated "document-overrides" and indicated that the agreement is to re-issue [pwg5100.4] without
2308   "document-overrides".
2309   11. Prefixed the following three Document Description attributes that are copies of Job Description attributes with
2310   "document-" so that no Document attribute has a "job-" prefix: "job-printer-uri" becomes "document-job-
2311   printer-uri", "job-uri" becomes "document-job-uri", and "job-id" becomes "document-job-id".
2312   12. Added the encoding for the "document-attributes-tag" as 0x09.
2313   13. Updated the IANA Registration section, but still needs more work.
2314
2315 Version 0.8, 24 March 2003, agreements from the March 20 telecon:
2316   1. Changed the name of the Send-Document-Data back to Send-Data to keep the name short. There wasn't
2317   support for keeping the name of the object affected in the name of the operation.
2318   2. Changed "job-mandatory-attributes" operation/Job Description attribute so that a Printer MUST support it.
2319   3. Changed the name of the collection attribute back to "document-format-details".
2320   4. Removed the Operation attributes and Document Description attributes that were already in the member
2321   attributes of "document-format-details", so that any details must use the "document-format-details" (1setOf
2322   collection).
2323   5. Clarified that with the removal of "document-overrides", that the client can achieve subset finishing using
2324   "pages-per-subset" and "page-overrides".
2325   6. Clarified that a Printer that supports "page-overrides" Document Template attribute MUST also support it as
2326   an Operation attribute in Send-Document and Send-URI, but not Create-Document, for backward
2327   compatibility.
2328   7. Clarified that containers may contain containers, but that the "document-format-details" MUST be flattened, if
2329   present.

2330   8. Clarified that the collection values MAY describe the container format itself, in which case, it must be the first
2331   collection value.
2332   9. Added "document-format-details-detected (1setOf collection) Document Description attribute.
2333   10. Clarified that "document-natural-language" identifies the primary or first language if a Document contains
2334   more than one language.
2335   11. Added document-format-details-supported (1setOf type2 keyword) Printer Description attribute.
2336   12. Added document-format-details-implemented (1setOf collection) Printer Description attribute.
2337   13. Clarified that a Printer MUST support the "document-creation-attributes-supported" (1setOf type2 keywords)
2338   Printer Description attribute.
2339

2340   Version 0.9, 7 April 2003, agreements from the April 3 telecon:
2341   1. Added "document-charset" (charset), "document-digital-signature" (type2 keyword), "document-format-
2342   version" (text(127)), and "document-natural-language" (naturalLanguage) Operation and Document
2343   Description attributes and corresponding "xxx-default" and "xxx-supported" Printer Description attributes.
2344   2. Changed the "document-natural-language" member attribute of "document-format-details" (1setOf collection)
2345   operation attribute to be 1setOf, but kept the top level "document-natural-language" Operation attribute as
2346   single-valued.
2347   3. Added Summary Table 2 of new Operation/Document Description attributes.
2348   4. Defined CONDITIONALLY REQUIRED and CMUST Conformance Terms.
2349   5. Deleted the "document-id-uri" Operation attribute no longer needed by PSI.
2350   6. Changed "ipp-attribute-fidelity" so it doesn't affect operation attributes, so it is the same as in [rfc2911].
2351   7. Clarified the operation attributes supplied at the Job Level in Print-Job and Print-URI versus Create-Job by
2352   introducing the "p" notation in Table 8.
2353   8. Added columns to Table 8 to show the corresponding Document Description attributes and the "xxx-default"
2354   and "xxx-supported" Printer Description attributes.
2355   9. Clarified that all of the new Operation attributes are hints, except "document-charset" and "document-format"
2356   and that the client can turn them into Must Honor by supplying their keyword attribute names in the "job-
2357   mandatory-attributes Operation attribute.
2358   10. Add the unique lang prefix from the Printer MIB to all "document-format-version" values, so that they can all
2359   be in a single flat list for the Printer's "document-format-version-supported" Printer Description attribute.
2360

2361   Version 0.10, May 1, 2003, agreements from the May 1 telecon:
2362   1. Removed the conformance language from the Abstract.
2363   2. Clarified that the "job-mandatory-attributes" can include keywords that the Printer doesn't support. The
2364   rejection occurs only if the client actually supplies the unsupported Template attribute in a request.
2365   3. Clarified that a Print-Job is indistinguishable to Create-Job and one Send-Document.
2366   4. Added that the Printer MUST reject a redundant Close-Job.
2367   5. Clarified that the Printer MUST validate Create-Document in the context of the Job as a whole, including
2368   previous Documents in the same Job.
2369   6. Split Table 7 of Operation Attributes into two. Show the syntaxes for the "xxx-default" and "xxx-supported"
2370   attributes in the first table.
2371   7. Split the Print-Job/Print-URI from the Create-Job into two columns.
2372   8. Added "output-device-requested" Operation attribute.
2373   9. Added the Printer options (reject, hold, ignore) when the client supplies unsupported values in the Operation
2374   attributes for all but "compression", "document-charset", "document-format".
2375   10. Use the 'application/vnd.PWG-XXX' for unregistered Printer MIB printer languages.
2376   11. Added "output-device-requested (name(127) Operation/Job Description attribute for Job Creation operations.
2377   12. Added "document-format-target" (mimeMediaType) and "document-format-version-target" (text(127) Job
2378   Template and Document Template attributes.
2379   13. Clarified that a Document Template attribute share the "xxx-default" and "xxx-supported" Printer attribute
2380   values with the Job Template attribute of the same name.
2381   14. Added that Document Template attributes MAY have corresponding "xxx-actual" Document Description
2382   attributes.
2383   15. Added "document-format-version-detected" Document Description attribute.

2384	16. Added 'digital-signature-did-not-verify', and 'digital-signature-type-not-supported', and [job-]errors-detected' to
2385	"job-state-reasons" and "document-state-reasons".
2386	17. Added 'job-digital-signature-wait' to "job-state-reasons".
2387	
2388	Version 0.11, May 9, 2003, agreements from the May 1 telecon:
2389	1. Split the document up into 3 separate documents.
2390	a. The Document Object extension to IPP
2391	b. Job and Document extensions to IPP from IPPFAX, PSI and others
2392	c. Future extensions
2393	2. Added 'server-error-too-many-jobs' and 'server-error-too-many-documents' statues codes.
2394	3. Removed Create-Document and Send-Data operations.
2395	4. Removed Job State and job-state-reasons info
2396	