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The Printer Working Group (PWG)

4

Standard for The Internet Printing Protocol (IPP): Document Object

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

14 This specification defines new operations or extends [rfc2911] operations as follows:
15   1 [rfc 2911] operation that creates a Job object: Create-Job
16   2 [rfc 2911] operations that create a Job and Document object: Print-Job, Print-URI
17   2 [rfc 2911] operations that create Document objects: Send-Document, Send-URI
18   5 new operations: Get-Documents, Get-Document-Attributes, Set-Document-Attributes, Cancel-Document,
19   Delete-Document
20 This specification uses the new Operation attributes (defined in [jobx]) that describe the contents of the Document
21 and permit the Printer to reject requests that it cannot process correctly to define new Document Description
22 attributes. The Printer copies these Operation attributes to the corresponding Document Description attributes,
23 which clients may query.

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

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

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34 Working Draft, October 14, 2003

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

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41 This version of the PWG Proposed Standard is available electronically at:
42
43 ftp://ftp.pwg.org/pub/pwg/ipp/new_DOC/wd-ippdoc10-20031014.pdf , .doc, .rtf

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

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82 and support services. The IEEE-ISTO provides a forum not only to develop standards, but also to facilitate activities
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89 **About the IEEE-ISTO PWG**

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

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

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

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

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

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

119 # Contents

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281 # 1   Introduction and Summary

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

292 This specification defines one new operation for Job objects, four new operations for Document objects once they
293 have been created, and extends [rfc2911] operations as follows:

294   1 REQUIRED Job operation: Get-Documents
295   1 REQUIRED Job and Document Creation operation: PrintJob [rfc2911]
296   1 OPTIONAL Job and Document Creation operation: Print-URI [rfc2911]
297   1 REQUIRED Document Creation operation: Send-Document [rfc2911]
298   1 OPTIONAL Document Creation operation: Send-URI [rfc2911]
299   2 REQUIRED Document operations: Cancel-Document, Get-Document-Attributes
300   2 OPTIONAL Document operations: Delete-Document, Set-Document-Attributes.

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

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

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

317 This specification describes an IPP extension which is referenced as part of the PWG Semantic Model. The purpose
318 for specifying the Document object is so the print industry has a common semantic specification for use in IPP, the
319 PWG Semantic Model [pwg-sm], the PWG Print Service Interface (PSI) project [pwg-psi], and the Free Standards
320 Group Job Ticket API [fsg-jt], which all have a Document object.

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

321 **1.1 Scope**

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

328 The Document object is a passive object[2] and is operated upon by the Job. The client uses any of the existing Send-
329 Document, Send-URI, Print-Job, or Print-URI operations to create a Document object. In addition there are 5 new
330 operations that affect the Document object after it has been created as summarized in Table 1.

331   **Table 1 - Summary of operations**

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

332
333 This specification uses existing [rfc2911] and [jobx] Operation attributes summarized in Table 2 to define new
334 Document Description attributes. The Printer copies these Operation attributes supplied by the client in the request
335 to the corresponding Job or Document Description attributes.

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

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

Operation attribute	Creation operation	Printer support	Description
ipp-attribute-fidelity (boolean) * [rfc2911] §15.1	Job	MUST	Allows the client to indicate whether or not the Printer MUST support all Job Template and Document Template attributes.
job-mandatory-attributes (1setOf type2 keyword) [jobx] § 4.1.2	Job	MUST	Allows the client to list which Job Template and Document Template attributes that the Printer MUST support.
document-charset (charset) [jobx] § 4.2.1	Document	CMUST[4]	The charset of the Document Object content.
document-digital-signature (type2 keyword) [jobx] § 4.2.2	Document	MAY	The type of digital signature, if any, used in the Document Object content.
document-format (mimeMediaType) * [rfc2911] §3.2.1.1	Document	MUST	The document format of the Document Object content.
document-format-details (1setOf collection) [jobx] § 4.2.4	Document	CMUST[5]	The details of the Document Object content, including when it's a package of files (e.g. zip, multipart/related). The details include information, such as the application and the operating system that created the document, the intended device type (when the format is device-dependent), and the natural languages of the document.
document-format-version (text(127)) [jobx] § 4.2.5	Document	MAY	The level or version of the document format.
document-natural-language (naturalLanguage) * [rfc2911] §3.2.1.1	Document	MAY	The primary language of the Document Object content.

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

339 # 2 Terminology

340 This section defines terminology used throughout this document.

341 ## 2.1 Conformance Terminology

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

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

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

350   ## 2.2 Other Terminology

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

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

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

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

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

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

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

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

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

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

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

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

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

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

398   **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	

399

400 3 New Job operations and semantic extensions to Job operations

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

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

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

407   3.1 Job Creation operations

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

409   3.1.1 Fidelity Attributes

410   The following Operation attributes have additional semantics when used with document objects. These attributes
411   apply for all the Job Creation operations..   The Fidelity Attributes must be retained when supplied by the Client on
412   Job Creation operations so that they are available when Documents are added to the Job. The semantics of Fidelity
413   on a Job are inherited by all the Documents within that Job.

414   **3.1.1.1 ipp-attribute-fidelity (boolean) ([rfc2911] § 3.2.1 and 15)**

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

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

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

427   **3.1.1.2 job-mandatory-attributes (1setOf type2 keyword) Operation attribute**

428   This REQUIRED Operation attribute identifies which Job Template and Document Template attributes the Printer
429   MUST Honor in this Job Creation request and all subsequent Document Creation requests for this Job.

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

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[8] The Printer MUST NOT copy up to the Job object any Document attributes supplied at the Document Level in
Create-Document, Send-Document, or Send-URI to the Job object as observable by the client in any Get-Job-
Attributes operation responses.

[9] The Printer MUST NOT copy up to the Job object any Document attributes supplied at the Document Level in
Create-Document, Send-Document, or Send-URI to the Job object as observable by the client in any Get-Jobs
operation responses.

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

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

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] § 3.2.4)

443 This REQUIRED[11] 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 attributes [rfc2911] that are a mixture of Job and Document attributes supplied together in the Job attribute
446 group in the request[12]. For example, Job Template attributes such as "job-priority" and "job-hold-until" are Job
447 attributes that affect the Job as a whole. On the other hand, Job Template attributes such 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 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] § 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 Get-Job-Attributes and Get-Document-Attributes, a Job created by Print-Job will be indistinguishable to
471 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-

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

[12] 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.

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).

478   3.1.4 Print-URI ([rfc2911] § 3.2.2)

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

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

485   3.2 Validate-Job ([rfc2911] § 3.2.4)

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

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

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

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

505   3.3 Get-Documents Operation

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

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

514 ### 3.3.1 Get-Documents Request

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

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

519 **Group 1: Operation Attributes**

520 **Natural Language and Character Set:**
521 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] § 3.1.4.1.

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

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

528 **3.3.1.1 "limit" (integer(1:MAX)):**

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

535 **3.3.1.2 "requested-attributes" (1setOf type2 keyword):**

536 The client OPTIONALLY supplies this attribute. The Printer MUST support this attribute. It is a set of
537 Document attribute names and/or attribute groups names in whose values the requester is interested. This
538 set of attributes is returned for each Document object that is returned. The allowed attribute group names
539 are the same as those defined in the Get-Document-Attributes operation in section 4.3.

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

542 'document-number' (see section 9.1.23)

543

544 ### 3.3.2 Get-Documents Response

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

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

550   **Group 1: Operation Attributes**

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

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

557   **Group 2: Unsupported Attributes**

558   See [rfc2911] § 3.1.7 for details on returning Unsupported Attributes.

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

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

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

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

3.4 Cancel-Job ([rfc2911] § 3.3.3)

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

3.5 Send-Document ([rfc2911] § 3.3.1)

582   This REQUIRED Job operation is a Document Creation operation that has been extended to accept a new Document
583   Attributes group (Group 4) that the client can supply (see section 4.1 for the extension semantics).

3.6 Send-URI ([rfc2911] § 3.3.2)

585   This OPTIONAL Job operation is a Document Creation operation that has been extended to accept a new Document
586   Attributes group (Group 4) that the client can supply (see section 4.2 for the extension semantics).

587 ## 3.7 Hold-Job ([rfc2911] § 3.3.5)

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

591 ## 3.8 Release-Job ([rfc2911] § 3.3.6)

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

595 ## 3.9 Restart-Job ([rfc2911] § 3.3.7)

596 This OPTIONAL operation starts the Job over again by processing *all* Documents in the Job as described in [rfc2911]
597 § 3.3.7, including Documents that have been canceled by a previous Cancel-Document operation (see section 4.5).
598 Therefore, the Printer removes any 'canceled-by-*xxx*' values from any of the "document-state-reasons" attributes and
599 the Job's "job-state-reasons" attribute so that any canceled Documents are reprocessed along with the other
600 Documents.

601 ## 3.10 Reprocess-Job ([adm-ops] § 4.1)

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

606 # 4   Document Operations

607 This section defines the Document Creation and Document operations. The Document object semantics are as
608 parallel to the Job object semantics as possible. Therefore, most of the Job operations have analogous Document
609 operations as shown in Table 17 in section "Appendix A: Document operations compared to Job operations".
610 Operations that can apply only to an entire job have no analogous document operation as indicated. This extension
611 adds 5 new Document operations that operate on the Document object once it is created by either of the existing four
612 operations: Send-Document, Send-URI operations, Print-Job and Print-URI.

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

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

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

	Send-Document	Send-URII	Print-Job	Print-URI
Target	MUST be Job	MUST be Job	MUST be Printer	MUST be Printer
"document-uri"	MUST NOT	MUST	MUST NOT	MUST
Document Template attributes	MAY	MAY	MAY	MAY

Data	MUST	MUST NOT	MUST	MUST NOT

618

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

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

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

621

622 4.1 Send-Document ([rfc2911] § 3.3.1) extension

623 This REQUIRED[13] Document Creation operation allows a client to submit multiple documents in a single Job by
624 making a Send-Document request for each Document. In this specification, the Send-Document creates a
625 Document object ([rfc2911] did not have a Document object). A Printer MUST support this operation with the
626 semantics specified in [rfc2911] and with the extension defined in this specification, since this specification
627 REQUIRES the Printer to support multiple document jobs.

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

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

633 4.1.1 Send-Document Request

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

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

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

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

639 The client OPTIONALLY supplies a set of Document Template attributes as listed in Table 10. For example,
640 "media" and "number-up". If the client is not supplying any Document Template attributes in the request, the

---

[13] 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.

641   client SHOULD omit Group 2 rather than sending an empty group. However, a Printer MUST be able to
642   accept an empty group.

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

644   The client MUST supply the document data in-line to be processed for this Document if the "last-document"
645   flag is set to 'false' or omitted. However, since a client might not know that the previous Document Creation
646   operation that the client had supplied (a Send-Document or a Send-URI operation) was the last document
647   (i.e., the client had supplied the "last-document" attribute with a 'false' value), the client MUST use a Send-
648   Document request with no document data where the "last-document" flag is set to 'true' (see [rfc2911] §
649   3.3.1). For this Send-Document case with no data, the Printer MUST NOT increment the value of the Job
650   object's "number-of-documents" attribute, since no Document object was added to the job. In addition, it is
651   not an error for a client to submit a job with no actual document data, i.e., only a single Create-Job and
652   Send-Document request with a "last-document" Operation attribute set to 'true' with no document data; it is
653   an empty job that is scheduled and scheduled and processed normally.

4.1.2 Send-Document Response

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

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

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

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

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

664   See [rfc2911] § 3.1.7 for details on returning Unsupported Attributes.

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

666   The Printer MUST return the same set of Job status attributes as for the Print-Job response as specified in
667   [rfc2911] § 3.2.1.2.

Group 4: Document Object Attributes (new)

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

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

671   The Printer MUST return the document number of this Document object that was assigned by the Printer
672   starting with 1 for each Job (see section 9.1.23).

4.1.2.2 document-state (type1 enum)

674   The Printer MUST return the state of this Document object (see section 9.1.25).

675   **4.1.2.3 document-state-reasons (1setOf type2 keyword)**

676   The Printer MUST return the associated state reasons for this Document (see section 9.1.27).

677   **4.1.2.4 document-state-message (text(MAX))**

678   The Printer MAY return the localized description of the "document-state" and "document-state-reasons"
679   values for this Document (see section 9.1.26).

680   ## 4.2 Send-URI ([rfc2911] § 3.3.2) extension

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

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

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

693   ## 4.3 Get-Document-Attributes

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

698   The Printer MUST return the Document Description attributes that a client supplied in the Document Creation
699   operation (Print-Job, Print-URI, Send-Document or Send-URI) as Operation attributes (see the PJ/PU and SD/SU
700   columns in Table 8 and the Doc column in Table 11), any Document Template attributes supplied by Send-Document
701   or Send-URI operations (see the D column in Table 10), plus any additional Document Description attributes that the
702   Printer has generated, such as "document-state" (see the Doc column in Table 11). The Printer MUST NOT return
703   any Job Level attributes that the Document object inherits and MUST NOT factor out common Document object
704   attributes and return them as Job object attributes. Thus Get-Document-Attributes returns to clients only the
705   attributes that clients submitted in Document Creation operations, plus the additional Document Description attributes
706   that the Printer sets.

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

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

715   - 'document-template': the subset of the Document Template attributes (the "D" column in Table 10) that the
716   implementation supports for Document objects.

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

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

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

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

727 4.3.1 Get-Document-Attributes Request

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

730 **Group 1: Operation Attributes**

731 **Natural Language and Character Set:**
732   The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] § 3.1.4.1.

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

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

742 **4.3.1.1 "requested-attributes" (1setOf keyword):**

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

746 4.3.2 Get-Document-Attributes Response

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

748 **Group 1: Operation Attributes**

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

753   **Natural Language and Character Set:**
754   The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] § 3.1.4.2. The
755   "attributes-natural-language" MAY be the natural language of the Document object, rather than the one
756   requested.

757   **Group 2: Unsupported Attributes**

758   See [rfc2911] § 3.1.7 for details on returning Unsupported Attributes.

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

764   **Group 3: Document Object Attributes**

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

775 4.4 Set-Document-Attributes

776 This OPTIONAL Document operation allows a client to set the values of the attributes of a Document object after the
777 Document object is submittedto the Printer. In the request, the client supplies the set of Document keyword attribute
778 names and values that are to be set. In the response, the Printer returns success or rejects the entire request with
779 indications of which attribute or attributes could not be set.

780 This operation is almost identical to the Set-Job-Attributes operation and follows the same rules for validation (see
781 [rfc3380] § 4.2). The only difference is that the Set-Document-Attributes operation is directed at a Document object
782 rather than a Job object. As with the Set-Job-Attributes operation, the Set-Document-Attributes operation can add an
783 attribute to the Target object and accept the 'delete-attributes' out-of-band value to remove an attribute from the
784 Target object. In addition the validation is the same as the Send-Document and Send-URI operations that create
785 Document objects, i.e., the Printer validation depends on the "xxx-supported" Printer Description attributes (see
786 [rfc2911] § 3.1).

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

790 If the client supplies a document attribute with the "out-of-band" value 'delete-attribute' (see [rfc3380] § 8.2), then the
791 Printer MUST remove the attribute and all of its values from the Document object, if present. The semantic effect of
792 the client supplying the 'delete-attribute' value in a Set-Document-Attributes operation MUST be the same as if the
793 attribute had not been supplied with the Document object in the Document Creation operation, i.e., the Printer applies
794 its default attribute or behavior with lower precedence that the PDL (see the beginning of [rfc2911] § 4.2 and
795 [rfc2911] 3.2.1.1). Any subsequent query of the Document object using Get-Document-Attributes or Get-Documents
796 MUST NOT return any attribute that has been deleted using the 'delete-attribute' out-of-band value. However, a

797 client can re-establish such a deleted Document attribute with any supported value(s) using a subsequent Set-
798 Document-Attributes operation.

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

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

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

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

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

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

825

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

4.4.1 Settable and READ-ONLY Document Description attributes

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

832 Most Document Description attributes (see [rfc2911] § 4.3) are NOT settable, i.e., they are defined to be READ-
833 ONLY. Only Document Description attributes marked with "(r/w)" in Table 11 MAY be settable using Set-Document-
834 Attributes. The Printer MUST reject a Set-Document-Attributes request that attempts to set any attributes in Table 11
835 that are not marked "(r/w)".

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

839 *Access Rights:* The authenticated user (see [rfc2911] § 8.3) performing this operation must either be the job owner
840 (as determined in the Job Creation operation) or an operator or administrator of the Printer (see [rfc2911] § 1 and
841 8.5).

4.4.2 Set-Document-Attributes Request

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

844 **Group 1: Operation Attributes**

845 **Natural Language and Character Set:**
846 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] § 3.1.4.1.

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

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

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

864 **Group 2: Document Attributes**

865 The client MUST supply a set of Document Template attributes with one or more values (including explicitly
866 allowed out-of-band values) as listed in the "D" column in Table 10, and Document Description attributes
867 flagged with "(r/w)" and listed in the "Doc" column in Table 11, and any attribute extensions supported by the
868 Printer. The value(s) of each Document attribute supplied in Group 2 replaces the value(s) of the
869 corresponding Document attribute on the target Document object. For attributes that can have multiple

870   values (1setOf), all values supplied by the client replace all values of the corresponding Document object
871   attribute.

872   In order to set the Document's "document-message" Document Description attribute (see section 9.1.20), the
873   client MUST supply the attribute in Group 2, rather than supplying a "document-message" Operation attribute
874   in Group 1.

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

877 4.4.3 Set-Document-Attributes Response

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

879   **Group 1: Operation Attributes**

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

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

886   **Group 2: Unsupported Attributes**

887   See [rfc2911] § 3.1.7 for details on returning Unsupported Attributes.

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

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

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

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

902   4. The Printer doesn't support the value: if the attribute in the operation has a single value, return it.
903   If the attribute in the operation is multi-valued, return only those values in a 1setOf that are not
904   supported. Return the 'client-error-attributes-or-values-not-supported' status code (see [rfc2911] §
905   13.1.4.12).

906   5. The values of some of the supplied attributes conflict with one another and/or other Document
907   attribute values not being set: if the conflicting attribute in the operation has a single value, return
908   the attribute and the value. If the attribute in the operation is multi-valued, return only the attribute

909   and those values in a 1setOf that are conflicting with other attributes. Return the 'client-error-
910   conflicting-attributes' status code (see [rfc2911] § 13.1.4.15).

911 **4.5 Cancel-Document**

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

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

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

928   The Printer MUST accept or reject the request based on the document's current state and transition the document to
929   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'

930
931   Rule 1: If the implementation requires some measurable time to cancel the document in the 'processing' document
932   states, the Printer MUST add the 'processing-to-stop-point' value to the document's "document-state-reasons"
933   attribute and then transition the document to the 'canceled' state when the processing ceases (see [rfc2911] § 4.3.8).

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

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

940 **4.5.1 Cancel-Document Request**

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

942   **Group 1: Operation Attributes**

943   **Natural Language and Character Set:**
944   The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] § 3.1.4.1.

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

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

954   **4.5.1.1 document-message (text(MAX)):**

955   The client MAY supply this Operation attribute. If the Printer supports this attribute, the Printer MUST also
956   support the corresponding "document-message" (text(MAX)) Document Description attribute (see section
957   9.1.20) and copy this value to the "document-message" Document Description attribute. The end user can
958   use this Document Description attribute as a message to the operator and the operator can use it as a
959   message to the end user. The Printer MAY print this message on a document start sheet for this document,
960   if any.

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

963 4.5.2 Cancel-Document Response

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

965   **Group 1: Operation Attributes**

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

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

972   **Group 2: Unsupported Attributes**

973   See [rfc2911] § 3.1.7 for details on returning Unsupported Attributes.

974   Once a successful response has been sent, the implementation guarantees that the Document will eventually end up
975   in the 'canceled' state. Between the time the Cancel-Document operation is accepted and when the document
976   enters the 'canceled' document-state (see section 9.1.25), the "document-state-reasons" attribute (see section
977   9.1.27) MUST contain the 'processing-to-stop-point' value which indicates to later queries that although the
978   Document might still be 'processing', it will eventually end up in the 'canceled' state, not the 'completed' state.

979 **5   Administrative Job and Document operations**

980 This section summarizes the extensions to existing Administrative Job and Printer operations and defines new
981 Document Administrative operations. The following administrative operations: **Promote-Job** ([adm-ops] § 4.4.1),
982 **Release-Held-New-Jobs** ([adm-ops] § 3.3.2)**, Resume-Job** ([adm-ops] § 4.3.2)**, Schedule-Job-After** ([adm-ops] §
983 4.4.2) do not affect the Document objects because they are defined to affect the Job object as a whole.

984 **5.1 Purge-Jobs** ([rfc2911] § 3.2.9)

985 This OPTIONAL Administrative Printer operation removes all Jobs and all of their contained Document objects.

986 **5.2 Cancel-Current-Job** ([adm-ops] § 4.2)

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

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

993 **5.3 Suspend-Current-Job** ([adm-ops] § 4.3.1)

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

998 **5.4 Delete-Document**

 999 This OPTIONAL Administrative Document operation removes the specified Document object and its data
1000 immediately from the specified Job. The Printer MUST reject the request if the Document is in any state other than
1001 'pending" (there is no 'pending-held' state for Documents). The Printer does not reassign the "document-number"
1002 Document Description attribute values of the remaining Document objects in the Job, so that the deleted Document
1003 object leaves a gap in the document numbering space for the Job. The Printer MUST return a 'client-error-not-found'
1004 status code, in a subsequent Get-Document-Attributes operation for this Document object specifying its former
1005 "document-number". This operation is similar to the Purge-Jobs operation that immediately deletes all jobs from the
1006 Printer. However, the Delete-Document operation only deletes a single Document from the specified Job.

1007 *Access Rights:* The authenticated user (see [rfc2911] § 8.3) performing this operation MUST be an operator or
1008 administrator of the Printer (see [rfc2911] § 1 and 8.5). Otherwise, the Printer MUST reject the operation and return:
1009 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate. This operation
1010 requires operator/administrator privileges, otherwise a rogue client could submit, then delete, at will using up valuable
1011 spooling space. Instead of using this operation, unprivileged users use Cancel-Document which goes through the
1012 normal accounting, if any.

1013 The Delete-Document request and Delete-Document response have the same attribute groups and attributes as the
1014 Cancel-Document operation (see section 4.5).

1015 # 6   Job and Document Template Attribute Precedence during Job processing

1016 This section defines the Attribute Precedence rules that the Printer MUST follow when processing jobs, including
1017 instructions in the PDL data. These rules cover Queue Override attributes, Page Override attributes, Document
1018 Object attributes (Operation/Document Description and Document Template), Document Override attributes, Job
1019 Object attributes (Operation/Job Description and Job Template), PDL instructions, PDL Interpreter initialization files,
1020 and Printer defaults. Since each attribute can be specified at all of these levels, it is important to define which level
1021 takes precedence when the same attribute occurs at different levels with differing values.

1022 The attribute precedence model has the following features:

1023   1) In principle, each defined attribute can occur at each of the precedence levels.

1024   2) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print
1025   driver, submission client, protocol, and Printer:

1026   ?   Attributes are supplied by different agents in the system: application, user, print driver, administrator,
1027   operator, Printer, and the output device hardware.

1028   ?   Attributes are supplied at different points in time: PDL generation, job submission, job acceptance, job
1029   pending, job processing.

1030   3) The later that an attribute is introduced into the work flow or the closer the specified scope of the attribute is to
1031   the affected object, the higher the precedence is assigned to that attribute, since precedence is intended to
1032   reflect the user's wishes.

1033 The following levels of Attribute Precedence are defined in order of decreasing priority:

1034   **1. Document Level - page override programming** - The special "overrides" collection Document
1035   Template attribute (see [OvrRide]) supplied at the Document Level, that is, as a Document Template
1036   Attribute in a Send-Document or Send-URI operation, that contains the attributes that are to have the
1037   page override status for the specified ranges of pages. This can be supplied by the client when
1038   submitting a Document object, or set either by the user or operator after the Document has been
1039   accepted using the Set-Document-Attributes operation, or by the operator using means local to the
1040   Printer. Example: " overrides" = {"pages" = '1:1'; " media" = 'letterhead'}

1041   2. **Job Level - page override programming** - The special "overrides" collection Job Template attribute
1042   (see [OvrRide]) supplied at the Job Level, that is, in a Job Creation operation, that contains the attributes
1043   that are to have the page override status for the specified ranges of pages in the specified Document.
1044   This can be supplied by the client when submitting a job, or set either by the user or operator after the
1045   job has been accepted using the Set-Job-Attributes operation, or by the operator using means local to
1046   the Printer. Example: " overrides" = {"pages" = '1:1'; "document-numbers" = '1:1'; "media" = 'letterhead'}

1047   **3. Document Level - Document object attributes -** The Document attributes supplied at the Document
1048   Level, that is, Operation/Document Description and Document Template attributes supplied in a Send-
1049   Document or Send-URI operation to apply to the Input Document. This can be supplied by the client
1050   when submitting a Document object, or set either by the user or operator after the Document has been
1051   accepted using the Set-Document-Attributes operation, or by the operator using means local to the
1052   Printer. Examples: "media" = 'na-letter' and "copies" = '2'.

1053   4. **Job Level - Job object and Document object attributes** - The Job attributes (Operation/Job
1054   Description and Job Template) and Document attributes (Operation/Document Description and
1055   Document Template) supplied at the Job Level, i.e., with a Create-Job, Print-Job, or Print-URI operation.

1056   This can be supplied by the client when submitting a Job, or set either by the user or operator after the
1057   job has been accepted using the Set-Job-Attributes operation, or by the operator using means local to
1058   the Printer. Examples: "media" = 'na-letter' and "copies" = '2'.

1059   5. **PDL document data** - An instruction in the PDL document data. This is supplied by the application or
1060   print driver that created the PDL. Example: PostScript setPageDevice specifying na-letter media.
1061   Whether PDL document data is actually lower precedence than the preceding levels depends on the
1062   implementation as expressed in the "pdl-override-supported" Printer Description attribute (see [rfc2911] §
1063   4.4.28).
1064
1065   Job Template and Document Template attributes of the form "xxx-requested", such as "orientation-
1066   requested" (see [rfc2911] § 4.2.10) have a lower priority than the PDL. If the PDL contains a
1067   corresponding instruction, that PDL instruction will be used instead of the supplied "xxx-requested"
1068   attribute. For example, PostScript PDL data always has a well-defined orientation, so that "orientation-
1069   requested" never affects the result. On the other hand, PDLs such as text/plain never have orientation
1070   and PCL MAY omit orientation, in which case, "orientation-requested" takes effect.

1071   6. **PDL Init File data** - A file that the Printer uses to initialize the PDL Interpreter before it starts interpreting
1072   each document in a Job. It is immaterial how this file is specified, whether it be by job object attribute or
1073   printer default – the precedence of the contents of this file is at this level.

1074   7. **Printer default** - A Printer "xxx-default" attribute that is applied by the Printer provided that none of the
1075   higher levels have supplied a value. The Printer implementation supplies values for the Printer's "xxx-
1076   default" attributes that reflect the out-of-the-box action by the output device. For example, if the output
1077   device will use media from the large-capacity input tray if not directed otherwise, the implementation
1078   supplies the Printer's "media-default" attribute with the 'large-capacity' keyword value without requiring
1079   the administrator to configure that value. Implementations might allow the administrator to configure the
1080   Printer's "xxx-default" attributes to other values, if other values are supported by the implementation.
1081   Example: The administrator changes the Printer's "media-default" from 'large-capacity' to 'na-letter'.

1082   8. **Hardware default** - When none of the above conditions supply an explicit value, the printer will apply the
1083   defaults supplied by the hardware. An example of these implicit defaults would be a "copies" value of 1
1084   or a "sides" value of 'one-sided'. Note that this level is outside the scope of IPP. The defaults at this
1085   level only apply if there are no explicit values in the higher level. Since this level is outside the scope of
1086   IPP there is no IPP specific way to query the defaults at this level.

1087 7   Operation Attributes for the Job and Document Creation operations

1088 This section defines some new Operation/Description attributes and lists *all* the Operation/Description attributes that
1089 have been defined in other IPP specifications that are used in Job Creation operations and extends their use to the
1090 Document Creation operations. In addition, some new Job/Document Description attributes have been defined to be
1091 set from existing Operation attributes. Note: Operation attributes relate to the operation and do not depend on the
1092 printing capabilities of the Printer.

1093 7.1 Operation Attributes *supplied* at the Job and Document Levels for Creation

1094 Table 7 lists all the Operation attributes and their attribute syntax supplied in Job Creation and Document Creation
1095 operations and the attribute syntaxes of their corresponding "xxx-default" and "xxx-supported" Printer Description
1096 attributes, if any. A "-" indicates that there isn't an "xxx-default" or "xxx-supported" Printer Description attribute.

1097   **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 [14]
attributes-natural-language	naturalLanguage	-	1setOf naturalLanguage [15]
compression	type3 keyword	-	1setOf type3 keyword
document-charset	charset	charset	1setOf charset
document-digital-signature	type2 keyword	type2 keyword	1setOf type2 keyword
document-format	mimeMediaType	mimeMediaType	1setOf mimeMediaType
document-format-details	1setOf collection	1setOf collection	1setOf type2 keyword
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 [16]
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 [17]
original-requesting-user-name	name(MAX)	-	-
output-device-requested	name(127)	name(127) [18]	1setOf name(MAX) [19]
printer-uri	uri	-	1setOf uri
request-id	integer(1:MAX)	-	-

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

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

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

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

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

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

Operation attribute	Operation attribute syntax	Printer: Default Value attribute syntax	Printer: Supported Values attribute syntax
requesting-user-name	name(MAX)	-	-
version-number	X.Y	-	1setOf type2 keyword[20]

1098

1099 Table 8 lists the Operation attributes that clients supply at the Job Level and/or the Document Level and whether the
1100 Printer copies (indicated by **"? "**) the supplied value to corresponding Job Description and/or Document Description
1101 attributes.

1102 *Legend:*
1103 "*****"   an attribute that has a "job-" prefix in its name in [rfc2911]. The "job-" prefix is omitted in the table. Job level
1104   attributes use the "-job" prefix. Document level attributes do not use the prefix.   The only difference in the
1105   semantics are whether it applies to just the Document or to the entire Job. Note: For the PWG Semantic
1106   Model, the "**job-**" prefix is dropped altogether.
1107 "**Level Supplied**" column indicates whether the Operation attribute can be supplied at the Job Level (PJ=Print-Job,
1108   PU=Print-URI, and CJ=Create-Job) and at the Document Level (SD=Send-Document, and SU=Send-URI).
1109 "**y**"   the Operation attribute is defined for the indicated operation, but does not have a corresponding Job
1110   Description or Document Description attribute (no "**?** ").
1111 "**y?** "   the Operation attribute has a corresponding Job Description (y**?** J) or Document Description (y**?** D) attribute
1112   to which the Printer MUST copy this Operation attribute. See Table 11 for the corresponding Job and
1113   Document Description attributes.
1114 "**-**"   the Operation attribute is *not* defined for the indicated operation.
1115 ******   these Operation attributes are defined for *all* operations, not just Job Creation and Document Creation
1116   operations.
1117 "**Conformance**" column indicates the conformance requirements for what the client supplies in a request and the
1118   Printer supports in a request. If an Operation attribute that is a collection attribute is supported (see
1119   [rfc3382]), then there are conformance requirements for which member attributes MUST be supported by a
1120   Printer and which member attributes a client MUST supply as indicated in the Conformance column for each
1121   collection member attribute in Table 8.
1122 "**Reference and Section**" column indicates where the Operation attribute is defined in other IPP specs and this spec.
1123

1124   **Table 8 - Operation Attributes supplied at the Job and Document Levels in Job and Document Creation**
1125   **Requests**

Operation attribute name for Job and Document Creation *requests*	Attribute Syntax	Level Supplied			Conformance		Reference and Section
		Job		Doc			
		CJ	PJ, PU	SD, SU	Client supply	Printer support	
attributes-charset **	charset	**y? J**	**y? J**	**y? D**	MUST	MUST	[rfc2911] §3.1.4
attributes-natural-language **	naturalLanguage	**y? J**	**y? J**	**y? D**	MUST	MUST	[rfc2911] §3.1.4
compression	type3 keyword	-	**y? D**	**y? D**	MAY	MUST	[rfc2911] §3.2.1.1
document-charset	charset	-	**y? D**	**y? D**	MAY	CMUST[21]	[jobx] §43.2.1

---

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

Operation attribute name for Job and Document Creation *requests*	Attribute Syntax	Level Supplied			Conformance		Reference and Section
		Job		Doc			
		CJ	PJ, PU	SD, SU	Client supply	Printer support	
document-digital-signature	type2 keyword	-	**y? D**	**y? D**	MAY	MAY	[jobx] §3.2.2
document-format	mimeMediaType	-	**y? 22D**	**y? D**	MAY	MUST	[rfc2911] §3.2.1.1, [jobx] §3.2.3
document-format-details	1setOf collection	-	**y? D**	**y? D**	MAY	CMUST 23	[jobx] §3.2.4
document-source-application-name	name(MAX)	-	y? D	y? D	MAY	MAY	[jobx] §3.2.4.1
document-source-application-version	text(127)	-	y? D	y? D	MAY	MAY	[jobx] §3.2.4.2
document-source-os-name	name(40)	-	y? D	y? D	MAY	MAY	[jobx] §3.2.4.3
document-source-os-version	text(40)	-	y? D	y? D	MAY	MAY	[jobx] §3.2.4.4
document-format	mimeMediaType	-	y? D	y? D	MUST	MUST	[jobx] §3.2.4.5
document-format-device-id	text(127)	-	y? D	y? D	MAY	MAY	[jobx] §3.2.4.6
document-format-version	text(127)	-	y? D	y? D	SHOULD	MUST	[jobx] §3.2.4.7
document-natural-language	naturalLanguage	-	y? D	y? D	MAY	MAY	[jobx] §3.2.4.8
document-format-version	text(127)	-	**y? D**	**y? D**	MAY	MAY	[jobx] §3.2.5
document-message	text(MAX)	-	**y? D**	**y? D**	MAY	MAY	[jobx] §3.2.6
document-name	name(MAX)	-	**y? D**	**y? D**	MAY	MUST	[rfc2911] §3.2.1.1
document-natural-language	naturalLanguage	-	**y? D**	**y? D**	MAY	MAY	[rfc2911] §3.2.1.1, [this spec] §7.2.1
document-uri	uri	-	**y? D24**	**y? D25**	CMUST 26	MAY	[rfc2911] §3.2.2
impressions*	integer(0:MAX)	**y? J**	**y? J**	**y? D**	MAY	MAY	[rfc2911] §3.2.1.1
ipp-attribute-fidelity	boolean	**y? J27**	**y? J27**	-	MAY	MUST	[rfc2911] §3.2.1.1, [this spec] §3.1.1.1

---

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

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

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

[24] The Printer MUST copy the "document-uri" Operation attribute to the corresponding (new) Document Description attribute defined in this specification for Print-Uri. The document-Uri does does not apply to Print-Job.

[25] The Printer MUST copy the "document-uri" Operation attribute to the corresponding (new) Document Description attribute defined in this specification for Send-Uri. . The document-Uri does does not apply to Send-Document.

[26] 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.

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

Operation attribute name for Job and Document Creation *requests*	Attribute Syntax	Level Supplied			Conformance		Reference and Section
		Job		Doc			
		CJ	PJ, PU	SD, SU	Client supply	Printer support	
job-mandatory-attributes	1setOf type2 keyword	**y? J**[28]	**y? J**	**-**	MAY	MUST	[this spec] §3.1.1.2
job-name	name(MAX)	**y? J**	**y? J**	**-**	MAY	MUST	[rfc2911] §4.3.5
k-octets*	integer(0:MAX)	**y? J**	**y? J**	**y? D**	MAY	MAY	[rfc2911] §3.2.1.1
last-document	boolean	**-**	**-**	**y? D** [29]	MUST	MUST	[rfc2911] §3.3.1.1
media-sheets*	integer(0:MAX)	**y? J**	**y? J**	**y? D**	MAY	MAY	[rfc2911] §3.2.1.1
**operation-id **	integer(1:0x8FFF)	**y**	**y**	**y**	MUST	MUST	[rfc2911] §3.1.2
**original-requesting-user-name **	name(MAX)	**y? J**	**y? J**	**-**	MAY	MAY	[adm-ops] §11.7.2.2
output-device-requested	name(127)	**y? J**	**y? J**	**-**	MAY	MAY	[jobx] §5.5
**printer-uri **	uri	**y? J**[30]	**y? J**[30]	**y? D**[30]	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? J**[31]	**y? J**[31]	**y**	SHOULD	MUST	[rfc2911] §3.2.1.1
**version-number **	X.Y	**y**	**y**	**y**	MUST	MUST	[rfc2911] §3.1.8

1126 "**y**", "**y?** ", and "******": see Legend at the beginning of the Table.

1127 7.2 Operation/Document Description attributes

1128 The rest of this section defines the semantics for the Operation attributes that a client MAY supply in a Document
1129 Creation operation and their corresponding Document Description attributes. The following statements apply to all of
1130 these Operation/Document Description attributes and are *not* repeated in each Description:

1131 If the Printer doesn't support the "xxx" Operation attribute, the Printer MUST ignore the "xxx" attribute (as with any
1132 OPTIONAL Operation attribute) and return the "xxx" attribute with the supplied value as unsupported in the
1133 Unsupported Attributes group as specified in [rfc2911] § 3.1.7.

1134 If the Printer supports the "xxx" Operation attribute, the Printer MUST support it at the Job and Document level. The
1135 Printer MUST also:

---

[28] The Printer MUST copy the "job-mandatory-attributes" 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.
[29] 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.
[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.
[31] The operational attribute "requesting-user-name" may be copied to the Job Description attribute "job-originating-user-name" per the rules specified in [rfc2911] §4.3.6.

1136   1.   support the corresponding "xxx" Document Description attribute of the same name (see section 9.1) and vice
1137   versa.

1138   2.   copy the value of the "xxx" Operation attribute, if supplied by the client, to the corresponding "xxx" Document
1139   Description attribute.

1140   3.   support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if defined
1141   (see section 9.2) and vice versa.

1142   4.   validate the values supplied by the client in the "xxx" Operation attribute against the values indicated in the
1143   Printer's corresponding "xxx-supported" Printer Description attribute (see section 9.2). If the values do not
1144   validate, the Printer MUST either reject the operation or accept the operation as indicated for each of the
1145   attributes described below.

1146   If the client supplies one of the "xxx" Operation/Document attributes with a value that the Printer does not support,
1147   the Printer MUST perform one of the actions indicated for that Operation, unless specified otherwise, such as (1)
1148   reject the request, (2) accept the request and either (a) hold the job for operator intervention or (b) print the Job
1149   ignoring the attribute. In all of these cases, the Printer MUST return the Operation attribute with the unsupported
1150   value in the Unsupported Attributes group in the response (see [rfc2911] § 3.1.7).

1151

1152 7.2.1 document-natural-language (naturalLanguage)

1153   This OPTIONAL Operation attribute specifies the natural language of the Document Object content (see [rfc2911] §
1154   3.2.1.1 and section 4.1.8).

1155   If the client supplies this "document-natural-language" Operation attribute with a value that the Printer doesn't
1156   support, the Printer MUST perform one of the following actions: (1) reject the request OR (2) accept the request and
1157   either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See section 7.2 above
1158   for more details.

1159   The values MAY include the region as well as the language according to [rfc2911] § 4.1.8. If the document contains
1160   more than one language, the value is the first or primary language of the document. The Printer MAY use this value
1161   to select fonts or other Internationalization processing. As indicated in [rfc2911] § 4.1.8, examples include:

1162   'en': for English
1163   'en-us': for US English
1164   'fr': for French
1165   'de': for German
1166

1167 7.3 Operation Attributes *returned* in Job and Document Creation responses

1168   Table 9 lists the Operation attributes that Printers return in Job Creation operation *responses* (Print-Job, Print-URI
1169   and Create-Job) and in Document Creation operation *responses* (Send-Document and Send-URI). The column
1170   labeled "Conformance" indicates the conformance for what the Printer returns and what the Printer supports. The
1171   References column lists the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

1172   **Table 9 - Operation attributes *returned* in Job and Document Creation operation *responses***

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

Operation attribute name	Attribute Syntax Values	Conformance		References
		Printer return	Printer support	
	'utf-8'	MAY	MUST	[rfc2911] §4.1.7
	'us-ascii'	MAY	MAY	[rfc2911] §4.1.7
	'iso-8859-1'	MAY	MAY	[rfc2911] §4.1.7
	'iso-10646-ucs-2'	MAY	MAY	[rfc2911] §4.1.7
attributes-natural-language *	naturalLanguage	MUST	MUST	[rfc2911] §3.1.4
	'en-US'	MAY	MAY	[rfc2911] §4.1.8
detailed-status-messages *	text(MAX)	MAY	MAY	[rfc2911] §3.1.6.3
document-access-error	text(MAX)	MAY	MAY	[rfc2911] §3.1.6.4
document-number	integer(1:MAX)	MUST	MUST	§9.1.23
job-id	integer(1:MAX)	MUST	MUST	[rfc2911] §4.3.2
job-uri	uri	MUST	MUST	[rfc2911] §4.3.1
redirect-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

1173 * - indicates attributes that are defined for *all* operations, not just Job Creation operations
1174

1175 **8   Job Template and Document Template attributes**

1176 Table 10 lists *all* of the Job Template attributes defined in other IPP specifications and lists their corresponding
1177 Document Template attributes defined in this IPP specification. The Job Template attributes can be supplied in the
1178 Job Creation operations: Print-Job, Print-URI, and Create-Job operations.

1179 A subset of these Job Template attributes (e.g. "number-up" and "media", but not "job-priority") are also defined to
1180 apply to Documents and are called Document Template attributes when supplied at the Document Level. Document
1181 Template attributes can be supplied in the Send-Document and Send-URI operations.

1182 A subset of the Document Template attributes that apply to pages (e.g., "media", but not "document-format") can also
1183 be supplied as Page Overrides using the "overrides" Job Template collection attribute (see [OvrRide]) or Document
1184 Template attribute.

1185 Job Template and Document Template attributes are OPTIONAL for a Printer to support and for a client to supply in
1186 a Job Creation or Document Creation request or Page Overrides. If a Printer supports a Job Template or Document
1187 Template attribute, then it MUST copy the supplied attribute to the Job or Document object, respectively, so that a
1188 client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs and Get-Document-Attributes/Get-
1189 Documents operations, respectively. The effect of Job Template Attributes supplied in Job Creation requests are
1190 inherited by the Document objects, unless the Document Creation operation supplies the attribute with a different
1191 value.

---

[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.

1192 Every Job or Document Template attribute (e.g. "copies") has associated printer attributes that provide the default
1193 value(s) (e.g. "finishings-default) and the supported value(s)[33] (e.g. "finishings -supported"). Also allowed is the list of
1194 values that are ready to use without human intervention (e.g. "finishings-ready").   Since some attributes (e.g.
1195 "finishings") can be Job Template and Document Template attributes both the Job and the Document share the same
1196 default and supported values.

1197 If a Job Template collection attribute is supported (see [rfc3382]), then there are conformance requirements for which
1198 member attributes MUST be supported by a Printer and which member attributes a client MUST supply as indicated
1199 in the Conformance column for each collection member attribute in Table 10.

1200 The "Defined for use" column indicates whether the client MAY supply and the Printer support the attribute at the
1201 Job, Document, or Page Level with the following semantics:

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

1202

1203   "*****" - Most Job Template and Document Template attributes correspond to the PWG Semantic Model Job
1204   Processing and Document Processing attributes, respectively. However, 4 of the IPP Job Template
1205   attributes are represented in the PWG Semantic Model as Job Description attributes, instead of Job
1206   Processing attributes. These are indicated in the first column with "*****".

1207   **Table 10 - Job Template and Document Template attributes**

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

---

[33] Note that collections follow their own rules for the "xxx-supported" Printer attribute.

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

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

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

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

Job Template / Document Template **attribute name**	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
job-accounting-sheets	collection	**y**	**n**	**n**	MAY	MAY	[pwg5100.3] §3.8
job-accounting-sheets-type	type3 keyword | name(MAX)				MUST	MUST	[pwg5100.3] §3.8.1
media	type3 keyword | name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.8.2
media-col	collection					MAY	[pwg5100.3] §3.8.2
job-accounting-output-bin	type3 keyword | name(MAX)				MAY	MAY	[pwg5100.3] §3.8.3
job-accounting-user-id**	name(MAX)	**y**	**n**	**n**	MAY	MAY	[pwg5100.3] §3.7
job-copies	integer(1:MAX)	**y**	**n** [37]	**n**	MAY	MAY	[jobx] §4.1.1
job-cover-back	collection	**y**	**n** [38]	**n**	MAY	MAY	[jobx] §4.1.2
same as cover-back	**see cover-back**						
job-cover-front	collection	**y**	**n** [39]	**n**	MAY	MAY	[jobx] §4.1.3
same as cover-front	**see cover-front**						
job-error-sheet	collection	**y**	**n**	**n**	MAY	MAY	[pwg5100.3] §3.9
job-error-sheet-type	type3 keyword | name(MAX)				MUST	MUST	[pwg5100.3] §3.9.1
job-error-sheet-when	type2 keyword				MAY	MAY	[pwg5100.3] §3.9.2
media	type3 keyword | name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.9.3
media-col	collection					MAY	[pwg5100.3] §3.9.3
job-finishings	1setOf type2 enum	**y**	**n** [40]	**n**	MAY	MAY	[jobx] §4.1.4
job-finishings-col	collection	**y**	**n** [41]	**n**	MAY	MAY	[jobx] §4.1.5
same as finishings-col	**see finishings-col**						
job-hold-until	type3 keyword | name(MAX)	**y**	**n**	**n**	MAY	MAY	[rfc2911] §4.2.2
job-message-to-operator	text(MAX)	**y**	**n** [42]	**n**	MAY	MAY	[pwg5100.3] §3.10
job-priority	integer(1:100	**y**	**n**	**n**	MAY	MAY	[rfc2911] §4.2.1

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

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

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

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

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

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

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
job-sheet-message	text(MAX)	**y**	**n**	**n**	MAY	MAY	[pwg5100.3] §3.12
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-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-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-type	type3 keyword | name(MAX)				MAY	MAY	[pwg5100.3] §3.13.2
media-weight-metric	integer(0:MAX)				MAY	MAY	[pwg5100.3] §3.13.9
media-input-tray-check	type3 keyword | name(MAX)	**y**	**y**	**y**	MAY	MAY	[pwg5100.3] §3.14
media-type [43]	type3 keyword | name(MAX)	**y**	**y**	**y**	MAY	MAY	[upnp], [pwg5100.3] §3.13.2
multiple-document-handling	type2 keyword	**y**	**n**	**n**	MAY	MUST[44]	[rfc2911] §4.2.4
number-up	integer(1:MAX)	**y**	**y**	**y**	MAY	MAY	[rfc2911] §4.2.9
orientation-requested	type2 enum	**y**	**y**	**y**	MAY	MAY	[rfc2911] §4.2.10
output-bin	type2 keyword | name(MAX)	**y**	**n**	**n**	MAY	MAY	[pwg5100.2] §2.1
Output-device	name(MAX)	**y**	**y**	**y**	MAY	MAY	[jobx] §3.1.3

---

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

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

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
overrides	1setOf collection	**y**	**y**	**n**	MAY	MAY	[OvrRide] §4.1, also see §8.2
pages	1setOf rangeOfInteger(1:MAX)				MUST	MUST	[OvrRide] §4.1.1
document-numbers	1setOf rangeOfInteger(1:MAX)				MAY	MUST	[OvrRide] §4.1.2
document-copies	1setOf rangeOfInteger(1:MAX)				MAY	MAY	[OvrRide] §4.1.3
any other Template attributes that affect pages, such as "media" or "media-col"					MAY	MAY	[OvrRide] §4.1.4
page-delivery	type2 keyword	**y**	**y**	**n**	MAY	MAY	[pwg5100.3] §3.15
page-order-received**	type2 keyword	**y**	**y**	**n**	MAY	MAY	[pwg5100.3] §3.16
page-ranges	1setOf rangeOfInteger(1:MAX)	**y**	**y**	**n**	MAY	MAY	[rfc2911] §4.2.7
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
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
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

1208 "**" - These 4 attributes are Job Description attributes, not Job Processing attributes, in the PWG Semantic Model
1209   [pwg-sm] - see the comment just before the Table.
1210

8.1 Document Template attributes

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

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

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

8.2 Document Template attributes containing explicit Document numbers

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

8.3 Sheet Collation at the Document Level

Since "sheet-collate" can be applied at the Document level it is possible for a Job to contain some Documents which
are collated and others that are not. To describe this condition the Printer MUST set the "job-collation-type" to a
value of '3' (i.e 'other'.).

9   Job Description and Document Description attributes

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

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

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

1250 Note: There are no corresponding Page Range (or Page Override) Description attributes. The Page Range is not an
1251 object with a state and it cannot be queried.

1252 *Legend:*
1253 "*"   an attribute that has a "job-" prefix in its name in [rfc2911]. The "job-" prefix is omitted in the table. Job level
1254   attributes use the "-job" prefix. Document level attributes do not use the prefix.   The only difference in the
1255   semantics are whether it applies to just the Document or to the entire Job. Note: For the PWG Semantic
1256   Model, the "**job-**" prefix is dropped altogether.
1257 "-"   indicates that the Job or Document attribute is *not* defined.
1258 "? y"   the Printer MUST populate this Job or Document Description attribute by copying *from* the corresponding
1259   Operation attribute that the client MAY supply[45] in a Job or Document Creation operation.   See Table 8 for
1260   the corresponding Operation attribute.
1261 (r/w)   indicates that the Job Description or Document Description attribute is read/write, so that the client can
1262   changes its value using the Set-Job-Attributes or Set-Document-Attributes operation (see section 4.4).
1263

1264   **Table 11 - Job and Document Description attributes**

Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform-ance	Reference Job Description Attr	Doc Desc.
attributes-charset	charset	**? y**	**? y**	MUST	[rfc2911] §4.3.19	§9.1.1
attributes-natural-language	naturalLanguage	**? y**	**? y**	MUST	[rfc2911] §4.3.20	§9.1.2
compression	type3 keyword	**-**	**? y**	MUST	[rfc2911] §3.2.1.1	§9.1.3
current-page-order	type2 keyword	**y**	**y**	MAY	[pwg5100.3] §4.1	§9.1.4
date-time-at-completed	dateTime	**y**	**y**	MAY	[rfc2911] §4.3.14.7	§9.1.5
date-time-at-creation	dateTime	**y**	**y**	MAY	[rfc2911] §4.3.14.5	§9.1.6
date-time-at-processing	dateTime	**y**	**y**	MAY	[rfc2911] §4.3.14.6	§9.1.7
detailed-status-messages*	1setOf text(MAX)	**y**	**y**	MAY	[rfc2911] §4.3.10	§9.1.8
document-access-errors*	1setOf text(MAX)	**y**	**y**	MAY	[rfc2911] §4.3.11	§9.1.9
document-charset	charset	**-**	**? y**	CMUST[46]	-	§9.1.10
document-digital-signature	type2 keyword	**-**	**? y**	MAY	-	§9.1.11
document-format	mimeMediaType	**-**	**? y**	MUST	[rfc2911] §3.2.1.1	§9.1.12
document-format-details	1setOf collection	**-**	**? y**	CMUST[47]	[jobx] §3.2.4	§9.1.13
document-format	mimeMediaType	**-**	**? y**	MUST	[jobx] §3.2.4.5	
document-format-device-id	text(127)	**-**	**? y**	MUST	[jobx] §3.2.4.6	
document-format-version	text(127)	**-**	**? y**	MAY	[jobx] §3.2.4.7	
document-source-application-name	name(MAX)	**-**	**? y**	MAY	[jobx] §3.2.4.1	
document-source-application-version	text(127)	**-**	**? y**	MAY	[jobx] §3.2.4.2	
document-source-os-name	name(40)	**-**	**? y**	MAY	[jobx] §3.2.4.3	
document-source-os-version	text(40)	**-**	**? y**	MAY	[jobx] §3.2.4.4	
document-natural-language	naturalLanguage	**-**	**? y**	MAY	[jobx] §3.2.4.8	

---

[45] 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.

[46] The Printer MUST support the "document-charset" Operation/Document Description attributes if the Printer supports any charset-ambiguous document formats (see [jobx] §3.2.1).

[47] 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-format-details-detected	1setOf collection	-	y	MAY	-	§9.1.14
document-format-detected	mimeMediaType	-	y	MAY	-	§9.1.15
document-format-version	text(127)	-	? y	MAY	[jobx] §3.2.5	§9.1.16
document-format-version-detected	text(127)	-	y	MAY	-	§9.1.17
document-job-id	integer(1:MAX)	-	y	MUST	-	§9.1.18
document-job-uri	uri	-	y	MUST	-	§9.1.19
document-message (r/w)	text(MAX)	-	y	MAY	[jobx] §3.2.6	§9.1.20
document-name (r/w)	name(MAX)	-	? y	MUST	[rfc2911] §3.2.1.1	§9.1.21
document-natural-language	naturalLanguage	-	? y	MAY		§9.1.22
document-number	integer(1:MAX)	-	y	MUST	-	§9.1.23
document-printer-uri	uri	-	y	MUST	-	§9.1.24
document-state	type1 enum	-	y	MUST	-	§9.1.25
document-state-message	text(MAX)	-	y	MAY	-	§9.1.26
document-state-reasons	1setOf type2 keyword	-	y	MUST	-	§9.1.27
document-uri	uri	-	? y	MAY	-	§9.1.28
errors-count	integer(0:MAX)	y	y	MAY	[jobx] §5.2	§9.1.29
Impressions*	integer(0:MAX)	? y	? y	MAY	[rfc2911] §4.3.17.2	§9.1.30
impressions-completed*	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.18.2	§9.1.31
impressions-completed-current-copy	integer(0:MAX)	y	y	MAY	[rfc3381] §4.4	§9.1.32
ipp-attribute-fidelity	boolean	? y	-	MUST	[rfc2911] §3.2.1.1 [jobx] §5.1	-
job-collation-type	type2 enum	y	-	MAY	[rfc3381] §4.1	-
job-id	integer (1:MAX)	y	-	MUST	[rfc2911] §4.3.2	-
job-mandatory-attributes	1setOf type2 keyword	? y	-	MUST	[jobx] §5.3	-
job-message-from-operator	text(127)	y	- [48]	MAY	[rfc2911] §4.3.16	-
job-name (r/w)	name(MAX)	? y	- [49]	MUST	[rfc2911] §4.3.5	-
job-originating-user-name	name (MAX)	y	-	MUST	[rfc2911] §4.3.6	-
job-printer-uri	uri	? [50] y	-	MUST	[rfc2911] §4.3.3	-
job-state	type1 enum	y	- [51]	MUST	[rfc2911] §4.3.7	-
job-state-message	text(MAX)	y	- [52]	MAY	[rfc2911] §4.3.9	-
job-state-reasons	1setOf type2 keyword	y	- [53]	MUST	[rfc2911] §4.3.8	-

[48] 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 9.1.20) to communicate with each other.
[49] The Document Description attribute that corresponds to the "job-name" Job Description attribute is the (existing) "document-name" attribute defined in [rfc2911] and also discussed in this spec in section 9.1.21.
[50] The Printer sets the "job-printer-uri" Job Description attribute from the "printer-uri" Operation attribute.
[51] The Document Description attribute that corresponds to the "job-state" Job Description attribute is the (new) "document-state" attribute.
[52] The Document Description attribute that corresponds to the "job-state-message" Job Description attribute is the (new) "document-state-message" attribute.

Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform-ance	Reference Job Description Attr	Doc Desc.
job-uri	uri	**y**	**-**	MUST	[rfc2911] §4.3.1	-
k-octets*	integer(0:MAX)	**? y**	**? y**	MAY	[rfc2911] §4.3.17.1	§9.1.33
k-octets-processed*	integer(0:MAX)	**y**	**y**	MAY	[rfc2911] §4.3.18.1	§9.1.34
last-document	boolean	**-**	**? y**	MUST	-	§9.1.35
media-sheets*	integer(0:MAX)	**? y**	**? y**	MAY	[rfc2911] §4.3.17.3	§9.1.36
media-sheets-completed*	integer(0:MAX)	**y**	**y**	MAY	[rfc2911] §4.3.18.3	§9.1.37
more-info*	uri	**y**	**y**	MAY	[rfc2911] §4.3.4	§9.1.38
number-of-documents	integer(0:MAX)	**y**	**-**	MUST	[rfc2911] §4.3.12	-
number-of-intervening-jobs	integer(0:MAX)	**y**	**-**	MAY	[rfc2911] §4.3.15	-
output-device-assigned	name(127)	**y**	**y**	MAY	[rfc2911] §4.3.13	§9.1.39
output-device-requested	name(127)	**y**	**-**	MAY	[jobx] §5.5	-
printer-up-time*	integer (1:MAX)	**y**	**y**	MUST	[rfc2911] §4.3.14.4	§9.1.40
sheet-completed-copy-number	integer(0:MAX)	**y**	**y**	MAY	[rfc3381] §4.2	§9.1.41
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	§9.1.42
time-at-creation	integer (MIN:MAX)	**y**	**y**	MUST	[rfc2911] §4.3.14.1	§9.1.43
time-at-processing	integer (MIN:MAX)	**y**	**y**	MUST	[rfc2911] §4.3.14.2	§9.1.44
warnings-count*	integer(0:MAX)	**y**	**y**	MAY	[jobx] §5.3	§9.1.45

1265 "**y**", "**? y**", "-"   See the description in the Legend before the table.
1266

1267 Most of the existing "job-state" and "job-state-reasons" Job Description attribute values apply equally well to
1268 individual documents in a multi-document job (with removal of the 'job-' prefix for those that apply to both Job and
1269 Document). The reason for separating state from reasons is so that the states can be the fundamental states that
1270 most implementations have, while the state reasons can vary depending on the sophistication of the system. The
1271 states are the ones that clients are most likely to base actions upon, and the state reasons are more information,
1272 both for programs and people.

1273 9.1 Document Description attributes

1274 This section contains *all* of the Document Description attributes for use with the Document object. Most of these
1275 definitions refer to the corresponding Job Template attribute semantics in other specifications. However, the
1276 semantics of each Document Description attribute only applies to the Document object containing the Document
1277 Description attribute. The Printer MAY support changing these Document Description attributes with the Set-
1278 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!*

1279 9.1.1 attributes-charset (charset)

1280 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1281 attribute (see [rfc2911] §4.3.19) applied to the Document object. The Printer sets this Document Description attribute
1282 from the corresponding Operation attribute supplied by the client in the Document Creation operation (see Table 3).

---

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

1283 9.1.2 attributes-naturaHanguage (naturalLanguage)

1284 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1285 attribute (see [rfc2911] §4.3.20) applied to the Document object. The Printer sets this Document Description attribute
1286 from the corresponding Operation attribute supplied by the client in the Document Creation operation (see Table 3).

1287 9.1.3 compression (type3 keyword)

1288 This REQUIRED Document Description attribute specifies the compression used to represent this document (see
1289 [rfc2911] §3.2.1.1). The Printer sets this Document Description attribute from the corresponding Operation attribute
1290 supplied by the client in the Document Creation operation (see Table 3).

1291 9.1.4 current-page-order (type2 keyword)

1292 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1293 attribute (see [pwg5100.3] §4.1) applied to the Document object.

1294 9.1.5 date-time-at-completed (dateTime)

1295 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1296 attribute (see [rfc2911] §4.3.14.7) applied to the Document object.

1297 9.1.6 date-time-at-creation (dateTime)

1298 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1299 attribute (see [rfc2911] §4.3.14.5) applied to the Document object.

1300 9.1.7 date-time-at-processing (dateTime)

1301 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1302 attribute (see [rfc2911] §4.3.14.6) applied to the Document object.

1303 9.1.8 detailed-status-messages (1setOf text(MAX))

1304 This OPTIONAL Document Description attribute has the same semantics as the corresponding "job-detailed-status-
1305 messages" Job Description attribute (see [rfc2911] §4.3.10) applied to the Document object.

1306 9.1.9 document-access-errors (1setOf text(MAX))

1307 This OPTIONAL Document Description attribute has the same semantics as the corresponding "job-document-
1308 access-errors" Job Description attribute (see [rfc2911] job-document-access-errors §4.3.11) applied to the Document
1309 object.

1310 9.1.10 document-charset (charset)

1311 This CONDITIONALLY REQUIRED Document Description attribute specifies the charset used to represent this
1312 document (see [jobx] §4.2.1). The Printer sets this Document Description attribute from the corresponding Operation
1313 attribute supplied by the client in the Document Creation operation (see Table 3). This attribute is REQUIRED for a
1314 Printer to support if the Printer supports any charset-ambiguous document formats; otherwise, this attribute is
1315 OPTIONAL. Note, however, that if a Printer supports the "document-charset" Operation attribute, the Printer MUST
1316 support this "document-charset" Document Description attribute.

9.1.11 document-digital-signature (type2 keyword)

1318 This OPTIONAL Document Description attribute specifies the digital signature technology used in the Document
1319 content. The Printer sets this Document Description attribute from the corresponding "document-digital-signature"
1320 Operation attribute ([jobx] §4.2.2 for the semantics), if supplied by the client in the Document Creation operation (see
1321 Table 3). If a Printer supports the "document-digital-signature" Operation attribute, the Printer MUST support this
1322 "document-digital-signature" Document Description attribute.

9.1.12 document-format (mimeMediaType)

1324 This REQUIRED[54] Document Description attribute specifies the document format of the Document Object content.
1325 The Printer sets this Document Description attribute from the corresponding "document-format" Operation attribute
1326 (see section [jobx] §4.2.3 for the semantics), if supplied by the client in the Document Creation operation (see Table
1327 3).

9.1.13 document-format-details (1setOf collection)

1329 This CONDITIONALLY REQUIRED Document Description attribute specifies the details of the document format(s) of
1330 the Document Object content. The Printer sets this Document Description attribute from the corresponding
1331 "document-format-details" Operation attribute ([jobx] §4.2.4 for the semantics), if supplied by the client in the
1332 Document Creation operation (see Table 3). This attribute is REQUIRED for a Printer to support if the Printer
1333 supports a packaging MIME type document format, such as 'application/zip' or 'multipart/related'; otherwise, this
1334 attribute is OPTIONAL Note, however, that if a Printer supports the "document-format-details" Operation attribute,
1335 the Printer MUST support this "document-format-details" Document Description attribute.

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

1337 This OPTIONAL Document Description attribute is generated by the Printer to indicate the actual document format
1338 details of the Document object as detected by the Printer. The member attributes are the same as the "document-
1339 format-details" Operation attribute. (see [jobx] §6.6.4 for details)

9.1.15 document-format-detected (mimeMediaType)

1341 This OPTIONAL Document Description attribute is generated by the Printer to indicate the actual document format of
1342 the Document object content as detected by the Printer. See [jobx] §6.6.5 for detailed semantics.

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

1344 This OPTIONAL Document Description attribute specifies the version of the document format of the Document
1345 Object content. The Printer sets this Document Description attribute from the corresponding "document-format-
1346 version" Operation attribute ([jobx] §4.2.6 for the semantics), if supplied by the client in the Document Creation
1347 operation (see Table 3). If a Printer supports the "document-format-version" Operation attribute, the Printer MUST
1348 support this "document-format-version" Document Description attribute.

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

1350 This OPTIONAL Document Description attribute is generated by the Printer to indicate the actual document format
1351 version of the Document content as detected by the Printer. See [jobx] §6.6.7 for detailed semantics.

---

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

9.1.18 document-job-id (integer(1:MAX))

1352

1353 This REQUIRED Document Description attribute is a *copy* of the Job's "job-id" Job Description attribute (see
1354 [rfc2911] §4.3.2), i.e., the "job-id" of the Job containing this Document.

9.1.19 document-job-uri (uri)

1355

1356 This REQUIRED Document Description attribute is a *copy* of the Job's "job-uri" Job Description attribute (see
1357 [rfc2911] §4.3.1), i.e., the URI of the Job that contains this Document. Example:
1358 ipp://www.company.com/printers/myprinter/jobs/22

9.1.20 document-message (text(MAX))

1359

1360 This OPTIONAL Document Description attribute contains a message from either (1) the user to the operator about
1361 the Document or (2) from the operator, system administrator, or "intelligent" process to indicate to the end user the
1362 reasons for modification or other management action taken on the Document. The Printer populates this Document
1363 Description attribute from the "document-message" (text(MAX)) Operation attribute value supplied by the client in any
1364 of the Document Creation operations (see Table 3) or in a Cancel-Document operation (see section 4.5).

1365 In addition, the user and the operator can set the value of this Document Description attribute explicitly using the Set-
1366 Document-Attributes operation (see section 4.4).

9.1.21 document-name (name(MAX))

1367

1368 This REQUIRED[55] Document Description attribute specifies the name of the document (see [rfc2911] §3.2.1.1).   The
1369 Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client in
1370 the Document Creation operation (see Table 3).

1371 This attribute may be modified by a client using the Set-Document-Attributes operation (see section 4.4).

9.1.22 document-natural-language (naturalLanguage)

1372

1373 This OPTIONAL Document Description attribute specifies the natural language of the Document Object content. The
1374 Printer sets this Document Description attribute from the corresponding "document-natural-language" Operation
1375 attribute (section 7.2.1 for the semantics), if supplied by the client in the Document Creation operation (see Table 3).
1376 If a Printer supports the "document-natural-language" Operation attribute, the Printer MUST support this "document-
1377 natural-language" Document Description attribute.

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

1378

1379 This REQUIRED Document Description attribute is the ordinal number of the document within the job, and
1380 determines its order of being printed in a multi-document job. The Printer MUST generate the values monotonically
1381 increasing from 1 for each job.

9.1.24 document-printer-uri (uri)

1382

1383 This REQUIRED Document Description attribute is a *copy* of the "printer-uri" Operation attribute (see [rfc2911]
1384 §3.1.5), i.e., the URI of the Printer containing the Job which contains this Document. Example:
1385 ipp://www.company.com/printers/myprinter.

---

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

1386   **9.1.25 document-state (type1 enum)**

1387   The REQUIRED "document-state" Document Description attributes identifies the current state of the document. The
1388   values for "document-state" are a subset of the values for "job-state" ([rfc2911] §4.3.7); in particular, the "job-state"
1389   values 'pending-held' and 'processing-stopped' do not apply to "document-state". Even though IPP defines five
1390   values for document state (plus the out-of-band 'unknown' value - see [rfc2911] § 4.1), implementations only need to
1391   support those states which are appropriate for the particular implementation. In other words, an IPP Printer
1392   implementation supports only those document states implemented by the output device and available to the IPP
1393   Printer implementation.

1394   Table 12 lists the "document-state" attribute values.

1395   **Table 12 - "document-state" attribute values**

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

1396

1397   Standard enum values are:

Value	Symbolic Name and Description
'3'	**'pending'** : The Document has not started to be processed at all.
'5'	**'processing'** : One or more of:

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

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

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

| '7' | **'canceled'** : The 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- |

Value	Symbolic Name and Description
	user', 'canceled-by-operator', or 'canceled-at-device' values. 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, 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.

1398 The final value for this attribute MUST be one of: 'completed', 'canceled', or 'aborted' before the Printer removes the
1399 Document altogether. The length of time that Documents remain in the 'canceled', 'aborted', and 'completed' states
1400 depends on implementation.

1401 Documents reach one of the three terminal states: 'completed', 'canceled', or 'aborted', after the Job has completed
1402 all activity for the Document, including stacking output media, and all Document status attributes have reached their
1403 final values for the Document.

1404

1405 **9.1.25.1 The "document-state" Document Description attribute and the Document object life Cycle**

1406 The "document-state" attribute is one of the most important Document Description attributes. Figure 1 shows the
1407 values of the "document-state" attribute and the Document object life cycle as affected by actions on the Job,
1408 Document, Printer, and job processing. Documents are not active objects. Active objects in IPP are Printers and
1409 Jobs. Printers and Jobs have URIs where requests are sent and acted upon. Documents have no such URI.
1410 Printers schedule Jobs and Jobs, once scheduled, process the Documents that they contain. The Document's life
1411 cycle is closely tied to the lifecycle of a Job[56]. Documents basically have three states.   The first is waiting to be
1412 processed by a Job (i.e. pending). The second state is from the time the Job first starts processing the Document
1413 (i.e. processing) and until it reaches one of its terminal states. The third state for a Document is one of its terminal
1414 states (i.e. completed, canceled, or aborted).

---

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

pending

Job starts
Processing
Document

processing

Cancel-Document

canceled

Completes

completed

Delete-Document

Aborts

aborted

start*

Document does not exist

Restart-Job, Reprocess-Job

* Action = Print-Job, Print-URI,
Send-Document, Send-URI
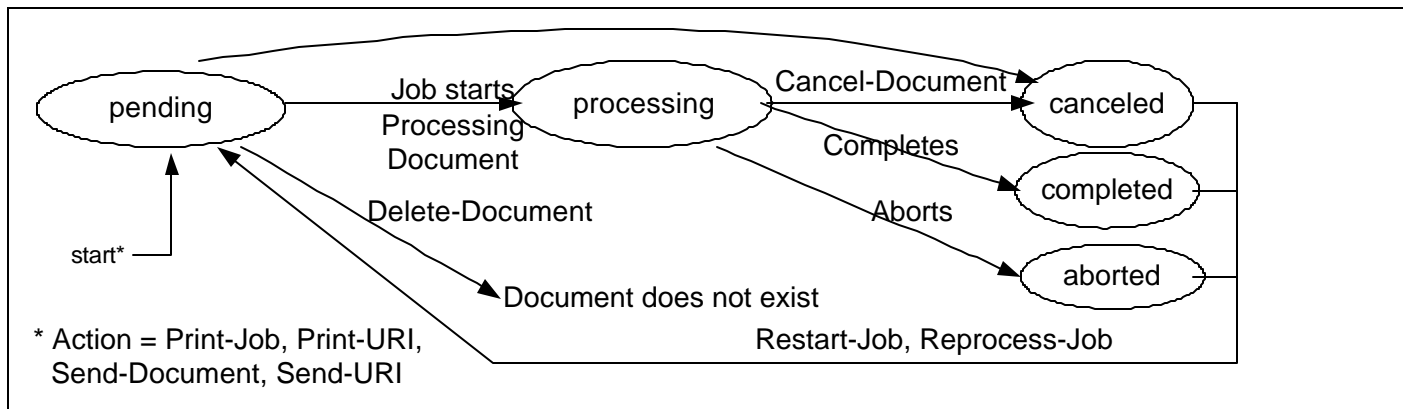
1415

1416   **Figure 1 - The "document-state" Document Description attribute and the Document object life cycle**

1417 A Document object has a much simpler life cycle than a Job object. A Document always progresses from left to right
1418 in the state diagram. No other state transitions are defined.

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

1420 This OPTIONAL Document Description attribute specifies information about the "document-state" and "document-
1421 state-reasons" attributes in human readable text. If the Printer supports this attribute, the Printer MUST be able to
1422 generate this message in any of the natural languages identified by the Printer's "generated-natural-language-
1423 supported" attribute (see the "attributes-natural-language" Operation attribute specified in [rfc2911] § 3.1.4.1).

1424 The value SHOULD NOT contain additional information not contained in the values of the "document-state" and
1425 "document-states-reasons" attributes, such as interpreter error information. Otherwise, application programs might
1426 attempt to parse the (localized text). For additional information such as interpreter errors for application program
1427 consumption or specific document access errors, new attributes with keyword values, needs to be developed and
1428 registered.

9.1.27 document-state-reasons (1setOf type2 keyword)

1430 The REQUIRED "document-state-reasons" Document Description attribute provides additional information about
1431 each document's current state, i.e., information that augments the value of the Document's "document-state"
1432 attribute.

1433 These values MAY be used with any document state for which the reason makes sense. Some of these value
1434 definitions indicate conformance requirements; the rest are OPTIONAL. Furthermore, when implemented, the Printer
1435 MUST return these values when the reason applies and MUST NOT return them when the reason no longer applies
1436 whether the value of the Document's "document-state" attribute changed or not. When the Document does not have
1437 any reasons for being in its current state, the value of the Document's "document-state-reasons" attribute MUST be
1438 'none'.

1439 Some of the Job's "job-state-reasons" values affect job scheduling, such as 'resources-are-not-ready' and 'job-hold-
1440 until-specified'. However, "document-state-reasons" values MUST NOT affect job scheduling, since Document
1441 objects are passive objects operated on by the containing Job object.

1442 Note: While values cannot be added to the "document-state" attribute without impacting deployed clients that take
1443 actions upon receiving "document-state" values, it is the intent that additional "document-state-reasons' values can
1444 be defined and registered without impacting such deployed clients. In other words, the "document-state-reasons"
1445 attribute is intended to be extensible.

1446 Table 13 lists the standard keyword values for the "document-state-reasons" attribute defined in this specification and
1447 derived from "job-state-reasons" defined in other IPP specifications as indicated in the References column. In Table
1448 13 the keywords are listed in alphabetic order, while in their descriptions following Table 13, they are listed in the
1449 most likely order of occurrence to help understanding.

1450 When the Document object is supported, the Printer implementation SHOULD still support the corresponding Job
1451 level "job-state-reasons", so that clients that do not support the Document object will receive the same information.
1452 Also it is usually more convenient for the client to obtain just the Job level status. However, the client SHOULD
1453 query both Job and Document attributes and convert them to some canonical form for display to the user, so that all
1454 Jobs and their Documents are displayed in a uniform manner, no matter from which clients they were submitted.

1455   **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	9.1.27
	aborted-by-system	MAY	[rfc2911] §4.3.8
	compression-error	MAY	[rfc2911] §4.3.8
	digital-signature-did-not-verify	MAY	[jobx] §6.1
	digital-signature-type-not-supported	MAY	[jobx] §6.1
	document-access-error	MAY	[rfc2911] §4.3.8
	document-format-error	MAY	[rfc2911] §4.3.8
	canceled-at-device	MAY	[rfc2911] §4.3.8 *
	canceled-by-operator	MAY	[rfc2911] §4.3.8 *
	canceled-by-user	MAY	[rfc2911] §4.3.8 *
	completed-successfully	MAY	[rfc2911] §4.3.8 *
	completed-with-errors	MAY	[rfc2911] §4.3.8 *
	completed-with-warnings	MAY	[rfc2911] §4.3.8 *
	data-insufficient	MAY	[rfc2911] §4.3.8 *
	digital-signature-wait	MAY	[jobx] §6.1 *
	errors-detected	MAY	[jobx] §6.1 *
	incoming	MAY	[rfc2911] §4.3.8 *
	interpreting	MAY	[rfc2911] §4.3.8 *
	none	MUST	[rfc2911] §4.3.8
	outgoing	MAY	[rfc2911] §4.3.8 *
	printing	MAY	[rfc2911] §4.3.8 *
	processing-to-stop-point	MAY	[rfc2911] §4.3.8
	queued	MAY	[rfc2911] §4.3.8 *
	queued-for-marker	MAY	[rfc2911] §4.3.8 *
	queued-in-device	MAY	[rfc2911] §4.3.8
	resources-are-not-ready	MAY	[rfc2911] §4.3.8
	resources-are-not-supported	MAY	[pwg5100.3] §6.1
	submission-interrupted	MAY	[rfc2911] §4.3.8
	transforming	MAY	[rfc2911] §4.3.8 *
	unsupported-compression	MUST	[rfc2911] §4.3.8
	unsupported-document-format	MUST	[rfc2911] §4.3.8
	warnings-detected	MAY	[jobx] §6.1 *

1456   * The state reason keyword value is derived from an existing "job-state-reasons" value. The associated value is
1457   prefixed by 'job-' when it is a value of the "job-state-reasons" attribute[57]. The semantics for the reasons differ
1458   only by the object to which they are bound. For example 'job-printing' means that at least one document in
1459   the job is printing, i.e. the job is printing, while 'printing' means the document within the job is printing.

1461   For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely
1462   to occur (if implemented), starting with the 'none' value:

1463   **'none' :** There are no reasons for the Document's current state. This state reason is semantically equivalent
1464   to "document-state-reasons" without any value and MUST be used when there is no other value,
1465   since the 1setOf attribute syntax requires at least one value. [rfc2911] §4.3.8

1466   **'resources-are-not-supported'** : At least one of the resources needed by the Document, such as media,
1467   fonts, resource objects, etc., is not supported on any of the physical printers for which the Document
1468   is a candidate. This condition MAY be detected when the Document is accepted, or subsequently
1469   while the Document is pending or processing, depending on implementation. The Job containing the
1470   Document may (1) remain in its current state, (2) be moved to the 'pending-held' state, depending on
1471   implementation and/or job scheduling policy, or (3) scheduled normally, but the Printer is put into the
1472   'stopped' state when the Document is attempted to be processed on the Printer. This value is
1473   intended for use with an implementation that supports the "user-defined-values-supported" Printer
1474   attribute (see [pwg5100.3] § 6.1), which allows a Job to be accepted with an unsupported 'name'
1475   value. [pwg5100.3] §6.1

1476   **'resources-are-not-ready'** : At least one of the resources needed by the Document, such as media, fonts,
1477   resource objects, etc., is not ready on any of the physical printers for which the Document is a
1478   candidate. This condition MAY be detected when the Document is accepted, or subsequently while
1479   the Document is pending or processing, depending on implementation. The Job containing the
1480   Document may remain in its current state or be moved to the 'pending-held' state, depending on
1481   implementation and/or scheduling policy. [rfc2911] §4.3.8

1482   **'digital-signature-type-not-supported'** : The Document contains a digital signature type that is not
1483   supported. Implementation or site policy determines the state of the Job containing the Document
1484   once this condition is detected. [jobx] § 6.1.

1485   **'incoming'** : The Printer is retrieving/accepting Document data as a result of a Print-Job, Print-URI, Send-
1486   Document or Send-URI operation. [rfc2911] §4.3.8

1487   **'data-insufficient'** : The Printer is expecting additional Document data before it can move the Document
1488   into the 'processing' state. If a Printer starts processing before it has received all data, the Printer
1489   removes the 'data-insufficient' reason, but the 'incoming' remains. If a Printer starts processing after
1490   it has received all data, the Printer removes the 'data-insufficient' reason and the 'incoming' at the
1491   same time. [rfc2911] §4.3.8

1492   **'unsupported-compression'** : The document was aborted by the system because the Printer determined
1493   while attempting to decompress the Document data that the compression is actually not among
1494   those supported by the Printer. This value MUST be supported, since "compression" is a
1495   REQUIRED Operation attribute. [rfc2911] §4.3.8

1496   **'compression-error'** : The document was aborted by the system because the Printer encountered an error
1497   in the Document data while decompressing it. If the Printer posts this reason, the Document data
1498   has already passed any tests that would have led to the 'unsupported-compression' job-state-
1499   reason/document-state-reason. [rfc2911] §4.3.8

1500   **'document-access-error'** : After accepting a Print-URI or Send-URI request, the Printer could not access
1501   the Document's reference. This reason is intended to cover any file access problem, including file
1502   does not exist and access denied because of an access control problem. The Printer MAY also

---

[57] 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.

1503	indicate the Document access error using the "document-access-errors" Printer Description attribute.
1504	Whether the Printer aborts the Document and moves the Document to the 'aborted' Document state
1505	or prints all Documents that are accessible and moves the Document to the 'completed' Document
1506	state and adds the 'completed-with-errors' value in the Job's "job-state-reasons" or Document's
1507	"document-state-reasons" attribute depends on implementation and/or site policy. This value
1508	SHOULD be supported if the Print-URI or Send-URI operations are supported. [rfc2911] §4.3.8

1509 **'unsupported-document-format'** : The Document was aborted by the system because the Document data's
1510   document-format is not among those supported by the Printer. If the client specifies the document-
1511   format as 'application/octet-stream', the printer MAY abort the Document and post this reason even
1512   though the format is a member of the "document-format-supported" printer attribute, but not among
1513   the auto-sensed document-formats. This value MUST be supported, since "document-format" is a
1514   REQUIRED Operation attribute. [rfc2911] §4.3.8

1515 **'document-format-error'** : The Document was aborted by the system because the Printer encountered an
1516   error in the Document data while processing it. If the Printer posts this reason, the Document data
1517   has already passed any tests that would have led to the 'unsupported-document-format' job-state-
1518   reason/document-state-reason. [rfc2911] §4.3.8

1519 **'submission-interrupted'** : The Document was not completely submitted for some unforeseen reason, such
1520   as: (1) the Printer has crashed before the document was closed by the client, (2) the Printer or the
1521   document transfer method has crashed in some non-recoverable way before the Document data was
1522   entirely transferred to the Printer, (3) the client crashed or failed to close the job before the time-out
1523   period. See the description of the "multiple-operation-time-out" Printer attribute in [rfc2911] § 4.4.31.
1524   [rfc2911] §4.3.8

1525 **'digital-signature-wait'** : The Job is currently being held because the Document was submitted with a
1526   "document-digital-signature" attribute value that is not supported. The operator MAY either cancel
1527   the job or release it to be processed. [jobx] §6.1.

1528 **'outgoing'** : The Printer is transmitting the Document to the output device. [rfc2911] §4.3.8

1529 **'queued'** : The Document is in the 'processing' state, but more specifically, the Printer has queued the
1530   Document data. [rfc2911] §4.3.8

1531 **'interpreting'** : The Document is in the 'processing' state, but more specifically, the Printer is interpreting the
1532   Document data. [rfc2911] §4.3.8

1533 **'queued-for-marker'** : The Document is in the 'processing' state, but more specifically, the Printer has
1534   completed enough processing of the document to be able to start marking and the document is
1535   waiting for the marker. rfc2911] §4.3.8

1536 **'printing'** : The output device is marking media for this Document. This value is useful for Printers which
1537   spend a great deal of time processing (1) when no marking is happening and then want to show that
1538   marking is now happening or (2) when the Document is in the process of being canceled or aborted
1539   while the Document remains in the 'processing' state, but the marking has not yet stopped so that
1540   impression or sheet counts are still increasing for the Document. [rfc2911] §4.3.8

1541 **'digital-signature-did-not-verify'** : The Document contains a digital signature type that is supported but the
1542   signature did not verify when the Printer attempted to verify the signature. [jobx] §6.1

1543 **'canceled-by-user'** : The Document was canceled by the owner of the Job containing the Document using
1544   the Cancel-Document request, i.e., by a user whose authenticated identity is the same as the value
1545   of the originating user that created the Job, or by some other authorized end-user, such as a
1546   member of the job owner's security group. The 'canceled-by-user' value SHOULD be supported for
1547   the "document-state-reasons" attribute for use with the Cancel-Document. [rfc2911] §4.3.8

1548 **'canceled-by-operator'** : The Document was canceled by the operator using the Cancel-Document request,
1549   i.e., by a user who has been authenticated as having operator privileges (whether local or remote). If
1550   the security policy is to allow anyone to cancel anyone's Document, then these values may be used
1551   when the Document is canceled by other than the owner of the job. For such a security policy, in

1552 effect, everyone is an operator as far as canceling Documents is concerned. This value SHOULD be
1553 supported if the implementation permits canceling by other than the owner of the job. [rfc2911]
1554 §4.3.8

1555 **'canceled-at-device'** : The Document was canceled by an unidentified local user, i.e., a user at a console at
1556 the device. This value SHOULD be supported if the implementation supports canceling
1557 Jobs/Documents at the console. [rfc2911] §4.3.8

1558 **'aborted-by-system'** : The Document (1) is in the process of being aborted, or (2) has been aborted by the
1559 system and placed in the 'aborted' state.. This value SHOULD be supported. [rfc2911] §4.3.8

1560 **'processing-to-stop-point'** : The requester has issued a Cancel-Document operation or the Printer has
1561 aborted the Document, but is still performing some actions on the Document until a specified stop
1562 point occurs or Document termination/cleanup is completed.
1563 If the implementation requires some measurable time to cancel the Document in the 'processing' or
1564 'processing-stopped' Document states, the Printer MUST use this value to indicate that the Printer is
1565 still performing some actions on the Document while the Document remains in the 'processing' state.
1566 After all the Document's Document Description attributes have stopped incrementing, the Printer
1567 moves the Document from the 'processing' state to the 'canceled' or 'aborted' Document states.
1568 [rfc2911] §4.3.8

1569 **'errors-detected'** : Errors were detected during the processing of this Document. If the Printer supports this
1570 value, the Printer MUST add the value to "document-state-reasons" when it generates the first error
1571 message. That is, a single occurrence of this value is present in the "document-state-reasons" if the
1572 Printer has generated one or more errors. An error indicates loss of information, such as a page not
1573 imaged. A warning indicates no loss of information (see 'warnings-detected' state reason). [jobx]
1574 §6.1

1575 **'warnings-detected'** : Warnings were detected during the processing of this Document. If the Printer
1576 supports this value, the Printer MUST add the value to "document-state-reasons" when it generates
1577 the first warning message. That is, a single occurrence of this value is present in the "document-
1578 state-reasons" if the Printer has generated one or more warnings. A warning indicates something
1579 did not go as expected, but there was no loss of information; for example, a font substitution. An
1580 error indicates loss of information (see 'errors-detected' state reason). [jobx] §6.1

1581 **'completed-successfully'** : The Document completed successfully. There were no warnings or errors in
1582 printing. This value SHOULD be supported. [rfc2911] §4.3.8

1583 **'completed-with-warnings'** : The printing of the Document completed with warnings This value SHOULD
1584 be supported if the implementation detects warnings. [rfc2911] §4.3.8
1585 **'completed-with-errors'** : The printing of the Document completed with errors (and possibly warnings too).
1586 This value SHOULD be supported if the implementation detects errors. [rfc2911] §4.3.8

1587 **'queued-in-device'** : The Document has been forwarded to a device or print system that is unable to send
1588 back status. The Printer sets the Document's "document-state" attribute to 'completed' and adds
1589 the 'queued-in-device' value to the Document's " document-state-reasons" attribute to indicate that
1590 the Printer has no additional information about the Document and never will have any better
1591 information. See the description of the "document-state" attribute above, as well as the description
1592 of "Forwarding Servers" in [rfc2911] § 4.3.7.1. [rfc2911] §4.3.8

1593 NOTE: The semantics of this attribute or the set of valid values may be different for different document formats.

1594 9.1.28 document-uri (uri)

1595 This Document Description attribute is the URI that the client supplied in the corresponding Operation attribute in a
1596 Send-URI operation (see [rfc2911] § 3.3.2). The Printer MUST support this attribute if the Printer supports the Send-
1597 URI operation (see section 4.2).

1598   Note: this URI identifies the source location of the document data. This URI is NOT the identifier of the Document
1599   Object. The simple identifier of the Document is the "document-number".

1600 **9.1.29 errors-count (integer(0:MAX))**

1601   This OPTIONAL Document Description attribute counts the number of errors that the Printer encounters while
1602   processing and printing the Document object. An error indicates loss of information, such as a page not imaged. A
1603   warning indicates no loss of information (see [jobx] job-errors-count §5.2).

1604 **9.1.30 impressions (integer(0:MAX))**

1605   This OPTIONAL Document Description attribute has the same semantics as the corresponding "job-impressions" Job
1606   Description attribute (see [rfc2911] job-impressions §4.3.17.2) applied to the Document object.   The Printer sets this
1607   Document Description attribute from the corresponding Operation attribute supplied by the client in the Document
1608   Creation operation (see §4), but may, as with "job-impressions", change the value if it is able to compute a value that
1609   is more accurate than the client supplied value (see [rfc2911] §4.3.17).

1610 **9.1.31 impressions-completed (integer(0:MAX))**

1611   This OPTIONAL Document Description attribute has the same semantics as the corresponding "job-impressions-
1612   completed" Job Description attribute (see [rfc2911] job-impressions-completes §4.3.18.2) applied to the Document
1613   object.

1614 **9.1.32 impressions-completed-current-copy (integer(0:MAX))**

1615   This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1616   attribute (see [rfc3381] §4.4) applied to the Document object.

1617 **9.1.33 k-octets (integer(0:MAX))**

1618   This OPTIONAL Document Description attribute has the same semantics as the corresponding "job-k-octets" Job
1619   Description attribute (see [rfc2911] job-k-octets §4.3.17.1) applied to the Document object. The Printer sets this
1620   Document Description attribute from the corresponding Operation attribute supplied by the client in the Document
1621   Creation operation (see §4), but may, as with "job-k-octets" change the value if it is able to compute a value that is
1622   more accurate than the client supplied value (see [rfc2911] §4.3.17).

1623 **9.1.34 k-octets-processed (integer(0:MAX))**

1624   This OPTIONAL Document Description attribute has the same semantics as the corresponding "job-k-octets-
1625   processed" Job Description attribute (see [rfc2911] job-k-octets-processed §4.3.18.1) applied to the Document
1626   object.

1627 **9.1.35 last-document (boolean)**

1628   This REQUIRED Document Description attribute indicates whether or not this Document is the last Document in the
1629   Job.   See [rfc2911] §4.3.12. The Printer sets this Document Description attribute from the corresponding Operation
1630   attribute supplied by the client in the Document Creation operation (see §4). Note that the last Document in a Job
1631   may not be known by the Printer until the client sends a final request containing no document data and the "last-
1632   document" attribute set to 'true'. In this event the Printer MUST set the "last-document" attribute of the Document
1633   created from the most recent Document Creation request 'true'. No Document object is created from the final
1634   request containing no document data and the "last-document" attribute set to 'true' sent to close the Job.

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

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

9.1.37 media-sheets-completed (integer(0:MAX))

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

9.1.38 more-info (uri)

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

9.1.39 output-device-assigned (name(127))

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

9.1.40 printer-up-time (integer (1:MAX))

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

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

9.1.41 sheet-completed-copy-number (integer(0:MAX))

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

9.1.42 time-at-completed (integer (MIN:MAX))

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

9.1.43 time-at-creation (integer (MIN:MAX))

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

1669   **9.1.44 time-at-processing (integer (MIN:MAX))**

1670   This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1671   attribute (see [rfc2911] §4.3.14.2) applied to the Document object.

1672   **9.1.45 warnings-count (integer(0:MAX))**

1673   This OPTIONAL Document Description attribute has the same semantics as the corresponding "job-warnings-count"
1674   Job Description attribute (see [jobx] job-warnings-count §5,4) applied to the Document object.   .A warning indicates
1675   something did not go as expected, but there was no loss of information; for example, a font substitution. An error
1676   indicates loss of information (see section 9.1.29).

1677   **9.2 "-actual" Job and Document Description Attributes**

1678   For each Template attribute defined in this specification or in any other IPP extension documents, an associated
1679   Description attribute is defined. The associated attribute is referred to as an "-actual" attribute,. The name of such
1680   attributes is found by taking the name of the Template attribute and appending "-actual". The "-actual" attribute is
1681   always multi-valued. The base type of the multi-valued attribute is derived from the Description attribute.

1682   The "-actual" attributes provide a summary of the Template attribute values that were applied at the level it occurs.
1683   For the Document Description "-actual", it contains all the values of the Document Template attribute that were
1684   applied to the Document and the pages within the Document. The Job Description "-actual" lists all the Document
1685   and Job Template values that were applied to the Job, its contained Documents, and the pages of the Document.
1686   These new attributes are OPTIONAL for a Printer to support, and are OPTIONAL for a client to use.

1687   Table 14 lists the "-actual" Document Description attributes for all Document Template defined in this specification.

1688   **Table 14 "-actual" Job/Document Description attributes**

Template Attribute	"-actual" Description attribute	Job	Document
copies (integer(1:MAX))	copies-actual (1setOf integer(1:MAX))	Yes	Yes
cover-back (collection)	cover-back-actual (1setOf (collection))	Yes	Yes
cover-front (collection)	cover-front-actual (1setOf (collection))	Yes	Yes
finishings (1setOf (type2 enum))	finishings-actual (1setOf (type2 enum)	Yes	Yes
finishings-col (collection)	finishings-col-actual (1setOf (collection))	Yes	Yes
force-front-side (1setOf integer(1:MAX))	force-front-side-actual (1setOf (1setOf integer(1:MAX)))	Yes	Yes
imposition-template (type3 keyword	name(MAX))	imposition-template-actual (1setOf (type3 keyword	name(MAX)))	Yes	Yes
insert-sheet (collection)	insert-sheet-actual (1setOf (collection))	Yes	Yes
job-account-id (name(MAX))	job-account-id-actual (1setOf (name(MAX)))	Yes	No
job-accounting-sheets (collection)	job-accounting-sheets-actual (1setOf (collection))	Yes	No
job-accounting-user-id (name(MAX))	job-accounting-user-id-actual (1setOf (name(MAX)))	Yes	No
job-copies (integer(1:MAX))	job-copies-actual (1setOf integer(1:MAX))	Yes	No
job-collation-type (type2 keyword)	job-collation-type-actual (1setOf (type2 keyword))	Yes	No
job-cover-back (collection)	job-cover-back-actual (1setOf (collection))	Yes	No
job-cover-front (collection)	job-cover-front-actual (1setOf (collection))	Yes	No
job-error-sheet (collection)	job-error-sheet-actual (1setOf (collection))	Yes	No
Job-finishings (1setOf (type2 enum))	Job-finishings-actual (1setOf (type2 enum))	Yes	No
Job-finishings-col (collection)	Job-finishings-col-actual (1setOf (collection))	Yes	No

Template Attribute	"-actual" Description attribute	Job	Document
job-hold-until (type3 keyword | name)	job-hold-until-actual (1setOf (type3 keyword | name))	Yes	No
job-message-to-operator (text(MAX))	job-message-to-operator-actual (1setOf (text(MAX)))	Yes	No
job-priority (integer(1:100))	job-priority-actual (1setOf integer(1:100))	Yes	No
job-sheet-message (text(MAX))	job-sheet-message-actual (1setOf (text(MAX)))	Yes	No
job-sheets (type3 keyword | name)	job-sheets-actual (1setOf (type3 keyword | name))	Yes	No
job-sheets-col (collection)	job-sheets-col-actual (1setOf (collection))	Yes	No
media (type3 keyword | name(MAX))	media-actual (1setOf (type3 keyword | name(MAX)))	Yes	Yes
media-col (collection)	media-col-actual (1setOf (collection))	Yes	Yes
media-input-tray-check (type3 keyword | name(MAX))	media-input-tray-check-actual (1setOf(type3 keyword | name(MAX)))	Yes	Yes
multiple-document-handling (type2 keyword)	multiple-document-handling-actual (1setOf (type2 keyword))	Yes	No
number-up (integer(1:MAX))	number-up-actual (1setOf integer(1:MAX))	Yes	Yes
orientation-requested (type2 enum)	orientation-requested-actual (1setOf (type2 enum))	Yes	Yes
output-bin (type2 keyword | name(MAX))	output-bin-actual (1setOf (type2 keyword | name(MAX)))	Yes	Yes
output-bin(name(MAX))	output-bin-axtual(1setOf (name(MAX))		
overrides (1setOf collection)	overrides-actual (1setOf collection)	Yes	Yes
page-delivery (type2 keyword)	page-delivery-actual (1setOf (type2 keyword))	Yes	Yes
page-order-received (type2 keyword)	page-order-received-actual (1setOf (type2 keyword))	Yes	Yes
page-ranges (1setOf rangeOfInteger(1:MAX))	page-ranges-actual (1setOf rangeOfInteger(1:MAX))	Yes	Yes
presentation-direction-number-up (type2 keyword)	presentation-direction-number-up-actual (1setOf (type2 keyword))	Yes	Yes
print-quality (type2 enum)	print-quality-actual (1setOf (type2 enum))	Yes	Yes
printer-resolution (resolution)	printer-resolution-actual (1setOf resolution)	Yes	Yes
separator-sheets (collection)	separator-sheets-actual (1setOf (collection))	Yes	Yes
sheet-collate (type2 keyword)	sheet-collate-actual (1setOf (type2 keyword))	Yes	Yes
sides (type2 keyword)	sides-actual (1setOf (type2 keyword))	Yes	Yes
x-image-position (type2 keyword)	x-image-position-actual (1setOf (type2 keyword))	Yes	Yes
x-image-shift (integer (MIN:MAX))	x-image-shift-actual (1setOf (integer (MIN:MAX)))	Yes	Yes
x-side1-image-shift (integer (MIN:MAX))	x-side1-image-shift-actual (1setOf (integer (MIN:MAX)))	Yes	Yes
x-side2-image-shift (integer (MIN:MAX))	x-side2-image-shift-actual (1setOf (integer (MIN:MAX)))	Yes	Yes
y-image-position (type2 keyword)	y-image-position-actual (1setOf (type2 keyword))	Yes	Yes
y-image-shift (integer (MIN:MAX))	y-image-shift-actual (1setOf (integer (MIN:MAX)))	Yes	Yes
y-side1-image-shift (integer (MIN:MAX))	y-side1-image-shift-actual (1setOf (integer (MIN:MAX)))	Yes	Yes
y-side2-image-shift (integer (MIN:MAX))	y-side2-image-shift-actual (1setOf (integer (MIN:MAX)))	Yes	Yes

1689

1690 Note that Table 14 is not meant to be an exhaustive list of the "-actual" attributes a Printer might implement. Any
1691 Document Template attributes created by present, or future IPP standard documents, implies a corresponding "-
1692 actual" Document Description attribute exists and can be implemented by a Printer or queried by a client.

1693 **10 New Printer attributes**

1694 This section newly defined Printer attributes. Printer attributes are divided into three disjoint groups:
1695

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" indicates the supported values. 2. "xxx-default" indicates the values that will be used if the client and the PDL omit the attribute. 3. "xxx-ready" indicates the supported values that are available without human intervention, for those few attributes that require human intervention, such as "media" and possibly "job-finishing". 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" indicates the supported values. 2. "xxx-default" indicates the values that will be used if the client and the PDL omit the attribute. 3. "xxx-ready" indicates the supported values that are available without human intervention, for those few attributes that require human intervention, such as "media" and possibly "finishing". These Printer attributes are also returned in a Get-Printer-Attributes response when the client supplies: "requested-attributes" = 'document-template' (new value defined in this specification).
Printer Description attributes (PD)	These Printer attributes describe the Printer, such as "printer-current-time" and "printer-is-accepting-jobs". 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.

1696
1697   In a Get-Printer-Attributes request, a client can request all of the Printer attributes in the Job Template (JT),
1698   Document Template (DT), or Printer Description (PD) groups by supplying the 'job-template', 'document-template', or
1699   'printer-description' group name, respectively. The client can also request 'all'.

1700   In Table 15, the column labels are:

1701   "**Attribute Syntax**" - indicates the attribute syntax (see [rfc2911] § 4.1). Many "xxx-default" and "xxx-
1702   supported" attributes have the 'collection' syntax which consists of a number of member attributes.
1703   These member attributes are not listed in this table when they are the same as the corresponding
1704   "xxx" attribute in Table 10. Only those few Printer attribute collection attributes that do not have a
1705   corresponding Job Template attribute show the member attributes in this table.

1706   "**Grp**" - indicates to which group the attribute belongs. "PD" = Printer Description; "JT" = Job Template; "DT"
1707   = Document Template as explained above.

1708   "**Printer Conf**." - indicates the Printer conformance requirements for supporting the attribute. Those
1709   attributes labeled as "MAY" may have conditional requirements that require their support, if the
1710   Printer supports a related attribute, operation, or feature. For example, all Job Template attributes
1711   are OPTIONAL for a Printer to support. However, if a Printer supports Job Template attribute "xxx",
1712   then it MUST also support the corresponding "xxx-default" and "xxx-supported" attributes. Similarly,
1713   if Event Notification is supported, then some of the attributes indicated as "MAY" in this table become
1714   MUST.

1715   "**Reference**" - lists the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

1716   **Table 15 – New Printer attributes**

Printer attribute name (Job Template, Document Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
document-creation-attribute s- supported	1setOf type2 keyword	PD	MUST	[this-spec] §10.1

1717

1718 10.1 document-creation-attributes-supported (1setOf type2 keyword)

1719 This REQUIRED Printer Description attribute lists the keyword names of the Document Template and Operation
1720 attributes that the Printer will accept in the Send-Document and Send-URI Document Creation operations. Note: The
1721 attribute "document-uri" is operation specific. Implementations that support Send-URI MUST include the 'document-
1722 uri' keyword in "document-creation-attributes-supported". Implementations that do not support Send-URI MUST NOT
1723 include the 'document-uri' keyword in "document-creation-attributes-supported". Inclusion of the 'document-uri'
1724 keyword in "document-creation-attributes-supported" does not imply that the "document-URI" attribute is valid for
1725 Send-Document.

1726 11 New Values for Existing Printer Description Attributes

1727 This section contains those attributes for which additional values are added.

1728 11.1 operations-supported (1setOf type2 enum)

1729 The following "operation-id" values are added in order to support the new operations defined in this document:

1730   **Table 16 – Operation-id assignments**

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

1731

1732 12 Encodings of Additional Attribute Tags

1733 This section assigns values to an attributes tag as an extension to the encoding defined in [rfc2910].

1734 The "document-attributes-tag" delimits Document Template Attributes Groups in requests and Document Attributes
1735 Groups in responses.

1736 The following table specifies the values for the delimiter tag:

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

1737

13 Conformance Summary

This section specifies the conformance requirements for Printers and clients. This section does not change any of the preceeding normative definitions. If there is any conflict , the previous definitions apply.

13.1 Printer conformance requirements

In order to conform to this specification, a Printer:

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

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

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

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

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

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

7. MUST support any Operation attributes that section 7 REQUIRES a Printer to support along with the corresponding Document Description attributes that section 9.1 REQUIRES a Printer to support and any "xxx-default" and "xxx-supported" Printer attributes that section 9.2 REQUIRES a Printer to support.

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

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

10. MUST support the Printer attributes that section 9.2 REQUIRES a Printer to support..

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

13.2 Client conformance requirements

In order to conform to this specification, a client:

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

2. MAY support any of the new operations, or new semantics for existing operations, defined in sections 3, 4, and 5.

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

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

1770   5. SHOULD support any of the Document Description attributes that section 9.1 REQUIRES a Printer to support.

1771   6. MAY support any of the Printer attributes listed in section 9.2.

1772   7. MAY support any of the values of the Printer Description attributes in section 11.

1773 # 14 Normative References

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1873 # 16 IANA Considerations

1874 This section contains the registration information for IANA to add to the various IPP Registries according to the
1875 procedures defined in RFC 2911 [rfc2911] § 6 to cover the definitions in this document. The resulting registrations
1876 will be published in the http://www.iana.org/assignments/ipp-registrations registry.

1877 *Note to the RFC Editor: Replace the References below to [this spec] with the IEEE PWG number for the*
1878 *appropriate document, so that it accurately reflects the content of the information for the IANA Registry.*

1879 ## 16.1 Attribute Registrations

1880 The following table lists all the attributes defined in this specification. These are to be registered according to the
1881 procedures in RFC 2911 [rfc2911] § 6.2. If the attribute has a separate sub-section definition in this specification,
1882 that sub-section is listed as the Reference. This specification lists most Job Template attributes as also being
1883 Document Template attributes. However, the definitions of these Document Template attributes are not duplicated in
1884 this specification. Instead, the Reference column in this sub-section indicates Section 8 which contains a table of all
1885 Job Template and corresponding Document Template attributes (including dropping the "job-" prefix). This table
1886 contains the reference in another specification that completely defines each attribute.   These Document Template
1887 attributes will also be added to the IANA IPP Registry under the Document Template attributes with a reference to
1888 this specification and Section 8.
1889
```
1890  Attribute Name (attribute syntax)              Reference    Section
1891  ---------------------------------              ----------   --------
1892  Document Description attributes:
1893  attributes-charset (charset)                   [this spec]  9.1.1
1894  attributes-natural-language (naturalLanguage)  [this spec]  9.1.2
1895  compression (type3 keyword)                    [this spec]  9.1.3
1896  copies-actual (1setOf integer(1:MAX))          [this spec]  9.2
1897  cover-back-actual (1setOf collection)          [this spec]  9.2
1898     cover-type (type2 keyword)                  [this spec]  8
1899     media  (type3 keyword | name)              [this spec]  8
1900     media-col  (collection)                     [this spec]  8
1901  cover-front-actual (1setOf collection)         [this spec]  9.2
1902     cover-type (type2 keyword)                  [this spec]  8
1903     media  (type3 keyword | name)              [this spec]  8
1904     media-col  (collection)                     [this spec]  8
1905  current-page-order (type2 keyword)             [this spec]  9.1.4
1906  date-time-at-completed (dateTime)              [this spec]  9.1.5
1907  date-time-at-creation (dateTime)               [this spec]  9.1.6
1908  date-time-at-processing (dateTime)             [this spec]  9.1.7
1909  detailed-status-messages (1setOf text(MAX))    [this spec]  9.1.8
1910  document-access-errors (1setOf text(MAX))      [this spec]  9.1.9
1911  document-charset (charset)                     [this spec]  9.1.10
1912  document-digital-signature (type2 keyword)     [this spec]  9.1.11
1913  document-format (mimeMediaType)                [this spec]  9.1.12
1914  document-format-details (1setOf collection)    [this spec]  9.1.13
1915  document-format-details-detected (1setOf collection)
1916                                                 [this spec]  9.1.14
1917  document-format-detected (mimeMediaType)       [this spec]  9.1.15
```

```
1918   document-format-version (text(127))             [this spec]  9.1.16
1919   document-format-version-detected (text(127))    [this spec]  9.1.17
1920   document-job-id (integer(1:MAX))                [this spec]  9.1.11
1921   document-job-uri (uri)                          [this spec]  9.1.19
1922   document-message (text(MAX))                    [this spec]  9.1.20
1923   document-name (name(MAX))                       [this spec]  9.1.21
1924   document-natural-language (naturalLanguage)     [this spec]  9.1.22
1925   document-number (integer(1:MAX))                [this spec]  9.1.23
1926   document-printer-uri (uri)                      [this spec]  9.1.24
1927   document-state (type1 enum)                     [this spec]  9.1.25
1928   document-state-message (text(MAX))              [this spec]  9.1.26
1929   document-state-reasons (1setOf type2 keyword)   [this spec]  9.1.27
1930   document-uri (uri)                              [this spec]  9.1.28
1931   errors-count (integer(0:MAX))                   [this spec]  9.1.29
1932   finishings-actual (1setOf type2 enum)           [this spec]  9.2
1933   finishings-col-actual (1setOf collection)       [this spec]  9.2
1934      finishing-template (name (MAX))              [this spec]  8
1935      stitching (collection)                       [this spec]  8
1936        stitching-reference-edge (type2 keyword)   [this spec]  8
1937        stitching-offset (integer(0:MAX))          [this spec]  8
1938        stitching-locations (1setOf integer(0:MAX)) [this spec] 8
1939   force-front-side-actual (1setOf integer(1:MAX)  [this spec]  9.2
1940   impressions  (integer(0:MAX))                   [this spec]  9.1.30
1941   impressions-completed (integer(0:MAX))          [this spec]  9.1.31
1942   impressions-completed-current-copy (integer(0:MAX))
1943                                                   [this spec]  9.1.32
1944   imposition-template-actual (1setOf type3 keyword|name)
1945                                                   [this spec]  9.2
1946   insert-sheet-actual (1setOf collection)         [this spec]  9.2
1947      insert-after-page-number (integer(0:MAX))    [this spec]  8
1948      insert-count (integer(0:MAX))                [this spec]  8
1949      media (type3 keyword | name)                 [this spec]  8
1950      media-col (collection)                       [this spec]  8
1951   k-octets  (integer(0:MAX))                      [this spec]  9.1.33
1952   k-octets-processed (integer(0:MAX))             [this spec]  9.1.34
1953   last-document  (boolean)                        [this spec]  9.1.35
1954   media-actual (1setOf type3 keyword|name)        [this spec]  9.2
1955   media-col-actual (1setOf collection)            [this spec]  9.2
1956      media-back-coating (type3 keyword|name(MAX)) [this spec]  8
1957      media-color (type3 keyword|name(MAX))        [this spec]  8
1958      media-front-coating (type3 keyword|name(MAX)) [this spec] 8
1959      media-hole-count (integer(0:MAX))            [this spec]  8
1960      media-info (text(255))                       [this spec]  8
1961      media-key (type3 keyword|name(MAX))          [this spec]  8
1962      media-order-count (integer(1:MAX))           [this spec]  8
1963      media-preprinted (type3 keyword|name(MAX))   [this spec]  8
```

```
1964      media-recycled (type3 keyword|name(MAX))        [this spec]  8
1965      media-size  (collection)                        [this spec]  8
1966        x-dimension (integer(0:MAX))                  [this spec]  8
1967        y-dimension (integer(0:MAX))                  [this spec]  8
1968      media-type (type3 keyword|name(MAX))            [this spec]  8
1969      media-weight-metric (integer(0:MAX))            [this spec]  8
1970   media-input-tray-check-actual (1setOf type3 keyword|name)
1971                                                      [this spec]  9.2
1972   media-sheets  (integer(0:MAX))                     [this spec]  9.1.36
1973   media-sheets-completed (integer(0:MAX))            [this spec]  9.1.37
1974   more-info (uri)                                    [this spec]  9.1.38
1975   number-up-actual (1setOf integer)                  [this spec]  9.2
1976   orientation-requested-actual (1setOf type2 enum) [this spec]  9.2
1977   output-bin-actual (1setOf name(MAX))               [this spec]  9.2
1978   overrides-actual (1setOf collection)               [this spec]  9.2
1979      pages (1setOf RangeOfInteger(1:MAX))            [this spec]  8
1980      document-numbers (1setOf RangeOfInteger(1:MAX)))
1981                                                      [this spec]  8
1982      document-copies (1setOf RangeOfInteger(1:MAX)))
1983                                                      [this spec]  8
1984      <any other Template attribute affecting pages>[this spec]  8
1985   output-device-assigned (name(127))                 [this spec]  9.1.39
1986   page-delivery-actual (1setOf type2 keyword)        [this spec]  9.2
1987   page-order-received-actual (1setOf type2 keyword)[this spec]  9.2
1988   page-ranges-actual (1setOf rangeOfInteger(1:MAX))[this spec]  9.2
1989   presentation-direction-number-up-actual (1setOf type2 keyword)
1990                                                      [this spec]  9.2
1991   print-quality-actual (1setOf type2 enum)           [this spec]  9.2
1992   printer-resolution-actual (1setOf resolution)    [this spec]  9.2
1993   printer-up-time (integer (1:MAX))                  [this spec]  9.1.40
1994   separator-sheets-actual (1setOf collection)        [this spec]  9.2
1995     separator-sheets-type (type3 keyword|name(MAX))[this spec]  8
1996    media(type3 keyword|name(MAX))                    [this spec]  8
1997    media-col(collection)                             [this spec]  8
1998   sheet-collate-actual (1setOf type2 keyword)        [this spec]  9.2
1999   sheet-completed-copy-number (integer(0:MAX))       [this spec]  9.1.41
2000   sides-actual (1setOf type2 keyword)                [this spec]  9.2
2001   time-at-completed (integer (MIN:MAX))              [this spec]  9.1.42
2002   time-at-creation (integer (MIN:MAX))               [this spec]  9.1.43
2003   time-at-processing (integer (MIN:MAX))             [this spec]  9.1.44
2004   x-image-position-actual (1setOf type2 keyword)   [this spec]  9.2
2005   x-image-shift-actual (1setOf integer(MIN:MAX))   [this spec]  9.2
2006   x-side1-image-shift-actual (1setOf integer(MIN:MAX))
2007                                                      [this spec]  9.2
2008   x-side2-image-shift-actual (1setOf integer(MIN:MAX))
2009                                                      [this spec]  9.2
```

```
2010  y-image-position-actual (1setOf type2 keyword)    [this spec]  9.2
2011  y-image-shift-actual (1setOf integer(MIN:MAX))    [this spec]  9.2
2012  y-side1-image-shift-actual (1setOf integer(MIN:MAX))
2013                                                    [this spec]  9.2
2014  y-side2-image-shift-actual (1setOf integer(MIN:MAX))
2015                                                    [this spec]  9.2
2016
2017
2018  Document Templates attributes:
2019  copies (integer(1:MAX))                           [this spec]   8
2020  cover-back (collection)                           [this spec]   8
2021    cover-type (type2 keyword)                      [this spec]   8
2022    media (type3 keyword | name(MAX))               [this spec]   8
2023    media-col (collection)                          [this spec]   8
2024  cover-front (collection)                          [this spec]   8
2025    cover-type (type2 keyword)                      [this spec]   8
2026    media (type3 keyword | name(MAX))               [this spec]   8
2027    media-col (collection)                          [this spec]   8
2028  feed-orientation (type3 keyword)                  [this spec]   8
2029  finishings (1setOf type2 enum)                    [this spec]   8
2030  finishings-col (collection)                       [this spec]   8
2031    finishing-template (name(MAX))                  [this spec]   8
2032    stitching (collection)                          [this spec]   8
2033      stitching-locations (1setOf integer(0:MAX))   [this spec]   8
2034      stitching-offset (integer (0:MAX))            [this spec]   8
2035      stitching-reference-edge (type2 keyword)      [this spec]   8
2036  font-name-requested (name(MAX))                   [this spec]   8
2037  font-size-requested (integer(1:MAX))              [this spec]   8
2038  force-front-side (1setOf integer(1:MAX))          [this spec]   8
2039  imposition-template (type3 keyword | name(MAX))   [this spec]   8
2040  insert-sheet (1setOf collection)                  [this spec]   8
2041    insert-after-page-number (integer(0:MAX))       [this spec]   8
2042    insert-count (integer(0:MAX))                   [this spec]   8
2043    media (type3 keyword | name(MAX))               [this spec]   8
2044    media-col (collection)                          [this spec]   8
2045  media (type3 keyword | name(MAX))                 [this spec]   8
2046                                                    [this spec]   8
2047  media-col (collection)                            [this spec]   8
2048    media-back-coating (type3 keyword | name(MAX)) [this spec]   8
2049    media-color (type3 keyword | name(MAX))         [this spec]   8
2050    media-front-coating (type3 keyword | name(MAX))[this spec]   8
2051    media-grain (type3 keyword | name(MAX))         [this spec]   8
2052    media-hole-count (integer(0:MAX))               [this spec]   8
2053    media-info (text(255))                          [this spec]   8
2054    media-key (type3 keyword | name(MAX))           [this spec]   8
2055    media-material (type3 keyword | name(MAX))      [this spec]   8
```

```
2056    media-order-count (integer(1:MAX))              [this spec]    8
2057    media-preprinted (type3 keyword | name(MAX))    [this spec]    8
2058    media-recycled (type3 keyword | name(MAX))      [this spec]    8
2059    media-size (collection)                         [this spec]    8
2060      x-dimension (integer(0:MAX))                  [this spec]    8
2061      y-dimension (integer(0:MAX))                  [this spec]    8
2062    media-thickness (integer(1:MAX))                [this spec]    8
2063    media-tooth (type3 keyword | name(MAX))         [this spec]    8
2064    media-type (type3 keyword | name(MAX))          [this spec]    8
2065    media-weight-metric (integer(0:MAX))            [this spec]    8
2066  media-input-tray-check (type3 keyword | name(MAX))
2067                                                    [this spec]    8
2068  media-type (type3 keyword | name(MAX))            [this spec]    8
2069  number-up (integer(1:MAX))                        [this spec]    8
2070  orientation-requested (type2 enum)                [this spec]    8
2071  overrides (1setOf collection)                     [this spec]    8
2072    pages (1setOf rangeOfInteger(MAX))              [this spec]    8
2073    document-numbers (1setOf rangeOfInteger(MAX))   [this spec]    8
2074    document-copies (1setOf rangeOfInteger(MAX))    [this spec]    8
2075  page-delivery (type2 keyword)                     [this spec]    8
2076  page-order-received (type2 keyword)               [this spec]    8
2077  page-ranges (1setOf rangeOfInteger(1:MAX))        [this spec]    8
2078  pdl-init-file (1setOf collection)                 [this spec]    8
2079    pdl-init-file-entry (name(MAX))                 [this spec]    8
2080    pdl-init-file-location (uri)                    [this spec]    8
2081    pdl-init-file-name (name(MAX))                  [this spec]    8
2082  presentation-direction-number-up (type2 keyword) [this spec]    8
2083  print-quality (type2 enum)                        [this spec]    8
2084  printer-resolution (resolution)                   [this spec]    8
2085  separator-sheets (collection)                     [this spec]    8
2086    media (type3 keyword | name(MAX))               [this spec]    8
2087    media-col (collection)                          [this spec]    8
2088    separator-sheets-type (type3 keyword | name(MAX))
2089                                                    [this spec]    8
2090  sheet-collate (type2 keyword)                     [this spec]    8
2091  sides (type2 keyword)                             [this spec]    8
2092  x-image-position (type2 keyword)                  [this spec]    8
2093  x-image-shift (integer(MIN:MAX))                  [this spec]    8
2094  x-side1-image-shift (integer(MIN:MAX))            [this spec]    8
2095  x-side2-image-shift (integer(MIN:MAX))            [this spec]    8
2096  y-image-position (type2 keyword)                  [this spec]    8
2097  y-image-shift (integer(MIN:MAX))                  [this spec]    8
2098  y-side1-image-shift (integer(MIN:MAX))            [this spec]    8
2099  y-side2-image-shift (integer(MIN:MAX))            [this spec]    8
2100
2101
```

```
2102
2103   Job Description attributes:
2104   job-copies-actual (1setOf integer(1:MAX))        [this spec]  9.2
2105   job-cover-back-actual (1setOf collection)        [this spec]  9.2
2106   job-cover-front-actual (1setOf collection)       [this spec]  9.2
2107   job-collation-type-actual (1setOf type2 keyword) [this spec]  9.2
2108   job-finishings-actual (1setOf type2 enum)        [this spec]  9.2
2109   job-finishings-col-actual (1setOf collection)    [this spec]  9.2
2110
2111
2112   Job Template attributes:
2113   job-copies  (integer(1:MAX))                     [this spec]  8
2114   job-copies-default  (integer(1:MAX))             [this spec]  8
2115   job-copies-supported  (rangeOfInteger (1:MAX))   [this spec]  8
2116   job-cover-back  (collection)                     [this spec]  8
2117   job-cover-back-default  (collection)             [this spec]  8
2118   job-cover-back-supported  (1setOf type2 keyword) [this spec]  8
2119   job-cover-front (collection)                     [this spec]  8
2120   job-cover-front-default  (collection)            [this spec]  8
2121   job-cover-front-supported  (1setOf type2 keyword)[this spec]  8
2122   job-finishings (1setOf type2 enum)               [this spec]  8
2123   job-finishings-default (1setOf type2 enum)       [this spec]  8
2124   job-finishings-supported (1setOf type2 enum)     [this spec]  8
2125   job-finishings-col (collection)                  [this spec]  8
2126   job-finishings-col-default (collection)          [this spec]  8
2127   job-finishings-col-supported (1setOf type2 keyword)
2128                                                    [this spec]  8
2129
2130
2131   Printer Description attributes:
2132   document-creation-attributes-supported (1setOf type2 keyword)
2133                                                    [this spec]  10.1
```

2134 16.2 Keyword attribute values

```
2135   document-state-reasons (1setOf type2 keyword)    [this spec]  9.1.27
2136     aborted-by-system                             [this spec]  9.1.27
2137     compression-error                             [this spec]  9.1.27
2138     digital-signature-did-not-verify              [this spec]  9.1.27
2139     digital-signature-type-not-supported          [this spec]  9.1.27
2140     document-access-error                         [this spec]  9.1.27
2141     document-format-error                         [this spec]  9.1.27
2142     canceled-at-device                            [this spec]  9.1.27
2143     canceled-by-operator                          [this spec]  9.1.27
2144     canceled-by-user                              [this spec]  9.1.27
2145     completed-successfully                        [this spec]  9.1.27
2146     completed-with-errors                         [this spec]  9.1.27
```

```
2147    completed-with-warnings                      [this spec]  9.1.27
2148    data-insufficient                            [this spec]  9.1.27
2149    digital-signature-wait                       [this spec]  9.1.27
2150    errors-detected                              [this spec]  9.1.27
2151    incoming                                     [this spec]  9.1.27
2152    interpreting                                 [this spec]  9.1.27
2153    none                                         [this spec]  9.1.27
2154    outgoing                                     [this spec]  9.1.27
2155    printing                                     [this spec]  9.1.27
2156    processing-to-stop-point                     [this spec]  9.1.27
2157    queued                                       [this spec]  9.1.27
2158    queued-for-marker                            [this spec]  9.1.27
2159    queued-in-device                             [this spec]  9.1.27
2160    resources-are-not-ready                      [this spec]  9.1.27
2161    resources-are-not-supported                  [this spec]  9.1.27
2162    submission-interrupted                       [this spec]  9.1.27
2163    transforming                                 [this spec]  9.1.27
2164    unsupported-compression                      [this spec]  9.1.27
2165    unsupported-document-format                  [this spec]  9.1.27
2166    warnings-detected                            [this spec]  9.1.27
```

2167 **16.3 Enum Attribute Values**

2168 The following table lists all the new enum attribute values defined in this document as additional type2 enum values.
2169 These are to be registered according to the procedures in RFC 2911 [rfc2911] § 6.1.
2170

```
2171    Value       Name                             Reference   Section:
2172    --------     ----------------------           ---------   -------
2173    document-state (type1 enum)                   [this spec] 9.1.25
2174    3    pending                                  [this spec] 9.1.25
2175    5    processing                               [this spec] 9.1.25
2176    7    canceled                                 [this spec] 9.1.25
2177    8    aborted                                  [this spec] 9.1.25
2178    9    completed                                [this spec] 9.1.25
2179    operations-supported (1setOf type2 enum)      [rfc2911]   4.4.15
2180    0x0033     Cancel-Document                    [this spec] 4.5
2181    0x0034     Get-Document-Attributes            [this spec] 4.3
2182    0x0035     Get-Documents                      [this spec] 3.3
2183    0x0036     Delete-Document                    [this spec] 5.4
2184    0x0037     Set-Document-Attributes            [this spec] 4.4
```

2185

2186 **16.4 Operations**

2187 The following table lists all of the operations defined in this document. These are to be registered according to the
2188 procedures in RFC 2911 [rfc2911] § 6.4.
2189

```
2190    Operations                                    Reference   Section
```

```
2191   --------------------------                              ---------   --------
2192   Cancel-Document                                         [this spec]  4.5
2193   Delete-Document                                         [this spec]  5.4
2194   Get-Document-Attributes                                 [this spec]  4.3
2195   Get-Documents                                           [this spec]  3.3
2196   Set-Document-Attributes                                 [this spec]  4.4
2197
```

2198 16.5 Attribute Group tags

2199 The following table lists all the attribute group tags defined in this specification. These are to be registered according
2200 to the procedures in RFC 2911 [rfc2911] § 6.5.

```
2201   Value     Name                                   Reference      Section
2202   -----     ------------------------------------   ---------      -------
2203   0x09      document-attributes-tag                [this spec]    12
2204
```

2205 16.6 Status codes

2206 The following table lists all the status codes defined in this specification. These are to be registered according to the
2207 procedures in RFC 2911 [rfc2911] § 6.6.

```
2208   Value     Status Code Name                       Reference      Section
2209   ------    ------------------------------------   ---------      -------
2210   0x0500:0x05FF - Server Error:
2211   0x050B    server-error-too-many-jobs             [jobx]         8.1
2212   0x050C    server-error-too-many-documents        [jobx]         8.2
2213
```

2214 16.7 Attribute Group name Registrations

2215 The following table lists the one new attribute group name defined in this document. This is to be registered
2216 according to the procedures in RFC 2911 [rfc2911] § 6.2.

```
2217   Attribute Group name                             Reference      Section
2218   --------------------                             ---------      -------
2219   document-template                                [this spec]    4.3
```

2220 17 Internationalization Considerations

2221 The internationalization considerations for this extension for handling the Document object are the same as for
2222 handling the Job object in [rfc2911].

2223 18 Security Considerations

2224 The Document object should provide no more increased security considerations than the Job object. The Printer
2225 MUST provide the same access control for Document objects as for Job objects.

2226 The Printer implementer needs to consider counter measures for denial of service attacks for the Create-Job
2227 operation. For example, a rogue client could issue repeated Create-Job and/or Send-Document/Send-URI requests
2228 in an attempt to exceed the capacity of the Printer to absorb such requests and thereby deny Job Creation and
2229 Document Creation requests from other clients. For example, a Printer might avoid a fixed set of allocations for Jobs
2230 and Documents and also be able to detect when an excessive number of Create-Job and Send-Document/Send-URI
2231 requests have been supplied. In such a case, the Printer would return either a 'server-error-too-many-jobs' status-
2232 code (see section **Error! Reference source not found.**) or a 'server-error-too-many-documents' status-code (see
2233 section **Error! Reference source not found.**).

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2240

20 Acknowledgments

2241

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2270 ## 22 Appendix A: Document operations compared to Job operations
2271 ## (Informative)

2272 This appendix compares the Document operations with the existing Job operations to show the parallelism.

2273 Table 17 compares the Job and Document operations. The two Conf. columns indicate the conformance
2274 requirements (REQUIRED = REQ, OPTIONAL = OPT) for the Job and Document operations respectively. A "REQ"
2275 in the Document Conformance column means if the Document object is supported. Whether a Document operation
2276 is a method on the Job object or the Document object depends on the modeling regime and is not an essential part
2277 of the semantics described here, since these semantics are intended to apply to both object-oriented and object-
2278 based protocols, APIs, and implementations.

2279 **Table 17 - 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*	
Cancel-Job	REQ	**Cancel-Document**	REQ
Get-Job-Attributes	REQ	**Get-Document-Attributes**	REQ
Get-Jobs	REQ	**Get-Documents**	REQ
Hold-Job		*N/A, can only hold an entire job*	
Print-Job	REQ	**Send-Document** (existing operation - see [rfc2911] with an additional Document attributes group defined in section 4.1)	REQ
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*	

2280
2281

2282 ## 23 Annex B: IEEE-ISTO 5100.4-2001 Document Overrides (informative)

2283 With the introduction of the Document Object, there is no longer a need for the "document-overrides" (1setOf
2284 collection) attribute [pwg5100.4-2001] as an Operation attribute or a Job Template attribute. A new Overrides
2285 document [OvrRide] without the "document-overrides" attribute will be published. With the introduction of the
2286 Document object, the client simply supplies the Document Template attributes (see Table 10) for each Document

2287 Creation request (in a new Document Template attribute group). There is no longer a need for the "document-
2288 overrides" attribute.

2289 Page Overrides will be specified in a new document [OvrRide] that replaces the obsolete [pwg5100.4-2001].   Other
2290 [pwg5100.4-2001] features such as Subset Processing and Error/Warning counts have been moved to other
2291 specifications.

2292 24 Annex C: Change Log (informative)

2293 The following summaries of the changes in reverse chronological order:

2294 Version 0.18, October 14, 2003,
2295   1. Updated dates and references

2296 Version 0.17, October 1, 2003,
2297   2. Made changes based on Jerry Thrasher's 15 editorial comments
2298
2299 Version 0.16, September 8, 2003,
2300   3. Cleanup for Last Call
2301   4. Removed highglighting
2302   5. Removed previous Change Log content
2303