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1 Working Draft, 16 March 2003
2 Maturity Level: Development -18 ISSUES are highlighted like this, some are in footnotes.
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The Printer Working Group (PWG)
Standard for
The Internet Printing Protocol (IPP):
Document Object
8

9 **Abstract:** This IPP specification extends the IPP Model and Semantics [rfc2911] object model by defining a
10 Document object. The [rfc2911] Job object is extended to contain one or more Document objects which are passive
11 objects operated on by the Job. A new REQUIRED Create-Document operation allows a client to supply the
12 Document Attributes without the data (like Create-Job does for a Job object). Then the client sends the data content
13 for that Document object using the new REQUIRED Send-Document-Data operation.

14 This specification also defines five new operations for Document objects once they have been created:
15   1 REQUIRED Job operation: Close-Job
16   3 REQUIRED Document operations: Cancel-Document, Get-Document-Attributes, Get-Documents
17   2 OPTIONAL Document operations: Delete-Document, Set-Document-Attributes.
18 This specification also lists all of the attributes defined in other IPP specifications to show their relationship to
19 corresponding attributes defined in this IPP specification for use with the Document object.

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

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

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

34
35 ftp://ftp.pwg.org/pub/pwg/ipp/new_DOC/wd-ippdoc20030314.pdf, .doc, .rtf

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

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295   This IPP specification extends the IPP Model and Semantics [rfc2911] object model by defining a Document object.
296   The [rfc2911] Job object is extended to contain one or more Document objects which are passive objects operated
297   on by the Job. The Job object is created by the REQUIRED[1] Create-Job (see [rfc2911] section 3.2.4) operation and
298   is closed by the Close-Job operation (see section 4.3). The Document object is created by the REQUIRED[2] Send-
299   Document (see [rfc2911] section 3.3.1) and OPTIONAL Send-URI (see [rfc2911] section 3.3.2) operations and
300   represents an Input Document to the Job. This specification also adds a Document Attributes group (and tag) to
301   these Send-Document and Send-URI requests. The Document Attributes group contains any Document Template
302   attributes to be applied to this Document object being created, overriding any corresponding Job Template attribute
303   supplied at the job level. A new REQUIRED Create-Document operation allows a client to supply the Document
304   Attributes without the data (like Create-Job does for a Job object). Then the client sends the data content for that
305   Document object using the new REQUIRED Send-Document-Data operation.

306   This specification defines one new operation for Job objects and five new operations for Document objects once they
307   have been created:

308   1 REQUIRED Job operation: Close-Job
309   3 REQUIRED Document operations: Cancel-Document, Get-Document-Attributes, Get-Documents
310   2 OPTIONAL Document operations: Delete-Document, Set-Document-Attributes.

311   This specification also lists all of the attributes defined in other IPP specifications[3] to show their relationship to
312   corresponding attributes defined in this IPP specification for use with the Document object. The full semantics of the
313   "document-state", "document-state-reasons", and "document-state-message" Document Description attributes are
314   given along side of the corresponding [rfc2911] "job-state", "job-state-reasons", and "job-state-message" Job
315   Description attributes.

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

320   This specification also defines "media-size-name" and "media-type" as Job Template and Document Template
321   attributes to provide a detailed specification for reference from the PWG Semantic Model.

1.1   Scope

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

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[1] The Create-Job operation is OPTIONAL in [rfc2911], but is REQUIRED in order to support the Document object
defined in this specification.
[2] The Send-Document is OPTIONAL in [rfc2911], but is REQUIRED in order to support the Document object defined
in this specification.
[3] 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.

329 The Document object is a passive object[4] and is operated upon by the Job. The client uses the new Create-
330 Document operation or either of the existing Send-Document and Send-URI operations to create a Document object.
331 In addition there are 8 new operations that affect the Document object after it has been created as summarized in
332 Table 1.

333 **Table 1 - List of operations**

Operation Name	Printer support	Brief Description
Close-Job	REQUIRED	Closes the Job object that was created with Document objects.
Create-Document [5]	REQUIRED	Creates a Document object with Document attributes, but no data.
Send-Document-Data	REQUIRED	Sends data to the Document object created by Create-Document.
Send-Document *	REQUIRED	Creates a Document object with Document attributes and data.
Send-URI *	OPTIONAL	Creates a Document object with Document attributes and a URL reference to the data (print-by-reference).
Get-Document-Attributes	REQUIRED	Get requested attributes of specified Document in the specified Job.
Get-Documents	REQUIRED	Get requested attributes of all of the Documents in the specified Job.
Set-Document-Attributes	OPTIONAL	Set the supplied Document attributes on the specified Document.
Cancel-Document	REQUIRED	Cancel the specified Document in the specified Job, but don't remove it.
Delete-Document	OPTIONAL	Remove the specified Document object and its data from the Job.

334 * The existing IPP/1.1 operations defined in [rfc2911] with an extension so the client can supply Document Template
335 attributes in a new attribute Group in the request.
336 This specification also specifies the life cycle of the Document object by defining the "document-state", "document-
337 state-reasons", and "document-state-message" attributes. Finally, the analogous Document Descriptions attributes
338 that correspond to the Job Description attributes are defined.

339 # 2 Terminology

340 This section defines terminology used throughout this document.

2.1 Conformance Terminology

342 Capitalized terms, such as **MUST, MUST NOT, REQUIRED, SHOULD, SHOULD NOT, MAY, NEED NOT,** and
343 **OPTIONAL**, have special meaning relating to conformance as defined in RFC 2119 [rfc2119] and [rfc2911] section
344 12.1. If an implementation supports the extension defined in this document, then these terms apply; otherwise, they
345 do not. These terms define conformance to *this document (and [rfc2911]) only*; they do not affect conformance to
346 other documents, unless explicitly stated otherwise. To be more specific:

347 **REQUIRED** - an adjective used to indicate that a conforming IPP Printer implementation MUST support the indicated
348 operation, object, attribute, attribute value, status code, or out-of-band value in requests and responses. See
349 [rfc2911] "Appendix A - Terminology for a definition of "support". *Since support of this entire Document Object*
350 *specification is OPTIONAL for conformance to IPP/1.1, the use of the term REQUIRED in this document means*
351 *"REQUIRED if this OPTIONAL Document Object specification is implemented".*

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[4] 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.
[5] The Create-Document operation maps to the PWG PSI Send-Document-By-Post operation and the Send-Document-Data maps to the HTTP Post operation.

352   **RECOMMENDED** - an adjective used to indicate that a conforming IPP Printer implementation is recommended to
353   support the indicated operation, object, attribute, attribute value, status code, or out-of-band value in requests and
354   responses. *Since support of this entire Document Object specification is OPTIONAL for conformance to IPP/1.1, the*
355   *use of the term RECOMMENDED in this document means "RECOMMENDED if this OPTIONAL Document Object*
356   *specification is implemented".*

357   **OPTIONAL** - an adjective used to indicate that a conforming IPP Printer implementation MAY, but is NOT
358   REQUIRED to, support the indicated operation, object, attribute, attribute value, status code, or out-of-band value in
359   requests and responses.

360   **2.2   Other Terminology**

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

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

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

368   **Document Creation operation** - operations that create Document objects. Specifically: Create-Document, Print-
369   Job, Print-URI, Send-Document and Send-URI. Note: the Print-Job and Print-URI are both **Job Creation** and
370   **Document Creation** operations, since they create both Job and a **Document object** at the same time. Also this
371   specification does not extend the Print-Job and Print-URI operations. However, this specification does extend the
372   Send-Document and Send-URI operations to allow the client to supply **Document Template** attributes in each
373   request.

374   **Job Level** - attributes supplied in the Print-Job, Print-URI, and Create-Job are referred to as being supplied at the
375   **Job Level**. Attributes supplied at the **Job Level** are a mixture of **Job attributes** and **Document attributes**. **Job**
376   **attributes** apply to the Job as a whole, while **Document attributes** provide defaults for the **Document objects** in
377   case the client does not supply a **Document attribute** at the **Document Level** for a **Document object**. Put another
378   way, **Document objects** *inherit* **Document attributes** from the **Job object** which are used if the client didn't supply
379   a corresponding attribute for the **Document object**.

380   **Document Level** - attribute supplied in the Send-Document, Send-URI, and Create-Document operations are
381   referred to as being supplied at the **Document Level**. Note: attribute supplied in the Print-Job and Print-URI
382   requests are considered as being supplied at the **Job Level** only, *not* also at the **Document Level**, even though
383   Print-Job and Print-URI also create **Document objects**.

384   **Attribute Precedence** - the precedence rules which dictate which attribute value takes precedence when the same
385   attribute is supplied at different points in the work flow with different values, such as at both the **Job Level** and the
386   **Document Level**. See section 5.

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

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

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

394 Table 2 shows this terminology as applied to the six operations. Note that Print-Job and Print-URI are both Job
395 Creation operations and Document Creation operations, though they only create single Document jobs. In other
396 words, for Print-Job and Print-URI, there is only one document per job, so whether the attributes are considered to be
397 submitted at the Job Level and then inherited by the Document object, is moot, since these operations do not have a
398 separate Document group in which the client can supply Document attributes. Note also that for the "Level" concept,
399 no operation supplies attributes at more than one level.[6]

400 **Table 2 - Job Creation and Document Creation operations**

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

401

3 Document Operations

403 The Document object semantics are as parallel to the Job object semantics as possible. Therefore, most of the Job
404 operations have analogous Document operations as shown in Table 15 in section "Appendix A: Document operations
405 compared to Job operations". Operations that can apply only to an entire job, have no analogous document
406 operation as indicated. This extension adds 8 new Document operations that operate on the Document object once
407 it is created by the new Create-Document operation or either of the existing two operations: Send-Document and
408 Send-URI operations.

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

411 The signatures of the operation requests that create and/or validate Document objects are very similar as shown in
412 Table 3 and defined in section 3.1 through section 3.4. The entries in the table show what a client MUST, MAY, or
413 MUST NOT supply in the indicated operation requests.

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[6] 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.
The Printer copies all of these client's supplied attributes to the Job or Document object. Read-only Job and
Document attributes that the system sets are called Job Status and Document Status attributes (instead of
Description attributes).

414   **Table 3 - Client-supplied Document Creation and Validation Request Signatures**

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

415

416 The entries in Table 4 show what a Printer MUST, MAY, or MUST not support and return in the indicated operations
417 responses.

418   **Table 4 - Printer-returned Document Creation and Validation Response Signatures**

	Create-Document	Send-Document-Data	Send-Document	Send-URI
Status code/message	MUST	MUST	MUST	MUST
Unsupported Attributes	MUST, if any	MUST, if any	MUST, if any	MUST, if any
Job status attributes	MUST	MUST	MUST	MUST
Document status attributes:				
"document-number"	MUST	MUST	MUST	MUST
"document-id-uri"	MUST	MUST	MUST	MUST
"document-state"	MUST	MUST	MUST	MUST
"document-state-reasons	MUST	MUST	MUST	MUST
"document-state-message	MAY	MAY	MAY	MAY

419

420 **3.1 Create-Document Operation**

421 This REQUIRED operation allows a client to create a Document object, supply Document attributes, and have the
422 Printer validate those attributes without sending any document content data. If the Printer rejects the request, the
423 client won't have sent the possibly time-consuming data. The client MUST perform the operations in the following
424 order: (1) Create-Job to create the Job object, (2) Create-Document to create the Document object, (3) Send-
425 Document-Data (see section 3.2) to send the content data for the Document object.

426 The client can supply multiple documents for a single Job using pairs of Create-Document and Send-Document-Data
427 operations. The order of the corresponding Send-Document-Data operations is not important, so that the client can
428 send pairs of Create-Document and Send-Document-Data operations or can send a number of Create-Document
429 operations followed by the corresponding Send-Document-Data operations. The latter approach is useful if the client
430 wants to make sure that all Documents will be accepted by the Printer before sending any of the Document data to
431 the Printer.

432 If a Printer supports the Document object, the Printer:

433   1. MUST also support the Create-Document and Send-Document-Data operations

434   2. MUST support the "multiple-operation-time-out" Printer Description attribute (see [rfc2911] section 4.4.31).

435   3. MUST support the "multiple-document-jobs-supported" Printer Description attribute (see [rfc2911] section
436   4.4.16) with a 'true' value, that is the Printer MUST support multiple document jobs.

437   4. MUST support the "multiple-document-handling" Job Template job attribute with at least one value (see
438   [rfc2911] section 4.2.4) and the associated "multiple-document-handling-default" and "multiple-document-
439   handling-supported" Job Template Printer attributes (see [rfc2911] section 4.2).

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

442   The Printer sets the value of the Document's "document-state" Document Description attribute to 'pending', if the
443   Printer accepts the Create-Document request. A Printer MAY set the 'job-data-insufficient' value of the Document's
444   "document-state-reason" Document Description attribute to indicate that processing cannot begin until sufficient data
445   has arrived and set the "document-state" to 'pending'. A non-spooling printer that doesn't implement the 'pending'
446   document state may even set the "document-state" to 'processing', even though there is not yet any data to process.
447   See sections 8.2.25 and 8.2.27.

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

452 3.1.1 Create-Document Request

453   The client supplies the following groups as part of the Create-Document Request:

454   **Group 1: Operation Attributes**

455   **Natural Language and Character Set:**
456   First, the client MUST supply the "attributes-charset" and "attributes-natural-language" Operation attributes
457   as described in [rfc2911] section 3.1.4.1. The Printer object MUST copy these values to the corresponding
458   Job Description attributes described in [rfc2911] sections 4.3.19 and 4.3.20.

459   **Target:**
460   Next, the client MUST supply either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri"
461   (uri) operation attribute(s) which define the target Job object for this operation as described in [rfc2911]
462   section 3.1.5. The client MAY supply the remaining Operation attributes in any order following:

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

466   **3.1.1.1 input-document-number (integer(1:MAX)) DEPRECATED**

467   ISSUE 00: Or should we just delete "input-document-number" when we republish pwg5100.4 without
468   "document-overrides?

469   The "input-document-number" operation attribute ([pwg5100.4] section 9.2.1) is DEPRECATED. A client
470   MUST NOT supply the "input-document-number" operation attribute. Clients that want to submit multiple
471   (large) document data in parallel MUST create each Document object separately in the order desired. Then
472   the client MAY send the data in parallel with separate Send-Document operations (see section 3.2). If the
473   client does supply the DEPRECATED "input-document-number" operation attribute, the Printer MUST ignore
474   the value and assign the "document-number" Document Description attribute monotonically increasing
475   starting with 1 for each job (see below).

476 **3.1.1.2 last-document (boolean)**

477 The client MUST supply this attribute (as in the Send-Document and Send-URI operation requests). The
478 Printer object MUST support this attribute. This attribute is a boolean flag that the client supplies with a 'true'
479 value if this is the last document for the Job, 'false' otherwise. Note: The client MAY indicate the last
480 document using the Close-Job operation (see section).

481 **3.1.1.3 document-message (text(MAX))**

482 The client MAY supply this operation attribute. If the Printer supports this attribute, the Printer MUST also
483 support the corresponding "document-message" (text(MAX)) Document Description attribute (see section
484 8.2.21) and copy this value to the "document-message" Document Description attribute. The end user can
485 use this Document Description attribute as a message to the operator and the operator can use it as a
486 message to the user. The Printer MAY print this message on a document start sheet for this document, if
487 any.

488 **3.1.1.4 Additional Operation attributes:**

489 Any of the other Operation attributes indicated in the "Level Supplied" column labeled with a "y" in the "Doc"
490 column in Table 6, such as "document-name" and "document-format". These operation attributes are said to
491 be supplied at the Document Level and apply to the Document object, overriding any operation attributes
492 supplied at the Job Level. For example, if "document-format" = 'application/postscript' at the Job Level and
493 "document-format" = 'text/plain' in this Create-Document request, this Document will be 'text/plain'. If the
494 next Create-Document request for this Job omits the "document-format" operation attribute, that Document
495 will be 'application/postscript'.

496 **3.1.1.5 Ignoring unsupported or improper operation attributes:**

497 The Printer MUST ignore any operation attributes which are unsupported or are not defined for use with the
498 Create-Document operation, such as "ipp-attribute-fidelity" (see section 4.4.1) and "job-mandatory-attributes"
499 (see section 4.4.2) which are defined for use in Job Creation operations only.

500 **Group 2: Document Template Attributes**

501 **Any Document Template attributes in any order:**
502 The client OPTIONALLY supplies a set of Document Template attributes, that is any attributes indicated in
503 Table 8 in the "Defined for use" column labeled with a "y" in the "D" column. These Document Template
504 attributes are said to be supplied at the Document Level and apply to the Document object, overriding any
505 Document Template attributes supplied at the Job Level. For example, if "media" = 'na-letter-white' at the
506 Job Level and "media" = 'na-letter-transparency' in this Create-Document request, this Document will be 'na-
507 letter-transparency'. If the next Create-Document operation for this Job omits the "media" operation attribute,
508 that Document will be 'na-letter-white' which it inherits from the Job.

509 If the client is not supplying any Document Template attributes in the request, the client SHOULD omit Group
510 2 rather than sending an empty group. However, a Printer object MUST be able to accept an empty group.

511 The client MUST NOT supply the document data in this operation request. See Send-Document-Data
512 operation (section 3.2).

513 **Group 3: Subscription Attributes (see [ntfy] section 11.1.3.1):** *MUST NOT be present. Notification is only at*
514 *the Job Level.*

515 In addition to the MANDATORY parameters required for every operation request (see [rfc2911]), the simplest Create-
516 Document request consists of just the "attributes-charset" and "attributes-natural-language" operation attributes;

517   either (1) the "printer-uri" target operation attribute and the "job-id" or (2) the "job-uri" and nothing else. In this simple
518   case, the Printer object:

519   - creates a new Document object and adds it to the specified Job object,

520   - assigns the lowest document number not yet used by this Job, starting a 1. Copy the document number
521   assigned to the Document object's "document-number" Document Description attribute.

522   - stores a generated Document name in the "document-name" Document Description attribute in the natural
523   language and charset requested (see [rfc2911] section 3.1.4.1) (if those are supported, otherwise using the
524   Printer object's default natural language and charset), and

525   - at job processing time, uses its corresponding default value attributes for the supported Document Template
526   attributes that were (1) not supplied by the client as IPP attributes and (2) not embedded instructions in the
527   document data.

3.1.2 Create-Document Response

529   The Printer object MUST return the following sets of attributes to the client as part of the Create-Document response:

530   **Group 1: Operation Attributes**

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

535   The Printer MUST reject the operation if the client had supplied in the original Job Creation operation, either:

536   the "ipp-attribute-fidelity" operation attribute (see section 4.4.1) with a 'true' value and the client
537   supplies any unsupported and/or conflicting Job Template or Document Template attributes in this
538   Document Creation request OR

539   the "ipp-attribute-fidelity" operation attribute (section 4.4.1) with a 'false' value or had omitted it and
540   had supplied keyword values of the "job-mandatory-attributes" operation attribute (in the original Job
541   Creation operation) that identify attributes supplied in this request that are unsupported and/or
542   conflicting.

543   Otherwise, the Printer MUST accept the operation and ignore or substitute unsupported and/or conflicting
544   attribute values supplied by the client. See the Implementer's Guide [rfc3196] for a complete description of
545   the suggested steps for processing the attributes in a create request.

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

548   **Group 2: Unsupported Attributes**

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

550   The value of the "ipp-attribute-fidelity" and the "job-mandatory-attributes" operation attributes supplied by the
551   client in the original Job Creation request does not affect what attributes the Printer object returns in this
552   group. The value of these two operation attributes in the original Job Creation request only affects whether
553   the Create-Document operation is accepted or rejected. If the request is accepted, the client may query the
554   Document object using the Get-Document-Attributes operation (see section 3.5) requesting the unsupported

555   attributes that were returned in the create response to see which attributes were ignored (not stored on the
556   Document object) and which attributes were stored with other (substituted) values.

557   **Group 3: Job Object Attributes**

558   In addition, the Printer MUST return the same Job status attributes that [rfc2911] REQUIRES for the Send-
559   Document and Send-URI operation responses (which are the same as for the Print-Job response - [rfc2911]
560   section 3.2.1.2):

561   "job-uri" (uri) - see [rfc2911] section 4.3.1
562   "job-id" (integer(1:MAX)) - see [rfc2911] section 4.3.2
563   "job-state" (type1 enum) - see [rfc2911] section 4.3.7
564   "job-state-reasons" (1setOf type2 keyword) - see [rfc2911] section 4.3.8
565
566   The Printer MAY return:

567   "job-state-message" (text(MAX)) - see [rfc2911] section 4.3.9
568   "number-of-intervening-jobs" (integer(0:MAX)) - see [rfc2911] section 4.3.15
569
570   **Group 4: Document Object Attributes**

571   **3.1.2.1 document-number (integer(1:MAX))**

572   The Printer MUST return the document number of this Document object that was either assigned by the
573   Printer (see section 3.1.1) or supplied by the client (see section 3.1.1.1).

574   **3.1.2.2 document-id-uri (uri)**

575   The Printer MUST return the document id of this Document object as a URI as assigned by the Printer (see
576   section 8.2.17).

577   **3.1.2.3 document-state (type1 enum)**

578   The Printer MUST return the state of this Document object (see section 8.2.25).

579   **3.1.2.4 document-state-reasons (1setOf type2 keyword)**

580   The Printer MUST return the associated state reasons for this Document (see section 8.2.27).

581   **3.1.2.5 document-state-message (text(MAX))**

582   The Printer MAY return the localized description of the "document-state" and "document-state-reasons"
583   values for this Document (see section 8.2.26).

584   ## 3.2 Send-Document-Data Operation

585   ISSUE 01: OK: OK to rename Send-Data to Send-Document-Data to reflect the object on which it operates?

586   This REQUIRED operation allows the client to create a Document object using the Create-Document operation (see
587   section 3.1) that the Printer validates before the client sends any document content data. Then the client can skip
588   sending the data to the Printer, if the Printer rejects the Document Creation operation.

589 Since the Create-Document and the Send-Document-Data operation that follows could occur over an arbitrarily long
590 period of time for a particular Document, a client MUST send the Send-Document-Data operation within an IPP
591 Printer defined minimum time interval after the receipt of the previous request for the job. If a Printer object supports
592 the Document object, the Printer object MUST support the "multiple-operation-time-out" attribute (see [rfc2911]
593 section 4.4.31). This attribute indicates the minimum number of seconds the Printer object will wait for the next send
594 operation before taking some recovery action. See the description under Send-Document in [rfc2911] section 3.3.1,
595 for the possible Printer actions, if the client does not supply a Send-Document-Data request in time.

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

600 3.2.1 Send-Document-Data request

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

602 **Group 1: Operation Attributes**

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

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

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

614 **Group 2: Document Content**

615 The client MUST supply the document data in-line to be processed for this Document, just like supplying
616 data in the Send-Document and Print-Job requests.

617 3.2.2 Send-Document-Data Response

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

619 **Group 1: Operation Attributes**

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

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

626 **Group 2: Unsupported Attributes**

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

628 **Group 3: Job Object Attributes**

629 The Printer MUST return the same set of Job status attributes as for the Print-Job, Send-Document, and
630 Create-Document responses (see section 3.1.2).

631 **Group 4: Document Object Attributes**

632 The Printer MUST return the same set of Document status attributes as for the Create-Document operation
633 response (see section 3.1.2)

634 3.3 Send-Document Operation

635 This REQUIRED[7] operation allows a client to submit multiple documents in a single Job by making a Send-Document
636 request for each Document. In this specification, the Send-Document creates a Document object ([rfc2911] did not
637 have a Document object). A Printer MUST support this operation with the semantics specified in [rfc2911] and with
638 the extension defined in this specification, since this specification REQUIRES the Printer to support multiple
639 document jobs.

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

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

645 3.3.1 Send-Document Request

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

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

648 As specified in [rfc2911] section 3.3.1 Send-Document request, plus any extensions indicated in Table 6.
649 For example, "compression", "document-format", and "document-name". So this group is the same as for
650 Create-Document (see section 3.1.1).

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

652 The client OPTIONALLY supplies a set of Document Template attributes as listed in Table 8. For example,
653 "media" and "number-up". If the client is not supplying any Document Template attributes in the request, the
654 client SHOULD omit Group 2 rather than sending an empty group. However, a Printer object MUST be able
655 to accept an empty group.

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

657 The client MUST supply the document data in-line to be processed for this Document if the "last-document"
658 flag is set to 'false'. However, since a client might not know that the previous Document object created with a

---

[7] The Send-Document operation is REQUIRED in this specification while it was OPTIONAL in [rfc2911]. This
difference is because this specification REQUIRES Printer support of multiple document jobs, while [rfc2911] did not.

659 Create-Job, Send-Document, or Send-URI operation was the last document (i.e., the "last-document"
660 attribute was set to 'false'), it is legal to send a Send-Document request with no document data where the
661 "last-document" flag is set to 'true'. For this case, the Printer MUST NOT increment the value of the Job
662 object's "number-of-documents" attribute, since no Document object was added to the job. In addition, it is
663 not an error for a client to submit a job with no actual document data, i.e., only a single Create-Job and
664 Send-Document request with a "last-document" operation attribute set to 'true' with no document data; it is
665 only an empty job which is scheduled and processed normally.

666 3.3.2 Send-Document Response

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

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

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

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

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

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

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

678 The Printer MUST return the same set of Job status attributes as for the Print-Job, Send-Document, and
679 Create-Document responses (see section 3.1.2).

680 **Group 4: Document Object Attributes (new - as in Create-Document Group 3 - see section 3.1.2)**

681 The Printer MUST return the same set of Document status attributes as for the Create-Document operation
682 response (see section 3.1.2).

683 3.4 Send-URI Operation

684 This OPTIONAL operation has the same request and response semantics as the Send-Document operation (see
685 section 3.3) except that a client MUST supply a URI reference ("document-uri" operation attribute) rather than the
686 document data itself. If a Printer object supports this operation, clients can use both Send-URI or Send-Document
687 operations to add new documents to an existing multi-document Job object. However, if a client needs to indicate
688 that the previous Send-URI or Send-Document was the last document, the client MUST use the Send-Document
689 operation with no document data and the "last-document" flag set to 'true' (rather than using a Send-URI operation
690 with no "document-uri" operation attribute).

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

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

695 3.5 Get-Document-Attributes Operation

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

700 The Printer MUST return the attributes that a client supplied in the Create-Document, Send-Document, or Send-URI
701 operations, plus any Document Description attributes that the Printer has generated. The Printer MUST NOT return
702 any Job Level attributes that the Document object inherits and MUST NOT factor out common Document object
703 attributes and return them as Job object attributes. Thus the Get-Document-Attributes returns to clients the attributes
704 that clients submitted with the Job object and with the Document object.

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

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

713   - 'document-template': the subset of the Document Template attributes that apply to a Document object (the "D"
714   column in Table 8) that the implementation supports for Document objects.

715   - 'document-description': the subset of the Document Description attributes specified in the "Doc" column of
716   Table 9 that the implementation supports for Document objects.

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

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

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

725 3.5.1 Get-Document-Attributes Request

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

728 **Group 1: Operation Attributes**

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

731   **Target:**
732   The "document-number" (integer(1:MAX)) operation attribute MUST be supplied immediately after either (1)
733   the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) operation attribute(s) which define
734   the target Document object for this operation as described in [rfc2911] section 3.1.5. If the client omits the

735 "document-number" operation attribute, the Printer MUST reject the request and return the 'client-error-bad-
736 request' status code.

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

3.5.1.1 "requested-attributes" (1setOf keyword):

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

3.5.2 Get-Document-Attributes Response

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

Group 1: Operation Attributes

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

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

Group 2: Unsupported Attributes

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

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

Group 3: Document Object Attributes

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

773 ## 3.6 Get-Documents Operation

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

777 This operation is similar to the Get-Document-Attributes operation (see section 3.5), except that this Get-Documents
778 operation returns attributes from all Document objects contained in the Job object, instead of from a single selected
779 Document object in the Job object. As with the Get-Document-Attributes operation the Printer MUST only return
780 attributes that were submitted by a client when the Document object was created by the Create-Document, Send-
781 Document, or Send-URI operations and possibly modified by the Set-Document-Attributes operation (see section
782 3.7).

783 ### 3.6.1 Get-Documents Request

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

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

788 **Group 1: Operation Attributes**

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

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

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

797 **3.6.1.1 "limit" (integer(1:MAX)):**

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

804 **3.6.1.2 "requested-attributes" (1setOf type2 keyword):**

805 The client OPTIONALLY supplies this attribute. The Printer object MUST support this attribute. It is a set of
806 Document attribute names and/or attribute groups names in whose values the requester is interested. This
807 set of attributes is returned for each Document object that is returned. The allowed attribute group names
808 are the same as those defined in the Get-Document-Attributes operation in section 3.5.1.

809 If the client does not supply this attribute, the Printer MUST respond as if the client had supplied this attribute
810 with the two values:

811 'document-number' (see section 8.2.24)

812   'document-id-uri' (see section 8.2.17).
813

3.6.2 Get-Documents Response

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

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

820 **Group 1: Operation Attributes**

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

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

827 **Group 2: Unsupported Attributes**

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

829   The response NEED NOT contain the "requested-attributes" operation attribute with any supplied values
830   (attribute keywords) that were requested by the client but are not supported by the Printer. If the Printer
831   object does return unsupported attributes referenced in the "requested-attributes" operation attribute and that
832   attribute included group names, such as 'all', the unsupported attributes MUST NOT include attributes
833   described in the standard but not supported by the implementation.

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

835   The Printer object responds with one set of Document Object Attributes for each returned Document object.
836   The Printer object ignores (does not respond with) any requested attribute or value which is not supported or
837   which is restricted by the security policy in force, including whether the requesting user is the user that
838   submitted the job (job originating user) or not (see [rfc2911] section 8). However, the Printer object MUST
839   respond with the 'unknown' value for any supported attribute (including all REQUIRED attributes) for which
840   the Printer object does not know the value, unless it would violate the security policy. See the description of
841   the "out-of-band" values in the beginning of [rfc2911] section 4.1.

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

3.7 Set-Document-Attributes Operation

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

849 This operation is almost identical to the Set-Job-Attributes operation and follows the same rules for validation (see
850 [rfc3380] section 4.2). The only differences are that the Set-Document-Attributes operation is directed at a Document

851   object rather than a Job object. As with the Set-Job-Attributes operation, The Set-Document-Attributes operation
852   can add an attribute to the Target object, accepts the 'delete-attributes' out-of-band value to remove an attribute from
853   the Target object. In addition the validation is the same as the Create-Document, Send-Document, and Send-URI
854   operations that create Document objects, i.e., the Printer validation depends on the "xxx-supported" Printer
855   Description attributes (see [rfc2911] section 3.1).

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

859   If the client supplies a document attribute with the "out-of-band" value 'delete-attribute' (see [rfc3380] section 8.2),
860   then the Printer MUST remove the attribute and all of its values from the Document object, if present. The semantic
861   effect of the client supplying the 'delete-attribute' value in a Set-Document-Attributes operation MUST be the same as
862   if the attribute had not been supplied with the Document object in the Document Creation operation, i.e., the Printer
863   applies its default attribute or behavior with lower precedence that the PDL (see the beginning of [rfc2911] section
864   4.2 and [rfc2911] 3.2.1.1). Any subsequent query of the Document object using Get-Document-Attributes or Get-
865   Documents MUST NOT return any attribute that has been deleted using the 'delete-attribute' out-of-band value.
866   However, a client can re-establish such a deleted Document attribute with any supported value(s) using a
867   subsequent Set-Document-Attributes operation.

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

872   The validation of the Set-Document-Attributes request is performed by the Printer as if the document had been
873   submitted originally with the new attribute values (and the deleted attributes removed) and with "ipp-attribute-fidelity"
874   set to 'true', i.e., all modified attributes Document attributes and values MUST be supported in combination with the
875   Document attributes not modified. If such a Document Creation operation would have been accepted, then the Set-
876   Document-Attributes MUST be accepted. If such a Document Creation operation would have been rejected, then the
877   Set-Document-Attributes MUST be rejected and the Document MUST be unchanged. In addition, if any of the
878   supplied attributes are not supported, are not settable, or the values are not supported, the Printer object MUST
879   reject the entire operation; the Printer object MUST NOT partially set some of the supplied attributes. In other words,
880   after the operation, all the supplied attributes MUST be set or none of them MUST be set, thus making the Set-
881   Document-Attributes an atomic operation.

882   The Printer MUST accept or reject this operations when the Document's READ-ONLY "document-state" attribute has
883   the values shown in Table 5. The document's current state MUST affect whether the Printer accepts or rejects the
884   request. However, the Set-Document-Attributes operation MUST NOT change the state of the Document object
885   (since the Document is a passive object and the Document state is a subset of the Job State). For example, in the
886   case where the operation creates a request for unavailable resources, the Job (but not the Document) transitions to a
887   new state. Table 5 shows the allowed behaviors in each document state.

888   **Table 5 - Document State Table for the Set-Document-Attributes operation**

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

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

889

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

3.7.1 Settable and READ-ONLY Document Description attributes

894 If the Printer supports the Set-Document-Attributes operation, then it SHOULD support setting of:
895   all Document Template document ("xxx") attributes
896 that the implementation supports (see the column labeled "D" in Table 8).

897 Almost all Document Description attributes (see [rfc2911] section 4.3) MUST NOT be settable, i.e., they are defined
898 to be READ-ONLY. Only Document Description attributes marked with "(r/w) in Table 8 MAY be settable using Set-
899 Document-Attributes. The Printer MUST reject a Set-Document-Attributes request that attempts to set any attributes
900 in Table 8 that is not marked "(r/w).

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

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

3.7.2 Set-Document-Attributes Request

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

909 **Group 1: Operation Attributes**

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

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

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

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

Requesting User Name:
926
927   The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
928   [rfc2911] section 8.3.

Group 2: Document Attributes
929

930   The client MUST supply a set of Document Template attributes with one or more values (including explicitly
931   allowed out-of-band values) as listed in column labeled "D" in Table 8 - Job Template and Document
932   Template attributes and Document Description attributes flagged with "(r/w)" and listed in the column labeled
933   "Doc" in Table 9 - Job and Document Description attributes, and any attribute extensions supported by the
934   Printer. The value(s) of each Document attribute supplied in Group 2 replaces the value(s) of the
935   corresponding Document attribute on the target Document object. For attributes that can have multiple
936   values (1setOf), all values supplied by the client replace all values of the corresponding Document object
937   attribute.

938   In order to set the Document's "document-message" Document Description attribute (see section 8.2.21), the
939   client MUST supply the attribute in Group 2, rather than supplying a "document-message" operation attribute
940   in Group 1.

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

3.7.3 Set-Document-Attributes Response
943

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

Group 1: Operation Attributes
945

Status Message:
946
947   In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
948   "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
949   in [rfc2911] sections 13 and 3.1.6.

Natural Language and Character Set:
950
951   The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

Group 2: Unsupported Attributes
952

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

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

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

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

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

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

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

3.8 Cancel-Document Operation

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

982 The Cancel-Document operation does not remove the Document from the Job and Printer, but only sets the specified
983 Document's "document-state" Document Description attribute to 'canceled' and the Document's "document-state-
984 reasons" Document Description attribute to 'canceled-by-user' or 'cancel-by-operator'. If the Job object is printed
985 again using operations such as the Reprocess-Job operation (see [adm-ops] section 4.1) or the Restart-Job
986 operation (see [rfc2911] section 3.3.7), any canceled Documents are also printed again. Thus Cancel-Document has
987 the same semantics as Cancel-Job (see [rfc2911] section 3.3.3), which only cancels the processing of the job, and
988 doesn't delete the Job object itself. See the Delete-Document operation (section 3.9) to remove the Document object
989 itself immediately from the Job and Printer.

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

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

Current "document-state"	New "document-state"	Printer object'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'

996 Rule 1: If the implementation requires some measurable time to cancel the document in the 'processing' document
997 states, the Printer object MUST add the 'processing-to-stop-point' value to the document's "document-state-reasons"
998 attribute and then transition the document to the 'canceled' state when the processing ceases (see [rfc2911] section
999 4.3.8).

1000 Rule 2: If the Document object already has the 'processing-to-stop-point' value in its "document-state-reasons"
1001 attribute, then the Printer object MUST reject a Cancel-Document operation.

1002 *Access Rights:* The authenticated user (see [rfc2911] section 8.3) performing this operation must either be the job
1003 owner or an operator or administrator of the Printer object (see [rfc2911] sections 1 and 8.5). Otherwise, the Printer
1004 MUST reject the operation and return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-
1005 authorized' as appropriate.

1006 ## 3.8.1 Cancel-Document Request

1007 The following groups of attributes are part of the Cancel-Document Request:

1008 **Group 1: Operation Attributes**

1009 **Natural Language and Character Set:**
1010 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.1.

1011 **Target:**
1012 The client MUST supply the "document-number" (integer(1:MAX)) operation attribute immediately after either
1013 (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) operation attribute(s) which
1014 define the target Document object for this operation as described in section [rfc2911] 3.1.5. If the client omits
1015 the "document-number" operation attribute, the Printer MUST reject the request and return the 'client-error-
1016 bad-request' status code.

1017 **Requesting User Name:**
1018 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
1019 [rfc2911] section 8.3.

1020 **3.8.1.1 document-message (text(MAX))** **operation attribute**

1021 The client MAY supply this operation attribute. If the Printer supports this attribute, the Printer MUST also
1022 support the corresponding "document-message" (text(MAX)) Document Description attribute (see section
1023 8.2.21) and copy this value to the "document-message" Document Description attribute. The end user can
1024 use this Document Description attribute as a message to the operator and the operator can use it as a
1025 message to the user. The Printer MAY print this message on a document start sheet for this document, if
1026 any.

1027   The Printer MUST ignore the new "job-message-from-operator" operation attribute (see [adm-ops] section 6)
1028   for this operation, since that is a job only attribute and Cancel-Document is a Document operation.

1029   3.8.2 Cancel-Document Response

1030   The following sets of attributes are part of the Cancel-Document Response:

1031   **Group 1: Operation Attributes**

1032   **Status Message:**
1033   In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
1034   "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
1035   in [rfc2911] sections 13 and 3.1.6.

1036   **Natural Language and Character Set:**
1037   The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

1038   **Group 2: Unsupported Attributes**

1039   See [rfc2911] section 3.1.7 for details on returning Unsupported Attributes.

1040   Once a successful response has been sent, the implementation guarantees that the Document will eventually end up
1041   in the 'canceled' state. Between the time of the Cancel-Document operation is accepted and when the document
1042   enters the 'canceled' document-state (see section 8.2.25), the "document-state-reasons" attribute (see section
1043   8.2.27) SHOULD contain the 'processing-to-stop-point' value which indicates to later queries that although the
1044   Document might still be 'processing', it will eventually end up in the 'canceled' state, not the 'completed' state.

1045   3.9   Delete-Document Operation

1046   This OPTIONAL operation removes the specified Document object and its data immediately from the specified Job.
1047   The Printer MUST reject the request if the Document is in any state, but 'pending" (there is no 'pending-held' state for
1048   Documents). The Printer does not reassign the "document-number" Document Description attribute values of the
1049   remaining Document objects in the Job, so that the deleted Document object leaves a gap in the document
1050   numbering space for the Job. The Printer MUST return a 'client-error-not-found' status code, in a subsequent Get-
1051   Document-Attributes operation for this Document object specifying its former "document-number". This operation is
1052   similar to the Purge-Jobs operation which immediately deletes all jobs from the Printer. However, the Delete-
1053   Document operation only deletes a single Document from the specified Job.

1054   *Access Rights:* The authenticated user (see [rfc2911] section 8.3) performing this operation MUST be an operator or
1055   administrator of the Printer object (see [rfc2911] sections 1 and 8.5). Otherwise, the Printer MUST reject the
1056   operation and return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as
1057   appropriate. This operation requires operator/administrator privileges, otherwise a rogue client could submit, then
1058   delete, at will using up valuable spooling space. Instead of using this operation, unprivileged users use Cancel-
1059   Document which goes through the normal accounting, if any.

1060   The Delete-Document request and Delete-Document response have the same attribute groups and attributes as the
1061   Cancel-Document operation (see section 3.8).

1062   4   Semantic extensions to Job operations

1063   This section defines the new Close-Job operation and the effects that Job operations have on the Document object.
1064   Printer and Subscription object (Event Notification [ntfy]) operations MUST have no effect on the Document object

1065   and the Document object has no effect on the semantics of the Printer and Subscription operations. The Job
1066   operations that MUST NOT have any effect on the Document object because they are defined to affect the Job
1067   object as a whole are: **Get-Job-Attributes**[8] ([rfc2911] section 3.3.4)**, Get-Jobs**[9] ([rfc2911] section 3.2.6)**, Hold-Job**
1068   ([rfc2911] section 3.3.5), **Promote-Job** ([adm-ops] section 4.4.1), **Release-Held-New-Jobs** ([adm-ops] section
1069   3.3.2), **Resume-Job** ([adm-ops] section 4.3.2)**, Schedule-Job-After** ([adm-ops] section 4.4.2)**, Set-Job-Attributes**
1070   ([rfc3380] section 4.2), and **Validate-Job** ([rfc2911] section 3.2.3).

1071   The Job operations that affect Document objects or that Document objects affect the semantics of the Job operations
1072   are, in alphabetical order:

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

1074   The Printer sets the "document-state" Document Description attribute to 'canceled' and the "document-state-reasons"
1075   Document Description attribute to 'canceled-by-xxx' for any documents in the current Job that have not yet reached a
1076   terminal state ('completed', 'canceled', or 'aborted'), where "xxx" is 'user' or 'operator'. See [adm-ops] section 4.2.

4.2   Cancel-Job ([rfc2911] section 3.3.3)

1078   The Printer sets "document-state" Document Description attribute to 'canceled' and the "document-state-reasons"
1079   Document Description attribute to 'canceled-by-user' or 'canceled-by-operator' for *all* Document objects in the
1080   identified Job that have not yet reached a terminal state ('completed', 'canceled', or 'aborted').

4.3   Close-Job (new)

1082   <mark>ISSUE 02: OK to add Close-Job and to REQUIRE a Printer to support it, since PSI is using it?</mark>

1083   This REQUIRED operation closes the Job. The Printer MUST support this operation. The client MAY issue this
1084   operation to close the job, instead of supplying the "last-document" operation attribute (see section 3.1.1.2) with a
1085   'true' value in a Document Creation operation (or a Send-Document operation - see [RFC2911] section 3.3.1).

1086   *Access Rights:* The authenticated user (see [rfc2911] section 8.3) performing this operation must either be the job
1087   owner (as determined in the Create-Job operation) or an operator or administrator of the Printer object (see [rfc2911]
1088   sections 1 and 8.5). Otherwise, the Printer MUST reject the operation and return: 'client-error-forbidden', 'client-error-
1089   not-authenticated', or 'client-error-not-authorized' as appropriate.

4.3.1 Close-Job Request

1091   The client supplies the following groups as part of the Close-Job Request:

1092   **Group 1: Operation Attributes**

1093   **Natural Language and Character Set:**
1094   First, the client MUST supply the "attributes-charset" and "attributes-natural-language" Operation attributes
1095   as described in [rfc2911] section 3.1.4.1. The Printer object MUST copy these values to the corresponding
1096   Job Description attributes described in [rfc2911] sections 4.3.19 and 4.3.20.

---

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

1097   **Target:**
1098   Next, the client MUST supply either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri"
1099   (uri) operation attribute(s) which define the target Job object for this operation as described in [rfc2911]
1100   section 3.1.5. The client MAY supply the remaining Operation attributes in any order following:

1101   **Requesting User Name:**
1102   The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
1103   [rfc2911] section 8.3.

1104 **Group 2: Document Template Attributes:** *MUST NOT be present.*

1105 **Group 3: Subscription Attributes (see [ntfy] section 11.1.3.1):** *MUST NOT be present.*

4.3.2 Close-Job Response

1107 The Printer object MUST return the following sets of attributes to the client as part of the Close-Job response:

1108 **Group 1: Operation Attributes**

1109   **Status Message:**
1110   In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
1111   "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
1112   in [rfc2911] sections 13 and 3.1.6.

1113   **Natural Language and Character Set:**
1114   The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

1115 **Group 2: Unsupported Attributes**

1116   See [rfc2911] section 3.1.7 for details on returning Unsupported Attributes.

1117 **Group 3: Job Object Attributes**

1118   In addition, the Printer MUST return the same Job status attributes that [rfc2911] REQUIRES for the Send-
1119   Document and Send-URI operation responses (which are the same as for the Print-Job response - [rfc2911]
1120   section 3.2.1.2):

1121   "job-uri" (uri) - see [rfc2911] section 4.3.1
1122   "job-id" (integer(1:MAX)) - see [rfc2911] section 4.3.2
1123   "job-state" (type1 enum) - see [rfc2911] section 4.3.7
1124   "job-state-reasons" (1setOf type2 keyword) - see [rfc2911] section 4.3.8
1125
1126   The Printer MAY return:

1127   "job-state-message" (text(MAX)) - see [rfc2911] section 4.3.9
1128   "number-of-intervening-jobs" (integer(0:MAX)) - see [rfc2911] section 4.3.15
1129

4.4 Job Creation operations

1131 This section defines the extensions to Job Creation operations.

1132 The following operation attribute extensions are defined for use in all the Job Creation operations and Validate-Job:

4.4.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)

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

The Printer MUST copy this attribute to the corresponding (new) Job Description attribute (see section 8.1.1) and use its value for validating subsequent Document Creation operations for this job.

Note: The inheritance of the effect of the "ipp-attribute-fidelity" operation attribute by subsequent Document Creation operations is like the inheritance of other operation attributes.

4.4.2 job-mandatory-attributes (1setOf type2 keyword) operation attribute

ISSUE 03: Should we make "job-mandatory-attributes" a REQUIRED attribute for a Printer to support (if it supports the Document object)? Otherwise, clients won't support it and will be stuck with the "ipp-attribute-fidelity" attribute?

This OPTIONAL operation attribute identifies which Job Template and Document Template attributes the Printer MUST honor in this Job Creation request and all subsequent Document Creation requests for this job. The Printer MUST reject this Job Creation operation or any subsequent Document Creation operations for this job, if the client supplies an unsupported Job Template or Document Template attribute or value in the request that is also identified in this list. The client MAY supply this attribute in a Job Creation operation. If the Printer supports this operation attribute, the Printer MUST support this attribute in Job Creation operations and Validate-Job with any values and MUST NOT support this attribute in any other operations.

The values of the "job-mandatory-attributes" attribute are the keyword attribute names that identify Job Template and/or Document Template attributes, for example, 'job-hold-until', 'job-finishings' (see section 7.1.4), 'copies' and 'media'. In order to identify a member attribute of a collection attribute, the keyword names of both the collection attribute and the member attribute are given separated by a period (.) character. For example, to make the "media" attribute of the "cover-front" collection attribute mandatory, supply the keyword value: 'cover-front.media'.

The Printer MUST ignore this attribute if the client supplies the "ipp-attribute-fidelity" operation attribute (see section 4.4.1) with a 'true' value in this operation, since a 'true' value indicates that the Printer MUST honor all supplied Job Template and Document Template attributes.

The Printer MUST copy this attribute to the corresponding "job-mandatory-attributes" Job Description attribute (see section 4.4.2) for auditing and trouble shooting purposes and use its value for validating subsequent Document Creation operations for this job.

If a client supplies this operation attribute in a Document Creation operation, the Printer MUST ignore it; only the Job level attribute MUST have effect. Note: The inheritance of the effect of "job-mandatory-attributes" operation attribute supplied at the Job Level subsequent Document Creation operations is like the inheritance of other operation and Job Template attributes.

4.4.3 Create-Job ([rfc2911] section 3.2.4)

The Printer creates the Job object with all of the mixture of Job and Document attributes supplied in the Create-Job operation. The Document objects that are subsequently created for the specified Job inherit the Document attributes from the Job object. However, the Printer MUST NOT copy down any Job Level attributes to the Document object as observable by a client in any Get-Documents or Get-Document-Attributes operation responses.

1175 [rfcA Printer that supports the Document object MUST support the Create-Job operation[10] since the Create-Job
1176 operation is the only operation that creates a Job object so that subsequent Document objects can be created in the
1177 Job object.

4.4.4 Print-Job ([rfc2911] section 3.2.1)

1179 The Printer creates one Document object as a side effect of the Print-Job operation. All of the attributes supplied by
1180 the client MUST remain at the Job Level as part of the Job object. Any Document attributes supplied have affect on
1181 the Document object because the Document object inherits them from the Job object. The Printer MUST populate
1182 the single Document object's "document-state", "document-state-reasons", and "document-number" Document
1183 Description attributes with appropriate values. Thus a Get-Documents or Get-Document-Attributes for a Job created
1184 by Print-Job will return no attributes supplied by the client, but will return the populated Document Description
1185 attributes.

4.4.5 Print-URI ([rfc2911] section 3.2.2)

1187 The Printer creates one Document object as a side effect of the Print-URI operation. All of the attributes supplied by
1188 the client MUST remain at the Job Level as part of the Job object. Any Document attributes supplied have affect on
1189 the Document object because the Document object inherits them from the Job object. The Printer MUST populate
1190 the Document object's "document-state", "document-state-reasons", and "document-number" Document Description
1191 attributes with appropriate values. Thus a Get-Documents or Get-Document-Attributes for a Job created by Print-Job
1192 will return no attributes supplied by the client, but will return the populated Document Description attributes.

4.5   Purge-Jobs ([rfc2911] section 3.2.9)

1194 The Printer removes all Job and all of their contained Document objects.

4.6   Release-Job ([rfc2911] section 3.3.6)

1196 The Printer moves the job to the 'pending' state, if there are no other "job-state-reasons" to hold the job. The values
1197 of the "document-state-reasons" attributes MUST NOT affect job scheduling (see Table 12), only the Job's "job-state-
1198 reasons" values.

4.7   Reprocess-Job ([adm-ops] section 4.1)

1200 The Printer processes the Job again by processing *all* Documents in the Job, including ones that have been
1201 canceled by a previous Cancel-Document operation. Therefore, the Printer removes any 'canceled-by-xxx' values
1202 from any of the "document-state-reasons" attributes and the Job's "job-state-reasons" attributes.

4.8   Restart-Job ([rfc2911] section 3.3.7)

1204 The Printer starts the Job over again by processing *all* Documents in the Job, including ones that have been
1205 canceled by a previous Cancel-Document operation. Therefore, the Printer removes any 'canceled-by-xxx' values
1206 from any of the "document-state-reasons" attributes and the Job's "job-state-reasons" attributes and

---

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

1207 ## 4.9 Send-Document ([rfc2911] section 3.3.1)

1208 The Printer accepts a new Document Attributes group (Group 4) that the client can supply Document Template
1209 attribute and creates a Document object (see section 3.3).

1210 ## 4.10 Send-URI ([rfc2911] section 3.3.2)

1211 The Printer accepts a new Document Attributes group (Group 4) that the client can supply Document Template
1212 attribute and creates a Document object (see section 3.4).

1213 ## 4.11 Suspend-Current-Job ([adm-ops] section 4.3.1)

1214 The Printer suspends the current job and sets the Job's "job-state" Job Description attribute to 'processing-stopped'
1215 and "job-state-reasons" to 'job-suspended-by-xxx', where 'xxx' is 'user' or 'operator'. The Documents' "document-
1216 state" and "document-state-reasons" Document Description attributes are unaffected (but the Documents are not
1217 processed any further, since the Job is stopped).

1218 # 5 Attribute Precedence during job processing

1219 This section defines the Attribute Precedence rules that the Printer MUST follow when processing jobs, including
1220 instructions in the PDL data. These rules cover Queue Override attributes, Page Override attributes, Document
1221 Object attributes, Document Override attributes, Job Object attributes, PDL instructions, PDL Interpreter initialization
1222 files, and Printer object defaults. Since each attribute can be specified for all of these levels, it is important to define
1223 which level takes precedence when the same attribute occurs at different levels with differing values.

1224 The attribute precedence model has the following features:

1225   1) In principle, each defined attribute can occur at each of the precedence levels.

1226   2) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print
1227   driver, submission client, protocol, and Printer:

1228   •   Attributes are supplied by different agents in the system: application, user, print driver, administrator,
1229   operator, Printer object, and the output device hardware.

1230   •   Attributes are supplied at different points in time: PDL generation, job submission, job acceptance, job
1231   pending, job processing.

1232   3) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print
1233   driver, submission client, protocol, and Printer.

1234   4) The later that an attribute is introduced into the work flow or the closer the specified scope of the attribute is to
1235   the affected object, the higher the precedence is assigned to that attribute, since precedence is intended to
1236   reflect the user's wishes.

1237 The following levels of Attribute Precedence are defined in order of decreasing priority:

1238   1. **queue override** - The value that the Printer enforces for any job submitted to it (see [ippsave] section
1239   3.1). Set by the administrator when configuring the Printer by setting an "xxx-supported" Printer attribute
1240   to contain a single value, i.e., the override value. Example: the administrator sets the Printer's "sides" =

1241   'two-sided-long' so that all jobs submitted to that (logical) Printer are printed two-sided flipped along the
1242   long edge.

1243   Note: The **queue override** level is only available for Printers that support the 'guaranteed' value for
1244   its "pdl-override-supported" attribute (see [ippsave] section 8.1). All other levels are available for all
1245   Printers independent of the "pdl-override-supported" value.

1246   **2. Document Level - page override programming** - The special "page-overrides" collection Document
1247   Template attribute (see [pwg5100.4]) supplied at the Document Level, that is, in a Create-Document,
1248   Send-Document, or Send-URI operation, that contains the attributes that are to have the page override
1249   status for the specified ranges of pages in the Input-Document or the Output-Document. Supplied by the
1250   client when submitting a Document object, or set by the user or operator after the Document has been
1251   accepted either using the Set-Document-Attributes operation, or by the operator using means local to the
1252   Printer. Example: "page-overrides" = {"input-documents" = '1:1'; "pages" = '1:1'; "media" = 'letterhead'}

1253   3. **Job Level - page override programming** - The special "page-overrides" collection Job Template
1254   attribute (see [pwg5100.4]) supplied at the Job Level, that is, in a Job Creation operation, that contains
1255   the attributes that are to have the page override status for the specified ranges of pages in the Input-
1256   Document or the Output-Document. Supplied by the client when submitting a job either in the protocol,
1257   or set by the user or operator after the job has been accepted either using the Set-Job-Attributes
1258   operation, or by the operator using means local to the Printer. Example: "page-overrides" = {"input-
1259   documents" = '1:1'; "pages" = '1:1'; "media" = 'letterhead'}

1260   **4. Document Level - Document object attributes -** The Document attributes supplied at the Document
1261   Level, that is, in a Create-Document, Send-Document, or Send-URI operation to apply to the Input
1262   Document. Supplied by the client when submitting a Document object, or set by the user or operator
1263   after the Document has been accepted either using the Set-Job-Attributes operation, or by the operator
1264   using means local to the Printer. Examples: "media" = 'na-letter' and "copies" = '2'.

1265   5. **Document Level - document override programming -** The special "document-overrides" collection
1266   operation attribute (see [pwg5100.4]) supplied by the client in the Send-Document or Send-URI request.
1267   The collection contains the member attributes that are to override attributes specified at lower
1268   precedence for the specified range of documents, including the current Document and subsequently
1269   created Documents. Clients that support the Document object SHOULD supply the attributes as
1270   Document Template attributes directly when creating the Document, instead of using the operation
1271   attribute mechanism. Example: "document-overrides" = {"input-documents" = '5:5'; "media" =
1272   'transparency'}

1273   6. **Job Level - document override programming** - The special "document-overrides" collection Job
1274   Template attribute (see [pwg5100.4]) that contains the attributes that are to have the document override
1275   status for the specified Input-Documents or Output-Documents. Supplied by the client when submitting a
1276   job either in the protocol, or set by the user or operator after the job has been accepted either using the
1277   Set-Job-Attributes operation, or by the operator using means local to the Printer. Example: "document-
1278   overrides" = {"input-documents" = '5:5'; "media" = 'transparency'}

1279   7. **Job Level - Job object and Document object attributes** - The Job attributes and Document attributes
1280   supplied at the Job Level, i.e., with a Create-Job, Print-Job, or Print-URI operation. Supplied by the
1281   client when submitting a Job in the protocol, or set by the user or operator after the job has been
1282   accepted either using the Set-Job-Attributes operation, or by the operator using means local to the
1283   Printer. Examples: "media" = 'na-letter' and "copies" = '2'.

1284   8. **PDL document data** - an instruction in the PDL document data. Supplied by the application or print
1285   driver that created the PDL. Example: PostScript setPageDevice specifying na-letter media. Whether
1286   PDL document data is actually lower precedence than the preceding levels depends on the
1287   implementation as expressed in the "pdl-override-supported" Printer Description attribute (see [rfc2911]

1288   section 4.4.28 and [ippsave] section 8.1).
1289
1290   Job Template and Document Template attributes of the form "xxx-requested", such as "orientation-
1291   requested" (see [rfc2911] section 4.2.10) have a lower priority than the PDL. If the PDL contains a
1292   corresponding instruction, that PDL instruction will be used instead of the supplied "xxx-requested"
1293   attribute. For example, PostScript PDL data always has a well-defined orientation, so that "orientation-
1294   requested" never affects the result. On the other hand, PDLs such as text/plain never has orientation
1295   and PCL NEED NOT have orientation, in which case, "orientation-requested" takes affect.

1296   9. **PDL Init File data** - a file that the Printer uses to initialize the PDL Interpreter before it starts interpreting
1297   each document in a Job. See description of "pdl-init-file" Job Template attribute in [ippsave] Section 5.8.
1298   It is immaterial how this file is specified, whether it be by a queue override, job object attribute or printer
1299   default – the precedence of the contents of this file is at this level.

1300   10. **printer default** - a Printer "xxx-default" attribute that is applied by the Printer provided that none of the
1301   higher levels have supplied a value. The Printer implementation MUST supply values for all of the
1302   Printer's "xxx-default" attributes that reflect the out-of-the-box action by the output device. For example,
1303   if the output device will use media from the large-capacity input tray if not directed otherwise, the
1304   implementation MUST supply the Printer's "media-default" attribute with the 'large-capacity' keyword
1305   value without requiring the administrator to configure that value. The implementation MUST allow the
1306   administrator to configure the Printer's "xxx-default" attributes to other values, if other value are
1307   supported by the implementation. Example: The administrator changes the Printer's "media-default"
1308   from 'large-capacity' to 'na-letter'.

1309   Note: Because of the requirement that the implementation supply pre-configured values for the
1310   Printer's "xxx-default" attributes, there is no need for a lower "hardware default" precedence
1311   level.

1312 6 Operation Attributes for the Job and Document Creation operations

1313 This section lists *all* the Operation attributes that have been defined in other IPP specifications that are used in Job
1314 Creation operations and extends their use to the Document Creation operations defined in the IPP specification.
1315 Operation attributes relate to the operation and do not depend on the printing capabilities of the Printer.

1316 6.1 Operation Attributes supplied at the Job and Document Levels for Creation

1317 Table 6 lists the Operation attributes that clients supply at the Job Level and/or the Document Level.

1318 The "Level Supplied" column indicates whether the Operation attribute can be supplied at the Job Level (Print-Job,
1319 Print-URI, and Create-Job) and at the Document Level (Create-Document, Send-Document, and Send-URI) . The
1320 Conformance column indicates the conformance requirements for what the client supplies in a request and the
1321 Printer supports in a request. The Reference and Section columns list the IETF or IEEE-ISTO specification which
1322 defines the semantics of the attribute.

1323 Legend:
1324 [job-] indicates an attribute that shouldn't have had a "job-" prefix in its name in [rfc2911], so that the same attribute
1325   name could also be used for the Document object as a Document Description attribute. Note: For the PWG
1326   Semantic Model, the "job-" prefix is dropped.
1327 "-"   indicates that the Job or Document operation attribute is *not* defined.
1328 *   For most of these operation attributes the Printer MUST copy these operation attributes to the corresponding
1329   Job Description or Document Description attributes.   The * in the Job and Doc column indicate that there is
1330   *no* corresponding Job Description or Document Description attribute, respectively. See Table 9 for the
1331   corresponding Job and Document Description attributes.

1332 ** these operation attributes are defined for *all* operations, not just Job Creation and Document Creation
1333   operations

1334 **Table 6 - Operation Attributes supplied at the Job and Document Levels in Creation Requests**

Operation attribute name for Job and Document Creation *requests*	Attribute Syntax	Level Supplied		Conformance		Reference
		Job	Doc	Client supply	Printer support	
**attributes-charset **	charset	y	y	MUST	MUST	[rfc2911] §3.1.4
attributes-natural-language **	naturalLanguage	y	y	MUST	MUST	[rfc2911] §3.1.4
compression	type3 keyword	y *	y	MAY	MUST	[rfc2911] §3.2.1.1
document-container-summary*	1setOf collection	-	y	MAY	MAY[11]	§8.2.8
document-creator-application-name*	name(MAX)	-	y	MAY	MAY	§8.2.9
document-creator-application-version*	text(127)	-	y	MAY	MAY	§8.2.10
document-creator-os-name*	name(40)	-	y	MAY	MAY	§8.2.11
document-creator-os-version*	text(40)	-	y	MAY	MAY	§8.2.12
document-format	mimeMediaType	y *	y	MAY	MUST	[rfc2911] §3.2.1.1
document-format-device-id*	text(127)	-	y	MAY	MAY	§8.2.15
document-format-version*	text(127)	-	y	SHOULD	MUST	§8.2.16
**document-message **	text(MAX)	-	y	MAY	MAY	§8.2.21
document-name	name(MAX)	y *	y	MAY	MUST	[rfc2911] §3.2.1.1
document-natural-language	naturalLanguage	y *	y	MAY	MAY	[rfc2911] §3.2.1.1
document-overrides[12]	1setOf collection	-	y	MAY	MAY	[pwg5100.4] §5.1, §9.2.2
See "document-overrides" in Table 8 for the list of member attributes						
document-uri	uri	y *	y	CMUST [13]	MAY	[rfc2911] §3.2.2
input-document-number DEPRECATED	integer(1:MAX)	-	y	MAY	MAY	§3.1.1.1, [pwg5100.4] §9.2
ipp-attribute-fidelity	boolean	y	-	MAY	MUST	§4.4.1, [rfc2911] §3.2.1.1
[job-]impressions	integer(0:MAX)	y	y	MAY	MAY	[rfc2911] §3.2.1.1
[job-]k-octets	integer(0:MAX)	y	y	MAY	MAY	[rfc2911] §3.2.1.1
job-mandatory-attributes	1setOf type2 keyword	y	-	MAY	MAY [14]	§4.4.2
[job-]media-sheets	integer(0:MAX)	y	y	MAY	MAY	[rfc2911] §3.2.1.1
job-name	name(MAX)	y	-	MAY	MUST	[rfc2911] §4.3.5

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[11] The "document-container-summary" Document Description attribute MUST be supported by a Printer that supports a container MIME type document format, such as 'application/zip' or 'multipart/related'.

[12] The "document-overrides" operation attribute is proposed to be removed from the next version of the PWG 5100.4 Candidate Standard in Send-Document and Send-URI operations.

[13] 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.

[14] ISSUE 03 (repeat): Should we make "job-mandatory-attributes" a REQUIRED attribute for a Printer to support (if it supports the Document object)? Otherwise, clients won't support it and will be stuck with the "ipp-attribute-fidelity" attribute?

Operation attribute name for Job and Document Creation *requests*	Attribute Syntax	Level Supplied		Conformance		Reference
		Job	Doc	Client supply	Printer support	
job-password	octetString(255)	y	-	MAY	MAY	[ippsave] §4.1
job-password-encryption	type3 keyword | name(MAX)	y	-	MAY	MAY	[ippsave] §4.2
last-document	boolean	-	y	MUST	MUST	[rfc2911] §3.3.1.1
operation-id **	integer(1:0x8FFF)	y *	y *	MUST	MUST	[rfc2911] §3.1.2
original-requesting-user-name	name(MAX)	y	y	MAY	MAY	[adm-ops] §11.7.2.2
page-overrides	1setOf collection	-	y	MAY	MAY	[pwg5100.4] §5.2, §9.2.3
See "page-overrides" in Table 8 for the list of member attributes						
printer-uri **	uri	y *[15]	y *	MUST	MUST	[rfc2911] §3.1.5
request-id **	integer(1:MAX)	y *	y *	MUST	MUST	[rfc2911] §3.1.2
requesting-user-name **	name(MAX)	y *	y *	SHOULD	MUST	[rfc2911] §3.2.1.1
version-number **	X.Y	y *	y *	MUST	MUST	[rfc2911] §3.1.8

1335   * and **. See Legend at the beginning of the Table.

1336 ## 6.2 Override operation attributes in Send-Document and Send-URI

1337 With the introduction of the Document Object, there is no longer a need for the "document-overrides" (1setOf
1338 collection) attribute [pwg5100.4] as an operation attribute or a Document Template attribute. Also we are unaware of
1339 any implementations of the "document-overrides" attribute. Therefore, the intent is to republish the Overrides
1340 document with only the "page-overrides" attribute. With the introduction of the Document object, the client simply
1341 supplies the Document Template attributes (see Table 8) for each Document Creation request (in a new Document
1342 Template attribute group) without needing a collection (and the "document-overrides" attribute).

1343 The "document-overrides" attribute is also useful in combination with the "pages-per-subset" attribute (see
1344 [pwg5100.4]) which divides up the Input Page stream concatenated across the Input Documents into separate
1345 Output Documents. For example, making every 10 Input Pages be a separate Output Document but the client only
1346 wants to staple the first Output Document. ISSUE 04: But what about Subset Finishing? Can we it be done without
1347 "document-overrides"?

1348 Similarly, according to [pwg5100.4], the "page-overrides" (collection) attribute MAY be supplied by the client in a
1349 Send-Document or Send-URI request as an Operation attribute to apply page overrides to this and/or subsequent
1350 documents in the job. See the "page-overrides" Job Template attribute in Table 8 for the listing of the member
1351 attributes. However, with the introduction of the Document object, the "page-overrides" (collection) attribute
1352 SHOULD be more simply supplied as one of the Document Template attributes for the document being created only.
1353 However, a Printer MUST also support the "page-overrides" attribute as an operation attribute for backward
1354 compatibility with clients that do not support the Document object.

1355 ISSUE 05: OK that when a Printer supports Page Overrides, that we REQUIRE the Printer to continue to support the
1356 "page-overrides" as an operation attribute in Send-Document and Send-URI as well as a Document Template
1357 attribute?

---

[15] The Printer copies the "printer-uri" operation attribute to the Job's "job-printer-uri" Job Description attribute and
Document's "job-printer-uri" Document Description attribute.

1358 ## 6.3   Operation Attributes returned in Job and Document Creation responses

1359 Table 7 lists the Operation attributes that Printers return in Job Creation operation *responses*: Print-Job, Print-URI,
1360 and Create-Job and in Document Creation operation *responses*: Send-Document and Send-URI. The column
1361 labeled "Conformance" indicates the conformance for what the Printer returns and what the Printer supports. The
1362 Reference and Section columns list the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

1363 **Table 7 - Operation attributes returned in Job and Document Creation operation *responses***

Operation attribute name	Attribute Syntax Values	Conformance		References
		Printer return	Printer support	
attributes-charset *	charset	MUST	MUST	[rfc2911] §3.1.4
	'utf-8'	MAY	MUST	[rfc2911] §4.1.7
	'us-ascii'	MAY	MAY	[rfc2911] §4.1.7
	'iso-8859-1'	MAY	MAY	[rfc2911] §4.1.7
	'iso-10646-ucs-2'	MAY	MAY	[rfc2911] §4.1.7
attributes-natural-language *	naturalLanguage	MUST	MUST	[rfc2911] §3.1.4
	'en-US'	MAY	MAY	[rfc2911] §4.1.8
detailed-status-message *	text	MAY	MAY	[rfc2911] §3.1.6.3
document-access-error	text	MAY	MAY	[rfc2911] §3.1.6.4
document-id-uri	uri	MUST	MUST	§8.2.17
document-number	integer(1:MAX)	MUST	MUST	§8.2.24
job-id	integer(1:MAX)	MUST	MUST	[rfc2911] §4.3.2
job-uri	uri	MUST	MUST	[rfc2911] §4.3.1
redirect-uri (uri) [16]	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

1364 * - indicates attributes that are defined for *all* operations, not just Job Creation operations
1365

1366 # 7   Job Template and Document Template attributes

1367 Table 8 lists *all* of the Job Template attributes defined in other IPP specifications and lists their corresponding
1368 Document Template attributes defined in this IPP specification. The Job Template attributes can be supplied in the
1369 Job Creation operations: Print-Job, Print-URI, and Create-Job operations.

1370 A subset of these Job Template attributes (e.g., "document-format" and "media", but not "job-priority") are also
1371 defined to apply to Documents and are called Document Template attributes when supplied at the Document Level.
1372 Document Template attribute can be supplied in the Create-Document, Send-Document, and Send-URI operations.

---

[16] 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.

1373   These Document Template attributes can also be supplied as Document Overrides using the "document-overrides"
1374   Job Template attribute (see [pwg5100.4]).

1375   A subset of the Document Template attributes that apply to pages (e.g., "media", but not "document-format" or "job-
1376   priority") can also be supplied as Page Overrides using the "page-overrides" Job Template collection attribute (see
1377   [pwg5100.4]) or as a Document Template attribute.

1378   "**" - Most Job Template and Document Template attributes correspond to the PWG Semantic Model Job Processing
1379   and Document Processing attributes, respectively. However, 4 of the IPP Job Template attributes are
1380   represented in the PWG Semantic Model as Job Description attributes, instead of Job Processing attributes.
1381   These are indicated in the first column with "**".

1382   The "Defined for use" column indicates whether the client MAY supply and the Printer support the attribute at the
1383   Job, Document, or Page Level with the following semantics:

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

1384
1385   Job Template and Document Template attributes are OPTIONAL for a Printer to support and for a client to supply in
1386   a Job Creation or Document Creation request or a Document Overrides or Page Overrides. If a Printer supports a
1387   Job Template or Document Template attribute, then it MUST copy the supplied attribute to the Job or Document
1388   object, respectively so that a client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs and Get-
1389   Document-Attributes/Get-Documents operations, respectively. The effect of Job Template Attributes supplied in Job
1390   Creation requests are inherited by the Document objects, unless the Document Creation operation supplies the
1391   attribute with a different value.

1392   If a Job Template collection attribute is supported (see [coll]), then there are conformance requirements for which
1393   member attributes MUST be supported and which member attributes a client MUST supply as indicated in the
1394   Conformance column for each collection member attribute in Table 8.

1395   **Table 8 - 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 [17]	y	n	MAY	MAY	[rfc2911] §4.2.5

---

[17] 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

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
document-overrides To be removed from the next version of [pwg5100.4]	collection	y	y	n	MAY	MAY	[pwg5100.4] §5.1
input-documents [18]	1setOf rangeOfInteger(MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.4] §5.1.1
output-documents	1setOf rangeOfInteger(MAX)					MUST	[pwg5100.4] §5.1.2
document-copies	1setOf rangeOfInteger(MAX)				MAY	MAY	[pwg5100.4] §5.1.3
document-format	mimeMediaType				MAY	MUST	[pwg5100.4] §5.1.4
document-name	name (MAX)				MAY	MUST	[pwg5100.4] §5.1.5
compression	type3 keyword				MAY	MUST	[pwg5100.4] §5.1.6
document-natural-language	naturalLanguage				MAY	MAY	[pwg5100.4] §5.1.7
page-ranges	1setOf rangeOfInteger (1:MAX)				MAY	MAY	[pwg5100.4] §5.1.8
any other Job Template attributes that affect documents, such as "media" or "media-col"					MAY	MAY	
feed-orientation	type3 keyword	y	y	n	MAY	MAY	[ippsave] §5.1

---

copies of the job as a whole with the multiple input documents concatenated into a single output document for each job copy. The 'separate-document-uncollated-copies' value produce N copies of the first input document followed by N copies of the second input document, etc. The 'separate-document-collated-copies' produce N successive job copies, each job copy consisting of 1 copy of the first document followed by 1 copy of the second document, etc.

[18] The Printer MUST support "document-format", "document-name", "compression", "document-natural-language", and "page-ranges" with the "input-documents" member attribute, but not with the "output-documents" member attribute.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
finishings	1setOf type2 enum	y [19]	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 [20]	y	y		MAY	[pwg5100.3] §3.2
finishing-template	name(MAX)				MAY	MAY	[pwg5100.3] §3.2.1
stitching	collection				MAY	MAY	[pwg5100.3] §3.2.2
stitching-reference-edge	type2 keyword				MUST	MUST	[pwg5100.3] §3.2.2.1
stitching-offset	integer (0:MAX)				MUST	MUST	[pwg5100.3] §3.2.2.2
stitching-locations	1setOf integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.2.2.3
font-name-requested	name(MAX)	y	y	y	MAY	MAY	[ippsave] §5.2
font-size-requested	integer (1:MAX)	y	y	y	MAY	MAY	[ippsave] §5.3
force-front-side	1setOf integer(1:MAX)	y [21]	y	y	MAY	MAY	[pwg5100.3] §3.3
imposition-template	type2 keyword | name(MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.4
insert-sheet	1setOf collection	y [22]	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
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 [23]	n	MAY	MAY	§7.1.1

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

[20] See the footnote on the "finishings" attribute.

[21] 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.

[22] See the footnote on "force-front-side".

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

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
job-cover-back	collection	y	n [24]	n	MAY	MAY	§7.1.2
same as **cover-back**	**see cover-back**						
job-cover-front	collection	y	n [25]	n	MAY	MAY	§7.1.3
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 [26]	n	MAY	MAY	§7.1.4
job-finishings-col	collection	y	n [27]	n	MAY	MAY	§7.1.5
same as **finishings-col**	**see finishings-col**						
job-hold-until	type3 keyword | name(MAX)	y	n	n	MAY	MAY	[rfc2911] §4.2.2
job-hold-until-time	dateTime	y	n	n	MAY	MAY	[ippsave] §5.4
job-message-to-operator	text(MAX)	y	n [28]	n	MAY	MAY	[pwg5100.3] §3.10
job-phone-number	text(127)	y	n	n	MAY	MAY	[ippsave] §5.5
job-priority	integer(1:100	y	n	n	MAY	MAY	[rfc2911] §4.2.1
job-recipient-name **	name(MAX)	y	n	n	MAY	MAY	[ippsave] §5.6
job-save-disposition	collection	y	n	n	MAY	MAY	[ippsave] §5.7
save-disposition	type3 keyword	y	n	n	MAY	MAY	[ippsave] §5.7.1.1
save-info	1setOf collection	y	n	n	MAY	MAY	[ippsave] §5.7.1.2
save-location	uri	y	n	n	MAY	MAY	[ippsave] §5.7.1.2.3.1
save-name	name(MAX)	y	n	n	MAY	MAY	[ippsave] §5.7.1.2.3.2
save-document-format	mimeMediaType	y	n	n	MAY	MAY	[ippsave] §5.7.1.2.3.3
job-sheet-message	text(MAX)	y	n	n	MAY	MAY	[pwg5100.3] §3.12

[24] 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'.

[25] 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'.

[26] 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'.

[27] 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'.

[28] 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-sheets	type3 keyword | name(MAX)	y	n	n	MAY be neither or one of, but NOT both	MAY, MUST if "job-sheets-col" supported	[rfc2911] §4.2.3
job-sheets-col	collection	y	n	n		MAY	[pwg5100.3] §3.11
job-sheets	type3 keyword | name(MAX)				MUST	MUST	[pwg5100.3] §3.11.1
media	type3 keyword | name(MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.3] §3.11.2
media-col	collection					MAY	[pwg5100.3] §3.11.2
media	type3 keyword | name(MAX)	y	y	y	MAY be neither or one of, but NOT both	MAY, MUST if "media-col" supported	[rfc2911] §4.2.11
media-col	collection	y	y	y		MAY	[pwg5100.3] §3.13
media-back-coating	type3 keyword | name(MAX)				MAY	MAY	[pwg5100.3] §3.13.10
media-color	type3 keyword | name(MAX)				MAY	MAY	[pwg5100.3] §3.13.4
media-front-coating	type3 keyword | name(MAX)				MAY	MAY	[pwg5100.3] §3.13.10
media-grain	type3 keyword | name(MAX)				MAY	MAY	[ippsave] §8.4.2
media-hole-count	integer(0:MAX)				MAY	MAY	[pwg5100.3] §3.13.6
media-info	text(255)				MAY	MAY	[pwg5100.3] §3.13.3
media-key	type3 keyword | name(MAX)				MAY	MAY	[pwg5100.3] §3.13.1
media-material	type3 keyword | name(MAX)				MAY	MAY	[ippsave] §8.4.3
media-order-count	integer(1:MAX)				MAY	MAY	[pwg5100.3] §3.13.7
media-preprinted	type3 keyword | name(MAX)				MAY	MAY	[pwg5100.3] §3.13.5
media-recycled	type3 keyword | name(MAX)				MAY	MAY	[pwg5100.3] §3.13.11
media-size	collection				MAY	MUST	[pwg5100.3] §3.13.8
x-dimension	integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.13.8.1
y-dimension	integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.13.8.2
media-size-name	type3 keyword | name(MAX)				MAY	MAY	§7.1.6
media-thickness	integer(1:MAX)				MAY	MAY	[ippsave] §8.4.4
media-tooth	type3 keyword | name(MAX)				MAY	MAY	[ippsave] §8.4.1
media-type	type3 keyword | name(MAX)				MAY	MAY	[pwg5100.3] §3.13.2
media-weight-metric	integer(0:MAX)				MAY	MAY	[pwg5100.3] §3.13.9
media-input-tray-check	type3 keyword | name(MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.14
media-size-name [29]	type3 keyword | name(MAX)	y	y	y	MAY	MAY	§7.1.6, [upnp]
media-type [30]	type3 keyword | name(MAX)	y	y	y	MAY	MAY	[upnp], [pwg5100.3] §3.13.2

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[29] UPnPv1 and UPnPv2 define a separate MediaSizeName Job Template attribute with values from PWG 5101.1.
[30] UPnPv1 and UPnPv2 define a separate MediaType Job Template attribute with the same values as the "media-type" member attribute of "media-col".

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
multiple-document-handling	type2 keyword	y	n	n	MAY	MUST if multiple document jobs supported	[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
page-delivery	type2 keyword	y	y	n	MAY	MAY	[pwg5100.3] §3.15
page-order-received**	type2 keyword	y	y	n	MAY	MAY	[pwg5100.3] §3.16
page-overrides	1setOf collection	y [31]	y	n	MAY	MAY	[pwg5100.4] §5.2
input-documents	1setOf rangeOfInteger(1:MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.4] §5.2.1
output-documents	1setOf rangeOfInteger(1:MAX)					MUST	[pwg5100.4] §5.2.2
document-copies	1setOf rangeOfInteger(1:MAX)				MAY	MAY	[pwg5100.4] §5.2.3
pages	1setOf rangeOfInteger(1:MAX)				MUST	MUST	[pwg5100.4] §5.2.4
any other Job Template attributes that affect pages, such as "media" or "media-col"					MAY	MAY	
page-ranges	1setOf rangeOfInteger(1:MAX)	y	y	n	MAY	MAY	[rfc2911] §4.2.7
pages-per-subset	1setOf integer(1:MAX)	y [32]	n	n	MAY	MAY	[pwg5100.3] §5.3
pdl-init-file	1setOf collection	y	y	n	MAY	MAY	[ippsave] §5.8
pdl-init-file-location	uri				MAY	MAY	[ippsave] §5.8.1.1
pdl-init-file-name	name(MAX)				MAY	MAY	[ippsave] §5.8.1.2
pdl-init-file-entry	name(MAX)				MAY	MAY	[ippsave] §5.8.1.3
presentation-direction-number-up	type2 keyword	y	y	y	MAY	MAY	[pwg5100.3] §3.17
print-quality	type2 enum	y	y	y	MAY	MAY	[rfc2911] §4.2.13
printer-resolution	resolution	y	y	y	MAY	MAY	[rfc2911] §4.2.12
proof-print	collection	y	n	n	MAY	MAY	[ippsave] §5.9
proof-print-copies	integer (0:MAX)	y	n	n	MAY	MAY	[ippsave] §5.9.1.1
media	type3 keyword | name(MAX)				MAY be neither or one of, but NOT both	MUST	[ippsave] §5.8.1.2
media-col	collection					MAY	[ippsave] §5.8.1.2

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

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

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
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

1396 "**" - These 4 attributes are Job Description attributes, not Job Processing attributes in the PWG Semantic Model -
1397 see Legend before the Table.

7.1   Job Template attributes defined for use with multi-document jobs

1399 This section defines additional Job Template attributes for use with the Document object.

7.1.1 job-copies (integer(1:MAX))

1401 This attribute specifies the number of job copies, i.e., with all of the Document objects taken together. Its
1402 interpretation is independent of the value of the "multiple-document-handling" Job Template attribute. See the
1403 "copies" Job Template attribute defined in [rfc2911] section 4.2.5 which switches between job copies and document
1404 copies depending on the value of the "multiple-document-handling" Job Template attribute.

7.1.2 job-cover-back (collection)

1406 This attribute specifies the cover for the back of the job, i.e., with all of the Document objects taken together and is
1407 independent of the value of the "multiple-document-handling" Job Template attribute. The member attributes are the
1408 same as "cover-back" (see [pwg5100.3] section 3.1). However, the "cover-back" Job Template attribute switches
1409 between a job back cover and a document back cover depending on the value of the "multiple-document-handling"
1410 Job Template attribute.

1411 7.1.3 job-cover-front (collection)

1412 This attribute specifies the cover for the front of the job, i.e., with all of the Document objects taken together and is
1413 independent of the value of the "multiple-document-handling" Job Template attribute. The member attributes are the
1414 same as the "cover-front" Job Template attribute (see [pwg5100.3] section 3.2). However, the "cover-front" Job
1415 Template attribute switches between a job front cover and a document front cover depending on the value of the
1416 "multiple-document-handling" Job Template attribute.

1417 7.1.4 job-finishings (1setOf type2 enum)

1418 This attribute specifies the job finishings, i.e., with all of the Document objects taken together. Its interpretation is
1419 independent of the value of the "multiple-document-handling" Job Template attribute. See the "finishings" Job
1420 Template attribute defined in [rfc2911] section 4.2.6 which switches between job finishings and document finishings
1421 depending on the value of the "multiple-document-handling" Job Template attribute.

1422 7.1.5 job-finishings-col (1setOf collection)

1423 This attribute specifies the job finishings collection, i.e., with all of the Document objects taken together. Its
1424 interpretation is independent of the value of the "multiple-document-handling" Job Template attribute. See the
1425 "finishings" Job Template attribute defined in [rfc2911] section 4.2.6 which switches between job finishings collection
1426 and document finishings collection depending on the value of the "multiple-document-handling" Job Template
1427 attribute.

1428 7.1.6 media-size-name (type3 keyword | name(MAX))

1429 This Job Template and Document Template attribute specifies the name of a size of media. The values are defined
1430 in [pwg5101.1]. The attribute is used in [upnp] as a Job Template attribute.

1431 The "media-size-name" attribute is also defined as a member attribute of the "media-col" Job Template (see
1432 [pwg5100.3] section 3.13) and Document Template attribute. Examples:

1433   **'na_letter_8.5x11in'** - The letter size (8.5 inches by 11 inches) used in North America.
1434   **'iso_a4_210x297mm'** - The iso A4 size (210 mm by 297 mm) used in metric countries.

1435 7.1.7 media-type (type3 keyword | name(MAX))

1436 This Job Template and Document Template attribute specifies the type of media. The values are defined in
1437 [pwg5101.1] and [pwg5100.3] section 3.13.2. The attribute is used in [upnp] as a Job Template attribute.

1438 The "media-type" attribute is also defined as a member attribute of the "media-col" Job Template (see [pwg5100.3]
1439 section 3.13.2) and Document Template attribute. Examples:

1440   **'stationery'** - Separately cut sheets of an opaque material.
1441   **'transparency'** - Separately cut sheets of a transparent material
1442

1443 7.2 Document Template attributes

1444 Most Job Template attributes can be used as Document Template attributes for use in Document Creation
1445 operations to apply to the Document object. However, the Job Template attributes that have the "job-" prefix MUST
1446 NOT be used as Document Template attributes, since they are defined to apply to the job as a whole. Table 8 shows
1447 lists all of the Document Template attributes for use with the Document Creation operations and the Document
1448 object. All of the definitions of the Document Template attributes are done by reference to the corresponding Job
1449 Template attributes in other specifications. However, the semantics of each Document Template attribute only
1450 applies to the Document object with which the attribute is associated either by being supplied by the client in the

1451 Document Creation operation or supplied by the Printer as a default because the client did not (and the PDL did not
1452 have any corresponding instruction). See section 5 for defaulting semantics.

1453 8   Job Description and Document Description attributes

1454 Table 9 lists all the Job Description defined in other IPP specifications and the corresponding Document Description
1455 attributes defined in this IPP specification. Job Description and Document Description attributes are Job object and
1456 Document object attributes, respectively, that are filled in by the Printer. Some Job/Document Description attribute
1457 values are supplied by the client in the Job/Document Creation operation using corresponding Operation attributes
1458 as flagged with "". Unless specified otherwise herein, the Printer MUST NOT support modification of Job Description
1459 and Document Descriptions attributes.

1460 The column labeled "attribute syntax" indicates the attribute syntax (see [rfc2911] section 4.1). The Printer
1461 conformance is indicated along with the reference to the specification in which the attribute is defined. The
1462 conformance for Document Description attributes (if the Printer supports the Document object) is the same as the
1463 corresponding Job Description attributes.

1464 Each of the Document Description attributes have a sub-section in section 8.2. The column labeled References
1465 column contains references to the sub-section in this document if there is significant information there. Those
1466 subsections that are only references to other specifications contain only that reference in the Reference column.
1467 Those attributes that are only Job Description attributes with no subsection in this specification have a "n/a" in the
1468 "Doc Desc" column.

1469 Note: There are no corresponding Page Range (or Page Override) Description attributes. The Page Range is not an
1470 object with a state and it cannot be queried.

1471 Legend:
1472 [job-]   indicates an attribute that shouldn't have had a "job-" prefix in its name in [rfc2911], so that the same attribute
1473   name could also be used for the Document object as a Document Description attribute. Note: For the PWG
1474   Semantic Model, the "job-" prefix is dropped.
1475 "-"   indicates that the Job or Document attribute is *not* defined.
1476 "*"   indicates a Job and/or Document Description attribute that the client MAY supply the values for in a
1477   corresponding Operation attribute[33] in a Job or Document Creation operation.   See Table 6 for the
1478   corresponding operation attribute.
1479 (r/w)   indicates that the Job Description or Document Description attribute is read/write, so that the client can
1480   changes its value using the Set-Job-Attributes or Set-Document-Attributes operation (see section 3.7).

1481   **Table 9 - Job and Document Description attributes**

IPP 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	§8.2.1
attributes-natural-language *	naturalLanguage	y	y	MUST	[rfc2911] §4.3.20	§8.2.2
compression *	type3 keyword	-	y	MUST	[rfc2911] §3.2.1.1	§8.2.3
current-page-order	type2 keyword	y	y	MAY	[pwg5100.3] §4.1	§8.2.4
date-time-at-completed	dateTime	y	y	MAY	[rfc2911] §4.3.14.7	§8.2.5
date-time-at-creation	dateTime	y	y	MAY	[rfc2911] §4.3.14.5	§8.2.6

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[33] 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.

IPP Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform-ance	Reference Job Description Attr	Doc Desc.
date-time-at-processing	dateTime	y	y	MAY	[rfc2911] §4.3.14.6	§8.2.7
document-container-summary *	1setOf collection	-	y	MAY[34]	(new)	§8.2.8
document-creator-application-name *	name(MAX)	-	y	MAY	(new)	§8.2.9
document-creator-application-version *	text(127)	-	y	MAY	(new)	§8.2.10
document-creator-os-name *	name(40)	-	y	MAY	(new)	§8.2.11
document-creator-os-version *	text(40)	-	y	MAY	(new)	§8.2.12
document-format *	mimeMediaType	-	y	MUST	[rfc2911] §3.2.1.1	§8.2.13
document-format-detected	mimeMediaType	-	y	MAY	(new)	§8.2.14
document-format-device-id *	text(127)	-	y	MUST	(new)	§8.2.15
document-format-version *	text(127)	-	y	MAY	(new)	§8.2.16
document-id-uri	uri	-	y	MUST	(new)	§8.2.17
document-job-id	integer(1:MAX)	-	y	MUST	(new)	§8.2.18
document-job-printer-uri	uri	-	y	MUST	(new)	§8.2.19
document-job-uri	uri	-	y	MUST	(new)	§8.2.20
document-message *(r/w)	text(MAX)	-[35]	y	MAY	(new)	§8.2.21
document-name *(r/w)	name(MAX)	-	y	MUST	[rfc2911] §3.2.1.1	§8.2.22
document-natural-language *	naturalLanguage	-	y	MAY	[rfc2911] §3.2.1.1	§8.2.23
document-number	integer(0:MAX)	-	y	MUST	(new)	§8.2.24
document-state	type1 enum	-	y	MUST	(new)	§8.2.25
document-state-message	text(MAX)	-	y	MAY	(new)	§8.2.26
document-state-reasons	1setOf type2 keyword	-	y	MUST	(new)	§8.2.27
document-uri *	uri	-	y	MAY	(new)	§8.2.28
impressions-completed-current-copy	integer(0:MAX)	y	y	MAY	[rfc3381] §4.4	§8.2.29
ipp-attribute-fidelity *	boolean	y	-	MUST	[rfc2911] §3.2.1.1	§8.1.1
job-collation-type	type2 enum	y	-	MAY	[rfc3381] §4.1	n/a
[job-]detailed-status-message	1setOf text (MAX)	y	y	MAY	[rfc2911] §4.3.10	§8.2.30
[job-]document-access-errors	1setOf text(MAX)	y	y	MAY	[rfc2911] §4.3.11	§8.2.31
[job-]impressions *	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.17.2	§8.2.32
[job-]impressions-completed	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.18.2	§8.2.33
[job-]k-octets *	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.17.1	§8.2.34
[job-]k-octets-processed	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.18.1	§8.2.35
job-mandatory-attributes *	1setOf type2 keyword	y	-	MAY[36]	(new)	§8.1.2

---

[34] The "document-container-summary" Document Description attribute MUST be supported by a Printer that supports a container MIME type document format, such as 'application/zip' or 'multipart/related'.

[35] The "document-message" (text(127)) Document Description attribute has a corresponding "job-message-from-operator" (text(127)) Job Description attribute (see [rfc2911] section 4.3.16) which handles operator to user communication only and a "job-message-to-operator (text(MAX)) Job Template attribute (see [pwg5100.3] section 3.10) for user to operator communication.

[36] ISSUE 03 (repeat): Should we make "job-mandatory-attributes" a REQUIRED attribute for a Printer to support (if it supports the Document object)? Otherwise, clients won't support it and will be stuck with the "ipp-attribute-fidelity" attribute?

IPP Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform- ance	Reference Job Description Attr	Doc Desc.
[job-]media-sheets *	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.17.3	§8.2.36
[job-]media-sheets-completed	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.18.3	§8.2.37
job-message-from-operator	text(127)	y	- [37]	MAY	[rfc2911] §4.3.16	n/a
[job-]more-info	uri	y	y	MAY	[rfc2911] §4.3.4	§8.2.38
job-name *(r/w)	name(MAX)	y	- [38]	MUST	[rfc2911] §4.3.5	n/a
job-originating-user-name	name (MAX)	y	-	MUST	[rfc2911] §4.3.6	n/a
job-password *	octetString(255)	y	-	MAY	[ippsave] §4.1	n/a
job-password-encryption *	type3 keyword | name(MAX)	y	-	MAY	[ippsave] §4.2	n/a
job-printer-make-and-model	text(127)	y	-	CMUST [39]	[rfc2911] §4.3.14.4	n/a
[job-]printer-up-time	integer (1:MAX)	y	y	MUST	[rfc2911] §4.3.14.4	§8.2.39
job-state	type1 enum	y	- [40]	MUST	[rfc2911] §4.3.7	§8.2.25
job-state-message	text(MAX)	y	- [41]	MAY	[rfc2911] §4.3.9	§8.2.26
job-state-reasons	1setOf type2 keyword	y	- [42]	MUST	[rfc2911] §4.3.8	§8.2.27
[job-]warnings-count	integer(0:MAX)	y	y	MAY	[pwg5100.4] §6.1	§8.2.40
last-document *	boolean	-	y	MAY	[rfc2911] §4.3.12	§8.2.41
number-of-documents	integer(0:MAX)	y	-	MAY	[rfc2911] §4.3.15	n/a
number-of-intervening-jobs	integer(0:MAX)	y	-	MAY	[rfc2911] §4.3.13	n/a
output-device-assigned	name(127)	y	y	MAY	[rfc2911] §4.3.7.2	§8.2.42
sheet-completed-copy-number	integer(0:MAX)	y	y	MAY	[rfc3381] §4.2	§8.2.43
sheet-completed-document-number	integer(0:MAX)	y	-	MAY	[rfc3381] §4.3	n/a
time-at-completed	integer (MIN:MAX)	y	y	MUST	[rfc2911] §4.3.14.3	§8.2.44
time-at-creation	integer (MIN:MAX)	y	y	MUST	[rfc2911] §4.3.14.1	§8.2.45
time-at-processing	integer (MIN:MAX)	y	y	MUST	[rfc2911] §4.3.14.2	§8.2.46

1482   "" See the description in the Legend before the table.
1483
1484   Most of the existing "job-state" and "job-state-reasons" Job Description attribute values apply equally well to
1485   individual documents in a multi-document job (with removal of the 'job-' prefix for those that apply to both Job and
1486   Document). Furthermore, the job states are completely service-type neutral, so they can apply to scanning. faxing,
1487   formatting processes as well. The job state reasons have a number of reasons that are print service specific, but
1488   most can apply to other types of service as well. The reason for separating state from reasons, is so that the states

---

[37] 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 8.2.21) to communicate with each other.

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

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

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

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

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

1489 can be the fundamental states that most implementations have, while the state reasons can vary depending on the
1490 sophistication of the system. The states are the ones that clients are most likely to base actions upon, and the state
1491 reasons are more information, both for programs and people.

1492 The descriptions of the new "document-state" and "document-state-reasons" attributes are merged in with the
1493 existing "job-state" and "job-state-reasons". Such merging shows the parallelism in the description to aid
1494 understanding and implementation and so that future maintenance will continue this strong parallelism. The "/"
1495 character separates the words: Job from Document so that the same description can serve for both Job and
1496 Document objects.

8.1   Job Description attributes

1498 This section contains *only* the Job Description attributes that are defined in this specification and are not defined in
1499 any other specification.

8.1.1 ipp-attribute-fidelity (boolean)

1501 This REQUIRED Job Description attribute indicates the value of the corresponding "ipp-attribute-fidelity" operation
1502 attribute ([rfc2911] section 3.2.1.1)[43] that the client supplied in the Job Creation operation. This Job Description
1503 attribute has no effect on the processing of the job once the Job Creation and Document Creation operations have
1504 been accepted. However, this attribute does provide an audit capability to the user and service desk for comparing
1505 unexpected printed results with what was submitted.

8.1.2 job-mandatory-attributes (1setOf type2 keyword)

1507 ISSUE 03 repeat: Should we make "job-mandatory-attributes" a REQUIRED attribute for a Printer to support (if it
1508 supports the Document object)? Otherwise, clients won't support it and will be stuck with the "ipp-attribute-fidelity"
1509 attribute?

1510 This OPTIONAL Job Description attribute indicates which Job Template and Document Template attributes the client
1511 required that the Printer honor in order to accept the Job Creation and subsequent Document Creation requests.
1512 The Printer populates this attribute with the value of the corresponding "job-mandatory-attributes" operation attribute
1513 (see section 4.4.2) supplied by the client in the Job Creation operation. This Job Description attribute has no effect
1514 on the processing of the job once the Job Creation and Document Creation operations have been accepted.
1515 However, this attribute does provide an audit capability to the user and service desk for comparing unexpected
1516 printed results with what was submitted.

8.2   Document Description attributes

1518 This section contains *all* of the Document Description attributes for use with the Document object. Most of these
1519 definitions refer to the corresponding Job Template attribute semantics in other specifications. However, the
1520 semantics of each Document Description attribute only applies to the Document object containing the Document
1521 Description attribute.

> *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!*

---

[43] The "ipp-attribute-fidelity" attribute is defined as an operation attribute only in [RFC2911]. This specification is defining it as a Document Description attribute which the Printer MUST support.

8.2.1 attributes-charset (charset)

1522

1523 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1524 attribute (see [rfc2911] §4.3.19) applied to the Document object.   The Printer sets this Document Description
1525 attribute from the corresponding operation attribute supplied by the client in the Document Creation operation (see
1526 section 3.1).

8.2.2 attributes-natural-language (naturalLanguage)

1527

1528 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1529 attribute (see [rfc2911] §4.3.20) applied to the Document object.   The Printer sets this Document Description
1530 attribute from the corresponding operation attribute supplied by the client in the Document Creation operation (see
1531 section 3.1).

8.2.3 compression (type3 keyword)

1532

1533 This REQUIRED Document Description attribute specifies the compression used to represent this document (see
1534 [rfc2911] §3.2.1.1). The Printer sets this Document Description attribute from the corresponding operation attribute
1535 supplied by the client in the Document Creation operation (see section 3.1).

8.2.4 current-page-order (type2 keyword)

1536

1537 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1538 attribute (see [pwg5100.3] §4.1) applied to the Document object.

8.2.5 date-time-at-completed (dateTime)

1539

1540 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1541 attribute (see [rfc2911] §4.3.14.7) applied to the Document object.

8.2.6 date-time-at-creation (dateTime)

1542

1543 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1544 attribute (see [rfc2911] §4.3.14.5) applied to the Document object.

8.2.7 date-time-at-processing (dateTime)

1545

1546 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1547 attribute (see [rfc2911] §4.3.14.6) applied to the Document object.

8.2.8 document-container-summary (1setOf collection)

1548

1549

1550 This OPTIONAL Document Description attribute summarizes the document format content of the body parts, if the
1551 document's document format is a container type, such as 'multipart/related' or 'application/zip'. If a Printer supports
1552 such a container MIME type, the Printer MUST support this "document-container-summary" Document Description
1553 attribute and all the member attributes in Table 10 that the Printer supports as top level Document Description
1554 attributes. The purpose of the "document-container-summary" attribute is to allow a receiving Printer to determine
1555 whether or not it supports all of the document formats in the supplied instance of the container. However, the
1556 "document-container-summary" attribute does not provide means to associate each collection value with particular
1557 document in the archive file, so it does not provide a "manifest" of the container.

1558 The member attributes defined for this collection are listed in Table 10 and are the same as those defined for the
1559 corresponding Document Description attributes themselves, i.e., a recursive definition. But there MUST NOT be any
1560 duplicate collection values, that is no collection values with all the same member attribute values; its a set, not a
1561 sequence. So 100 PostScript files with the same details in a .zip file would have 'application/zip' as the MIME type
1562 for the top level "document-format" Document Description attribute for the Document object and a "document-
1563 container-summary" Document Description collection attribute with only one collection value containing a "document-
1564 format" member attribute with the 'application/postscript' MIME type value.

1565 If a file in a container file is itself a container file, the single "document-container-summary" (1setOf collection)
1566 Document Description attribute SHOULD contain the flattened distinct collection values for all files at all nested
1567 levels. The "document-container-summary" attribute is not recursively defined to contain "document-format-details".
1568 ISSUE 06: OK that "document-container-summary" is only one level deep?

1569 ISSUE 07: Is the description of "document-container-summary" attribute OK?

1570

1571 <div align="center">**Table 10 - "document-container-summary" member attributes**</div>

Member Attribute Name	Attribute Syntax	Present	Printer Support	Section
document-creator-application-name	name(MAX)	MAY	MAY	8.2.11
document-creator-application-version	text(127)	MAY	MAY	
document-creator-os-name	name(40)	MAY	MAY	8.2.11
document-creator-os-version	text(40)	MAY	MAY	
document-format	mimeMediaType	MUST	MUST	8.2.13
document-format-device-id	text(127)	MAY	MAY	8.2.15
document-format-version	text(127)	SHOULD	MUST	8.2.16
document-natural-language	naturalLanguage	MAY	MAY	8.2.23

1572 ISSUE 08: Are the conformance requirements for the "document-container-summary" attributes OK?

1573 ISSUE: 09: How can a Printer indicate which combinations of document-creator-application-name (name(MAX)),
1574 document-creator-application-version (text(127)), document-creator-os-name (name(40)), document-creator-os-
1575 version (text(40)), document-format-device-id (text(127)), document-format-version (text(127), document-format
1576 (mimeMediaType) and "document-natural-language (naturalLanguage) are supported?

8.2.9 document-creator-application-name (name(MAX))

1577
1578 This OPTIONAL Document Description identifies the application that created the document. The version number
1579 MUST NOT be included (see the "document-creator-application-version" attribute). Examples: "Photoshop",
1580 "Microsoft Word".

8.2.10 document-creator-application-version (text(127))

1581
1582 The OPTIONAL Document Description attribute identifies the version number of the application that created the
1583 document. The version number MUST NOT include the application name. See "document-creator-application-
1584 name" attribute. Examples: 'V3.0.', 'V6.0'

8.2.11 document-creator-os-name (name(40))

This OPTIONAL Document Description attribute identifies the name of the operating system on which the document was generated. Valid values are the operating system names defined in the IANA Operating System name registry [os-names]with the version number portion removed (see the "document-creator-os-version" attribute). IANA Operating System Names are consist of up to 40 *uppercase* US-ASCII letters, hyphen ("-"), period ("."), and slash ("/") characters. The zero length string represents unknown (rather than the UNKNOWN value in the IANA OS Registry, since clients are not expected to localize names).

Example IANA OS Registry values: 'AIX, 'DOS', 'LINUX', 'MACOS', 'MSDOS', 'MVS', 'NETWARE', 'OS/2', 'SUN', 'SUN-OS', 'UNIX', 'VMS', 'WINDOWS'.

8.2.12 document-creator-os-version (text(40))

This OPTIONAL Document Description attribute identifies the version of the operating system on which the document was generated. Valid values include the version portion of any of the operating system names defined in the IANA Registry [os-names]. The value MUST NOT include the name portion of the registered OS name (see "document-creator-os-name" attribute). The zero length string represents unknown (rather than the UNKNOWN value in the IANA OS Registry, since clients are not expected to localize names).
Example values for the indicated "document-creator-os-name" value:
       For 'AIX': '370', 'PS/2'
       For 'LINUX': '1.0', '1.2', '2,0', '2.2', '2.4'
       For 'MVS': 'SP'
       For 'NETWARE': '3', '3.11', '4.0', '4.1', '5.0'
       For 'SUN-OS': '3.5', '4.0'
       For 'UNIX': 'BSD', 'V', 'V.1', 'V.2', 'V.3', 'PC'
       For 'WINDOWS': '95', '98', 'CE', 'NT', 'NT-2', 'NT-3', 'NT-3.5', 'NT-3.51', 'NT-4', 'NT-5', '2000', 'XP' [not registered yet]

8.2.13 document-format (mimeMediaType)

This REQUIRED Document Description attribute specifies the document format (see [rfc2911] §3.2.1.1) for the Document object. The standard values for this attribute are Internet Media types (sometimes called MIME types). For further details see the description of the 'mimeMediaType' attribute syntax in [rfc2911] section 4.1.9. If it is a MIME Media Type, such as 'multipart/related' or 'application/zip', that is a container format that contains document parts, the "document-container-summary" attribute summarizes the content (see section 8.2.8). The Printer sets this Document Description attribute from the corresponding operation attribute supplied by the client in the Document Creation operation (see section 3.1).

8.2.14 document-format-detected (mimeMediaType)

This OPTIONAL Document Description attribute is generated by the Printer to indicate the actual document format of the Document object. This value will differ from the value submitted by the client or defaulted by the Printer, if the Printer automatically senses the document format by examining the document content, such as when the "document-format" attribute has the value: 'application/octet-stream' (see [rfc2911] section 4.1.9.1). Before the document format is known, the Printer populates this attribute with a zero length string.

8.2.15 document-format-device-id (text(127))

This OPTIONAL Document Description attribute identifies the type of device for which the document was formatted, including manufacturer and model. This attribute is intended to identify document formats that are not portable, e.g., PDLs that are device dependent. The value of this variable MUST exactly match the IEEE 1284-2000 Device ID string (see [IEEE1284] clause 6), except the length field MUST not be specified. See the Microsoft Universal Plug

1629   and Play [upnp] section 2.2.6 DeviceId parameter for details and examples. Here is an example showing only the
1630   required fields for a PostScript document:
1631   `MANUFACTURER:ACME Co.;COMMAND SET:PS;MODEL:LaserBeam 9;`

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

1633   This REQUIRED Document Description attribute contains the level or version of the document format. Possible
1634   values are the same as the Printer MIB [rfc1759] prtInterpreterLangLevel (not prtInterpreterLangVersion). For those
1635   document formats that are defined in standards, the "document-format-version" may contain the official designation
1636   of that standard.

1637   ISSUE 10: OK that "document-format-version" is REQUIRED for a Printer to support?

1638   ISSUE: 11: The problem with separating "document-format" and "document-format-version" is how can a Printer
1639   describe what versions are supported, since the versions have to be associated with the document format.

1640   Standard text values are:
1641   '3': For Postscript level 3 [rfc1759].
1642   '5e': For PCL 5e [rfc1759].
1643   '**PDF/X**-1:2001': From the ISO standard that specifies PDF/X. ISSUE 12: Or should the official ISO standard
1644   number, part number and date, be used instead, e.g., "ISO nnnnn.n-2001"?
1645   'ISO 12639-1:1996': From the ISO standard that specified TIFF/IT Profile 1.

8.2.17 document-id-uri (uri)

1647   This REQUIRED Document Description attribute is generated by the Printer as a unique URI to identify a Document
1648   object, in the same way that the "job-uri" (uri) Job Description attribute uniquely identifies a Job object. Unlike the
1649   "job-uri" (uri) (see [rfc2911] section 4.3.1) attribute and "document-job-uri" (uri) (see §8.2.20), the client cannot supply
1650   this attribute as a target of any operation. Example: ipp://www.company.com/printers/myprinter/jobs/22/doc3.

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

1652   This REQUIRED Document Description attribute is a *copy* of the Job's "job-id" Job Description attribute (see
1653   [rfc2911] §4.3.2), i.e., the "job-id" of the Job containing this Document.

8.2.19 document-job-printer-uri (uri)

1655   This REQUIRED Document Description attribute is a *copy* of the Job's "job-printer-uri" Job Description attribute (see
1656   [rfc2911] §4.3.3), i.e., the URI of the Printer containing the Job which contains this Document. Example:
1657   ipp://www.company.com/printers/myprinter.

8.2.20 document-job-uri (uri)

1659   This REQUIRED Document Description attribute is a *copy* of the Job's "job-uri" Job Description attribute (see
1660   [rfc2911] §4.3.1), i.e., the URI of the Job that contains this Document. Example:
1661   ipp://www.company.com/printers/myprinter/jobs/22

8.2.21 document-message (text(MAX))

1663   This OPTIONAL Document Description contains a message from either (1) the user to the operator about the
1664   Document or (2) from the operator, system administrator, or "intelligent" process to indicate to the end user the
1665   reasons for modification or other management action taken on the Document. The Printer populates this Document
1666   Description attribute from the "document-message" (text(MAX) operation attribute value supplied by the client in any
1667   of the Document Creation operations (see section 3.1.1) or in a Cancel-Document operation (see section 3.8).

1668 In addition, the user and the operator can set the value of this Document Description attribute explicitly using the Set-
1669 Document-Attributes operation (see section 3.7).

8.2.22 document-name (name(MAX))

1671 This REQUIRED Document Description attribute specifies the name of the document (see [rfc2911] §3.2.1.1).   The
1672 Printer sets this Document Description attribute from the corresponding operation attribute supplied by the client in
1673 the Document Creation operation (see section 3.1).

1674 This attribute may be modified by a client using the Set-Document-Attributes operation (see section 3.7).

8.2.23 document-natural-language (naturalLanguage)

1676 This OPTIONAL Document Description attribute specified the natural language of the document (see [rfc2911]
1677 §3.2.1.1 and [pwg5100.4] §5.1.7). The Printer sets this Document Description attribute from the corresponding
1678 operation attribute supplied by the client in the Document Creation operation (see section 3.1). The Printer MAY use
1679 this value to select fonts or other Globalization processing.

1680 ISSUE 13: The definition in [rfc2911] §3.2.1.1 and [pwg5100.4] §5.1.7 is single-valued. OK that this document
1681 attribute isn't 1setOf? Or should we extend "document-natural-language" to 1setOf naturalLanguage) and keep the
1682 same name? Or change the name to "document-natural-languages"?

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

1684 This REQUIRED Document Description attribute is the ordinal number of the document within the job which
1685 determines its order of being printed in a multi-document job. The Printer MUST generate the values monotonically
1686 increasing from 1 for each job.

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

1688 The REQUIRED "job-state" and the REQUIRED "document-state" Document Description attributes identify the
1689 current state of the job and document, respectively. Even though IPP defines seven values for job/document states
1690 (plus the out-of-band 'unknown' value - see [rfc2911] section 4.1), implementations only need to support those states
1691 which are appropriate for the particular implementation. In other words, an IPP Printer object implementation
1692 supports only those job/document states implemented by the output device and available to the IPP Printer object
1693 implementation.

1694 Table 11 lists the "job-state" and "document-state" attribute values.

1695 **Table 11 - "job-state" and "document-state" attribute values**

Values	"job-state"	"document-state"
3 pending	y	y
4 pending-held	y	n/a
5 processing	y	y
6 processing-stopped	y	n/a
7 canceled	y	y
8 aborted	y	y
9 completed	y	y

1696

1697 The (JD) and (J) notation below indicates whether the keyword is defined for the "job-state" and "document-state"
1698 attributes or just the "job-state" attribute as indicated in Table 11. Standard enum values are:

Value	Symbolic Name and Description
'3'	**'pending'** (JD): The job is a candidate to start processing, but is not yet processing. The document has not started to be processed at all.
'4'	**'pending-held"** (J): The job is not a candidate for processing for any number of reasons but will return to the 'pending' state as soon as the reasons are no longer present. The job's "job-state-reason" attribute MUST indicate why the job is no longer a candidate for processing. The 'pending-held' state does not apply to the Document object's "document-state" attribute.
'5'	**'processing'** (JD): One or more of:

> 1.   The job is using, or is attempting to use, one or more purely software processes that are analyzing, creating, or interpreting a PDL, etc.,
> 2.   The job is 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.,
> 3.   The Printer object has made the job ready for printing, but the output device is not yet printing it, either because the job hasn't reached the output device or because the job is queued in the output device or some other spooler, awaiting the output device to print it.

> When the job is in the 'processing' state, the entire job/document state includes the detailed status represented in the Printer object's "printer-state", "printer-state-reasons", and "printer-state-message" attributes.

> On the other hand, 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, though they NEED NOT, include additional values in the job's/document's "job-state-reasons"/"document-state-reasons" attribute to indicate the progress of the job/document, such as adding the 'job-printing'/'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 job/document. Most implementations won't bother with this nuance.

Value	Symbolic Name and Description
'6'	**'processing-stopped'** (J): The job has stopped while processing for any number of reasons and will return to the 'processing' state as soon as the reasons are no longer present.

> The job's "job-state-reason" attribute MAY indicate why the job has stopped processing. For example, if the output device is stopped, the 'printer-stopped' value MAY be included in the job's "job-state-reasons" attribute.

> Note: When an output device is stopped, the device usually indicates its condition in human readable form locally at the device. A client can obtain more complete device status remotely by querying the Printer object's "printer-state", "printer-state-reasons" and "printer-state-message" attributes.

> The 'processing-stopped' state does not apply to the Document object's "document-state" attribute.

Value	Symbolic Name and Description
'7'	**'canceled'** (JD): The job/document has been canceled by a Cancel-Job/Cancel-Document operation and the Printer object has completed canceling the job/document and all

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

1699 The final value for this attribute MUST be one of: 'completed', 'canceled', or 'aborted' before the Printer removes the
1700 job/document altogether. The length of time that jobs/document remain in the 'canceled', 'aborted', and 'completed'
1701 states depends on implementation.

1702 Jobs/documents reach one of the three terminal states: 'completed', 'canceled', or 'aborted', after the jobs/documents
1703 have completed all activity, including stacking output media, after the jobs/documents have completed all activity,
1704 and all job/document status attributes have reached their final values for the job/document.

1705 **8.2.25.1 The "job-state" Job Description attribute and the Job Life Cycle**

1706 The "job-state" attribute is one of the most important Job Description attributes. Figure 1 shows the values of the
1707 "job-state" attribute and the Job object life cycle as affected by actions on the Job, Printer, and job processing.

* start = PrintJob, PrintUri, CreateJob
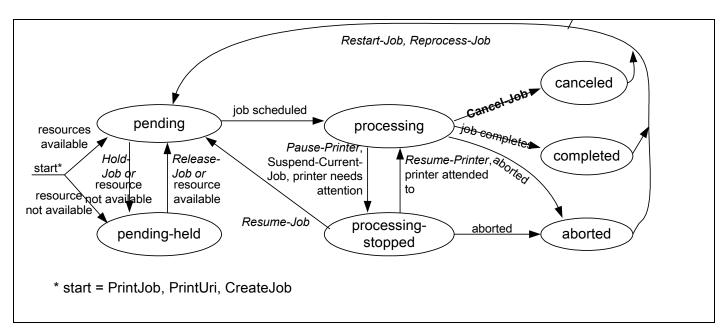
1708

1709   **Figure 1 - The "job-state" Job Description attribute and the Job object life cycle**

1710   Normally a job progresses from left to right. Other state transitions are unlikely, but are not forbidden. Not shown
1711   are the transitions to the 'canceled' state from the 'pending', 'pending-held', and 'processing-stopped' states.

1712   **8.2.25.2 The "document-state" Document Description attribute and the Document object life Cycle**

1713   The "document-state" attribute is one of the most important Document Description attributes. Figure 2 shows the
1714   values of the "document-state" attribute and the Document object life cycle as affected by actions on the Job,
1715   Document, Printer, and job processing. Documents are not active objects and their life cycle is closely tied to the
1716   lifecycle of a Job[44]. Documents basically have three states.   The first is waiting to be processed by a Job (i.e.
1717   pending). The second state is from the time the Job first starts processing the Document (i.e., processing) and until it
1718   reaches one of its terminal states. The third state for a Document is one of its terminal states (i.e., completed,
1719   canceled, or aborted).

1720
1721

---

[44] 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
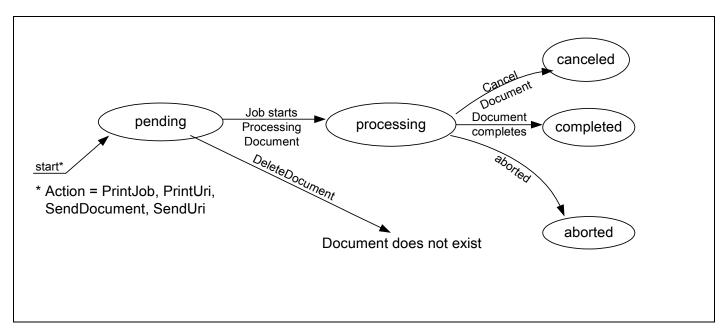whether or not the Document object is supported.

1722

1723   **Figure 2 - The "document-state" Document Description attribute and the Document object life Cycle**

1724 A Document object has a much simpler life cycle than a Job object. A Document always progresses from left to right
1725 in the state diagram. No other state transitions are defined.

1726 **8.2.25.3 Forwarding Servers**

1727 As with all other IPP attributes, if the implementation can not determine the correct value for this attribute, it SHOULD
1728 respond with the out-of-band value 'unknown' (see [rfc2911] Section 4.1) rather than try to guess at some possibly
1729 incorrect value and give the end user the wrong impression about the state of the Job/Document object. For
1730 example, if the implementation is just a gateway into some printing system from which it can normally get status, but
1731 temporarily is unable, then the implementation should return the 'unknown' value. However, if the implementation is
1732 a gateway to a printing system that never provides detailed status about the print job/document, the implementation
1733 MAY set the IPP Job/Document object's state to 'completed', provided that it also sets the 'queued-in-device' value in
1734 the job's/document's "job-state-reasons"/"document-state-reasons" attribute (see "job-state-reasons"/"document-
1735 state-reasons" attribute below).

1736 **8.2.25.4 Partitioning of Job/Document States**

1737 This section partitions the job/document states into phases: Job/Document Not Completed, Job/Document
1738 Retention, Job/Document History, and Job/Document Removal. This section also explains the 'job-restartable' value
1739 of the "job-state-reasons" Job Description attribute for use with the Restart-Job operation.

1740 **Job**/Document **Not Completed**: When a job is in the 'pending', 'pending-held', 'processing', or 'processing-stopped'
1741 states, the job is not completed. When a Document is in the 'pending' or 'processing' state, it is not completed.

1742 **Job Retention**: When a job enters one of the three terminal job states: 'completed', 'canceled', or 'aborted', the IPP
1743 Printer object MAY "retain" the job in a restartable condition for an implementation-defined time period. This time
1744 period MAY be zero seconds and MAY depend on the terminal job state. This phase is called Job Retention. While
1745 in the Job Retention phase, the job's document data is retained and a client may restart the job using the Restart-Job
1746 operation. If the Printer supports the Restart-Job operation, then it SHOULD indicate that the job is restartable by
1747 adding the 'job-restartable' value to the job's "job-state-reasons" attribute (see section 8.2.27) during the Job
1748 Retention phase. If the Printer supports the Document object, then the Get-Document-Attributes and Get-
1749 Documents operations MUST be supported while the job is in the Job Retention phase.

1750 **Job History**: After the Job Retention phase expires for a job, the Printer object deletes the document data for the
1751 job and the job becomes part of the Job History. The Printer object MAY also delete any number of the job and
1752 document attributes. Since the job is no longer restartable, the Printer object MUST remove the 'job-restartable'
1753 value from the job's "job-state-reasons" attribute, if present. If the implementation supports the Document object, it
1754 SHOULD retain at least the "document-state" and "document-state-reasons" attributes on the Document object
1755 during the Job History phase which can be queried using the Get-Document-Attributes and Get-Documents
1756 operations.

1757 **Job Removal**: After the job has remained in the Job History for an implementation-defined time, such as when the
1758 number of jobs exceeds a fixed number or after a fixed time period (which MAY be zero seconds), the IPP Printer
1759 removes the Job and Document objects from the system.

1760 Using the Get-Jobs/Get-Documents operation and supplying the 'not-completed' value for the "which-jobs" operation
1761 attribute, a client is requesting jobs/documents in the Job/Document Not Completed phase. Using the Get-Jobs/Get-
1762 Documents operation and supplying the 'completed' value for the "which-jobs" operation attribute, a client is
1763 requesting jobs/documents in the Job Retention and Job History phases. Using the Get-Job-Attributes/Get-
1764 Document-Attributes operation, a client is requesting a job/documents in any phase except Job Removal. After Job
1765 Removal, the Get-Job-Attributes/Get-Document-Attributes and Get-Jobs/Get-Documents operations no longer are
1766 capable of returning any information about a job/document.

1767 NOTE: The semantics of this attribute or the set of valid values may be different for different document formats.

8.2.26 document-state-message (text(MAX)) and job-state-message (text(MAX))

1769 This OPTIONAL Document Description attribute specifies information about the "job-state"/"document-state" and
1770 "job-state-reasons"/"document-state-reasons" attributes in human readable text. If the Printer object supports this
1771 attribute, the Printer object MUST be able to generate this message in any of the natural languages identified by the
1772 Printer's "generated-natural-language-supported" attribute (see the "attributes-natural-language" operation attribute
1773 specified in [rfc2911] Section 3.1.4.1).

1774 The value SHOULD NOT contain additional information not contained in the values of the "job-state" and "job-states-
1775 reasons" attributes, such as interpreter error information. Otherwise, application programs might attempt to parse the
1776 (localized text). For such additional information such as interpreter errors for application program consumption or
1777 specific document access errors, new attributes with keyword values, needs to be developed and registered.

8.2.27 document-state-reasons (1setOf type2 keyword) and job-state-reasons(1setOf type2 keyword)

1780 The REQUIRED "job-state-reasons" and the REQUIRED "document-state-reasons" Document Description attributes
1781 provide additional information about the job's and each document's current state, i.e., information that augments the
1782 value of the job's "job-state" attribute and each Document's "document-state" attribute, respectively. The Printer
1783 SHOULD support the same values for both the "job-state-reasons" and the "document-state-reasons" attribute for
1784 those attributes that are defined for both as indicated in the "Job" and "Doc" columns in Table 12.

1785 These values MAY be used with any job or document state or states for which the reason makes sense. Some of
1786 these value definitions indicate conformance requirements; the rest are OPTIONAL. Furthermore, when
1787 implemented, the Printer MUST return these values when the reason applies and MUST NOT return them when the
1788 reason no longer applies whether the value of the Job's "job-state" attribute or the Document's "document-state"
1789 attribute changed or not. When the Job or Document does not have any reasons for being in its current state, the
1790 value of the Job's "job-state-reasons" attribute or Document's "document-state-reasons" attribute MUST be 'none'.

1791 Some of the Job's "job-state-reasons" values affect job scheduling, such as 'resources-are-not-ready' and 'job-hold-
1792 until-specified'. However, "document-state-reasons" values MUST NOT affect job scheduling, since Document
1793 objects are passive objects operated on by the containing Job object.

1794 Note: While values cannot be added to the "job-state" or "document-state" attributes without impacting deployed
1795 clients that take actions upon receiving "job-state" or "document-state" values, it is the intent that additional "job-
1796 state-reasons" and "document-state-reasons' values can be defined and registered without impacting such deployed
1797 clients. In other words, the "job-state-reasons" and the "document-state-reasons" attributes are intended to be
1798 extensible.

1799 Table 12 lists the standard keyword values for the "job-state-reasons" and/or "document-state-reasons" attributes
1800 defined in this and other IPP specifications as indicated in the References column. In Table 12 the keywords are
1801 listed in alphabetic order (observing the "[job-]" prefix), while in their descriptions following Table 12, they are listed in
1802 the most likely order of occurrence to help understanding.

1803 When the Document object is supported, the Printer implementation SHOULD still support the corresponding Job
1804 level "job-state-reasons", so that clients that do not support the Document object will receive the same information.
1805 Also it is usually more convenient for the client to obtain just the Job level status. However, the client SHOULD
1806 query both Job and Document attributes and convert them to some canonical form for display to the user, so that all
1807 Jobs and their Documents are displayed in a uniform manner, no matter from which clients they were submitted.

1808 **Notation:**
1809 [job-]   indicates a state reason keyword value that has the 'job-' prefix when it is a value of the "job-state-reasons"
1810   attribute, but does not have the 'job-' prefix when it is a value of the "document-state-reasons" attribute[45].
1811   For purposes of sorting in Table 12, the "[job-]" prefix is observed, since this is an IPP specification.
1812 "-"   indicates that the Job or Document value is *not* defined.

1813   **Table 12 - "job-state-reasons" and "document-state-reasons" attribute values**

IPP Job Description / Document Description attribute name	IPP Attribute Syntax plus Values	Job	Doc	Printer conformance	Reference
job-state-reasons	1setOf type2 keyword	y	-[46]	MUST	[rfc2911] §4.3.8
document-state-reasons	1setOf type2 keyword	-	y	MUST	8.2.27
	aborted-by-system	y	y	MAY	[rfc2911] §4.3.8
	compression-error	y	y	MAY	[rfc2911] §4.3.8
	document-access-error	y	y	MAY	[rfc2911] §4.3.8
	document-format-error	y	y	MAY	[rfc2911] §4.3.8
	[job-]canceled-at-device	y	y	MAY	[rfc2911] §4.3.8
	[job-]canceled-by-operator	y	y	MAY	[rfc2911] §4.3.8
	[job-]canceled-by-user	y	y	MAY	[rfc2911] §4.3.8
	[job-]completed-successfully	y	y	MAY	[rfc2911] §4.3.8
	[job-]completed-with-errors	y	y	MAY	[rfc2911] §4.3.8
	[job-]completed-with-warnings	y	y	MAY	[rfc2911] §4.3.8
	job-data-insufficient	y	-	MAY	[rfc2911] §4.3.8
	job-hold-until-specified	y	-	MAY	[rfc2911] §4.3.8
	[job-]incoming	y	y	MAY	[rfc2911] §4.3.8
	[job-]interpreting	y	y	MAY	[rfc2911] §4.3.8
	[job-]outgoing	y	y	MAY	[rfc2911] §4.3.8
	job-password-wait	y	-	MAY	[ippsave] §8.3.1
	[job-]printing	y	y	MAY	[rfc2911] §4.3.8
	[job-]queued	y	y	MAY	[rfc2911] §4.3.8
	[job-]queued-for-marker	y	y	MAY	[rfc2911] §4.3.8

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[45] 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.
[46] The Document Description attribute that corresponds to the "job-state-reasons" Job Description attribute is the (new) "document-state-reasons" attribute.

IPP Job Description / Document Description attribute name	IPP Attribute Syntax plus Values	Job	Doc	Printer conformance	Reference
	job-restartable	y	-	MAY	[rfc2911] §4.3.8
	job-resuming	y	-	MAY	[ippsave] §8.3.1
	job-saved-successfully	y	-	MAY	[ippsave] §8.3.1
	job-save-error	y	-	MAY	[ippsave] §8.3.1
	job-saving	y	-	MAY	[ippsave] §8.3.1
	job-scheduling	y	-	MAY	[ippsave] §8.3.1
	[job-]spooling	y	y	MAY	[ippsave] §8.3.1
	[job-]streaming	y	y	MAY	[ippsave] §8.3.1
	job-suspended	y	-	MAY	[adm-ops] §9.1
	job-suspended-by-operator	y	-	MAY	[ippsave] §8.3.1
	job-suspended-by-system	y	-	MAY	[ippsave] §8.3.1
	job-suspended-by-user	y	-	MAY	[ippsave] §8.3.1
	job-suspending	y	-	MAY	[ippsave] §8.3.1
	[job-]transforming	y	y	MAY	[rfc2911] §4.3.8
	[job-]warnings-detected	y	y	MAY	[pwg5100.4] §7.1
	none	y	y	MUST	[rfc2911] §4.3.8
	printer-stopped	y	-	MAY	[rfc2911] §4.3.8
	printer-stopped-partly	y	-	MAY	[rfc2911] §4.3.8
	processing-to-stop-point	y	-	MAY	[rfc2911] §4.3.8
	proof-print-wait	y	-	MAY	[ippsave] §8.3.1
	queued-in-device	y	y	MAY	[rfc2911] §4.3.8
	resources-are-not-ready	y	-	MAY	[rfc2911] §4.3.8
	resources-are-not-supported	y	y	MAY	[pwg5100.3] §6.1
	service-off-line	y	-	MAY	[rfc2911] §4.3.8
	submission-interrupted	y	y	MAY	[rfc2911] §4.3.8
	unsupported-compression	y	y	MUST	[rfc2911] §4.3.8
	unsupported-document-format	y	y	MUST	[rfc2911] §4.3.8

1814
1815   For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely
1816   to occur (if implemented), starting with the 'none' value. Note: The order is improved over that in [rfc2911]. The (JD),
1817   (J), and (D) notation is identical to the "Job" and "Doc" columns in Table 12 indicating whether the keyword is defined
1818   for the "job-state-reasons" and/or "document-state-reasons" attributes:

1819   **'none' (JD):** There are no reasons for the job's or document's current state. This state reason is
1820   semantically equivalent to "job-state-reasons" or "document-state-reasons" attribute without any
1821   value and MUST be used when there is no other value, since the 1setOf attribute syntax requires at
1822   least one value.

1823   **'job-hold-until-specified' (J)**: The value of the job's "job-hold-until" attribute was specified with a time
1824   period that is still in the future. The job MUST NOT be a candidate for processing until this reason is
1825   removed and there are no other reasons to hold the job. This value SHOULD be supported if the
1826   "job-hold-until" Job Template attribute is supported.

1827   **'job-password-wait' (J)**: The Job is currently being held until the correct password is entered at the device.
1828   If the "job-password" (octetString(255)) Operation attribute (See [ippsave] section 4.1) is supported,
1829   this value MUST be supported.

1830   **'proof-print-wait' (J)**: The job is currently being held until the operator verifies the output of the proof print
1831   and performs a Release-Job operation. If the "proof-print" (collection) Job Template attribute (See
1832   [ippsave] section 5.9) is supported, this value MUST be supported.

1833   **'resources-are-not-supported' (JD)**: At least one of the resources needed by the job/document, such as
1834   media, fonts, resource objects, etc., is not supported on any of the physical printers for which the
1835   job/document is a candidate. This condition MAY be detected when the job/document is accepted,
1836   or subsequently while the job/document is pending or processing, depending on implementation.
1837   The job/document may (1) remain in its current state, (2) be moved to the 'pending-held' state,
1838   depending on implementation and/or job scheduling policy, or (3) scheduled normally, but the Printer
1839   is put into the 'stopped' state when the job/document is attempted to be processed on the Printer.
1840   This value is intended for use with an implementation that supports the "user-defined-values-
1841   supported" Printer attribute (see [pwg5100.3] section 6.1) which allows a job to be accepted with an
1842   unsupported 'name' value.

1843   **'resources-are-not-ready' (JD)**: At least one of the resources needed by the job/document, such as media,
1844   fonts, resource objects, etc., is not ready on any of the physical printer's for which the job/document
1845   is a candidate. This condition MAY be detected when the job/document is accepted, or
1846   subsequently while the job/document is pending or processing, depending on implementation. The
1847   job/document may remain in its current state or be moved to the 'pending-held' state, depending on
1848   implementation and/or job/document scheduling policy.

1849   **'[job-]incoming' (JD)**: Either (1) the Printer has accepted the Create-Job operation and is expecting
1850   additional Send-Document and/or Send-URI operations or (2) the Printer is retrieving/accepting
1851   document data as a result of a Print-Job, Print-URI, Send-Document or Send-URI operation.

1852   **'[job-]spooling' (JD)**: Same as 'job-incoming' with the specialization that the Printer is spooling the
1853   Job/Document data before processing it. This value corresponds to the 'spool' or 'automatic' value of
1854   the "job-spooling-supported" Printer Description attribute.

1855   **'[job-]streaming' (JD)**: Same as 'job-incoming' with the specialization that the Printer is processing the
1856   Job/Document data as it is being received (that is, the document is not being spooled, but rather is
1857   being processed in chunks by the output device and is being imaged during reception). This value
1858   corresponds to the 'stream' or 'automatic' value of the "job-spooling-supported" Printer Description
1859   attribute.

1860   **'job-data-insufficient' (J)**: The Create-Job operation has been accepted by the Printer, but the Printer is
1861   expecting additional document data before it can move the job into the 'processing' state. If a Printer
1862   starts processing before it has received all data, the Printer removes the 'job-data-insufficient'
1863   reason, but the 'job-incoming' remains. If a Printer starts processing after it has received all data, the
1864   Printer removes the 'job-data-insufficient' reason and the 'job-incoming' at the same time.

1865   **'unsupported-compression' (JD)**: The job/document was aborted by the system because the Printer
1866   determined while attempting to decompress the document-data's that the compression is actually not
1867   among those supported by the Printer. This value MUST be supported, since "compressions is a
1868   REQUIRED operation attribute.

1869   **'compression-error' (JD)**: The job/document was aborted by the system because the Printer encountered
1870   an error in the document-data while decompressing it. If the Printer posts this reason, the document-
1871   data has already passed any tests that would have led to the 'unsupported-compression' job-state-
1872   reason/document-state-reason.

1873   **'document-access-error' (JD)**: After accepting a Print-URI or Send-URI request, the Printer could not
1874   access one or more documents passed by reference. This reason is intended to cover any file
1875   access problem, including file does not exist and access denied because of an access control
1876   problem. The Printer MAY also indicate the document access error using the "job-document-access-
1877   errors" Job Description attribute (see the description of "job-document-access-errors" above).
1878   Whether the Printer aborts the job/document and moves the job/document to the 'aborted' job state
1879   or prints all documents that are accessible and moves the job/document to the 'completed'
1880   job/document state and adds the 'completed-with-errors' value in the job's "job-state-reasons" or
1881   document's "document-state-reasons" attribute depends on implementation and/or site policy. This
1882   value SHOULD be supported if the Print-URI or Send-URI operations are supported.

1883 **'unsupported-document-format' (JD)**: The job/document was aborted by the system because the
1884   document-data's document-format is not among those supported by the Printer. If the client
1885   specifies the document-format as 'application/octet-stream', the printer MAY abort the job/document
1886   and post this reason even though the format is a member of the "document-format-supported" printer
1887   attribute, but not among the auto-sensed document-formats. This value MUST be supported, since
1888   "document-format" is a REQUIRED operation attribute.

1889 **'document-format-error' (JD)**: The job/document was aborted by the system because the Printer
1890   encountered an error in the document-data while processing it. If the Printer posts this reason, the
1891   document-data has already passed any tests that would have led to the 'unsupported-document-
1892   format' job-state-reason/document-state-reason.

1893 **'submission-interrupted' (JD)**: The job or document was not completely submitted for some unforeseen
1894   reason, such as: (1) the Printer has crashed before the job was closed by the client, (2) the Printer or
1895   the document transfer method has crashed in some non-recoverable way before the document data
1896   was entirely transferred to the Printer, (3) the client crashed or failed to close the job before the time-
1897   out period. See the description of the "multiple-operation-time-out" Printer attribute in [rfc2911]
1898   Section 4.4.31.

1899 **'[job-]outgoing' (JD)**: The Printer is transmitting the job/document to the output device.

1900 **'job-scheduling' (J)**: The printer is in the process of scheduling the processing for the Job.

1901 **'[job-]queued' (JD)**: Job is in the 'processing' state, but more specifically, the Printer has queued the
1902   Document data.

1903 **'[job-]transforming' (JD)**: Job/document is in the 'processing' state, but more specifically, the Printer is
1904   interpreting document data and producing another electronic representation.

1905 **'[job-]interpreting' (JD)**: Job/document is in the 'processing' state, but more specifically, the Printer is
1906   interpreting the document data.

1907 **'[job-]queued-for-marker' (JD)**: Job/document is in any of the 'pending-held', 'pending', or 'processing'
1908   states, but more specifically, the Printer has completed enough processing of the document to be
1909   able to start marking and the job/document is waiting for the marker. Systems that require human
1910   intervention to release jobs using the Release-Job operation, put the job into the 'pending-held' job
1911   state. Systems that automatically select a job to use the marker put the job into the 'pending' job
1912   state or keep the job in the 'processing' job state while waiting for the marker, depending on
1913   implementation. All implementations put the job/document into (or back into) the 'processing' state
1914   when marking does begin.

1915 **'[job-]printing' (JD)**: The output device is marking media. This value is useful for Printers which spend a
1916   great deal of time processing (1) when no marking is happening and then want to show that marking
1917   is now happening or (2) when the job/document is in the process of being canceled or aborted while
1918   the job/document remains in the 'processing' state, but the marking has not yet stopped so that
1919   impression or sheet counts are still increasing for the job/document.

1920 **'printer-stopped-partly' (J)**: The value of the Printer's "printer-state-reasons" attribute contains the value
1921   'stopped-partly'.

1922 **'printer-stopped'** (J): The value of the Printer's "printer-state" attribute is 'stopped'.

1923 **'job-suspending' (J)**: The printer is in the process of moving the Job from a processing condition to a
1924   suspended condition where other jobs can be processed.

1925 **'job-suspended' (J)**: The job has been suspended while processing using the Suspend-Current-Job
1926   operation and other jobs can be processed on the Printer. The Job can be resumed using the
1927   Resume-Job operation which removes this value. Note: Documents cannot be suspended and there
1928   is no Suspend-Current-Document operation.

1929 **'job-suspended-by-operator' (J)**: The Job has been indefinitely suspended by the printer operator.

1930   **'job-suspended-by-user' (J)**: The Job has been indefinitely suspended by the user.

1931   **'job-suspended-by-system' (J)**: The Job has been indefinitely suspended by the Printer's system software
1932   during normal processing of the job.

1933   **'job-resuming' (J)**: The printer is in the process of moving the Job from a suspended condition to become a
1934   candidate for processing.

1935   **'[job-]canceled-by-user' (JD)**: The job/document was canceled by the owner of the job using the Cancel-
1936   Job/Cancel-Document request, i.e., by a user whose authenticated identity is the same as the value
1937   of the originating user that created the Job object, or by some other authorized end-user, such as a
1938   member of the job owner's security group. This 'job-canceled' value SHOULD be supported. The
1939   'canceled-by-user' value SHOULD be supported for the "document-state-reasons" attributes for use
1940   with the Cancel-Document.

1941   **'[job-]canceled-by-operator' (JD)**: The job/document was canceled by the operator using the Cancel-
1942   Job/Cancel-Document request, i.e., by a user who has been authenticated as having operator
1943   privileges (whether local or remote). If the security policy is to allow anyone to cancel anyone's
1944   job/document, then these values may be used when the job/document is canceled by other than the
1945   owner of the job. For such a security policy, in effect, everyone is an operator as far as canceling
1946   jobs/documents is concerned. These values SHOULD be supported if the implementation permits
1947   canceling by other than the owner of the job.

1948   **'[job-]canceled-at-device' (JD)**: The job/document was canceled by an unidentified local user, i.e., a user
1949   at a console at the device. This value SHOULD be supported if the implementation supports
1950   canceling jobs/documents at the console.

1951   **'aborted-by-system' (JD)**: The job/document (1) is in the process of being aborted, (2) has been aborted by
1952   the system and placed in the 'aborted' state, or (3) has been aborted by the system and placed in the
1953   'pending-held' state, so that a user or operator can manually try the job/document again. This value
1954   SHOULD be supported.

1955   **'processing-to-stop-point' (J)**: The requester has issued a Cancel-Job/Cancel-Document operation or the
1956   Printer object has aborted the job/document, but is still performing some actions on the job/document
1957   until a specified stop point occurs or job/document termination/cleanup is completed.
1958   If the implementation requires some measurable time to cancel the job/document in the 'processing'
1959   or 'processing-stopped' job/document states, the Printer MUST use this value to indicate that the
1960   Printer object is still performing some actions on the job/document while the job/document remains in
1961   the 'processing' or 'processing-stopped' state. After all the job's/document's job/document
1962   description attributes have stopped incrementing, the Printer object moves the job/document from
1963   the 'processing' state to the 'canceled' or 'aborted' job/document states.

1964   **'service-off-line' (J)**: The Printer is off-line and accepting no jobs. All 'pending' jobs are put into the
1965   'pending-held' state. This situation could be true if the service's or document transform's input is
1966   impaired or broken.

1967   **'[job-]warnings-detected' (JD)**: If the Printer supports these values, the Printer MUST add the value to "job-
1968   state-reasons" / "document-state-reasons" when it generates the first warning message. That is, a
1969   single occurrence of this value is present in the "job-state-reasons" / "document-state-reasons" if the
1970   Printer has generated one or more warnings.

1971   **'[job-]completed-successfully' (JD)**: The job/document completed successfully. There were no warnings
1972   or errors in printing. This value SHOULD be supported.

1973   **'[job-]completed-with-warnings' (JD)**: The print part of the job/document completed with warnings
1974   (whether or not there were save errors). This value SHOULD be supported if the implementation
1975   detects warnings. [rfc2911]

1976   **'[job-]completed-with-errors' (JD)**: The print part of the job/document completed with errors (and possibly
1977   warnings too) (whether or not there were save errors). This value SHOULD be supported if the
1978   implementation detects errors. [rfc2911]

1979   **'job-saving' (J)**: The Printer is transmitting the Job to the save location. This is similar to the 'job-printing'
1980   value.

1981   **'job-saved-successfully' (J)**: The Printer saved the Job successfully.

1982   **'job-save-error' (J)**: The Printer did not save the Job successfully (whether or not it was printed successfully,
1983   printed with warnings, printed with errors, or not printed). The Printer MUST ensure that none of the
1984   saved job is accessible, if it was unable to successfully save all of the job.

1985   **'job-restartable' (J)**: This job is retained (see the description of "job-state" above, specifically "Partitioning of
1986   Job States") and is currently able to be restarted using the Restart-Job operation (see [rfc2911]
1987   Section 3.3.7). If 'job-restartable' is a value of the job's "job-state-reasons" attribute, then the Printer
1988   MUST accept a Restart-Job operation for that job. This value SHOULD be supported if the Restart-
1989   Job operation is supported.

1990   **'queued-in-device' (JD)**: The job/document has been forwarded to a device or print system that is unable to
1991   send back status. The Printer sets the job's/document's "job-state" / "document-state" attribute to
1992   'completed' and adds the 'queued-in-device' value to the job's/document's "job-state-reasons" /
1993   "document-state-reasons" attribute to indicate that the Printer has no additional information about the
1994   job/document and never will have any better information. See the description of the "job-state" /
1995   "document-state" attribute above, specifically the portion on "Forwarding Servers".

1996 NOTE: The semantics of this attribute or the set of valid values may be different for different document formats.

1997 8.2.28 document-uri (uri)

1998 This Document Description attribute is the URI that the client supplied in the corresponding operation attribute in a
1999 Send-URI operation (see [rfc2911] section 3.3.2). The Printer MUST support this attribute if the Printer supports the
2000 Send-URI operation (see section 3.4).

2001 8.2.29 impressions-completed-current-copy (integer(0:MAX))

2002 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
2003 attribute (see [rfc3381] §4.4) applied to the Document object.

2004 8.2.30 <mark>[job-]</mark>detailed-status-message (1setOf text(MAX))

2005 This OPTIONAL "detailed-status-message" Document Description attribute has the same semantics as the
2006 corresponding "job-detailed-status-message" Job Description attribute (see [rfc2911] §4.3.10) applied to the
2007 Document object.

2008 8.2.31 <mark>[job-]</mark>document-access-errors (1setOf text(MAX))

2009 This OPTIONAL "document-access-errors" Document Description attribute has the same semantics as the
2010 corresponding "job-detailed-status-message" Job Description attribute (see [rfc2911] §4.3.11) applied to the
2011 Document object.

2012 8.2.32 <mark>[job-]</mark>impressions (integer(0:MAX))

2013 This OPTIONAL "impressions" Document Description attribute has the same semantics as the corresponding "job-
2014 impressions" Job Description attribute (see [rfc2911] §4.3.17.2) applied to the Document object.   The Printer sets
2015 this Document Description attribute from the corresponding operation attribute supplied by the client in the Document
2016 Creation operation (see section 3.1).

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

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

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

This OPTIONAL "k-octets" Document Description attribute has the same semantics as the corresponding "job-k-octets" Job Description attribute (see [rfc2911] §4.3.17.1) applied to the Document object. The Printer sets this Document Description attribute from the corresponding operation attribute supplied by the client in the Document Creation operation (see section 3.1).

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

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

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

This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-media-sheets" Job Description attribute (see [rfc2911] §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 section 3.1).

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

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

8.2.38 [job-]more-info (uri)

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

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

This REQUIRED "printer-up-time" 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] section 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 Job 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.

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

This OPTIONAL "warnings-count" Document Description attribute has the same semantics as the corresponding "job-warnings-count" Job Description attribute (see [pwg5100.4] §6.1.) applied to the Document object.   See [pwg5100.4] §6.1.

2053 **8.2.41 last-document (boolean)**

2054 This OPTIONAL Document Description attribute indicates whether or not this Document is the last Document in the
2055 Job.   See [rfc2911] §4.3.12. The Printer sets this Document Description attribute from the corresponding operation
2056 attribute supplied by the client in the Document Creation operation (see section 3.1). If the client issues the Close-
2057 Job operation (see section 4.3.1), the Printer sets the value of the "last-document" Document Description attribute of
2058 the last document in the Job to 'true'.

2059 **8.2.42 output-device-assigned (name(127))**

2060 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
2061 attribute (see [rfc2911] §4.3.7.2) applied to the Document object.

2062 **8.2.43 sheet-completed-copy-number (integer(0:MAX))**

2063 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
2064 attribute (see [rfc3381] §4.2) applied to the Document object.

2065 **8.2.44 time-at-completed (integer (MIN:MAX))**

2066 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
2067 attribute (see [rfc2911] §4.3.14.3) applied to the Document object.

2068 **8.2.45 time-at-creation (integer (MIN:MAX))**

2069 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
2070 attribute (see [rfc2911] §4.3.14.1) applied to the Document object.

2071 **8.2.46 time-at-processing (integer (MIN:MAX))**

2072 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
2073 attribute (see [rfc2911] §4.3.14.2) applied to the Document object.

2074 # 9   Printer attributes

2075 This section lists *all* of the Printer attributes defined in other IPP documents. Printer attributes are divided into three
2076 disjoint groups:
2077

Job Template attributes (JT)	These Printer attributes are related directly to the "xxx" Job Template attributes that a client can supply in a Job Creation request as follows: 1. "xxx-supported" indicate the supported values 2. "xxx-default" indicate the values that will be used if the client and the PDL omit the attribute. 3. "xxx-ready" indicate the supported values that are available without human intervention, for those few attributes that require human intervention, such as "media" and possibly "job-finishing". These Printer attributes are also returned in a Get-Printer-Attributes response when the client supplies: "requested-attributes" = 'job-template'.
Document Template attributes (DT)	These Printer attributes are related directly to the "xxx" Document Template attributes that a client can supply in a Document Creation request as follows: 1. "xxx-supported" indicate the supported values 2. "xxx-default" indicate the values that will be used if the client and the PDL

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

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

"**Attribute Syntax**" - indicates the attribute syntax (see [rfc2911] section 4.1). Many "xxx-default" and "xxx-supported" attributes have the 'collection' syntax which consists of a number of member attributes. These member attributes are not listed in this table when they are the same as the corresponding "xxx" attribute in Table 8. Only those few Printer attribute collection attributes that do not have a corresponding Job Template attributes show the member attributes in this table.

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

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

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

ISSUE 14: TBD - Need to add the "xxx-default" and "xxx-supported" to Table 14 that go with the Document Template attributes.

Table 13 - Printer attributes (Job Template and Printer Description)

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
charset-configured	charset	PD	MUST	[rfc2911] §4.4.17
charset-supported	1setOf charset	PD	MUST	[rfc2911] §4.4.18
color-supported	boolean	PD	MAY	[rfc2911] §4.4.26
compression-supported	type3 keyword	PD	MUST	[rfc2911] §4.4.32
copies-default	integer(1:MAX)	JT	MAY	[rfc2911] §4.2.5
copies-supported	rangeOfInteger(1:MAX)	JT	MAY	[rfc2911] §4.2.5
cover-back-default	collection	JT	MAY	[pwg5100.3] §3.1.3
cover-back-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.1.4
cover-front-default	collection	JT	MAY	[pwg5100.3] §3.1.3
cover-front-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.1.4
cover-type-supported	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.1.2.1
document-creation-attributes-supported	1setOf type2 keyword	PD	MAY	[this-spec] §9.1

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
document-format-default	mimeMediaType	PD	MUST	[rfc2911] §4.4.21
document-format-supported	1setOf mimeMediaType	PD	MUST	[rfc2911] §4.4.22
document-format-varying-attributes	1setOf type2 keyword	PD	MAY	[rfc3380] §6.3
document-overrides-supported	1setOf type2 keyword		MAY	[pwg5100.4] §5.1.14
finishings-col-default	collection	JT	MAY	[pwg5100.3] §3.2.3
finishings-col-ready	1setOf collection	JT	MAY	[pwg5100.3] §3.2.4
finishings-col-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.2.5
finishings-default	1setOf type2 enum	JT	MAY	[rfc2911] §4.2.6
finishings-ready	1setOf type2 enum	JT	MAY	[rfc2911] §4.2.6
finishings-supported	1setOf type2 enum	JT	MAY	[rfc2911] §4.2.6
finishing-template-supported	1setOf name(MAX)	-	MAY	[pwg5100.3] §3.2.1.1
force-front-side-default	1setOf integer(1:MAX)	JT	MAY	[pwg5100.3] §3.3
force-front-side-supported	rangeOfInteger(1:MAX)	JT	MAY	[pwg5100.3] §3.3
generated-natural-language-supported	1setOf naturalLanguage	PD	MUST	[rfc2911] §4.4.20
imposition-template-default	type3 keyword | name(MAX)	-	MAY	[pwg5100.3] §3.4
imposition-template-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[pwg5100.3] §3.4
insert-after-page-number-supported	rangeOfInteger(0:MAX)	-	MAY	[pwg5100.3] §3.5.1.1
insert-count-supported	rangeOfInteger(0:MAX)	-	MAY	[pwg5100.3] §3.5.2.1
insert-sheet-default	1setOf collection	JT	MAY	[pwg5100.3] §3.5.4
insert-sheet-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.5.5
ippget-event-life	integer(15:MAX)	PD	MAY	[get-method] §8.1
ipp-versions-supported	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.20
job-account-id-default	name(MAX)	JT	MAY	[pwg5100.3] §3.6
job-account-id-supported	boolean	JT	MAY	[pwg5100.3] §3.6
job-accounting-output-bin-default	type3 keyword | name(MAX)	-	MAY	[pwg5100.3] §3.8.3.1
job-accounting-output-bin-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[pwg5100.3] §3.8.3.2
job-accounting-sheets-default	collection	JT	MAY	[pwg5100.3] §3.8.4
job-accounting-sheets-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.8.5
job-accounting-sheets-type-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[pwg5100.3] §3.8.1.1
job-accounting-user-id-default	name(MAX)	JT	MAY	[pwg5100.3] §3.7
job-accounting-user-id-supported	boolean	JT	MAY	[pwg5100.3] §3.7
job-creation-attributes-supported	1setOf type2 keyword	PD	MAY	[ippsave] §7.1
job-error-sheet-default	collection	JT	MAY	[pwg5100.3] §3.7
job-error-sheet-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.9.5
job-error-sheet-type-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[pwg5100.3] §3.9.1.1
job-error-sheet-when-supported	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.9.2.1
job-hold-until-default	type3 keyword | name(MAX)	JT	MAY	[rfc2911] §4.2.2
job-hold-until-supported	1setOf (type3 keyword | name(MAX))	JT	MAY	[rfc2911] §4.2.2
job-impressions-supported	rangeOfInteger(0:MAX)	PD	MAY	[rfc2911] §4.4.34
job-k-octets-supported	rangeOfInteger(0:MAX)	PD	MAY	[rfc2911] §4.4.33
job-media-sheets-supported	rangeOfInteger(0:MAX)	PD	MAY	[rfc2911] §4.4.35
job-message-to-operator-default	text(MAX)	JT	MAY	[pwg5100.3] §3.12
job-message-to-operator-supported	boolean	JT	MAY	[pwg5100.3] §3.12
job-password-supported	integer(0:127)	PD	MAY	[ippsave] §7.2

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
job-password-encryption-supported	1setOf (type3 keyword | name(MAX))	PD	MAY	[ippsave] §7.3
job-priority-default	integer(1:100)	JT	MAY	[rfc2911] §4.2.1
job-priority-supported	1setOf integer(1:100)	JT	MAY	[rfc2911] §4.2.1
job-settable-attributes-supported	1setOf type2 keyword	PD	MAY	[rfc3380] §6.2
job-sheet-message-default	text(MAX)		MAY	[pwg5100.3] §3.12
job-sheet-message-supported	boolean		MAY	[pwg5100.3] §3.12
job-sheets-col-default	collection	JT	MAY	[pwg5100.3] §3.11.3
job-sheets-col-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.11.4
job-sheets-default	type3 keyword | name(MAX)	JT	MAY	[rfc2911] §4.2.3
job-sheets-supported	1setOf (type3 keyword | name(MAX))	JT	MAY	[rfc2911] §4.2.3
job-spooling-supported	type2 keyword	PD	MAY	[ippsave] §7.4
max-save-info-supported	integer(1:MAX)	PD	MAY	[ippsave] §7.5
max-stitching-locations-supported	integer(1:MAX)	PD	MAY	[pwg5100.3] §5.2
media-back-coating-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[pwg5100.3] §3.13.10.2
media-col-database	1setOf collection	- [47]	MAY	[ippsave] §7.6
any "media-col" member attribute				
media-col-default	collection	JT	MAY	[pwg5100.3] §3.13.12
any "media-col" member attribute				
media-color-supported	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.13.4.1
media-col-ready	1setOf collection	JT	MAY	[pwg5100.3] §3.13.13
any "media-col" member attribute				
media-col-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.13.14
media-default	type3 keyword | name(MAX)	JT	MAY	[rfc2911] §4.2.11
media-front-coating-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[pwg5100.3] §3.13.10.1
media-hole-count-supported	1setOf rangeOfInteger(0:MAX)	-	MAY	[pwg5100.3] §3.13.6.1
media-info-supported	boolean	-	MAY	[pwg5100.3] §3.13.3.1
media-input-tray-check-default	type3 keyword | name(MAX)	JT	MAY	[pwg5100.3] §3.14
media-input-tray-check-supported	1setOf (type3 keyword | name(MAX))	JT	MAY	[pwg5100.3] §3.14
media-key-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[pwg5100.3] §3.13.1.1
media-order-count-supported	1setOf rangeOfInteger(1:MAX)	-	MAY	[pwg5100.3] §3.13.7.1
media-pre-printed-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[pwg5100.3] §3.13.5.1
media-ready	1setOf (type3 keyword | name(MAX))	JT	MAY	[rfc2911] §4.2.11
media-recycled-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[pwg5100.3] §3.13.11.1
media-size-supported	1setOf collection	-	MAY	[pwg5100.3] §3.13.8.3
media-supported	1setOf (type3 keyword | name(MAX))	JT	MAY	[rfc2911] §4.2.11
media-type-supported	1setOf (type3 keyword |	-	MAY	[pwg5100.3] §3.13.2.1

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

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
	name(MAX))			
media-weight-metric-supported	1setOf rangeOfInteger(1:MAX)	-	MAY	[pwg5100.3] §3.13.9.1
multiple-document-handling-default	type2 keyword	JT	MAY	[rfc2911] §4.2.4
multiple-document-handling-supported	1setOf type2 keyword	JT	MAY	[rfc2911] §4.2.4
multiple-document-jobs-supported	boolean	PD	MAY	[rfc2911] §4.4.16
multiple-operation-time-out	integer(1:MAX)	PD	MAY	[rfc2911] §4.4.31
natural-language-configured	naturalLanguage	PD	MUST	[rfc2911] §4.4.19
notify-attributes-supported	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.4
notify-events-default	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.3
notify-events-supported	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.3
notify-lease-duration-default	integer(0:67108863)	PD	MAY	[ntfy] §5.3.8
notify-lease-duration-supported	1setOf (integer(0: 67108863) | rangeOfInteger(0:67108863))	PD	MAY	[ntfy] §5.3.8
notify-lease-expiration-time	integer(0:MAX)	PD	MAY	[ntfy] §5.4.3
notify-max-events-supported	integer(2:MAX)	PD	MAY	[ntfy] §5.3.3
notify-pull-method-supported	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.2
notify-schemes-supported	1setOf uriScheme	PD	MAY	[ntfy] §5.3.1
number-up-default	integer(1:MAX)	JT	MAY	[rfc2911] §4.2.9
number-up-supported	1setOf (integer(1:MAX) | rangeOfInteger(1:MAX))	JT	MAY	[rfc2911] §4.2.9
operations-supported	1setOf type2 enum	PD	MUST	[rfc2911] §4.4.15
orientation-requested-default	type2 enum	JT	MAY	[rfc2911] §4.2.10
orientation-requested-supported	1setOf type2 enum	JT	MAY	[rfc2911] §4.2.10
output-bin-default	type2 keyword | name(MAX)	JT	MAY	[pwg5100.2] §2.1
output-bin-supported	1setOf (type2 keyword | name(MAX))	JT	MAY	[pwg5100.2] §2.1
page-delivery-default	type2 keyword	JT	MAY	[pwg5100.3] §3.15
page-delivery-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.15
page-order-received-default	type2 keyword	JT	MAY	[pwg5100.3] §3.16
page-order-received-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.16
page-overrides-supported	1setOf type2 keyword	PD	MAY	[pwg5100.4] §5.2.9
page-ranges-supported	boolean	JT	MAY	[rfc2911] §4.2.7
pages-per-minute	integer(0:MAX)	PD	MAY	[rfc2911] §4.4.36
pages-per-minute-color	integer(0:MAX)	PD	MAY	[rfc2911] §4.4.37
pages-per-subset-supported	boolean	PD	MAY	[pwg5100.4] §5.3.2
parent-printers-supported	1setOf uri	PD	MAY	[adm-ops] §7.2
pdl-override-supported	type2 keyword	PD	MUST	[rfc2911] §4.4.28 [ippsave] §8.1
presentation-direction-number-up-default	type2 keyword	JT	MAY	[pwg5100.3] §3.17
presentation-direction-number-up-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.17
printer-current-time	dateTime	PD	MAY	[rfc2911] §4.4.30
printer-detailed-status-messages	1setOf text(MAX)	PD	MAY	[ippsave] §7.7
printer-driver-installer	uri	PD	MAY	[rfc2911] §4.4.8
printer-info	text(127)	PD	MAY	[rfc2911] §4.4.6
printer-is-accepting-jobs	boolean	PD	MUST	[rfc2911] §4.4.23
printer-location	text(127)	PD	MAY	[rfc2911] §4.4.5
printer-make-and-model	text(127)	PD	MAY	[rfc2911] §4.4.9

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
printer-message-date-time	dateTime	PD	MAY	[rfc3380] §6.5
printer-message-from-operator	text(127)	PD	MAY	[rfc2911] §4.4.25
printer-message-time	integer(MIN:MAX)	PD	MAY	[rfc3380] §6.4
printer-more-info	uri	PD	MAY	[rfc2911] §4.4.7
printer-more-info-manufacturer	uri	PD	MAY	[rfc2911] §4.4.10
printer-name	name(127)	PD	MUST	[rfc2911] §4.4.4
printer-notify-server-uri	uri	PD	MAY	[not-srv] §4.1
printer-resolution-default	resolution	JT	MAY	[rfc2911] §4.2.12
printer-resolution-supported	1setOf resolution	JT	MAY	[rfc2911] §4.2.12
printer-settable-attributes-supported	1setOf type2 keyword	PD	MAY	[rfc3380] §6.1
printer-state	type1 enum	PD	MUST	[rfc2911] §4.4.11
printer-state-change-date-time	dateTime	PD	MAY	[ntfy] §6.2
printer-state-change-time	integer(1:MAX)	PD	MAY	[ntfy] §6.1
printer-state-message	text(MAX)	PD	MAY	[rfc2911] §4.4.13
printer-state-reasons	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.12
printer-up-time	integer(1:MAX))	PD	MUST	[rfc2911] §4.4.29
printer-uri-supported	1setOf uri	PD	MUST	[rfc2911] §4.4.1
printer-xri-supported	1setOf collection	PD	MAY	[rfc3380] §6.6
xri-uri	uri	PD	MUST	[rfc3380] §6.6
xri-authentication	1setOf type2 keyword	PD	MUST	[rfc3380] §6.6
xri-security	1setOf type2 keyword	PD	MUST	[rfc3380] §6.6
print-quality-default	type2 enum	JT	MAY	[rfc2911] §4.2.13
print-quality-supported	1setOf type2 enum	JT	MAY	[rfc2911] §4.2.13
queued-job-count	integer(0:MAX)	PD	MUST	[rfc2911] §4.4.24
reference-uri-schemes-supported	1setOf uriScheme	PD	MAY	[rfc2911] §4.4.27
separator-sheets-default	collection	JT	MAY	[pwg5100.3] §3.18.3
separator-sheets-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.18.4
separator-sheets-type-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[pwg5100.3] §3.18.1.1
sheet-collate-default	type2 keyword	JT	MAY	[rfc3381] §3.1
sheet-collate-supported	1setOf type2 keyword	JT	MAY	[rfc3381] §3.1
sides-default	type2 keyword	JT	MAY	[rfc2911] §4.2.8
sides-supported	1setOf type2 keyword	JT	MAY	[rfc2911] §4.2.8
stitching-locations-supported	1setOf (integer(0:MAX) | rangeOfInteger(0:MAX))	-	MAY	[pwg5100.3] §3.2.2.3.1
stitching-offset-supported	1setOf (integer (0:MAX) | rangeOfInteger(0:MAX))	-	MAY	[pwg5100.3] §3.2.2.2.1
stitching-reference-edge-supported	1setOf type2 keyword		MAY	[pwg5100.3] §3.2.2.1.1
subordinate-printers-supported	1setOf uri	PD	MAY	[adm-ops] §7.1
uri-authentication-supported	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.2
uri-security-supported	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.3
user-defined-values-supported	1setOf type2 keyword	PD	MAY	[pwg5100.3] §5.1
which-jobs-supported	1setOf type2 keyword	PD	MAY	[ippsave] §7.8
x-image-position-default	type2 keyword	JT	MAY	[pwg5100.3] §3.19.2
x-image-position-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.19.2
x-image-shift-default	integer(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.3

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
x-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.3
xri-authentication-supported	1setOf type2 keyword	PD	MAY	[rfc3380] §6.8
xri-security-supported	1setOf type2 keyword	PD	MAY	[rfc3380] §6.9
xri-uri-scheme-supported	1setOf uriScheme	PD	MAY	[rfc3380] §6.7
x-side1-image-shift-default	integer(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.4
x-side1-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.4
x-side2-image-shift-default	integer(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.5
x-side2-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.5
y-image-position-default	type2 keyword	JT	MAY	[pwg5100.3] §3.19.6
y-image-position-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.19.6
y-image-shift-default	integer(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.7
y-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.7
y-side1-image-shift-default	integer(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.8
y-side1-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.8
y-side2-image-shift-default	integer(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.9
y-side2-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.9

2100

2101 9.1 document-creation-attributes-supported (1setOf type2 keyword)

2102 This Printer Description attribute lists the keyword names of the Document Template and Operation attributes that
2103 the Printer will accept in the Create-Document, Send-Document, and Send-URI Document Creation operations.

2104 9.2 printer-state-reasons (1setOf type2 keyword)

IPP Printer Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
printer-state-reasons	1setOf type2 keyword	MUST	[rfc2911] §4.4.12
	other	MAY	[rfc2911] §4.4.12
	none	MUST	[rfc2911] §4.4.12
	connecting-to-device	MAY	[rfc2911] §4.4.12
	cover-open	MAY	[rfc2911] §4.4.12
	deactivated	MAY	[adm-ops] §8.2
	developer-empty	MAY	[rfc2911] §4.4.12
	developer-low	MAY	[rfc2911] §4.4.12
	door-open	MAY	[rfc2911] §4.4.12
	fuser-over-temp	MAY	[rfc2911] §4.4.12
	fuser-under-temp	MAY	[rfc2911] §4.4.12
	hold-new-jobs	MAY	[adm-ops] §8.1
	input-tray-missing	MAY	[rfc2911] §4.4.12
	interlock-open	MAY	[rfc2911] §4.4.12
	interpreter-resource-unavailable	MAY	[rfc2911] §4.4.12
	marker-supply-empty	MAY	[rfc2911] §4.4.12
	marker-supply-low	MAY	[rfc2911] §4.4.12
	marker-waste-almost-full	MAY	[rfc2911] §4.4.12
	marker-waste-full	MAY	[rfc2911] §4.4.12
	media-empty	MAY	[rfc2911] §4.4.12

IPP Printer Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
	media-jam	MAY	[rfc2911] §4.4.12
	media-low	MAY	[rfc2911] §4.4.12
	media-needed	MAY	[rfc2911] §4.4.12
	moving-to-paused	CMUST [48]	[rfc2911] §4.4.12
	opc-life-over	MAY	[rfc2911] §4.4.12
	opc-near-eol	MAY	[rfc2911] §4.4.12
	output-area-almost-full	MAY	[rfc2911] §4.4.12
	output-area-full	MAY	[rfc2911] §4.4.12
	output-tray-missing	MAY	[rfc2911] §4.4.12
	paused	CMUST [49]	[rfc2911] §4.4.12
	shutdown	MAY	[rfc2911] §4.4.12
	spool-area-full	SHOULD	[rfc2911] §4.4.12
	stopped-partly	MAY	[rfc2911] §4.4.12
	stopping	MAY	[rfc2911] §4.4.12
	timed-out	MAY	[rfc2911] §4.4.12
	toner-empty	MAY	[rfc2911] §4.4.12
	toner-low	MAY	[rfc2911] §4.4.12

2105

2106 This description is taken from [rfc2911] with additions from other IPP extension documents:

2107 This REQUIRED Printer attribute supplies additional detail about the device's state. Some of the these value
2108 definitions indicate conformance requirements; the rest are OPTIONAL.

2109 Each keyword value MAY have a suffix to indicate its level of severity. The three levels are: report (least severe),
2110 warning, and error (most severe).

2111 **'-report'**: This suffix indicates that the reason is a "report". An implementation may choose to omit some or
2112 all reports. Some reports specify finer granularity about the printer state; others serve as a precursor
2113 to a warning. A report MUST contain nothing that could affect the printed output.

2114 **'-warning'**: This suffix indicates that the reason is a "warning". An implementation may choose to omit some
2115 or all warnings. Warnings serve as a precursor to an error. A warning MUST contain nothing that
2116 prevents a job from completing, though in some cases the output may be of lower quality.

2117 **'-error'**: This suffix indicates that the reason is an "error". An implementation MUST include all errors. If this
2118 attribute contains one or more errors, printer MUST be in the stopped state.

2119 If the implementation does not add any one of the three suffixes, all parties MUST assume that the reason is an
2120 "error".

2121 If a Printer object controls more than one output device, each value of this attribute MAY apply to one or more of the
2122 output devices. An error on one output device that does not stop the Printer object as a whole MAY appear as a
2123 warning in the Printer's "printer-state-reasons attribute". If the "printer-state" for such a Printer has a value of
2124 'stopped', then there MUST be an error reason among the values in the "printer-state-reasons" attribute.

2125 The following standard keyword values are defined (in alphabetical order):

---

[48] The 'moving-to-paused' value MUST be supported if the Pause-Printer operation is supported and it takes
significant time to move to paused.
[49] The 'paused' value MUST be supported if the Pause-Printer operation is supported.

2126   **'other'**: The device has detected an error other than one listed in this document.

2127   **'none'**: There are not reasons. This state reason is semantically equivalent to "printer-state-reasons" without
2128   any value and MUST be used, since the 1setOf attribute syntax requires at least one value.

2129   **'connecting-to-device'**: The Printer object has scheduled a job on the output device and is in the process of
2130   connecting to a shared network output device (and might not be able to actually start printing the job
2131   for an arbitrarily long time depending on the usage of the output device by other servers on the
2132   network).

2133   **'cover-open'**: One or more covers on the device are open.

2134   **'deactivated'**: A client has issued a Deactivate-Printer operation for the Printer object (see [adm-ops]
2135   section 3.4.1) and the Printer is in the process of becoming deactivated or has become deactivated.
2136   The Printer MUST reject all requests except Activate-Printer, queries (Get-Printer-Attributes, Get-
2137   Job-Attributes, Get-Jobs, etc.), Send-Document, and Send-URI (so that partial job submission can
2138   be completed - see [adm-ops] section 3.1.1) and return the 'server-error-service-unavailable' status
2139   code.

2140   **'developer-empty'**: The device is out of developer.

2141   **'developer-low'**: The device is low on developer.

2142   **'door-open'**: One or more doors on the device are open.

2143   **'fuser-over-temp'**: The fuser temperature is above normal.

2144   **'fuser-under-temp'**: The fuser temperature is below normal.

2145   **'hold-new-jobs'**: The operator has issued the Hold-New-Jobs operation (see [adm-ops] section 3.3.1) or
2146   other means, but the output-device(s) are taking an appreciable time to stop. Later, when all output
2147   has stopped, the "printer-state" becomes 'stopped', and the 'paused' value replaces the 'moving-to-
2148   paused' value in the "printer-state-reasons" attribute. This value MUST be supported, if the Hold-
2149   New-Jobs operation is supported and the implementation takes significant time to pause a device in
2150   certain circumstances.

2151   **'input-tray-missing'**: One or more input trays are not in the device.

2152   **'interlock-open'**: One or more interlock devices on the printer are unlocked.

2153   **'interpreter-resource-unavailable'**: An interpreter resource is unavailable (i.e. font, form)

2154   **'marker-supply-empty'**: The device is out of at least one marker supply. (e.g. toner, ink, ribbon)

2155   **'marker-supply-low'**: The device is low on at least one marker supply. (e.g. toner, ink, ribbon)

2156   **'marker-waste-almost-full'**: The device marker supply waste receptacle is almost full.

2157   **'marker-waste-full'**: The device marker supply waste receptacle is full.

2158   **'media-empty'**: At least one input tray is empty.

2159   **'media-jam'**: The device has a media jam.

2160   **'media-low'**: At least one input tray is low on media.

2161   **'media-needed'**: A tray has run out of media.

2162   **'moving-to-paused'**: Someone has paused the Printer object using the Pause-Printer operation (see
2163   [rfc2911] section 3.2.7) or other means, but the device(s) are taking an appreciable time to stop.
2164   Later, when all output has stopped, the "printer-state" becomes 'stopped', and the 'paused' value
2165   replaces the 'moving-to-paused' value in the "printer-state-reasons" attribute. This value MUST be
2166   supported, if the Pause-Printer operation is supported and the implementation takes significant time
2167   to pause a device in certain circumstances.

2168   **'opc-life-over'**: The optical photo conductor is no longer functioning.

2169   **'opc-near-eol'**: The optical photo conductor is near end of life.

2170   **'output-area-almost-full'**: One or more output area is almost full (e.g. tray, stacker, collator).

2171   **'output-area-full'**: One or more output area is full. (e.g. tray, stacker, collator)

2172   **'output-tray-missing'**: One or more output trays are not in the device

2173   **'paused'**: Someone has paused the Printer object using the Pause-Printer operation (see [rfc2911] section
2174   3.2.7) or other means and the Printer object's "printer-state" is 'stopped'. In this state, a Printer
2175   MUST NOT produce printed output, but it MUST perform other operations requested by a client. If a
2176   Printer had been printing a job when the Printer was paused, the Printer MUST resume printing that
2177   job when the Printer is no longer paused and leave no evidence in the printed output of such a
2178   pause. This value MUST be supported, if the Pause-Printer operation is supported.

2179   **'shutdown'**: Someone has removed a Printer object from service, and the device may be powered down or
2180   physically removed. In this state, a Printer object MUST NOT produce printed output, and unless the
2181   Printer object is realized by a print server that is still active, the Printer object MUST perform no other
2182   operations requested by a client, including returning this value. If a Printer object had been printing a
2183   job when it was shutdown, the Printer NEED NOT resume printing that job when the Printer is no
2184   longer shutdown. If the Printer resumes printing such a job, it may leave evidence in the printed
2185   output of such a shutdown, e.g. the part printed before the shutdown may be printed a second time
2186   after the shutdown.

2187   **'spool-area-full'**: The limit of persistent storage allocated for spooling has been reached. The Printer is
2188   temporarily unable to accept more jobs. The Printer will remove this value when it is able to accept
2189   more jobs. This value SHOULD be used by a non-spooling Printer that only accepts one or a small
2190   number jobs at a time or a spooling Printer that has filled the spool space.

2191   **'stopped-partly'**: When a Printer object controls more than one output device, this reason indicates that one
2192   or more output devices are stopped. If the reason is a report, fewer than half of the output devices
2193   are stopped. If the reason is a warning, fewer than all of the output devices are stopped.

2194   **'stopping'**: The Printer object is in the process of stopping the device and will be stopped in a while. When
2195   the device is stopped, the Printer object will change the Printer object's state to 'stopped'. The
2196   'stopping-warning' reason is never an error, even for a Printer with a single output device. When an
2197   output-device ceases accepting jobs, the Printer will have this reason while the output device
2198   completes printing.

2199   **'timed-out'**: The server was able to connect to the output device (or is always connected), but was unable to
2200   get a response from the output device.

2201   **'toner-empty'**: The device is out of toner.

2202   **'toner-low'**: The device is low on toner.

10 New Values for Existing Printer Description Attributes

2204   This section contains those attributes for which additional values are added.

10.1 operations-supported (1setOf type2 enum)

2206   The following "operation-id" values are added in order to support the new operations defined in this document:

2207   **Table 14 – Operation-id assignments**

Value	Operation Name	Reference
0x000F	Close-Job	[this-spec] §4.3
0x0033	Cancel-Document	[this-spec] §3.8
0x0034	Get-Document-Attributes	[this-spec] §3.5
0x0035	Get-Documents	[this-spec] §3.6
0x0036	Delete-Document	[this-spec] §3.9
0x0037	Set-Document-Attributes	[this-spec] §3.7
0x0039	Create-Document	[this-spec] §3.1
0x003A	Send-Document-Data	[this-spec] §3.2

2208

2209   11 Encodings of Additional Attribute Tags

2210   This section assigns values to an attributes tags as an extension to the encoding defined in [rfc2910]).

2211   The "document-attributes-tag" delimits Document Template Attributes Groups in requests and Document Attributes
2212   Groups in responses.

2213   The following table specifies the values for the delimiter tag:

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

2214

2215   12 Conformance Requirements

2216   This section specifies the conformance requirements for Printers and clients.

2217   12.1 Printer conformance requirements

2218   In order to conform to this specification, a Printer:

2219   1. MUST meet the conformance requirements for Printers specified in [rfc2911].

2220   2. MUST support the Create-Job operation as specified in [rfc2911], even though a Printer NEED NOT support
2221   the Create-Job operation in order to conform to [rfc2911].

2222   3. MUST support the Document operations that section 3 REQUIRES a Printer to support.

2223   4. MUST support the Close-Job Job operation as defined in section 4.3.

2224   5. MUST support the operation attributes in the Send-Document operation and, if supported, the Send-URI
2225   operation that section 6 REQUIRES a Printer to support.

2226   6. MAY support any of the Document Template attributes in Document Creation operations as indicated in
2227   section 7 and MUST NOT support them for contexts for where they are not defined as indicated in the Table
2228   9 with an "n".

2229   7. MUST support the Document Description attributes that section 8 REQUIRES a Printer to support.

2230   8. MUST support the Printer attributes that section 8.2.1 REQUIRES a Printer to support.

2231   9. MUST support the values of Printer Descriptions attribute that section 10 REQUIRES a Printer to support.

2232 12.2 Client conformance requirements

2233 In order to conform to this specification, a client:

2234   1. MUST meet the conformance requirements for clients specified in [rfc2911]

2235   2. MAY support any of the Document operations defined in section 3.

2236   3. MUST supply the operation attributes that section 6 REQUIRES a client to supply in operation requests.

2237   4. MUST supply any Document Template attributes in the format that section 7 REQUIRES a client to supply in
2238   Document Creation operations and MUST NOT support them for contexts for where they are not defined as
2239   indicated in the Table 9 with an "n".

2240   5. SHOULD support any of the Document Description attributes that section 8 REQUIRES a Printer to support.

2241   6. MAY support any of the Printer attributes listed in section 8.2.1.

2242   7. MAY support any of the values of the Printer Descriptions attributes in section 10.

2243 13 Normative References

2244 Note: The references in the body of this IEEE-ISTO document use the more reader-friendly mnemonic symbols
2245 below, rather than the RFC number (except for [rfc2910] and [rfc2911]). IETF RFCs and IANA registrations require
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2314   1999.

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2320   Guide", RFC 3196, November 2001.

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2323   Device Administrative Operations", RFC 3239, February 2002.

2324   # 15 IANA Considerations

2325   This section contains the registration information for IANA to add to the various IPP Registries according to the
2326   procedures defined in RFC 2911 [rfc2911] section 6 to cover the definitions in this document. The resulting
2327   registrations will be published in the http://www.iana.org/assignments/ipp-registrations registry.

2328   *Note to the RFC Editor: Replace the References below to [this spec] with the RFC number for the appropriate*
2329   *document, so that it accurately reflects the content of the information for the IANA Registry.*

15.1 Attribute Registrations

The following table lists all the attributes defined in this specification. These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.2. If the attribute has a separate sub-section definition in this specification, that sub-section is listed as the Reference. This specification lists most Job Template attributes as also being Document Template attributes. However, the definitions of these Document Template attributes are not duplicated in this specification. Instead, the Reference column in this sub-section indicates Section 7 which contains a table of all Job Template and corresponding Document Template attributes (including dropping the "job-" prefix). This table contains the reference in another specification that completely defines each attribute.   These Document Template attributes will also be added to the IANA IPP Registry under the Document Template attributes with a reference to this specification and Section 7.

```
Attribute Name (attribute syntax)                Reference     Section
--------------------------------                 ----------    --------
Document Description attributes:
attributes-charset (charset)                     [this spec]   8.2.1
attributes-natural-language (naturalLanguage)    [this spec]   8.2.2
compression (type3 keyword)                      [this spec]   8.2.3
current-page-order (type2 keyword)               [this spec]   8.2.4
date-time-at-completed (dateTime)                [this spec]   8.2.5
date-time-at-creation (dateTime)                 [this spec]   8.2.6
date-time-at-processing (dateTime)               [this spec]   8.2.7
detailed-status-message (1setOf text (MAX))      [this spec]   8.2.30
document-access-errors (1setOf text(MAX))        [this spec]   8.2.31
document-container-summary (collection)          [this spec]   8.2.8
  document-creator-application-name (name(MAX))  [this spec]   8.2.9
  document-creator-application-version (text(127))
                                                 [this spec]   8.2.10
  document-creator-os-name (name(40))            [this spec]   8.2.11
  document-creator-os-version (text(40))         [this spec]   8.2.12
  document-format (mimeMediaType                 [this spec]   8.2.13
  document-format-device-id (text(127))          [this spec]   8.2.15
  document-format-version (text(127)             [this spec]   8.2.16
  document-natural-language (naturalLanguage)    [this spec]   8.2.23
document-creator-application-name (name(MAX))    [this spec]   8.2.9
document-creator-application-version (text(127)) [this spec]   8.2.10
document-creator-os-name (name(40))              [this spec]   8.2.11
document-creator-os-version (text(40))           [this spec]   8.2.12
document-format (mimeMediaType)                  [this spec]   8.2.13
document-format-detected (mimeMediaType)         [this spec]   8.2.14
document-format-device-id (text(127))            [this spec]   8.2.15
document-format-version (text(127)               [this spec]   8.2.16
document-id-uri (uri)                            [this spec]   8.2.17
document-job-id (integer(1:MAX))                 [this spec]   8.2.18
document-job-printer-uri (uri)                   [this spec]   8.2.19
document-job-uri (uri)                           [this spec]   8.2.20
document-message (text(MAX))                     [this spec]   8.2.21
document-name (name(MAX))                        [this spec]   8.2.22
```

```
2377  document-natural-language (naturalLanguage)         [this spec]  8.2.23
2378  document-number (integer(0:MAX))                    [this spec]  8.2.24
2379  document-state (type1 enum)                         [this spec]  8.2.25
2380  document-state-message (text(MAX))                  [this spec]  8.2.26
2381  document-state-reasons (1setOf type2 keyword)       [this spec]  8.2.27
2382  document-uri (uri)                                  [this spec]  8.2.28
2383  impressions  (integer(0:MAX))                       [this spec]  8.2.32
2384  impressions-completed (integer(0:MAX))              [this spec]  8.2.33
2385  impressions-completed-current-copy (integer(0:MAX))
2386                                                      [this spec]  8.2.29
2387  k-octets  (integer(0:MAX))                          [this spec]  8.2.34
2388  k-octets-processed (integer(0:MAX))                 [this spec]  8.2.35
2389  last-document  (boolean)                            [this spec]  8.2.41
2390  media-sheets  (integer(0:MAX))                      [this spec]  8.2.36
2391  media-sheets-completed (integer(0:MAX))             [this spec]  8.2.37
2392  more-info (uri)                                     [this spec]  8.2.38
2393  output-device-assigned (name(127))                  [this spec]  8.2.42
2394  printer-up-time (integer (1:MAX))                   [this spec]  8.2.39
2395  sheet-completed-copy-number (integer(0:MAX))        [this spec]  8.2.43
2396  time-at-completed (integer (MIN:MAX))               [this spec]  8.2.44
2397  time-at-creation (integer (MIN:MAX))                [this spec]  8.2.45
2398  time-at-processing (integer (MIN:MAX))              [this spec]  8.2.46
2399  warnings-count (integer(0:MAX))                     [this spec]  8.2.40
2400
2401
2402  Document Templates attributes:
2403  ISSUE 15:  TBD - Need to add the xxx-default and xxx-supported for each.
2404  copies (integer(1:MAX))                             [this spec]     7
2405  cover-back (collection)                             [this spec]     7
2406    cover-type (type2 keyword)                        [this spec]     7
2407    media (type3 keyword | name(MAX))                 [this spec]     7
2408    media-col (collection)                            [this spec]     7
2409  cover-front (collection)                            [this spec]     7
2410    cover-type (type2 keyword)                        [this spec]     7
2411    media (type3 keyword | name(MAX))                 [this spec]     7
2412    media-col (collection)                            [this spec]     7
2413  feed-orientation (type3 keyword)                    [this spec]     7
2414  finishings (1setOf type2 enum)                      [this spec]     7
2415  finishings-col (collection)                         [this spec]     7
2416    finishing-template (name(MAX))                    [this spec]     7
2417    stitching (collection)                            [this spec]     7
2418      stitching-locations (1setOf integer(0:MAX))     [this spec]     7
2419      stitching-offset (integer (0:MAX))              [this spec]     7
2420      stitching-reference-edge (type2 keyword)        [this spec]     7
2421  font-name-requested (name(MAX))                     [this spec]     7
2422  font-size-requested (integer(1:MAX))                [this spec]     7
```

```
2423  force-front-side (1setOf integer(1:MAX))        [this spec]   7
2424  imposition-template (type2 keyword | name(MAX))  [this spec]   7
2425  insert-sheet (1setOf collection)                 [this spec]   7
2426    insert-after-page-number (integer(0:MAX))      [this spec]   7
2427    insert-count (integer(0:MAX))                  [this spec]   7
2428    media (type3 keyword | name(MAX))              [this spec]   7
2429    media-col (collection)                         [this spec]   7
2430  media (type3 keyword | name(MAX))                [this spec]   7
2431  media-col (collection)                           [this spec]   7
2432    media-back-coating (type3 keyword | name(MAX)) [this spec]   7
2433    media-color (type3 keyword | name(MAX))        [this spec]   7
2434    media-front-coating (type3 keyword | name(MAX))[this spec]   7
2435    media-hole-count (integer(0:MAX))              [this spec]   7
2436    media-info (text(255))                         [this spec]   7
2437    media-key (type3 keyword | name(MAX))          [this spec]   7
2438    media-order-count (integer(1:MAX))             [this spec]   7
2439    media-preprinted (type3 keyword | name(MAX))   [this spec]   7
2440    media-recycled (type3 keyword | name(MAX))     [this spec]   7
2441    media-size (collection)                        [this spec]   7
2442      x-dimension (integer(0:MAX))                 [this spec]   7
2443      y-dimension (integer(0:MAX))                 [this spec]   7
2444    media-type (type3 keyword | name(MAX)          [this spec]   7
2445    media-weight-metric (integer(0:MAX))           [this spec]   7
2446  media-input-tray-check (type3 keyword | name(MAX))
2447                                                   [this spec]   7
2448  number-up (integer(1:MAX))                       [this spec]   7
2449  orientation-requested (type2 enum)               [this spec]   7
2450  output-bin (type2 keyword | name(MAX))           [this spec]   7
2451  page-delivery (type2 keyword)                    [this spec]   7
2452  page-order-received (type2 keyword)              [this spec]   7
2453  page-overrides (1setOf collection)               [this spec]   7
2454    document-copies (1setOf rangeOfInteger(MAX))   [this spec]   7
2455    input-documents (1setOf rangeOfInteger(MAX))   [this spec]   7
2456    output-documents (1setOf rangeOfInteger(MAX))  [this spec]   7
2457    pages (1setOf rangeOfInteger(MAX))             [this spec]   7
2458    <any other Job Template attributes that affect pages,
2459     such as media or media-col>
2460  page-ranges (1setOf rangeOfInteger(1:MAX))       [this spec]   7
2461  pages-per-subset (1setOf integer(1:MAX))         [this spec]   7
2462  presentation-direction-number-up (type2 keyword) [this spec]   7
2463  print-quality (type2 enum)                       [this spec]   7
2464  printer-resolution (resolution)                  [this spec]   7
2465  separator-sheets (collection)                    [this spec]   7
2466    media (type3 keyword | name(MAX))              [this spec]   7
2467    media-col (collection)                         [this spec]   7
2468    separator-sheets-type (type3 keyword | name(MAX))
```

```
2469                                                      [this spec]    7
2470   sheet-collate (type2 keyword)                      [this spec]    7
2471   sides (type2 keyword)                              [this spec]    7
2472   x-image-position (type2 keyword)                   [this spec]    7
2473   x-image-shift (integer(MIN:MAX))                   [this spec]    7
2474   x-side1-image-shift (integer(MIN:MAX))             [this spec]    7
2475   x-side2-image-shift (integer(MIN:MAX))             [this spec]    7
2476   y-image-position (type2 keyword)                   [this spec]    7
2477   y-image-shift (integer(MIN:MAX))                   [this spec]    7
2478   y-side1-image-shift (integer(MIN:MAX))             [this spec]    7
2479   y-side2-image-shift (integer(MIN:MAX))             [this spec]    7
2480
2481
2482   Job Template attributes:
2483   ISSUE 16:   TBD - Need to add the xxx-default and xxx-supported.
2484   job-copies (integer(1:MAX))                        [this spec]  7.1.1
2485   job-cover-back (collection)                        [this spec]  7.1.2
2486     <member attributes are the same as "cover-back">
2487   job-cover-front (collection)                       [this spec]  7.1.3
2488     <member attributes are the same as "cover-front">
2489   job-finishings (1setOf type2 enum)                 [this spec]  7.1.4
2490   job-finishings-col (1setOf collection)             [this spec]  7.1.5
2491     <member attributes are the same as "finishings-col">
2492   media-size-name (type3 keyword | name(MAX))        [this spec]  7.1.6
2493   media-type (type3 keyword | name(MAX))             [this spec]  7.1.7
2494
2495
2496   Printer Description attributes:
2497   document-creation-attributes-supported (1setOf type2 keyword)
2498                                                      [this spec]  9.1
2499
2500
2501   Operation attributes:
2502   document-message (text(MAX))                       [this spec]   3.8.1.1
2503   job-mandatory-attributes (1setOf type2 keyword)    [this spec]   4.4.2
2504   last-document (boolean)                            [this spec]    0
2505
```

2506   ## 15.2 Keyword attribute values

2507   ISSUE 17: TBD - Need to list the keyword attribute values. Do so by reference to the values registered for
2508   corresponding attributes.

2509   ## 15.3 Enum Attribute Values

2510   The following table lists all the new enum attribute values defined in this document as additional type2 enum values.
2511   These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.

```
2512
2513    Value       Name                            Reference   Section:
2514    --------     -----------------------         ---------   -------
2515  document-state (type1 enum)                     [this spec] 8.2.25
2516    3   pending                                   [this spec] 8.2.25
2517    5   processing                                [this spec] 8.2.25
2518    7   canceled                                  [this spec] 8.2.25
2519    8   aborted                                   [this spec] 8.2.25
2520    9   completed                                 [this spec] 8.2.25
2521
2522  job-finishings (1setOf type2 enum)              [this spec] 7.1.4
2523    <enum values are the same as "finishings">
2524
2525  operations-supported (type2 enum)              [rfc2911]   4.4.15
2526    0x000F     Close-Job                          [this spec] 4.3
2527    0x0033     Cancel-Document                    [this spec] 3.8
2528    0x0034     Get-Document-Attributes            [this spec] 3.5
2529    0x0035     Get-Documents                      [this spec] 3.6
2530    0x0036     Delete-Document                    [this spec] 3.9
2531    0x0037     Set-Document-Attributes            [this spec] 3.7
2532    0x0039     Create-Document                    [this spec] 3.1
2533    0x003A     Send-Document-Data                 [this spec] 3.2
2534
```

2535 ## 15.4 Operations

2536 The following table lists all of the operations defined in this document. These are to be registered according to the
2537 procedures in RFC 2911 [rfc2911] section 6.4.
2538

```
2539  Operations                              Reference   Section
2540  ------------------------                ---------   --------
2541  Cancel-Document                         [this spec] 3.8
2542  Close-Job                               [this spec] 4.3
2543  Create-Document                         [this spec] 3.1
2544  Delete-Document                         [this spec] 3.9
2545  Get-Document-Attributes                 [this spec] 3.5
2546  Get-Documents                           [this spec] 3.6
2547  Send-Document-Data                      [this spec] 3.2
2548  Set-Document-Attributes                 [this spec] 3.7
2549
```

2550 ## 15.5 Attribute Group tags

2551 The following table lists all the attribute group tags defined in this document. These are to be registered according to
2552 the procedures in RFC 2911 [rfc2911] section 6.5.

```
2553  Value     Name                                  Reference    Section
2554  -----     ------------------------------------  ---------    -------
2555  0x09      document-attributes-tag               [this spec]  11
2556
```

16 Internationalization Considerations

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

17 Security Considerations

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

18 Contributors

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19 Acknowledgments

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21 Appendix A: Document operations compared to Job operations

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

2588 Table 15 compares the Job and Document operations. The two Conf. columns indicate the conformance
2589 requirements (REQUIRED = REQ, OPTIONAL = OPT) for the Job and Document operations respectively. A "REQ"
2590 in the Document Conformance column means if the Document object is supported. Whether a Document operation
2591 is a method on the Job object or the Document object depends on the modeling regime and is not an essential part
2592 of the semantics described here, since these semantics are intended to apply to both to object-oriented and object-
2593 based protocols, APIs, and implementations.

2594   **Table 15 - Document operations compared to Job operations**

Job operations	Job Conf.	Document operations	Doc Conf
Cancel-Current-Job	OPT	*N/A, can only cancel a document explicitly by document number and explicit job id.*	OPT
Cancel-Job	REQ	**Cancel-Document**	REQ
Create-Job	OPT	**Create-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 3.3)	REQ[50]
Print-URI	OPT	**Send-URI** (existing operation - see [rfc2911] with an additional Document attributes group defined in section 3.4)	OPT
N/A		**Send-Document-Data**	REQ
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 use Create-Job with "ipp-attribute-fidelity" = 'true' and Create-Document request to validate a multi-document job.*	REQ

2595
2596

2597   22 Annex B: Change Log (informative)

2598 The following summaries of the changes in chronological order:

2599 Version 0.3, 9 September 2002:
2600   1. Reformatted as an IEEE-ISTO standard and added the usual sections for a standard.
2601   2. Added "original-requesting-user-name" Operation attribute to Table 6.
2602   3. Added "y" to "output-bin" in Table 8 so it MAY be a Document Template attribute.
2603   4. Clarified the * and in Table 9 - Job and Document Description attributes.

---

[50] The Send-Document operation is OPTIONAL for a Printer to conform to [rfc2911], but is REQUIRED for a Printer
to conform to this Document object specification.

2604   5. Added section 8.2.1 all of the Printer attributes defined In any IPP standard.
2605   6. Allocated operation-id enums in section 10 to the 7 Document operations.
2606   7. Added the conformance section 12
2607   8. Completed the IANA Considerations section 15.
2608
2609 Version 0.4, 14 October 2002:
2610   1. Added the operation specifications.
2611   2. Added the Create-Document and Send-Data to be more parallel with Jobs and support PWG PSI.
2612   3. Resolved the 15 issues in version 0.3 as discussed on the mailing list.
2613   4. Added the Attribute Precedence section 5.
2614   5. Added [ippsave] attributes.
2615   6. Added job-mandatory-attributes, job-cover-back, job-cover-front, job-copies, job-finishings, job-finishings-col.
2616   document-id-uri, and redirect-uri.
2617
2618 Version 0.5, 25 October 2002, as a result of the PWG Semantic Model telecon, October 24, 2002:
2619   1. Fixed the title to say "Proposed Standard" and removed the 5100.n number until the document is approved by
2620   the PWG Last Call to progress as a Draft Standard.
2621   2. Changed Cancel-Document from OPTIONAL to REQUIRED.
2622   3. Added Table 3 and Table 4 to show the request and response signatures of the Document Creation and
2623   Validation operations.
2624   4. Renamed the "document-number" operation attribute to "input-document-number", to agree with [pwg5100.4]
2625   and because the Document object is really the Input Document (as opposed to the Output Document). The
2626   Printer copies this value to the Document's "document-number" Document Description attribute.
2627   5. Clarified that the Printer MUST reject a Create-Document request if the "document-number" already exists.
2628   6. Clarified that the client cannot supply Subscription attributes in any Document Creation requests.
2629   7. Added "document-message" (text(127)) operation attribute to the Document Creation requests to go with the
2630   "document-message" agreement (see point #15).
2631   8. Fixed Create-Document response to return Job status attributes in Group 3 and Document status attributes in
2632   Group 4.
2633   9. Required the Printer to return just the "document-number" and "document-id-uri" (uri) Document Description
2634   attribute in a Document Creation response.
2635   10. Added the "document-mandatory-attributes" operation attribute.
2636   11. Separated the returned Job status attributes and the Document status attributes into two groups, one Job
2637   Attributes and the other Document attributes.
2638   12. Allowed the client to supply or omit the "document-uri" operation attribute in a Validate-Job request.
2639   13. Clarified that the "document-number" operation attribute MUST follow the Printer and Job Target in Group 1.
2640   14. Changed the Get-Documents response when there is no "requested-attributes" to simply "document-number"
2641   and "document-id-uri" to be parallel with the Get-Jobs operation.
2642   15. Changed the "message" operation attribute in Cancel-Document and Cancel-Current-Document to
2643   "document-message" operation attribute which the Printer copies to the "document-message" Document
2644   Description attribute for use both by the user and the operator.
2645   16. Clarified that the "document-state-reasons" values never affect Job scheduling.
2646   17. Made Job Level - page override programming higher precedence than Document level Document object
2647   attributes.
2648   18. Clarified PDL document data precedence and its relationship to Job Template attributes ending with "-
2649   requested".
2650   19. In Table 6, flagged the operation attributes that the Printer copies to the corresponding Job and Document
2651   Description attributes in Document Creations operations.
2652   20. Fixed "job-mandatory-attributes" operation attribute so its only supplied at Job level, now that we have
2653   "document-mandatory-attributes" operation attribute.
2654   21. Clarified that "ipp-attribute-fidelity" can be supplied at both the Job and Document Levels and how it interacts
2655   with "job-mandatory-attributes" and "document-mandatory-attributes" operation attributes.
2656   22. Disallowed "output-bin" at the Document Level (and Page Level). It subsets the single stream of Input-Pages
2657   across Input-Documents.
2658   23. Disallowed "page-ranges" at the Page Level.

2659   24. Disallowed "pages-per-subset" at the Document level (and Page Level).
2660   25. Disallowed "separator-sheets" at the Page Level.
2661   26. Added "document-printer-up-time" Document Description attribute for Get-Documents and Get-Document-
2662   Attributes responses that the Printer MUST support, just like "job-printer-up-time" operation attribute for Get-
2663   Jobs and Get-Job-Attributes.
2664
2665 Version 0.6, 13 January 2003, agreements from New Orleans October PWG meeting and subsequent telecons:
2666   1. Deleted the Cancel-Current-Document and Validate-Document operations.
2667   2. Deprecated the "input-document-number" operation attribute from the Document Creation operations.
2668   3. Deleted the "document-mandatory-attributes" operation attribute to align with the PWG Semantic model. So
2669   both specifications have only the "job-mandatory-attributes" operation attribute. The client can only supply at
2670   the Job Level. The Document Level inherits from the Job Level.
2671   4. Increased "document-message" operation attribute length from 127 to MAX (1023) octets.
2672   5. Clarified that "ipp-attribute-fidelity" and "job-mandatory-attributes" can only be supplied at the Job Level; the
2673   Document level inherits their values.
2674   6. Added "ipp-attribute-fidelity" and "job-mandatory-attributes" Job Description attributes.
2675   7. Added the "media-size-name" as a member attribute of "media-col" and as a separate Job Template attribute
2676   as used by UPnPv1 and UPnPv2.
2677   8. Added the "media-type" as a Job and Document Template attribute on its own as used by UPnPv1 and
2678   UPnPv2 (as well as leaving it as a member attribute of the "media-col" Job and Document Template
2679   attributes).
2680   9. Renamed "document-printer-up-time" Document Description attribute to simply "printer-up-time".
2681   10. Added the following Job Description attributes: "ipp-attribute-fidelity", and "job-mandatory-attributes".
2682   11. Removed the following Document Description attributes: "ipp-attribute-fidelity".
2683   12. Added the following Document Description attributes: "document-format-detail", "document-format-detected",
2684   "job-id", "job-printer-uri", "job-uri", "output-device-assigned".
2685   13. Defined all of the Document Description attributes, often with references to other specifications, so that they
2686   appear in the table of contents.
2687
2688 Version 0.6, 14 March 2003, agreements from the Maui January PWG meeting and subsequent telecons:
2689   1. Fixed up the file naming and numbering to agree with the latest PWG process agreements.
2690   2. Updated the Abstract and Introduction to reflect the additions.
2691   3. Fixed cross references to use the standard numbers as agreed, rather than mnemonic references.
2692   4. Deprecated the "input-document-number" operation attribute ([pwg5100.4] section 9.2.1 in the Create-
2693   Document Requests
2694   5. Renamed Send-Data to Send-Document-Data to more clearly reflect the scope of the operation.
2695   6. Added the REQUIRED Close-Job operation to close a job that contains Document objects. Using "last-
2696   document" still works too and the Printer MUST support both ways.
2697   7. Retained the idea that the Printer MUST NOT copy down any attributes supplied in the Job Creation
2698   operation to the Document object as observable in Document object query responses. Document objects
2699   inherit that effect from the Job object.
2700   8. Added the following operation and Document Description attributes: document-container-summary
2701   (collection), document-creator-application-name (name(MAX)), document-creator-application-version
2702   (text(127)), document-creator-os-name (name(40)), document-creator-os-version (text(40)), document-
2703   format-device-id (text(127)), document-format-version (text(127). The "document-container-summary"
2704   collection attribute may contain them, plus "document-format" and "document-natural-language".
2705   9. REQUIRED Printers to support "document-format-version" Document Description.
2706   10. Deprecated "document-overrides" and indicated that the agreement is to re-issue [pwg5100.4] without
2707   "document-overrides".
2708   11. Prefixed the following three Document Description attributes that are copies of Job Description attributes with
2709   "document-" so that no Document attribute has a "job-" prefix: "job-printer-uri" becomes "document-job-
2710   printer-uri", "job-uri" becomes "document-job-uri", and "job-id" becomes "document-job-id".
2711   12. Added the encoding for the "document-attributes-tag" as 0x09.
2712   13. Updated the IANA Registration section, but still needs more work.
2713